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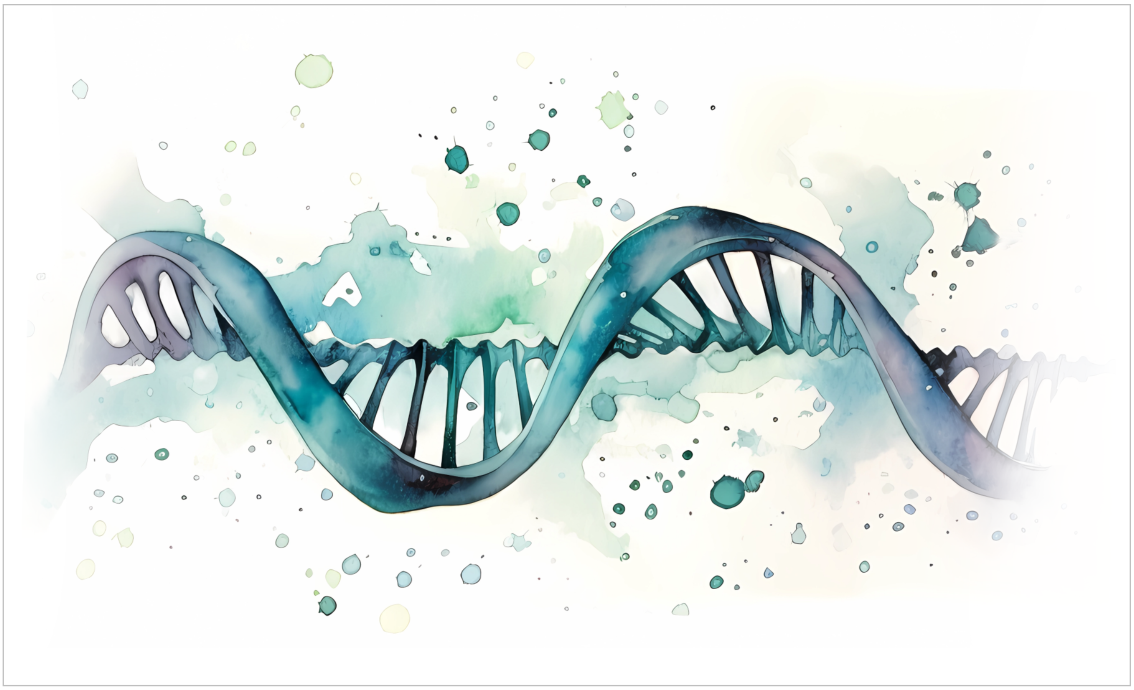
Effects of *Wolbachia* on transposable element dynamics and on fitness traits in *Drosophila melanogaster*

Ana Teresa Mendes Eugénio



Dissertation presented to obtain the **Ph.D. degree** in **Integrative Biology and Biomedicine**

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Oeiras, June, 2023

INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA ANTÓNIO XAVIER | UNIVERSIDADE NOVA DE LISBOA

Oeiras, June, **2023** **Effects of *Wolbachia* on transposable element dynamics and on fitness traits in *Drosophila melanogaster*** Ana Teresa Mendes Eugénio

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Research work coordinated by: INSTITUTO GULBENKIAN DE CIÊNCIA

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If you know you are on the right track,
if you have this inner knowledge,
then nobody can turn you off…
no matter what they say.

- **Barbara McClintock**

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Summary

Transposable elements (TEs) are repetitive DNA sequences capable of changing position independently of their host genome, and that are widespread across eukaryotes (Bourque et al. 2018; Wells & Feschotte 2020). TE mobilization can produce genetic variation, which may affect host adaptation and resistance to environmental change (Pappalardo et al. 2021; Liu et al. 2022) and produce novel gene or gene regulatory networks (Trizzino et al. 2017). Furthermore, TEs have potential applications in biotechnology (Sandoval-Villegas et al. 2021) and in gene therapy (Amberger & Ivics 2020). However, TE mobilization can also be disruptive and generate deleterious mutations that cause disabilities and diseases (Ni et al. 2017; Payer & Burns 2019). Because of the many effects of TEs on genome evolution and function, and on host biology, as well as their potential contribution to novel therapeutic strategies and their role in disease, it is crucially important to study TEs and their behaviour, and the factors that affect them.

The knowledge on which factors can affect TE mobilization is still rather incomplete, with some studies focused on internal host properties, such as host age (Sturm et al. 2015; Signor et al. 2022), or on external conditions, such as temperature (Kelly et al. 2018; Cappucci et al. 2019). Although there is little information on biotic factors, some studies have suggested that endosymbionts, namely *Wolbachia*, could potentially affect TEs, by affecting the mechanisms of TE regulation (Kraaijeveld & Bast 2012; Mayoral et al. 2014) and by altering the rate of TE transposition (Touret et al. 2014), for example.

Wolbachia pipientis is a maternally transmitted Gram-negative bacterium, common in arthropods (Werren et al. 2008; Lefoulon et al. 2016). It is able to manipulate the reproductive system of some of its hosts in a variety of ways, such as the developmental feminization of genetic males (Kern et al. 2015; Badawi et al. 2018), by killing developing males infected with *Wolbachia* (Arai et al. 2020; Hill et al. 2022), and inducing parthenogenesis, in which infected virgin mothers produce female offspring (Lindsey et al. 2016; Ning et al. 2019). Moreover, *Wolbachia* can also induce cytoplasmic incompatibility, a phenomenon in which a cross between an uninfected female and an infected male, or between parents infected with different *Wolbachia* strains, results in embryonic lethality (Bagheri et al. 2019; Namias et al. 2022). *Wolbachia* can also enhance or reduce fertility and fecundity in both females and males of different host species (Gruntenko et al. 2019; Zhang et al. 2021).

Besides reproduction, *Wolbachia* can have other effects on host biology, including longevity and aging (Maistrenko et al. 2015), and resistance to arboviruses (Hedges et al. 2008; Teixeira et al. 2008).

The latter has led to *Wolbachia* being used as a tool to reduce and prevent mosquito-borne arboviral infections in humans (Utarini et al. 2021).

In this thesis, I aimed at testing the hypothesis that *Wolbachia* infection affected TE activity in *Drosophila melanogaster* hosts. To the best of our knowledge, this was the first study to apply a systematic approach to answer this question, investigating different transposable elements and multiple host genotypes. As we found effects that depended on host genotype, we also aimed at exploring whether potential effects of *Wolbachia* infection on host fitness differed between host genotypes.

In **Chapter 2**, we investigated the effect of *Wolbachia* on the expression of TEs in genotypes of *Drosophila melanogaster*. Specifically, we first measured *Wolbachia* titers in whole bodies of 25 isogenic genotypes from the *Drosophila melanogaster* Genetic Reference Panel – DGRP (Mackay et al. 2012), and observed significant differences between genotypes, albeit within the same order of magnitude. For these 25 genotypes, we also compiled the number of insertions called "novel" in Mackay et al. (i.e., insertions not present in the Release 5 of the *Drosophila melanogaster*'s reference genome) for 14 different TEs, using data from the TIDAL-FLY v1.0 tool (Rahman et al. 2015), and observed significant variation in number of novel TE insertions between genotypes. Finally, we studied the effect of *Wolbachia* in the expression of the 14 TEs, in paired *Wolbachia*-positive (Wolb+) / *Wolbachia*-negative (Wolb-) genotypes, and found significant differences in levels of TE transcript in 21.1% of the 350 TE-genotype combinations. *Wolbachia* effects on TE transcription depended on TE identity, *Wolbachia* infection status, and on host genotype. This chapter has been published in the journal Genome Biology and Evolution (Eugénio et al. 2023).

In **Chapter 3**, we furthered the investigation on *Wolbachia* effects in *Drosophila melanogaster* host lines, specifically exploring its loads within hosts, and its potential effect on host fitness. First, we measured *Wolbachia* proliferation in whole bodies of adult females of ten DGRP lines, every five days until day 35 post-pupal hatching, and observed significant differences between host genotypes, and with age, with older flies having generally higher *Wolbachia* loads. We also collected other datasets on *Wolbachia* loads: 1) in different body parts of adult females (heads, thoraxes, and abdomens) of two DGRP lines reared at different temperatures (20, 25 and 30ºC), where we observed significant differences between genotypes, body parts, and with temperature; 2) in female whole bodies of three DGRP lines at different temperatures (18 and 25°C) and timepoints (pupal stage ~11 and days 1, 5, 10, 15, 20 and 30 post-pupal hatching), and we observed differences in *Wolbachia* loads between genotypes, temperatures and ages. Finally, we measured fecundity (counting the number of living adult offspring) of couples from ten Wolb+/Wolb- DGRP paired lines of the same genotype, annotating parental death during this period.

We observed for both traits that there were differences between genotypes, and that, albeit in only some host lines, *Wolbachia* could affect overall fecundity, offspring sex ratios, and survival.

Overall, our work showed that the endosymbiont *Wolbachia* can, indeed, affect transposable element dynamics and fitness of *Drosophila melanogaster* hosts, and that these effects are highly dependent on the genotype of the host.

Resumo

Os elementos transponíveis (transposões; TEs) são sequências de DNA repetitivas com capacidade de alterar a sua posição no genoma hospedeiro, sendo comuns na maioria dos eucariotas (Bourque et al. 2018; Wells & Feschotte 2020). A mobilização destes elementos pode criar variação genética no hospedeiro e afetar a sua potencial adaptação e resistência a mudanças ambientais (Pappalardo et al. 2021; Liu et al. 2022), e pode ser um fator na criação de redes regulatórias dos genes (Trizzino et al. 2017). Além disso, os TEs podem ter aplicações nas áreas da biotecnologia (Sandoval-Villegas et al. 2021) e da terapia genética (Amberger & Ivics 2020). No entanto, a mobilização de TEs pode também ser disruptiva e gerar mutações deletérias, causando deficiências e doenças (Ni et al. 2017; Payer & Burns 2019). Devido aos efeitos dos TEs na evolução e funções do genoma, e na biologia do hospedeiro, assim como potencialmente contribuir para o desenvolvimento de novas estratégias terapêuticas e causar doenças sérias, é crucial estudar o seu comportamento no genoma hospedeiro e quais os possíveis fatores que os afetam.

O conhecimento dos fatores que afetam a mobilização dos TEs ainda tem várias lacunas, sendo que os estudos se focam nas propriedades internas do hospedeiro, como a sua idade (Sturm et al. 2015; Signor et al. 2022), ou condições ambientais externas, como a temperatura (Kelly et al. 2018; Cappucci et al. 2019). Embora ainda haja pouca informação sobre fatores bióticos, alguns estudos sugerem que endossimbiontes, em particular a bactéria *Wolbachia*, podem afetar TEs, por exemplo, manipulando os mecanismos de regulação nos hospdeiros (Kraaijeveld & Bast 2012; Mayoral et al. 2014) e a sua taxa de transposição (Touret et al. 2014).

Wolbachia pipientis é uma bactéria Gram-negativa comum em artrópodes, que é transmitida por via materna, (Werren et al. 2008; Lefoulon et al. 2016). É capaz de manipular o sistema reprodutivo de alguns hospedeiros, através da feminização de machos genéticos durante o seu desenvolvimento (Kern et al. 2015; Badawi et al. 2018), matando machos infetados com *Wolbachia* durante o seu desenvolvimento (Arai et al. 2020; Hill et al. 2022) e induzindo partenogénese, na qual mães virgens infetadas produzem descendentes fêmeas (Lindsey et al. 2016; Ning et al. 2019). Além disso, a *Wolbachia* também pode induzir incompatibilidade citoplasmática, na qual um cruzamento entre uma fêmea não infetada e um macho infetado, ou entre pais infetados com diferentes estirpes de *Wolbachia*, resulta em letalidade embrionária (Bagheri et al. 2019; Namias et al. 2022). A *Wolbachia* pode ainda aumentar ou reduzir a fertilidade e a fecundidade em fêmeas e machos de diferentes espécies hospedeiras (Gruntenko et al. 2019; Zhang et al. 2021).

Além de afetar o sistema reprodutor do hospedeiro, a *Wolbachia* pode ter outros efeitos na sua biologia, incluindo na longevidade e no envelhecimento (Maistrenko et al. 2015), bem como conferir resistência a infeções por arbovírus (Hedges et al. 2008; Teixeira et al. 2008). Este último aspeto leva a que esta bactéria esteja a ser usada como ferramenta na redução e prevenção de doenças em humanos provocadas por infeções virais transmitidas por mosquitos (Utarini et al. 2021).

Nesta tese, o meu principal objetivo era testar a hipótese de que infeções provocadas por *Wolbachia* podem afetar a atividade de TEs no genoma do hospedeiro *Drosophila melanogaster*. Do que sabemos, este foi o primeiro estudo a aplicar uma abordagem sistemática, investigando diferentes TEs e múltiplos genótipos de um hospedeiro. Os nossos dados mostraram que os efeitos de *Wolbachia* são dependentes do genótipo hospedeiro e isso levou-nos a investigar também a potencial interferência desta bactéria na *fitness* do mesmo.

No **Capítulo 2**, investigámos o efeito de *Wolbachia* na expressão de TEs em *Drosophila melanogaster*. Primeiro medimos a quantidade de *Wolbachia* presente em moscas de 25 genótipos provenientes do *Drosophila melanogaster* Genetic Reference Panel (DGRP; Mackay et al. 2012) e observámos diferenças significativas entre os genótipos, embora dentro da mesma ordem de grandeza. Para esses 25 genótipos, recolhemos o número de inserções descritas como "novel" em Mackay et al. (ou seja, inserções não presentes na Versão 6 do genoma de referência de *Drosophila melanogaster*) para 14 TEs diferentes, usando dados da TIDAL-FLY v1.0 (Rahman et al. 2015). Observámos variação significativa no número de novas inserções de TEs entre genótipos. Por fim, estudámos o efeito de *Wolbachia* na expressão dos 14 TEs, em genótipos com *Wolbachia* (Wolb+) e sem *Wolbachia* (Wolb-). Encontrámos diferenças significativas nos níveis de transcrição de TE em 21,1% das 350 combinações TE – genótipo testadas. Os efeitos da *Wolbachia* na transcrição de TEs dependeram do tipo de TE, na presença de *Wolbachia* e do genótipo do hospedeiro. Este capítulo foi publicado na revista *Genome Biology and Evolution* (Eugénio et al. 2023).

No **Capítulo 3**, aprofundámos a investigação de *Wolbachia* nos genótipos de *Drosophila melanogaster*, explorando especificamente a quantidade de bactérica presente nos hospedeiros e o seu efeito na *fitness* dos mesmos. Primeiro, medimos a proliferação de *Wolbachia* em corpos de fêmeas adultas de dez linhas DGRP, a cada cinco dias até ao dia 35, e observámos diferenças significativas entre genótipos e com a idade, com moscas mais velhas apresentando geralmente maior carga desta bactéria.

Também adquirimos dados acerca da quantidade de *Wolbachia* em: 1) diferentes partes do corpo de fêmeas adultas (cabeça, tórax e abdómen) de duas linhas DGRP a diferentes temperaturas (20, 25 e 30ºC), e observámos diferenças significativas entre genótipos, partes do corpo e temperaturas; 2) corpos de fêmeas de três linhas de DGRP a diferentes temperaturas (18 e 25ºC) e estados de desenvolvimento (estádio pupal ~11 e dias 1, 5, 10, 15, 20 e 30 pós-eclosão), sendo que observámos diferenças na proliferação de *Wolbachia* entre genótipos, temperatura e desenvolvimento. Finalmente, medimos a fecundidade (contando o número de descendentes adultos vivos) de casais de dez linhas Wolb+/Wolb- DGRP do mesmo genótipo, anotando a morte dos pais durante este período. Observámos que, para ambas as características, havia diferenças entre genótipos e que, embora apenas em algumas linhas, a *Wolbachia* afetava o número e o rácio sexual dos descendentes, bem como a sobrevivência das moscas.

No geral, este projeto mostrou que o endossimbionte *Wolbachia* consegue afetar a dinâmica dos TEs e a *fitness* dos hospedeiros de *Drosophila melanogaster*, sendo que estes efeitos são grandemente dependentes do genótipo do hospedeiro.

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CHAPTER 1

General Introduction

Author contributions

Ana Eugénio wrote this chapter. Patrícia Beldade commented on the structure of a first draft.

Transposable elements

Genetic variation describes the differences in DNA sequences that occur between organisms of a population or species. When heritable and translated to phenotypic variation, it is the raw material for biological evolution, and essential for adaptation to environmental change (Krebs & Loeschcke 1994; Bernatchez 2016; Kardos et al. 2021). An important and relatively understudied source of genetic variation are the mutations caused by transposable elements (Kidwell & Lisch 1997; Rey et al. 2016; Catlin & Josephs 2022).

Transposable elements (TEs) are repetitive DNA sequences capable of replicating independently within host genomes (Sawyer & Hartl 1986; Bourque et al. 2018; Wells & Feschotte 2020), with size ranging from a few hundred to several thousand base pairs (Arkhipova & Yushenova 2019). TEs were first discovered in the maize genome by Barbara McClintock (McClintock 1950; Ravindran 2012), for which she was awarded the *Nobel Prize in Physiology or Medicine* in 1983 (Lewin 1983). TEs have since been found in almost all organisms, making up for from small to very high percentages of their host's genome (Fig. 1.1) (Kidwell 2002; Chénais et al. 2012).

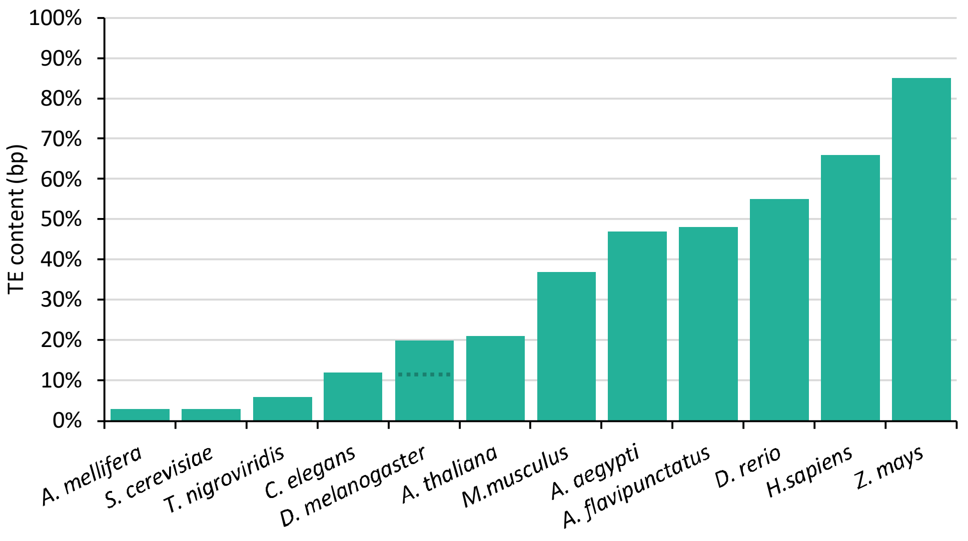

Fig. 1.1 Percentage of TE content in the genome of different species – *Apis mellifera*: ~3% (The Honeybee Genome Sequencing Consortium 2006), *Saccharomyces cerevisiae*: ~3% (Kim et al. 1998), *Tetraodon nigroviridis*: ~6% (Chalopin et al. 2015), *Caenorhabditis elegans*: ~12% (Sijen & Plasterk 2003), *Drosophila melanogaster*: ~11-20% (11% is represented by a dash line in the bar plot; Quesneville et al. 2005; Sessegolo et al. 2016), *Arabidopsis thaliana*: ~21% (Buisine et al. 2008), *Mus musculus*: ~37% (Chinwalla et al. 2002), *Aedes aegypti*: ~47% (Nene et al. 2007), *Aneides Flavipunctatus*: ~48% (Sun et al. 2012), *Danio rerio*: ~55% (Chalopin et al. 2015), *Homo sapiens*: ~66% (de Koning et al. 2011), *Zea mays*: ~85% (Schnable et al. 2009).

In the context of their natural history, TEs they have been able to spread and fixate in almost all organisms, by horizontal transmission across species (Bartolomé et al. 2009; Melo & Wallau 2020; Zhang et al. 2020), and by efficient vertical transmission via the germline (Haig 2016; de Albuquerque et al. 2020). Despite the large diversity of TEs, which reflects their evolution and adaptation to different hosts, they can be categorized in groups based on similarities in sequence, behaviour, and origin. Different classifications have been proposed in the Literature, as more information about these elements is gathered. Here, I present a TE classification structure in eukaryotes (Fig. 1.2) based on the integration of some of the most commonly used classifications (Wicker et al. 2007; Bourque et al. 2018; Wells & Feschotte 2020).

TE classification

TEs can be classified by either autonomous or non-autonomous, according to their ability, or lack of it, to replicate independently of other TEs (Naville et al. 2019; Wicker et al. 2022). Separately from their autonomy, TEs can be divided into two major classes, according to their mechanism of transposition, that either includes the production of an RNA intermediate (Class 1), or not (Class 2), and either involves the copy of their sequence first, which is traditionally called a *copy-and-paste* mechanism, or by directly excising both or just one of their DNA strands from the donor DNA site, respectively called *cut-and-paste* and *peel-and-paste*. They are further divided based on their mechanism of integration in the target DNA site, which so far has been found to be either catalysed by integrases (Li et al. 2022), transposases (Nesmelova & Hackett 2010), tyrosine recombinases (YR) (Poulter & Butler 2015), a reverse transcriptase - endonuclease combination (Pyatkov et al. 2004), or by a rolling-circle replication initiator (Kapitonov & Jurka 2007).

Class 1 TEs, also called retrotransposons, produce an RNA intermediate that is reverse transcribed to DNA by a TE-encoded reverse transcriptase to create a new TE copy (Malik & Eickbush 1999; Finnegan 2012), that is then inserted into a new location in the host genome (Fig. 1.2). This corresponds to the so-called *copy-and-paste* mechanism for transposition. Retrotransposons can be further subdivided into: 1) retrotransposons that contain long terminal repeats (LTR retrotransposons), which integration is catalysed by an integrase (Wells & Feschotte 2020), similarly to retroviruses (Boeke & Stoye 1997; Wang & Han 2022); 2) long interspersed nuclear elements (LINEs), which encode a combination of reverse transcriptase and endonucleases necessary for their target-primed reverse transcription process for integration (Finnegan 1997; Han 2010); 3) short interspersed nuclear elements (SINEs), which are non-autonomous and use LINEs' machinery for mobilization (Han 2010), and together with LINEs are frequently referred as the non-LTR retrotransposons (Han 2010; Wells & Feschotte 2020);4) *Dictyostelium* intermediate repeat sequences (DIRSs), also called YR retroelements, encode a tyrosine recombinase, are framed by inverted or split direct repeats, and mobilize via single-stranded linear extrachromosomal cDNA intermediates (Goodwin & Poulter 2001; Malicki et al. 2020); 5) Penelope-like elements (PLEs), contain direct or inverted pseudo-LTRs, and encode both reverse transcriptases and endonucleases (Pyatkov et al. 2004; Craig et al. 2021). The transposition mechanisms of DIRS and PLE retrotransposons are still not completely understood.

Class 2 TEs are called DNA transposons and do not produce an RNA intermediate. They can transpose either by a *cut-and-paste* mechanism, whereby their double-stranded DNA sequence is cleaved from the donor site before inserting elsewhere, or by a *peel-and-paste* mechanism, whereby only one DNA strand is displaced from the donor site before integration elsewhere, and before complementary DNA strands are synthesized in donor and recipient sites (Fig. 1.2). *Cut-and-paste* DNA transposons mobilize by excision from the donor site, but are still able to increase copy number through methods such as the exploitation of the host's gap repair system after excision (Engels et al. 1990) and during chromosome recombination (Schaack et al. 2010). These TEs are further divided into: 1) TEs flanked by terminal inverted repeats (TIRs), that produce a transposase that recognizes those TIRs and cuts the double-stranded DNA at both ends (Feschotte & Pritham 2007); 2) Cryptons/YR DNA transposons, which encode tyrosine recombinase and are thought to be cut from the donor site as an extrachromosomal circular DNA (Goodwin et al. 2003). *Peel-and-paste* DNA transposons are divided into: 1) Helitrons, that encode a rolling-circle replication initiator for their integration (Kapitonov & Jurka 2007; Touati et al. 2021); 2) Polintons/Mavericks, giant TEs that contain TIR sequences and encode integrase, and seem to replicate using a self-encoded DNA polymerase (Pritham et al. 2007; Haapa-Paananen et al. 2014). The transposition mechanisms of Helitrons, and especially Cryptons and Polintons, still need to be better understood. Within classes, TEs are further organized into superfamilies that have a common genetic organization and phylogenetic origin, and then into families, that share a family-specific ancestral consensus sequence (Bourque et al. 2018).

TE content is highly variable across species (Feschotte & Pritham 2007; Warren et al. 2015), and animals seem to have the highest variance in TE superfamilies and families' content, while fungi and protists seem to have the lowest variance (Elliott & Gregory 2015). Examples of the most common families of TEs across all taxa are the LTR retrotransposons *Ty3/gypsy* and *Ty1/copia* (Flavell et al. 1997; Tubío et al. 2005), and the TIR DNA transposons *Tc1/mariner* and *hAT* (Plasterk et al. 1999; Atkinson 2015).

Figures 1.1 and 1.2 show part of what we know today about TE content and organization but, as previously mentioned, TEs and the way they are classified is still being revised (Piégu et al. 2015; Guio & González 2019), as more studies on phylogeny, genetic structure, and mobilization mechanisms are performed, novel TEs are discovered, and new methods to detect insertions are established.

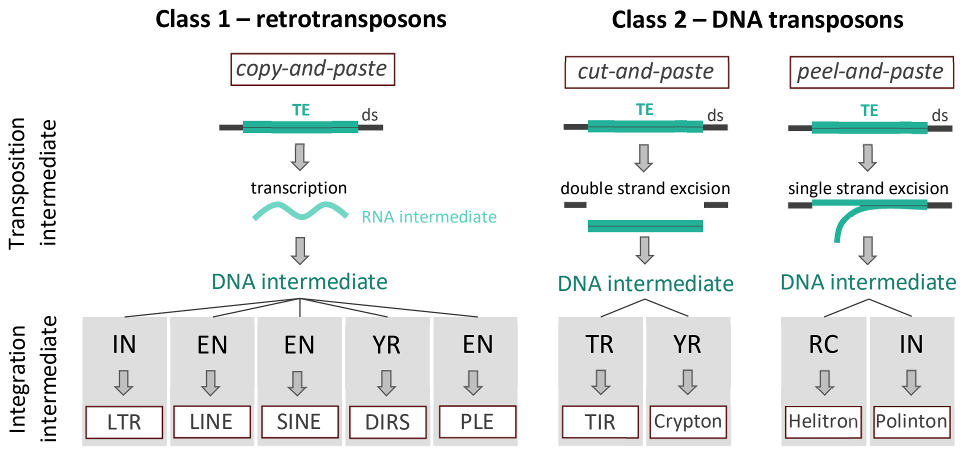

Fig. 1.2 Schematic representation of a TE classification in eukaryotes, focused on class and further subdivisions. The donor DNA site (ds) contains a TE insertion (green) that may be transcribed to an RNA intermediate first (Class 1; *copy-and-paste*) or directly remove both (*cut-and-paste*) or just one (*peel-and-paste*) of their DNA strands from the donor site (Class 2). TEs are further divided depending on their integration mechanism, that can either be catalysed by integrases (IN), endonucleases (EN), tyrosine-recombinases (YR), transposases (TR) or with a rolling-circle replication initiator (RC). Other abbreviations can be found in the text.

There are different approaches to detect TE insertions from sequence data that either rely on assembled genomes or are based on raw reads (Goerner-Potvin & Bourque 2018; Miyao & Yamanouchi 2022). This is a challenging process, as TE sequences can be long, repetitive, and truncated, and are frequently discarded from genomic studies. However, advances in DNA sequencing techniques (Shahid & Slotkin 2020) and new bioinformatic tools have been allowing for longer reads and for the completeness of genomes, which is leading to a better documentation of TE identity and distribution in the genome, and also to a better understanding of the complex relationship that transpires between TEs, theirs hosts and the environment.

Transposable elements, hosts, and the environment

TEs are selfish genetic elements capable of independent mobilization and of creating new insertions in host genomes. When these insertions cause mutations that are strongly deleterious, they are usually quickly removed from a population. On the other hand, insertions of little or no fitness effect may be fixed through genetic drift or gradually eliminated at a neutral rate (Lynch et al. 2016). However, an ever-increasing number of studies has been showing that TEs can be domesticated and exapted, having their genes and enzymatic machinery appropriated, and therefore be beneficial to host genomes (Sinzelle et al. 2009; Alzohairy et al. 2013; Jangam et al. 2017; Joly-Lopez & Bureau 2018; Capy 2021).

Studies have shown that TEs can be crucial components of gene and gene regulatory networks (Volff 2006; Feschotte 2008; Trizzino et al. 2017; Liu et al. 2022). For example, MER20 is a DNA transposon that was recruited for a gene regulatory network necessary for the origin of the placenta and pregnancy in mammals (Lynch et al. 2011), reverse transcriptases were shown to be necessary for normal chromosome telomere replication in different eukaryote genomes (Lingner et al. 1997), some neuronal enhancers were derived from SINE retrotransposons (Bejerano et al. 2006; Santangelo et al. 2007), the DNA transposon *S-element* has been associated with the evolution of heat-shock genes in *Drosophila melanogaster* (Maside et al. 2002), and the *PiggyMac* transposase seems to be involved in the rearrangement of the genome in *Paramecium tetraurelia* (Baudry et al. 2009).

TEs can also play important roles in host adaptation and in resistance to stress and environmental change (Casacuberta & González 2013; Schrader & Schmitz 2019; Pappalardo et al. 2021; Liu et al. 2022). For example, the *carbonaria* DNA transposon insertion was responsible for the iconic industrial melanism of *Biston betularia* (Hof et al. 2016a), Helitrons affect heat shock response in *Caenorhabditis* species (Garrigues et al. 2019), a *Ty1/copia*-like retrotransposon has been associated with adaptation to high latitudes in the soybean *Glycine max* (Kanazawa et al. 2009), *Bari-Jheh* is a DNA transposon that mediates resistance to oxidative stress (Guio et al. 2014) and *Accord* is a retrotransposon that mediates insecticide resistance (Chung et al. 2007), both in *Drosophila melanogaster*, and Tf1 retrotransposon insertions were shown to be crucial for the resistance to heavy metals and other stressors in the yeast *Schizosaccharomyces pombe* (Esnault et al. 2019). Furthermore, because of their ability to efficiently mobilize DNA sequences, TEs have been used as tools for genome engineering, by appropriation of their transposition machinery to introduce foreign DNA sequences into diverse host genomes (Sandoval-Villegas et al. 2021). For example, the synthetic *Sleeping Beauty* transposon system, derived from the ancient inactive *Sleeping Beauty* DNA transposon found in salmonid fish, has been extensively used for therapeutic gene delivery (Hudecek & Ivics 2018; Amberger & Ivics 2020).

Despite the potential usefulness of TEs, when their mobilization is uncontrolled and new insertions disrupt coding or regulatory regions of the host genome, they can cause deleterious mutations that, when not promptly eliminated, can lead to reduced fitness (Pasyukova 2004), disabilities such as sterility (Ni et al. 2017), and illnesses like cancer (Burns 2017; Payer & Burns 2019). To minimize potential harmful effects, there are several mechanisms that regulate and repress TE activity.

TEs have evolved mechanisms of self-regulation to control their own transposition and copy number (Lohe & Hartl 1996; Bouuaert et al. 2013; Saha et al. 2022), reducing deleterious effects and avoiding the fitness disadvantages that would lead to their purge from the host population. But hosts themselves have also evolved a variety of genetic mechanisms to control TE activity. These mechanisms include DNA modifications (Deniz et al. 2019; Jansz 2019), chromatin rearrangements (He et al. 2019), transcriptional regulators such as KRAB zinc finger proteins (Ecco et al. 2017; Reggiardo et al. 2022), and small RNA, including siRNAs (Liu et al. 2004; Tran et al. 2005), miRNAs (Shalgi et al. 2010), and piRNAs.

piRNAs are the largest class of small non-coding RNAs in animals. They are derived from discrete genomic loci called piRNA clusters (Brennecke et al. 2007; Kofler 2019) that can be expressed in different tissues (Klattenhoff & Theurkauf 2008; Yan et al. 2011; Perera et al. 2019), and are part of the *piRNA pathway*, a crucial repressor of TE activity, mostly studied in germline tissues. The piRNA pathway consists of a ribonucleoprotein formed by piRNAs, which recognize and bind to specific complementary TE sequences, and by PIWI proteins from the Argonaute family, which have effector properties (Tóth et al. 2016; Parhad & Theurkauf 2019; Teefy et al. 2020; Wu et al. 2020; Xin Wang et al. 2022).

Alongside host mechanisms that have evolved to regulate TE activity, other host factors can impact TEs. One important example is age, with several studies showing that TEs are derepressed in aging tissues (De Cecco et al. 2013; Sturm et al. 2015; Signor et al. 2022), and can have impactful consequences in senior hosts, such as neurodegenerative diseases (Li et al. 2022; Gorbunova et al. 2021; Ravel-Godreuil et al. 2021). Apart from hosts, many studies have also been showing that TEs can be affected by different external environmental factors.

As mentioned before, TEs can be important sources of genetic variation and play crucial roles in host adaptation to the environment. But, on the flip side, environmental changes, especially when environments become stressful to organisms (Killen et al. 2013), negatively impacting their ability to develop, reproduce, and/or survive, can also impact TEs and their regulation (Miousse et al. 2015; Negi et al. 2016; Horváth et al. 2017; Capy et al. 2000; Pimpinelli & Piacentini 2020; Mombach et al. 2022).

Most studies on these effects over TEs have focused on abiotic factors, such as heat shock (Kelly et al. 2018; Cappucci et al. 2019), ionizing radiation (Koturbash et al. 2016; Prior et al. 2016), and heavy metals (Morales et al. 2015; Cong et al. 2019). Although information on biotic effects is still lacking, a few studies have suggested that endosymbionts, in particular *Wolbachia*, can affect TEs by, for example, affecting DNA methylation and Argonaute proteins (Kraaijeveld & Bast 2012), affecting the abundance of some piRNAs (Mayoral et al. 2014), or altering the rate of transposition of specific TEs (Touret et al. 2014).

Wolbachia

Wolbachia pipientis is an obligate intracellular and maternally transmitted Gram-negative bacterium, from the class Alphaproteobacteria and Rickettsiales order. It is currently thought to be the most prevalent endosymbiont in arthropods, and it is also present in nematodes and crustaceans (Bouchon et al. 1998; Werren et al. 2008; Weinert et al. 2015; Lefoulon et al. 2016). It was first described around a century ago (Hertig & Wolbach 1924) and it is commonly just referred to as *Wolbachia* (Kaur et al. 2021). A few dozen strains have been identified (Zhou et al. 1998; Martinez et al. 2017), though many more are expected to exist (Detcharoen et al. 2019). For example, in *Drosophila melanogaster*, the three most well studied strains are wMelCS, that existed globally at higher prevalence but has been almost completely replaced by the strain wMel (both infect natural populations) (Riegler et al. 2005; Chrostek et al. 2013), and the pathogenic wMelPop strain that has been isolated from a laboratory line and that can strongly impact hosts' fitness (Min & Benzer 1997; Chrostek et al. 2013).

The successful spreading and maintenance of *Wolbachia* across so many species seems to be due to both its ability of horizontal transmission (Brown & Lloyd 2015; Ahmed et al. 2016; Bailly-Bechet et al. 2017; Sanaei et al. 2021), and maintaining a vertical relationship with its host, by maternal transmission through the egg cytoplasm (Newton et al. 2015; Zheng et al. 2018; Adekunle et al. 2019). In addition, in some hosts, *Wolbachia* increases its vertical transmission efficiency throughout manipulations of the hosts' reproductive system, affecting the sex ratio of progeny in favour of infected females, which includes the developmental feminization of genetic males (Kern et al. 2015; Badawi et al. 2018), male killing, in which males infected with *Wolbachia* die during developmental stages (Arai et al. 2020; Hill et al. 2022), and inducing parthenogenesis, in which infected virgin mothers produce female offspring (Lindsey et al. 2016; Ning et al. 2019).

Moreover, *Wolbachia* can also induce cytoplasmic incompatibility, in which a cross between an uninfected female and an infected male, or when each parent carries a different *Wolbachia* strain, results in embryonic lethality (Bagheri et al. 2019; Namias et al. 2022). *Wolbachia* has also been shown to affect reproduction by enhancing or reducing fertility and fecundity traits in both females and males of different host species (Wade & Chang 1995; Vavre et al. 1999; Snook et al. 2000; Gruntenko et al. 2019; Zhang et al. 2021).

Besides its effects on reproduction, *Wolbachia* can affect host behavioural traits, such as mating and oviposition choices (Vala et al. 2004; Bagheri et al. 2019), male competition and aggression (Panteleev et al. 2007; Rohrscheib et al. 2015), temperature preference (Arnold et al. 2019; Truitt et al. 2019; Hague et al. 2020), and sleep (Bi et al. 2018), amongst others (Bi & Wang 2020). It can also affect host's longevity and aging (Maistrenko et al. 2015), gut microbiome composition (Simhadri et al. 2017), gene expression (Baião et al. 2019; Biwot et al. 2020), and meiotic recombination rate (Singh 2019). Nevertheless, perhaps one of the most distinguishing effects of *Wolbachia*, and one with potential application in public health, is its ability to repress viral infections in some arthropod hosts.

Wolbachia and disease control

Most known arthropod-borne viruses (arboviruses) have an RNA genome (an exception being the African swine fever virus, which is a dsDNA virus; (Sánchez-Vizcaíno et al. 2019), and from over 500 arboviruses known, approximately 150 can infect humans, by being transmitted via blood-feeding arthropods such as mosquitoes and ticks (Gubler 2001; Goh et al. 2020). *Wolbachia*'s ability to confer its hosts resistance to RNA arboviruses was discovered in *Drosophila melanogaster* (Hedges et al. 2008; Teixeira et al. 2008). Since then, studies have observed this effect in different host species and for a variety of these viruses, and have also documented a dependency on *Wolbachia* strains (Osborne et al. 2009; Micieli & Glaser 2014; Martinez et al. 2017; Pimentel et al. 2021). Although studies on how *Wolbachia* can repress these viruses are still lacking, it has been hypothesised that *Wolbachia* may compete with viruses for cell resources by interfering with the host's autophagy system (Voronin et al. 2012) and iron and cholesterol reserves (Lin & Rikihisa 2003; Gill et al. 2014), it can pre-activate the immune system when transinfected into hosts that are not naturally infected with *Wolbachia*, such as the mosquito *Aedes aegypti* (Ross et al. 2020), and induce phenoloxidase activity in hosts, which is part of the immune response to viruses in mosquitos (Thomas et al. 2011; Rodriguez-Andres et al. 2012).

Due to this ability to repress arboviruses, *Wolbachia* has the potential to be a tool to reduce or prevent arboviral infections in humans, such as dengue, Zika and yellow fever diseases, which are caused by mosquito-borne viruses. In this context, the *World Mosquito Program* is an important ongoing global initiative that is releasing *Wolbachia*-carrying *Aedes aegypti* mosquitos into susceptible populations, in at least 12 countries all over the world (https://www.worldmosquitoprogram.org: accessed on the 30th of November 2022; (O'Neill 2018). One of their most recent trials happened in Yogyakarta, Indonesia, and showed 77% reduction in dengue incidence and 86% reduction in dengue hospitalizations in areas treated with *Wolbachia* versus untreated areas (Utarini et al. 2021). Furthermore, *Wolbachia* can also be the target of treatments used to cure diseases. As mentioned before, *Wolbachia* can infect a variety of species, including filarial nematodes, which are parasitic worms. Some species of these worms can cause diseases in humans, such as lymphatic filariasis (commonly known as elephantiasis) and onchocerciasis (river blindness). Studies have shown that the elimination of *Wolbachia* from these hosts can result in their death or sterility (Mark J Taylor et al. 2010) and, consequently, strategies for treating diseases caused by these nematodes are including the intake of doxycycline antibiotics that target *Wolbachia*, which are generally less toxic than antinematode medications (Taylor et al. 2005; Johnston et al. 2021).

As described, *Wolbachia* can induce important host phenotypes, and its effects can range from parasitic to mutualistic. However, these effects, as well as *Wolbachia*'s ability to be transmitted and to produce stable infections, are highly dependent on *Wolbachia* titre within hosts.

Wolbachia titre, hosts, and the environment

Wolbachia titre can shape the effects this bacterium has on hosts, and a higher titre usually increases the intensity of the effect. A higher density of *Wolbachia* cells within hosts have been shown to, for example, affect hosts' gene expression (Baião et al. 2019), mediate antiviral protection (Lu et al. 2012; Osborne et al. 2012), and increase the efficiency of the male killing phenotype and maternal transmission (Unckless et al. 2009). Therefore, it is important to take titre into consideration and understand what factors can affect it, while studying *Wolbachia* and its interactions with hosts.

There are several within-host factors that can affect *Wolbachia* titre (Fig. 1.3). For example, it has been observed that *Wolbachia* strains can compete with each other while co-infecting hosts, reducing overall *Wolbachia* density (Kondo et al. 2005).

Furthermore, other bacteria infecting hosts, such as the endosymbiont *Spiroplasma*, can be competitors for space and host resources (Goto et al. 2006). *Wolbachia* titre also depends on host genotypes, varying even within the same population (Kondo et al. 2005; Kaur et al. 2020), and have been shown to possess genetic mechanisms that control *Wolbachia*'s density. For example, the host gene grk, that encodes an axis determinant, has a dose-sensitive impact on *Wolbachia* titre in *Drosophila melanogaster* oogenesis (Serbus et al. 2011), and the maternal effect gene Wds negatively affects *Wolbachia* titre during oogenesis in the wasp *Nasonia vitripennis* (Funkhouser-Jones et al. 2018). Even within the same genotype, titre can vary between host tissues (Toomey & Frydman 2014; Kaur et al. 2020), with sex (Correa & Ballard 2012), with gut microbiota composition (Ye et al. 2017), and throughout the lifespan of hosts (Unckless et al. 2009; Kaur et al. 2020). Hosts' diet composition (Serbus et al. 2015; Camacho et al. 2017) can also play a role in the regulation of *Wolbachia*'s density.

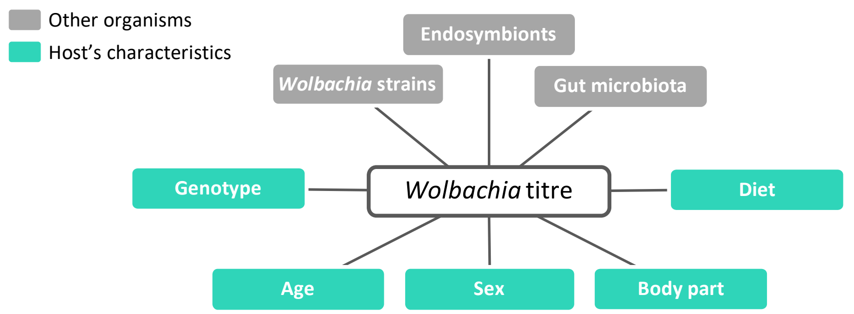

Fig. 1.3 Schematic representation of within-host factors that can affect *Wolbachia* titers, which can be: 1) other organisms (grey) such as other *Wolbachia* strains (Kondo et al. 2005), other endosymbionts (Goto et al. 2006), and the host's gut microbiota (Ye et al. 2017); 2) host's characteristics (green), such as genotype (Serbus et al. 2011), sex (Correa & Ballard 2012), age (Kaur et al. 2020), body part or tissue where *Wolbachia* is located (Toomey & Frydman 2014), and the host's diet composition (Camacho et al. 2017).

Wolbachia titre can also be affected by external environmental conditions (Xiaoyu Hu et al. 2019; Stuckert & Matute 2022), and perhaps one of the most well studied factors has been temperature. Studies on the effect of temperature shown that, for example, *Wolbachia* titre was highest at 26°C relative to lower temperatures (from 14 to 25°C) in the wasp *Leptopilina heterotoma* (Mouton et al. 2006), heat stress above 26°C reduced titre to the point of hindering *Wolbachia*'s ability to invade *Aedes aegypti* mosquito populations (Ross et al. 2020), low temperature effects on *Wolbachia* density can depend on host life stage of exposure, also in *Aedes aegypti* (Lau et al. 2020), and that a higher temperature (29 relative to 25°C) significantly increased the titre of wMelPop *Wolbachia* strain in *Drosophila melanogaster* (Strunov et al. 2013).

Study system

Drosophila melanogaster is an established model organism, with a sequenced and extensively annotated genome (Adams et al. 2000; Arbeitman et al. 2002; Giot et al. 2003; Lemaitre & Hoffmann 2007; Miguel-Aliaga et al. 2018; Flatt 2020), and abundant and sophisticated genetic tools and resources (Chintapalli et al. 2007; Larkin et al. 2021). Flies are easy to rear in the lab and have a fast life cycle (around 10 days from egg to adulthood, at 25°C). Approximately 11-20% of *Drosophila melanogaster's* genome consists of TE sequences, from both Class 1 and 2 (Quesneville et al. 2005; Sessegolo et al. 2016). Most TE families contain less than 300 copies in the host genome, and are considered to be active presently, with the exception of the INE-1 family, that contains around 2000 copies and that has been inactive for at least 3 million years (Kapitonov & Jurka 2007; Wang et al. 2007; Piégu et al. 2015). *Drosophila* TEs are perhaps amongst the best characterized in terms of identity, location, activity, and regulation mechanisms (Mérel et al. 2020). This fly species is also a natural host for *Wolbachia*, and this bacterium prevalence, evolution, genome dynamics, and effects on hosts have been studied extensively (Fry et al. 2004; Richardson et al. 2012; Serga et al. 2021). In this context, the *Drosophila melanogaster* Genetic Reference Panel (DGRP) (Mackay et al. 2012; Huang et al. 2014) can be a useful tool to study host-symbiont interactions and, in particular, TEs and *Wolbachia*. The DGRP consists of 205 fully sequenced isogenic genotypes, that were derived from a natural population from Raleigh, North Carolina, USA (Mackay et al. 2012; Huang et al. 2014). The panel was constructed by collecting mated females, followed by 20 generations of sibling inbreeding of the progeny. Lines were sequenced using a combination of Illumina and 454 sequencing technologies, and in silico predictions identified over 5 million SNPs, almost 400 thousand microsatellite loci, from which over 100 thousand were polymorphic, and almost 200 thousand TE insertions, distributed in around 40 thousand insertion sites and from 149 different TE families (Mackay et al. 2012).

TE insertions were further classified as "shared", if present in the Release 5 *Drosophila melanogaster* reference genome, "novel", if not present in the reference genome, or as "unique", a subset of novel insertions that are present in a single DGRP line. On average, each DGRP genotype contained 1175 TE insertions, from a minimum of 105 in RAL-237 and a maximum of 2477 insertions in RAL-357 (Mackay et al. 2012). Furthermore, DGRP lines were tested for *Wolbachia* and 108 (~53%) were identified as being infected (Mackay et al. 2012; Huang et al. 2014). The DGRP has been shown to be a useful resource that has been extensively used to analyse population genomics and quantitative traits, such as fecundity and longevity (Ivanov et al. 2015; Zwoinska et al. 2020), body size plasticity (Lafuente et al. 2018), cold tolerance (Ørsted et al. 2019), resistance to viral infection (Magwire et al. 2011), amongst others (Durham et al. 2014; Morozova et al. 2015; Pool 2015; Rohde et al. 2017; Havula et al. 2022; Saha et al. 2022; Savola et al. 2022).

Thesis overview

Both TEs and *Wolbachia* are important and prevalent symbionts of a variety of host species, affecting these hosts in a multitude of ways. Research focused on interactions between TEs and *Wolbachia*, however, is surprisingly scarce, despite suggestions of its relevance, such as *Wolbachia*'s impact on TE repression mechanisms, such as DNA methylation and Argonaute proteins (Kraaijeveld & Bast 2012) and some piRNAs expression (Mayoral et al. 2014), the rate of transposition of the retrotransposon *gypsy* (Touret et al. 2014), and *Wolbachia*'s strain-replacement co-occurring with the invasion of the P-element DNA transposon (Riegler et al. 2005). In fact, there is currently no systematic study that approaches this possible interplay between TEs and *Wolbachia*.

In this thesis, we set out to study if and how much *Wolbachia* infection affected TE activity, and whether this effect depended on host genotype, TE identity, and *Wolbachia* titre. Afterwards, we explored the possible effect of *Wolbachia* infection on host's fitness, particularly on fecundity, and whether this effect depended on host genotype and *Wolbachia* titre. For this, we randomly selected a set of 25 DGRP genotypes for which TE identity and location have been characterized, and that are naturally infected with *Wolbachia*. For each line, we created a *Wolbachia*-positive (*Wolb*+; infected with *Wolbachia*) versus *Wolbachia*-negative (*Wolb*-; in which *Wolbachia* has been removed) panel for our experiments.

In **Chapter 2**, we first measured *Wolbachia* titres on the 25 *Wolb*+ DGRP lines, and observed statistically significant variation between host genotypes, albeit within the same order of magnitude. Then, we compiled the number of novel insertions for 14 diverse TEs selected in this project, using data from the TIDAL-FLY v1.0 tool of (Rahman et al. 2015), and observed significant differences in the number of novel insertions between genotypes and *Wolbachia* titres. Finally, we tested whether the expression of the 14 TEs was different for the paired *Wolb*+/*Wolb*- genotype pairs, and found statistically significant differences in levels of TE transcript, that was dependent on the combination of TE identity, *Wolbachia* infection status, and on host genotype.

As our results in Chapter 2 showed *Wolbachia*'s effect being highly dependent on host genotype, in **Chapter 3** we furthered the study on the effects of *Wolbachia* infection on hosts, specifically exploring its proliferation within hosts, and its potential effect on their fitness. First, we measured *Wolbachia* titers throughout the lifespan of hosts, on a subset of ten Wolb+ genotypes from the original set on Chapter 2, and observed significant differences between hosts. We also collected other datasets on loads from *Wolbachia* located in different host body parts and at different ambient temperatures, observing that both factors can also affect this endosymbiont's proliferation.

Then, we counted the number of living adult offspring as a measured of fecundity for couples from the ten Wolb+/Wolb- DGRP paired lines and annotated parental death during this period, observing that *Wolbachia* infection can affect, albeit in only some host genotypes, overall fecundity, offspring sex ratios, and survival.

Finally, in **Chapter 4**, I comment on the context of our experimental choices and designs, and discuss the main results of this thesis, what could have been done differently or improved, future perspectives for this project, and its possible impact.

Note: figures in Chapter 2 and Chapter 3 were designed and tested to be colourblind-friendly (blue/pink colours).

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CHAPTER 2

Effects of *Wolbachia* on transposable element expression vary between *Drosophila melanogaster* host genotypes

Author contributions

Marta Marialva conceptualized the hypothesis of *Wolbachia* affecting TE dynamics depending on host genotype, and designed, together with Patrícia Beldade, the experiment for the confirmation of in silico predictions for TE insertions in the DGRP lines. Ana Eugénio designed the *Wolbachia* titre and the TE expression with *Wolbachia* status experiments, and performed all experiments and statistical analysis. Ana Eugénio and Patrícia Beldade wrote this chapter.

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Abstract

Transposable elements (TEs) are repetitive DNA sequences capable of changing position in host genomes, thereby causing mutations. TE insertions typically have deleterious effects but they can also be beneficial. Increasing evidence of the contribution of TEs to adaptive evolution further raises interest in understanding what factors impact TE activity. Based on previous studies associating the bacterial endosymbiont *Wolbachia* with changes in the abundance of piRNAs, a mechanism for TE repression, and to transposition of specific TEs, we hypothesized that *Wolbachia* infection would interfere with TE activity. We tested this hypothesis by studying the expression of 14 TEs in a panel of 25 *Drosophila melanogaster* host genotypes, naturally infected with *Wolbachia* and annotated for TE insertions. The host genotypes differed significantly in *Wolbachia* titers inside individual flies, with broad-sense heritability around 20%, and in the number of TE insertions, which depended greatly on TE identity. By removing *Wolbachia* from the target host genotypes, we generated a panel of 25 pairs of *Wolbachia*-positive and *Wolbachia*-negative lines in which we quantified transcription levels for our target TEs. We found variation in TE expression that was dependent on *Wolbachia* status, TE identity, and host genotype. Comparing between pairs of *Wolbachia*-positive and *Wolbachia*-negative flies, we found that *Wolbachia* removal affected TE expression in 21.1% of the TE-genotype combinations tested, with up to 2.3 times differences in the median level of transcript. Our data show that *Wolbachia* can impact TE activity in host genomes, underscoring the importance this endosymbiont can have in the generation of genetic novelty in hosts.

Introduction

Transposable elements (TEs) are repetitive DNA sequences capable of changing position independently in the host genome (Bouchon et al. 1998; Mérel et al. 2020), and make up a significant fraction of many eukaryotic genomes (Guio & González 2019). They are divided into two major classes, depending on whether the mechanism of transposition does (for retrotransposons) or does not (for DNA transposons) involve an RNA intermediate that is reverse transcribed before integrating back into the host genome (Bourque et al. 2018). TE insertions can cause mutations, which typically have deleterious effects because they disrupt proper gene function in a variety of manners (McFadden & Knowles 1997; Hedges & Deininger 2007; Belancio et al. 2008; Ayarpadikannan & Kim 2014). Consequently, host organisms have evolved mechanisms to control and repress TE activity, including the piRNA pathway in animals (Tóth et al. 2016). On the other hand, an increasing number of studies have been providing compelling examples of TE insertions with positive effects on host fitness, contributing to adaptation (González & Petrov 2009; González et al. 2010; Hof et al. 2016), stress resistance (Guio et al. 2014; Pereira & Ryan 2019), and the origin of novel traits (Emera & Wagner 2012; Bennetzen & Wang 2014; Santos et al. 2014; Trizzino et al. 2017). Moreover, TEs might also contribute to reproductive isolation, as in the case of TE-mediated hybrid incompatibility (Petrov et al. 1995; Serrato-Capuchina & Matute 2018). TE contribution to adaptive evolution and diversification raises interest in understanding what factors impact TE activity.

TE activity differs between TEs (Venner et al. 2009; Mérel et al. 2020) and between host genotypes (Anderson et al. 2019; Signor 2020; Yiguan Wang et al. 2022). Furthermore, studies on different organisms have shown that TE activity can be affected by external environmental factors, including temperature (Chen et al. 2018), radiation (Newman et al. 2014), heavy metals (Habibi et al. 2014), starvation (Rep et al. 2005), and various other stressors (Miousse et al. 2015). Not much is known about how these factors can affect the molecular mechanisms responsible for TE regulation, including the piRNA pathway. On the other hand, *Wolbachia*, a common endosymbiotic bacterium, has been shown to affect the abundance of some piRNAs (in *Aedes aegypti* mosquitoes; Mayoral et al. 2014) and the rate of transposition of the retrotransposon *gypsy* (in *Drosophila melanogaster*; (Touret et al. 2014). Moreover, the invasion of the DNA transposon *P-element* in populations of *Drosophila* reportedly co-occurred with a replacement of *Wolbachia* strain infecting those flies (Riegler et al. 2005). However, there has been no systematic analysis of the effects of *Wolbachia* on the activity of different TEs in different host genotypes.

Wolbachia is a maternally inherited endosymbiont that is prevalent in invertebrates, including insects, arachnids, and nematodes (Werren et al. 2008; Kaur et al. 2021). Multiple studies have documented *Wolbachia* prevalence (Clark et al. 2005; Riegler et al. 2005; Weeks et al. 2007) and load (López-Madrigal & Duarte 2019; Liu & Li 2021) in natural and laboratory populations of *Drosophila* hosts. Associated with its mode of transmission, *Wolbachia* can have important effects on host reproduction, being responsible for phenomena such as cytoplasmic incompatibility, feminization, and male killing (Werren et al. 2008; Kaur et al. 2021). *Wolbachia* can also affect other aspects of host biology, including resistance to viral infection (Teixeira et al. 2008), gut microbiome composition (Simhadri et al. 2017), thermal preference (Truitt et al. 2019), sleep behavior (Bi et al. 2018), and fecundity and lifespan (Serga et al. 2021). At the molecular level, *Wolbachia* is known to affect host gene expression (Baião et al. 2019; Biwot et al. 2020), and meiotic recombination rate (Singh 2019), as well as the aforementioned TE-related properties (Riegler et al. 2005; Mayoral et al. 2014; Touret et al. 2014).

Here, we test the impact of *Wolbachia* on TE expression by using host lines where *Wolbachia* is present versus where it was removed. Specifically, we use flies from the *Drosophila melanogaster* Genetic Reference Panel (DGRP), a panel of isogenic lines derived from a natural population, whose genomes have been fully sequenced and annotated for TE insertions ((Mackay et al. 2012; Rahman et al. 2015). We selected 25 DGRP lines that were naturally infected with *Wolbachia* for which we estimated *Wolbachia* loads in individual flies and recorded the number of TE insertions for 14 TEs, representing different families. We found differences in *Wolbachia* loads and in number of TE insertions between genotypes, as well as an association between the two. We then generated a *Wolbachia*-free counterpart for each of the 25 target genotypes and used our panel of 25 paired *Wolbachia*-positive and *Wolbachia*-negative lines to quantify transcription levels of the 14 target TEs. We found variation in TE expression depending on host genotype, TE identity, and *Wolbachia* status. Whether *Wolbachia* removal led to increased or decreased, TE expression appeared to be more of a property of host genotype than of TE identity.

Results & Discussion

To investigate the effect of *Wolbachia* infection on TE expression, we focused on 25 *Drosophila melanogaster* genotypes, for which we documented differences in *Wolbachia* loads and in number of insertions of 14 target TEs (Fig. 2.1). We focused specifically on what were called "novel insertions" (Mackay et al. 2012; Rahman et al 2015), which correspond to TE insertions found in the DGRP genomes but not in Release 5 of the *Drosophila melanogaster*'s reference genome (counts cf. Rahman et al. 2015). We then generated a corresponding panel of 25 lines from which *Wolbachia* was cleared, and compared expression level of our target TEs in adult females between the pairs of *Wolbachia*-positive (Wolb+) and *Wolbachia*-negative (Wolb−) flies (Fig. 2.2).

Host genotypes differ in *Wolbachia* loads and in number of TE insertions

We randomly chose 25 of the 85 DGRP lines known to be infected with the wMel strain of *Wolbachia* (Mackay et al. 2012; Richardson et al. 2012). For each of these lines, we measured *Wolbachia* loads in five individual adult females 10 days post-eclosion, the same sex and age used to measure TE expression. For this, we used quantitative real-time polymerase chain reaction (qPCR) with primers for one *Wolbachia*-specific gene (*wsp*), to estimate number of bacterial cells, and for one host-specific gene (*actin*), to assess number of host cells.

Across the ∼125 flies assayed individually, *Wolbachia* loads varied between a minimum of 3.5 and a maximum of 51 *Wolbachia* cells per host cell. Only six individuals, of different genotypes, had >20 *Wolbachia* per host cell. These estimates of *Wolbachia* density fall along the same order of magnitude as those found through sequencing of the DGRP lines (0.9–17.1 copies per host cell; Richardson et al. 2012), or through qPCR of whole bodies (Bénard et al. 2021; Chrostek et al. 2021) and gonadal tissues (Correa & Ballard 2012) of other *Drosophila melanogaster* genotypes, as well as for other *Wolbachia* strains (Chrostek & Teixeira 2015).

We found differences in *Wolbachia* loads between host genotypes, with median values ranging from 5 to 15 copies of *Wolbachia* per host cell (Fig. 2.1 A), and estimated broad-sense heritability (H2) of 0.22 (among-line variance = 10.3, within-line variance = 36.0). Although little is known about what host loci harbour natural allelic variation contributing to variation in *Wolbachia* loads, we do know that loads vary with environmental factors, including temperature (Wiwatanaratanabutr & Kittayapong 2009), host diet (Ponton et al. 2015; Serbus et al. 2015), and viral infection (Kaur et al. 2020).

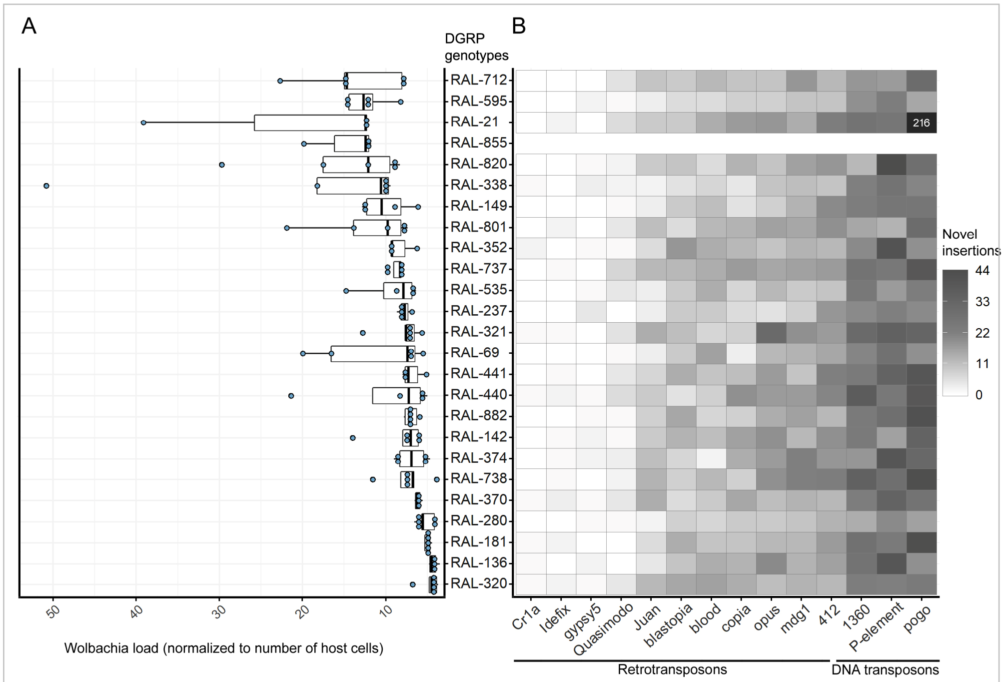


Fig. 2.1 Characterization of our 25 target host lines in relation to *Wolbachia* load in individual flies (A) and to the number of novel TE insertions in their genomes (B). The 25 genotypes are organized along the y-axis in order of the median value of *Wolbachia* load. (A) *Wolbachia* load relative to number of host cells (x-axis). Each blue dot is a biological replicate and represents one single female. *Wolbachia* load is significantly different across genotypes (ANOVA; $F_{24,5508}$= 4.5e+27, p-value<2e-16). (B) Heatmap representing the predicted number of novel insertions for our 14 target TEs. TEs are organized in the x-axis by median number of novel insertions across genotypes. The scale of grey, from white to dark grey, represents, respectively, from the lowest to highest number of novel insertions. The TE *pogo* in genotype RAL-21 is out of the scale, with 216 novel insertions annotated. There was no information in Rahman et al. (2015) for RAL-855. The number of novel insertions differed significantly between genotypes (ANCOVA; genotype: $F_{22,4974}$=1.3e+28, p<2e-16, TEs: $F_{13,4974}$=1.7e+29, p<2e-16, and *Wolbachia* titers: $F_{1,4974}$=2.2e+27, p<2e-16).

We then validated in silico predictions of insertions (Mackay et al. 2012) by PCR with primers for the fly genomic sequence flanking 132 predicted novel insertions in 11 genotypes (Supplementary Table S2.1). The amplicons from each of the insertions were sized (agarose gel) and sequenced to confirm the presence, length, and identity of the inserted DNA (Supplementary Table S2.1). For 100% of the predicted insertion locations we tested, we confirmed the presence of a TE insertion, and, in most cases, we also confirmed that the size and the sequence of the inserted DNA corresponded to the predicted TE identity (Supplementary Fig. S2.1 A).

For 113 (85.6%) of the insertions tested, the inserted TE corresponded to the most likely expected identity (cf. the predictions made from the whole-genome sequence data), and for 16, it corresponded to the second most likely TE (Mackay et al. 2012). We observed that 67 insertions (50.8%) had the size corresponding to the expected full length of that TE, 44 (33.3%) were smaller, and 21 (15.9%) were larger (Supplementary Fig. S2.1 A and Table S2.1).

With predictions of novel insertions validated, we used data from the TIDAL-FLY v1.0 tool of Rahman et al. (2015) to gather information about the number of novel insertions for each of our 14 target TEs in 24 of our 25 study genotypes (there were no data for genotype RAL-855). We found significant differences in the number of novel insertions between genotypes and *Wolbachia* titers. The retrotransposons *Cr1a*, *gypsy5*, and *Idefix* had the lowest number of predicted novel insertions (with zero for the majority of the lines), whereas the DNA transposons *1360*, *pogo*, and *P-element* generally had the highest number of novel insertions, in accordance with other studies describing DNA transposons as most active (Bourque et al. 2018). For most individual TEs, the estimated number of novel insertions varied between 0 and 44, with the exception of the TE *pogo*, predicted to have 216 novel insertions in the line RAL-21 (Fig. 2.1 B; Rahman et al. 2015). Note that the in silico predictions of the number of TE insertions are likely to be underestimates of the actual number of insertions.

The DGRP lines were originally sequenced using a combination of Illumina and 454 sequencing technologies (Mackay et al. 2012), which generate short-reads and, as such, are not ideal for detecting TE insertions (Fiston-Lavier et al. 2015; Goerner-Potvin & Bourque 2018; Panda & Slotkin 2020; Rech et al. 2022). Moreover, new insertions may also have occurred after sequencing. We confirmed experimentally multiple “false negatives” in TE insertion predictions for the DGRPs. By running PCRs with TE-specific primers and DNA from eight DGRP genotypes predicted in Mackay et al. (2012) to have no insertions (novel or shared) of particular TEs. In all 17 cases tested, we verified the presence of those TEs (Supplementary Fig. S2.1 B). However, even if predictions are underestimates of actual number of insertions, the effects should be similar/random across TEs and genotypes with equivalent sequence coverage depth.

TE transcription level varies with *Wolbachia* status in a host genotype-dependent manner

Using qPCR with TE-specific primers and a reference host gene, we quantified the expression of our 14 target TEs in eight replicate pools of ten 10-day-old females each, for each of the 25 Wolb+ and Wolb− pairs of genotypes (Cq data in Supplementary Table S2.2).

Expression levels differed significantly (analysis of variance, ANOVA), between TEs ($F_{13,4796}$ = 4.75, P = 2.97e−08), genotypes ($F_{24,4796}$ = 26.63, P < 2.2e−16), and with *Wolbachia* status ($F_{1,4796}$ = 28.79, P = 8.5e−08), with all interactions being significant (P < 0.0001 in all cases; Fig. 2.2).

Given the significant effect of *Wolbachia* status on TE expression, we then specifically compared expression of each of the 14 TEs in each of the 25 host genotypes with versus without *Wolbachia*. We found statistically significant differences in TE expression between Wolb+ and Wolb− lines for a total of 74 of the 350 (21.1%) genotype-TE combinations tested (Fig. 2.2; Supplementary Fig. S2.2 and Table S2.3). We observed distinct scenarios depending on TE and genotype: higher expression in Wolb− flies for 47 in 350 cases (13.4%) and higher expression in Wolb+ flies for 26 in 350 cases (7.4%). For any given TE, the effect of *Wolbachia* on expression was not the same across genotypes, and, for any given genotype, the effect of *Wolbachia* on TE expression was not the same across TEs. However, for some genotypes, we observed some consistency in the effects of *Wolbachia* on TE expression. For genotypes RAL-142 and RAL-181, when statistically significantly different between Wolb+ and Wolb− flies, TE expression was always higher in Wolb+ (blue shades in Fig. 2.2 C) relative to Wolb− flies. Conversely, for genotypes RAL-712, RAL-21, and RAL-321, when significantly different, TE expression was always higher in Wolb− (pink shades in Fig. 2.2 C) relative to Wolb+ flies.

Effect size of *Wolbachia* removal on TE expression levels

For each TE in each Wolb+/Wolb− genotype pair, the raw effect size of *Wolbachia* removal was calculated by subtr*actin*g the median log2 TE expression (normalized to reference gene) in the Wolb− flies from the median log2 TE expression in the Wolb+ flies (Fig. 2.2 C and D; Supplementary Table S2.5). There were more cases in which *Wolbachia* removal resulted in an increase in TE expression than the reverse (i.e., more cases with significantly higher TE expression in Wolb− relative to Wolb+ flies; pink shades in Fig. 2.2 C and pink dots in 2.2 D).

Also, the size of the effect of *Wolbachia* removal on TE expression tended to be larger when this removal resulted in increased expression relative to when it resulted in decreased expression (i.e., further from zero in the x-axis of Fig. 2.2 D). The median effect size for statistically significantly higher expression in Wolb− relative to Wolb+ (i.e., pink dots in Fig. 2.2 D) was approximately −1.0, corresponding to almost 100% increase in expression upon *Wolbachia* removal.

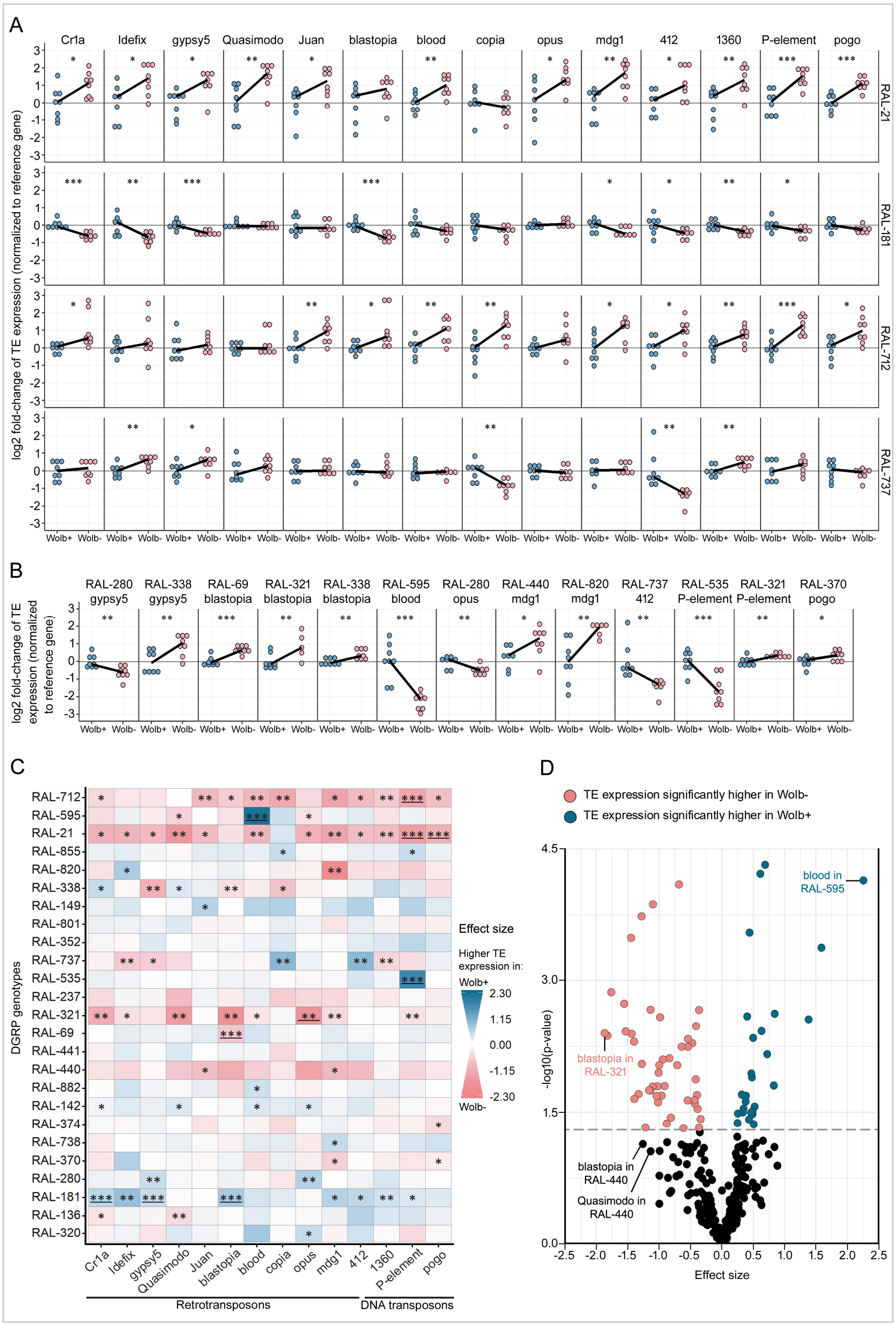

A
Cr1a
Idefix
gypsy5
Quasimodo
Juan
blastopia
blood
copia
opus
mdg1
412
1360
P-element
pogo
RAL-21
RAL-181
RAL-712
RAL-737
log2 fold-change of TE expression (normalized to reference gene)
Wolb+ Wolb-
B
RAL-280 gypsy5
RAL-338 gypsy5
RAL-69 blastopia
RAL-321 blastopia
RAL-338 blastopia
RAL-595 blood
RAL-280 opus
RAL-440 mdg1
RAL-820 mdg1
RAL-737 412
RAL-535 P-element
RAL-321 P-element
RAL-370 pogo
log2 fold-change of TE expression (normalized to reference gene)
C
DGRP genotypes
Effect size
Higher TE expression in:
Wolb+
2.30
1.15
0.00
-1.15
-2.30
Wolb-
Retrotransposons
DNA transposons
D
TE expression significantly higher in Wolb-
TE expression significantly higher in Wolb+
blood in RAL-595
blastopia in RAL-321
blastopia in RAL-440
Quasimodo in RAL-440
-log10(p-value)
Effect size

Fig. 2.2 Expression levels of 14 TEs in adult female flies of 25 genotypes with (blue) versus without (pink) *Wolbachia*. TEs are ordered from left to right by median (and average, for tied medians) number of novel insertions. Statistical significance for expression differences between Wolb+ and Wolb- is shown as * for p<0.05, ** for p<0.01, and *** for p<0.001 (ANOVA, see Material and Methods). (A) Expression of the 14 TEs in genotypes RAL-21, RAL-181, RAL-712 and RAL-737. The same plots for all other genotypes can be found in Fig S2.2. (B) Expression of different TEs across various genotypes, illustrating cases where expression levels are statistically different between *Wolbachia* status. Each dot in plots (A) and (B) represents a biological replicate, corresponding to a pool of 10 female flies. (C) Heatmap representing differences in expression level for the 14 target TEs between Wolb+ and Wolb- flies of all 25 different genotypes. Genotypes in the y-axis are ordered by *Wolbachia* load (as in Fig. 2.1 B). Cells are displayed in a gradient of colour, representing effect size (colour intensity) and whether expression is higher in Wolb+ relative to Wolb- (blue shades) or the other way around (pink shades). Underlined asterisks represent significant differences after Benjamini-Hochberg correction for multiple comparisons. (D) Volcano plot representing the effect size (x-axis) and p-value (testing for log2 fold-change of TE expression differences between Wolb+ and Wolb-; y-axis). Dots relative to largest effect sizes (*blastopia* in RAL-321 and *blood* in RAL-595), and to non-significant effect size below -1, corresponding to 100% difference in TE expression after *Wolbachia* removal (*blastopia* in RAL-440 and *Quasimodo* in RAL-440), are labelled. The dashed grey line represents the threshold of statistical significance for differences in TE expression levels (p-value=0.05). Effect sizes in (C) and (D) correspond to the difference of the log2 fold-change in TE expression between Wolb+ and Wolb- paired genotypes.

On the other hand, the median effect size for statistically significant lower expression in Wolb− relative to Wolb+ (i.e., blue dots in Fig. 2.2 D) was around +0.5, corresponding to around 71% reduction in expression upon *Wolbachia* removal. In 24 of the 350 TE-genotype combinations tested, *Wolbachia* removal resulted in an increase in TE expression >100% increase (effect size <−1.0 in Fig. 2.2 D). Of these 24 cases, only two were not statistically significant (*blastopia* and *Quasimodo*, both in RAL-440; highlighted in Fig. 2.2 D). Interestingly, two genotypes, RAL-21 and RAL-712, stood out for having among the highest *Wolbachia* loads (fig. 2.1 A) and a general increase in expression for most TEs after *Wolbachia* removal (Fig. 2.2 A and C), with median effect sizes across TEs of around −1.1 (107% increase) and around −0.9 (93% increase), respectively.

In three of the 350 TE-genotype combinations tested, *Wolbachia* removal resulted in a >100% reduction (effect size >+1.0) in TE expression. Of these, blood in RAL-595 stood out with an effect size around 2.3, corresponding to a 246% reduction in expression after *Wolbachia* removal (fig. 2D).

Conclusion

In this study, we investigated the hypothesis of a relationship between *Wolbachia* infection and TE activity. *Wolbachia* is a prevalent endosymbiotic bacterium whose impact on TE mobilization was suggested by distinct lines of evidence, including: (1) effect on piRNA expression (Mayoral et al. 2014), (2) effect on rate of transposition of retrotransposon *gypsy* (Touret et al. 2014), and (3) *Wolbachia* strain-replacement co-occurring with invasion of DNA transposon *P-element* (Riegler et al. 2005). We tested whether the expression of 14 diverse TEs was different between *Wolbachia*-infected and *Wolbachia*-free *Drosophila melanogaster* flies of 25 distinct genotypes differing in *Wolbachia* loads and in number of TE insertions. We focused on TE expression, which is often used as a proxy for TE activity (e.g., Becking et al. 2020; Torres et al. 2021), reasoning that higher expression creates more opportunities for insertions. TE transcript levels were quantified using qPCR, with effort put into carrying out and explaining in detail data structure, quality control, and analyses (see Materials and Methods). However, transcription is only one, albeit necessary, step in TE mobilization, and *Wolbachia*, or other factors, may impact TE integration post-transcriptionally.

We found statistically significant differences in levels of TE transcript between Wolb+ and Wolb− flies in 21.1% of the 350 genotype-TE combinations analysed, and a maximum effect size of 2.3 lower expression upon *Wolbachia* removal (Supplementary Table S2.5). The observed effects of *Wolbachia* removal were not uniform for any given TE (i.e., one same TE could increase, decrease, or not change expression depending on genotype) nor for most genotypes (i.e., one same genotype could have TEs that increased, TEs that decreased, and TEs that did not change expression). However, some genotypes did stand out in having multiple TEs for which the direction *Wolbachia* effect on expression was the same. In particular, genotypes RAL-21 and RAL-712 showed both some of the highest *Wolbachia* loads and significant increase in expression for most TEs when *Wolbachia* was removed. Various factors can potentially lead to *Wolbachia* removal affecting TE expression. *Wolbachia* may affect piRNAs, as has been shown for a narrow set of piRNAs in *Aedes aegypti* mosquitoes (Mayoral et al. 2014), which are naturally devoid of *Wolbachia*. *Wolbachia* removal might also act as a stress factor for host genotypes, which might have adjusted to having *Wolbachia*.

This study was performed using a subset of the DGRP lines, a panel of isogenic and fully sequenced genotypes that provide the possibility of looking at genotypic variation. Even though the genotypes are not naturally occurring, in that they were highly isogenized post-collection of a natural population, they represent naturally segregating allelic variants.

Many studies showed differences between DGRP genotypes for various different types of traits (e.g., Magwire et al. 2012; Durham et al. 2014; Ivanov et al. 2015; Howick & Lazzaro 2017; Lafuente et al. 2018; Mackay & Huang 2018). Our results highlight differences between genotypes in *Wolbachia* loads and number of TE insertions, as well as in the effect of *Wolbachia* removal on TE activity. The inter-genotype differences further emphasize the importance of analysing multiple genotypes to have a more complete understanding of any biological phenomena. Studies that only focus on a single or a few genotypes may miss or misrepresent general properties.

Novel genetic variants created by TE mobilization can be, and are often, deleterious (McFadden & Knowles 1997; Hedges & Deininger 2007; Belancio et al. 2008; Ayarpadikannan & Kim 2014). As such, high TE activity can put natural populations under stable conditions at a disadvantage. On the other hand, TE insertions can also be beneficial and, particularly in conditions of environmental perturbation, TE activity could contribute to novel genetic variants better adjusted to the changed conditions (e.g., Rey et al. 2016). The question of which and how intrinsic and extrinsic factors affect TE activity is a fundamentally interesting and largely unresolved question, especially for animal when comparing with plant TEs (Thieme et al. 2017). Our study shows that the maternally inherited *Wolbachia* endosymbiont, which is prevalent in insects and nematodes, affected TE expression in *Drosophila melanogaster*. We expect future studies to provide insight about which and how different factors affect TE mobilization, including *Wolbachia* and other environmental factors in multiple hosts.

Materials & Methods

Confirming in silico predictions of TE insertions in DGRP lines

We looked to validate in silico predictions in terms of both potential false positives (focusing on specific insertions) and potential false negatives (focusing on particular TEs deemed as having no insertions in some genotypes). TE insertions in the DGRPs have been classified as “shared” versus “novel” depending on whether they were versus were not present in the reference genome, Release 5 (Mackay et al. 2012; Rahman et al. 2015). Although nonreference insertions might not necessarily be novel, we kept the terminology from the original articles that documented TE insertions in the DGRPs, and which is used in various other studies referring to those data.

First, we selected 132 of the predicted novel insertions in 12 of the DGRP lines and designed primers for the sequence flanking those insertions (Supplementary Table S2.1). For each of the lines, we extracted gDNA from pools of ten males (homogenized using pestles), using DNeasy Blood and Tissue kit (Qiagen), following manufacturer's instructions. We then used 4 ng of this gDNA in 15 µl long PCRs with 0.5 µM primers, 2% DMSO, 0.5 mM dNTPs mix, 0.21 µl of GoTaq enzyme (Promega). Thermocycler conditions included 2 min at 92 °C; 10 cycles of 92 °C for 10 s, 60 °C for 15 s, 68 °C for 10 min; 30 cycles of 92 °C for 15 s, 60 °C for 30 s, 68 °C for 10 min + 20 s cycle elongation for each successive cycle; 7 min at 68 °C. Amplicons were sized (1% agarose gel electrophoresis) and sequenced (ThermoFisher BigDye Terminator v1.1, or SUPREMErun™ from; same forward primers used for amplification) and these were NZYTech compared with the size and sequence of the canonical *Drosophila* transposons (Flybase version 9.42). Second, we tested the absence of specific TEs in genotypes annotated as having no insertions of that TE. We ran PCR with primers specific for each of seven TEs (*blood*, *copia*, *gypsy5*, *H-element*, *jockey*, *opus*, and *pogo*; Supplementary Table S2.4) and gDNA extracted from pools of ten adult females (extractions as described above) of eight genotypes (RAL-109, RAL-161, RAL-237, RAL-350, RAL-362, RAL-555, RAL-776, and RAL-808) predicted to not have one or more of those TEs (Mackay et al. 2012), confirming the presence or absence of insertion band in 1% agarose gel (Supplementary Fig. S2.1 B). With the gDNA from each of the target genotypes, we ran two types of positive controls: (1) with TE-specific primers with gDNA extracted from a genotype (RAL-321) predicted to have insertions of all six TEs, and (2) with primers for the *Drosophila* gene RPL32 (Supplementary Table S2.4) present in every line. The gDNA extracted, as described above, was used in 10 µl PCRs containing 0.4 ng gDNA, 0.25 U GoTaq (Promega), 1.5 mM MgCl2, and 0.5 µM of each primer. The thermal cycling protocol was: 10 min at 95 °C; 35 cycles of 95 °C for 30 s, 60 °C for 1 min, 72 °C for 30 s; 5 min at 72 °C.

Fly lines and husbandry

We randomly chose 25 DGRP lines described to be infected with *Wolbachia* (Mackay et al. 2012) and none were described to be infected with the endosymbiont *Spiroplasma* (Richardson et al. 2012). See the complete list of target DGRP genotypes in Supplementary Tables S2.2 and S2.3. For each of the lines selected, we generated a *Wolbachia*-free version following procedures described in Teixeira et al. (2008) and Chrostek et al. 2013. In short, flies were first rid of *Wolbachia* by feeding on food supplemented with tetracycline antibiotic (0.05 mg/ml) for two generations. Their gut flora was then restored by placing sterilized eggs of *Wolbachia*-cleared flies (10 min in 50% bleach followed by washing in sterilized water) on food supplemented with a bacterial inoculum (150 µl of a mix prepared by mixing 2 ml of sterile water with 1 g of a month-old food filtered to remove eggs and larvae) of each respective untreated (Wolbachia-positive) line. Flies were *Wolbachia*-free and gut microbiota-homogenized for at least five generations before the experiments were initiated.

Flies were reared at 25 °C and 12 h:12 h light:dark cycle, in vials with cornmeal-agar food (45 g/l molasses, 75 g/l white sugar, 70 g/l corn flour, 20 g/l yeast extract, 10 g/l agar-agar, and 25 ml Nipagin at 10%) and similar density conditions. For our experiments, we transferred newly eclosed adult flies to vials in groups of ten females and six males. Females were sampled for extraction of DNA (for quantification of *Wolbachia*) or of RNA (for quantification of TE expression) at 10 days of age.

Wolbachia presence and loads

We used *Wolbachia*-specific primers against the *Wolbachia* surface protein gene (*wsp*; sequence from Teixeira et al. 2008) to confirm that the tetracycline-treated Wolb− lines were indeed *Wolbachia* free and to quantify *Wolbachia* loads in the untreated Wolb+ lines. We confirmed the absence of *Wolbachia* in each of the tetracycline-treated lines in 10 µl PCRs, containing 0.4 ng gDNA template, 0.25 U GoTaq (Promega), 1.5 mM MgCl2, and 0.5 µM of each primer (*wsp*). We used gDNA extracted (Qiagen's DNeasy Blood and tissue kit, following manufacturer's indications) from 3 pools of 10 females (mixed ages) from each of the 25 Wolb− lines, homogenized using Qiagen Tissue Lyser II (2 min at 23 s/f). As positive control, we extracted gDNA from the 25 Wolb+ lines (same protocol) and used those samples as template. Thermal cycle was 4 min at 95 °C; 35 cycles of 95 °C for 30 s, 60 °C for 1 min and 72 °C for 30 s; 5 min at 72 °C. PCR amplicons were checked by electrophoresis gel (1% agarose) and we confirmed the successful removal of *Wolbachia* (no amplicon) in all 25 target DGRP lines.

We measured *Wolbachia* loads in 5 individual females (10 days post-eclosion) from each of our 25 target Wolb+ lines. Individual females were homogenized in Qiagen ATL Buffer in 96 well-plates with a sterile glass bead per well on a Tissue Lyser II (Qiagen) at 23 s/f for 2 min, before DNA was extracted using the Quick-DNA™ 96 kit (Zymo Research), following manufacturer's instructions. DNA was eluted in 200 µl buffer AE from the kit and stored at −20 °C until qPCR, which was run using primers (Supplementary Table S2.4) either for a *Wolbachia* gene (*wsp*; measuring *Wolbachia* load) or for a host gene (*actin*, proxy for number of host cells) as described below.

RNA extraction and cDNA synthesis for TE expression quantification by qPCR

To quantify TE expression, we extracted RNA from eight replicate pools of 10 co-housed, 10-day-old females, for each of the 25 pairs of Wolb+ and Wolb− genotypes (total of 50 lines). Whole bodies were homogenized in 400 µl TRIzol (Invitrogen) using a sterile glass bead in microcentrifuge tubes and a Tissue Lyser II (Qiagen) at 26 s/f for 1 min. Homogenates were stored at −80 °C until further processing. Once thawed, we added 80 µl of chloroform, centrifuged (12,000 × g for 15 min at 4 °C) and collected the supernatant aqueous phase containing the RNA (to avoid carrying fly tissues and fat to the RNA extraction step), and then we added 400 µl more TRIzol. Total RNA was then extracted using the Direct-zol™ 96 RNA Kit (Zymo Research), following manufacturer instructions. We used 4 µg of RNA to synthesize cDNA with NZY First-Strand cDNA Synthesis Kit (NZYTech), following manufacturer's instructions. cDNA was then diluted 1:10 in sterile water (Sigma) to be used as template in qPCR with primers (Supplementary Table S2.4) against each of the 14 target TEs (*412*, *1360*, *blastopia*, *blood*, *copia*, *Cr1a*, *gypsy5*, *Idefix*, *Juan*, *mdg1*, *opus*, *Quasimodo*, *P-element*, *pogo*) or against one reference gene, EF1, chosen from a number of candidates (18S, Act5c, *actin*, EF1, ELF2, Gapdh1, Mnf, Rpl32, Rps20, TBP, tubulin) using Normfinder (Andersen et al. 2004) and selecting a gene with Cq values similar to that of the TEs being tested (qPCR reagents and thermocycle as described below).

qPCR with standard curves

We used qPCR to measure both *Wolbachia* titers (gDNA template and primers for one *Wolbachia*-specific gene, *wsp*, and one host-specific reference gene, *actin*) and TE expression (cDNA template and primers for each of the 14 target TEs and one reference gene). Template preparation and primers were described above.

Our qPCR studies followed MIQE guidelines (Taylor et al. 2010), including technical and biological replication, ensuring template quality, careful selection of reference genes, and correction for differences in primer efficiency. Moreover, all samples being directly compared were ran together and using the same batch of reagents.

For each biological replicate sample, we ran two technical replicate reactions in an QuantStudio™ 7 Flex Real-Time PCR System (Applied Biosystems™). We used 4 µl of genomic template, 0.5 µl of each primer (0.2 µM) and 5 µl of SYBR Green I® (Bio Rad), and the following thermal cycling conditions: 2 min at 50 °C; 10 min at 95 °C; 40 cycles of 95 °C for 30 s, 60 °C for 1 min and 72 °C for 30 s. We discarded biological replicates for which the standard deviation between Cq values of the two technical replicates was >0.5, and calculated the mean Cq value between technical replicates for each of all other biological replicates. Processing of Cq data of biological replicates is detailed below.

For each gene and each TE, we also obtained standard curves relating amount of template and Cq values. These were obtained by using as template a 1:10 serial dilution (8 dilutions) of a cleaned (Macherey-Nagel's NucleoSpin Gel and PCR Clean-up) and quantified (Invitrogen's Qubit™) PCR product (obtained by PCR on gDNA extracted from flies from the standard line Oregon R). We used the equations for the linear regression of log quantity of starting template (x-axis) and Cq value (y-axis) to: (1) do absolute quantification of *wsp* and *actin*, as there in no obvious calibrator sample for analysis of *Wolbachia* loads, and (2) calculate primer efficiency required for the relative quantification of TE expression using the Pfaffl method (2001).

Processing qPCR Cq data to quantify *Wolbachia* and TE expression

For the absolute quantification of *Wolbachia* loads, we used the mean Cq values of each biological sample and the standard curves for *wsp* and *actin* to determine the quantity of each of the genes in the sample used as template: quantity = 10((Cq−b)/m), where b is the intercept and m is the slope of the linear regression equation. We estimated the quantity of both *wsp* and *actin* in each sample and then calculated the ratio between the two (quantity of *wsp*/quantity of *actin*) as a measurement of *Wolbachia* load in relation to host cells. For the relative quantification of TE expression, we used the Pfaffl method: expression ratio = E(TE)ΔCq(TE)/E(EF1)ΔCq(EF1). E is the amplification efficiency for each primer pair and is calculated based on the equation of the linear regression of the respective standard curve: E = 10−1/slope (primer efficiencies in Supplementary Table S2.4). For all TE × genotype samples, ΔCq refers to the difference in Cq values between a calibrator sample (average of same-genotype Wolb+ samples) and each sample for that genotype (Wolb− and Wolb+).

Statistical analysis

All statistical analyses were performed in R (version 4.3.1), using Rstudio (version 2022.07.2).

We estimated broad sense heritability (H2) for *Wolbachia* loads as $H2 = \sigma 2A/(\sigma 2A + \sigma 2W)$, where σ2A is the among-lines variance and σ2W is the within-line variance. Variance components were extracted using the VCA R package (Schuetzenmeister & Dufey 2020).

We tested for differences between the 25 target DGRP genotypes in: (1) *Wolbachia* loads, using ANOVA with genotype as fixed factor: aov(*Wolbachia* load ~ genotype) in R syntax, and (2) the number of novel TE insertions, using ANCOVA with *Wolbachia* load as covariate, and genotype and TE as fixed factors: aov(novel TE insertions ~ mean *Wolbachia* load + genotype * TE) in R syntax.

To account for variation in TE expression with *Wolbachia* status (Wolb+/Wolb−), we used ANOVA with TE, genotype, and *Wolbachia* status as fixed factors: aov(log2 TE expression normalized to reference gene expression ~ TE * genotype * *Wolbachia* status) in R syntax. Then, for each TE in each paired Wolb+/Wolb- genotype, we compared TE expression between Wolb+ and Wolb− flies using ANOVA with *Wolbachia* status as fixed factor: aov(log2 TE expression normalized to reference gene expression of TE expression ~ *Wolbachia* status) in R syntax.

We plotted the residuals of the models and found that their distributions were sufficiently close to normal to justify parametric tests. However, we also applied a nonparametric test (Kruskal–Wallis test), which gave mostly equivalent results (Supplementary Table S2.3).

Supplementary Material

Supplementary Figures

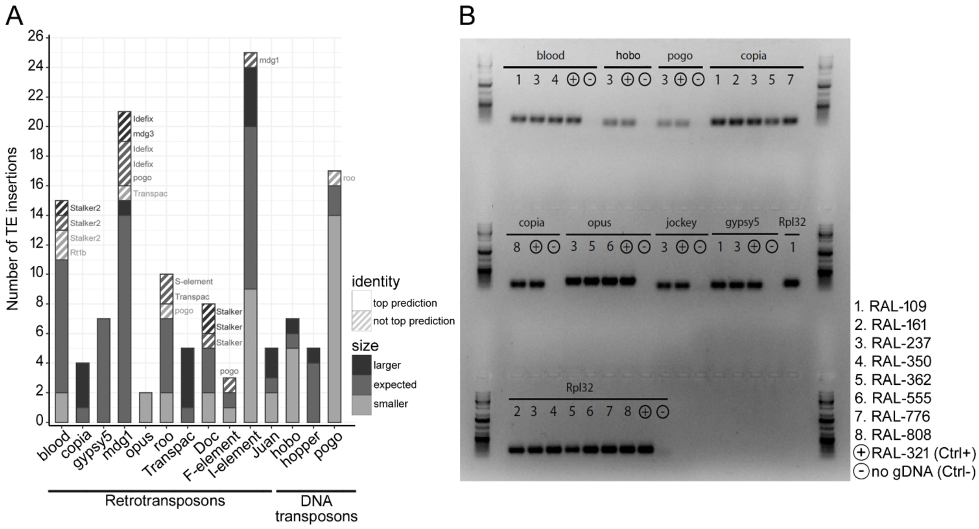
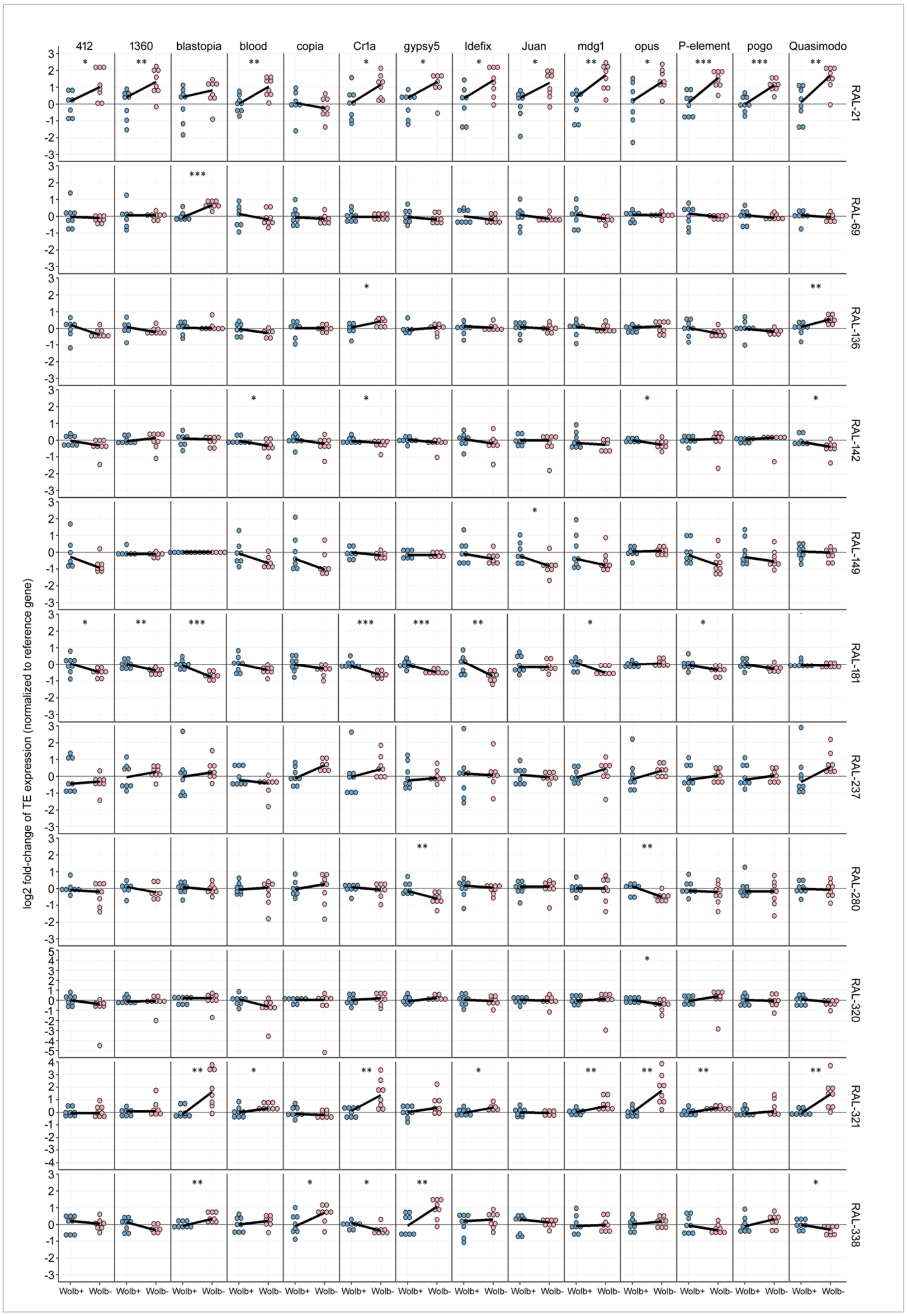
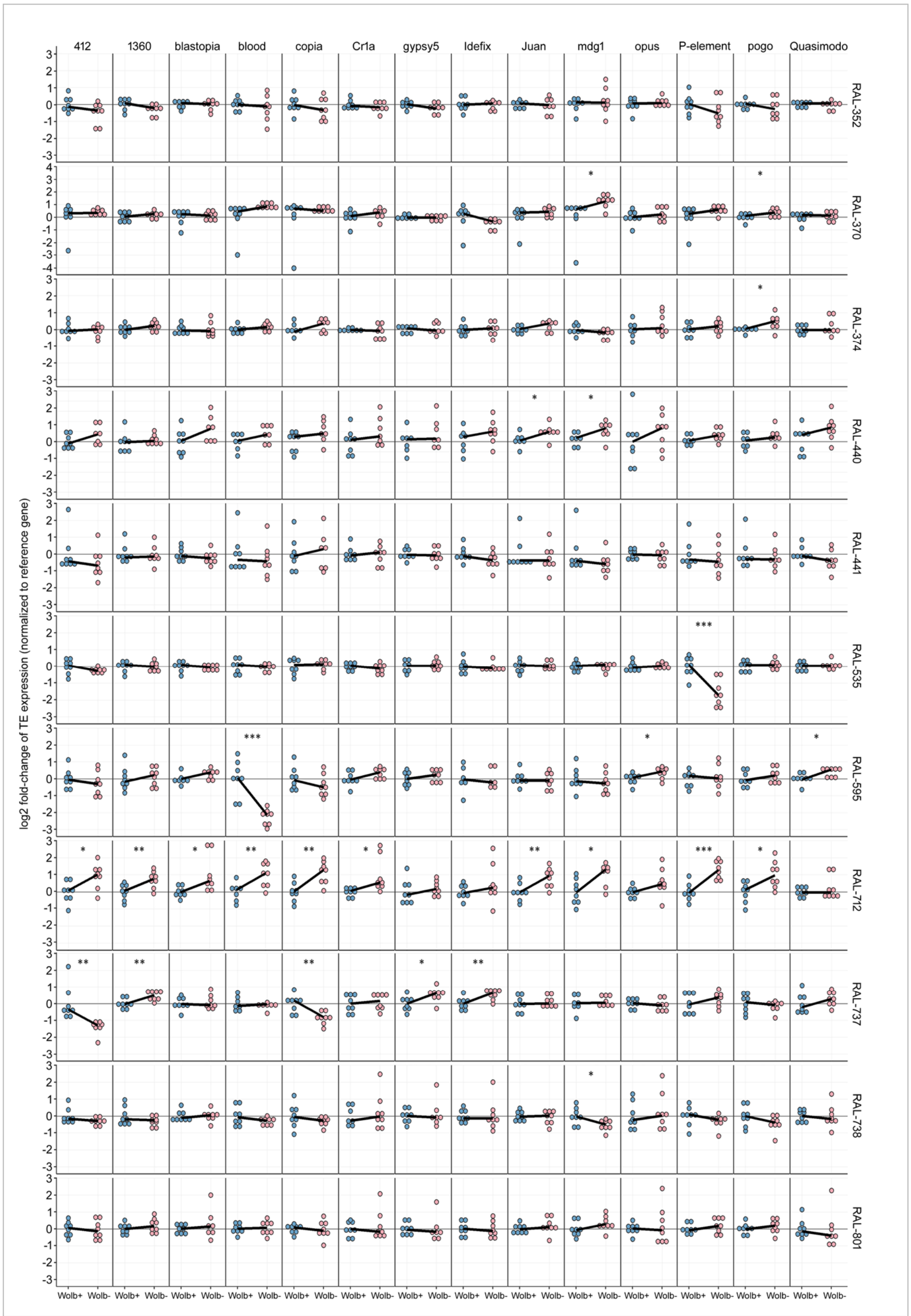


Fig. S2.1 Confirmation of in silico predictions of TE insertions in the DGRP lines (Mackay et al. 2012). (A) Confirmation of the identity and size of 132 predicted TE insertions. For each TE, the histogram represents the number of insertions we did and did not confirm the identity to be the most likely cf. the in silico prediction (solid versus pattern fill), and whether the size of the inserted fragment corresponded to that of the predicted TE (shade of grey). For the cases where the inserted TE did not correspond to the top prediction (pattern fill), the figure includes the name of the actual TE identity confirmed by sequencing the inserted fragment. (B) Electrophoresis gel of PCR amplicons confirming the presence (amplification with TE specific primers) of insertions in DGRPs (numbers) described as not having specific TEs (names on top of gel lanes). The positive control (Ctrl+) corresponds to PCR using as template DNA from a line predicted to contain insertions of all the TEs studied (RAL-321), and the negative control (Ctrl-) corresponds to PCR run with primers for each TE but without gDNA. For each DNA sample, we also ran PCR using primers for a host gene present in all lines (Rpl32).



412
1360
blastopia
blood
copia
Cr1a
gypsy5
Idefix
Juan
mdg1
opus
P-element
pogo
Quasimodo
RAL-21
RAL-69
RAL-136
RAL-142
RAL-149
RAL-181
RAL-237
RAL-280
RAL-320
RAL-321
RAL-338
log2 fold-change of TE expression (normalized to reference gene)
Wolb+
Wolb-



412
1360
blastopia
blood
copia
Cr1a
gypsy5
Idefix
Juan
mdg1
opus
P-element
pogo
Quasimodo
RAL-352
RAL-370
RAL-374
RAL-440
RAL-441
RAL-535
RAL-595
RAL-712
RAL-737
RAL-738
RAL-801
log2 fold-change of TE expression (normalized to reference gene)
Wolb+
Wolb-

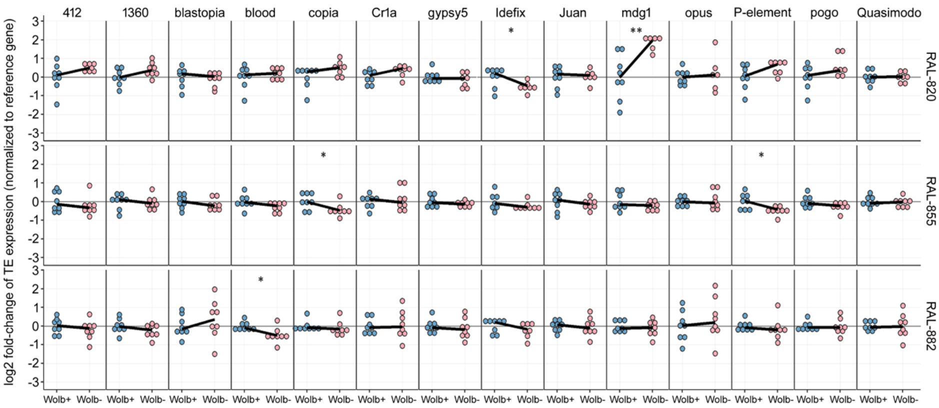


Fig. S2.2 Complete panel of expression levels for the 14 target TEs in adult female flies from our 25 target lines with (blue; Wolb+) versus without (pink; Wolb-) *Wolbachia*. Each panel corresponds to data for one TE (labels on top) in one genotype (labels on the right). Each dot in a panel represents a biological replicate, corresponding to a pool of 10 female flies, and black lines join medians for Wolb+ and Wolb- samples. Statistical significance for expression differences between Wolb+ and Wolb- is shown as * for p<0.05, ** for p<0.01, and *** for p<0.001 (ANOVA model, see Material and Methods; actual F and P-values in Supplementary Table S2.3). Note that, for completeness, this figure includes panels also represented in Fig. 2.2 A and B.

Supplementary Tables

Supplementary Table S2.1: Experimental confirmation of TE insertions predicted in Mackay et al. (2012)

DGRP	insertion position	identity predicted	identity confirmation	size predicted (bp)	size confirmation (bp)	Forward primer (5' – 3')	Reverse primer (5' – 3')
RAL-321	2L:14056691..14056894	*blood*	no (Stalker2)	7410	yes (7000)	CGGGGATGTTGTCTTTCGG	TGCAATTCATCACCCCAAGT
RAL-321	2R:4932328..4932331	*blood*	yes	7410	yes (7000)	CCTTGTCCATGAACACGGG	ACAACACTGCGGTTTCCA
RAL-321	3L:1030460..1030467	*blood*	yes	7410	no, smaller (700)	TAAGTTTACCGCCAGCACG	GCGACACTTTTCCTCCTGT
RAL-321	3L:22887401..22887413	*blood*	no (Rt1b)	7410	no, smaller (4000)	AGTAAATAGTCGGGGCGGG	CGATGGCAATCCTCCATTTG
RAL-358	3R:7387389..7387392	*blood*	no (Stalker2)	7410	no, smaller (4000)	TCCAGCGGGCTCCAATTTA	CCGTCCCAGACTATATCACC
RAL-790	2L:9310321..9310326	*blood*	yes	7410	yes (7000)	CAGCTCTCATGATGACGACG	GACCGAAATACACCGTTCCA
RAL-790	2L:18683411..18683415	*blood*	yes	7410	yes (7000)	GACACCAGTACTTGACGCA	CAATGACCTGGCATCGCT
RAL-790	2R:20107115..20107118	*blood*	yes	7410	yes (7000)	GACTCGAGTTCTTTACGCCA	AAGGACAAAGGATGCGGAT
RAL-790	3L:5167028..5167031	*blood*	yes	7410	yes (7000)	TGTCGCATAAATCCACTCCG	CCCCATAATTCCCCGCAAT
RAL-790	3R:7994453..7994456	*blood*	yes	7410	yes (7000)	GGTCAGAGCAAACCGGAAAA	CGTGTCGGCCCAGAATAT
RAL-790	3R:19792545..19792549	*blood*	yes	7410	yes (7000)	ATCTGCTCTGGGGCCTCA	GGCCGTTGAGACTGAATTG
RAL-790	3R:22107018..22107022	*blood*	yes	7410	no, smaller (1000)	AGTCAGGGCATGTGGTACTA	CTAAAAGGACCTTCTGCCCC
RAL-790	X:10922194..10922200	*blood*	no (Stalker2)	7410	no, higher (10000)	AGCATGCTTCAAAGGCAGG	AAGTGGAAGCAAGGAGTCC
RAL-810	3R:4991260..4991264	*copia*	yes	5100	no, higher (6000)	TCCTCTCCCCCTCTCTGTCT	TTAAGCCCAACCACATAGCC
RAL-812	3R:4991260..4991264	*copia*	yes	5100	no, higher (6000)	TCCTCTCCCCCTCTCTGTCT	TTAAGCCCAACCACATAGCC
RAL-908	3R:13161944..13161944	*copia*	yes	5100	no, higher (6000)	CACGTGTCCATAGCCCATTT	CTGCTTAACCATTGCGTCCT
RAL-908	2L:4426305..4426310	*copia*	yes	5100	yes (5000)	CTCGAGAGTTCGGAAAGCAT	AGGACTCTGGACAGGTGGTG
RAL-790	2L:19806748..19807008	*gypsy5*	yes	7369	yes (7000)	GCGTCTTAGCCATGATGAAGAA	TTGCCAAGTTTACGCTACG
RAL-790	2R:15116726..15116809	*gypsy5*	yes	7369	yes (7000)	GTTTTGTGTGATCGCGCTG	AGTGGGAGTTGAAGGGGTG
RAL-790	3L:773447..773450	*gypsy5*	yes	7369	yes (7000)	TGAACGTGAACTGAGAGTGG	CGGGCTCGCTGAATTGTC
RAL-790	3L:3891219..3891222	*gypsy5*	yes	7369	yes (7000)	GCTGAAAGAGGAGCCCAG	GGCAAGCTGGTGTATTGAAA
RAL-790	3L:9736885..9736886	*gypsy5*	yes	7369	yes (7000)	TTGGATGGGTAGGCAGTAGA	GCGTGGGAGTTATTGCGTA
RAL-790	3R:2368919..2368922	*gypsy5*	yes	7369	yes (7000)	TTTGCCGTTAGAAGCTGGAG	GCCACTGGACCCCACTTA
RAL-790	3R:22031220..22031223	*gypsy5*	yes	7369	yes (7000)	GCTAATACCGCCAGCCTTT	GATGGAGCTGGCCTTGAAA
RAL-357	2L:1788665..1788852	*mdg1*	no (Idefix)	7480	yes (7000)	TGACTTTCTTTGTGCGCCC	TCTCCTTAAACGTGGCTAGTG
RAL-357	2L:15102151..15102178	*mdg1*	yes	7480	yes (7000)	GACCACCGTCGACTTTAAAA	GAGGAGCCGAGATCTGTC
RAL-357	2R:19003049..19003053	*mdg1*	yes	7480	yes (7000)	TACGGCCTCCCCAAGTGAA	GGATATGACTGGTGCTTCTTATC
RAL-357	2R:19347971..19347974	*mdg1*	no (mdg3)	7480	no, higher (10000)	ACTTGGCCTAGGGAGCAATA	AGTTCAGTCCCAGAGGCC
RAL-357	3L:10095528..10095532	*mdg1*	yes	7480	yes (7000)	AGAGGCCTGTGAGATCCTTT	AAGTGTTGCCCCATTCGAA
RAL-357	3L:20245853..20245856	*mdg1*	yes	7480	yes (7000)	TGCCCGTACATTTATGCAGC	CGTGTGTGTGGAGCGATC
RAL-357	3R:5798180..5798183	*mdg1*	yes	7480	yes (7000)	AGGGCACACAGTTTTGGTAC	CTCGAATGGCAACCTGTACT
RAL-357	3R:12117132..12117136	*mdg1*	yes	7480	yes (7000)	CCAGAACGTCGACCAACC	GTGACCTAACGCAATACACAA
RAL-357	3R:23192134..23192145	*mdg1*	no (Idefix)	7480	no, higher (10000)	CCTCAACAAGTCGGCGGG	CCCCATTCCAACGCACAA
RAL-357	X:345626..345630	*mdg1*	no (Transpac)	7480	no, smaller (5000)	TACAAGTTGGGGCACAGGA	TCGCAGCGGGAATATGAATT
RAL-357	X:16472629..16472643	*mdg1*	yes	7480	yes (7000)	TAAAGGCGAGAGGAAAGAGC	TTTTGCCCCGTTCGAGTG
RAL-908	2L:19305699..19305703	*mdg1*	yes	7480	yes (7000)	AACTCCACCGACTTGCTTTT	TGGCTCTGACATGACCTAGA
RAL-908	2R:11793310..11793699	*mdg1*	yes	7480	yes (7000)	AAAGGAGCAGGAGAAGGAGT	GAGGCAAAACAACGAGCATC
RAL-908	3L:676970..677090	*mdg1*	yes	7480	yes (7000)	ATATTCACGGTTTTGGCCAG	GAGGGGCCGAGTCCTAAAT
RAL-908	3L:13514785..13514789	*mdg1*	yes	7480	yes (7000)	CGCGCTTTGTTAACGTGG	CATATTGGCTCGCGTTTTGT

RAL-908	3R:5737883..5737886	*mdg1*	yes	7480	yes (7000)	GAACACGCCGAGGATAGC	CGAAAATCTACTCAGCCTGCT
RAL-908	3R:8620803..8620806	*mdg1*	yes	7480	yes (7000)	CTGACTGAGAAATGGGGCG	TCACCAAAGTTGCAGTCGAA
RAL-908	3R:16918669..16918673	*mdg1*	yes	7480	yes (7000)	ACCGGGTGCCAAGGAATG	CTTCCTCTTCGCTTCAGTGG
RAL-908	3R:18045826..18045829	*mdg1*	yes	7480	no, higher (10000)	ACTCTACGGCAAATGAATGGG	GGCGTGACCCTTACTGAA
RAL-908	X:22997736..22997762	*mdg1*	no (Idefix)	7480	yes (7000)	AAAAGAGTCCGCAAGTCCAG	AGCTGTGTAACCGGGTAAGA
RAL-908	X:5024909..5024914	*mdg1*	no (pogo)	7480	yes (7000)	ACAGAGAGCGACGAAAGC	CGATGCGATGTCATGTCC
RAL-908	2L:7336324..7336327	*opus*	yes	7500	no, smaller (700)	GCATGACGATTACGTGGCTA	ACAACCAAACGCTTTTCACC
RAL-443	2R:17950637..17950706	*opus*	yes	7500	no, smaller (3000)	ATATGTCCTCGCCTGACCTG	GTTTCCACTGCACAGCCATA
RAL-358	3R:17957511..17957520	*roo*	yes	9092	no, smaller (700)	ATCAGCGTTTAGGTCGATCG	CGATGATGCCCAGTCTTAAAT
RAL-358	3R:7884988..7884992	*roo*	yes	9092	yes (10000)	CCCACATAGTTGCATGCCA	GTGTGTGGCAGTGGTAGT
RAL-358	3R:17515331..17515334	*roo*	no (Transpac)	9092	yes (10000)	CAGTGCCCCATTGTTACGA	CGAACTCATTGCAACTCCCT
RAL-908	X:21270475..21270477	*roo*	no (pogo)	9092	no, smaller (1500)	TCGTTCTCTCAGCAACCAAC	AGAGAACCGAAACGCTACTG
RAL-908	2L:9204672..9204675	*roo*	yes	9092	no, smaller (7000)	TTGGCGGGGAACAAATACAC	TGCCCCTTACCGCTCCAT
RAL-908	2L:9361897..9361901	*roo*	yes	9092	yes (10000)	TCTTGTTTCCCCGCATCATG	TCTACCTCCGGAGCTCACA
RAL-908	2L:9705174..9705181	*roo*	yes	9092	yes (10000)	CAACTGATGGGGTAAGCAATG	GCGAGCAAAGACAGCACTA
RAL-908	2L:12191481..12191488	*roo*	no (S-element)	9092	yes (10000)	CGGTGCTTGAGGTGTCCC	CACTTCAAGCCTGGTTACCC
RAL-908	2L:12434248..12434266	*roo*	yes	9092	yes (10000)	CACGACGTTAGAGCTGGAAC	CACGCATCAAGTCAGGGTT
RAL-908	2L:12902268..12902274	*roo*	yes	9092	yes (10000)	GAATTTCGGGCTGGTTTTCA	CCATGATGTCCTGTGCTCC
RAL-810	2R:12108723..12108729	*Transpac*	yes	5200	no, higher (6000)	ATAAACCGCAGCAAAAGTGG	CCAATGGATTTTCGAGAGGA
RAL-908	3L:12856836..12856842	*Transpac*	yes	5200	no, higher (6000)	CCCACTTCCTCTTCCACTCA	AGTCGACCAGGGACAATGAC
RAL-357	X:345626..345630	*Transpac*	yes	5200	yes, (5000)	TAACGATGGTGGCTGCTACA	AAGGAAAGCGATTCAAGACC
RAL-892	X:345626..345630	*Transpac*	yes	5200	no, higher (6000)	TAACGATGGTGGCTGCTACA	AAGGAAAGCGATTCAAGACC
RAL-443	X:15333499..15333504	*Transpac*	yes	5200	no, higher (6000)	CTGCAACTTTCCATGGCTTT	ACAGCTTTCCCCTTCTGGAT
RAL-357	2L:11138677..11138734	*Doc*	yes	4700	no, smaller (3000)	AAAATCCATTCGGCAAACTG	TCGATCAGCGCCTAGTATCA
RAL-892	2L:11138677..11138734	*Doc*	yes	4700	yes (5000)	AAAATCCATTCGGCAAACTG	TCGATCAGCGCCTAGTATCA
RAL-357	3R:7873179..7873180	*Doc*	no (Stalker)	4700	no, higher (7000)	ATTGTCTGCGCAACTGTCTG	ATGAATTCGTCTGCCTGTCC
RAL-381	3R:7873179..7873180	*Doc*	no (Stalker)	4700	no, higher (7000)	CCCACATAGTTGCATGCCA	GTGTGTGGCAGTGGTAGT
RAL-761	3R:7873179..7873180	*Doc*	no (Stalker)	4700	yes (5000)	CAGTGCCCCATTGTTACGA	CGAACTCATTGCAACTCCCT
RAL-810	2R:7936918..7936946	*Doc*	yes	4700	yes (5000)	CGAAGACATCAGTCCTGCAA	CCGCTGACTGTGATTGCTAA
RAL-908	3R:10301789..10301822	*Doc*	yes	4700	no, smaller (3000)	GCACGAGACTCACACAGGAA	TTATGGCCATTGTACGCTGA
RAL-908	2L:1399467..1399478	*Doc*	yes	4700	yes, (5000)	TGCATCTGTGTGCGTATGTG	GCACTTTTTGCCTCTGTTCC
RAL-810	3R:6947766..6947992	*F-element*	no (pogo)	4700	yes (5000)	TAGGCGCTGTTATTGAAACC	CAGTGAAAGTGGGTGCAAA
RAL-908	3L:7996067..7996071	*F-element*	yes	4700	no, smaller (3500)	GGGATTTGCTCTTGCTCTTG	GCCATGGTCGAAACAAAACT
RAL-908	3R:9994118..9994126	*F-element*	yes	4700	yes (5000)	GCTTGTCAAAGGGTCCAAGA	TGTTATGTGCGCGAACTTGT
RAL-357	2R:10573276..10573286	*I-element*	yes	5300	no, smaller (700)	TCCGTCGGCTCTTATTTGTC	CGTCTTACACTCGCAGCAAA
RAL-810	2R:13861586..13861600	*I-element*	yes	5300	no, smaller (1500)	CCCAGATTCGCAATACCAAA	AACAAAAGCAACCACCAAGG
RAL-908	3L:5068011..5068084	*I-element*	yes	5300	no, smaller (700)	TCGAATTGATACAACCCCAAT	CTACTACGGCGGTGTTGGTT
RAL-357	3R:11405981..11405987	*I-element*	yes	5300	yes (5000)	GGCAGTGCAAACAAAAACAA	CTGAGGCCAAGGACTTATGC
RAL-810	3R:14271683..14271693	*I-element*	yes	5300	no, smaller (2000)	ACCTCATAGGGGGTGCTTTT	TTGGAAGTGAAGGCTTTGAA
RAL-790	2L:11388784..11388793	*I-element*	yes	5300	no, smaller (4000)	CTTGAAGACCGGGTACTTCT	GCTGGCATATCTTCTCCGAC
RAL-790	2R:7961110..7961122	*I-element*	yes	5300	no, smaller (1000)	AACCCAGGGAGCTAAGTAGA	ATTGAATGTCCGGGGATCTT

RAL-790	2R:12732718..12732730	*I-element*	yes	5300	no, smaller (700)	GCCGAACAGCATATACCCT	TCAAGCGTGTTTCCTCGAT
RAL-790	2R:14371197..14371209	*I-element*	yes	5300	yes (5000)	TACCCGCCACTCAATTATCC	AGTATGGCGTCGAGTGTG
RAL-790	3R:4277178..4277189	*I-element*	yes	5300	yes (5000)	CTTTAAGCACCACGAGACGA	ACCCAAATGCAAAGCCGT
RAL-790	3R:14671496..14671508	*I-element*	yes	5300	yes (5000)	TAAATAAGTGCCTTCGCCCC	TGTATCTCGGCTGTCTCCA
RAL-790	3R:21118597..21118611	*I-element*	yes	5300	yes (5000)	CCGGAGCCTGGTAGTTCTT	TATCTTTCTCCCAGCCCGTC
RAL-790	3R:21756397..21756400	*I-element*	yes	5300	no, higher (7000)	CGCGCCTAGAACTATGCAA	ACACACTAGCAAGCACTGG
RAL-908	2R:2648988..2649001	*I-element*	yes	5300	no, higher (7000)	CCCCTCGTTTTCTACTGCTAC	GTGGGTGTGGAACTCTGTG
RAL-908	2R:7224003..7224015	*I-element*	yes	5300	no, higher (7000)	TAGCCTGCTTTTGTGTGGAG	CTTGCAAGTTGGTTTTGGGG
RAL-908	3L:4501669..4501675	*I-element*	no (mdg1)	5300	yes (5000)	ACAGAAGTACAGTGAGCGT	GGGGAGGTTCAATTGGTCA
RAL-908	3L:5068011..5068084	*I-element*	yes	5300	no, smaller (700)	AGTCAATTCGCCTAGTACCAC	CAATTGGAGCTGCATCCTTT
RAL-908	3L:10088380..10088381	*I-element*	yes	5300	yes (5000)	AGGGCACTTTCCTCGAGA	ATATGCTTTGATACGGCGCT
RAL-908	3L:22408430..22408442	*I-element*	yes	5300	yes (5000)	GTCTTGACGCCTTGCCTAG	CACTGCATTTCAAACGCTCG
RAL-908	3R:8071617..8071628	*I-element*	yes	5300	no, higher (7000)	GAACACGCCGAGGATAGC	CGAAAATCTACTCAGCCTGCT
RAL-908	3R:11192794..11192806	*I-element*	yes	5300	yes (5000)	GCCTTCCACACGCATCTG	GATGCCCGCACTGAGAGA
RAL-908	3R:22596610..22596622	*I-element*	yes	5300	yes (5000)	ACCCAAGTTCTTGTCGCC	GCGGCGCATCAACTAATG
RAL-908	3R:22850421..22850434	*I-element*	yes	5300	no, smaller (3000)	TCCGCTGGAGAAATTGCAT	AATCTAAAAGGGGCTGCCA
RAL-908	X:302449..302464	*I-element*	yes	5300	yes (5000)	TAAGTCACAACCCTACAGCA	TGACAGCAGTTGGGATCAA
RAL-908	X:10027285..10027298	*I-element*	yes	5300	yes (5000)	CGCTTACACTGTATTTGCCC	GCCACCGTCTCTACTTGC
RAL-810	2R:5572279..5572291	*Juan*	yes	4200	no, smaller (600)	CTAACACGTTTCCGCCAAGT	TTCGAGGGTGTGGGTGTATT
RAL-357	3L:17698435..17698491	*Juan*	yes	4200	yes (4000)	TCAAGTCCCAGATGCACTCA	ATGTGGAACTTGGAGGATGC
RAL-761	3L:17698435..17698491	*Juan*	yes	4200	no, higher (5000)	TCAAGTCCCAGATGCACTCA	ATGTGGAACTTGGAGGATGC
RAL-908	X:18924423..18924436	*Juan*	yes	4200	no, higher (5000)	TCGAAGCCATTGCTATTTTTG	TGACACCTATTCCTCAGACTCG
RAL-443	3L:16130441..16130456	*Juan*	yes	4200	no, smaller (400)	CAATCGCCTAGATCGCTTGT	AGTAGCAGGTCGCCTTGAAA
RAL-357	3R:10703373..10703379	*hobo*	yes	2900	no, smaller (1500)	CTCCCAAGGATTCTGTCCAA	AATGTTTCCCAAAGCTGACG
RAL-357	3R:22133514..22133521	*hobo*	yes	2900	no, higher (4000)	GGGTCTGAAAGCAGCTATGG	CATTGTTCTTGGCTGACGAA
RAL-810	2R:12871101..12871113	*hobo*	yes	2900	no, smaller (2000)	TCAACGCTGAAAAGTATGCAA	GCAGATGATGTTGGCTTGAA
RAL-761	3L:19555349..19555354	*hobo*	yes	2900	no, smaller (2000)	AGCTTTAGCCACAGCCACAT	GAGAGGCACGCAGGTAAGAC
RAL-810	3L:19555349..19555354	*hobo*	yes	2900	no, smaller (2000)	AGCTTTAGCCACAGCCACAT	GAGAGGCACGCAGGTAAGAC
RAL-812	3L:19555349..19555354	*hobo*	yes	2900	yes (3000)	AGCTTTAGCCACAGCCACAT	GAGAGGCACGCAGGTAAGAC
RAL-908	3R:22134885..22134892	*hobo*	yes	2900	no, smaller (1500)	CAAAGGCAGGGCTAACAAAA	CACAAGTGGGAGCATCAACA
RAL-357	2L:2390528..2390533	*hopper*	yes	1400	yes (1750)	ACCCATCAGACTTCCACGAC	GGAATCGCCTACAGAAGCTG
RAL-357	3R:13938897..13938901	*hopper*	yes	1400	yes (1750)	TCGATTTGGCTGGAAACTCT	ATGCTGAACACGATGTGGAA
RAL-812	3R:13938897..13938901	*hopper*	yes	1400	yes (1750)	TCGATTTGGCTGGAAACTCT	ATGCTGAACACGATGTGGAA
RAL-908	3R:15010776..15010780	*hopper*	yes	1400	yes (1750)	GGGTACAATCAAATCGAGCTTC	GCGAAAACTGCACTCAATCA
RAL-810	X:4110151..4110442	*hopper*	yes	1400	no, higher (2000)	CTTCGTTTCATTTGGCCATT	TGTGCCAAAAACACAGGCTA
RAL-810	2R:11767856..11767857	*pogo*	yes	2100	no, smaller (500)	GGCTACGACATTTCCGTTGT	AACCTATTCCTTGCGGACCT
RAL-381	2R:11767856..11767857	*pogo*	yes	2100	no, smaller (500)	GGCTACGACATTTCCGTTGT	AACCTATTCCTTGCGGACCT
RAL-810	3L:21388576..21388578	*pogo*	yes	2100	no, smaller (500)	TTCAATACGGATTTGCCACA	GCAAAAATAAGGGCCATCCT
RAL-812	3L:21388576..21388578	*pogo*	yes	2100	no, smaller (500)	TTCAATACGGATTTGCCACA	GCAAAAATAAGGGCCATCCT
RAL-357	3R:11292096..11292097	*pogo*	yes	2100	no, smaller (1250)	GTTGAGCAAACAGACCCACA	GGAGCCTCATAATCCGGTCT
RAL-357	3R:2926760..2926761	*pogo*	yes	2100	no, smaller (500)	AACTCGAATCTGGCTCGAAA	AGTGGCCTTATCGATTGGAA

RAL-908	X:6015256..6015259	*pogo*	yes	2100	no, smaller (500)	GATGTTTCGTGTGGCTGTTG	GCAGTCGCTGCAGTTTGATA
RAL-381	X:6015256..6015259	*pogo*	yes	2100	no, smaller (500)	GATGTTTCGTGTGGCTGTTG	GCAGTCGCTGCAGTTTGATA
RAL-358	3L:1571691..1571694	*pogo*	yes	2100	no, smaller (500)	TGCACATGACTGGATTCACA	CACACGAACATTGCTCCGA
RAL-908	2L:12470302..12470309	*pogo*	yes	2100	no, smaller (700)	TTAGAAAGCAAGTACCGGCA	TTCTGCCATCGTGTTGCC
RAL-908	2L:13770337..13770338	*pogo*	yes	2100	yes (2000)	GTGGGGCCTCATAGATACGT	TATGCGCTGAGGTACACTTG
RAL-908	2L:13780514..13780515	*pogo*	yes	2100	no, smaller (700)	CCGGCCCATGTTAAGCTTTA	GAGGCAGCGGATCAATTCA
RAL-908	2L:15151373..15151377	*pogo*	yes	2100	no, smaller (500)	TGTTCGGGTGGTAAAAGCG	CAACGTTCCCAGGACACC
RAL-908	2L:18860089..18860091	*pogo*	yes	2100	no, smaller (700)	ACGCCTCGGATTTGACATC	CCGTTGGCATTTTGTGGATA
RAL-908	2R:1749442..1749443	*pogo*	yes	2100	no, smaller (500)	ATAGCACATTCAGCCACACG	TGCTGAATTCGGAAAGAGCT
RAL-908	2R:5741587..5741594	*pogo*	yes	2100	yes (2000)	GGTTTCGATTCGGTATTGGTTG	ATTGCTTCGTGTTAGGACCC
RAL-908	2R:6426442..6426443	*pogo*	no (roo)	2100	no, smaller (500)	CTGAGTCGAGCTGGTAGGT	CGACATTTTCTGCGGCCG

Insertions, identity and size refer to the properties of the TEs in study. Identity confirmation was obtained by sequencing. Size confirmation was obtained by Long-PCR.

Supplementary Table S2.2: TE expression data (qPCR)																	
DGRP	**TE**	***Wolb.***	**R.**	**TE**	**EF1**	**DGRP**	**TE**	***Wolb.***	**R.**	**TE**	**EF1**	**DGRP**	**TE**	***Wolb.***	**R.**	**TE**	**EF1**
RAL-136	*412*	negative	1	21,94	25,52	RAL-136	*copia*	negative	7	18,05	25,71	RAL-136	*Juan*	positive	2	21,74	25,70
RAL-136	*412*	negative	2	21,65	25,08	RAL-136	*copia*	negative	8	18,48	26,02	RAL-136	*Juan*	positive	3	21,71	25,91
RAL-136	*412*	negative	3	21,77	25,32	RAL-136	*copia*	positive	1	17,57	24,69	RAL-136	*Juan*	positive	4	22,02	26,41
RAL-136	*412*	negative	4	21,67	25,46	RAL-136	*copia*	positive	2	17,96	25,70	RAL-136	*Juan*	positive	5	21,36	25,52
RAL-136	*412*	negative	5	21,36	25,53	RAL-136	*copia*	positive	3	18,09	26,25	RAL-136	*Juan*	positive	6	21,69	25,73
RAL-136	*412*	negative	6	21,99	25,50	RAL-136	*copia*	positive	4	17,42	25,47	RAL-136	*Juan*	positive	7	21,71	25,76
RAL-136	*412*	negative	7	21,89	25,71	RAL-136	*copia*	positive	5	17,90	25,63	RAL-136	*Juan*	positive	8	22,56	26,19
RAL-136	*412*	negative	8	22,47	26,02	RAL-136	*copia*	positive	6	17,72	25,59	RAL-136	*mdg1*	negative	1	22,21	25,66
RAL-136	*412*	positive	1	21,93	24,69	RAL-136	*copia*	positive	7	19,23	25,99	RAL-136	*mdg1*	negative	2	21,82	25,26
RAL-136	*412*	positive	2	21,47	25,70	RAL-136	*Cr1a*	negative	1	23,57	25,52	RAL-136	*mdg1*	negative	3	21,98	25,57
RAL-136	*412*	positive	3	21,65	26,25	RAL-136	*Cr1a*	negative	2	23,64	25,08	RAL-136	*mdg1*	negative	4	21,87	25,63
RAL-136	*412*	positive	4	21,32	25,47	RAL-136	*Cr1a*	negative	3	23,86	25,32	RAL-136	*mdg1*	negative	5	21,61	25,61
RAL-136	*412*	positive	5	21,43	25,63	RAL-136	*Cr1a*	negative	4	23,96	25,46	RAL-136	*mdg1*	negative	6	22,18	25,58
RAL-136	*412*	positive	6	21,71	25,59	RAL-136	*Cr1a*	negative	5	23,56	25,53	RAL-136	*mdg1*	negative	7	22,52	25,77
RAL-136	*412*	positive	7	22,34	25,99	RAL-136	*Cr1a*	negative	6	23,75	25,50	RAL-136	*mdg1*	negative	8	22,86	26,09
RAL-136	*1360*	negative	1	24,57	25,52	RAL-136	*Cr1a*	negative	7	23,72	25,71	RAL-136	*mdg1*	positive	1	22,29	24,86
RAL-136	*1360*	negative	2	24,29	25,08	RAL-136	*Cr1a*	negative	8	24,18	26,02	RAL-136	*mdg1*	positive	2	21,97	25,70
RAL-136	*1360*	negative	3	24,51	25,32	RAL-136	*Cr1a*	positive	1	24,08	24,69	RAL-136	*mdg1*	positive	3	22,09	25,91
RAL-136	*1360*	negative	4	24,57	25,46	RAL-136	*Cr1a*	positive	2	24,27	25,70	RAL-136	*mdg1*	positive	4	22,36	26,41
RAL-136	*1360*	negative	5	24,13	25,53	RAL-136	*Cr1a*	positive	3	24,73	26,25	RAL-136	*mdg1*	positive	5	21,94	25,52
RAL-136	*1360*	negative	6	24,42	25,50	RAL-136	*Cr1a*	positive	4	24,25	25,47	RAL-136	*mdg1*	positive	6	22,11	25,73
RAL-136	*1360*	negative	7	25,01	25,71	RAL-136	*Cr1a*	positive	5	23,96	25,63	RAL-136	*mdg1*	positive	7	22,22	25,76
RAL-136	*1360*	negative	8	25,29	26,02	RAL-136	*Cr1a*	positive	6	23,90	25,59	RAL-136	*mdg1*	positive	8	23,10	26,19
RAL-136	*1360*	positive	1	24,49	24,69	RAL-136	*Cr1a*	positive	7	24,72	25,99	RAL-136	*opus*	negative	1	26,03	25,66
RAL-136	*1360*	positive	2	24,41	25,70	RAL-136	*gypsy5*	negative	1	26,98	25,52	RAL-136	*opus*	negative	2	25,66	25,26
RAL-136	*1360*	positive	3	24,51	26,25	RAL-136	*gypsy5*	negative	2	27,11	25,08	RAL-136	*opus*	negative	3	25,76	25,57
RAL-136	*1360*	positive	4	24,58	25,63	RAL-136	*gypsy5*	negative	3	26,67	25,32	RAL-136	*opus*	negative	4	26,63	25,63
RAL-136	*1360*	positive	5	24,31	25,59	RAL-136	*gypsy5*	negative	4	27,28	25,46	RAL-136	*opus*	negative	5	25,98	25,61
RAL-136	*1360*	positive	6	25,15	25,99	RAL-136	*gypsy5*	negative	5	26,74	25,53	RAL-136	*opus*	negative	6	26,29	25,58
RAL-136	*blastopia*	negative	1	25,32	25,52	RAL-136	*gypsy5*	negative	6	26,84	25,50	RAL-136	*opus*	negative	7	26,63	25,77
RAL-136	*blastopia*	negative	2	24,89	25,08	RAL-136	*gypsy5*	negative	7	27,24	25,71	RAL-136	*opus*	negative	8	27,20	26,09
RAL-136	*blastopia*	negative	3	24,97	25,32	RAL-136	*gypsy5*	negative	8	27,59	26,02	RAL-136	*opus*	positive	1	25,31	24,86
RAL-136	*blastopia*	negative	4	25,21	25,46	RAL-136	*gypsy5*	positive	1	26,31	24,69	RAL-136	*opus*	positive	2	26,37	25,70
RAL-136	*blastopia*	negative	5	24,49	25,53	RAL-136	*gypsy5*	positive	2	27,27	25,70	RAL-136	*opus*	positive	3	26,41	25,91
RAL-136	*blastopia*	negative	6	25,23	25,50	RAL-136	*gypsy5*	positive	3	27,37	25,47	RAL-136	*opus*	positive	4	26,96	26,41
RAL-136	*blastopia*	negative	7	25,57	25,71	RAL-136	*gypsy5*	positive	4	26,53	25,63	RAL-136	*opus*	positive	5	26,49	25,52
RAL-136	*blastopia*	negative	8	25,87	26,02	RAL-136	*gypsy5*	positive	5	27,19	25,59	RAL-136	*opus*	positive	6	26,26	25,73
RAL-136	*blastopia*	positive	1	24,85	24,69	RAL-136	*gypsy5*	positive	6	27,69	25,99	RAL-136	*opus*	positive	7	26,57	25,76
RAL-136	*blastopia*	positive	2	25,45	25,70	RAL-136	*Idefix*	negative	1	25,98	25,66	RAL-136	*opus*	positive	8	27,05	26,19
RAL-136	*blastopia*	positive	3	25,63	26,25	RAL-136	*Idefix*	negative	2	25,46	25,26	RAL-136	*P-element*	negative	1	22,53	25,66
RAL-136	*blastopia*	positive	4	24,91	25,47	RAL-136	*Idefix*	negative	3	25,93	25,57	RAL-136	*P-element*	negative	2	21,97	25,26
RAL-136	*blastopia*	positive	5	25,25	25,63	RAL-136	*Idefix*	negative	4	25,89	25,63	RAL-136	*P-element*	negative	3	21,92	25,57
RAL-136	*blastopia*	positive	6	25,33	25,59	RAL-136	*Idefix*	negative	5	25,45	25,61	RAL-136	*P-element*	negative	4	22,42	25,63
RAL-136	*blastopia*	positive	7	26,36	25,99	RAL-136	*Idefix*	negative	6	25,88	25,58	RAL-136	*P-element*	negative	5	22,39	25,61
RAL-136	*blood*	negative	1	20,95	25,52	RAL-136	*Idefix*	negative	7	26,05	25,77	RAL-136	*P-element*	negative	6	22,60	25,58
RAL-136	*blood*	negative	2	20,70	25,08	RAL-136	*Idefix*	negative	8	26,54	26,09	RAL-136	*P-element*	negative	7	22,64	25,77
RAL-136	*blood*	negative	3	20,82	25,53	RAL-136	*Idefix*	positive	1	25,91	24,86	RAL-136	*P-element*	negative	8	22,96	26,09
RAL-136	*blood*	negative	4	21,10	25,50	RAL-136	*Idefix*	positive	2	25,90	25,70	RAL-136	*P-element*	positive	1	22,26	24,86
RAL-136	*blood*	negative	5	21,60	25,71	RAL-136	*Idefix*	positive	3	26,07	25,91	RAL-136	*P-element*	positive	2	22,02	25,70
RAL-136	*blood*	negative	6	21,97	26,02	RAL-136	*Idefix*	positive	4	26,26	26,41	RAL-136	*P-element*	positive	3	21,92	25,91
RAL-136	*blood*	positive	1	20,60	24,69	RAL-136	*Idefix*	positive	5	25,71	25,52	RAL-136	*P-element*	positive	4	22,41	26,41
RAL-136	*blood*	positive	2	20,72	25,70	RAL-136	*Idefix*	positive	6	25,93	25,73	RAL-136	*P-element*	positive	5	22,13	25,52
RAL-136	*blood*	positive	3	21,16	26,25	RAL-136	*Idefix*	positive	7	26,14	25,76	RAL-136	*P-element*	positive	6	22,36	25,73
RAL-136	*blood*	positive	4	20,84	25,47	RAL-136	*Idefix*	positive	8	26,78	26,19	RAL-136	*P-element*	positive	7	22,22	25,76
RAL-136	*blood*	positive	5	20,81	25,63	RAL-136	*Juan*	negative	1	21,76	25,66	RAL-136	*P-element*	positive	8	23,14	26,19
RAL-136	*blood*	positive	6	21,06	25,59	RAL-136	*Juan*	negative	2	21,35	25,26	RAL-136	*pogo*	negative	1	22,55	25,66
RAL-136	*blood*	positive	7	21,77	25,99	RAL-136	*Juan*	negative	3	21,63	25,57	RAL-136	*pogo*	negative	2	22,15	25,26
RAL-136	*copia*	negative	1	17,79	25,52	RAL-136	*Juan*	negative	4	21,60	25,63	RAL-136	*pogo*	negative	3	22,68	25,57
RAL-136	*copia*	negative	2	17,39	25,08	RAL-136	*Juan*	negative	5	21,26	25,61	RAL-136	*pogo*	negative	4	22,25	25,63
RAL-136	*copia*	negative	3	17,45	25,32	RAL-136	*Juan*	negative	6	21,44	25,58	RAL-136	*pogo*	negative	5	22,45	25,61
RAL-136	*copia*	negative	4	17,74	25,46	RAL-136	*Juan*	negative	7	21,97	25,77	RAL-136	*pogo*	negative	6	22,68	25,58
RAL-136	*copia*	negative	5	17,52	25,53	RAL-136	*Juan*	negative	8	22,46	26,09	RAL-136	*pogo*	negative	7	22,73	25,77
RAL-136	*copia*	negative	6	18,10	25,50	RAL-136	*Juan*	positive	1	21,62	24,86	RAL-136	*pogo*	negative	8	22,85	26,09

RAL-136	*pogo*	positive	1	22,58	24,86	RAL-142	*blastopia*	positive	2	20,34	23,51	RAL-142	*gypsy5*	positive	4	26,13	23,86
RAL-136	*pogo*	positive	2	22,42	25,70	RAL-142	*blastopia*	positive	3	20,32	23,86	RAL-142	*gypsy5*	positive	5	26,72	24,21
RAL-136	*pogo*	positive	3	22,23	25,91	RAL-142	*blastopia*	positive	4	20,19	24,21	RAL-142	*gypsy5*	positive	6	26,50	23,99
RAL-136	*pogo*	positive	4	22,42	26,41	RAL-142	*blastopia*	positive	5	20,29	23,99	RAL-142	*gypsy5*	positive	7	26,34	23,82
RAL-136	*pogo*	positive	5	22,28	25,52	RAL-142	*blastopia*	positive	6	20,61	23,82	RAL-142	*gypsy5*	positive	8	26,61	24,00
RAL-136	*pogo*	positive	6	22,52	25,73	RAL-142	*blastopia*	positive	7	20,41	24,00	RAL-142	*Idefix*	negative	1	23,41	22,73
RAL-136	*pogo*	positive	7	22,48	25,76	RAL-142	*blood*	negative	1	22,79	23,07	RAL-142	*Idefix*	negative	2	23,66	24,16
RAL-136	*pogo*	positive	8	22,78	26,19	RAL-142	*blood*	negative	2	22,91	23,93	RAL-142	*Idefix*	negative	3	24,08	24,51
RAL-136	*Quasimodo*	negative	1	26,22	25,66	RAL-142	*blood*	negative	3	22,84	24,22	RAL-142	*Idefix*	negative	4	23,50	24,32
RAL-136	*Quasimodo*	negative	2	25,78	25,26	RAL-142	*blood*	negative	4	23,18	24,10	RAL-142	*Idefix*	negative	5	23,67	24,28
RAL-136	*Quasimodo*	negative	3	25,87	25,57	RAL-142	*blood*	negative	5	23,17	24,02	RAL-142	*Idefix*	negative	6	23,90	24,47
RAL-136	*Quasimodo*	negative	4	26,47	25,63	RAL-142	*blood*	negative	6	23,04	24,42	RAL-142	*Idefix*	negative	7	23,36	24,13
RAL-136	*Quasimodo*	negative	5	25,89	25,61	RAL-142	*blood*	negative	7	22,98	24,02	RAL-142	*Idefix*	negative	8	23,14	24,61
RAL-136	*Quasimodo*	negative	6	26,18	25,58	RAL-142	*blood*	negative	8	23,73	24,50	RAL-142	*Idefix*	positive	1	23,37	24,04
RAL-136	*Quasimodo*	negative	7	26,49	25,77	RAL-142	*blood*	positive	1	22,52	23,65	RAL-142	*Idefix*	positive	2	23,29	23,82
RAL-136	*Quasimodo*	negative	8	27,03	26,09	RAL-142	*blood*	positive	2	21,95	23,51	RAL-142	*Idefix*	positive	3	23,96	23,94
RAL-136	*Quasimodo*	positive	1	26,24	24,86	RAL-142	*blood*	positive	3	22,48	23,76	RAL-142	*Idefix*	positive	4	23,14	24,12
RAL-136	*Quasimodo*	positive	2	26,71	25,70	RAL-142	*blood*	positive	4	22,58	23,86	RAL-142	*Idefix*	positive	5	23,39	24,47
RAL-136	*Quasimodo*	positive	3	27,03	25,91	RAL-142	*blood*	positive	5	22,55	24,21	RAL-142	*Idefix*	positive	6	23,40	24,23
RAL-136	*Quasimodo*	positive	4	27,26	26,41	RAL-142	*blood*	positive	6	22,76	23,99	RAL-142	*Idefix*	positive	7	23,17	24,00
RAL-136	*Quasimodo*	positive	5	26,48	25,52	RAL-142	*blood*	positive	7	22,74	23,82	RAL-142	*Idefix*	positive	8	22,89	24,24
RAL-136	*Quasimodo*	positive	6	26,41	25,73	RAL-142	*blood*	positive	8	22,77	24,00	RAL-142	*Juan*	negative	1	24,10	22,73
RAL-136	*Quasimodo*	positive	7	26,83	25,76	RAL-142	*copia*	negative	1	15,92	23,07	RAL-142	*Juan*	negative	2	24,00	24,16
RAL-136	*Quasimodo*	positive	8	28,11	26,19	RAL-142	*copia*	negative	2	15,43	23,93	RAL-142	*Juan*	negative	3	23,83	24,51
RAL-142	*412*	negative	1	20,91	23,07	RAL-142	*copia*	negative	3	16,12	24,22	RAL-142	*Juan*	negative	4	23,69	24,32
RAL-142	*412*	negative	2	20,66	23,93	RAL-142	*copia*	negative	4	15,78	24,10	RAL-142	*Juan*	negative	5	23,64	24,28
RAL-142	*412*	negative	3	20,88	24,22	RAL-142	*copia*	negative	5	15,99	24,02	RAL-142	*Juan*	negative	6	23,87	24,47
RAL-142	*412*	negative	4	20,49	24,10	RAL-142	*copia*	negative	6	15,66	24,42	RAL-142	*Juan*	negative	7	24,11	24,13
RAL-142	*412*	negative	5	20,50	24,02	RAL-142	*copia*	negative	7	16,00	24,02	RAL-142	*Juan*	negative	8	24,30	24,61
RAL-142	*412*	negative	6	20,73	24,42	RAL-142	*copia*	negative	8	16,05	24,50	RAL-142	*Juan*	positive	1	23,40	23,82
RAL-142	*412*	negative	7	20,81	24,02	RAL-142	*copia*	positive	1	15,95	23,65	RAL-142	*Juan*	positive	2	23,50	23,94
RAL-142	*412*	negative	8	21,32	24,50	RAL-142	*copia*	positive	2	15,11	23,51	RAL-142	*Juan*	positive	3	23,38	24,12
RAL-142	*412*	positive	1	20,32	23,65	RAL-142	*copia*	positive	3	15,33	23,76	RAL-142	*Juan*	positive	4	23,58	24,47
RAL-142	*412*	positive	2	19,75	23,51	RAL-142	*copia*	positive	4	15,55	23,86	RAL-142	*Juan*	positive	5	23,90	24,23
RAL-142	*412*	positive	3	19,86	23,76	RAL-142	*copia*	positive	5	15,49	24,21	RAL-142	*Juan*	positive	6	23,94	24,00
RAL-142	*412*	positive	4	19,95	23,86	RAL-142	*copia*	positive	6	15,20	23,99	RAL-142	*Juan*	positive	7	24,03	24,24
RAL-142	*412*	positive	5	20,20	24,21	RAL-142	*copia*	positive	7	15,35	23,82	RAL-142	*mdg1*	negative	1	20,58	24,16
RAL-142	*412*	positive	6	20,60	23,99	RAL-142	*copia*	positive	8	15,48	24,00	RAL-142	*mdg1*	negative	2	21,17	24,51
RAL-142	*412*	positive	7	20,57	23,82	RAL-142	*Cr1a*	negative	1	23,38	23,07	RAL-142	*mdg1*	negative	3	20,55	24,32
RAL-142	*412*	positive	8	20,65	24,00	RAL-142	*Cr1a*	negative	2	23,42	23,93	RAL-142	*mdg1*	negative	4	20,75	24,28
RAL-142	*1360*	negative	1	23,41	23,07	RAL-142	*Cr1a*	negative	3	23,90	24,22	RAL-142	*mdg1*	negative	5	21,60	24,47
RAL-142	*1360*	negative	2	23,55	23,93	RAL-142	*Cr1a*	negative	4	23,81	24,10	RAL-142	*mdg1*	negative	6	21,25	24,13
RAL-142	*1360*	negative	3	23,46	24,22	RAL-142	*Cr1a*	negative	5	23,79	24,02	RAL-142	*mdg1*	negative	7	21,56	24,61
RAL-142	*1360*	negative	4	23,05	24,10	RAL-142	*Cr1a*	negative	6	23,98	24,42	RAL-142	*mdg1*	positive	1	20,77	24,04
RAL-142	*1360*	negative	5	22,86	24,02	RAL-142	*Cr1a*	negative	7	23,53	24,02	RAL-142	*mdg1*	positive	2	20,54	23,82
RAL-142	*1360*	negative	6	23,21	24,42	RAL-142	*Cr1a*	negative	8	24,03	24,50	RAL-142	*mdg1*	positive	3	20,53	23,94
RAL-142	*1360*	negative	7	23,43	24,02	RAL-142	*Cr1a*	positive	1	23,08	23,65	RAL-142	*mdg1*	positive	4	20,32	24,12
RAL-142	*1360*	negative	8	23,47	24,50	RAL-142	*Cr1a*	positive	2	22,59	23,51	RAL-142	*mdg1*	positive	5	19,86	24,47
RAL-142	*1360*	positive	1	23,13	23,65	RAL-142	*Cr1a*	positive	3	23,41	23,76	RAL-142	*mdg1*	positive	6	20,10	24,23
RAL-142	*1360*	positive	2	22,80	23,51	RAL-142	*Cr1a*	positive	4	23,39	23,86	RAL-142	*mdg1*	positive	7	20,82	24,00
RAL-142	*1360*	positive	3	23,08	23,76	RAL-142	*Cr1a*	positive	5	23,50	24,21	RAL-142	*mdg1*	positive	8	20,70	24,24
RAL-142	*1360*	positive	4	22,76	23,86	RAL-142	*Cr1a*	positive	6	23,48	23,99	RAL-142	*opus*	negative	1	23,38	22,73
RAL-142	*1360*	positive	5	23,15	24,21	RAL-142	*Cr1a*	positive	7	23,32	23,82	RAL-142	*opus*	negative	2	23,91	24,16
RAL-142	*1360*	positive	6	23,23	23,99	RAL-142	*Cr1a*	positive	8	23,55	24,00	RAL-142	*opus*	negative	3	24,65	24,51
RAL-142	*1360*	positive	7	23,20	23,82	RAL-142	*gypsy5*	negative	1	26,64	23,07	RAL-142	*opus*	negative	4	24,66	24,32
RAL-142	*1360*	positive	8	23,28	24,00	RAL-142	*gypsy5*	negative	2	26,69	23,93	RAL-142	*opus*	negative	5	24,24	24,28
RAL-142	*blastopia*	negative	1	20,20	23,07	RAL-142	*gypsy5*	negative	3	26,80	24,22	RAL-142	*opus*	negative	6	24,78	24,47
RAL-142	*blastopia*	negative	2	20,52	23,93	RAL-142	*gypsy5*	negative	4	26,81	24,10	RAL-142	*opus*	negative	7	24,26	24,13
RAL-142	*blastopia*	negative	3	21,17	24,22	RAL-142	*gypsy5*	negative	5	26,65	24,02	RAL-142	*opus*	negative	8	24,89	24,61
RAL-142	*blastopia*	negative	4	20,45	24,10	RAL-142	*gypsy5*	negative	6	26,96	24,42	RAL-142	*opus*	positive	1	24,06	24,04
RAL-142	*blastopia*	negative	5	20,48	24,02	RAL-142	*gypsy5*	negative	7	26,76	24,02	RAL-142	*opus*	positive	2	23,77	23,82
RAL-142	*blastopia*	negative	6	20,87	24,42	RAL-142	*gypsy5*	negative	8	27,04	24,50	RAL-142	*opus*	positive	3	24,04	23,94
RAL-142	*blastopia*	negative	7	20,71	24,02	RAL-142	*gypsy5*	positive	1	26,53	23,65	RAL-142	*opus*	positive	4	24,44	24,47
RAL-142	*blastopia*	negative	8	20,85	24,50	RAL-142	*gypsy5*	positive	2	25,87	23,51	RAL-142	*opus*	positive	5	24,01	24,23
RAL-142	*blastopia*	positive	1	20,85	23,65	RAL-142	*gypsy5*	positive	3	26,35	23,76	RAL-142	*opus*	positive	6	23,86	24,00

RAL-142	*opus*	positive	7	24,13	24,24	RAL-149	*1360*	negative	6	23,82	22,53	RAL-149	*gypsy5*	negative	2	27,27	22,99
RAL-142	*P-element*	negative	1	23,17	22,73	RAL-149	*1360*	negative	7	24,01	22,76	RAL-149	*gypsy5*	negative	3	27,15	22,63
RAL-142	*P-element*	negative	2	22,92	24,16	RAL-149	*1360*	positive	1	24,44	23,30	RAL-149	*gypsy5*	negative	4	26,87	22,33
RAL-142	*P-element*	negative	3	22,90	24,51	RAL-149	*1360*	positive	2	24,45	23,24	RAL-149	*gypsy5*	negative	5	27,11	22,67
RAL-142	*P-element*	negative	4	23,00	24,32	RAL-149	*1360*	positive	3	23,37	22,32	RAL-149	*gypsy5*	negative	6	27,14	22,53
RAL-142	*P-element*	negative	5	22,63	24,28	RAL-149	*1360*	positive	4	23,45	22,22	RAL-149	*gypsy5*	negative	7	27,04	22,76
RAL-142	*P-element*	negative	6	22,99	24,47	RAL-149	*1360*	positive	5	23,96	22,69	RAL-149	*gypsy5*	positive	1	30,13	25,98
RAL-142	*P-element*	negative	7	22,85	24,13	RAL-149	*1360*	positive	6	25,09	24,44	RAL-149	*gypsy5*	positive	2	27,44	23,30
RAL-142	*P-element*	negative	8	23,48	24,61	RAL-149	*blastopia*	negative	1	23,70	23,70	RAL-149	*gypsy5*	positive	3	27,83	23,24
RAL-142	*P-element*	positive	1	22,82	24,04	RAL-149	*blastopia*	negative	2	22,99	22,99	RAL-149	*gypsy5*	positive	4	27,01	22,32
RAL-142	*P-element*	positive	2	22,42	23,82	RAL-149	*blastopia*	negative	3	22,63	22,63	RAL-149	*gypsy5*	positive	5	26,76	22,22
RAL-142	*P-element*	positive	3	22,59	23,94	RAL-149	*blastopia*	negative	4	22,33	22,33	RAL-149	*gypsy5*	positive	6	26,90	22,69
RAL-142	*P-element*	positive	4	22,98	24,12	RAL-149	*blastopia*	negative	5	22,67	22,67	RAL-149	*gypsy5*	positive	7	28,92	24,44
RAL-142	*P-element*	positive	5	22,96	24,47	RAL-149	*blastopia*	negative	6	22,53	22,53	RAL-149	*Idefix*	negative	1	23,25	24,39
RAL-142	*P-element*	positive	6	23,08	24,23	RAL-149	*blastopia*	negative	7	22,76	22,76	RAL-149	*Idefix*	negative	2	22,90	23,86
RAL-142	*P-element*	positive	7	22,78	24,00	RAL-149	*blastopia*	positive	1	25,98	25,98	RAL-149	*Idefix*	negative	3	22,96	24,99
RAL-142	*P-element*	positive	8	23,44	24,24	RAL-149	*blastopia*	positive	2	23,30	23,30	RAL-149	*Idefix*	negative	4	22,01	23,33
RAL-142	*pogo*	negative	1	22,58	22,73	RAL-149	*blastopia*	positive	3	23,24	23,24	RAL-149	*Idefix*	negative	5	22,17	23,58
RAL-142	*pogo*	negative	2	22,56	24,16	RAL-149	*blastopia*	positive	4	22,32	22,32	RAL-149	*Idefix*	negative	6	21,95	23,38
RAL-142	*pogo*	negative	3	22,81	24,51	RAL-149	*blastopia*	positive	5	22,22	22,22	RAL-149	*Idefix*	negative	7	22,20	23,10
RAL-142	*pogo*	negative	4	22,74	24,28	RAL-149	*blastopia*	positive	6	22,69	22,69	RAL-149	*Idefix*	negative	8	22,53	23,67
RAL-142	*pogo*	negative	5	22,88	24,47	RAL-149	*blastopia*	positive	7	24,44	24,44	RAL-149	*Idefix*	positive	1	25,56	26,70
RAL-142	*pogo*	negative	6	22,50	24,13	RAL-149	*blood*	negative	1	20,85	23,70	RAL-149	*Idefix*	positive	2	22,70	23,72
RAL-142	*pogo*	negative	7	22,95	24,61	RAL-149	*blood*	negative	2	20,52	22,99	RAL-149	*Idefix*	positive	3	22,11	23,63
RAL-142	*pogo*	positive	1	22,79	24,04	RAL-149	*blood*	negative	3	20,51	22,63	RAL-149	*Idefix*	positive	4	21,50	24,45
RAL-142	*pogo*	positive	2	22,59	23,82	RAL-149	*blood*	negative	4	20,52	22,33	RAL-149	*Idefix*	positive	5	21,55	23,49
RAL-142	*pogo*	positive	3	22,60	23,94	RAL-149	*blood*	negative	5	20,55	22,67	RAL-149	*Idefix*	positive	6	21,88	23,41
RAL-142	*pogo*	positive	4	22,50	24,12	RAL-149	*blood*	negative	6	20,60	22,53	RAL-149	*Idefix*	positive	7	22,33	23,35
RAL-142	*pogo*	positive	5	22,85	24,47	RAL-149	*blood*	negative	7	20,77	22,76	RAL-149	*Idefix*	positive	8	23,66	25,78
RAL-142	*pogo*	positive	6	22,77	24,23	RAL-149	*blood*	positive	1	21,92	25,98	RAL-149	*Juan*	negative	1	21,46	24,39
RAL-142	*pogo*	positive	7	22,46	24,00	RAL-149	*blood*	positive	2	20,54	23,30	RAL-149	*Juan*	negative	2	21,26	23,86
RAL-142	*pogo*	positive	8	22,69	24,24	RAL-149	*blood*	positive	3	20,54	23,24	RAL-149	*Juan*	negative	3	21,04	24,99
RAL-142	*Quasimodo*	negative	1	25,76	22,73	RAL-149	*blood*	positive	4	20,41	22,32	RAL-149	*Juan*	negative	4	20,38	23,33
RAL-142	*Quasimodo*	negative	2	26,37	24,16	RAL-149	*blood*	positive	5	19,95	22,22	RAL-149	*Juan*	negative	5	20,70	23,58
RAL-142	*Quasimodo*	negative	3	26,51	24,51	RAL-149	*blood*	positive	6	20,45	22,69	RAL-149	*Juan*	negative	6	20,53	23,38
RAL-142	*Quasimodo*	negative	4	26,18	24,32	RAL-149	*blood*	positive	7	21,32	24,44	RAL-149	*Juan*	negative	7	21,07	23,10
RAL-142	*Quasimodo*	negative	5	26,24	24,28	RAL-149	*copia*	negative	1	15,67	23,70	RAL-149	*Juan*	negative	8	20,92	23,67
RAL-142	*Quasimodo*	negative	6	26,60	24,47	RAL-149	*copia*	negative	2	15,83	22,99	RAL-149	*Juan*	positive	1	21,91	26,70
RAL-142	*Quasimodo*	negative	7	26,22	24,13	RAL-149	*copia*	negative	3	16,49	22,63	RAL-149	*Juan*	positive	2	20,58	23,72
RAL-142	*Quasimodo*	negative	8	26,20	24,61	RAL-149	*copia*	negative	4	16,38	22,33	RAL-149	*Juan*	positive	3	20,19	23,63
RAL-142	*Quasimodo*	positive	1	25,70	23,82	RAL-149	*copia*	negative	5	16,29	22,67	RAL-149	*Juan*	positive	4	20,21	24,45
RAL-142	*Quasimodo*	positive	2	25,71	23,94	RAL-149	*copia*	negative	6	16,27	22,53	RAL-149	*Juan*	positive	5	19,65	23,49
RAL-142	*Quasimodo*	positive	3	25,41	24,12	RAL-149	*copia*	negative	7	16,50	22,76	RAL-149	*Juan*	positive	6	20,00	23,41
RAL-142	*Quasimodo*	positive	4	25,58	24,47	RAL-149	*copia*	positive	1	16,55	25,98	RAL-149	*Juan*	positive	7	20,42	23,35
RAL-142	*Quasimodo*	positive	5	26,07	24,23	RAL-149	*copia*	positive	2	15,96	23,30	RAL-149	*mdg1*	negative	1	21,76	24,39
RAL-142	*Quasimodo*	positive	6	25,94	24,00	RAL-149	*copia*	positive	3	16,33	23,24	RAL-149	*mdg1*	negative	2	21,86	23,86
RAL-142	*Quasimodo*	positive	7	25,96	24,24	RAL-149	*copia*	positive	4	16,00	22,32	RAL-149	*mdg1*	negative	3	21,24	24,99
RAL-149	*412*	negative	1	19,71	23,70	RAL-149	*copia*	positive	5	15,90	22,22	RAL-149	*mdg1*	negative	4	21,42	23,33
RAL-149	*412*	negative	2	19,91	22,99	RAL-149	*copia*	positive	6	16,06	22,69	RAL-149	*mdg1*	negative	5	21,23	23,58
RAL-149	*412*	negative	3	19,59	22,63	RAL-149	*copia*	positive	7	16,40	24,44	RAL-149	*mdg1*	negative	6	21,38	23,38
RAL-149	*412*	negative	4	19,59	22,33	RAL-149	*Cr1a*	negative	1	22,87	23,70	RAL-149	*mdg1*	negative	7	21,38	23,10
RAL-149	*412*	negative	5	19,82	22,67	RAL-149	*Cr1a*	negative	2	22,37	22,99	RAL-149	*mdg1*	negative	8	21,53	23,67
RAL-149	*412*	negative	6	19,97	22,53	RAL-149	*Cr1a*	negative	3	21,95	22,63	RAL-149	*mdg1*	positive	1	21,90	26,70
RAL-149	*412*	negative	7	19,96	22,76	RAL-149	*Cr1a*	negative	4	21,75	22,33	RAL-149	*mdg1*	positive	2	21,82	23,72
RAL-149	*412*	positive	1	20,47	25,98	RAL-149	*Cr1a*	negative	5	21,67	22,67	RAL-149	*mdg1*	positive	3	21,49	23,63
RAL-149	*412*	positive	2	19,48	23,24	RAL-149	*Cr1a*	negative	6	21,74	22,53	RAL-149	*mdg1*	positive	4	21,20	24,45
RAL-149	*412*	positive	3	19,10	22,32	RAL-149	*Cr1a*	negative	7	21,66	22,76	RAL-149	*mdg1*	positive	5	20,96	23,49
RAL-149	*412*	positive	4	19,29	22,22	RAL-149	*Cr1a*	positive	1	24,73	25,98	RAL-149	*mdg1*	positive	6	21,00	23,41
RAL-149	*412*	positive	5	19,73	22,69	RAL-149	*Cr1a*	positive	2	22,33	23,30	RAL-149	*mdg1*	positive	7	21,37	23,35
RAL-149	*412*	positive	6	20,23	24,44	RAL-149	*Cr1a*	positive	3	22,79	23,24	RAL-149	*mdg1*	positive	8	21,94	25,78
RAL-149	*1360*	negative	1	24,83	23,70	RAL-149	*Cr1a*	positive	4	21,73	22,32	RAL-149	*opus*	negative	1	24,95	24,39
RAL-149	*1360*	negative	2	24,50	22,99	RAL-149	*Cr1a*	positive	5	21,41	22,22	RAL-149	*opus*	negative	2	24,29	23,86
RAL-149	*1360*	negative	3	23,71	22,63	RAL-149	*Cr1a*	positive	6	21,69	22,69	RAL-149	*opus*	negative	3	25,14	24,99
RAL-149	*1360*	negative	4	23,50	22,33	RAL-149	*Cr1a*	positive	7	23,02	24,44	RAL-149	*opus*	negative	4	23,67	23,33
RAL-149	*1360*	negative	5	23,68	22,67	RAL-149	*gypsy5*	negative	1	27,99	23,70	RAL-149	*opus*	negative	5	23,84	23,58

RAL-149	*opus*	negative	6	23,90	23,38	RAL-181	*412*	negative	7	20,12	24,12	RAL-181	*copia*	negative	8	12,82	24,46
RAL-149	*opus*	negative	7	23,81	23,10	RAL-181	*412*	negative	8	20,64	24,46	RAL-181	*copia*	positive	1	12,91	23,72
RAL-149	*opus*	negative	8	23,76	23,67	RAL-181	*412*	positive	1	20,25	23,72	RAL-181	*copia*	positive	2	12,60	24,32
RAL-149	*opus*	positive	1	27,71	26,70	RAL-181	*412*	positive	2	20,02	24,32	RAL-181	*copia*	positive	3	12,56	24,71
RAL-149	*opus*	positive	2	24,34	23,72	RAL-181	*412*	positive	3	19,56	24,71	RAL-181	*copia*	positive	4	12,55	24,39
RAL-149	*opus*	positive	3	24,05	23,63	RAL-181	*412*	positive	4	19,71	24,39	RAL-181	*copia*	positive	5	13,02	24,46
RAL-149	*opus*	positive	4	24,87	24,45	RAL-181	*412*	positive	5	19,82	24,46	RAL-181	*copia*	positive	6	12,68	24,76
RAL-149	*opus*	positive	5	24,00	23,49	RAL-181	*412*	positive	6	20,26	24,76	RAL-181	*copia*	positive	7	13,12	24,30
RAL-149	*opus*	positive	6	23,52	23,41	RAL-181	*412*	positive	7	20,39	24,30	RAL-181	*copia*	positive	8	13,04	24,46
RAL-149	*opus*	positive	7	23,75	23,35	RAL-181	*412*	positive	8	20,26	24,46	RAL-181	*Cr1a*	negative	1	21,81	23,59
RAL-149	*opus*	positive	8	25,89	25,78	RAL-181	*1360*	negative	1	24,25	23,59	RAL-181	*Cr1a*	negative	2	22,35	24,20
RAL-149	*P-element*	negative	1	20,35	24,39	RAL-181	*1360*	negative	2	24,87	24,20	RAL-181	*Cr1a*	negative	3	22,40	24,37
RAL-149	*P-element*	negative	2	20,19	23,86	RAL-181	*1360*	negative	3	24,75	24,37	RAL-181	*Cr1a*	negative	4	22,48	24,12
RAL-149	*P-element*	negative	3	20,06	24,99	RAL-181	*1360*	negative	4	24,41	24,12	RAL-181	*Cr1a*	negative	5	22,10	23,96
RAL-149	*P-element*	negative	4	20,35	23,33	RAL-181	*1360*	negative	5	24,14	23,96	RAL-181	*Cr1a*	negative	6	22,18	24,27
RAL-149	*P-element*	negative	5	20,02	23,58	RAL-181	*1360*	negative	6	24,54	24,27	RAL-181	*Cr1a*	negative	7	21,86	24,12
RAL-149	*P-element*	negative	6	20,20	23,38	RAL-181	*1360*	negative	7	24,52	24,12	RAL-181	*Cr1a*	negative	8	22,50	24,46
RAL-149	*P-element*	negative	7	20,17	23,10	RAL-181	*1360*	negative	8	25,04	24,46	RAL-181	*Cr1a*	positive	1	21,12	23,72
RAL-149	*P-element*	negative	8	20,31	23,67	RAL-181	*1360*	positive	1	24,01	23,72	RAL-181	*Cr1a*	positive	2	21,64	24,32
RAL-149	*P-element*	positive	1	21,24	26,70	RAL-181	*1360*	positive	2	24,37	24,32	RAL-181	*Cr1a*	positive	3	21,62	24,71
RAL-149	*P-element*	positive	2	20,16	23,72	RAL-181	*1360*	positive	3	24,27	24,71	RAL-181	*Cr1a*	positive	4	21,99	24,39
RAL-149	*P-element*	positive	3	19,76	23,63	RAL-181	*1360*	positive	4	24,31	24,39	RAL-181	*Cr1a*	positive	5	21,94	24,46
RAL-149	*P-element*	positive	4	20,23	24,45	RAL-181	*1360*	positive	5	24,22	24,46	RAL-181	*Cr1a*	positive	6	22,35	24,76
RAL-149	*P-element*	positive	5	19,69	23,49	RAL-181	*1360*	positive	6	24,73	24,76	RAL-181	*Cr1a*	positive	7	21,95	24,30
RAL-149	*P-element*	positive	6	19,24	23,41	RAL-181	*1360*	positive	7	24,61	24,30	RAL-181	*Cr1a*	positive	8	22,11	24,46
RAL-149	*P-element*	positive	7	19,76	23,35	RAL-181	*1360*	positive	8	24,68	24,46	RAL-181	*gypsy5*	negative	1	25,81	23,59
RAL-149	*P-element*	positive	8	20,60	25,78	RAL-181	*blastopia*	negative	1	20,87	23,59	RAL-181	*gypsy5*	negative	2	26,59	24,20
RAL-149	*pogo*	negative	1	21,08	24,39	RAL-181	*blastopia*	negative	2	21,18	24,20	RAL-181	*gypsy5*	negative	3	26,69	24,37
RAL-149	*pogo*	negative	2	20,82	23,86	RAL-181	*blastopia*	negative	3	21,36	24,37	RAL-181	*gypsy5*	negative	4	26,43	24,12
RAL-149	*pogo*	negative	3	21,04	24,99	RAL-181	*blastopia*	negative	4	21,13	24,12	RAL-181	*gypsy5*	negative	5	26,20	23,96
RAL-149	*pogo*	negative	4	20,83	23,33	RAL-181	*blastopia*	negative	5	20,57	23,96	RAL-181	*gypsy5*	negative	6	26,27	24,27
RAL-149	*pogo*	negative	5	20,78	23,58	RAL-181	*blastopia*	negative	6	20,90	24,27	RAL-181	*gypsy5*	negative	7	26,25	24,12
RAL-149	*pogo*	negative	6	20,83	23,38	RAL-181	*blastopia*	negative	7	21,19	24,12	RAL-181	*gypsy5*	negative	8	26,84	24,46
RAL-149	*pogo*	negative	7	20,86	23,10	RAL-181	*blastopia*	negative	8	21,27	24,46	RAL-181	*gypsy5*	positive	1	25,55	23,72
RAL-149	*pogo*	negative	8	20,97	23,67	RAL-181	*blastopia*	positive	1	20,18	23,72	RAL-181	*gypsy5*	positive	2	26,17	24,32
RAL-149	*pogo*	positive	1	21,97	26,70	RAL-181	*blastopia*	positive	2	20,49	24,32	RAL-181	*gypsy5*	positive	3	26,12	24,71
RAL-149	*pogo*	positive	2	20,86	23,72	RAL-181	*blastopia*	positive	3	20,46	24,71	RAL-181	*gypsy5*	positive	4	26,36	24,39
RAL-149	*pogo*	positive	3	20,53	23,63	RAL-181	*blastopia*	positive	4	20,37	24,39	RAL-181	*gypsy5*	positive	5	26,07	24,46
RAL-149	*pogo*	positive	4	21,03	24,45	RAL-181	*blastopia*	positive	5	20,74	24,46	RAL-181	*gypsy5*	positive	6	26,50	24,76
RAL-149	*pogo*	positive	5	20,85	23,49	RAL-181	*blastopia*	positive	6	21,06	24,76	RAL-181	*gypsy5*	positive	7	26,08	24,30
RAL-149	*pogo*	positive	6	20,53	23,41	RAL-181	*blastopia*	positive	7	20,86	24,30	RAL-181	*gypsy5*	positive	8	26,65	24,46
RAL-149	*pogo*	positive	7	20,78	23,35	RAL-181	*blastopia*	positive	8	20,74	24,46	RAL-181	*Idefix*	negative	1	22,15	24,08
RAL-149	*pogo*	positive	8	21,48	25,78	RAL-181	*blood*	negative	1	21,42	23,59	RAL-181	*Idefix*	negative	2	22,32	24,79
RAL-149	*Quasimodo*	negative	1	24,84	24,39	RAL-181	*blood*	negative	2	21,53	24,20	RAL-181	*Idefix*	negative	3	22,44	24,66
RAL-149	*Quasimodo*	negative	2	24,20	23,86	RAL-181	*blood*	negative	3	21,64	24,37	RAL-181	*Idefix*	negative	4	22,35	24,54
RAL-149	*Quasimodo*	negative	3	24,42	24,99	RAL-181	*blood*	negative	4	21,58	24,12	RAL-181	*Idefix*	negative	5	21,69	24,38
RAL-149	*Quasimodo*	negative	4	23,22	23,33	RAL-181	*blood*	negative	5	21,18	23,96	RAL-181	*Idefix*	negative	6	21,97	24,76
RAL-149	*Quasimodo*	negative	5	23,20	23,58	RAL-181	*blood*	negative	6	21,24	24,27	RAL-181	*Idefix*	negative	7	22,05	24,63
RAL-149	*Quasimodo*	negative	6	23,09	23,38	RAL-181	*blood*	negative	7	21,23	24,12	RAL-181	*Idefix*	negative	8	22,52	24,95
RAL-149	*Quasimodo*	negative	7	23,18	23,10	RAL-181	*blood*	negative	8	21,94	24,46	RAL-181	*Idefix*	positive	1	22,03	24,82
RAL-149	*Quasimodo*	negative	8	23,34	23,67	RAL-181	*blood*	positive	1	21,18	23,72	RAL-181	*Idefix*	positive	2	21,63	25,15
RAL-149	*Quasimodo*	positive	1	26,49	26,70	RAL-181	*blood*	positive	2	21,28	24,32	RAL-181	*Idefix*	positive	3	21,53	25,52
RAL-149	*Quasimodo*	positive	2	24,20	23,72	RAL-181	*blood*	positive	3	20,82	24,71	RAL-181	*Idefix*	positive	4	21,69	24,99
RAL-149	*Quasimodo*	positive	3	23,60	23,63	RAL-181	*blood*	positive	4	21,20	24,39	RAL-181	*Idefix*	positive	5	22,10	25,40
RAL-149	*Quasimodo*	positive	4	24,05	24,45	RAL-181	*blood*	positive	5	21,38	24,46	RAL-181	*Idefix*	positive	6	22,26	24,74
RAL-149	*Quasimodo*	positive	5	23,07	23,49	RAL-181	*blood*	positive	6	21,29	24,76	RAL-181	*Idefix*	positive	7	22,60	25,16
RAL-149	*Quasimodo*	positive	6	22,75	23,41	RAL-181	*blood*	positive	7	21,87	24,30	RAL-181	*Juan*	negative	1	20,74	24,08
RAL-149	*Quasimodo*	positive	7	23,54	23,35	RAL-181	*blood*	positive	8	21,74	24,46	RAL-181	*Juan*	negative	2	21,15	24,79
RAL-149	*Quasimodo*	positive	8	24,95	25,78	RAL-181	*copia*	negative	1	13,01	23,59	RAL-181	*Juan*	negative	3	20,93	24,66
RAL-181	*412*	negative	1	20,19	23,59	RAL-181	*copia*	negative	2	12,91	24,20	RAL-181	*Juan*	negative	4	20,76	24,54
RAL-181	*412*	negative	2	20,60	24,20	RAL-181	*copia*	negative	3	13,15	24,37	RAL-181	*Juan*	negative	5	20,16	24,38
RAL-181	*412*	negative	3	20,47	24,37	RAL-181	*copia*	negative	4	13,21	24,12	RAL-181	*Juan*	negative	6	20,42	24,76
RAL-181	*412*	negative	4	20,23	24,12	RAL-181	*copia*	negative	5	12,61	23,96	RAL-181	*Juan*	negative	7	20,87	24,63
RAL-181	*412*	negative	5	19,76	23,96	RAL-181	*copia*	negative	6	12,80	24,27	RAL-181	*Juan*	negative	8	21,07	24,95
RAL-181	*412*	negative	6	20,15	24,27	RAL-181	*copia*	negative	7	12,74	24,12	RAL-181	*Juan*	positive	1	21,46	24,82

RAL-181	*Juan*	positive	2	21,45	25,15	RAL-181	*pogo*	positive	3	22,08	25,52	RAL-21	*blastopia*	positive	5	21,10	26,92
RAL-181	*Juan*	positive	3	20,82	25,52	RAL-181	*pogo*	positive	4	22,26	25,21	RAL-21	*blastopia*	positive	6	20,87	26,81
RAL-181	*Juan*	positive	4	20,85	25,21	RAL-181	*pogo*	positive	5	21,94	24,99	RAL-21	*blastopia*	positive	7	24,15	27,76
RAL-181	*Juan*	positive	5	21,08	24,99	RAL-181	*pogo*	positive	6	22,00	25,40	RAL-21	*blastopia*	positive	8	21,00	27,29
RAL-181	*Juan*	positive	6	20,88	25,40	RAL-181	*pogo*	positive	7	21,71	24,74	RAL-21	*blood*	negative	1	21,54	26,56
RAL-181	*Juan*	positive	7	21,16	24,74	RAL-181	*pogo*	positive	8	22,29	25,16	RAL-21	*blood*	negative	2	21,28	27,80
RAL-181	*Juan*	positive	8	21,59	25,16	RAL-181	*Quasimodo*	negative	1	24,87	24,08	RAL-21	*blood*	negative	3	21,28	27,55
RAL-181	*mdg1*	negative	1	22,77	24,08	RAL-181	*Quasimodo*	negative	2	25,37	24,79	RAL-21	*blood*	negative	4	20,15	26,82
RAL-181	*mdg1*	negative	2	23,42	24,79	RAL-181	*Quasimodo*	negative	3	25,25	24,66	RAL-21	*blood*	negative	5	20,51	26,95
RAL-181	*mdg1*	negative	3	22,79	24,66	RAL-181	*Quasimodo*	negative	4	25,21	24,54	RAL-21	*blood*	negative	6	21,23	26,74
RAL-181	*mdg1*	negative	4	23,21	24,54	RAL-181	*Quasimodo*	negative	5	24,91	24,38	RAL-21	*blood*	negative	7	20,25	26,04
RAL-181	*mdg1*	negative	5	22,50	24,38	RAL-181	*Quasimodo*	negative	6	25,16	24,76	RAL-21	*blood*	negative	8	21,18	26,77
RAL-181	*mdg1*	negative	6	22,82	24,76	RAL-181	*Quasimodo*	negative	7	25,07	24,63	RAL-21	*blood*	positive	1	22,15	26,65
RAL-181	*mdg1*	negative	7	23,14	24,63	RAL-181	*Quasimodo*	negative	8	25,60	24,95	RAL-21	*blood*	positive	2	21,75	26,37
RAL-181	*mdg1*	negative	8	23,67	24,95	RAL-181	*Quasimodo*	positive	1	25,47	24,82	RAL-21	*blood*	positive	3	20,73	26,46
RAL-181	*mdg1*	positive	1	22,81	24,82	RAL-181	*Quasimodo*	positive	2	25,66	25,15	RAL-21	*blood*	positive	4	21,47	26,98
RAL-181	*mdg1*	positive	2	23,34	25,15	RAL-181	*Quasimodo*	positive	3	25,67	25,52	RAL-21	*blood*	positive	5	22,02	26,92
RAL-181	*mdg1*	positive	3	23,39	25,52	RAL-181	*Quasimodo*	positive	4	25,90	25,21	RAL-21	*blood*	positive	6	21,73	26,81
RAL-181	*mdg1*	positive	4	23,04	25,21	RAL-181	*Quasimodo*	positive	5	25,55	24,99	RAL-21	*blood*	positive	7	23,56	27,76
RAL-181	*mdg1*	positive	5	22,90	24,99	RAL-181	*Quasimodo*	positive	6	25,75	25,40	RAL-21	*blood*	positive	8	22,12	27,29
RAL-181	*mdg1*	positive	6	23,02	25,40	RAL-181	*Quasimodo*	positive	7	25,45	24,74	RAL-21	*copia*	negative	1	18,25	27,29
RAL-181	*mdg1*	positive	7	23,20	24,74	RAL-181	*Quasimodo*	positive	8	25,82	25,16	RAL-21	*copia*	negative	2	19,25	26,56
RAL-181	*mdg1*	positive	8	23,75	25,16	RAL-21	*412*	negative	1	19,06	26,56	RAL-21	*copia*	negative	3	19,63	27,80
RAL-181	*opus*	negative	1	23,06	24,08	RAL-21	*412*	negative	2	18,14	27,80	RAL-21	*copia*	negative	4	18,26	27,55
RAL-181	*opus*	negative	2	23,49	24,79	RAL-21	*412*	negative	3	18,93	27,55	RAL-21	*copia*	negative	5	18,30	26,82
RAL-181	*opus*	negative	3	23,76	24,66	RAL-21	*412*	negative	4	17,26	26,82	RAL-21	*copia*	negative	6	18,62	26,95
RAL-181	*opus*	negative	4	23,75	24,54	RAL-21	*412*	negative	5	17,22	26,95	RAL-21	*copia*	negative	7	17,85	26,74
RAL-181	*opus*	negative	5	23,37	24,38	RAL-21	*412*	negative	6	18,56	26,74	RAL-21	*copia*	negative	8	18,00	26,04
RAL-181	*opus*	negative	6	23,50	24,76	RAL-21	*412*	negative	7	17,67	26,04	RAL-21	*copia*	positive	1	17,31	26,65
RAL-181	*opus*	negative	7	23,75	24,63	RAL-21	*412*	negative	8	19,21	26,77	RAL-21	*copia*	positive	2	17,53	26,37
RAL-181	*opus*	negative	8	24,11	24,95	RAL-21	*412*	positive	1	19,96	26,65	RAL-21	*copia*	positive	3	16,85	26,46
RAL-181	*opus*	positive	1	23,67	24,82	RAL-21	*412*	positive	2	19,25	26,37	RAL-21	*copia*	positive	4	18,44	26,98
RAL-181	*opus*	positive	2	24,19	25,15	RAL-21	*412*	positive	3	18,10	26,46	RAL-21	*copia*	positive	5	18,31	26,92
RAL-181	*opus*	positive	3	24,55	25,52	RAL-21	*412*	positive	4	18,69	26,92	RAL-21	*copia*	positive	6	19,72	26,81
RAL-181	*opus*	positive	4	24,48	25,21	RAL-21	*412*	positive	5	19,02	26,81	RAL-21	*copia*	positive	7	19,01	27,76
RAL-181	*opus*	positive	5	24,20	24,99	RAL-21	*412*	positive	6	21,18	27,76	RAL-21	*Cr1a*	negative	1	20,59	27,29
RAL-181	*opus*	positive	6	24,42	25,40	RAL-21	*412*	positive	7	19,63	27,29	RAL-21	*Cr1a*	negative	2	20,01	26,56
RAL-181	*opus*	positive	7	23,91	24,74	RAL-21	*1360*	negative	1	23,83	26,56	RAL-21	*Cr1a*	negative	3	20,06	27,80
RAL-181	*opus*	positive	8	24,32	25,16	RAL-21	*1360*	negative	2	22,83	27,80	RAL-21	*Cr1a*	negative	4	19,01	27,55
RAL-181	*P-element*	negative	1	21,60	24,08	RAL-21	*1360*	negative	3	23,00	27,55	RAL-21	*Cr1a*	negative	5	19,13	26,82
RAL-181	*P-element*	negative	2	22,41	24,79	RAL-21	*1360*	negative	4	21,85	26,82	RAL-21	*Cr1a*	negative	6	19,55	26,95
RAL-181	*P-element*	negative	3	22,55	24,66	RAL-21	*1360*	negative	5	21,72	26,95	RAL-21	*Cr1a*	negative	7	18,65	26,74
RAL-181	*P-element*	negative	4	22,57	24,54	RAL-21	*1360*	negative	6	22,95	26,74	RAL-21	*Cr1a*	negative	8	19,28	26,04
RAL-181	*P-element*	negative	5	21,90	24,38	RAL-21	*1360*	negative	7	22,01	26,04	RAL-21	*Cr1a*	positive	1	21,56	26,77
RAL-181	*P-element*	negative	6	22,05	24,76	RAL-21	*1360*	negative	8	23,10	26,77	RAL-21	*Cr1a*	positive	2	20,90	26,65
RAL-181	*P-element*	negative	7	21,99	24,63	RAL-21	*1360*	positive	1	24,76	26,65	RAL-21	*Cr1a*	positive	3	19,98	26,37
RAL-181	*P-element*	negative	8	22,54	24,95	RAL-21	*1360*	positive	2	23,86	26,37	RAL-21	*Cr1a*	positive	4	19,94	26,46
RAL-181	*P-element*	positive	1	22,00	24,82	RAL-21	*1360*	positive	3	23,19	26,46	RAL-21	*Cr1a*	positive	5	20,07	26,98
RAL-181	*P-element*	positive	2	22,41	25,15	RAL-21	*1360*	positive	4	23,17	26,98	RAL-21	*Cr1a*	positive	6	19,95	26,92
RAL-181	*P-element*	positive	3	22,53	25,52	RAL-21	*1360*	positive	5	23,40	26,92	RAL-21	*Cr1a*	positive	7	21,40	26,81
RAL-181	*P-element*	positive	4	22,62	25,21	RAL-21	*1360*	positive	6	23,43	26,81	RAL-21	*Cr1a*	positive	8	19,78	27,76
RAL-181	*P-element*	positive	5	22,23	24,99	RAL-21	*1360*	positive	7	26,51	27,76	RAL-21	*gypsy5*	negative	1	25,93	26,56
RAL-181	*P-element*	positive	6	21,99	25,40	RAL-21	*1360*	positive	8	23,74	27,29	RAL-21	*gypsy5*	negative	2	24,94	27,80
RAL-181	*P-element*	positive	7	22,06	24,74	RAL-21	*blastopia*	negative	1	22,01	26,56	RAL-21	*gypsy5*	negative	3	23,95	26,82
RAL-181	*P-element*	positive	8	22,80	25,16	RAL-21	*blastopia*	negative	2	21,10	27,80	RAL-21	*gypsy5*	negative	4	24,02	26,95
RAL-181	*pogo*	negative	1	21,32	24,08	RAL-21	*blastopia*	negative	3	21,00	27,55	RAL-21	*gypsy5*	negative	5	24,57	26,74
RAL-181	*pogo*	negative	2	22,11	24,79	RAL-21	*blastopia*	negative	4	19,91	26,82	RAL-21	*gypsy5*	negative	6	23,47	26,04
RAL-181	*pogo*	negative	3	21,97	24,66	RAL-21	*blastopia*	negative	5	20,21	26,95	RAL-21	*gypsy5*	negative	7	24,52	26,77
RAL-181	*pogo*	negative	4	21,97	24,54	RAL-21	*blastopia*	negative	6	20,99	26,74	RAL-21	*gypsy5*	positive	1	26,71	26,65
RAL-181	*pogo*	negative	5	21,62	24,38	RAL-21	*blastopia*	negative	7	20,16	26,04	RAL-21	*gypsy5*	positive	2	26,19	26,37
RAL-181	*pogo*	negative	6	21,59	24,76	RAL-21	*blastopia*	negative	8	20,76	26,77	RAL-21	*gypsy5*	positive	3	25,66	26,46
RAL-181	*pogo*	negative	7	21,77	24,63	RAL-21	*blastopia*	positive	1	22,39	26,65	RAL-21	*gypsy5*	positive	4	25,37	26,98
RAL-181	*pogo*	negative	8	22,04	24,95	RAL-21	*blastopia*	positive	2	21,22	26,37	RAL-21	*gypsy5*	positive	5	25,24	26,92
RAL-181	*pogo*	positive	1	22,24	24,82	RAL-21	*blastopia*	positive	3	20,44	26,46	RAL-21	*gypsy5*	positive	6	25,13	26,81
RAL-181	*pogo*	positive	2	22,00	25,15	RAL-21	*blastopia*	positive	4	20,41	26,98	RAL-21	*gypsy5*	positive	7	26,26	27,76

RAL-21	*gypsy5*	positive	8	25,24	27,29	RAL-21	*P-element*	negative	3	21,36	27,75	RAL-237	*1360*	negative	4	22,77	26,16
RAL-21	*Idefix*	negative	1	21,27	27,06	RAL-21	*P-element*	negative	4	19,99	26,81	RAL-237	*1360*	negative	5	25,17	28,31
RAL-21	*Idefix*	negative	2	19,87	27,97	RAL-21	*P-element*	negative	5	19,67	26,77	RAL-237	*1360*	negative	6	22,33	25,87
RAL-21	*Idefix*	negative	3	20,63	27,75	RAL-21	*P-element*	negative	6	20,56	26,97	RAL-237	*1360*	negative	7	23,87	26,56
RAL-21	*Idefix*	negative	4	18,95	26,81	RAL-21	*P-element*	negative	7	19,22	26,24	RAL-237	*1360*	negative	8	23,21	26,38
RAL-21	*Idefix*	negative	5	18,80	26,77	RAL-21	*P-element*	negative	8	20,19	26,82	RAL-237	*1360*	positive	1	23,23	26,90
RAL-21	*Idefix*	negative	6	20,22	26,97	RAL-21	*P-element*	positive	1	22,06	26,57	RAL-237	*1360*	positive	2	23,57	26,18
RAL-21	*Idefix*	negative	7	18,94	26,24	RAL-21	*P-element*	positive	2	21,98	26,66	RAL-237	*1360*	positive	3	24,30	28,04
RAL-21	*Idefix*	negative	8	20,57	26,82	RAL-21	*P-element*	positive	3	21,21	26,76	RAL-237	*1360*	positive	4	24,35	27,87
RAL-21	*Idefix*	positive	1	22,14	26,57	RAL-21	*P-element*	positive	4	21,32	27,02	RAL-237	*1360*	positive	5	25,39	29,65
RAL-21	*Idefix*	positive	2	21,05	26,66	RAL-21	*P-element*	positive	5	21,62	26,86	RAL-237	*1360*	positive	6	24,02	26,52
RAL-21	*Idefix*	positive	3	19,79	27,02	RAL-21	*P-element*	positive	6	21,07	27,17	RAL-237	*1360*	positive	7	23,90	26,18
RAL-21	*Idefix*	positive	4	20,67	26,86	RAL-21	*P-element*	positive	7	23,45	28,19	RAL-237	*1360*	positive	8	24,10	26,75
RAL-21	*Idefix*	positive	5	20,50	27,17	RAL-21	*P-element*	positive	8	21,01	27,19	RAL-237	*blastopia*	negative	1	24,89	26,67
RAL-21	*Idefix*	positive	6	23,51	28,19	RAL-21	*pogo*	negative	1	21,66	27,06	RAL-237	*blastopia*	negative	2	24,91	26,49
RAL-21	*Idefix*	positive	7	20,94	27,19	RAL-21	*pogo*	negative	2	21,40	27,97	RAL-237	*blastopia*	negative	3	25,24	27,21
RAL-21	*Juan*	negative	1	21,36	27,06	RAL-21	*pogo*	negative	3	21,69	27,75	RAL-237	*blastopia*	negative	4	24,44	26,16
RAL-21	*Juan*	negative	2	20,12	27,97	RAL-21	*pogo*	negative	4	20,37	26,81	RAL-237	*blastopia*	negative	5	25,13	28,31
RAL-21	*Juan*	negative	3	20,29	27,75	RAL-21	*pogo*	negative	5	20,67	26,77	RAL-237	*blastopia*	negative	6	23,67	25,87
RAL-21	*Juan*	negative	4	19,26	26,81	RAL-21	*pogo*	negative	6	21,16	26,97	RAL-237	*blastopia*	negative	7	25,35	26,56
RAL-21	*Juan*	negative	5	19,07	26,77	RAL-21	*pogo*	negative	7	20,08	26,24	RAL-237	*blastopia*	negative	8	24,06	26,38
RAL-21	*Juan*	negative	6	20,42	26,97	RAL-21	*pogo*	negative	8	20,93	26,82	RAL-237	*blastopia*	positive	1	24,88	26,90
RAL-21	*Juan*	negative	7	19,52	26,24	RAL-21	*pogo*	positive	1	22,04	26,57	RAL-237	*blastopia*	positive	2	24,41	26,18
RAL-21	*Juan*	negative	8	20,53	26,82	RAL-21	*pogo*	positive	2	21,84	26,66	RAL-237	*blastopia*	positive	3	26,59	28,04
RAL-21	*Juan*	positive	1	22,58	26,57	RAL-21	*pogo*	positive	3	21,75	26,76	RAL-237	*blastopia*	positive	4	25,93	27,87
RAL-21	*Juan*	positive	2	21,34	26,66	RAL-21	*pogo*	positive	4	21,63	27,02	RAL-237	*blastopia*	positive	5	25,31	29,65
RAL-21	*Juan*	positive	3	20,49	26,76	RAL-21	*pogo*	positive	5	21,95	26,86	RAL-237	*blastopia*	positive	6	25,93	26,52
RAL-21	*Juan*	positive	4	20,37	27,02	RAL-21	*pogo*	positive	6	21,82	27,17	RAL-237	*blastopia*	positive	7	25,76	26,18
RAL-21	*Juan*	positive	5	20,40	26,86	RAL-21	*pogo*	positive	7	23,84	28,19	RAL-237	*blastopia*	positive	8	26,06	26,75
RAL-21	*Juan*	positive	6	20,77	27,17	RAL-21	*pogo*	positive	8	21,56	27,19	RAL-237	*blood*	negative	1	22,39	26,67
RAL-21	*Juan*	positive	7	22,41	28,19	RAL-21	*Quasimodo*	negative	1	21,70	27,06	RAL-237	*blood*	negative	2	22,36	26,49
RAL-21	*Juan*	positive	8	21,00	27,19	RAL-21	*Quasimodo*	negative	2	20,39	27,97	RAL-237	*blood*	negative	3	22,61	27,21
RAL-21	*mdg1*	negative	1	22,82	27,06	RAL-21	*Quasimodo*	negative	3	20,76	27,75	RAL-237	*blood*	negative	4	22,46	26,16
RAL-21	*mdg1*	negative	2	21,41	27,97	RAL-21	*Quasimodo*	negative	4	19,37	26,81	RAL-237	*blood*	negative	5	25,65	28,31
RAL-21	*mdg1*	negative	3	21,73	27,75	RAL-21	*Quasimodo*	negative	5	19,26	26,77	RAL-237	*blood*	negative	6	21,60	25,87
RAL-21	*mdg1*	negative	4	20,39	26,81	RAL-21	*Quasimodo*	negative	6	20,14	26,97	RAL-237	*blood*	negative	7	22,48	26,56
RAL-21	*mdg1*	negative	5	20,47	26,77	RAL-21	*Quasimodo*	negative	7	19,04	26,24	RAL-237	*blood*	negative	8	22,28	26,38
RAL-21	*mdg1*	negative	6	21,98	26,97	RAL-21	*Quasimodo*	negative	8	20,27	26,82	RAL-237	*blood*	positive	1	22,80	26,90
RAL-21	*mdg1*	negative	7	20,58	26,24	RAL-21	*Quasimodo*	positive	1	22,61	26,57	RAL-237	*blood*	positive	2	22,14	26,18
RAL-21	*mdg1*	negative	8	21,78	26,82	RAL-21	*Quasimodo*	positive	2	21,67	26,66	RAL-237	*blood*	positive	3	22,84	28,04
RAL-21	*mdg1*	positive	1	23,89	26,57	RAL-21	*Quasimodo*	positive	3	21,06	26,76	RAL-237	*blood*	positive	4	22,75	27,87
RAL-21	*mdg1*	positive	2	22,99	26,66	RAL-21	*Quasimodo*	positive	4	20,81	27,02	RAL-237	*blood*	positive	5	24,44	29,65
RAL-21	*mdg1*	positive	3	22,13	26,76	RAL-21	*Quasimodo*	positive	5	21,57	26,86	RAL-237	*blood*	positive	6	22,03	26,52
RAL-21	*mdg1*	positive	4	22,15	27,02	RAL-21	*Quasimodo*	positive	6	20,59	27,17	RAL-237	*blood*	positive	7	22,15	26,18
RAL-21	*mdg1*	positive	5	22,60	26,86	RAL-21	*Quasimodo*	positive	7	24,06	28,19	RAL-237	*blood*	positive	8	22,70	26,75
RAL-21	*mdg1*	positive	6	22,53	27,17	RAL-21	*Quasimodo*	positive	8	20,77	27,19	RAL-237	*copia*	negative	1	15,32	26,67
RAL-21	*mdg1*	positive	7	25,52	28,19	RAL-237	*412*	negative	1	19,86	26,67	RAL-237	*copia*	negative	2	15,91	26,49
RAL-21	*mdg1*	positive	8	22,57	27,19	RAL-237	*412*	negative	2	19,67	26,49	RAL-237	*copia*	negative	3	15,80	27,21
RAL-21	*opus*	negative	1	22,80	27,06	RAL-237	*412*	negative	3	19,89	27,21	RAL-237	*copia*	negative	4	15,50	26,16
RAL-21	*opus*	negative	2	22,07	27,97	RAL-237	*412*	negative	4	19,43	26,16	RAL-237	*copia*	negative	5	22,59	28,31
RAL-21	*opus*	negative	3	21,29	27,75	RAL-237	*412*	negative	5	22,71	28,31	RAL-237	*copia*	negative	6	14,94	25,87
RAL-21	*opus*	negative	4	20,73	26,81	RAL-237	*412*	negative	6	19,26	25,87	RAL-237	*copia*	negative	7	15,84	26,56
RAL-21	*opus*	negative	5	21,38	26,77	RAL-237	*412*	negative	7	19,95	26,56	RAL-237	*copia*	negative	8	15,35	26,38
RAL-21	*opus*	negative	6	21,54	26,97	RAL-237	*412*	negative	8	19,90	26,38	RAL-237	*copia*	positive	1	15,78	26,90
RAL-21	*opus*	negative	7	20,97	26,24	RAL-237	*412*	positive	1	20,35	26,90	RAL-237	*copia*	positive	2	16,39	26,18
RAL-21	*opus*	negative	8	21,62	26,82	RAL-237	*412*	positive	2	20,01	26,18	RAL-237	*copia*	positive	3	17,82	28,04
RAL-21	*opus*	positive	1	23,41	26,57	RAL-237	*412*	positive	3	20,02	28,04	RAL-237	*copia*	positive	4	17,72	27,87
RAL-21	*opus*	positive	2	22,35	26,66	RAL-237	*412*	positive	4	19,73	27,87	RAL-237	*copia*	positive	5	19,44	29,65
RAL-21	*opus*	positive	3	21,92	26,76	RAL-237	*412*	positive	5	21,24	29,65	RAL-237	*copia*	positive	6	16,87	26,52
RAL-21	*opus*	positive	4	23,21	26,86	RAL-237	*412*	positive	6	19,97	26,52	RAL-237	*copia*	positive	7	15,67	26,18
RAL-21	*opus*	positive	5	21,54	27,17	RAL-237	*412*	positive	7	20,17	26,18	RAL-237	*copia*	positive	8	15,86	26,75
RAL-21	*opus*	positive	6	26,32	28,19	RAL-237	*412*	positive	8	20,55	26,75	RAL-237	*Cr1a*	negative	1	23,51	26,67
RAL-21	*opus*	positive	7	21,81	27,19	RAL-237	*1360*	negative	1	22,90	26,67	RAL-237	*Cr1a*	negative	2	23,88	26,49
RAL-21	*P-element*	negative	1	21,26	27,06	RAL-237	*1360*	negative	2	22,83	26,49	RAL-237	*Cr1a*	negative	3	24,74	27,21
RAL-21	*P-element*	negative	2	20,81	27,97	RAL-237	*1360*	negative	3	23,39	27,21	RAL-237	*Cr1a*	negative	4	23,74	26,16

RAL-237	*Cr1a*	negative	5	23,91	28,31	RAL-237	*mdg1*	negative	6	22,46	26,20	RAL-237	*Quasimodo*	negative	7	26,10	26,69
RAL-237	*Cr1a*	negative	6	22,80	25,87	RAL-237	*mdg1*	negative	7	22,84	26,69	RAL-237	*Quasimodo*	negative	8	24,97	26,54
RAL-237	*Cr1a*	negative	7	23,68	26,56	RAL-237	*mdg1*	negative	8	22,40	26,54	RAL-237	*Quasimodo*	positive	1	26,36	27,14
RAL-237	*Cr1a*	negative	8	22,66	26,38	RAL-237	*mdg1*	positive	1	22,72	27,14	RAL-237	*Quasimodo*	positive	2	25,80	26,11
RAL-237	*Cr1a*	positive	1	24,25	26,90	RAL-237	*mdg1*	positive	2	22,46	26,11	RAL-237	*Quasimodo*	positive	3	28,35	28,07
RAL-237	*Cr1a*	positive	2	23,59	26,18	RAL-237	*mdg1*	positive	3	24,39	28,07	RAL-237	*Quasimodo*	positive	4	27,59	27,72
RAL-237	*Cr1a*	positive	3	25,64	28,04	RAL-237	*mdg1*	positive	4	23,70	27,72	RAL-237	*Quasimodo*	positive	5	26,33	29,49
RAL-237	*Cr1a*	positive	4	25,13	27,87	RAL-237	*mdg1*	positive	5	25,24	29,49	RAL-237	*Quasimodo*	positive	6	27,22	26,49
RAL-237	*Cr1a*	positive	5	24,47	29,65	RAL-237	*mdg1*	positive	6	23,23	26,49	RAL-237	*Quasimodo*	positive	7	26,66	26,25
RAL-237	*Cr1a*	positive	6	24,90	26,52	RAL-237	*mdg1*	positive	7	22,77	26,25	RAL-237	*Quasimodo*	positive	8	27,30	26,68
RAL-237	*Cr1a*	positive	7	24,68	26,18	RAL-237	*mdg1*	positive	8	22,99	26,68	RAL-280	*412*	negative	1	21,70	27,71
RAL-237	*Cr1a*	positive	8	25,13	26,75	RAL-237	*opus*	negative	1	25,33	26,85	RAL-280	*412*	negative	2	21,54	27,55
RAL-237	*gypsy5*	negative	1	25,58	26,67	RAL-237	*opus*	negative	2	25,70	26,82	RAL-280	*412*	negative	3	22,12	26,67
RAL-237	*gypsy5*	negative	2	26,33	26,49	RAL-237	*opus*	negative	3	26,25	27,11	RAL-280	*412*	negative	4	21,85	26,12
RAL-237	*gypsy5*	negative	3	27,08	27,21	RAL-237	*opus*	negative	4	25,22	26,30	RAL-280	*412*	negative	5	21,69	26,76
RAL-237	*gypsy5*	negative	4	25,93	26,16	RAL-237	*opus*	negative	5	27,09	28,34	RAL-280	*412*	negative	6	21,34	26,70
RAL-237	*gypsy5*	negative	5	28,30	28,31	RAL-237	*opus*	negative	6	25,52	26,20	RAL-280	*412*	negative	7	21,21	27,11
RAL-237	*gypsy5*	negative	6	25,24	25,87	RAL-237	*opus*	negative	7	26,01	26,69	RAL-280	*412*	negative	8	21,46	27,03
RAL-237	*gypsy5*	negative	7	26,76	26,56	RAL-237	*opus*	negative	8	24,94	26,54	RAL-280	*412*	positive	1	22,05	27,31
RAL-237	*gypsy5*	negative	8	26,06	26,38	RAL-237	*opus*	positive	1	25,91	27,14	RAL-280	*412*	positive	2	21,12	26,65
RAL-237	*gypsy5*	positive	1	25,64	26,90	RAL-237	*opus*	positive	2	25,48	26,11	RAL-280	*412*	positive	3	21,43	27,17
RAL-237	*gypsy5*	positive	2	26,40	26,18	RAL-237	*opus*	positive	3	28,08	28,07	RAL-280	*412*	positive	4	21,09	26,70
RAL-237	*gypsy5*	positive	3	28,47	28,04	RAL-237	*opus*	positive	4	26,80	27,72	RAL-280	*412*	positive	5	21,28	26,82
RAL-237	*gypsy5*	positive	4	27,99	27,87	RAL-237	*opus*	positive	5	26,47	29,49	RAL-280	*412*	positive	6	21,22	26,90
RAL-237	*gypsy5*	positive	5	28,14	29,65	RAL-237	*opus*	positive	6	26,15	26,49	RAL-280	*412*	positive	7	21,71	28,18
RAL-237	*gypsy5*	positive	6	26,98	26,52	RAL-237	*opus*	positive	7	26,28	26,25	RAL-280	*412*	positive	8	22,05	27,57
RAL-237	*gypsy5*	positive	7	26,01	26,18	RAL-237	*opus*	positive	8	26,14	26,68	RAL-280	*1360*	negative	1	26,38	27,71
RAL-237	*gypsy5*	positive	8	26,20	26,75	RAL-237	*P-element*	negative	1	23,45	26,85	RAL-280	*1360*	negative	2	26,20	27,55
RAL-237	*Idefix*	negative	1	25,26	26,85	RAL-237	*P-element*	negative	2	22,93	26,82	RAL-280	*1360*	negative	3	25,94	26,67
RAL-237	*Idefix*	negative	2	25,25	26,82	RAL-237	*P-element*	negative	3	23,41	27,11	RAL-280	*1360*	negative	4	25,84	26,12
RAL-237	*Idefix*	negative	3	26,81	27,11	RAL-237	*P-element*	negative	4	23,03	26,30	RAL-280	*1360*	negative	5	26,37	26,70
RAL-237	*Idefix*	negative	4	24,53	26,30	RAL-237	*P-element*	negative	5	25,90	28,34	RAL-280	*1360*	negative	6	26,57	27,11
RAL-237	*Idefix*	negative	5	24,85	28,34	RAL-237	*P-element*	negative	6	22,91	26,20	RAL-280	*1360*	negative	7	26,35	27,03
RAL-237	*Idefix*	negative	6	24,41	26,20	RAL-237	*P-element*	negative	7	22,94	26,69	RAL-280	*1360*	positive	1	26,54	27,31
RAL-237	*Idefix*	negative	7	25,43	26,69	RAL-237	*P-element*	negative	8	22,93	26,54	RAL-280	*1360*	positive	2	25,53	26,65
RAL-237	*Idefix*	negative	8	24,90	26,54	RAL-237	*P-element*	positive	1	22,72	27,14	RAL-280	*1360*	positive	3	26,05	27,17
RAL-237	*Idefix*	positive	1	25,43	27,14	RAL-237	*P-element*	positive	2	22,65	26,11	RAL-280	*1360*	positive	4	25,78	26,70
RAL-237	*Idefix*	positive	2	24,34	26,11	RAL-237	*P-element*	positive	3	25,23	28,07	RAL-280	*1360*	positive	5	26,66	26,82
RAL-237	*Idefix*	positive	3	26,26	28,07	RAL-237	*P-element*	positive	4	24,48	27,72	RAL-280	*1360*	positive	6	26,81	28,18
RAL-237	*Idefix*	positive	4	25,64	27,72	RAL-237	*P-element*	positive	5	25,39	29,49	RAL-280	*1360*	positive	7	26,58	27,57
RAL-237	*Idefix*	positive	5	25,06	29,49	RAL-237	*P-element*	positive	6	23,04	26,49	RAL-280	*blastopia*	negative	1	24,46	27,71
RAL-237	*Idefix*	positive	6	25,61	26,49	RAL-237	*P-element*	positive	7	22,69	26,25	RAL-280	*blastopia*	negative	2	24,26	27,55
RAL-237	*Idefix*	positive	7	25,97	26,25	RAL-237	*P-element*	positive	8	23,01	26,68	RAL-280	*blastopia*	negative	3	23,30	26,67
RAL-237	*Idefix*	positive	8	26,64	26,68	RAL-237	*pogo*	negative	1	22,68	26,85	RAL-280	*blastopia*	negative	4	23,14	26,12
RAL-237	*Juan*	negative	1	22,82	26,85	RAL-237	*pogo*	negative	2	22,80	26,82	RAL-280	*blastopia*	negative	5	23,29	26,76
RAL-237	*Juan*	negative	2	22,92	26,82	RAL-237	*pogo*	negative	3	23,38	27,11	RAL-280	*blastopia*	negative	6	22,74	26,70
RAL-237	*Juan*	negative	3	23,10	27,11	RAL-237	*pogo*	negative	4	22,79	26,30	RAL-280	*blastopia*	negative	7	23,56	27,11
RAL-237	*Juan*	negative	4	22,66	26,30	RAL-237	*pogo*	negative	5	24,65	28,34	RAL-280	*blastopia*	negative	8	23,33	27,03
RAL-237	*Juan*	negative	5	24,66	28,34	RAL-237	*pogo*	negative	6	22,30	26,20	RAL-280	*blastopia*	positive	1	24,09	27,31
RAL-237	*Juan*	negative	6	22,67	26,20	RAL-237	*pogo*	negative	7	22,31	26,69	RAL-280	*blastopia*	positive	2	23,25	26,65
RAL-237	*Juan*	negative	7	23,40	26,69	RAL-237	*pogo*	negative	8	22,07	26,54	RAL-280	*blastopia*	positive	3	23,70	27,17
RAL-237	*Juan*	negative	8	22,83	26,54	RAL-237	*pogo*	positive	1	23,27	27,14	RAL-280	*blastopia*	positive	4	22,83	26,70
RAL-237	*Juan*	positive	1	23,04	27,14	RAL-237	*pogo*	positive	2	22,93	26,11	RAL-280	*blastopia*	positive	5	23,19	26,82
RAL-237	*Juan*	positive	2	22,75	26,11	RAL-237	*pogo*	positive	3	23,34	28,07	RAL-280	*blastopia*	positive	6	23,04	26,90
RAL-237	*Juan*	positive	3	23,98	28,07	RAL-237	*pogo*	positive	4	23,19	27,72	RAL-280	*blastopia*	positive	7	24,50	28,18
RAL-237	*Juan*	positive	4	23,64	27,72	RAL-237	*pogo*	positive	5	24,34	29,49	RAL-280	*blastopia*	positive	8	24,79	27,57
RAL-237	*Juan*	positive	5	24,72	29,49	RAL-237	*pogo*	positive	6	23,02	26,49	RAL-280	*blood*	negative	1	22,65	27,71
RAL-237	*Juan*	positive	6	22,92	26,49	RAL-237	*pogo*	positive	7	22,62	26,25	RAL-280	*blood*	negative	2	22,36	27,55
RAL-237	*Juan*	positive	7	23,05	26,25	RAL-237	*pogo*	positive	8	23,12	26,68	RAL-280	*blood*	negative	3	22,27	26,67
RAL-237	*Juan*	positive	8	23,43	26,68	RAL-237	*Quasimodo*	negative	1	25,93	26,85	RAL-280	*blood*	negative	4	23,16	26,12
RAL-237	*mdg1*	negative	1	22,33	26,85	RAL-237	*Quasimodo*	negative	2	26,33	26,82	RAL-280	*blood*	negative	5	22,80	26,76
RAL-237	*mdg1*	negative	2	22,45	26,82	RAL-237	*Quasimodo*	negative	3	26,63	27,11	RAL-280	*blood*	negative	6	21,99	26,70
RAL-237	*mdg1*	negative	3	22,11	27,11	RAL-237	*Quasimodo*	negative	4	25,39	26,30	RAL-280	*blood*	negative	7	21,98	27,11
RAL-237	*mdg1*	negative	4	21,89	26,30	RAL-237	*Quasimodo*	negative	5	25,90	28,34	RAL-280	*blood*	negative	8	22,08	27,03
RAL-237	*mdg1*	negative	5	26,10	28,34	RAL-237	*Quasimodo*	negative	6	25,52	26,20	RAL-280	*blood*	positive	1	22,77	27,31

RAL-280	*blood*	positive	2	22,09	26,65	RAL-280	*Idefix*	positive	4	25,65	26,77	RAL-280	*P-element*	positive	5	22,96	26,89
RAL-280	*blood*	positive	3	22,41	27,17	RAL-280	*Idefix*	positive	5	25,99	26,89	RAL-280	*P-element*	positive	6	22,49	26,89
RAL-280	*blood*	positive	4	22,03	26,70	RAL-280	*Idefix*	positive	6	26,27	26,89	RAL-280	*P-element*	positive	7	23,11	28,12
RAL-280	*blood*	positive	5	22,47	26,82	RAL-280	*Idefix*	positive	7	27,54	28,12	RAL-280	*P-element*	positive	8	23,42	27,55
RAL-280	*blood*	positive	6	21,81	26,90	RAL-280	*Idefix*	positive	8	27,30	27,55	RAL-280	*pogo*	negative	1	23,57	27,56
RAL-280	*blood*	positive	7	22,78	28,18	RAL-280	*Juan*	negative	1	24,47	27,56	RAL-280	*pogo*	negative	2	22,94	27,50
RAL-280	*blood*	positive	8	22,67	27,57	RAL-280	*Juan*	negative	2	24,09	27,50	RAL-280	*pogo*	negative	3	23,26	26,88
RAL-280	*copia*	negative	1	15,71	27,71	RAL-280	*Juan*	negative	3	23,81	26,88	RAL-280	*pogo*	negative	4	23,94	26,13
RAL-280	*copia*	negative	2	15,43	27,55	RAL-280	*Juan*	negative	4	24,16	26,13	RAL-280	*pogo*	negative	5	23,85	26,77
RAL-280	*copia*	negative	3	15,25	26,67	RAL-280	*Juan*	negative	5	23,63	26,77	RAL-280	*pogo*	negative	6	23,36	26,57
RAL-280	*copia*	negative	4	16,73	26,12	RAL-280	*Juan*	negative	6	23,25	26,57	RAL-280	*pogo*	negative	7	23,05	27,23
RAL-280	*copia*	negative	5	16,47	26,76	RAL-280	*Juan*	negative	7	23,65	27,23	RAL-280	*pogo*	negative	8	23,48	27,14
RAL-280	*copia*	negative	6	15,73	26,70	RAL-280	*Juan*	negative	8	23,62	27,14	RAL-280	*pogo*	positive	1	23,32	26,92
RAL-280	*copia*	negative	7	15,34	27,11	RAL-280	*Juan*	positive	1	24,62	26,92	RAL-280	*pogo*	positive	2	23,08	26,64
RAL-280	*copia*	negative	8	15,49	27,03	RAL-280	*Juan*	positive	2	23,65	26,64	RAL-280	*pogo*	positive	3	23,07	27,02
RAL-280	*copia*	positive	1	16,36	27,31	RAL-280	*Juan*	positive	3	23,82	27,02	RAL-280	*pogo*	positive	4	23,29	26,77
RAL-280	*copia*	positive	2	15,39	26,65	RAL-280	*Juan*	positive	4	23,22	26,77	RAL-280	*pogo*	positive	5	23,59	26,89
RAL-280	*copia*	positive	3	15,59	27,17	RAL-280	*Juan*	positive	5	23,65	26,89	RAL-280	*pogo*	positive	6	23,26	26,89
RAL-280	*copia*	positive	4	16,06	26,70	RAL-280	*Juan*	positive	6	23,64	26,89	RAL-280	*pogo*	positive	7	23,05	28,12
RAL-280	*copia*	positive	5	15,73	26,90	RAL-280	*Juan*	positive	7	24,57	28,12	RAL-280	*pogo*	positive	8	23,67	27,55
RAL-280	*copia*	positive	6	16,08	28,18	RAL-280	*Juan*	positive	8	24,57	27,55	RAL-280	*Quasimodo*	negative	1	26,69	27,56
RAL-280	*copia*	positive	7	16,67	27,57	RAL-280	*mdg1*	negative	1	24,48	27,56	RAL-280	*Quasimodo*	negative	2	27,15	27,50
RAL-280	*Cr1a*	negative	1	24,83	27,71	RAL-280	*mdg1*	negative	2	24,10	27,50	RAL-280	*Quasimodo*	negative	3	26,81	26,88
RAL-280	*Cr1a*	negative	2	24,52	27,55	RAL-280	*mdg1*	negative	3	24,22	26,88	RAL-280	*Quasimodo*	negative	4	26,49	26,13
RAL-280	*Cr1a*	negative	3	24,08	26,67	RAL-280	*mdg1*	negative	4	24,94	26,13	RAL-280	*Quasimodo*	negative	5	26,60	26,77
RAL-280	*Cr1a*	negative	4	24,05	26,12	RAL-280	*mdg1*	negative	5	24,95	26,77	RAL-280	*Quasimodo*	negative	6	26,00	26,57
RAL-280	*Cr1a*	negative	5	23,85	26,76	RAL-280	*mdg1*	negative	6	24,17	26,57	RAL-280	*Quasimodo*	negative	7	26,53	27,23
RAL-280	*Cr1a*	negative	6	23,51	26,70	RAL-280	*mdg1*	negative	7	24,08	27,23	RAL-280	*Quasimodo*	negative	8	26,00	27,14
RAL-280	*Cr1a*	negative	7	23,77	27,11	RAL-280	*mdg1*	negative	8	24,58	27,14	RAL-280	*Quasimodo*	positive	1	27,02	26,92
RAL-280	*Cr1a*	negative	8	23,64	27,03	RAL-280	*mdg1*	positive	1	24,88	26,92	RAL-280	*Quasimodo*	positive	2	26,33	26,64
RAL-280	*Cr1a*	positive	1	24,86	27,31	RAL-280	*mdg1*	positive	2	23,98	26,64	RAL-280	*Quasimodo*	positive	3	26,53	27,02
RAL-280	*Cr1a*	positive	2	23,61	26,65	RAL-280	*mdg1*	positive	3	24,35	27,02	RAL-280	*Quasimodo*	positive	4	25,81	26,77
RAL-280	*Cr1a*	positive	3	24,17	27,17	RAL-280	*mdg1*	positive	4	24,30	26,77	RAL-280	*Quasimodo*	positive	5	26,59	26,89
RAL-280	*Cr1a*	positive	4	23,45	26,70	RAL-280	*mdg1*	positive	5	24,47	26,89	RAL-280	*Quasimodo*	positive	6	26,20	26,89
RAL-280	*Cr1a*	positive	5	23,86	26,82	RAL-280	*mdg1*	positive	6	24,12	26,89	RAL-280	*Quasimodo*	positive	7	27,04	28,12
RAL-280	*Cr1a*	positive	6	23,73	26,90	RAL-280	*mdg1*	positive	7	24,85	28,12	RAL-280	*Quasimodo*	positive	8	26,98	27,55
RAL-280	*Cr1a*	positive	7	24,92	28,18	RAL-280	*mdg1*	positive	8	25,02	27,55	RAL-320	*412*	negative	1	21,68	25,98
RAL-280	*Cr1a*	positive	8	24,39	27,57	RAL-280	*opus*	negative	1	28,03	27,56	RAL-320	*412*	negative	2	21,81	26,09
RAL-280	*gypsy5*	negative	1	29,60	27,71	RAL-280	*opus*	negative	2	27,99	27,50	RAL-320	*412*	negative	3	21,85	26,46
RAL-280	*gypsy5*	negative	2	28,81	27,55	RAL-280	*opus*	negative	3	27,54	26,88	RAL-320	*412*	negative	4	21,45	25,35
RAL-280	*gypsy5*	negative	3	28,52	26,67	RAL-280	*opus*	negative	4	26,94	26,13	RAL-320	*412*	negative	5	30,06	30,23
RAL-280	*gypsy5*	negative	4	28,49	26,12	RAL-280	*opus*	negative	5	27,54	26,77	RAL-320	*412*	negative	6	21,86	25,67
RAL-280	*gypsy5*	negative	5	28,47	26,76	RAL-280	*opus*	negative	6	26,95	26,57	RAL-320	*412*	negative	7	21,57	25,75
RAL-280	*gypsy5*	negative	6	28,26	26,70	RAL-280	*opus*	negative	7	27,61	27,23	RAL-320	*412*	negative	8	21,90	26,04
RAL-280	*gypsy5*	negative	7	28,66	27,11	RAL-280	*opus*	negative	8	27,13	27,14	RAL-320	*412*	positive	1	20,58	24,87
RAL-280	*gypsy5*	negative	8	28,26	27,03	RAL-280	*opus*	positive	1	27,41	26,92	RAL-320	*412*	positive	2	20,91	24,80
RAL-280	*gypsy5*	positive	1	28,51	27,31	RAL-280	*opus*	positive	2	26,45	26,64	RAL-320	*412*	positive	3	20,84	24,78
RAL-280	*gypsy5*	positive	2	28,07	26,65	RAL-280	*opus*	positive	3	26,93	27,02	RAL-320	*412*	positive	4	20,86	25,88
RAL-280	*gypsy5*	positive	3	27,92	27,17	RAL-280	*opus*	positive	4	26,50	26,77	RAL-320	*412*	positive	5	20,75	26,10
RAL-280	*gypsy5*	positive	4	27,91	26,70	RAL-280	*opus*	positive	5	26,86	26,89	RAL-320	*412*	positive	6	21,10	25,83
RAL-280	*gypsy5*	positive	5	28,16	26,82	RAL-280	*opus*	positive	6	26,63	26,89	RAL-320	*412*	positive	7	20,67	25,37
RAL-280	*gypsy5*	positive	6	27,69	26,90	RAL-280	*opus*	positive	7	27,96	28,12	RAL-320	*412*	positive	8	21,39	25,75
RAL-280	*gypsy5*	positive	7	28,50	28,18	RAL-280	*opus*	positive	8	28,05	27,55	RAL-320	*1360*	negative	1	24,02	25,98
RAL-280	*gypsy5*	positive	8	28,75	27,57	RAL-280	*P-element*	negative	1	23,82	27,56	RAL-320	*1360*	negative	2	24,53	26,09
RAL-280	*Idefix*	negative	1	27,06	27,56	RAL-280	*P-element*	negative	2	22,87	27,50	RAL-320	*1360*	negative	3	24,36	26,46
RAL-280	*Idefix*	negative	2	26,76	27,50	RAL-280	*P-element*	negative	3	22,82	26,88	RAL-320	*1360*	negative	4	23,89	25,35
RAL-280	*Idefix*	negative	3	26,63	26,88	RAL-280	*P-element*	negative	4	23,33	26,13	RAL-320	*1360*	negative	5	30,89	30,23
RAL-280	*Idefix*	negative	4	26,16	26,13	RAL-280	*P-element*	negative	5	23,39	26,77	RAL-320	*1360*	negative	6	24,32	25,67
RAL-280	*Idefix*	negative	5	26,09	26,77	RAL-280	*P-element*	negative	6	22,80	26,57	RAL-320	*1360*	negative	7	24,23	25,75
RAL-280	*Idefix*	negative	6	25,93	26,57	RAL-280	*P-element*	negative	7	22,83	27,23	RAL-320	*1360*	negative	8	24,39	26,04
RAL-280	*Idefix*	negative	7	26,67	27,23	RAL-280	*P-element*	negative	8	23,06	27,14	RAL-320	*1360*	positive	1	23,39	24,87
RAL-280	*Idefix*	negative	8	26,38	27,14	RAL-280	*P-element*	positive	1	23,36	26,92	RAL-320	*1360*	positive	2	23,22	24,80
RAL-280	*Idefix*	positive	1	27,51	26,92	RAL-280	*P-element*	positive	2	22,74	26,64	RAL-320	*1360*	positive	3	23,31	24,78
RAL-280	*Idefix*	positive	2	25,81	26,64	RAL-280	*P-element*	positive	3	22,67	27,02	RAL-320	*1360*	positive	4	23,67	25,88
RAL-280	*Idefix*	positive	3	26,22	27,02	RAL-280	*P-element*	positive	4	22,86	26,77	RAL-320	*1360*	positive	5	24,06	26,10

RAL-320	*1360*	positive	6	24,08	25,83	RAL-320	*Cr1a*	positive	7	23,55	25,37	RAL-320	*opus*	negative	1	25,50	26,43
RAL-320	*1360*	positive	7	24,02	25,37	RAL-320	*Cr1a*	positive	8	23,93	25,75	RAL-320	*opus*	negative	2	26,09	26,36
RAL-320	*1360*	positive	8	24,53	25,75	RAL-320	*gypsy5*	negative	1	27,75	25,98	RAL-320	*opus*	negative	3	26,04	26,71
RAL-320	*blastopia*	negative	1	25,50	25,98	RAL-320	*gypsy5*	negative	2	27,88	26,09	RAL-320	*opus*	negative	4	25,56	25,75
RAL-320	*blastopia*	negative	2	26,04	26,09	RAL-320	*gypsy5*	negative	3	27,91	26,46	RAL-320	*opus*	negative	5	31,74	31,08
RAL-320	*blastopia*	negative	3	25,76	26,46	RAL-320	*gypsy5*	negative	4	27,35	25,35	RAL-320	*opus*	negative	6	25,54	25,99
RAL-320	*blastopia*	negative	4	25,40	25,35	RAL-320	*gypsy5*	negative	5	27,57	25,67	RAL-320	*opus*	negative	7	26,24	26,01
RAL-320	*blastopia*	negative	5	31,93	30,23	RAL-320	*gypsy5*	negative	6	27,54	25,75	RAL-320	*opus*	negative	8	25,78	26,07
RAL-320	*blastopia*	negative	6	25,33	25,67	RAL-320	*gypsy5*	negative	7	27,47	26,04	RAL-320	*opus*	positive	1	24,23	25,06
RAL-320	*blastopia*	negative	7	25,74	25,75	RAL-320	*gypsy5*	positive	1	27,40	24,87	RAL-320	*opus*	positive	2	24,25	25,15
RAL-320	*blastopia*	negative	8	25,39	26,04	RAL-320	*gypsy5*	positive	2	27,06	24,80	RAL-320	*opus*	positive	3	24,08	25,10
RAL-320	*blastopia*	positive	1	25,42	24,87	RAL-320	*gypsy5*	positive	3	26,94	24,78	RAL-320	*opus*	positive	4	25,18	26,10
RAL-320	*blastopia*	positive	2	25,09	24,80	RAL-320	*gypsy5*	positive	4	27,67	25,88	RAL-320	*opus*	positive	5	25,87	26,51
RAL-320	*blastopia*	positive	3	25,27	24,78	RAL-320	*gypsy5*	positive	5	27,41	26,10	RAL-320	*opus*	positive	6	25,76	26,19
RAL-320	*blastopia*	positive	4	25,67	25,88	RAL-320	*gypsy5*	positive	6	27,56	25,83	RAL-320	*opus*	positive	7	25,20	25,70
RAL-320	*blastopia*	positive	5	25,72	26,10	RAL-320	*gypsy5*	positive	7	27,48	25,37	RAL-320	*opus*	positive	8	25,52	25,92
RAL-320	*blastopia*	positive	6	25,56	25,83	RAL-320	*gypsy5*	positive	8	27,89	25,75	RAL-320	*P-element*	negative	1	23,58	26,43
RAL-320	*blastopia*	positive	7	25,01	25,37	RAL-320	*Idefix*	negative	1	25,25	26,43	RAL-320	*P-element*	negative	2	23,17	26,36
RAL-320	*blastopia*	positive	8	25,58	25,75	RAL-320	*Idefix*	negative	2	25,78	26,36	RAL-320	*P-element*	negative	3	23,31	26,71
RAL-320	*blood*	negative	1	21,41	25,98	RAL-320	*Idefix*	negative	3	25,57	26,71	RAL-320	*P-element*	negative	4	23,30	25,75
RAL-320	*blood*	negative	2	21,81	26,09	RAL-320	*Idefix*	negative	4	24,88	25,75	RAL-320	*P-element*	negative	5	30,69	31,08
RAL-320	*blood*	negative	3	21,57	26,46	RAL-320	*Idefix*	negative	5	31,05	31,08	RAL-320	*P-element*	negative	6	23,22	25,99
RAL-320	*blood*	negative	4	21,31	25,35	RAL-320	*Idefix*	negative	6	25,26	25,99	RAL-320	*P-element*	negative	7	22,82	26,01
RAL-320	*blood*	negative	5	29,24	30,23	RAL-320	*Idefix*	negative	7	25,61	26,01	RAL-320	*P-element*	negative	8	23,13	26,07
RAL-320	*blood*	negative	6	21,84	25,67	RAL-320	*Idefix*	negative	8	25,51	26,07	RAL-320	*P-element*	positive	1	23,15	25,06
RAL-320	*blood*	negative	7	21,76	25,75	RAL-320	*Idefix*	positive	1	25,25	25,06	RAL-320	*P-element*	positive	2	22,95	25,15
RAL-320	*blood*	negative	8	21,99	26,04	RAL-320	*Idefix*	positive	2	24,88	25,15	RAL-320	*P-element*	positive	3	22,95	25,10
RAL-320	*blood*	positive	1	19,93	24,87	RAL-320	*Idefix*	positive	3	24,42	25,10	RAL-320	*P-element*	positive	4	23,68	26,10
RAL-320	*blood*	positive	2	20,96	24,80	RAL-320	*Idefix*	positive	4	24,87	26,10	RAL-320	*P-element*	positive	5	23,56	26,51
RAL-320	*blood*	positive	3	20,36	24,78	RAL-320	*Idefix*	positive	5	25,02	26,51	RAL-320	*P-element*	positive	6	23,26	26,19
RAL-320	*blood*	positive	4	21,06	25,88	RAL-320	*Idefix*	positive	6	25,16	26,19	RAL-320	*P-element*	positive	7	22,88	25,70
RAL-320	*blood*	positive	5	20,54	26,10	RAL-320	*Idefix*	positive	7	24,89	25,70	RAL-320	*P-element*	positive	8	23,50	25,92
RAL-320	*blood*	positive	6	21,06	25,83	RAL-320	*Idefix*	positive	8	25,49	25,92	RAL-320	*pogo*	negative	1	19,92	26,43
RAL-320	*blood*	positive	7	20,51	25,37	RAL-320	*Juan*	negative	1	22,61	26,43	RAL-320	*pogo*	negative	2	19,17	26,36
RAL-320	*blood*	positive	8	21,37	25,75	RAL-320	*Juan*	negative	2	23,05	26,36	RAL-320	*pogo*	negative	3	19,52	26,71
RAL-320	*copia*	negative	1	15,74	25,98	RAL-320	*Juan*	negative	3	22,67	26,71	RAL-320	*pogo*	negative	4	19,53	25,75
RAL-320	*copia*	negative	2	16,51	26,09	RAL-320	*Juan*	negative	4	22,29	25,75	RAL-320	*pogo*	negative	5	25,48	31,08
RAL-320	*copia*	negative	3	16,77	26,46	RAL-320	*Juan*	negative	5	28,50	31,08	RAL-320	*pogo*	negative	6	19,90	25,99
RAL-320	*copia*	negative	4	16,24	25,35	RAL-320	*Juan*	negative	6	22,75	25,99	RAL-320	*pogo*	negative	7	19,44	26,01
RAL-320	*copia*	negative	5	25,77	30,23	RAL-320	*Juan*	negative	7	22,67	26,01	RAL-320	*pogo*	negative	8	19,48	26,07
RAL-320	*copia*	negative	6	16,71	25,67	RAL-320	*Juan*	negative	8	22,46	26,07	RAL-320	*pogo*	positive	1	19,04	25,06
RAL-320	*copia*	negative	7	16,15	25,75	RAL-320	*Juan*	positive	1	21,85	25,06	RAL-320	*pogo*	positive	2	19,04	25,15
RAL-320	*copia*	negative	8	16,15	26,04	RAL-320	*Juan*	positive	2	21,82	25,15	RAL-320	*pogo*	positive	3	19,03	25,10
RAL-320	*copia*	positive	1	15,80	24,87	RAL-320	*Juan*	positive	3	22,26	25,10	RAL-320	*pogo*	positive	4	19,66	26,10
RAL-320	*copia*	positive	2	15,57	24,80	RAL-320	*Juan*	positive	4	22,47	26,10	RAL-320	*pogo*	positive	5	19,25	26,51
RAL-320	*copia*	positive	3	14,97	24,78	RAL-320	*Juan*	positive	5	22,70	26,51	RAL-320	*pogo*	positive	6	19,20	26,19
RAL-320	*copia*	positive	4	16,25	25,88	RAL-320	*Juan*	positive	6	22,48	26,19	RAL-320	*pogo*	positive	7	18,97	25,70
RAL-320	*copia*	positive	5	16,30	26,10	RAL-320	*Juan*	positive	7	21,98	25,70	RAL-320	*pogo*	positive	8	19,04	25,92
RAL-320	*copia*	positive	6	16,11	25,83	RAL-320	*Juan*	positive	8	22,53	25,92	RAL-320	*Quasimodo*	negative	1	25,13	26,43
RAL-320	*copia*	positive	7	15,76	25,37	RAL-320	*mdg1*	negative	1	23,14	26,43	RAL-320	*Quasimodo*	negative	2	25,64	26,36
RAL-320	*copia*	positive	8	16,15	25,75	RAL-320	*mdg1*	negative	2	23,31	26,36	RAL-320	*Quasimodo*	negative	3	25,63	26,71
RAL-320	*Cr1a*	negative	1	24,17	25,98	RAL-320	*mdg1*	negative	3	23,62	26,71	RAL-320	*Quasimodo*	negative	4	24,68	25,75
RAL-320	*Cr1a*	negative	2	24,90	26,09	RAL-320	*mdg1*	negative	4	23,10	25,75	RAL-320	*Quasimodo*	negative	5	30,77	31,08
RAL-320	*Cr1a*	negative	3	24,63	26,46	RAL-320	*mdg1*	negative	5	31,90	31,08	RAL-320	*Quasimodo*	negative	6	24,93	25,99
RAL-320	*Cr1a*	negative	4	24,60	25,35	RAL-320	*mdg1*	negative	6	23,39	25,99	RAL-320	*Quasimodo*	negative	7	25,06	26,01
RAL-320	*Cr1a*	negative	5	29,86	30,23	RAL-320	*mdg1*	negative	7	23,26	26,01	RAL-320	*Quasimodo*	negative	8	25,05	26,07
RAL-320	*Cr1a*	negative	6	24,24	25,67	RAL-320	*mdg1*	negative	8	23,44	26,07	RAL-320	*Quasimodo*	positive	1	24,23	25,06
RAL-320	*Cr1a*	negative	7	24,35	25,75	RAL-320	*mdg1*	positive	1	22,79	25,06	RAL-320	*Quasimodo*	positive	2	24,36	25,15
RAL-320	*Cr1a*	negative	8	24,06	26,04	RAL-320	*mdg1*	positive	2	22,66	25,15	RAL-320	*Quasimodo*	positive	3	24,44	25,10
RAL-320	*Cr1a*	positive	1	24,05	24,87	RAL-320	*mdg1*	positive	3	23,07	25,10	RAL-320	*Quasimodo*	positive	4	24,80	26,10
RAL-320	*Cr1a*	positive	2	23,84	24,80	RAL-320	*mdg1*	positive	4	23,21	26,10	RAL-320	*Quasimodo*	positive	5	24,67	26,51
RAL-320	*Cr1a*	positive	3	24,31	24,78	RAL-320	*mdg1*	positive	5	23,31	26,51	RAL-320	*Quasimodo*	positive	6	24,79	26,19
RAL-320	*Cr1a*	positive	4	24,73	25,88	RAL-320	*mdg1*	positive	6	23,23	26,19	RAL-320	*Quasimodo*	positive	7	24,03	25,70
RAL-320	*Cr1a*	positive	5	24,76	26,10	RAL-320	*mdg1*	positive	7	23,04	25,70	RAL-320	*Quasimodo*	positive	8	24,55	25,92
RAL-320	*Cr1a*	positive	6	24,46	25,83	RAL-320	*mdg1*	positive	8	23,54	25,92	RAL-321	*412*	negative	1	21,50	27,84

RAL-321	*412*	negative	2	21,30	28,08	RAL-321	*copia*	negative	5	17,47	26,99	RAL-321	*Juan*	positive	3	20,40	26,75
RAL-321	*412*	negative	3	21,33	27,06	RAL-321	*copia*	negative	6	17,50	27,33	RAL-321	*Juan*	positive	4	20,41	27,14
RAL-321	*412*	negative	4	21,24	26,84	RAL-321	*copia*	negative	7	17,58	27,04	RAL-321	*Juan*	positive	5	20,16	26,46
RAL-321	*412*	negative	5	21,33	27,20	RAL-321	*copia*	negative	8	17,77	27,11	RAL-321	*Juan*	positive	6	20,74	26,80
RAL-321	*412*	negative	6	21,39	27,52	RAL-321	*copia*	positive	1	17,38	27,00	RAL-321	*Juan*	positive	7	20,51	26,54
RAL-321	*412*	negative	7	21,40	27,07	RAL-321	*copia*	positive	2	18,14	27,40	RAL-321	*Juan*	positive	8	21,49	27,49
RAL-321	*412*	negative	8	21,70	27,12	RAL-321	*copia*	positive	3	16,55	26,68	RAL-321	*mdg1*	negative	1	24,33	27,80
RAL-321	*412*	positive	1	21,70	27,22	RAL-321	*copia*	positive	4	16,61	27,15	RAL-321	*mdg1*	negative	2	24,34	27,79
RAL-321	*412*	positive	2	21,17	27,43	RAL-321	*copia*	positive	5	16,24	26,49	RAL-321	*mdg1*	negative	3	24,09	26,82
RAL-321	*412*	positive	3	21,01	26,74	RAL-321	*copia*	positive	6	17,24	26,89	RAL-321	*mdg1*	negative	4	24,37	26,80
RAL-321	*412*	positive	4	20,78	27,22	RAL-321	*copia*	positive	7	17,01	26,61	RAL-321	*mdg1*	negative	5	24,50	27,13
RAL-321	*412*	positive	5	20,85	26,70	RAL-321	*copia*	positive	8	17,64	27,43	RAL-321	*mdg1*	negative	6	25,09	27,26
RAL-321	*412*	positive	6	21,58	27,05	RAL-321	*Cr1a*	negative	1	24,48	27,44	RAL-321	*mdg1*	negative	7	24,83	27,16
RAL-321	*412*	positive	7	20,89	26,71	RAL-321	*Cr1a*	negative	2	22,32	26,91	RAL-321	*mdg1*	negative	8	24,88	27,11
RAL-321	*412*	positive	8	21,94	27,74	RAL-321	*Cr1a*	negative	3	20,88	27,05	RAL-321	*mdg1*	positive	1	25,10	27,03
RAL-321	*1360*	negative	1	25,49	27,84	RAL-321	*Cr1a*	negative	4	23,34	27,10	RAL-321	*mdg1*	positive	2	25,79	27,46
RAL-321	*1360*	negative	2	26,39	27,06	RAL-321	*Cr1a*	negative	5	23,49	28,00	RAL-321	*mdg1*	positive	3	24,54	26,75
RAL-321	*1360*	negative	3	26,48	26,84	RAL-321	*Cr1a*	negative	6	24,05	27,40	RAL-321	*mdg1*	positive	4	24,70	27,14
RAL-321	*1360*	negative	4	26,40	27,20	RAL-321	*Cr1a*	negative	7	23,29	28,63	RAL-321	*mdg1*	positive	5	24,36	26,46
RAL-321	*1360*	negative	5	26,34	27,52	RAL-321	*Cr1a*	negative	8	23,77	26,89	RAL-321	*mdg1*	positive	6	24,70	26,80
RAL-321	*1360*	negative	6	26,62	27,07	RAL-321	*Cr1a*	positive	1	24,52	27,25	RAL-321	*mdg1*	positive	7	24,79	26,54
RAL-321	*1360*	negative	7	26,60	27,12	RAL-321	*Cr1a*	positive	2	25,28	28,47	RAL-321	*mdg1*	positive	8	25,52	27,49
RAL-321	*1360*	positive	1	26,89	27,22	RAL-321	*Cr1a*	positive	3	24,58	26,87	RAL-321	*opus*	negative	1	26,31	27,44
RAL-321	*1360*	positive	2	27,12	27,43	RAL-321	*Cr1a*	positive	4	24,04	27,14	RAL-321	*opus*	negative	2	23,91	26,91
RAL-321	*1360*	positive	3	26,18	27,22	RAL-321	*Cr1a*	positive	5	24,12	26,42	RAL-321	*opus*	negative	3	22,33	27,05
RAL-321	*1360*	positive	4	25,95	26,70	RAL-321	*Cr1a*	positive	6	23,80	26,86	RAL-321	*opus*	negative	4	24,88	27,10
RAL-321	*1360*	positive	5	26,41	27,05	RAL-321	*Cr1a*	positive	7	24,05	26,49	RAL-321	*opus*	negative	5	24,96	28,00
RAL-321	*1360*	positive	6	26,45	26,71	RAL-321	*Cr1a*	positive	8	24,52	27,56	RAL-321	*opus*	negative	6	25,58	27,40
RAL-321	*1360*	positive	7	27,11	27,74	RAL-321	*gypsy5*	negative	1	27,05	27,66	RAL-321	*opus*	negative	7	24,81	28,63
RAL-321	*blastopia*	negative	1	26,97	27,44	RAL-321	*gypsy5*	negative	2	28,52	26,73	RAL-321	*opus*	negative	8	25,20	26,89
RAL-321	*blastopia*	negative	2	24,35	26,91	RAL-321	*gypsy5*	negative	3	28,52	26,84	RAL-321	*opus*	positive	1	26,34	27,25
RAL-321	*blastopia*	negative	3	22,87	27,05	RAL-321	*gypsy5*	negative	4	27,78	26,99	RAL-321	*opus*	positive	2	27,83	28,47
RAL-321	*blastopia*	negative	4	25,09	27,10	RAL-321	*gypsy5*	negative	5	28,01	27,33	RAL-321	*opus*	positive	3	26,38	26,87
RAL-321	*blastopia*	negative	5	23,95	28,00	RAL-321	*gypsy5*	negative	6	28,47	27,04	RAL-321	*opus*	positive	4	25,90	27,14
RAL-321	*blastopia*	negative	6	26,29	27,40	RAL-321	*gypsy5*	negative	7	28,41	27,11	RAL-321	*opus*	positive	5	25,70	26,42
RAL-321	*blastopia*	negative	7	24,17	28,63	RAL-321	*gypsy5*	positive	1	29,13	27,00	RAL-321	*opus*	positive	6	25,34	26,86
RAL-321	*blastopia*	negative	8	25,46	26,89	RAL-321	*gypsy5*	positive	2	28,70	27,40	RAL-321	*opus*	positive	7	25,53	26,49
RAL-321	*blastopia*	positive	1	26,98	27,25	RAL-321	*gypsy5*	positive	3	29,16	26,68	RAL-321	*opus*	positive	8	26,62	27,56
RAL-321	*blastopia*	positive	2	28,05	28,47	RAL-321	*gypsy5*	positive	4	28,46	27,15	RAL-321	*P-element*	negative	1	21,84	27,80
RAL-321	*blastopia*	positive	3	26,71	26,87	RAL-321	*gypsy5*	positive	5	28,05	26,49	RAL-321	*P-element*	negative	2	21,79	27,79
RAL-321	*blastopia*	positive	4	26,62	27,14	RAL-321	*gypsy5*	positive	6	27,95	26,89	RAL-321	*P-element*	negative	3	20,92	26,82
RAL-321	*blastopia*	positive	5	26,10	26,42	RAL-321	*gypsy5*	positive	7	28,43	26,61	RAL-321	*P-element*	negative	4	20,91	26,80
RAL-321	*blastopia*	positive	6	25,71	26,86	RAL-321	*gypsy5*	positive	8	29,17	27,43	RAL-321	*P-element*	negative	5	21,08	27,13
RAL-321	*blastopia*	positive	7	26,02	26,49	RAL-321	*Idefix*	negative	1	26,05	26,73	RAL-321	*P-element*	negative	6	21,14	27,26
RAL-321	*blastopia*	positive	8	26,18	27,56	RAL-321	*Idefix*	negative	2	26,03	26,84	RAL-321	*P-element*	negative	7	21,30	27,16
RAL-321	*blood*	negative	1	22,62	27,84	RAL-321	*Idefix*	negative	3	25,99	26,99	RAL-321	*P-element*	negative	8	21,34	27,11
RAL-321	*blood*	negative	2	22,60	28,08	RAL-321	*Idefix*	negative	4	25,89	27,33	RAL-321	*P-element*	positive	1	21,67	27,03
RAL-321	*blood*	negative	3	22,21	27,06	RAL-321	*Idefix*	negative	5	26,11	27,04	RAL-321	*P-element*	positive	2	21,93	27,46
RAL-321	*blood*	negative	4	22,03	26,84	RAL-321	*Idefix*	negative	6	26,10	27,11	RAL-321	*P-element*	positive	3	21,08	26,75
RAL-321	*blood*	negative	5	22,28	27,20	RAL-321	*Idefix*	positive	1	26,64	27,00	RAL-321	*P-element*	positive	4	21,08	27,14
RAL-321	*blood*	negative	6	22,27	27,52	RAL-321	*Idefix*	positive	2	26,74	27,40	RAL-321	*P-element*	positive	5	21,12	26,46
RAL-321	*blood*	negative	7	22,16	27,07	RAL-321	*Idefix*	positive	3	26,37	26,68	RAL-321	*P-element*	positive	6	21,14	26,80
RAL-321	*blood*	negative	8	22,25	27,12	RAL-321	*Idefix*	positive	4	26,28	27,15	RAL-321	*P-element*	positive	7	21,18	26,54
RAL-321	*blood*	positive	1	22,58	27,22	RAL-321	*Idefix*	positive	5	26,16	26,49	RAL-321	*P-element*	positive	8	21,79	27,49
RAL-321	*blood*	positive	2	22,86	27,43	RAL-321	*Idefix*	positive	6	25,86	26,89	RAL-321	*pogo*	negative	1	21,32	27,85
RAL-321	*blood*	positive	3	22,61	26,74	RAL-321	*Idefix*	positive	7	26,16	26,61	RAL-321	*pogo*	negative	2	21,39	27,63
RAL-321	*blood*	positive	4	22,30	27,22	RAL-321	*Idefix*	positive	8	26,64	27,43	RAL-321	*pogo*	negative	3	21,45	26,51
RAL-321	*blood*	positive	5	22,39	26,70	RAL-321	*Juan*	negative	1	20,48	26,82	RAL-321	*pogo*	negative	4	21,53	26,74
RAL-321	*blood*	positive	6	22,89	27,05	RAL-321	*Juan*	negative	2	20,56	26,80	RAL-321	*pogo*	negative	5	21,69	27,26
RAL-321	*blood*	positive	7	22,10	26,71	RAL-321	*Juan*	negative	3	21,08	27,13	RAL-321	*pogo*	negative	6	21,91	27,00
RAL-321	*blood*	positive	8	22,30	27,74	RAL-321	*Juan*	negative	4	21,03	27,26	RAL-321	*pogo*	negative	7	22,15	27,05
RAL-321	*copia*	negative	1	17,66	27,66	RAL-321	*Juan*	negative	5	21,06	27,16	RAL-321	*pogo*	positive	1	22,14	27,15
RAL-321	*copia*	negative	2	17,71	27,73	RAL-321	*Juan*	negative	6	21,27	27,11	RAL-321	*pogo*	positive	2	21,92	27,43
RAL-321	*copia*	negative	3	17,04	26,73	RAL-321	*Juan*	positive	1	21,29	27,03	RAL-321	*pogo*	positive	3	21,38	26,62
RAL-321	*copia*	negative	4	17,25	26,84	RAL-321	*Juan*	positive	2	21,08	27,46	RAL-321	*pogo*	positive	4	21,47	27,19

RAL-321	*pogo*	positive	5	21,49	26,35	RAL-338	*blastopia*	positive	7	26,92	27,00	RAL-338	*Idefix*	negative	1	24,01	26,97
RAL-321	*pogo*	positive	6	21,63	26,68	RAL-338	*blastopia*	positive	8	25,93	25,99	RAL-338	*Idefix*	negative	2	23,55	26,20
RAL-321	*pogo*	positive	7	21,71	26,54	RAL-338	*blood*	negative	1	23,78	26,97	RAL-338	*Idefix*	negative	3	23,31	26,45
RAL-321	*pogo*	positive	8	22,42	27,31	RAL-338	*blood*	negative	2	23,24	26,62	RAL-338	*Idefix*	negative	4	22,10	25,84
RAL-321	*Quasimodo*	negative	1	26,56	27,44	RAL-338	*blood*	negative	3	23,46	25,76	RAL-338	*Idefix*	negative	5	22,29	26,26
RAL-321	*Quasimodo*	negative	2	24,28	26,91	RAL-338	*blood*	negative	4	23,31	26,31	RAL-338	*Idefix*	negative	6	23,03	26,62
RAL-321	*Quasimodo*	negative	3	22,66	27,05	RAL-338	*blood*	negative	5	23,81	26,65	RAL-338	*Idefix*	negative	7	22,71	26,31
RAL-321	*Quasimodo*	negative	4	24,93	27,10	RAL-338	*blood*	negative	6	23,28	26,57	RAL-338	*Idefix*	negative	8	23,32	26,53
RAL-321	*Quasimodo*	negative	5	25,65	28,00	RAL-338	*blood*	negative	7	23,80	26,60	RAL-338	*Idefix*	positive	1	24,50	26,60
RAL-321	*Quasimodo*	negative	6	26,17	27,40	RAL-338	*blood*	positive	1	24,27	26,68	RAL-338	*Idefix*	positive	2	23,38	25,67
RAL-321	*Quasimodo*	negative	7	25,86	28,63	RAL-338	*blood*	positive	2	23,36	25,61	RAL-338	*Idefix*	positive	3	22,69	25,99
RAL-321	*Quasimodo*	negative	8	25,61	26,89	RAL-338	*blood*	positive	3	22,99	25,78	RAL-338	*Idefix*	positive	4	22,52	26,11
RAL-321	*Quasimodo*	positive	1	26,44	27,25	RAL-338	*blood*	positive	4	22,91	26,05	RAL-338	*Idefix*	positive	5	22,69	26,31
RAL-321	*Quasimodo*	positive	2	27,76	28,47	RAL-338	*blood*	positive	5	23,44	26,23	RAL-338	*Idefix*	positive	6	23,49	26,80
RAL-321	*Quasimodo*	positive	3	26,28	26,87	RAL-338	*blood*	positive	6	23,45	26,86	RAL-338	*Idefix*	positive	7	23,72	27,45
RAL-321	*Quasimodo*	positive	4	26,42	27,14	RAL-338	*blood*	positive	7	23,79	27,00	RAL-338	*Idefix*	positive	8	23,25	26,24
RAL-321	*Quasimodo*	positive	5	25,70	26,42	RAL-338	*blood*	positive	8	23,65	25,99	RAL-338	*Juan*	negative	1	23,57	26,97
RAL-321	*Quasimodo*	positive	6	25,67	26,86	RAL-338	*copia*	negative	1	16,96	26,97	RAL-338	*Juan*	negative	2	23,36	26,20
RAL-321	*Quasimodo*	positive	7	25,64	26,49	RAL-338	*copia*	negative	2	17,43	26,42	RAL-338	*Juan*	negative	3	22,91	26,45
RAL-321	*Quasimodo*	positive	8	26,34	27,56	RAL-338	*copia*	negative	3	16,74	26,62	RAL-338	*Juan*	negative	4	22,74	25,84
RAL-338	*412*	negative	1	21,08	26,97	RAL-338	*copia*	negative	4	17,42	25,76	RAL-338	*Juan*	negative	5	22,74	26,26
RAL-338	*412*	negative	2	20,80	26,42	RAL-338	*copia*	negative	5	16,88	26,31	RAL-338	*Juan*	negative	6	23,40	26,62
RAL-338	*412*	negative	3	20,27	26,62	RAL-338	*copia*	negative	6	17,18	26,65	RAL-338	*Juan*	negative	7	22,91	26,31
RAL-338	*412*	negative	4	20,05	25,76	RAL-338	*copia*	negative	7	17,09	26,57	RAL-338	*Juan*	negative	8	23,27	26,53
RAL-338	*412*	negative	5	20,35	26,31	RAL-338	*copia*	negative	8	17,01	26,60	RAL-338	*Juan*	positive	1	24,12	26,60
RAL-338	*412*	negative	6	21,37	26,65	RAL-338	*copia*	positive	1	17,36	26,68	RAL-338	*Juan*	positive	2	23,14	25,67
RAL-338	*412*	negative	7	20,65	26,57	RAL-338	*copia*	positive	2	17,21	25,61	RAL-338	*Juan*	positive	3	22,30	25,99
RAL-338	*412*	negative	8	21,12	26,60	RAL-338	*copia*	positive	3	17,24	25,78	RAL-338	*Juan*	positive	4	22,65	26,11
RAL-338	*412*	positive	1	21,64	26,68	RAL-338	*copia*	positive	4	18,14	26,05	RAL-338	*Juan*	positive	5	22,60	26,31
RAL-338	*412*	positive	2	20,40	25,61	RAL-338	*copia*	positive	5	17,90	26,23	RAL-338	*Juan*	positive	6	23,28	26,80
RAL-338	*412*	positive	3	19,80	25,78	RAL-338	*copia*	positive	6	17,70	26,86	RAL-338	*Juan*	positive	7	23,84	27,45
RAL-338	*412*	positive	4	19,77	26,05	RAL-338	*copia*	positive	7	17,21	27,00	RAL-338	*Juan*	positive	8	23,58	26,24
RAL-338	*412*	positive	5	19,92	26,23	RAL-338	*copia*	positive	8	17,18	25,99	RAL-338	*mdg1*	negative	1	20,56	26,97
RAL-338	*412*	positive	6	20,69	26,86	RAL-338	*Cr1a*	negative	1	25,06	26,97	RAL-338	*mdg1*	negative	2	20,78	26,20
RAL-338	*412*	positive	7	21,09	27,00	RAL-338	*Cr1a*	negative	2	24,70	26,42	RAL-338	*mdg1*	negative	3	19,79	26,45
RAL-338	*412*	positive	8	20,89	25,99	RAL-338	*Cr1a*	negative	3	24,88	26,62	RAL-338	*mdg1*	negative	4	20,22	25,84
RAL-338	*1360*	negative	1	27,78	26,97	RAL-338	*Cr1a*	negative	4	24,15	25,76	RAL-338	*mdg1*	negative	5	20,21	26,26
RAL-338	*1360*	negative	2	27,42	26,42	RAL-338	*Cr1a*	negative	5	24,46	26,31	RAL-338	*mdg1*	negative	6	20,65	26,62
RAL-338	*1360*	negative	3	27,38	26,62	RAL-338	*Cr1a*	negative	6	24,84	26,65	RAL-338	*mdg1*	negative	7	20,75	26,31
RAL-338	*1360*	negative	4	26,58	26,31	RAL-338	*Cr1a*	negative	7	24,08	26,57	RAL-338	*mdg1*	negative	8	20,77	26,53
RAL-338	*1360*	negative	5	27,25	26,65	RAL-338	*Cr1a*	negative	8	24,80	26,60	RAL-338	*mdg1*	positive	1	20,92	26,60
RAL-338	*1360*	negative	6	27,00	26,57	RAL-338	*Cr1a*	positive	1	24,38	26,68	RAL-338	*mdg1*	positive	2	20,34	25,67
RAL-338	*1360*	negative	7	27,38	26,60	RAL-338	*Cr1a*	positive	2	23,29	25,61	RAL-338	*mdg1*	positive	3	19,95	25,99
RAL-338	*1360*	positive	1	27,31	26,68	RAL-338	*Cr1a*	positive	3	23,52	25,78	RAL-338	*mdg1*	positive	4	20,33	26,11
RAL-338	*1360*	positive	2	26,45	25,61	RAL-338	*Cr1a*	positive	4	23,91	26,05	RAL-338	*mdg1*	positive	5	20,45	26,31
RAL-338	*1360*	positive	3	26,00	25,78	RAL-338	*Cr1a*	positive	5	24,36	26,23	RAL-338	*mdg1*	positive	6	20,37	26,80
RAL-338	*1360*	positive	4	26,22	26,05	RAL-338	*Cr1a*	positive	6	24,37	26,86	RAL-338	*mdg1*	positive	7	20,58	27,45
RAL-338	*1360*	positive	5	26,22	26,23	RAL-338	*Cr1a*	positive	7	24,69	27,00	RAL-338	*mdg1*	positive	8	20,92	26,24
RAL-338	*1360*	positive	6	26,77	26,86	RAL-338	*Cr1a*	positive	8	24,13	25,99	RAL-338	*opus*	negative	1	26,58	26,97
RAL-338	*1360*	positive	7	27,27	27,00	RAL-338	*gypsy5*	negative	1	19,37	26,97	RAL-338	*opus*	negative	2	25,86	26,20
RAL-338	*1360*	positive	8	26,99	25,99	RAL-338	*gypsy5*	negative	2	19,94	26,42	RAL-338	*opus*	negative	3	25,72	26,45
RAL-338	*blastopia*	negative	1	26,66	26,97	RAL-338	*gypsy5*	negative	3	19,15	26,62	RAL-338	*opus*	negative	4	25,02	25,84
RAL-338	*blastopia*	negative	2	26,17	26,42	RAL-338	*gypsy5*	negative	4	18,84	25,76	RAL-338	*opus*	negative	5	25,18	26,26
RAL-338	*blastopia*	negative	3	25,61	26,62	RAL-338	*gypsy5*	negative	5	18,48	26,31	RAL-338	*opus*	negative	6	25,84	26,62
RAL-338	*blastopia*	negative	4	25,26	25,76	RAL-338	*gypsy5*	negative	6	18,60	26,65	RAL-338	*opus*	negative	7	25,26	26,31
RAL-338	*blastopia*	negative	5	25,44	26,31	RAL-338	*gypsy5*	negative	7	18,33	26,57	RAL-338	*opus*	negative	8	26,06	26,53
RAL-338	*blastopia*	negative	6	26,15	26,65	RAL-338	*gypsy5*	negative	8	18,48	26,60	RAL-338	*opus*	positive	1	26,51	26,60
RAL-338	*blastopia*	negative	7	25,75	26,57	RAL-338	*gypsy5*	positive	1	19,61	26,68	RAL-338	*opus*	positive	2	25,16	25,67
RAL-338	*blastopia*	negative	8	26,19	26,60	RAL-338	*gypsy5*	positive	2	19,53	25,61	RAL-338	*opus*	positive	3	24,83	25,99
RAL-338	*blastopia*	positive	1	26,73	26,68	RAL-338	*gypsy5*	positive	3	19,74	25,78	RAL-338	*opus*	positive	4	25,35	26,11
RAL-338	*blastopia*	positive	2	25,26	25,61	RAL-338	*gypsy5*	positive	4	19,98	26,05	RAL-338	*opus*	positive	5	25,68	26,31
RAL-338	*blastopia*	positive	3	25,68	25,78	RAL-338	*gypsy5*	positive	5	20,23	26,23	RAL-338	*opus*	positive	6	25,93	26,80
RAL-338	*blastopia*	positive	4	26,00	26,05	RAL-338	*gypsy5*	positive	6	19,61	26,86	RAL-338	*opus*	positive	7	27,02	27,45
RAL-338	*blastopia*	positive	5	25,92	26,23	RAL-338	*gypsy5*	positive	7	19,55	27,00	RAL-338	*opus*	positive	8	26,06	26,24
RAL-338	*blastopia*	positive	6	26,40	26,86	RAL-338	*gypsy5*	positive	8	18,96	25,99	RAL-338	*P-element*	negative	1	23,03	26,97

RAL-338	*P-element*	negative	2	22,66	26,20	RAL-352	*1360*	negative	3	27,68	27,04	RAL-352	*Cr1a*	negative	5	25,46	27,25
RAL-338	*P-element*	negative	3	22,29	26,45	RAL-352	*1360*	negative	4	27,56	27,44	RAL-352	*Cr1a*	negative	6	25,36	27,54
RAL-338	*P-element*	negative	4	22,46	25,84	RAL-352	*1360*	negative	5	27,19	27,25	RAL-352	*Cr1a*	negative	7	25,42	27,59
RAL-338	*P-element*	negative	5	22,62	26,26	RAL-352	*1360*	negative	6	27,53	27,54	RAL-352	*Cr1a*	negative	8	25,72	27,77
RAL-338	*P-element*	negative	6	23,03	26,62	RAL-352	*1360*	negative	7	27,40	27,59	RAL-352	*Cr1a*	positive	1	25,45	27,13
RAL-338	*P-element*	negative	7	22,52	26,31	RAL-352	*1360*	negative	8	28,35	27,77	RAL-352	*Cr1a*	positive	2	26,36	28,22
RAL-338	*P-element*	negative	8	23,01	26,53	RAL-352	*1360*	positive	1	27,54	27,13	RAL-352	*Cr1a*	positive	3	25,90	27,78
RAL-338	*P-element*	positive	1	23,13	26,60	RAL-352	*1360*	positive	2	27,90	28,22	RAL-352	*Cr1a*	positive	4	26,36	28,31
RAL-338	*P-element*	positive	2	22,23	25,67	RAL-352	*1360*	positive	3	27,32	27,78	RAL-352	*Cr1a*	positive	5	26,17	28,01
RAL-338	*P-element*	positive	3	21,44	25,99	RAL-352	*1360*	positive	4	27,86	28,31	RAL-352	*Cr1a*	positive	6	26,00	27,90
RAL-338	*P-element*	positive	4	22,32	26,11	RAL-352	*1360*	positive	5	27,46	28,01	RAL-352	*Cr1a*	positive	7	25,56	27,76
RAL-338	*P-element*	positive	5	22,41	26,31	RAL-352	*1360*	positive	6	27,77	27,90	RAL-352	*Cr1a*	positive	8	25,40	27,91
RAL-338	*P-element*	positive	6	22,50	26,80	RAL-352	*1360*	positive	7	27,55	27,76	RAL-352	*gypsy5*	negative	1	28,75	27,93
RAL-338	*P-element*	positive	7	22,85	27,45	RAL-352	*1360*	positive	8	28,06	27,91	RAL-352	*gypsy5*	negative	2	29,08	27,95
RAL-338	*P-element*	positive	8	22,83	26,24	RAL-352	*blastopia*	negative	1	25,96	27,93	RAL-352	*gypsy5*	negative	3	28,23	27,04
RAL-338	*pogo*	negative	1	24,33	26,97	RAL-352	*blastopia*	negative	2	26,13	27,95	RAL-352	*gypsy5*	negative	4	28,26	27,44
RAL-338	*pogo*	negative	2	24,66	26,20	RAL-352	*blastopia*	negative	3	25,63	27,04	RAL-352	*gypsy5*	negative	5	27,86	27,25
RAL-338	*pogo*	negative	3	24,37	26,45	RAL-352	*blastopia*	negative	4	25,74	27,44	RAL-352	*gypsy5*	negative	6	27,96	27,54
RAL-338	*pogo*	negative	4	24,43	25,84	RAL-352	*blastopia*	negative	5	25,49	27,25	RAL-352	*gypsy5*	negative	7	27,95	27,59
RAL-338	*pogo*	negative	5	24,37	26,26	RAL-352	*blastopia*	negative	6	25,59	27,54	RAL-352	*gypsy5*	negative	8	28,53	27,77
RAL-338	*pogo*	negative	6	24,33	26,62	RAL-352	*blastopia*	negative	7	25,88	27,59	RAL-352	*gypsy5*	positive	1	28,07	27,13
RAL-338	*pogo*	negative	7	24,01	26,31	RAL-352	*blastopia*	negative	8	26,62	27,77	RAL-352	*gypsy5*	positive	2	28,79	28,22
RAL-338	*pogo*	negative	8	24,31	26,53	RAL-352	*blastopia*	positive	1	25,57	27,13	RAL-352	*gypsy5*	positive	3	28,24	27,78
RAL-338	*pogo*	positive	1	24,67	26,60	RAL-352	*blastopia*	positive	2	26,88	28,22	RAL-352	*gypsy5*	positive	4	28,70	28,31
RAL-338	*pogo*	positive	2	24,28	25,67	RAL-352	*blastopia*	positive	3	26,69	28,31	RAL-352	*gypsy5*	positive	5	28,72	28,01
RAL-338	*pogo*	positive	3	24,18	25,99	RAL-352	*blastopia*	positive	4	26,05	28,01	RAL-352	*gypsy5*	positive	6	28,50	27,90
RAL-338	*pogo*	positive	4	24,63	26,11	RAL-352	*blastopia*	positive	5	26,02	27,90	RAL-352	*gypsy5*	positive	7	28,11	27,76
RAL-338	*pogo*	positive	5	24,66	26,31	RAL-352	*blastopia*	positive	6	25,95	27,76	RAL-352	*gypsy5*	positive	8	28,16	27,91
RAL-338	*pogo*	positive	6	24,59	26,80	RAL-352	*blastopia*	positive	7	25,97	27,91	RAL-352	*Idefix*	negative	1	27,68	28,08
RAL-338	*pogo*	positive	7	24,68	27,45	RAL-352	*blood*	negative	1	23,37	27,93	RAL-352	*Idefix*	negative	2	27,68	28,13
RAL-338	*pogo*	positive	8	24,73	26,24	RAL-352	*blood*	negative	2	23,73	27,95	RAL-352	*Idefix*	negative	3	27,01	27,07
RAL-338	*Quasimodo*	negative	1	26,61	26,97	RAL-352	*blood*	negative	3	24,21	27,04	RAL-352	*Idefix*	negative	4	27,01	27,34
RAL-338	*Quasimodo*	negative	2	26,04	26,20	RAL-352	*blood*	negative	4	24,24	27,44	RAL-352	*Idefix*	negative	5	26,57	27,08
RAL-338	*Quasimodo*	negative	3	26,01	26,45	RAL-352	*blood*	negative	5	23,75	27,25	RAL-352	*Idefix*	negative	6	27,10	27,58
RAL-338	*Quasimodo*	negative	4	25,08	25,84	RAL-352	*blood*	negative	6	23,88	27,54	RAL-352	*Idefix*	negative	7	27,48	27,45
RAL-338	*Quasimodo*	negative	5	25,46	26,26	RAL-352	*blood*	negative	7	23,89	27,59	RAL-352	*Idefix*	negative	8	27,75	27,62
RAL-338	*Quasimodo*	negative	6	25,84	26,62	RAL-352	*blood*	negative	8	25,57	27,77	RAL-352	*Idefix*	positive	1	27,40	27,09
RAL-338	*Quasimodo*	negative	7	25,64	26,31	RAL-352	*blood*	positive	1	23,47	27,13	RAL-352	*Idefix*	positive	2	27,66	28,05
RAL-338	*Quasimodo*	negative	8	26,30	26,53	RAL-352	*blood*	positive	2	25,05	28,22	RAL-352	*Idefix*	positive	3	26,78	27,65
RAL-338	*Quasimodo*	positive	1	25,87	26,60	RAL-352	*blood*	positive	3	24,11	27,78	RAL-352	*Idefix*	positive	4	27,31	28,07
RAL-338	*Quasimodo*	positive	2	25,13	25,67	RAL-352	*blood*	positive	4	24,43	28,31	RAL-352	*Idefix*	positive	5	27,70	27,89
RAL-338	*Quasimodo*	positive	3	24,92	25,99	RAL-352	*blood*	positive	5	23,78	28,01	RAL-352	*Idefix*	positive	6	27,61	27,97
RAL-338	*Quasimodo*	positive	4	25,22	26,11	RAL-352	*blood*	positive	6	24,16	27,90	RAL-352	*Idefix*	positive	7	27,52	27,76
RAL-338	*Quasimodo*	positive	5	25,52	26,31	RAL-352	*blood*	positive	7	24,42	27,76	RAL-352	*Idefix*	positive	8	27,57	27,60
RAL-338	*Quasimodo*	positive	6	25,63	26,80	RAL-352	*blood*	positive	8	23,98	27,91	RAL-352	*Juan*	negative	1	24,92	28,08
RAL-338	*Quasimodo*	positive	7	26,16	27,45	RAL-352	*copia*	negative	1	15,45	27,93	RAL-352	*Juan*	negative	2	25,32	28,13
RAL-338	*Quasimodo*	positive	8	25,84	26,24	RAL-352	*copia*	negative	2	15,91	27,95	RAL-352	*Juan*	negative	3	25,15	27,07
RAL-352	*412*	negative	1	22,81	27,93	RAL-352	*copia*	negative	3	16,22	27,04	RAL-352	*Juan*	negative	4	24,94	27,34
RAL-352	*412*	negative	2	23,41	27,95	RAL-352	*copia*	negative	4	15,92	27,44	RAL-352	*Juan*	negative	5	24,52	27,08
RAL-352	*412*	negative	3	23,54	27,04	RAL-352	*copia*	negative	5	16,22	27,25	RAL-352	*Juan*	negative	6	24,65	27,58
RAL-352	*412*	negative	4	22,95	27,44	RAL-352	*copia*	negative	6	16,13	27,54	RAL-352	*Juan*	negative	7	24,89	27,45
RAL-352	*412*	negative	5	22,67	27,25	RAL-352	*copia*	negative	7	15,46	27,59	RAL-352	*Juan*	negative	8	25,73	27,62
RAL-352	*412*	negative	6	22,74	27,54	RAL-352	*copia*	negative	8	16,99	27,77	RAL-352	*Juan*	positive	1	24,82	27,09
RAL-352	*412*	negative	7	22,68	27,59	RAL-352	*copia*	positive	1	15,45	27,13	RAL-352	*Juan*	positive	2	25,65	28,05
RAL-352	*412*	negative	8	24,27	27,77	RAL-352	*copia*	positive	2	17,27	28,22	RAL-352	*Juan*	positive	3	24,77	27,65
RAL-352	*412*	positive	1	22,75	27,13	RAL-352	*copia*	positive	3	16,09	27,78	RAL-352	*Juan*	positive	4	25,31	28,07
RAL-352	*412*	positive	2	23,53	28,22	RAL-352	*copia*	positive	4	16,28	28,31	RAL-352	*Juan*	positive	5	25,23	27,89
RAL-352	*412*	positive	3	22,49	27,78	RAL-352	*copia*	positive	5	16,48	28,01	RAL-352	*Juan*	positive	6	25,28	27,97
RAL-352	*412*	positive	4	23,19	28,31	RAL-352	*copia*	positive	6	16,08	27,90	RAL-352	*Juan*	positive	7	25,00	27,76
RAL-352	*412*	positive	5	22,29	28,01	RAL-352	*copia*	positive	7	15,18	27,76	RAL-352	*Juan*	positive	8	25,14	27,60
RAL-352	*412*	positive	6	23,27	27,90	RAL-352	*copia*	positive	8	15,81	27,91	RAL-352	*mdg1*	negative	1	21,90	28,08
RAL-352	*412*	positive	7	23,06	27,76	RAL-352	*Cr1a*	negative	1	26,10	27,93	RAL-352	*mdg1*	negative	2	22,51	28,13
RAL-352	*412*	positive	8	23,05	27,91	RAL-352	*Cr1a*	negative	2	26,25	27,95	RAL-352	*mdg1*	negative	3	22,72	27,07
RAL-352	*1360*	negative	1	27,98	27,93	RAL-352	*Cr1a*	negative	3	25,75	27,04	RAL-352	*mdg1*	negative	4	22,78	27,34
RAL-352	*1360*	negative	2	27,74	27,95	RAL-352	*Cr1a*	negative	4	25,78	27,44	RAL-352	*mdg1*	negative	5	22,14	27,08

RAL-352	*mdg1*	negative	6	22,77	27,58	RAL-352	*Quasimodo*	negative	7	26,57	27,45	RAL-370	*blood*	positive	1	29,57	29,83
RAL-352	*mdg1*	negative	7	22,77	27,45	RAL-352	*Quasimodo*	negative	8	26,30	27,62	RAL-370	*blood*	positive	2	21,55	25,59
RAL-352	*mdg1*	negative	8	24,05	27,62	RAL-352	*Quasimodo*	positive	1	26,04	27,09	RAL-370	*blood*	positive	3	21,70	25,83
RAL-352	*mdg1*	positive	1	22,29	27,09	RAL-352	*Quasimodo*	positive	2	26,92	28,05	RAL-370	*blood*	positive	4	22,42	26,08
RAL-352	*mdg1*	positive	2	24,35	28,05	RAL-352	*Quasimodo*	positive	3	26,35	27,65	RAL-370	*blood*	positive	5	21,93	25,88
RAL-352	*mdg1*	positive	3	22,88	27,65	RAL-352	*Quasimodo*	positive	4	26,68	28,07	RAL-370	*blood*	positive	6	22,02	25,59
RAL-352	*mdg1*	positive	4	23,44	28,07	RAL-352	*Quasimodo*	positive	5	26,76	27,89	RAL-370	*blood*	positive	7	21,90	25,92
RAL-352	*mdg1*	positive	5	22,96	27,89	RAL-352	*Quasimodo*	positive	6	26,62	27,97	RAL-370	*blood*	positive	8	22,19	25,46
RAL-352	*mdg1*	positive	6	23,00	27,97	RAL-352	*Quasimodo*	positive	7	26,42	27,76	RAL-370	*copia*	negative	1	14,97	26,01
RAL-352	*mdg1*	positive	7	22,97	27,76	RAL-352	*Quasimodo*	positive	8	26,14	27,60	RAL-370	*copia*	negative	2	14,96	26,38
RAL-352	*mdg1*	positive	8	23,22	27,60	RAL-370	*412*	negative	1	20,20	26,01	RAL-370	*copia*	negative	3	15,04	26,38
RAL-352	*opus*	negative	1	27,79	28,08	RAL-370	*412*	negative	2	20,05	26,38	RAL-370	*copia*	negative	4	14,87	25,85
RAL-352	*opus*	negative	2	27,92	28,13	RAL-370	*412*	negative	3	20,30	26,38	RAL-370	*copia*	negative	5	15,22	26,27
RAL-352	*opus*	negative	3	27,21	27,07	RAL-370	*412*	negative	4	19,94	25,85	RAL-370	*copia*	negative	6	15,18	26,22
RAL-352	*opus*	negative	4	27,38	27,34	RAL-370	*412*	negative	5	19,86	26,27	RAL-370	*copia*	negative	7	14,72	25,99
RAL-352	*opus*	negative	5	26,93	27,08	RAL-370	*412*	negative	6	20,25	26,22	RAL-370	*copia*	negative	8	15,05	26,06
RAL-352	*opus*	negative	6	26,93	27,58	RAL-370	*412*	negative	7	20,03	25,99	RAL-370	*copia*	positive	1	23,27	29,83
RAL-352	*opus*	negative	7	27,39	27,45	RAL-370	*412*	negative	8	19,97	26,06	RAL-370	*copia*	positive	2	14,84	25,59
RAL-352	*opus*	negative	8	27,60	27,62	RAL-370	*412*	positive	1	26,69	29,83	RAL-370	*copia*	positive	3	14,41	25,83
RAL-352	*opus*	positive	1	27,17	27,09	RAL-370	*412*	positive	2	19,64	25,59	RAL-370	*copia*	positive	4	14,94	26,08
RAL-352	*opus*	positive	2	27,71	28,05	RAL-370	*412*	positive	3	19,60	25,83	RAL-370	*copia*	positive	5	14,50	25,88
RAL-352	*opus*	positive	3	27,63	27,65	RAL-370	*412*	positive	4	19,79	26,08	RAL-370	*copia*	positive	6	14,30	25,59
RAL-352	*opus*	positive	4	27,93	28,07	RAL-370	*412*	positive	5	19,31	25,88	RAL-370	*copia*	positive	7	14,62	25,92
RAL-352	*opus*	positive	5	28,69	27,89	RAL-370	*412*	positive	6	19,80	25,59	RAL-370	*copia*	positive	8	14,99	25,46
RAL-352	*opus*	positive	6	27,55	27,97	RAL-370	*412*	positive	7	19,90	25,92	RAL-370	*Cr1a*	negative	1	23,28	26,01
RAL-352	*opus*	positive	7	27,91	27,76	RAL-370	*412*	positive	8	19,83	25,46	RAL-370	*Cr1a*	negative	2	23,05	26,38
RAL-352	*opus*	positive	8	27,25	27,60	RAL-370	*1360*	negative	1	25,23	26,01	RAL-370	*Cr1a*	negative	3	24,40	26,38
RAL-352	*P-element*	negative	1	22,51	28,08	RAL-370	*1360*	negative	2	25,23	26,38	RAL-370	*Cr1a*	negative	4	22,80	25,85
RAL-352	*P-element*	negative	2	22,72	28,13	RAL-370	*1360*	negative	3	25,43	26,38	RAL-370	*Cr1a*	negative	5	23,32	26,27
RAL-352	*P-element*	negative	3	23,26	27,07	RAL-370	*1360*	negative	4	24,70	25,85	RAL-370	*Cr1a*	negative	6	23,06	26,22
RAL-352	*P-element*	negative	4	23,27	27,34	RAL-370	*1360*	negative	5	24,80	26,27	RAL-370	*Cr1a*	negative	8	23,47	26,06
RAL-352	*P-element*	negative	5	22,97	27,08	RAL-370	*1360*	negative	6	24,98	26,22	RAL-370	*Cr1a*	positive	1	28,44	29,83
RAL-352	*P-element*	negative	6	23,11	27,58	RAL-370	*1360*	negative	7	25,32	25,99	RAL-370	*Cr1a*	positive	2	22,84	25,59
RAL-352	*P-element*	negative	7	22,80	27,45	RAL-370	*1360*	positive	1	29,56	29,83	RAL-370	*Cr1a*	positive	3	22,86	25,83
RAL-352	*P-element*	negative	8	23,99	27,62	RAL-370	*1360*	positive	2	24,65	25,59	RAL-370	*Cr1a*	positive	4	23,63	26,08
RAL-352	*P-element*	positive	1	22,04	27,09	RAL-370	*1360*	positive	3	24,56	25,83	RAL-370	*Cr1a*	positive	5	23,05	25,88
RAL-352	*P-element*	positive	2	23,02	28,05	RAL-370	*1360*	positive	4	24,90	26,08	RAL-370	*Cr1a*	positive	6	23,14	25,59
RAL-352	*P-element*	positive	3	21,92	27,65	RAL-370	*1360*	positive	5	24,51	25,88	RAL-370	*Cr1a*	positive	7	22,71	25,92
RAL-352	*P-element*	positive	4	23,75	28,07	RAL-370	*1360*	positive	6	24,97	25,59	RAL-370	*Cr1a*	positive	8	22,87	25,46
RAL-352	*P-element*	positive	5	23,29	27,89	RAL-370	*1360*	positive	7	25,01	25,92	RAL-370	*gypsy5*	negative	1	27,16	26,01
RAL-352	*P-element*	positive	6	23,20	27,97	RAL-370	*1360*	positive	8	25,07	25,46	RAL-370	*gypsy5*	negative	2	27,39	26,38
RAL-352	*P-element*	positive	7	22,84	27,76	RAL-370	*blastopia*	negative	1	24,71	26,01	RAL-370	*gypsy5*	negative	3	27,32	26,38
RAL-352	*P-element*	positive	8	23,52	27,60	RAL-370	*blastopia*	negative	2	24,51	26,38	RAL-370	*gypsy5*	negative	4	26,87	25,85
RAL-352	*pogo*	negative	1	24,70	28,08	RAL-370	*blastopia*	negative	3	24,72	26,38	RAL-370	*gypsy5*	negative	5	27,06	26,27
RAL-352	*pogo*	negative	2	24,65	28,13	RAL-370	*blastopia*	negative	4	23,85	25,85	RAL-370	*gypsy5*	negative	6	27,10	26,22
RAL-352	*pogo*	negative	3	24,97	27,07	RAL-370	*blastopia*	negative	5	24,17	26,27	RAL-370	*gypsy5*	negative	7	27,40	25,99
RAL-352	*pogo*	negative	4	24,98	27,34	RAL-370	*blastopia*	negative	6	24,56	26,22	RAL-370	*gypsy5*	negative	8	27,28	26,06
RAL-352	*pogo*	negative	5	24,79	27,08	RAL-370	*blastopia*	negative	7	24,67	25,99	RAL-370	*gypsy5*	positive	1	26,74	25,59
RAL-352	*pogo*	negative	6	24,75	27,58	RAL-370	*blastopia*	negative	8	24,71	26,06	RAL-370	*gypsy5*	positive	2	26,79	25,83
RAL-352	*pogo*	negative	7	24,57	27,45	RAL-370	*blastopia*	positive	1	29,51	29,83	RAL-370	*gypsy5*	positive	3	27,15	26,08
RAL-352	*pogo*	negative	8	25,65	27,62	RAL-370	*blastopia*	positive	2	24,02	25,59	RAL-370	*gypsy5*	positive	4	26,68	25,88
RAL-352	*pogo*	positive	1	24,16	27,09	RAL-370	*blastopia*	positive	3	23,93	25,83	RAL-370	*gypsy5*	positive	5	26,61	25,59
RAL-352	*pogo*	positive	2	25,41	28,05	RAL-370	*blastopia*	positive	4	24,14	26,08	RAL-370	*gypsy5*	positive	6	26,64	25,92
RAL-352	*pogo*	positive	3	24,72	27,65	RAL-370	*blastopia*	positive	5	23,81	25,88	RAL-370	*gypsy5*	positive	7	26,62	25,46
RAL-352	*pogo*	positive	4	25,49	28,07	RAL-370	*blastopia*	positive	6	23,87	25,59	RAL-370	*Idefix*	negative	1	24,49	25,69
RAL-352	*pogo*	positive	5	24,91	27,89	RAL-370	*blastopia*	positive	7	24,06	25,92	RAL-370	*Idefix*	negative	2	24,11	26,21
RAL-352	*pogo*	positive	6	25,18	27,97	RAL-370	*blastopia*	positive	8	24,33	25,46	RAL-370	*Idefix*	negative	3	24,36	26,25
RAL-352	*pogo*	positive	7	24,49	27,76	RAL-370	*blood*	negative	1	21,93	26,01	RAL-370	*Idefix*	negative	4	23,76	25,85
RAL-352	*pogo*	positive	8	24,73	27,60	RAL-370	*blood*	negative	2	21,82	26,38	RAL-370	*Idefix*	negative	5	23,89	26,08
RAL-352	*Quasimodo*	negative	1	26,52	28,08	RAL-370	*blood*	negative	3	22,14	26,38	RAL-370	*Idefix*	negative	6	24,15	26,36
RAL-352	*Quasimodo*	negative	2	26,77	28,13	RAL-370	*blood*	negative	4	21,74	25,85	RAL-370	*Idefix*	negative	7	23,92	25,85
RAL-352	*Quasimodo*	negative	3	26,23	27,07	RAL-370	*blood*	negative	5	21,83	26,27	RAL-370	*Idefix*	negative	8	24,37	25,74
RAL-352	*Quasimodo*	negative	4	26,08	27,34	RAL-370	*blood*	negative	6	21,83	26,22	RAL-370	*Idefix*	positive	1	29,88	30,26
RAL-352	*Quasimodo*	negative	5	25,77	27,08	RAL-370	*blood*	negative	7	21,97	25,99	RAL-370	*Idefix*	positive	2	23,04	25,87
RAL-352	*Quasimodo*	negative	6	26,25	27,58	RAL-370	*blood*	negative	8	21,86	26,06	RAL-370	*Idefix*	positive	3	22,42	25,63

RAL-370	*Idefix*	positive	4	23,44	25,95	RAL-370	*P-element*	positive	5	20,34	25,63	RAL-374	*1360*	positive	6	23,47	25,05
RAL-370	*Idefix*	positive	5	23,10	25,63	RAL-370	*P-element*	positive	6	20,39	25,58	RAL-374	*1360*	positive	7	22,99	24,89
RAL-370	*Idefix*	positive	6	22,83	25,58	RAL-370	*P-element*	positive	7	20,29	25,70	RAL-374	*1360*	positive	8	23,38	25,18
RAL-370	*Idefix*	positive	7	23,03	25,70	RAL-370	*P-element*	positive	8	20,76	25,33	RAL-374	*blastopia*	negative	1	23,57	25,32
RAL-370	*Idefix*	positive	8	23,31	25,33	RAL-370	*pogo*	negative	1	23,27	25,69	RAL-374	*blastopia*	negative	2	23,46	24,94
RAL-370	*Juan*	negative	1	21,25	25,69	RAL-370	*pogo*	negative	2	23,05	26,21	RAL-374	*blastopia*	negative	3	23,29	24,91
RAL-370	*Juan*	negative	2	20,89	26,21	RAL-370	*pogo*	negative	3	23,26	26,25	RAL-374	*blastopia*	negative	4	23,45	24,96
RAL-370	*Juan*	negative	3	21,52	26,25	RAL-370	*pogo*	negative	4	23,28	25,85	RAL-374	*blastopia*	negative	5	22,73	25,34
RAL-370	*Juan*	negative	4	20,75	25,85	RAL-370	*pogo*	negative	5	23,27	26,08	RAL-374	*blastopia*	negative	6	23,02	25,22
RAL-370	*Juan*	negative	5	20,68	26,08	RAL-370	*pogo*	negative	6	23,16	26,36	RAL-374	*blastopia*	negative	7	23,85	25,15
RAL-370	*Juan*	negative	6	21,00	26,36	RAL-370	*pogo*	negative	7	22,99	25,85	RAL-374	*blastopia*	negative	8	24,02	25,75
RAL-370	*Juan*	negative	7	20,99	25,85	RAL-370	*pogo*	negative	8	23,18	25,74	RAL-374	*blastopia*	positive	1	24,11	25,77
RAL-370	*Juan*	negative	8	21,13	25,74	RAL-370	*pogo*	positive	1	28,13	30,26	RAL-374	*blastopia*	positive	2	23,21	25,17
RAL-370	*Juan*	positive	1	27,54	30,26	RAL-370	*pogo*	positive	2	23,28	25,87	RAL-374	*blastopia*	positive	3	23,35	25,35
RAL-370	*Juan*	positive	2	21,00	25,87	RAL-370	*pogo*	positive	3	23,27	25,63	RAL-374	*blastopia*	positive	4	22,58	24,85
RAL-370	*Juan*	positive	3	20,66	25,63	RAL-370	*pogo*	positive	4	23,37	25,95	RAL-374	*blastopia*	positive	5	23,34	25,13
RAL-370	*Juan*	positive	4	20,80	25,95	RAL-370	*pogo*	positive	5	22,96	25,63	RAL-374	*blastopia*	positive	6	23,51	25,05
RAL-370	*Juan*	positive	5	20,49	25,63	RAL-370	*pogo*	positive	6	22,94	25,58	RAL-374	*blastopia*	positive	7	23,38	24,89
RAL-370	*Juan*	positive	6	20,64	25,58	RAL-370	*pogo*	positive	7	22,90	25,70	RAL-374	*blastopia*	positive	8	23,71	25,18
RAL-370	*Juan*	positive	7	21,18	25,70	RAL-370	*pogo*	positive	8	23,00	25,33	RAL-374	*blood*	negative	1	23,84	25,32
RAL-370	*Juan*	positive	8	20,85	25,33	RAL-370	*Quasimodo*	negative	1	25,05	25,69	RAL-374	*blood*	negative	2	24,01	24,94
RAL-370	*mdg1*	negative	1	20,55	25,69	RAL-370	*Quasimodo*	negative	2	24,88	26,21	RAL-374	*blood*	negative	3	23,87	24,91
RAL-370	*mdg1*	negative	2	19,76	26,21	RAL-370	*Quasimodo*	negative	3	25,09	26,25	RAL-374	*blood*	negative	4	24,20	24,96
RAL-370	*mdg1*	negative	3	20,08	26,25	RAL-370	*Quasimodo*	negative	4	24,36	25,85	RAL-374	*blood*	negative	5	24,12	25,34
RAL-370	*mdg1*	negative	4	19,21	25,85	RAL-370	*Quasimodo*	negative	5	24,97	26,08	RAL-374	*blood*	negative	6	23,97	25,22
RAL-370	*mdg1*	negative	5	19,87	26,08	RAL-370	*Quasimodo*	negative	6	24,85	26,36	RAL-374	*blood*	negative	7	23,77	25,15
RAL-370	*mdg1*	negative	6	19,48	26,36	RAL-370	*Quasimodo*	negative	7	24,91	25,85	RAL-374	*blood*	negative	8	24,74	25,75
RAL-370	*mdg1*	negative	7	19,63	25,85	RAL-370	*Quasimodo*	negative	8	25,10	25,74	RAL-374	*blood*	positive	1	24,74	25,77
RAL-370	*mdg1*	negative	8	19,87	25,74	RAL-370	*Quasimodo*	positive	1	30,04	30,26	RAL-374	*blood*	positive	2	24,07	25,17
RAL-370	*mdg1*	positive	1	29,41	30,26	RAL-370	*Quasimodo*	positive	2	24,62	25,87	RAL-374	*blood*	positive	3	23,96	25,35
RAL-370	*mdg1*	positive	2	20,31	25,87	RAL-370	*Quasimodo*	positive	3	24,30	25,63	RAL-374	*blood*	positive	4	24,01	24,85
RAL-370	*mdg1*	positive	3	19,87	25,63	RAL-370	*Quasimodo*	positive	4	25,13	25,95	RAL-374	*blood*	positive	5	24,21	25,13
RAL-370	*mdg1*	positive	4	20,22	25,95	RAL-370	*Quasimodo*	positive	5	24,32	25,63	RAL-374	*blood*	positive	6	24,38	25,05
RAL-370	*mdg1*	positive	5	19,88	25,63	RAL-370	*Quasimodo*	positive	6	24,48	25,58	RAL-374	*blood*	positive	7	24,06	24,89
RAL-370	*mdg1*	positive	6	20,01	25,58	RAL-370	*Quasimodo*	positive	7	24,43	25,70	RAL-374	*blood*	positive	8	24,18	25,18
RAL-370	*mdg1*	positive	7	20,61	25,70	RAL-370	*Quasimodo*	positive	8	24,45	25,33	RAL-374	*copia*	negative	1	15,78	25,32
RAL-370	*mdg1*	positive	8	20,50	25,33	RAL-374	*412*	negative	1	20,42	25,32	RAL-374	*copia*	negative	2	16,23	24,94
RAL-370	*opus*	negative	1	24,81	25,69	RAL-374	*412*	negative	2	20,91	24,94	RAL-374	*copia*	negative	3	15,97	24,91
RAL-370	*opus*	negative	2	24,66	26,21	RAL-374	*412*	negative	3	20,66	24,91	RAL-374	*copia*	negative	4	16,15	24,96
RAL-370	*opus*	negative	3	25,92	26,25	RAL-374	*412*	negative	4	20,31	24,96	RAL-374	*copia*	negative	5	15,66	25,34
RAL-370	*opus*	negative	4	24,45	25,85	RAL-374	*412*	negative	5	20,32	25,34	RAL-374	*copia*	negative	6	15,84	25,22
RAL-370	*opus*	negative	5	25,25	26,08	RAL-374	*412*	negative	6	20,41	25,22	RAL-374	*copia*	negative	7	15,84	25,15
RAL-370	*opus*	negative	6	25,01	26,36	RAL-374	*412*	negative	7	20,59	25,15	RAL-374	*copia*	negative	8	16,27	25,75
RAL-370	*opus*	negative	7	25,28	25,85	RAL-374	*412*	negative	8	20,96	25,75	RAL-374	*copia*	positive	1	16,50	25,77
RAL-370	*opus*	negative	8	25,47	25,74	RAL-374	*412*	positive	1	21,20	25,77	RAL-374	*copia*	positive	2	16,16	25,17
RAL-370	*opus*	positive	1	30,57	30,26	RAL-374	*412*	positive	2	20,49	25,17	RAL-374	*copia*	positive	3	15,75	25,35
RAL-370	*opus*	positive	2	24,56	25,87	RAL-374	*412*	positive	3	19,99	25,35	RAL-374	*copia*	positive	4	16,00	24,85
RAL-370	*opus*	positive	3	24,63	25,63	RAL-374	*412*	positive	4	20,11	24,85	RAL-374	*copia*	positive	5	16,29	25,13
RAL-370	*opus*	positive	4	25,32	25,95	RAL-374	*412*	positive	5	20,07	25,13	RAL-374	*copia*	positive	6	16,57	25,05
RAL-370	*opus*	positive	5	25,00	25,63	RAL-374	*412*	positive	6	20,88	25,05	RAL-374	*copia*	positive	7	16,07	24,89
RAL-370	*opus*	positive	6	24,93	25,58	RAL-374	*412*	positive	7	20,33	24,89	RAL-374	*Cr1a*	negative	1	23,25	25,32
RAL-370	*opus*	positive	7	24,81	25,70	RAL-374	*412*	positive	8	20,67	25,18	RAL-374	*Cr1a*	negative	2	23,35	24,94
RAL-370	*opus*	positive	8	24,86	25,33	RAL-374	*1360*	negative	1	22,95	25,32	RAL-374	*Cr1a*	negative	3	23,42	24,91
RAL-370	*P-element*	negative	1	21,02	25,69	RAL-374	*1360*	negative	2	23,16	24,94	RAL-374	*Cr1a*	negative	4	23,56	24,96
RAL-370	*P-element*	negative	2	20,72	26,21	RAL-374	*1360*	negative	3	22,96	24,91	RAL-374	*Cr1a*	negative	5	22,92	25,34
RAL-370	*P-element*	negative	3	20,92	26,25	RAL-374	*1360*	negative	4	22,73	24,96	RAL-374	*Cr1a*	negative	6	22,75	25,22
RAL-370	*P-element*	negative	4	20,74	25,85	RAL-374	*1360*	negative	5	22,73	25,34	RAL-374	*Cr1a*	negative	7	23,27	25,15
RAL-370	*P-element*	negative	5	20,76	26,08	RAL-374	*1360*	negative	6	22,73	25,22	RAL-374	*Cr1a*	negative	8	23,60	25,75
RAL-370	*P-element*	negative	6	20,71	26,36	RAL-374	*1360*	negative	7	23,07	25,15	RAL-374	*Cr1a*	positive	1	23,76	25,77
RAL-370	*P-element*	negative	7	20,35	25,85	RAL-374	*1360*	negative	8	23,52	25,75	RAL-374	*Cr1a*	positive	2	23,12	25,17
RAL-370	*P-element*	negative	8	20,48	25,74	RAL-374	*1360*	positive	1	23,96	25,77	RAL-374	*Cr1a*	positive	3	23,26	25,35
RAL-370	*P-element*	positive	1	27,04	30,26	RAL-374	*1360*	positive	2	23,10	25,17	RAL-374	*Cr1a*	positive	4	22,81	24,85
RAL-370	*P-element*	positive	2	20,96	25,87	RAL-374	*1360*	positive	3	23,11	25,35	RAL-374	*Cr1a*	positive	5	22,92	25,13
RAL-370	*P-element*	positive	3	20,57	25,63	RAL-374	*1360*	positive	4	22,68	24,85	RAL-374	*Cr1a*	positive	6	23,14	25,05
RAL-370	*P-element*	positive	4	21,18	25,95	RAL-374	*1360*	positive	5	22,66	25,13	RAL-374	*Cr1a*	positive	7	22,85	24,89

RAL-374	*Cr1a*	positive	8	23,05	25,18	RAL-374	*opus*	negative	1	24,77	25,25	RAL-440	*412*	negative	3	24,00	30,97
RAL-374	*gypsy5*	negative	1	28,12	25,32	RAL-374	*opus*	negative	2	25,23	24,92	RAL-440	*412*	negative	4	21,84	29,47
RAL-374	*gypsy5*	negative	2	27,80	24,94	RAL-374	*opus*	negative	3	25,15	24,89	RAL-440	*412*	negative	6	21,71	28,44
RAL-374	*gypsy5*	negative	3	27,72	24,91	RAL-374	*opus*	negative	4	25,41	25,04	RAL-440	*412*	negative	7	20,94	28,72
RAL-374	*gypsy5*	negative	4	28,09	24,96	RAL-374	*opus*	negative	5	24,44	25,29	RAL-440	*412*	negative	8	21,40	30,37
RAL-374	*gypsy5*	negative	5	27,59	25,34	RAL-374	*opus*	negative	6	24,31	25,38	RAL-440	*412*	positive	1	24,31	30,49
RAL-374	*gypsy5*	negative	6	27,43	25,22	RAL-374	*opus*	negative	7	25,85	25,25	RAL-440	*412*	positive	2	23,63	30,49
RAL-374	*gypsy5*	negative	7	27,94	25,15	RAL-374	*opus*	negative	8	25,99	25,99	RAL-440	*412*	positive	3	23,80	30,26
RAL-374	*gypsy5*	negative	8	28,19	25,75	RAL-374	*opus*	positive	1	25,13	25,20	RAL-440	*412*	positive	4	22,20	28,80
RAL-374	*gypsy5*	positive	1	28,38	25,77	RAL-374	*opus*	positive	2	25,58	25,38	RAL-440	*412*	positive	5	22,10	29,37
RAL-374	*gypsy5*	positive	2	27,65	25,17	RAL-374	*opus*	positive	3	24,13	24,65	RAL-440	*412*	positive	6	21,98	29,73
RAL-374	*gypsy5*	positive	3	27,92	25,35	RAL-374	*opus*	positive	4	24,98	24,93	RAL-440	*412*	positive	7	22,30	28,65
RAL-374	*gypsy5*	positive	4	27,50	24,85	RAL-374	*opus*	positive	5	25,44	25,08	RAL-440	*412*	positive	8	21,43	29,33
RAL-374	*gypsy5*	positive	5	27,79	25,13	RAL-374	*opus*	positive	6	25,81	24,82	RAL-440	*1360*	negative	1	25,86	29,76
RAL-374	*gypsy5*	positive	6	27,98	25,05	RAL-374	*opus*	positive	7	25,77	25,18	RAL-440	*1360*	negative	2	25,70	30,82
RAL-374	*gypsy5*	positive	7	27,90	24,89	RAL-374	*P-element*	negative	1	18,89	25,25	RAL-440	*1360*	negative	3	27,61	31,36
RAL-374	*gypsy5*	positive	8	28,16	25,18	RAL-374	*P-element*	negative	2	18,91	24,92	RAL-440	*1360*	negative	4	25,64	29,90
RAL-374	*Idefix*	negative	1	22,58	25,25	RAL-374	*P-element*	negative	3	19,16	24,89	RAL-440	*1360*	negative	5	26,46	30,69
RAL-374	*Idefix*	negative	2	21,99	24,92	RAL-374	*P-element*	negative	4	19,03	25,04	RAL-440	*1360*	negative	6	24,95	28,69
RAL-374	*Idefix*	negative	3	21,45	24,89	RAL-374	*P-element*	negative	5	19,07	25,29	RAL-440	*1360*	negative	7	24,43	28,47
RAL-374	*Idefix*	negative	4	21,94	25,04	RAL-374	*P-element*	negative	6	18,88	25,38	RAL-440	*1360*	negative	8	25,63	30,31
RAL-374	*Idefix*	negative	5	21,44	25,29	RAL-374	*P-element*	negative	7	18,78	25,25	RAL-440	*1360*	positive	1	26,98	31,13
RAL-374	*Idefix*	negative	6	21,69	25,38	RAL-374	*P-element*	negative	8	19,21	25,99	RAL-440	*1360*	positive	2	27,73	30,88
RAL-374	*Idefix*	negative	7	21,83	25,25	RAL-374	*P-element*	positive	1	19,08	25,63	RAL-440	*1360*	positive	3	28,18	32,40
RAL-374	*Idefix*	negative	8	22,66	25,99	RAL-374	*P-element*	positive	2	18,97	25,20	RAL-440	*1360*	positive	4	25,72	28,70
RAL-374	*Idefix*	positive	1	22,36	25,63	RAL-374	*P-element*	positive	3	18,83	25,38	RAL-440	*1360*	positive	5	26,22	29,37
RAL-374	*Idefix*	positive	2	21,83	25,20	RAL-374	*P-element*	positive	4	19,09	24,65	RAL-440	*1360*	positive	6	26,24	30,27
RAL-374	*Idefix*	positive	3	21,50	25,38	RAL-374	*P-element*	positive	5	18,82	24,93	RAL-440	*1360*	positive	7	25,95	29,86
RAL-374	*Idefix*	positive	4	21,19	24,65	RAL-374	*P-element*	positive	6	19,39	25,08	RAL-440	*1360*	positive	8	25,21	31,24
RAL-374	*Idefix*	positive	5	21,66	24,93	RAL-374	*P-element*	positive	7	18,84	24,82	RAL-440	*blastopia*	negative	1	27,05	29,48
RAL-374	*Idefix*	positive	6	21,95	25,08	RAL-374	*P-element*	positive	8	19,09	25,18	RAL-440	*blastopia*	negative	2	26,77	30,83
RAL-374	*Idefix*	positive	7	21,90	24,82	RAL-374	*pogo*	negative	1	21,74	25,25	RAL-440	*blastopia*	negative	3	28,37	30,97
RAL-374	*Idefix*	positive	8	22,26	25,18	RAL-374	*pogo*	negative	2	21,81	24,92	RAL-440	*blastopia*	negative	4	25,71	29,47
RAL-374	*Juan*	negative	1	21,77	25,25	RAL-374	*pogo*	negative	3	22,35	24,89	RAL-440	*blastopia*	negative	6	25,79	28,44
RAL-374	*Juan*	negative	2	22,02	24,92	RAL-374	*pogo*	negative	4	22,00	25,04	RAL-440	*blastopia*	negative	7	23,84	28,72
RAL-374	*Juan*	negative	3	22,07	24,89	RAL-374	*pogo*	negative	5	21,97	25,29	RAL-440	*blastopia*	negative	8	24,48	30,37
RAL-374	*Juan*	negative	4	21,87	25,04	RAL-374	*pogo*	negative	6	21,84	25,38	RAL-440	*blastopia*	positive	1	29,53	30,49
RAL-374	*Juan*	negative	5	21,73	25,29	RAL-374	*pogo*	negative	7	21,80	25,25	RAL-440	*blastopia*	positive	2	27,93	30,49
RAL-374	*Juan*	negative	6	21,86	25,38	RAL-374	*pogo*	negative	8	21,91	25,99	RAL-440	*blastopia*	positive	3	27,73	30,26
RAL-374	*Juan*	negative	7	21,86	25,25	RAL-374	*pogo*	positive	1	22,57	25,63	RAL-440	*blastopia*	positive	4	27,38	28,80
RAL-374	*Juan*	negative	8	22,37	25,99	RAL-374	*pogo*	positive	2	22,15	25,20	RAL-440	*blastopia*	positive	5	26,08	29,37
RAL-374	*Juan*	positive	1	22,38	25,63	RAL-374	*pogo*	positive	3	22,44	25,38	RAL-440	*blastopia*	positive	6	26,55	29,73
RAL-374	*Juan*	positive	2	22,11	25,20	RAL-374	*pogo*	positive	4	21,84	24,65	RAL-440	*blastopia*	positive	7	27,30	28,65
RAL-374	*Juan*	positive	3	21,95	25,38	RAL-374	*pogo*	positive	5	21,96	24,93	RAL-440	*blastopia*	positive	8	24,75	29,33
RAL-374	*Juan*	positive	4	21,68	24,65	RAL-374	*pogo*	positive	6	22,51	25,08	RAL-440	*blood*	negative	1	24,43	29,48
RAL-374	*Juan*	positive	5	21,83	24,93	RAL-374	*pogo*	positive	7	21,95	24,82	RAL-440	*blood*	negative	2	23,82	30,83
RAL-374	*Juan*	positive	6	22,30	25,08	RAL-374	*pogo*	positive	8	22,20	25,18	RAL-440	*blood*	negative	3	25,73	30,97
RAL-374	*Juan*	positive	7	21,93	24,82	RAL-374	*Quasimodo*	negative	1	26,10	25,25	RAL-440	*blood*	negative	4	23,33	29,47
RAL-374	*Juan*	positive	8	22,08	25,18	RAL-374	*Quasimodo*	negative	2	26,21	24,92	RAL-440	*blood*	negative	5	22,25	28,44
RAL-374	*mdg1*	negative	1	19,72	25,25	RAL-374	*Quasimodo*	negative	3	25,87	24,89	RAL-440	*blood*	negative	6	21,69	28,72
RAL-374	*mdg1*	negative	2	20,05	24,92	RAL-374	*Quasimodo*	negative	4	26,03	25,04	RAL-440	*blood*	negative	7	23,22	30,37
RAL-374	*mdg1*	negative	3	19,96	24,89	RAL-374	*Quasimodo*	negative	5	25,26	25,29	RAL-440	*blood*	positive	1	25,76	30,49
RAL-374	*mdg1*	negative	4	19,72	25,04	RAL-374	*Quasimodo*	negative	6	25,22	25,38	RAL-440	*blood*	positive	2	26,24	30,26
RAL-374	*mdg1*	negative	5	19,81	25,29	RAL-374	*Quasimodo*	negative	7	26,17	25,25	RAL-440	*blood*	positive	3	23,35	28,80
RAL-374	*mdg1*	negative	6	20,02	25,38	RAL-374	*Quasimodo*	negative	8	26,48	25,99	RAL-440	*blood*	positive	4	23,31	29,37
RAL-374	*mdg1*	negative	7	19,86	25,25	RAL-374	*Quasimodo*	positive	1	26,71	25,63	RAL-440	*blood*	positive	5	23,64	29,73
RAL-374	*mdg1*	negative	8	20,40	25,99	RAL-374	*Quasimodo*	positive	2	25,84	25,20	RAL-440	*blood*	positive	6	23,12	28,65
RAL-374	*mdg1*	positive	1	19,72	25,63	RAL-374	*Quasimodo*	positive	3	26,33	25,38	RAL-440	*blood*	positive	7	22,97	29,33
RAL-374	*mdg1*	positive	2	19,66	25,20	RAL-374	*Quasimodo*	positive	4	25,19	24,65	RAL-440	*copia*	negative	1	21,36	29,48
RAL-374	*mdg1*	positive	3	19,38	25,38	RAL-374	*Quasimodo*	positive	5	25,54	24,93	RAL-440	*copia*	negative	2	22,19	30,83
RAL-374	*mdg1*	positive	4	19,26	24,65	RAL-374	*Quasimodo*	positive	6	25,98	25,08	RAL-440	*copia*	negative	3	23,89	30,97
RAL-374	*mdg1*	positive	5	19,19	24,93	RAL-374	*Quasimodo*	positive	7	26,03	24,82	RAL-440	*copia*	negative	4	20,80	29,47
RAL-374	*mdg1*	positive	6	20,02	25,08	RAL-374	*Quasimodo*	positive	8	26,04	25,18	RAL-440	*copia*	negative	5	18,54	28,44
RAL-374	*mdg1*	positive	7	19,38	24,82	RAL-440	*412*	negative	1	22,93	29,48	RAL-440	*copia*	negative	6	18,42	28,72
RAL-374	*mdg1*	positive	8	19,67	25,18	RAL-440	*412*	negative	2	22,15	30,83	RAL-440	*copia*	negative	7	21,01	30,37

RAL-440	*copia*	positive	1	23,52	30,49	RAL-440	*Juan*	positive	6	23,76	28,67	RAL-440	*Quasimodo*	negative	4	25,61	29,36
RAL-440	*copia*	positive	2	23,58	30,49	RAL-440	*Juan*	positive	7	23,15	29,22	RAL-440	*Quasimodo*	negative	5	26,03	30,17
RAL-440	*copia*	positive	3	23,88	30,26	RAL-440	*mdg1*	negative	1	25,66	29,67	RAL-440	*Quasimodo*	negative	6	25,44	28,42
RAL-440	*copia*	positive	4	20,54	28,80	RAL-440	*mdg1*	negative	2	25,93	30,38	RAL-440	*Quasimodo*	negative	7	23,80	28,30
RAL-440	*copia*	positive	5	20,90	29,37	RAL-440	*mdg1*	negative	3	27,83	30,50	RAL-440	*Quasimodo*	negative	8	24,24	30,26
RAL-440	*copia*	positive	6	21,31	29,73	RAL-440	*mdg1*	negative	4	24,31	29,36	RAL-440	*Quasimodo*	positive	1	29,16	30,34
RAL-440	*copia*	positive	7	19,74	28,65	RAL-440	*mdg1*	negative	5	25,88	30,17	RAL-440	*Quasimodo*	positive	2	27,40	30,88
RAL-440	*copia*	positive	8	20,66	29,33	RAL-440	*mdg1*	negative	6	23,29	28,42	RAL-440	*Quasimodo*	positive	3	27,60	30,94
RAL-440	*Cr1a*	negative	1	24,62	29,48	RAL-440	*mdg1*	negative	7	23,13	28,30	RAL-440	*Quasimodo*	positive	4	27,38	28,36
RAL-440	*Cr1a*	negative	2	24,72	30,83	RAL-440	*mdg1*	negative	8	24,68	30,26	RAL-440	*Quasimodo*	positive	5	25,77	28,95
RAL-440	*Cr1a*	negative	3	26,55	30,97	RAL-440	*mdg1*	positive	1	27,74	30,34	RAL-440	*Quasimodo*	positive	6	26,37	29,65
RAL-440	*Cr1a*	negative	4	24,17	29,47	RAL-440	*mdg1*	positive	2	28,16	30,94	RAL-440	*Quasimodo*	positive	7	26,89	28,67
RAL-440	*Cr1a*	negative	6	23,98	28,44	RAL-440	*mdg1*	positive	3	24,65	28,36	RAL-440	*Quasimodo*	positive	8	24,54	29,22
RAL-440	*Cr1a*	negative	7	21,62	28,72	RAL-440	*mdg1*	positive	4	24,64	28,95	RAL-441	*412*	negative	1	20,53	23,91
RAL-440	*Cr1a*	negative	8	22,11	30,37	RAL-440	*mdg1*	positive	5	25,91	29,65	RAL-441	*412*	negative	2	19,84	24,13
RAL-440	*Cr1a*	positive	1	27,29	30,49	RAL-440	*mdg1*	positive	6	24,90	28,67	RAL-441	*412*	negative	3	20,20	25,72
RAL-440	*Cr1a*	positive	2	25,32	30,49	RAL-440	*mdg1*	positive	7	24,78	29,22	RAL-441	*412*	negative	4	20,08	23,33
RAL-440	*Cr1a*	positive	3	25,30	30,26	RAL-440	*opus*	negative	1	28,67	29,76	RAL-441	*412*	negative	5	19,61	23,45
RAL-440	*Cr1a*	positive	4	25,33	28,80	RAL-440	*opus*	negative	2	27,23	30,82	RAL-441	*412*	negative	6	19,65	23,88
RAL-440	*Cr1a*	positive	5	24,46	29,37	RAL-440	*opus*	negative	3	30,98	31,36	RAL-441	*412*	negative	7	20,21	22,90
RAL-440	*Cr1a*	positive	6	24,20	29,73	RAL-440	*opus*	negative	4	26,57	29,90	RAL-441	*412*	negative	8	20,28	23,83
RAL-440	*Cr1a*	positive	7	24,73	28,65	RAL-440	*opus*	negative	5	27,40	30,69	RAL-441	*412*	positive	1	20,03	23,89
RAL-440	*Cr1a*	positive	8	22,30	29,33	RAL-440	*opus*	negative	6	26,58	28,69	RAL-441	*412*	positive	2	19,52	24,25
RAL-440	*gypsy5*	negative	1	28,64	29,48	RAL-440	*opus*	negative	7	23,95	28,47	RAL-441	*412*	positive	3	19,38	23,44
RAL-440	*gypsy5*	negative	2	28,80	30,83	RAL-440	*opus*	negative	8	25,07	30,31	RAL-441	*412*	positive	4	19,72	26,79
RAL-440	*gypsy5*	negative	3	30,96	30,97	RAL-440	*opus*	positive	1	31,79	31,13	RAL-441	*412*	positive	5	20,02	23,77
RAL-440	*gypsy5*	negative	4	28,40	29,47	RAL-440	*opus*	positive	2	29,82	30,88	RAL-441	*412*	positive	6	19,59	23,43
RAL-440	*gypsy5*	negative	5	28,05	28,44	RAL-440	*opus*	positive	3	29,54	32,40	RAL-441	*412*	positive	7	19,31	23,35
RAL-440	*gypsy5*	negative	6	26,08	28,72	RAL-440	*opus*	positive	4	29,42	28,70	RAL-441	*412*	positive	8	19,92	23,67
RAL-440	*gypsy5*	negative	7	25,97	30,37	RAL-440	*opus*	positive	5	27,17	29,88	RAL-441	*1360*	negative	1	25,41	23,91
RAL-440	*gypsy5*	positive	1	29,52	30,49	RAL-440	*opus*	positive	6	27,78	30,27	RAL-441	*1360*	negative	2	25,12	24,13
RAL-440	*gypsy5*	positive	2	29,91	30,26	RAL-440	*opus*	positive	7	28,46	29,86	RAL-441	*1360*	negative	3	26,10	25,72
RAL-440	*gypsy5*	positive	3	29,69	28,80	RAL-440	*opus*	positive	8	24,62	31,24	RAL-441	*1360*	negative	4	25,02	23,33
RAL-440	*gypsy5*	positive	4	28,34	29,37	RAL-440	*P-element*	negative	1	23,89	29,67	RAL-441	*1360*	negative	5	24,97	23,45
RAL-440	*gypsy5*	positive	5	28,44	29,73	RAL-440	*P-element*	negative	2	23,46	30,38	RAL-441	*1360*	negative	6	25,29	23,88
RAL-440	*gypsy5*	positive	6	28,70	28,65	RAL-440	*P-element*	negative	3	25,10	30,50	RAL-441	*1360*	negative	7	25,18	22,90
RAL-440	*gypsy5*	positive	7	26,59	29,33	RAL-440	*P-element*	negative	4	23,17	29,36	RAL-441	*1360*	negative	8	25,51	23,83
RAL-440	*Idefix*	negative	1	26,15	29,67	RAL-440	*P-element*	negative	5	24,04	30,17	RAL-441	*1360*	positive	1	25,31	23,89
RAL-440	*Idefix*	negative	2	26,63	30,38	RAL-440	*P-element*	negative	6	22,60	28,42	RAL-441	*1360*	positive	2	25,31	24,25
RAL-440	*Idefix*	negative	3	28,53	30,50	RAL-440	*P-element*	negative	7	22,14	28,30	RAL-441	*1360*	positive	3	25,19	23,44
RAL-440	*Idefix*	negative	4	25,44	29,36	RAL-440	*P-element*	negative	8	23,27	30,26	RAL-441	*1360*	positive	4	27,01	26,79
RAL-440	*Idefix*	negative	5	26,08	30,17	RAL-440	*P-element*	positive	1	25,03	30,34	RAL-441	*1360*	positive	5	25,37	23,77
RAL-440	*Idefix*	negative	6	25,54	28,42	RAL-440	*P-element*	positive	2	25,16	30,94	RAL-441	*1360*	positive	6	25,25	23,43
RAL-440	*Idefix*	negative	7	23,69	28,30	RAL-440	*P-element*	positive	3	23,24	28,36	RAL-441	*1360*	positive	7	24,95	23,35
RAL-440	*Idefix*	negative	8	24,56	30,26	RAL-440	*P-element*	positive	4	23,41	28,95	RAL-441	*1360*	positive	8	25,22	23,67
RAL-440	*Idefix*	positive	1	29,09	30,34	RAL-440	*P-element*	positive	5	23,30	29,65	RAL-441	*blastopia*	negative	1	20,72	23,91
RAL-440	*Idefix*	positive	2	27,56	30,94	RAL-440	*P-element*	positive	6	23,03	28,67	RAL-441	*blastopia*	negative	2	20,60	24,13
RAL-440	*Idefix*	positive	3	26,40	28,36	RAL-440	*P-element*	positive	7	23,06	29,22	RAL-441	*blastopia*	negative	3	21,66	25,72
RAL-440	*Idefix*	positive	4	25,32	28,95	RAL-440	*pogo*	negative	1	22,52	29,67	RAL-441	*blastopia*	negative	4	20,15	23,33
RAL-440	*Idefix*	positive	5	26,17	29,65	RAL-440	*pogo*	negative	2	23,45	30,50	RAL-441	*blastopia*	negative	5	19,94	23,45
RAL-440	*Idefix*	positive	6	26,17	28,67	RAL-440	*pogo*	negative	3	22,22	29,36	RAL-441	*blastopia*	negative	6	20,51	23,88
RAL-440	*Idefix*	positive	7	24,65	29,22	RAL-440	*pogo*	negative	4	22,53	30,17	RAL-441	*blastopia*	negative	7	20,12	22,90
RAL-440	*Juan*	negative	1	23,93	29,67	RAL-440	*pogo*	negative	5	22,17	28,42	RAL-441	*blastopia*	negative	8	20,83	23,83
RAL-440	*Juan*	negative	2	24,50	30,38	RAL-440	*pogo*	negative	6	21,01	28,30	RAL-441	*blastopia*	positive	1	20,43	23,89
RAL-440	*Juan*	negative	3	25,89	30,50	RAL-440	*pogo*	negative	7	21,55	30,26	RAL-441	*blastopia*	positive	2	20,32	24,25
RAL-440	*Juan*	negative	4	23,39	29,36	RAL-440	*pogo*	positive	1	23,45	30,34	RAL-441	*blastopia*	positive	3	20,07	23,44
RAL-440	*Juan*	negative	5	24,35	30,17	RAL-440	*pogo*	positive	2	23,71	30,94	RAL-441	*blastopia*	positive	4	22,63	26,79
RAL-440	*Juan*	negative	6	22,60	28,42	RAL-440	*pogo*	positive	3	22,57	28,36	RAL-441	*blastopia*	positive	5	20,08	23,77
RAL-440	*Juan*	negative	7	22,29	28,30	RAL-440	*pogo*	positive	4	22,64	28,95	RAL-441	*blastopia*	positive	6	20,28	23,43
RAL-440	*Juan*	negative	8	23,18	30,26	RAL-440	*pogo*	positive	5	21,99	29,65	RAL-441	*blastopia*	positive	7	20,29	23,35
RAL-440	*Juan*	positive	1	26,32	30,34	RAL-440	*pogo*	positive	6	22,40	28,67	RAL-441	*blastopia*	positive	8	20,33	23,67
RAL-440	*Juan*	positive	2	25,85	30,94	RAL-440	*pogo*	positive	7	21,64	29,22	RAL-441	*blood*	negative	1	21,47	23,91
RAL-440	*Juan*	positive	3	23,50	28,36	RAL-440	*Quasimodo*	negative	1	26,25	29,67	RAL-441	*blood*	negative	2	21,15	24,13
RAL-440	*Juan*	positive	4	23,65	28,95	RAL-440	*Quasimodo*	negative	2	26,24	30,38	RAL-441	*blood*	negative	3	21,01	25,72
RAL-440	*Juan*	positive	5	24,39	29,65	RAL-440	*Quasimodo*	negative	3	28,51	30,50	RAL-441	*blood*	negative	4	21,59	23,33

RAL-441	*blood*	negative	5	20,69	23,45	RAL-441	*Idefix*	negative	6	22,67	24,02	RAL-441	*P-element*	negative	7	22,84	23,15
RAL-441	*blood*	negative	6	20,68	23,88	RAL-441	*Idefix*	negative	7	22,88	23,15	RAL-441	*P-element*	negative	8	22,89	24,06
RAL-441	*blood*	negative	7	21,38	22,90	RAL-441	*Idefix*	negative	8	23,14	24,06	RAL-441	*P-element*	positive	1	22,58	23,98
RAL-441	*blood*	negative	8	21,52	23,83	RAL-441	*Idefix*	positive	1	23,08	23,98	RAL-441	*P-element*	positive	2	22,30	24,44
RAL-441	*blood*	positive	1	20,78	23,89	RAL-441	*Idefix*	positive	2	22,80	24,44	RAL-441	*P-element*	positive	3	22,01	23,65
RAL-441	*blood*	positive	2	20,79	24,25	RAL-441	*Idefix*	positive	3	21,85	23,65	RAL-441	*P-element*	positive	4	23,50	27,13
RAL-441	*blood*	positive	3	20,41	23,44	RAL-441	*Idefix*	positive	4	24,62	27,13	RAL-441	*P-element*	positive	5	22,99	24,02
RAL-441	*blood*	positive	4	21,28	26,79	RAL-441	*Idefix*	positive	5	22,64	24,02	RAL-441	*P-element*	positive	6	22,45	23,78
RAL-441	*blood*	positive	5	21,42	23,77	RAL-441	*Idefix*	positive	6	22,38	23,78	RAL-441	*P-element*	positive	7	22,26	23,63
RAL-441	*blood*	positive	6	21,13	23,43	RAL-441	*Idefix*	positive	7	22,27	23,63	RAL-441	*P-element*	positive	8	22,77	23,99
RAL-441	*blood*	positive	7	21,05	23,35	RAL-441	*Idefix*	positive	8	22,70	23,99	RAL-441	*pogo*	negative	1	21,82	24,10
RAL-441	*blood*	positive	8	21,47	23,67	RAL-441	*Juan*	negative	1	22,98	24,10	RAL-441	*pogo*	negative	2	21,45	24,34
RAL-441	*copia*	negative	1	16,19	23,91	RAL-441	*Juan*	negative	2	22,58	24,34	RAL-441	*pogo*	negative	3	21,87	25,72
RAL-441	*copia*	negative	2	15,15	24,13	RAL-441	*Juan*	negative	3	22,91	25,72	RAL-441	*pogo*	negative	4	21,50	23,45
RAL-441	*copia*	negative	3	15,51	25,72	RAL-441	*Juan*	negative	4	22,53	23,45	RAL-441	*pogo*	negative	5	21,52	23,72
RAL-441	*copia*	negative	4	17,52	23,33	RAL-441	*Juan*	negative	5	22,40	23,72	RAL-441	*pogo*	negative	6	21,37	24,02
RAL-441	*copia*	negative	5	17,42	23,45	RAL-441	*Juan*	negative	6	22,32	24,02	RAL-441	*pogo*	negative	7	21,55	23,15
RAL-441	*copia*	negative	6	16,58	23,88	RAL-441	*Juan*	negative	7	22,96	23,15	RAL-441	*pogo*	negative	8	21,65	24,06
RAL-441	*copia*	negative	7	16,85	22,90	RAL-441	*Juan*	negative	8	22,94	24,06	RAL-441	*pogo*	positive	1	21,67	23,98
RAL-441	*copia*	negative	8	16,68	23,83	RAL-441	*Juan*	positive	1	22,93	23,98	RAL-441	*pogo*	positive	2	21,42	24,44
RAL-441	*copia*	positive	1	16,38	23,89	RAL-441	*Juan*	positive	2	22,38	24,44	RAL-441	*pogo*	positive	3	21,35	23,65
RAL-441	*copia*	positive	2	17,26	24,25	RAL-441	*Juan*	positive	3	22,43	23,65	RAL-441	*pogo*	positive	4	22,32	27,13
RAL-441	*copia*	positive	3	16,78	23,44	RAL-441	*Juan*	positive	4	23,35	27,13	RAL-441	*pogo*	positive	5	22,07	24,02
RAL-441	*copia*	positive	4	17,96	26,79	RAL-441	*Juan*	positive	5	22,89	24,02	RAL-441	*pogo*	positive	6	21,73	23,78
RAL-441	*copia*	positive	5	16,95	23,77	RAL-441	*Juan*	positive	6	22,63	23,78	RAL-441	*pogo*	positive	7	21,23	23,63
RAL-441	*copia*	positive	6	16,97	23,43	RAL-441	*Juan*	positive	7	22,39	23,63	RAL-441	*pogo*	positive	8	21,52	23,99
RAL-441	*copia*	positive	7	17,43	23,35	RAL-441	*Juan*	positive	8	22,79	23,99	RAL-441	*Quasimodo*	negative	1	25,19	24,10
RAL-441	*copia*	positive	8	17,94	23,67	RAL-441	*mdg1*	negative	1	24,33	24,10	RAL-441	*Quasimodo*	negative	2	24,83	24,34
RAL-441	*Cr1a*	negative	1	22,51	23,91	RAL-441	*mdg1*	negative	2	23,99	24,34	RAL-441	*Quasimodo*	negative	3	25,90	25,72
RAL-441	*Cr1a*	negative	2	22,40	24,13	RAL-441	*mdg1*	negative	3	24,31	25,72	RAL-441	*Quasimodo*	negative	4	24,89	23,45
RAL-441	*Cr1a*	negative	3	23,68	25,72	RAL-441	*mdg1*	negative	4	23,71	23,45	RAL-441	*Quasimodo*	negative	5	24,95	23,72
RAL-441	*Cr1a*	negative	4	22,80	23,33	RAL-441	*mdg1*	negative	5	23,50	23,72	RAL-441	*Quasimodo*	negative	6	25,05	24,02
RAL-441	*Cr1a*	negative	5	22,46	23,45	RAL-441	*mdg1*	negative	6	23,59	24,02	RAL-441	*Quasimodo*	negative	7	25,29	23,15
RAL-441	*Cr1a*	negative	6	22,48	23,88	RAL-441	*mdg1*	negative	7	23,79	23,15	RAL-441	*Quasimodo*	negative	8	25,54	24,06
RAL-441	*Cr1a*	negative	7	22,53	22,90	RAL-441	*mdg1*	negative	8	23,99	24,06	RAL-441	*Quasimodo*	positive	1	24,93	23,98
RAL-441	*Cr1a*	negative	8	22,46	23,83	RAL-441	*mdg1*	positive	1	23,99	23,98	RAL-441	*Quasimodo*	positive	2	24,80	24,44
RAL-441	*Cr1a*	positive	1	22,74	23,89	RAL-441	*mdg1*	positive	2	23,30	24,44	RAL-441	*Quasimodo*	positive	3	24,50	23,65
RAL-441	*Cr1a*	positive	2	22,77	24,25	RAL-441	*mdg1*	positive	3	23,43	23,65	RAL-441	*Quasimodo*	positive	4	26,99	27,13
RAL-441	*Cr1a*	positive	3	22,50	23,44	RAL-441	*mdg1*	positive	4	23,74	27,13	RAL-441	*Quasimodo*	positive	5	25,39	24,02
RAL-441	*Cr1a*	positive	4	24,62	26,79	RAL-441	*mdg1*	positive	5	23,90	24,02	RAL-441	*Quasimodo*	positive	6	24,66	23,78
RAL-441	*Cr1a*	positive	5	22,85	23,77	RAL-441	*mdg1*	positive	6	23,30	23,78	RAL-441	*Quasimodo*	positive	7	24,49	23,63
RAL-441	*Cr1a*	positive	6	22,44	23,43	RAL-441	*mdg1*	positive	7	23,33	23,63	RAL-441	*Quasimodo*	positive	8	24,93	23,99
RAL-441	*Cr1a*	positive	7	22,10	23,35	RAL-441	*mdg1*	positive	8	23,58	23,99	RAL-535	*412*	negative	1	22,24	24,91
RAL-441	*Cr1a*	positive	8	22,34	23,67	RAL-441	*opus*	negative	1	24,63	24,10	RAL-535	*412*	negative	2	22,15	24,89
RAL-441	*gypsy5*	negative	1	29,11	23,91	RAL-441	*opus*	negative	2	24,46	24,34	RAL-535	*412*	negative	3	22,10	24,90
RAL-441	*gypsy5*	negative	2	28,91	24,13	RAL-441	*opus*	negative	3	26,20	25,72	RAL-535	*412*	negative	4	21,81	24,78
RAL-441	*gypsy5*	negative	3	30,13	25,72	RAL-441	*opus*	negative	4	24,80	23,45	RAL-535	*412*	negative	5	21,92	24,59
RAL-441	*gypsy5*	negative	4	28,32	23,33	RAL-441	*opus*	negative	5	24,60	23,72	RAL-535	*412*	negative	6	22,28	24,74
RAL-441	*gypsy5*	negative	5	28,31	23,45	RAL-441	*opus*	negative	6	24,65	24,02	RAL-535	*412*	negative	7	22,20	24,75
RAL-441	*gypsy5*	negative	6	28,20	23,88	RAL-441	*opus*	negative	7	24,57	23,15	RAL-535	*412*	negative	8	22,08	24,74
RAL-441	*gypsy5*	negative	7	28,53	22,90	RAL-441	*opus*	negative	8	25,11	24,06	RAL-535	*412*	positive	1	22,51	24,70
RAL-441	*gypsy5*	negative	8	29,01	23,83	RAL-441	*opus*	positive	1	24,35	23,98	RAL-535	*412*	positive	2	21,68	24,93
RAL-441	*gypsy5*	positive	1	28,96	23,89	RAL-441	*opus*	positive	2	24,78	24,44	RAL-535	*412*	positive	3	21,41	24,80
RAL-441	*gypsy5*	positive	2	28,79	24,25	RAL-441	*opus*	positive	3	24,17	23,65	RAL-535	*412*	positive	4	21,53	24,96
RAL-441	*gypsy5*	positive	3	28,48	23,44	RAL-441	*opus*	positive	4	27,87	27,13	RAL-535	*412*	positive	5	21,78	24,74
RAL-441	*gypsy5*	positive	4	31,21	26,79	RAL-441	*opus*	positive	5	24,94	24,02	RAL-535	*412*	positive	6	22,08	25,14
RAL-441	*gypsy5*	positive	5	29,15	23,77	RAL-441	*opus*	positive	6	24,38	23,78	RAL-535	*412*	positive	7	22,15	24,99
RAL-441	*gypsy5*	positive	6	28,31	23,43	RAL-441	*opus*	positive	7	24,54	23,63	RAL-535	*412*	positive	8	22,03	24,52
RAL-441	*gypsy5*	positive	7	27,97	23,35	RAL-441	*opus*	positive	8	25,04	23,99	RAL-535	*1360*	negative	1	25,11	24,91
RAL-441	*gypsy5*	positive	8	28,55	23,67	RAL-441	*P-element*	negative	1	22,72	24,10	RAL-535	*1360*	negative	2	24,75	24,89
RAL-441	*Idefix*	negative	1	23,09	24,10	RAL-441	*P-element*	negative	2	22,09	24,34	RAL-535	*1360*	negative	3	24,98	24,90
RAL-441	*Idefix*	negative	2	22,76	24,34	RAL-441	*P-element*	negative	3	22,83	25,72	RAL-535	*1360*	negative	4	24,51	24,78
RAL-441	*Idefix*	negative	3	23,76	25,72	RAL-441	*P-element*	negative	4	22,88	23,45	RAL-535	*1360*	negative	5	24,47	24,59
RAL-441	*Idefix*	negative	4	22,56	23,45	RAL-441	*P-element*	negative	5	22,77	23,72	RAL-535	*1360*	negative	6	24,97	24,74
RAL-441	*Idefix*	negative	5	22,42	23,72	RAL-441	*P-element*	negative	6	22,35	24,02	RAL-535	*1360*	negative	7	25,04	24,75

RAL-535	*1360*	negative	8	24,22	24,74	RAL-535	*Cr1a*	positive	1	23,87	24,70	RAL-535	*mdg1*	positive	3	24,28	25,13
RAL-535	*1360*	positive	1	25,29	24,70	RAL-535	*Cr1a*	positive	2	23,73	24,93	RAL-535	*mdg1*	positive	4	24,40	24,98
RAL-535	*1360*	positive	2	24,81	24,93	RAL-535	*Cr1a*	positive	3	23,51	24,80	RAL-535	*mdg1*	positive	5	24,60	24,87
RAL-535	*1360*	positive	3	24,37	24,80	RAL-535	*Cr1a*	positive	4	23,99	24,96	RAL-535	*mdg1*	positive	6	24,68	25,10
RAL-535	*1360*	positive	4	24,68	24,96	RAL-535	*Cr1a*	positive	5	24,00	24,74	RAL-535	*mdg1*	positive	7	24,89	25,29
RAL-535	*1360*	positive	5	24,70	24,74	RAL-535	*Cr1a*	positive	6	24,04	25,14	RAL-535	*mdg1*	positive	8	24,63	24,78
RAL-535	*1360*	positive	6	25,01	25,14	RAL-535	*Cr1a*	positive	7	23,85	24,99	RAL-535	*opus*	negative	1	24,85	25,40
RAL-535	*1360*	positive	7	25,28	24,99	RAL-535	*Cr1a*	positive	8	23,15	24,52	RAL-535	*opus*	negative	2	24,76	25,19
RAL-535	*1360*	positive	8	24,32	24,52	RAL-535	*gypsy5*	negative	1	28,89	24,91	RAL-535	*opus*	negative	3	24,90	25,13
RAL-535	*blastopia*	negative	1	23,07	24,91	RAL-535	*gypsy5*	negative	2	28,68	24,89	RAL-535	*opus*	negative	4	25,01	25,11
RAL-535	*blastopia*	negative	2	22,79	24,89	RAL-535	*gypsy5*	negative	3	28,43	24,90	RAL-535	*opus*	negative	5	24,65	24,90
RAL-535	*blastopia*	negative	3	22,75	24,90	RAL-535	*gypsy5*	negative	4	28,53	24,78	RAL-535	*opus*	negative	6	24,80	25,12
RAL-535	*blastopia*	negative	4	22,70	24,78	RAL-535	*gypsy5*	negative	5	28,09	24,59	RAL-535	*opus*	negative	7	24,93	25,03
RAL-535	*blastopia*	negative	5	22,46	24,59	RAL-535	*gypsy5*	negative	6	28,75	24,74	RAL-535	*opus*	negative	8	24,49	24,97
RAL-535	*blastopia*	negative	6	23,01	24,74	RAL-535	*gypsy5*	negative	7	28,48	24,75	RAL-535	*opus*	positive	1	24,85	24,91
RAL-535	*blastopia*	negative	7	22,87	24,75	RAL-535	*gypsy5*	negative	8	27,94	24,74	RAL-535	*opus*	positive	2	24,58	25,08
RAL-535	*blastopia*	negative	8	22,84	24,74	RAL-535	*gypsy5*	positive	1	28,76	24,70	RAL-535	*opus*	positive	3	24,36	25,13
RAL-535	*blastopia*	positive	1	22,95	24,70	RAL-535	*gypsy5*	positive	2	28,70	24,93	RAL-535	*opus*	positive	4	24,87	24,98
RAL-535	*blastopia*	positive	2	22,78	24,93	RAL-535	*gypsy5*	positive	3	28,16	24,80	RAL-535	*opus*	positive	5	24,92	24,87
RAL-535	*blastopia*	positive	3	22,53	24,80	RAL-535	*gypsy5*	positive	4	29,03	24,96	RAL-535	*opus*	positive	6	24,82	25,10
RAL-535	*blastopia*	positive	4	22,79	24,96	RAL-535	*gypsy5*	positive	5	29,05	24,74	RAL-535	*opus*	positive	7	25,18	25,29
RAL-535	*blastopia*	positive	5	22,67	24,74	RAL-535	*gypsy5*	positive	6	28,74	25,14	RAL-535	*opus*	positive	8	24,48	24,78
RAL-535	*blastopia*	positive	6	22,73	25,14	RAL-535	*gypsy5*	positive	8	27,90	24,52	RAL-535	*P-element*	negative	1	22,93	25,40
RAL-535	*blastopia*	positive	7	22,96	24,99	RAL-535	*Idefix*	negative	1	25,96	25,40	RAL-535	*P-element*	negative	2	23,76	25,19
RAL-535	*blastopia*	positive	8	23,07	24,52	RAL-535	*Idefix*	negative	2	25,60	25,19	RAL-535	*P-element*	negative	3	23,81	25,13
RAL-535	*blood*	negative	1	20,01	24,91	RAL-535	*Idefix*	negative	3	25,60	25,13	RAL-535	*P-element*	negative	4	23,34	25,11
RAL-535	*blood*	negative	2	19,90	24,89	RAL-535	*Idefix*	negative	4	25,46	25,11	RAL-535	*P-element*	negative	5	24,19	24,90
RAL-535	*blood*	negative	3	20,05	24,90	RAL-535	*Idefix*	negative	5	24,73	24,90	RAL-535	*P-element*	negative	6	24,43	25,12
RAL-535	*blood*	negative	4	20,11	24,78	RAL-535	*Idefix*	negative	6	25,63	25,12	RAL-535	*P-element*	negative	7	24,04	25,03
RAL-535	*blood*	negative	5	20,25	24,59	RAL-535	*Idefix*	negative	7	25,54	25,03	RAL-535	*P-element*	negative	8	22,41	24,97
RAL-535	*blood*	negative	6	20,27	24,74	RAL-535	*Idefix*	negative	8	25,36	24,97	RAL-535	*P-element*	positive	1	22,34	24,91
RAL-535	*blood*	negative	7	19,92	24,75	RAL-535	*Idefix*	positive	1	25,73	24,91	RAL-535	*P-element*	positive	2	21,48	25,08
RAL-535	*blood*	negative	8	20,07	24,74	RAL-535	*Idefix*	positive	2	25,35	25,08	RAL-535	*P-element*	positive	3	21,80	25,13
RAL-535	*blood*	positive	1	20,21	24,70	RAL-535	*Idefix*	positive	3	24,74	25,13	RAL-535	*P-element*	positive	4	23,06	24,98
RAL-535	*blood*	positive	2	19,72	24,93	RAL-535	*Idefix*	positive	4	25,04	24,98	RAL-535	*P-element*	positive	5	22,15	24,87
RAL-535	*blood*	positive	3	19,93	24,80	RAL-535	*Idefix*	positive	5	25,39	24,87	RAL-535	*P-element*	positive	6	22,03	25,10
RAL-535	*blood*	positive	4	20,10	24,96	RAL-535	*Idefix*	positive	6	25,45	25,10	RAL-535	*P-element*	positive	7	22,32	25,29
RAL-535	*blood*	positive	5	20,40	24,74	RAL-535	*Idefix*	positive	7	25,98	25,29	RAL-535	*P-element*	positive	8	21,38	24,78
RAL-535	*blood*	positive	6	19,75	25,14	RAL-535	*Idefix*	positive	8	25,10	24,78	RAL-535	*pogo*	negative	1	22,55	25,40
RAL-535	*blood*	positive	7	20,09	24,99	RAL-535	*Juan*	negative	1	22,78	25,40	RAL-535	*pogo*	negative	2	22,37	25,19
RAL-535	*blood*	positive	8	20,38	24,52	RAL-535	*Juan*	negative	2	22,66	25,19	RAL-535	*pogo*	negative	3	22,56	25,13
RAL-535	*copia*	negative	1	18,04	24,91	RAL-535	*Juan*	negative	3	22,80	25,13	RAL-535	*pogo*	negative	4	22,48	25,11
RAL-535	*copia*	negative	2	17,54	24,89	RAL-535	*Juan*	negative	4	22,12	25,11	RAL-535	*pogo*	negative	5	22,41	24,90
RAL-535	*copia*	negative	3	17,76	24,90	RAL-535	*Juan*	negative	5	22,05	24,90	RAL-535	*pogo*	negative	6	22,78	25,12
RAL-535	*copia*	negative	4	17,50	24,78	RAL-535	*Juan*	negative	6	22,61	25,12	RAL-535	*pogo*	negative	7	22,32	25,03
RAL-535	*copia*	negative	5	17,40	24,59	RAL-535	*Juan*	negative	7	22,67	25,03	RAL-535	*pogo*	negative	8	21,82	24,97
RAL-535	*copia*	negative	6	18,08	24,74	RAL-535	*Juan*	negative	8	22,40	24,97	RAL-535	*pogo*	positive	1	22,70	24,91
RAL-535	*copia*	negative	7	17,62	24,75	RAL-535	*Juan*	positive	1	22,69	24,91	RAL-535	*pogo*	positive	2	22,08	25,08
RAL-535	*copia*	negative	8	17,20	24,74	RAL-535	*Juan*	positive	2	22,41	25,08	RAL-535	*pogo*	positive	3	22,21	25,13
RAL-535	*copia*	positive	1	17,88	24,70	RAL-535	*Juan*	positive	3	22,09	25,13	RAL-535	*pogo*	positive	4	22,65	24,98
RAL-535	*copia*	positive	2	17,43	24,93	RAL-535	*Juan*	positive	4	22,16	24,98	RAL-535	*pogo*	positive	5	22,65	24,87
RAL-535	*copia*	positive	3	17,27	24,80	RAL-535	*Juan*	positive	5	22,30	24,87	RAL-535	*pogo*	positive	6	22,48	25,10
RAL-535	*copia*	positive	4	18,03	24,96	RAL-535	*Juan*	positive	6	22,73	25,10	RAL-535	*pogo*	positive	7	22,55	25,29
RAL-535	*copia*	positive	5	18,44	24,74	RAL-535	*Juan*	positive	7	22,62	25,29	RAL-535	*pogo*	positive	8	22,03	24,78
RAL-535	*copia*	positive	6	17,75	25,14	RAL-535	*Juan*	positive	8	22,76	24,78	RAL-535	*Quasimodo*	negative	1	25,57	25,40
RAL-535	*copia*	positive	7	17,66	24,99	RAL-535	*mdg1*	negative	1	24,87	25,40	RAL-535	*Quasimodo*	negative	2	25,47	25,19
RAL-535	*copia*	positive	8	17,95	24,52	RAL-535	*mdg1*	negative	2	24,69	25,19	RAL-535	*Quasimodo*	negative	3	25,47	25,13
RAL-535	*Cr1a*	negative	1	24,03	24,91	RAL-535	*mdg1*	negative	3	24,64	25,13	RAL-535	*Quasimodo*	negative	4	25,26	25,11
RAL-535	*Cr1a*	negative	2	23,78	24,89	RAL-535	*mdg1*	negative	4	24,57	25,11	RAL-535	*Quasimodo*	negative	5	24,54	24,90
RAL-535	*Cr1a*	negative	3	24,26	24,90	RAL-535	*mdg1*	negative	5	24,35	24,90	RAL-535	*Quasimodo*	negative	6	25,35	25,12
RAL-535	*Cr1a*	negative	4	23,99	24,78	RAL-535	*mdg1*	negative	6	24,88	25,12	RAL-535	*Quasimodo*	negative	7	25,52	25,03
RAL-535	*Cr1a*	negative	5	23,38	24,59	RAL-535	*mdg1*	negative	7	25,14	25,03	RAL-535	*Quasimodo*	negative	8	25,10	24,97
RAL-535	*Cr1a*	negative	6	24,21	24,74	RAL-535	*mdg1*	negative	8	24,70	24,97	RAL-535	*Quasimodo*	positive	1	25,42	24,91
RAL-535	*Cr1a*	negative	7	23,72	24,75	RAL-535	*mdg1*	positive	1	24,96	24,91	RAL-535	*Quasimodo*	positive	2	25,30	25,08
RAL-535	*Cr1a*	negative	8	23,36	24,74	RAL-535	*mdg1*	positive	2	24,51	25,08	RAL-535	*Quasimodo*	positive	3	25,01	25,13

RAL-535	*Quasimodo*	positive	4	25,40	24,98	RAL-595	*blood*	positive	6	20,94	25,41	RAL-595	*Juan*	negative	3	20,00	23,54
RAL-535	*Quasimodo*	positive	5	25,46	24,87	RAL-595	*blood*	positive	7	21,57	24,54	RAL-595	*Juan*	negative	4	20,04	23,55
RAL-535	*Quasimodo*	positive	6	25,25	25,10	RAL-595	*blood*	positive	8	20,92	24,87	RAL-595	*Juan*	negative	5	19,81	23,67
RAL-535	*Quasimodo*	positive	7	25,41	25,29	RAL-595	*copia*	negative	1	17,21	23,53	RAL-595	*Juan*	negative	6	20,28	23,22
RAL-535	*Quasimodo*	positive	8	24,76	24,78	RAL-595	*copia*	negative	2	16,76	23,48	RAL-595	*Juan*	negative	7	20,50	24,70
RAL-595	*412*	negative	1	20,79	23,53	RAL-595	*copia*	negative	3	16,94	24,01	RAL-595	*Juan*	negative	8	20,83	24,86
RAL-595	*412*	negative	2	20,54	23,48	RAL-595	*copia*	negative	4	17,39	23,85	RAL-595	*Juan*	positive	1	20,26	23,75
RAL-595	*412*	negative	3	20,62	24,01	RAL-595	*copia*	negative	5	17,12	23,98	RAL-595	*Juan*	positive	2	19,90	23,35
RAL-595	*412*	negative	4	20,38	23,85	RAL-595	*copia*	negative	6	17,42	23,52	RAL-595	*Juan*	positive	3	19,82	22,82
RAL-595	*412*	negative	5	20,29	23,98	RAL-595	*copia*	negative	7	17,05	25,05	RAL-595	*Juan*	positive	4	19,95	23,50
RAL-595	*412*	negative	6	20,89	23,52	RAL-595	*copia*	negative	8	17,66	25,29	RAL-595	*Juan*	positive	5	19,97	23,40
RAL-595	*412*	negative	7	20,48	25,05	RAL-595	*copia*	positive	1	16,76	24,16	RAL-595	*Juan*	positive	6	20,37	24,87
RAL-595	*412*	negative	8	20,98	25,29	RAL-595	*copia*	positive	2	16,66	23,68	RAL-595	*Juan*	positive	7	20,37	24,14
RAL-595	*412*	positive	1	20,43	24,16	RAL-595	*copia*	positive	3	16,47	23,29	RAL-595	*Juan*	positive	8	20,77	24,63
RAL-595	*412*	positive	2	20,18	23,68	RAL-595	*copia*	positive	4	17,43	23,99	RAL-595	*mdg1*	negative	1	19,96	23,16
RAL-595	*412*	positive	3	20,15	23,29	RAL-595	*copia*	positive	5	17,09	23,82	RAL-595	*mdg1*	negative	2	19,66	23,08
RAL-595	*412*	positive	4	20,35	23,99	RAL-595	*copia*	positive	6	16,81	25,41	RAL-595	*mdg1*	negative	3	19,74	23,54
RAL-595	*412*	positive	5	20,74	23,82	RAL-595	*copia*	positive	7	17,12	24,54	RAL-595	*mdg1*	negative	4	19,75	23,55
RAL-595	*412*	positive	6	20,52	25,41	RAL-595	*copia*	positive	8	17,06	24,87	RAL-595	*mdg1*	negative	5	19,64	23,67
RAL-595	*412*	positive	7	20,66	24,54	RAL-595	*Cr1a*	negative	1	22,02	23,53	RAL-595	*mdg1*	negative	6	20,12	23,22
RAL-595	*412*	positive	8	20,78	24,87	RAL-595	*Cr1a*	negative	2	21,66	23,48	RAL-595	*mdg1*	negative	7	19,85	24,70
RAL-595	*1360*	negative	1	22,37	23,53	RAL-595	*Cr1a*	negative	3	21,85	24,01	RAL-595	*mdg1*	negative	8	20,45	24,86
RAL-595	*1360*	negative	2	21,98	23,48	RAL-595	*Cr1a*	negative	4	22,29	23,85	RAL-595	*mdg1*	positive	1	19,73	23,75
RAL-595	*1360*	negative	3	21,89	24,01	RAL-595	*Cr1a*	negative	5	21,91	23,98	RAL-595	*mdg1*	positive	2	19,51	23,35
RAL-595	*1360*	negative	4	21,96	23,85	RAL-595	*Cr1a*	negative	6	21,89	23,52	RAL-595	*mdg1*	positive	3	19,80	22,82
RAL-595	*1360*	negative	5	21,85	23,98	RAL-595	*Cr1a*	negative	7	22,75	25,05	RAL-595	*mdg1*	positive	4	19,74	23,50
RAL-595	*1360*	negative	6	22,26	23,52	RAL-595	*Cr1a*	negative	8	23,20	25,29	RAL-595	*mdg1*	positive	5	19,55	23,40
RAL-595	*1360*	negative	7	22,42	25,05	RAL-595	*Cr1a*	positive	1	22,62	24,16	RAL-595	*mdg1*	positive	6	19,57	24,87
RAL-595	*1360*	negative	8	22,87	25,29	RAL-595	*Cr1a*	positive	2	22,28	23,68	RAL-595	*mdg1*	positive	7	19,86	24,14
RAL-595	*1360*	positive	1	22,47	24,16	RAL-595	*Cr1a*	positive	3	21,91	23,29	RAL-595	*mdg1*	positive	8	20,07	24,63
RAL-595	*1360*	positive	2	22,45	23,68	RAL-595	*Cr1a*	positive	4	22,51	23,99	RAL-595	*opus*	negative	1	24,75	23,16
RAL-595	*1360*	positive	3	22,35	23,29	RAL-595	*Cr1a*	positive	5	23,03	23,82	RAL-595	*opus*	negative	2	24,30	23,08
RAL-595	*1360*	positive	4	22,53	23,99	RAL-595	*Cr1a*	positive	6	23,34	25,41	RAL-595	*opus*	negative	3	24,62	23,54
RAL-595	*1360*	positive	5	22,31	23,82	RAL-595	*Cr1a*	positive	7	22,81	24,54	RAL-595	*opus*	negative	4	24,83	23,55
RAL-595	*1360*	positive	6	22,21	25,41	RAL-595	*Cr1a*	positive	8	22,78	24,87	RAL-595	*opus*	negative	5	24,53	23,67
RAL-595	*1360*	positive	7	22,61	24,54	RAL-595	*gypsy5*	negative	1	25,54	23,53	RAL-595	*opus*	negative	6	24,15	23,22
RAL-595	*1360*	positive	8	22,67	24,87	RAL-595	*gypsy5*	negative	2	24,99	23,48	RAL-595	*opus*	negative	7	25,65	24,70
RAL-595	*blastopia*	negative	1	22,57	23,53	RAL-595	*gypsy5*	negative	3	25,23	24,01	RAL-595	*opus*	negative	8	26,66	24,86
RAL-595	*blastopia*	negative	2	22,05	23,48	RAL-595	*gypsy5*	negative	4	25,87	23,85	RAL-595	*opus*	positive	1	25,46	23,75
RAL-595	*blastopia*	negative	3	22,30	24,01	RAL-595	*gypsy5*	negative	5	25,58	23,98	RAL-595	*opus*	positive	2	24,73	23,35
RAL-595	*blastopia*	negative	4	22,69	23,85	RAL-595	*gypsy5*	negative	6	25,57	23,52	RAL-595	*opus*	positive	3	24,35	22,82
RAL-595	*blastopia*	negative	5	22,58	23,98	RAL-595	*gypsy5*	negative	7	26,37	25,05	RAL-595	*opus*	positive	4	25,00	23,50
RAL-595	*blastopia*	negative	6	22,63	23,52	RAL-595	*gypsy5*	negative	8	26,54	25,29	RAL-595	*opus*	positive	5	25,61	23,40
RAL-595	*blastopia*	negative	7	23,64	25,05	RAL-595	*gypsy5*	positive	1	26,10	24,16	RAL-595	*opus*	positive	6	26,18	24,87
RAL-595	*blastopia*	negative	8	23,90	25,29	RAL-595	*gypsy5*	positive	2	25,86	23,68	RAL-595	*opus*	positive	7	25,90	24,14
RAL-595	*blastopia*	positive	1	23,18	24,16	RAL-595	*gypsy5*	positive	3	25,67	23,29	RAL-595	*opus*	positive	8	25,79	24,63
RAL-595	*blastopia*	positive	2	22,87	23,68	RAL-595	*gypsy5*	positive	4	25,70	23,99	RAL-595	*P-element*	negative	1	20,30	23,16
RAL-595	*blastopia*	positive	3	22,72	23,29	RAL-595	*gypsy5*	positive	5	25,97	23,82	RAL-595	*P-element*	negative	2	19,80	23,08
RAL-595	*blastopia*	positive	4	22,98	23,99	RAL-595	*gypsy5*	positive	6	26,67	25,41	RAL-595	*P-element*	negative	3	19,92	23,54
RAL-595	*blastopia*	positive	5	23,79	25,41	RAL-595	*gypsy5*	positive	7	26,05	24,54	RAL-595	*P-element*	negative	4	19,75	23,55
RAL-595	*blastopia*	positive	6	23,48	24,54	RAL-595	*gypsy5*	positive	8	26,27	24,87	RAL-595	*P-element*	negative	5	19,82	23,67
RAL-595	*blastopia*	positive	7	23,87	24,87	RAL-595	*Idefix*	negative	1	16,81	23,08	RAL-595	*P-element*	negative	6	19,56	23,22
RAL-595	*blood*	negative	1	23,57	23,53	RAL-595	*Idefix*	negative	2	17,36	23,54	RAL-595	*P-element*	negative	7	20,04	24,70
RAL-595	*blood*	negative	2	22,68	23,48	RAL-595	*Idefix*	negative	3	16,46	23,67	RAL-595	*P-element*	negative	8	19,90	24,86
RAL-595	*blood*	negative	3	23,01	24,01	RAL-595	*Idefix*	negative	4	17,34	23,22	RAL-595	*P-element*	positive	1	19,77	23,75
RAL-595	*blood*	negative	4	23,62	23,85	RAL-595	*Idefix*	negative	5	17,49	24,70	RAL-595	*P-element*	positive	2	19,36	23,35
RAL-595	*blood*	negative	5	23,21	23,98	RAL-595	*Idefix*	negative	6	18,73	24,86	RAL-595	*P-element*	positive	3	19,84	22,82
RAL-595	*blood*	negative	6	23,27	23,52	RAL-595	*Idefix*	positive	1	18,52	23,75	RAL-595	*P-element*	positive	4	20,25	23,50
RAL-595	*blood*	negative	7	23,72	25,05	RAL-595	*Idefix*	positive	2	17,05	23,35	RAL-595	*P-element*	positive	5	19,99	23,40
RAL-595	*blood*	negative	8	24,38	25,29	RAL-595	*Idefix*	positive	3	16,69	22,82	RAL-595	*P-element*	positive	6	20,45	24,87
RAL-595	*blood*	positive	1	20,69	24,16	RAL-595	*Idefix*	positive	4	17,41	24,87	RAL-595	*P-element*	positive	7	20,26	24,14
RAL-595	*blood*	positive	2	20,60	23,68	RAL-595	*Idefix*	positive	5	17,04	24,14	RAL-595	*P-element*	positive	8	20,60	24,63
RAL-595	*blood*	positive	3	21,80	23,29	RAL-595	*Idefix*	positive	6	18,07	24,63	RAL-595	*pogo*	negative	1	22,71	23,16
RAL-595	*blood*	positive	4	21,08	23,99	RAL-595	*Juan*	negative	1	20,28	23,16	RAL-595	*pogo*	negative	2	22,28	23,08
RAL-595	*blood*	positive	5	22,40	23,82	RAL-595	*Juan*	negative	2	19,80	23,08	RAL-595	*pogo*	negative	3	22,47	23,54

RAL-595	*pogo*	negative	4	22,93	23,55	RAL-69	*blastopia*	negative	6	22,48	23,88	RAL-69	*gypsy5*	negative	8	27,10	24,06
RAL-595	*pogo*	negative	5	22,58	23,67	RAL-69	*blastopia*	negative	7	22,33	23,64	RAL-69	*gypsy5*	positive	1	26,53	23,76
RAL-595	*pogo*	negative	6	22,68	23,22	RAL-69	*blastopia*	negative	8	22,99	24,06	RAL-69	*gypsy5*	positive	2	26,99	24,18
RAL-595	*pogo*	negative	7	23,06	24,70	RAL-69	*blastopia*	positive	1	23,25	23,76	RAL-69	*gypsy5*	positive	3	26,58	24,08
RAL-595	*pogo*	negative	8	23,32	24,86	RAL-69	*blastopia*	positive	2	23,47	24,18	RAL-69	*gypsy5*	positive	4	27,28	25,26
RAL-595	*pogo*	positive	1	23,02	23,75	RAL-69	*blastopia*	positive	3	23,34	24,08	RAL-69	*gypsy5*	positive	5	26,82	23,74
RAL-595	*pogo*	positive	2	22,70	23,35	RAL-69	*blastopia*	positive	4	24,30	25,26	RAL-69	*gypsy5*	positive	6	26,71	24,30
RAL-595	*pogo*	positive	3	22,62	22,82	RAL-69	*blastopia*	positive	5	22,96	23,74	RAL-69	*gypsy5*	positive	7	26,83	23,80
RAL-595	*pogo*	positive	4	22,96	23,50	RAL-69	*blastopia*	positive	6	22,95	24,30	RAL-69	*gypsy5*	positive	8	27,04	23,75
RAL-595	*pogo*	positive	5	23,09	23,40	RAL-69	*blastopia*	positive	7	23,13	23,80	RAL-69	*Idefix*	negative	1	24,68	24,30
RAL-595	*pogo*	positive	6	23,53	24,87	RAL-69	*blastopia*	positive	8	23,17	23,75	RAL-69	*Idefix*	negative	2	24,70	24,52
RAL-595	*pogo*	positive	7	23,09	24,14	RAL-69	*blood*	negative	1	19,14	24,29	RAL-69	*Idefix*	negative	3	24,02	23,91
RAL-595	*pogo*	positive	8	23,20	24,63	RAL-69	*blood*	negative	2	19,41	24,48	RAL-69	*Idefix*	negative	4	24,55	24,44
RAL-595	*Quasimodo*	negative	1	24,04	23,16	RAL-69	*blood*	negative	3	19,23	23,65	RAL-69	*Idefix*	negative	5	23,80	23,89
RAL-595	*Quasimodo*	negative	2	23,78	23,08	RAL-69	*blood*	negative	4	19,55	24,01	RAL-69	*Idefix*	negative	6	24,37	24,66
RAL-595	*Quasimodo*	negative	3	23,79	23,54	RAL-69	*blood*	negative	5	19,49	23,71	RAL-69	*Idefix*	negative	7	24,19	23,84
RAL-595	*Quasimodo*	negative	4	23,81	23,55	RAL-69	*blood*	negative	6	19,65	23,88	RAL-69	*Idefix*	negative	8	24,16	23,77
RAL-595	*Quasimodo*	negative	5	23,85	23,67	RAL-69	*blood*	negative	7	19,56	23,64	RAL-69	*Idefix*	positive	1	24,14	23,91
RAL-595	*Quasimodo*	negative	6	23,90	23,22	RAL-69	*blood*	negative	8	20,22	24,06	RAL-69	*Idefix*	positive	2	24,27	24,65
RAL-595	*Quasimodo*	negative	7	24,92	24,70	RAL-69	*blood*	positive	1	19,07	24,18	RAL-69	*Idefix*	positive	3	24,03	24,49
RAL-595	*Quasimodo*	negative	8	25,19	24,86	RAL-69	*blood*	positive	2	19,40	24,08	RAL-69	*Idefix*	positive	4	25,96	25,66
RAL-595	*Quasimodo*	positive	1	24,66	23,75	RAL-69	*blood*	positive	3	19,80	25,26	RAL-69	*Idefix*	positive	5	24,10	24,41
RAL-595	*Quasimodo*	positive	2	24,25	23,35	RAL-69	*blood*	positive	4	19,62	23,74	RAL-69	*Idefix*	positive	6	24,18	24,72
RAL-595	*Quasimodo*	positive	3	23,72	22,82	RAL-69	*blood*	positive	5	19,42	24,30	RAL-69	*Idefix*	positive	7	24,34	23,99
RAL-595	*Quasimodo*	positive	4	24,42	23,50	RAL-69	*blood*	positive	6	19,86	23,80	RAL-69	*Idefix*	positive	8	23,93	23,55
RAL-595	*Quasimodo*	positive	5	24,88	23,40	RAL-69	*blood*	positive	7	20,16	23,75	RAL-69	*Juan*	negative	1	22,92	24,09
RAL-595	*Quasimodo*	positive	6	25,31	24,87	RAL-69	*copia*	negative	1	15,02	24,29	RAL-69	*Juan*	negative	2	23,24	24,45
RAL-595	*Quasimodo*	positive	7	24,86	24,14	RAL-69	*copia*	negative	2	14,80	24,48	RAL-69	*Juan*	negative	3	22,61	23,71
RAL-595	*Quasimodo*	positive	8	25,11	24,63	RAL-69	*copia*	negative	3	14,47	23,65	RAL-69	*Juan*	negative	4	22,76	24,01
RAL-69	*412*	negative	1	19,98	24,29	RAL-69	*copia*	negative	4	14,77	24,01	RAL-69	*Juan*	negative	5	22,39	23,70
RAL-69	*412*	negative	2	20,24	24,48	RAL-69	*copia*	negative	5	14,67	23,71	RAL-69	*Juan*	negative	6	22,39	24,03
RAL-69	*412*	negative	3	19,72	23,65	RAL-69	*copia*	negative	6	14,92	23,88	RAL-69	*Juan*	negative	7	22,62	23,66
RAL-69	*412*	negative	4	19,60	24,01	RAL-69	*copia*	negative	7	14,85	23,64	RAL-69	*Juan*	negative	8	22,97	24,22
RAL-69	*412*	negative	5	19,33	23,71	RAL-69	*copia*	negative	8	15,24	24,06	RAL-69	*Juan*	positive	1	23,07	23,48
RAL-69	*412*	negative	6	19,66	23,88	RAL-69	*copia*	positive	1	14,96	23,76	RAL-69	*Juan*	positive	2	22,77	24,24
RAL-69	*412*	negative	7	19,59	23,64	RAL-69	*copia*	positive	2	14,87	24,18	RAL-69	*Juan*	positive	3	22,52	24,17
RAL-69	*412*	negative	8	20,21	24,06	RAL-69	*copia*	positive	3	14,63	24,08	RAL-69	*Juan*	positive	4	22,78	25,18
RAL-69	*412*	positive	1	20,17	23,76	RAL-69	*copia*	positive	4	14,98	25,26	RAL-69	*Juan*	positive	5	22,46	23,84
RAL-69	*412*	positive	2	19,75	24,18	RAL-69	*copia*	positive	5	14,77	23,74	RAL-69	*Juan*	positive	6	22,71	24,40
RAL-69	*412*	positive	3	19,47	24,08	RAL-69	*copia*	positive	6	14,64	24,30	RAL-69	*Juan*	positive	7	22,79	23,99
RAL-69	*412*	positive	4	19,53	25,26	RAL-69	*copia*	positive	7	14,68	23,80	RAL-69	*Juan*	positive	8	22,98	23,72
RAL-69	*412*	positive	5	19,58	23,74	RAL-69	*copia*	positive	8	15,10	23,75	RAL-69	*mdg1*	negative	1	24,63	24,45
RAL-69	*412*	positive	6	19,68	24,30	RAL-69	*Cr1a*	negative	1	23,04	24,29	RAL-69	*mdg1*	negative	2	24,07	23,71
RAL-69	*412*	positive	7	19,79	23,80	RAL-69	*Cr1a*	negative	2	22,99	24,48	RAL-69	*mdg1*	negative	3	24,27	24,01
RAL-69	*412*	positive	8	20,17	23,75	RAL-69	*Cr1a*	negative	3	22,39	23,65	RAL-69	*mdg1*	negative	4	23,99	23,70
RAL-69	*1360*	negative	1	23,49	24,29	RAL-69	*Cr1a*	negative	4	22,86	24,01	RAL-69	*mdg1*	negative	5	24,15	24,03
RAL-69	*1360*	negative	2	23,33	24,48	RAL-69	*Cr1a*	negative	5	22,42	23,71	RAL-69	*mdg1*	negative	6	24,36	23,66
RAL-69	*1360*	negative	3	23,03	23,65	RAL-69	*Cr1a*	negative	6	22,25	23,88	RAL-69	*mdg1*	negative	7	24,70	24,22
RAL-69	*1360*	negative	4	23,05	24,01	RAL-69	*Cr1a*	negative	7	22,19	23,64	RAL-69	*mdg1*	positive	1	24,40	23,48
RAL-69	*1360*	negative	5	22,76	23,71	RAL-69	*Cr1a*	negative	8	22,57	24,06	RAL-69	*mdg1*	positive	2	24,33	24,24
RAL-69	*1360*	negative	6	23,05	23,88	RAL-69	*Cr1a*	positive	1	22,73	23,76	RAL-69	*mdg1*	positive	3	24,10	24,17
RAL-69	*1360*	negative	7	22,71	23,64	RAL-69	*Cr1a*	positive	2	22,65	24,18	RAL-69	*mdg1*	positive	4	24,30	25,18
RAL-69	*1360*	negative	8	23,57	24,06	RAL-69	*Cr1a*	positive	3	22,37	24,08	RAL-69	*mdg1*	positive	5	23,85	23,84
RAL-69	*1360*	positive	1	23,79	23,76	RAL-69	*Cr1a*	positive	4	23,89	25,26	RAL-69	*mdg1*	positive	6	24,07	24,40
RAL-69	*1360*	positive	2	23,33	24,18	RAL-69	*Cr1a*	positive	5	22,41	23,74	RAL-69	*mdg1*	positive	7	24,37	23,99
RAL-69	*1360*	positive	3	23,06	24,08	RAL-69	*Cr1a*	positive	6	22,32	24,30	RAL-69	*mdg1*	positive	8	24,78	23,72
RAL-69	*1360*	positive	4	23,18	25,26	RAL-69	*Cr1a*	positive	7	22,73	23,80	RAL-69	*opus*	negative	1	24,77	24,09
RAL-69	*1360*	positive	5	23,11	23,74	RAL-69	*Cr1a*	positive	8	22,58	23,75	RAL-69	*opus*	negative	2	24,99	24,45
RAL-69	*1360*	positive	6	23,35	24,30	RAL-69	*gypsy5*	negative	1	27,51	24,29	RAL-69	*opus*	negative	3	24,41	23,71
RAL-69	*1360*	positive	7	23,62	23,80	RAL-69	*gypsy5*	negative	2	26,95	24,48	RAL-69	*opus*	negative	4	24,92	24,01
RAL-69	*blastopia*	negative	1	22,79	24,29	RAL-69	*gypsy5*	negative	3	26,65	23,65	RAL-69	*opus*	negative	5	24,34	23,70
RAL-69	*blastopia*	negative	2	22,87	24,48	RAL-69	*gypsy5*	negative	4	26,83	24,01	RAL-69	*opus*	negative	6	24,61	24,03
RAL-69	*blastopia*	negative	3	22,28	23,65	RAL-69	*gypsy5*	negative	5	26,59	23,71	RAL-69	*opus*	negative	7	24,27	23,66
RAL-69	*blastopia*	negative	4	22,22	24,01	RAL-69	*gypsy5*	negative	6	26,42	23,88	RAL-69	*opus*	negative	8	24,60	24,22
RAL-69	*blastopia*	negative	5	21,97	23,71	RAL-69	*gypsy5*	negative	7	26,85	23,64	RAL-69	*opus*	positive	1	24,62	23,48

RAL-69	*opus*	positive	2	24,75	24,24	RAL-712	*412*	positive	4	21,96	27,53	RAL-712	*copia*	positive	6	19,31	27,10
RAL-69	*opus*	positive	3	24,59	24,17	RAL-712	*412*	positive	5	22,39	27,86	RAL-712	*copia*	positive	7	19,28	27,18
RAL-69	*opus*	positive	4	26,13	25,18	RAL-712	*412*	positive	6	22,20	27,10	RAL-712	*copia*	positive	8	19,90	27,57
RAL-69	*opus*	positive	5	24,45	23,84	RAL-712	*412*	positive	7	22,36	27,18	RAL-712	*Cr1a*	negative	1	26,80	29,47
RAL-69	*opus*	positive	6	24,68	24,40	RAL-712	*412*	positive	8	23,10	27,57	RAL-712	*Cr1a*	negative	2	24,55	29,35
RAL-69	*opus*	positive	7	24,58	23,99	RAL-712	*1360*	negative	1	27,66	29,47	RAL-712	*Cr1a*	negative	3	25,59	28,38
RAL-69	*opus*	positive	8	24,62	23,72	RAL-712	*1360*	negative	2	26,81	29,35	RAL-712	*Cr1a*	negative	4	23,87	28,33
RAL-69	*P-element*	negative	1	21,53	24,09	RAL-712	*1360*	negative	3	26,24	28,38	RAL-712	*Cr1a*	negative	5	24,80	27,14
RAL-69	*P-element*	negative	2	21,72	24,45	RAL-712	*1360*	negative	4	25,96	28,33	RAL-712	*Cr1a*	negative	6	25,94	28,41
RAL-69	*P-element*	negative	3	21,14	23,71	RAL-712	*1360*	negative	5	25,37	27,14	RAL-712	*Cr1a*	negative	7	25,11	27,65
RAL-69	*P-element*	negative	4	21,54	24,01	RAL-712	*1360*	negative	6	26,43	28,41	RAL-712	*Cr1a*	negative	8	25,00	27,08
RAL-69	*P-element*	negative	5	21,20	23,70	RAL-712	*1360*	negative	7	26,29	27,65	RAL-712	*Cr1a*	positive	1	24,81	26,42
RAL-69	*P-element*	negative	6	21,44	24,03	RAL-712	*1360*	negative	8	26,01	27,08	RAL-712	*Cr1a*	positive	2	24,16	25,93
RAL-69	*P-element*	negative	7	21,13	23,66	RAL-712	*1360*	positive	1	26,01	26,42	RAL-712	*Cr1a*	positive	3	24,40	26,52
RAL-69	*P-element*	negative	8	21,85	24,22	RAL-712	*1360*	positive	2	25,27	25,93	RAL-712	*Cr1a*	positive	4	25,52	27,53
RAL-69	*P-element*	positive	1	21,56	23,48	RAL-712	*1360*	positive	3	25,29	26,52	RAL-712	*Cr1a*	positive	5	25,60	27,86
RAL-69	*P-element*	positive	2	21,34	24,24	RAL-712	*1360*	positive	4	25,93	27,53	RAL-712	*Cr1a*	positive	6	25,01	27,10
RAL-69	*P-element*	positive	3	21,26	24,17	RAL-712	*1360*	positive	5	26,13	27,86	RAL-712	*Cr1a*	positive	7	24,88	27,18
RAL-69	*P-element*	positive	4	21,76	25,18	RAL-712	*1360*	positive	6	25,58	27,10	RAL-712	*Cr1a*	positive	8	25,34	27,57
RAL-69	*P-element*	positive	5	21,27	23,84	RAL-712	*1360*	positive	7	25,94	27,18	RAL-712	*gypsy5*	negative	1	28,00	29,47
RAL-69	*P-element*	positive	6	21,33	24,40	RAL-712	*1360*	positive	8	26,63	27,57	RAL-712	*gypsy5*	negative	2	27,56	29,35
RAL-69	*P-element*	positive	7	21,65	23,99	RAL-712	*blastopia*	negative	1	28,29	29,47	RAL-712	*gypsy5*	negative	3	25,67	28,38
RAL-69	*P-element*	positive	8	22,01	23,72	RAL-712	*blastopia*	negative	2	25,81	29,35	RAL-712	*gypsy5*	negative	4	25,83	28,33
RAL-69	*pogo*	negative	1	22,40	24,09	RAL-712	*blastopia*	negative	3	26,70	28,38	RAL-712	*gypsy5*	negative	5	24,84	27,14
RAL-69	*pogo*	negative	2	22,35	24,45	RAL-712	*blastopia*	negative	4	24,88	28,33	RAL-712	*gypsy5*	negative	6	26,35	28,41
RAL-69	*pogo*	negative	3	21,99	23,71	RAL-712	*blastopia*	negative	5	25,67	27,14	RAL-712	*gypsy5*	negative	7	26,05	27,65
RAL-69	*pogo*	negative	4	22,26	24,01	RAL-712	*blastopia*	negative	6	27,13	28,41	RAL-712	*gypsy5*	negative	8	25,12	27,08
RAL-69	*pogo*	negative	5	22,00	23,70	RAL-712	*blastopia*	negative	7	26,88	27,65	RAL-712	*gypsy5*	positive	1	25,24	26,42
RAL-69	*pogo*	negative	6	22,00	24,03	RAL-712	*blastopia*	negative	8	26,22	27,08	RAL-712	*gypsy5*	positive	2	24,75	25,93
RAL-69	*pogo*	negative	7	22,02	23,66	RAL-712	*blastopia*	positive	1	26,19	26,42	RAL-712	*gypsy5*	positive	3	24,74	26,52
RAL-69	*pogo*	negative	8	22,36	24,22	RAL-712	*blastopia*	positive	2	25,46	25,93	RAL-712	*gypsy5*	positive	4	24,28	27,53
RAL-69	*pogo*	positive	1	22,27	23,48	RAL-712	*blastopia*	positive	3	25,73	26,52	RAL-712	*gypsy5*	positive	5	25,50	27,86
RAL-69	*pogo*	positive	2	22,43	24,24	RAL-712	*blastopia*	positive	4	26,37	27,53	RAL-712	*gypsy5*	positive	6	24,93	27,10
RAL-69	*pogo*	positive	3	22,10	24,17	RAL-712	*blastopia*	positive	5	26,74	27,86	RAL-712	*gypsy5*	positive	7	25,94	27,18
RAL-69	*pogo*	positive	4	22,67	25,18	RAL-712	*blastopia*	positive	6	26,44	27,10	RAL-712	*gypsy5*	positive	8	26,01	27,57
RAL-69	*pogo*	positive	5	22,00	23,84	RAL-712	*blastopia*	positive	7	26,44	27,18	RAL-712	*Idefix*	negative	1	29,29	29,37
RAL-69	*pogo*	positive	6	22,27	24,40	RAL-712	*blastopia*	positive	8	27,01	27,57	RAL-712	*Idefix*	negative	2	26,62	29,37
RAL-69	*pogo*	positive	7	22,07	23,99	RAL-712	*blood*	negative	1	23,41	29,47	RAL-712	*Idefix*	negative	3	27,28	28,30
RAL-69	*pogo*	positive	8	22,46	23,72	RAL-712	*blood*	negative	2	23,24	29,35	RAL-712	*Idefix*	negative	4	24,88	28,46
RAL-69	*Quasimodo*	negative	1	25,62	24,09	RAL-712	*blood*	negative	3	22,51	28,38	RAL-712	*Idefix*	negative	5	26,43	27,68
RAL-69	*Quasimodo*	negative	2	25,66	24,45	RAL-712	*blood*	negative	4	22,94	28,33	RAL-712	*Idefix*	negative	6	27,44	28,88
RAL-69	*Quasimodo*	negative	3	25,16	23,71	RAL-712	*blood*	negative	5	22,36	27,14	RAL-712	*Idefix*	negative	7	26,72	27,79
RAL-69	*Quasimodo*	negative	4	25,53	24,01	RAL-712	*blood*	negative	6	22,97	28,41	RAL-712	*Idefix*	negative	8	25,95	27,42
RAL-69	*Quasimodo*	negative	5	24,92	23,70	RAL-712	*blood*	negative	7	23,06	27,65	RAL-712	*Idefix*	positive	1	26,04	26,40
RAL-69	*Quasimodo*	negative	6	25,28	24,03	RAL-712	*blood*	negative	8	22,85	27,08	RAL-712	*Idefix*	positive	2	25,06	25,90
RAL-69	*Quasimodo*	negative	7	25,31	23,66	RAL-712	*blood*	positive	1	22,90	26,42	RAL-712	*Idefix*	positive	3	24,80	26,38
RAL-69	*Quasimodo*	negative	8	25,22	24,22	RAL-712	*blood*	positive	2	22,17	25,93	RAL-712	*Idefix*	positive	4	26,22	27,59
RAL-69	*Quasimodo*	positive	1	25,52	23,48	RAL-712	*blood*	positive	3	22,02	26,52	RAL-712	*Idefix*	positive	5	26,46	27,90
RAL-69	*Quasimodo*	positive	2	25,40	24,24	RAL-712	*blood*	positive	4	22,38	27,53	RAL-712	*Idefix*	positive	6	25,98	27,02
RAL-69	*Quasimodo*	positive	3	25,14	24,17	RAL-712	*blood*	positive	5	22,49	27,10	RAL-712	*Idefix*	positive	7	26,48	27,34
RAL-69	*Quasimodo*	positive	4	26,42	25,18	RAL-712	*blood*	positive	6	22,76	27,18	RAL-712	*Idefix*	positive	8	26,98	27,79
RAL-69	*Quasimodo*	positive	5	24,82	23,84	RAL-712	*blood*	positive	7	23,42	27,57	RAL-712	*Juan*	negative	1	25,81	29,37
RAL-69	*Quasimodo*	positive	7	25,21	23,99	RAL-712	*copia*	negative	1	19,64	29,47	RAL-712	*Juan*	negative	2	24,65	29,37
RAL-69	*Quasimodo*	positive	8	25,06	23,72	RAL-712	*copia*	negative	2	19,73	29,35	RAL-712	*Juan*	negative	3	23,96	28,30
RAL-712	*412*	negative	1	23,37	29,47	RAL-712	*copia*	negative	3	19,05	28,38	RAL-712	*Juan*	negative	4	23,28	28,46
RAL-712	*412*	negative	2	22,53	29,35	RAL-712	*copia*	negative	4	19,19	28,33	RAL-712	*Juan*	negative	5	23,14	27,68
RAL-712	*412*	negative	3	22,54	28,38	RAL-712	*copia*	negative	5	18,64	27,14	RAL-712	*Juan*	negative	6	24,03	28,88
RAL-712	*412*	negative	4	22,20	28,33	RAL-712	*copia*	negative	6	19,28	28,41	RAL-712	*Juan*	negative	7	23,91	27,79
RAL-712	*412*	negative	5	21,54	27,14	RAL-712	*copia*	negative	7	19,28	27,65	RAL-712	*Juan*	negative	8	23,55	27,42
RAL-712	*412*	negative	6	22,61	28,41	RAL-712	*copia*	negative	8	19,19	27,08	RAL-712	*Juan*	positive	1	23,63	26,40
RAL-712	*412*	negative	7	22,66	27,65	RAL-712	*copia*	positive	1	19,46	26,42	RAL-712	*Juan*	positive	2	22,96	25,90
RAL-712	*412*	negative	8	22,66	27,08	RAL-712	*copia*	positive	2	18,67	25,93	RAL-712	*Juan*	positive	3	22,89	26,38
RAL-712	*412*	positive	1	22,73	26,42	RAL-712	*copia*	positive	3	18,64	26,52	RAL-712	*Juan*	positive	4	23,27	27,59
RAL-712	*412*	positive	2	21,56	25,93	RAL-712	*copia*	positive	4	19,18	27,53	RAL-712	*Juan*	positive	5	23,87	27,90
RAL-712	*412*	positive	3	21,59	26,52	RAL-712	*copia*	positive	5	19,11	27,86	RAL-712	*Juan*	positive	6	23,60	27,02

RAL-712	*Juan*	positive	7	23,94	27,34	RAL-712	*Quasimodo*	negative	1	28,28	29,37	RAL-737	*blood*	negative	2	21,46	25,73
RAL-712	*Juan*	positive	8	24,20	27,79	RAL-712	*Quasimodo*	negative	2	26,82	29,37	RAL-737	*blood*	negative	3	21,78	25,94
RAL-712	*mdg1*	negative	1	22,39	29,37	RAL-712	*Quasimodo*	negative	3	27,27	28,30	RAL-737	*blood*	negative	4	21,52	25,12
RAL-712	*mdg1*	negative	2	22,04	29,37	RAL-712	*Quasimodo*	negative	4	25,94	28,46	RAL-737	*blood*	negative	5	21,51	25,65
RAL-712	*mdg1*	negative	3	21,54	28,30	RAL-712	*Quasimodo*	negative	5	26,64	27,68	RAL-737	*blood*	negative	6	21,29	25,44
RAL-712	*mdg1*	negative	4	21,33	28,46	RAL-712	*Quasimodo*	negative	6	27,53	28,88	RAL-737	*blood*	negative	7	21,87	26,04
RAL-712	*mdg1*	negative	5	21,80	27,68	RAL-712	*Quasimodo*	negative	7	26,89	27,79	RAL-737	*blood*	positive	1	21,98	26,02
RAL-712	*mdg1*	negative	6	21,94	28,88	RAL-712	*Quasimodo*	negative	8	26,13	27,42	RAL-737	*blood*	positive	2	22,41	27,28
RAL-712	*mdg1*	negative	8	21,96	27,42	RAL-712	*Quasimodo*	positive	1	25,61	26,40	RAL-737	*blood*	positive	3	22,13	25,83
RAL-712	*mdg1*	positive	1	21,28	26,40	RAL-712	*Quasimodo*	positive	2	25,05	25,90	RAL-737	*blood*	positive	4	22,39	26,19
RAL-712	*mdg1*	positive	2	21,31	25,90	RAL-712	*Quasimodo*	positive	3	25,22	26,38	RAL-737	*blood*	positive	5	21,68	26,26
RAL-712	*mdg1*	positive	3	20,54	26,38	RAL-712	*Quasimodo*	positive	4	26,13	27,59	RAL-737	*blood*	positive	6	22,13	26,44
RAL-712	*mdg1*	positive	4	20,87	27,59	RAL-712	*Quasimodo*	positive	5	26,33	27,90	RAL-737	*blood*	positive	7	22,82	26,81
RAL-712	*mdg1*	positive	5	21,45	27,90	RAL-712	*Quasimodo*	positive	6	25,85	27,02	RAL-737	*copia*	negative	1	14,41	25,18
RAL-712	*mdg1*	positive	6	21,64	27,02	RAL-712	*Quasimodo*	positive	7	25,93	27,34	RAL-737	*copia*	negative	2	15,10	25,79
RAL-712	*mdg1*	positive	7	22,42	27,34	RAL-712	*Quasimodo*	positive	8	26,67	27,79	RAL-737	*copia*	negative	3	14,51	25,73
RAL-712	*mdg1*	positive	8	21,78	27,79	RAL-737	*412*	negative	1	21,18	25,18	RAL-737	*copia*	negative	4	15,06	25,94
RAL-712	*opus*	negative	1	28,03	29,37	RAL-737	*412*	negative	2	20,75	25,79	RAL-737	*copia*	negative	5	15,01	25,12
RAL-712	*opus*	negative	2	25,34	29,37	RAL-737	*412*	negative	3	20,51	25,73	RAL-737	*copia*	negative	6	15,22	25,65
RAL-712	*opus*	negative	3	26,00	28,30	RAL-737	*412*	negative	4	20,67	25,94	RAL-737	*copia*	negative	7	14,60	25,44
RAL-712	*opus*	negative	4	25,02	28,46	RAL-737	*412*	negative	5	20,33	25,12	RAL-737	*copia*	negative	8	14,84	26,04
RAL-712	*opus*	negative	5	25,13	27,68	RAL-737	*412*	negative	6	20,65	25,65	RAL-737	*copia*	positive	1	14,54	25,39
RAL-712	*opus*	negative	6	26,05	28,88	RAL-737	*412*	negative	7	20,45	25,44	RAL-737	*copia*	positive	2	14,16	26,02
RAL-712	*opus*	negative	7	25,30	27,79	RAL-737	*412*	negative	8	20,87	26,04	RAL-737	*copia*	positive	3	14,80	27,28
RAL-712	*opus*	negative	8	24,85	27,42	RAL-737	*412*	positive	1	16,87	25,39	RAL-737	*copia*	positive	4	14,87	25,83
RAL-712	*opus*	positive	1	24,32	26,40	RAL-737	*412*	positive	2	20,41	26,02	RAL-737	*copia*	positive	5	14,85	26,19
RAL-712	*opus*	positive	2	23,69	25,90	RAL-737	*412*	positive	3	20,28	27,28	RAL-737	*copia*	positive	6	14,40	26,26
RAL-712	*opus*	positive	3	23,79	26,38	RAL-737	*412*	positive	4	20,32	25,83	RAL-737	*copia*	positive	7	14,59	26,44
RAL-712	*opus*	positive	4	25,50	27,59	RAL-737	*412*	positive	5	20,23	26,19	RAL-737	*copia*	positive	8	15,06	26,81
RAL-712	*opus*	positive	5	26,20	27,90	RAL-737	*412*	positive	6	20,11	26,26	RAL-737	*Cr1a*	negative	1	22,37	25,18
RAL-712	*opus*	positive	6	24,75	27,02	RAL-737	*412*	positive	7	20,43	26,44	RAL-737	*Cr1a*	negative	2	22,27	25,79
RAL-712	*opus*	positive	7	25,55	27,34	RAL-737	*412*	positive	8	20,95	26,81	RAL-737	*Cr1a*	negative	3	22,15	25,73
RAL-712	*opus*	positive	8	25,74	27,79	RAL-737	*1360*	negative	1	25,82	25,18	RAL-737	*Cr1a*	negative	4	23,09	25,94
RAL-712	*P-element*	negative	1	23,17	29,37	RAL-737	*1360*	negative	2	26,16	25,79	RAL-737	*Cr1a*	negative	5	22,76	25,12
RAL-712	*P-element*	negative	2	23,07	29,37	RAL-737	*1360*	negative	3	25,70	25,73	RAL-737	*Cr1a*	negative	6	23,01	25,65
RAL-712	*P-element*	negative	3	22,82	28,30	RAL-737	*1360*	negative	4	25,91	25,94	RAL-737	*Cr1a*	negative	7	21,99	25,44
RAL-712	*P-element*	negative	4	22,74	28,46	RAL-737	*1360*	negative	5	25,55	25,12	RAL-737	*Cr1a*	negative	8	22,61	26,04
RAL-712	*P-element*	negative	5	22,79	27,68	RAL-737	*1360*	negative	6	25,61	25,65	RAL-737	*Cr1a*	positive	1	23,14	25,39
RAL-712	*P-element*	negative	6	22,81	28,88	RAL-737	*1360*	negative	7	25,81	25,44	RAL-737	*Cr1a*	positive	2	23,23	26,02
RAL-712	*P-element*	negative	7	22,74	27,79	RAL-737	*1360*	negative	8	25,99	26,04	RAL-737	*Cr1a*	positive	3	23,86	27,28
RAL-712	*P-element*	negative	8	22,30	27,42	RAL-737	*1360*	positive	1	26,41	25,39	RAL-737	*Cr1a*	positive	4	23,20	25,83
RAL-712	*P-element*	positive	1	22,83	26,40	RAL-737	*1360*	positive	2	27,11	26,02	RAL-737	*Cr1a*	positive	5	23,82	26,19
RAL-712	*P-element*	positive	2	22,08	25,90	RAL-737	*1360*	positive	3	27,57	27,28	RAL-737	*Cr1a*	positive	6	22,64	26,26
RAL-712	*P-element*	positive	3	22,07	26,38	RAL-737	*1360*	positive	4	26,62	25,83	RAL-737	*Cr1a*	positive	7	23,29	26,44
RAL-712	*P-element*	positive	4	22,40	27,59	RAL-737	*1360*	positive	5	27,03	26,19	RAL-737	*Cr1a*	positive	8	23,25	26,81
RAL-712	*P-element*	positive	5	23,17	27,90	RAL-737	*1360*	positive	6	26,58	26,26	RAL-737	*gypsy5*	negative	1	29,42	25,18
RAL-712	*P-element*	positive	6	22,88	27,02	RAL-737	*1360*	positive	7	27,12	26,44	RAL-737	*gypsy5*	negative	2	29,35	25,79
RAL-712	*P-element*	positive	7	23,06	27,34	RAL-737	*1360*	positive	8	27,54	26,81	RAL-737	*gypsy5*	negative	3	28,97	25,73
RAL-712	*P-element*	positive	8	23,47	27,79	RAL-737	*blastopia*	negative	1	24,77	25,18	RAL-737	*gypsy5*	negative	4	29,18	25,94
RAL-712	*pogo*	negative	1	22,37	29,37	RAL-737	*blastopia*	negative	2	24,98	25,79	RAL-737	*gypsy5*	negative	5	28,65	25,12
RAL-712	*pogo*	negative	2	21,84	29,37	RAL-737	*blastopia*	negative	3	24,25	25,73	RAL-737	*gypsy5*	negative	6	28,91	25,65
RAL-712	*pogo*	negative	3	21,79	28,30	RAL-737	*blastopia*	negative	4	25,43	25,94	RAL-737	*gypsy5*	negative	7	28,74	25,44
RAL-712	*pogo*	negative	4	22,54	28,46	RAL-737	*blastopia*	negative	5	24,92	25,12	RAL-737	*gypsy5*	negative	8	28,75	26,04
RAL-712	*pogo*	negative	5	22,17	27,68	RAL-737	*blastopia*	negative	6	25,20	25,65	RAL-737	*gypsy5*	positive	1	29,99	25,39
RAL-712	*pogo*	negative	6	22,27	28,88	RAL-737	*blastopia*	negative	7	24,37	25,44	RAL-737	*gypsy5*	positive	2	29,83	26,02
RAL-712	*pogo*	negative	7	22,00	27,79	RAL-737	*blastopia*	negative	8	25,52	26,04	RAL-737	*gypsy5*	positive	3	31,46	27,28
RAL-712	*pogo*	negative	8	22,20	27,42	RAL-737	*blastopia*	positive	1	25,50	25,39	RAL-737	*gypsy5*	positive	4	29,94	25,83
RAL-712	*pogo*	positive	1	22,22	26,40	RAL-737	*blastopia*	positive	2	25,62	26,02	RAL-737	*gypsy5*	positive	5	30,55	26,19
RAL-712	*pogo*	positive	2	21,32	25,90	RAL-737	*blastopia*	positive	3	26,32	27,28	RAL-737	*gypsy5*	positive	6	29,50	26,26
RAL-712	*pogo*	positive	3	21,38	26,38	RAL-737	*blastopia*	positive	4	25,26	25,83	RAL-737	*gypsy5*	positive	7	30,06	26,44
RAL-712	*pogo*	positive	4	21,70	27,59	RAL-737	*blastopia*	positive	5	25,77	26,19	RAL-737	*gypsy5*	positive	8	30,54	26,81
RAL-712	*pogo*	positive	5	22,04	27,90	RAL-737	*blastopia*	positive	6	25,16	26,26	RAL-737	*Idefix*	negative	1	24,50	25,55
RAL-712	*pogo*	positive	6	21,70	27,02	RAL-737	*blastopia*	positive	7	25,84	26,44	RAL-737	*Idefix*	negative	2	24,57	26,09
RAL-712	*pogo*	positive	7	21,79	27,34	RAL-737	*blastopia*	positive	8	25,93	26,81	RAL-737	*Idefix*	negative	3	24,04	25,85
RAL-712	*pogo*	positive	8	22,39	27,79	RAL-737	*blood*	negative	1	21,74	25,79	RAL-737	*Idefix*	negative	4	24,37	26,27

RAL-737	*Idefix*	negative	5	24,08	25,36	RAL-737	*P-element*	negative	7	23,01	25,81	RAL-738	*1360*	negative	8	23,99	27,57
RAL-737	*Idefix*	negative	6	24,51	26,19	RAL-737	*P-element*	negative	8	23,08	26,31	RAL-738	*1360*	positive	1	23,99	27,59
RAL-737	*Idefix*	negative	7	23,98	25,81	RAL-737	*P-element*	positive	1	23,84	25,63	RAL-738	*1360*	positive	2	23,48	27,43
RAL-737	*Idefix*	negative	8	24,51	26,31	RAL-737	*P-element*	positive	2	24,05	26,34	RAL-738	*1360*	positive	3	23,75	27,50
RAL-737	*Idefix*	positive	1	24,75	25,63	RAL-737	*P-element*	positive	3	24,34	27,49	RAL-738	*1360*	positive	4	23,27	26,81
RAL-737	*Idefix*	positive	2	25,63	26,34	RAL-737	*P-element*	positive	4	24,15	25,92	RAL-738	*1360*	positive	5	23,55	28,57
RAL-737	*Idefix*	positive	3	26,10	27,49	RAL-737	*P-element*	positive	5	24,58	26,54	RAL-738	*1360*	positive	6	23,47	27,66
RAL-737	*Idefix*	positive	4	24,77	25,92	RAL-737	*P-element*	positive	6	23,38	26,50	RAL-738	*1360*	positive	7	23,93	28,61
RAL-737	*Idefix*	positive	5	25,81	26,54	RAL-737	*P-element*	positive	7	23,81	26,81	RAL-738	*1360*	positive	8	23,86	27,48
RAL-737	*Idefix*	positive	6	24,75	26,50	RAL-737	*P-element*	positive	8	24,38	26,91	RAL-738	*blastopia*	negative	1	25,61	27,03
RAL-737	*Idefix*	positive	7	25,55	26,81	RAL-737	*pogo*	negative	1	22,41	25,55	RAL-738	*blastopia*	negative	2	25,48	27,57
RAL-737	*Idefix*	positive	8	25,87	26,91	RAL-737	*pogo*	negative	2	22,63	26,09	RAL-738	*blastopia*	negative	3	25,27	27,30
RAL-737	*Juan*	negative	1	19,98	25,55	RAL-737	*pogo*	negative	3	22,51	25,85	RAL-738	*blastopia*	negative	4	25,43	27,22
RAL-737	*Juan*	negative	2	20,50	26,09	RAL-737	*pogo*	negative	4	22,72	26,27	RAL-738	*blastopia*	negative	5	25,46	27,55
RAL-737	*Juan*	negative	3	19,64	25,85	RAL-737	*pogo*	negative	5	22,69	25,36	RAL-738	*blastopia*	negative	6	25,39	27,38
RAL-737	*Juan*	negative	4	19,92	26,27	RAL-737	*pogo*	negative	6	22,76	26,19	RAL-738	*blastopia*	negative	7	25,00	27,14
RAL-737	*Juan*	negative	5	19,87	25,36	RAL-737	*pogo*	negative	7	22,20	25,81	RAL-738	*blastopia*	negative	8	24,98	27,57
RAL-737	*Juan*	negative	6	20,64	26,19	RAL-737	*pogo*	negative	8	22,65	26,31	RAL-738	*blastopia*	positive	1	25,71	27,59
RAL-737	*Juan*	negative	7	20,00	25,81	RAL-737	*pogo*	positive	1	22,92	25,63	RAL-738	*blastopia*	positive	2	25,67	27,43
RAL-737	*Juan*	negative	8	20,35	26,31	RAL-737	*pogo*	positive	2	22,87	26,34	RAL-738	*blastopia*	positive	3	25,80	27,50
RAL-737	*Juan*	positive	1	20,60	25,63	RAL-737	*pogo*	positive	3	23,25	27,49	RAL-738	*blastopia*	positive	4	24,56	26,81
RAL-737	*Juan*	positive	2	20,73	26,34	RAL-737	*pogo*	positive	4	22,99	25,92	RAL-738	*blastopia*	positive	5	25,93	28,57
RAL-737	*Juan*	positive	3	21,20	27,49	RAL-737	*pogo*	positive	5	23,32	26,54	RAL-738	*blastopia*	positive	6	25,55	27,66
RAL-737	*Juan*	positive	4	20,02	25,92	RAL-737	*pogo*	positive	6	22,62	26,50	RAL-738	*blastopia*	positive	7	26,71	28,61
RAL-737	*Juan*	positive	5	20,84	26,54	RAL-737	*pogo*	positive	7	22,72	26,81	RAL-738	*blastopia*	positive	8	25,73	27,48
RAL-737	*Juan*	positive	6	20,21	26,50	RAL-737	*pogo*	positive	8	23,13	26,91	RAL-738	*blood*	negative	1	21,23	27,03
RAL-737	*Juan*	positive	7	21,09	26,81	RAL-737	*Quasimodo*	negative	1	25,88	25,55	RAL-738	*blood*	negative	2	21,14	27,57
RAL-737	*Juan*	positive	8	21,69	26,91	RAL-737	*Quasimodo*	negative	2	26,11	26,09	RAL-738	*blood*	negative	3	21,12	27,30
RAL-737	*mdg1*	negative	1	22,82	25,55	RAL-737	*Quasimodo*	negative	3	25,49	25,85	RAL-738	*blood*	negative	4	21,24	27,22
RAL-737	*mdg1*	negative	2	23,51	26,09	RAL-737	*Quasimodo*	negative	4	26,61	26,27	RAL-738	*blood*	negative	5	21,42	27,55
RAL-737	*mdg1*	negative	3	22,56	25,85	RAL-737	*Quasimodo*	negative	5	26,09	25,36	RAL-738	*blood*	negative	6	21,07	27,38
RAL-737	*mdg1*	negative	4	22,89	26,27	RAL-737	*Quasimodo*	negative	6	26,26	26,19	RAL-738	*blood*	negative	7	21,00	27,14
RAL-737	*mdg1*	negative	5	22,74	25,36	RAL-737	*Quasimodo*	negative	7	25,28	25,81	RAL-738	*blood*	negative	8	21,65	27,57
RAL-737	*mdg1*	negative	6	23,46	26,19	RAL-737	*Quasimodo*	negative	8	26,00	26,31	RAL-738	*blood*	positive	1	21,56	27,59
RAL-737	*mdg1*	negative	7	22,90	25,81	RAL-737	*Quasimodo*	positive	1	26,37	25,63	RAL-738	*blood*	positive	2	20,87	27,43
RAL-737	*mdg1*	negative	8	23,14	26,31	RAL-737	*Quasimodo*	positive	2	26,99	26,34	RAL-738	*blood*	positive	3	21,62	27,50
RAL-737	*mdg1*	positive	1	23,78	25,63	RAL-737	*Quasimodo*	positive	3	27,89	27,49	RAL-738	*blood*	positive	4	21,09	26,81
RAL-737	*mdg1*	positive	2	23,70	26,34	RAL-737	*Quasimodo*	positive	4	26,67	25,92	RAL-738	*blood*	positive	5	21,39	28,57
RAL-737	*mdg1*	positive	3	24,11	27,49	RAL-737	*Quasimodo*	positive	5	27,44	26,54	RAL-738	*blood*	positive	6	21,13	27,66
RAL-737	*mdg1*	positive	4	23,38	25,92	RAL-737	*Quasimodo*	positive	6	25,72	26,50	RAL-738	*blood*	positive	7	21,36	28,61
RAL-737	*mdg1*	positive	5	23,76	26,54	RAL-737	*Quasimodo*	positive	7	26,69	26,81	RAL-738	*blood*	positive	8	21,28	27,48
RAL-737	*mdg1*	positive	7	23,58	26,81	RAL-737	*Quasimodo*	positive	8	26,86	26,91	RAL-738	*copia*	negative	1	20,29	27,03
RAL-737	*mdg1*	positive	8	24,12	26,91	RAL-738	*412*	negative	1	20,61	27,03	RAL-738	*copia*	negative	2	20,08	27,57
RAL-737	*opus*	negative	1	23,84	25,55	RAL-738	*412*	negative	2	21,02	27,57	RAL-738	*copia*	negative	3	20,01	27,30
RAL-737	*opus*	negative	2	23,90	26,09	RAL-738	*412*	negative	3	21,12	27,30	RAL-738	*copia*	negative	4	20,16	27,22
RAL-737	*opus*	negative	3	24,22	25,85	RAL-738	*412*	negative	4	20,57	27,22	RAL-738	*copia*	negative	5	20,09	27,55
RAL-737	*opus*	negative	4	24,96	26,27	RAL-738	*412*	negative	5	20,72	27,55	RAL-738	*copia*	negative	6	19,85	27,38
RAL-737	*opus*	negative	5	23,93	25,36	RAL-738	*412*	negative	6	20,96	27,38	RAL-738	*copia*	negative	7	19,96	27,14
RAL-737	*opus*	negative	6	24,37	26,19	RAL-738	*412*	negative	7	20,95	27,14	RAL-738	*copia*	negative	8	20,29	27,57
RAL-737	*opus*	negative	7	23,61	25,81	RAL-738	*412*	negative	8	21,02	27,57	RAL-738	*copia*	positive	1	20,26	27,59
RAL-737	*opus*	negative	8	24,96	26,31	RAL-738	*412*	positive	1	21,24	27,59	RAL-738	*copia*	positive	2	20,04	27,43
RAL-737	*opus*	positive	1	24,27	25,63	RAL-738	*412*	positive	2	20,72	27,43	RAL-738	*copia*	positive	3	20,48	27,50
RAL-737	*opus*	positive	2	24,61	26,34	RAL-738	*412*	positive	3	20,92	27,50	RAL-738	*copia*	positive	4	20,34	26,81
RAL-737	*opus*	positive	3	25,30	27,49	RAL-738	*412*	positive	4	20,29	26,81	RAL-738	*copia*	positive	5	20,56	28,57
RAL-737	*opus*	positive	4	24,48	25,92	RAL-738	*412*	positive	5	20,84	28,57	RAL-738	*copia*	positive	6	19,75	27,66
RAL-737	*opus*	positive	5	24,78	26,54	RAL-738	*412*	positive	6	20,98	27,66	RAL-738	*copia*	positive	7	19,82	28,61
RAL-737	*opus*	positive	6	24,51	26,50	RAL-738	*412*	positive	7	21,44	28,61	RAL-738	*copia*	positive	8	19,86	27,48
RAL-737	*opus*	positive	7	24,74	26,81	RAL-738	*412*	positive	8	20,97	27,48	RAL-738	*Cr1a*	negative	1	25,69	27,03
RAL-737	*opus*	positive	8	25,02	26,91	RAL-738	*1360*	negative	1	23,78	27,03	RAL-738	*Cr1a*	negative	2	25,44	27,57
RAL-737	*P-element*	negative	1	23,35	25,55	RAL-738	*1360*	negative	2	23,52	27,57	RAL-738	*Cr1a*	negative	3	24,38	27,30
RAL-737	*P-element*	negative	2	23,62	26,09	RAL-738	*1360*	negative	3	23,48	27,30	RAL-738	*Cr1a*	negative	4	25,33	27,22
RAL-737	*P-element*	negative	3	22,94	25,85	RAL-738	*1360*	negative	4	23,42	27,22	RAL-738	*Cr1a*	negative	5	25,78	27,55
RAL-737	*P-element*	negative	4	23,38	26,27	RAL-738	*1360*	negative	5	23,41	27,55	RAL-738	*Cr1a*	negative	6	26,10	27,38
RAL-737	*P-element*	negative	5	23,40	25,36	RAL-738	*1360*	negative	6	23,57	27,38	RAL-738	*Cr1a*	negative	7	24,93	27,14
RAL-737	*P-element*	negative	6	23,50	26,19	RAL-738	*1360*	negative	7	23,72	27,14	RAL-738	*Cr1a*	negative	8	23,02	27,57

RAL-738	*Cr1a*	positive	1	24,77	27,59	RAL-738	*mdg1*	positive	4	21,72	26,82	RAL-738	*Quasimodo*	positive	5	27,19	28,63
RAL-738	*Cr1a*	positive	2	25,78	27,50	RAL-738	*mdg1*	positive	5	22,35	28,63	RAL-738	*Quasimodo*	positive	6	26,59	27,77
RAL-738	*Cr1a*	positive	3	24,13	26,81	RAL-738	*mdg1*	positive	6	22,01	27,77	RAL-738	*Quasimodo*	positive	7	27,98	28,68
RAL-738	*Cr1a*	positive	4	26,25	28,57	RAL-738	*mdg1*	positive	7	22,06	28,68	RAL-738	*Quasimodo*	positive	8	26,97	27,71
RAL-738	*Cr1a*	positive	5	25,91	27,66	RAL-738	*mdg1*	positive	8	22,03	27,71	RAL-801	*412*	negative	1	20,29	25,87
RAL-738	*Cr1a*	positive	6	27,17	28,61	RAL-738	*opus*	negative	1	26,93	26,91	RAL-801	*412*	negative	2	19,79	26,00
RAL-738	*Cr1a*	positive	7	26,02	27,48	RAL-738	*opus*	negative	2	26,80	27,66	RAL-801	*412*	negative	3	19,99	26,42
RAL-738	*gypsy5*	negative	1	30,29	27,57	RAL-738	*opus*	negative	3	25,30	27,44	RAL-801	*412*	negative	4	19,99	25,91
RAL-738	*gypsy5*	negative	2	29,58	27,30	RAL-738	*opus*	negative	4	26,54	27,54	RAL-801	*412*	negative	5	19,69	26,61
RAL-738	*gypsy5*	negative	3	29,91	27,22	RAL-738	*opus*	negative	5	27,13	27,64	RAL-801	*412*	negative	6	19,75	26,62
RAL-738	*gypsy5*	negative	4	30,55	27,55	RAL-738	*opus*	negative	6	27,78	27,97	RAL-801	*412*	negative	7	20,27	25,76
RAL-738	*gypsy5*	negative	5	30,62	27,38	RAL-738	*opus*	negative	7	26,49	27,35	RAL-801	*412*	negative	8	20,34	26,09
RAL-738	*gypsy5*	negative	6	29,88	27,14	RAL-738	*opus*	negative	8	24,55	27,74	RAL-801	*412*	positive	1	19,74	25,54
RAL-738	*gypsy5*	negative	7	28,30	27,57	RAL-738	*opus*	positive	1	25,86	27,99	RAL-801	*412*	positive	2	19,54	25,42
RAL-738	*gypsy5*	positive	1	30,23	27,59	RAL-738	*opus*	positive	2	26,90	27,54	RAL-801	*412*	positive	3	19,53	25,67
RAL-738	*gypsy5*	positive	2	30,38	27,43	RAL-738	*opus*	positive	3	26,76	27,77	RAL-801	*412*	positive	4	19,32	25,69
RAL-738	*gypsy5*	positive	3	29,99	27,50	RAL-738	*opus*	positive	4	25,04	26,82	RAL-801	*412*	positive	5	19,07	25,91
RAL-738	*gypsy5*	positive	4	28,93	26,81	RAL-738	*opus*	positive	5	28,18	28,63	RAL-801	*412*	positive	6	19,38	25,74
RAL-738	*gypsy5*	positive	5	30,69	28,57	RAL-738	*opus*	positive	6	27,21	27,77	RAL-801	*412*	positive	7	19,87	25,43
RAL-738	*gypsy5*	positive	6	30,27	27,66	RAL-738	*opus*	positive	7	28,60	28,68	RAL-801	*412*	positive	8	19,57	26,14
RAL-738	*gypsy5*	positive	7	31,56	28,61	RAL-738	*opus*	positive	8	27,65	27,71	RAL-801	*1360*	negative	1	23,43	25,87
RAL-738	*gypsy5*	positive	8	30,76	27,48	RAL-738	*P-element*	negative	1	23,13	26,91	RAL-801	*1360*	negative	2	23,05	26,00
RAL-738	*Idefix*	negative	1	27,34	26,91	RAL-738	*P-element*	negative	2	22,81	27,66	RAL-801	*1360*	negative	3	23,27	26,42
RAL-738	*Idefix*	negative	2	27,35	27,66	RAL-738	*P-element*	negative	3	22,84	27,44	RAL-801	*1360*	negative	4	23,18	25,91
RAL-738	*Idefix*	negative	3	26,66	27,44	RAL-738	*P-element*	negative	4	22,83	27,54	RAL-801	*1360*	negative	5	23,36	26,61
RAL-738	*Idefix*	negative	4	27,02	27,54	RAL-738	*P-element*	negative	5	23,12	27,64	RAL-801	*1360*	negative	6	23,04	26,62
RAL-738	*Idefix*	negative	5	27,48	27,64	RAL-738	*P-element*	negative	6	22,86	27,97	RAL-801	*1360*	negative	7	23,39	25,76
RAL-738	*Idefix*	negative	6	28,05	27,97	RAL-738	*P-element*	negative	7	22,58	27,35	RAL-801	*1360*	negative	8	23,50	26,09
RAL-738	*Idefix*	negative	7	27,03	27,35	RAL-738	*P-element*	negative	8	22,97	27,74	RAL-801	*1360*	positive	1	23,01	25,54
RAL-738	*Idefix*	negative	8	25,34	27,74	RAL-738	*P-element*	positive	1	23,02	27,99	RAL-801	*1360*	positive	2	23,01	25,42
RAL-738	*Idefix*	positive	1	27,22	27,99	RAL-738	*P-element*	positive	2	22,57	27,54	RAL-801	*1360*	positive	3	23,12	25,67
RAL-738	*Idefix*	positive	2	27,20	27,54	RAL-738	*P-element*	positive	3	23,29	27,77	RAL-801	*1360*	positive	4	22,88	25,69
RAL-738	*Idefix*	positive	3	27,44	27,77	RAL-738	*P-element*	positive	4	22,92	26,82	RAL-801	*1360*	positive	5	22,70	25,91
RAL-738	*Idefix*	positive	4	25,82	26,82	RAL-738	*P-element*	positive	5	23,16	28,63	RAL-801	*1360*	positive	6	22,93	25,74
RAL-738	*Idefix*	positive	5	27,85	28,63	RAL-738	*P-element*	positive	6	22,69	27,77	RAL-801	*1360*	positive	7	23,18	25,43
RAL-738	*Idefix*	positive	6	27,72	27,77	RAL-738	*P-element*	positive	7	22,92	28,68	RAL-801	*1360*	positive	8	23,25	26,14
RAL-738	*Idefix*	positive	7	28,53	28,68	RAL-738	*P-element*	positive	8	22,64	27,71	RAL-801	*blastopia*	negative	1	22,91	25,87
RAL-738	*Idefix*	positive	8	27,38	27,71	RAL-738	*pogo*	negative	1	23,43	26,91	RAL-801	*blastopia*	negative	2	24,39	26,00
RAL-738	*Juan*	negative	1	22,03	26,91	RAL-738	*pogo*	negative	2	22,98	27,66	RAL-801	*blastopia*	negative	3	25,67	26,42
RAL-738	*Juan*	negative	2	21,95	27,66	RAL-738	*pogo*	negative	3	22,86	27,44	RAL-801	*blastopia*	negative	4	24,81	25,91
RAL-738	*Juan*	negative	3	22,07	27,44	RAL-738	*pogo*	negative	4	23,07	27,54	RAL-801	*blastopia*	negative	5	25,44	26,62
RAL-738	*Juan*	negative	4	21,56	27,54	RAL-738	*pogo*	negative	5	23,31	27,64	RAL-801	*blastopia*	negative	6	25,47	25,76
RAL-738	*Juan*	negative	5	21,77	27,64	RAL-738	*pogo*	negative	6	23,03	27,97	RAL-801	*blastopia*	negative	7	25,33	26,09
RAL-738	*Juan*	negative	6	21,97	27,97	RAL-738	*pogo*	negative	7	22,88	27,35	RAL-801	*blastopia*	positive	1	24,87	25,54
RAL-738	*Juan*	negative	7	22,16	27,35	RAL-738	*pogo*	negative	8	22,78	27,74	RAL-801	*blastopia*	positive	2	24,76	25,42
RAL-738	*Juan*	negative	8	22,07	27,74	RAL-738	*pogo*	positive	1	23,02	27,99	RAL-801	*blastopia*	positive	3	24,61	25,67
RAL-738	*Juan*	positive	1	22,59	27,99	RAL-738	*pogo*	positive	2	22,81	27,54	RAL-801	*blastopia*	positive	4	24,54	25,69
RAL-738	*Juan*	positive	2	22,06	27,54	RAL-738	*pogo*	positive	3	23,49	27,77	RAL-801	*blastopia*	positive	5	24,68	25,91
RAL-738	*Juan*	positive	3	22,48	27,77	RAL-738	*pogo*	positive	4	22,79	26,82	RAL-801	*blastopia*	positive	6	24,46	25,74
RAL-738	*Juan*	positive	4	21,25	26,82	RAL-738	*pogo*	positive	5	22,98	28,63	RAL-801	*blastopia*	positive	7	24,75	25,43
RAL-738	*Juan*	positive	5	22,48	28,63	RAL-738	*pogo*	positive	6	22,71	27,77	RAL-801	*blastopia*	positive	8	25,26	26,14
RAL-738	*Juan*	positive	6	22,12	27,77	RAL-738	*pogo*	positive	7	22,92	28,68	RAL-801	*blood*	negative	1	22,17	25,87
RAL-738	*Juan*	positive	7	22,77	28,68	RAL-738	*pogo*	positive	8	22,86	27,71	RAL-801	*blood*	negative	2	21,57	26,00
RAL-738	*Juan*	positive	8	21,83	27,71	RAL-738	*Quasimodo*	negative	1	26,85	26,91	RAL-801	*blood*	negative	3	22,05	26,42
RAL-738	*mdg1*	negative	1	22,26	26,91	RAL-738	*Quasimodo*	negative	2	26,51	27,66	RAL-801	*blood*	negative	4	22,11	25,91
RAL-738	*mdg1*	negative	2	22,24	27,66	RAL-738	*Quasimodo*	negative	3	26,03	27,44	RAL-801	*blood*	negative	5	22,35	26,61
RAL-738	*mdg1*	negative	3	22,25	27,44	RAL-738	*Quasimodo*	negative	4	26,63	27,54	RAL-801	*blood*	negative	6	21,95	26,62
RAL-738	*mdg1*	negative	4	22,05	27,54	RAL-738	*Quasimodo*	negative	5	26,95	27,64	RAL-801	*blood*	negative	7	22,31	25,76
RAL-738	*mdg1*	negative	5	22,06	27,64	RAL-738	*Quasimodo*	negative	6	27,12	27,97	RAL-801	*blood*	negative	8	22,20	26,09
RAL-738	*mdg1*	negative	6	22,34	27,97	RAL-738	*Quasimodo*	negative	7	26,51	27,35	RAL-801	*blood*	positive	1	21,44	25,54
RAL-738	*mdg1*	negative	7	22,28	27,35	RAL-738	*Quasimodo*	negative	8	25,40	27,74	RAL-801	*blood*	positive	2	21,56	25,42
RAL-738	*mdg1*	negative	8	22,56	27,74	RAL-738	*Quasimodo*	positive	1	26,65	27,99	RAL-801	*blood*	positive	3	21,87	25,67
RAL-738	*mdg1*	positive	1	21,95	27,99	RAL-738	*Quasimodo*	positive	2	26,90	27,54	RAL-801	*blood*	positive	4	21,73	25,69
RAL-738	*mdg1*	positive	2	21,69	27,54	RAL-738	*Quasimodo*	positive	3	26,84	27,77	RAL-801	*blood*	positive	5	21,54	25,91
RAL-738	*mdg1*	positive	3	22,58	27,77	RAL-738	*Quasimodo*	positive	4	25,39	26,82	RAL-801	*blood*	positive	6	21,61	25,74

RAL-801	*blood*	positive	7	21,92	25,43	RAL-801	*Juan*	negative	1	21,15	26,01	RAL-801	*pogo*	negative	2	19,38	26,01
RAL-801	*blood*	positive	8	21,76	26,14	RAL-801	*Juan*	negative	2	21,09	26,01	RAL-801	*pogo*	negative	3	19,88	26,33
RAL-801	*copia*	negative	1	18,31	25,87	RAL-801	*Juan*	negative	3	21,15	26,33	RAL-801	*pogo*	negative	4	19,51	26,17
RAL-801	*copia*	negative	2	17,65	26,00	RAL-801	*Juan*	negative	4	21,22	26,17	RAL-801	*pogo*	negative	5	19,71	26,67
RAL-801	*copia*	negative	3	17,90	26,42	RAL-801	*Juan*	negative	5	21,05	26,67	RAL-801	*pogo*	negative	6	19,45	26,42
RAL-801	*copia*	negative	4	17,68	25,91	RAL-801	*Juan*	negative	6	20,78	26,42	RAL-801	*pogo*	negative	7	19,87	25,66
RAL-801	*copia*	negative	5	17,71	26,61	RAL-801	*Juan*	negative	7	21,49	25,66	RAL-801	*pogo*	negative	8	20,04	26,29
RAL-801	*copia*	negative	6	17,32	26,62	RAL-801	*Juan*	negative	8	21,38	26,29	RAL-801	*pogo*	positive	1	19,53	25,52
RAL-801	*copia*	negative	7	17,50	25,76	RAL-801	*Juan*	positive	1	20,98	25,52	RAL-801	*pogo*	positive	2	19,21	25,52
RAL-801	*copia*	negative	8	17,26	26,09	RAL-801	*Juan*	positive	2	20,85	25,52	RAL-801	*pogo*	positive	3	19,26	25,67
RAL-801	*copia*	positive	1	16,92	25,54	RAL-801	*Juan*	positive	3	20,77	25,67	RAL-801	*pogo*	positive	4	19,34	25,65
RAL-801	*copia*	positive	2	17,01	25,42	RAL-801	*Juan*	positive	4	20,97	25,65	RAL-801	*pogo*	positive	5	19,42	25,93
RAL-801	*copia*	positive	3	16,95	25,67	RAL-801	*Juan*	positive	5	20,63	25,93	RAL-801	*pogo*	positive	6	19,31	25,60
RAL-801	*copia*	positive	4	17,63	25,69	RAL-801	*Juan*	positive	6	20,70	25,60	RAL-801	*pogo*	positive	7	19,56	25,47
RAL-801	*copia*	positive	5	17,23	25,91	RAL-801	*Juan*	positive	7	20,92	25,47	RAL-801	*pogo*	positive	8	19,19	26,10
RAL-801	*copia*	positive	6	16,91	25,74	RAL-801	*Juan*	positive	8	21,08	26,10	RAL-801	*Quasimodo*	negative	1	23,59	26,01
RAL-801	*copia*	positive	7	17,11	25,43	RAL-801	*mdg1*	negative	1	23,70	26,01	RAL-801	*Quasimodo*	negative	2	25,62	26,01
RAL-801	*copia*	positive	8	17,52	26,14	RAL-801	*mdg1*	negative	2	23,30	26,01	RAL-801	*Quasimodo*	negative	3	27,01	26,33
RAL-801	*Cr1a*	negative	1	21,65	25,87	RAL-801	*mdg1*	negative	3	23,83	26,33	RAL-801	*Quasimodo*	negative	4	26,04	26,17
RAL-801	*Cr1a*	negative	2	23,10	26,00	RAL-801	*mdg1*	negative	4	23,74	26,17	RAL-801	*Quasimodo*	negative	5	26,90	26,67
RAL-801	*Cr1a*	negative	3	24,70	26,42	RAL-801	*mdg1*	negative	5	23,41	26,67	RAL-801	*Quasimodo*	negative	6	26,72	26,42
RAL-801	*Cr1a*	negative	4	23,67	25,91	RAL-801	*mdg1*	negative	6	23,44	26,42	RAL-801	*Quasimodo*	negative	7	26,45	25,66
RAL-801	*Cr1a*	negative	5	24,69	26,61	RAL-801	*mdg1*	negative	7	23,88	25,66	RAL-801	*Quasimodo*	negative	8	26,49	26,29
RAL-801	*Cr1a*	negative	6	24,68	26,62	RAL-801	*mdg1*	negative	8	23,81	26,29	RAL-801	*Quasimodo*	positive	1	25,63	25,52
RAL-801	*Cr1a*	negative	7	24,10	25,76	RAL-801	*mdg1*	positive	1	23,31	25,52	RAL-801	*Quasimodo*	positive	2	25,70	25,52
RAL-801	*Cr1a*	negative	8	24,34	26,09	RAL-801	*mdg1*	positive	2	23,63	25,52	RAL-801	*Quasimodo*	positive	3	26,07	25,67
RAL-801	*Cr1a*	positive	1	23,57	25,54	RAL-801	*mdg1*	positive	3	23,71	25,67	RAL-801	*Quasimodo*	positive	4	25,80	25,65
RAL-801	*Cr1a*	positive	2	23,92	25,42	RAL-801	*mdg1*	positive	4	23,38	25,65	RAL-801	*Quasimodo*	positive	5	25,72	25,93
RAL-801	*Cr1a*	positive	3	24,13	25,67	RAL-801	*mdg1*	positive	5	23,07	25,93	RAL-801	*Quasimodo*	positive	6	25,13	25,60
RAL-801	*Cr1a*	positive	4	23,56	25,69	RAL-801	*mdg1*	positive	6	23,50	25,60	RAL-801	*Quasimodo*	positive	7	25,32	25,47
RAL-801	*Cr1a*	positive	5	23,49	25,91	RAL-801	*mdg1*	positive	7	23,86	25,47	RAL-801	*Quasimodo*	positive	8	24,80	26,10
RAL-801	*Cr1a*	positive	6	23,13	25,74	RAL-801	*mdg1*	positive	8	23,20	26,10	RAL-820	*412*	negative	1	23,42	29,02
RAL-801	*Cr1a*	positive	7	23,35	25,43	RAL-801	*opus*	negative	1	23,26	26,01	RAL-820	*412*	negative	2	23,08	28,91
RAL-801	*Cr1a*	positive	8	23,50	26,14	RAL-801	*opus*	negative	2	24,68	26,01	RAL-820	*412*	negative	3	22,62	28,46
RAL-801	*gypsy5*	negative	1	24,64	25,87	RAL-801	*opus*	negative	3	26,59	26,33	RAL-820	*412*	negative	4	22,59	28,29
RAL-801	*gypsy5*	negative	2	26,31	26,00	RAL-801	*opus*	negative	4	25,28	26,17	RAL-820	*412*	negative	5	22,89	28,77
RAL-801	*gypsy5*	negative	3	27,03	26,42	RAL-801	*opus*	negative	5	26,23	26,67	RAL-820	*412*	negative	6	22,05	27,59
RAL-801	*gypsy5*	negative	4	26,44	25,91	RAL-801	*opus*	negative	6	26,85	26,42	RAL-820	*412*	negative	7	22,60	28,05
RAL-801	*gypsy5*	negative	5	27,34	26,61	RAL-801	*opus*	negative	7	26,07	25,66	RAL-820	*412*	negative	8	22,83	28,20
RAL-801	*gypsy5*	negative	7	26,73	25,76	RAL-801	*opus*	negative	8	26,12	26,29	RAL-820	*412*	positive	1	22,94	26,59
RAL-801	*gypsy5*	negative	8	27,09	26,09	RAL-801	*opus*	positive	1	25,29	25,52	RAL-820	*412*	positive	2	22,59	27,30
RAL-801	*gypsy5*	positive	1	26,02	25,54	RAL-801	*opus*	positive	2	25,33	25,52	RAL-820	*412*	positive	3	22,05	27,39
RAL-801	*gypsy5*	positive	2	26,23	25,42	RAL-801	*opus*	positive	3	25,89	25,67	RAL-820	*412*	positive	4	22,66	27,75
RAL-801	*gypsy5*	positive	3	26,46	25,67	RAL-801	*opus*	positive	4	25,28	25,65	RAL-820	*412*	positive	5	21,63	27,74
RAL-801	*gypsy5*	positive	4	26,13	25,69	RAL-801	*opus*	positive	5	25,30	25,93	RAL-820	*412*	positive	6	22,36	28,05
RAL-801	*gypsy5*	positive	5	26,22	25,91	RAL-801	*opus*	positive	6	24,73	25,60	RAL-820	*412*	positive	7	21,74	26,85
RAL-801	*gypsy5*	positive	6	25,67	25,74	RAL-801	*opus*	positive	7	25,04	25,47	RAL-820	*412*	positive	8	21,99	27,32
RAL-801	*gypsy5*	positive	7	26,13	25,43	RAL-801	*opus*	positive	8	25,61	26,10	RAL-820	*1360*	negative	1	28,27	29,02
RAL-801	*gypsy5*	positive	8	25,97	26,14	RAL-801	*P-element*	negative	1	20,87	26,01	RAL-820	*1360*	negative	2	27,37	28,91
RAL-801	*Idefix*	negative	1	20,58	26,01	RAL-801	*P-element*	negative	2	20,27	26,01	RAL-820	*1360*	negative	3	27,18	28,46
RAL-801	*Idefix*	negative	2	20,33	26,01	RAL-801	*P-element*	negative	3	20,64	26,33	RAL-820	*1360*	negative	4	27,27	28,29
RAL-801	*Idefix*	negative	3	20,54	26,33	RAL-801	*P-element*	negative	4	20,73	26,17	RAL-820	*1360*	negative	5	27,79	28,77
RAL-801	*Idefix*	negative	4	20,61	26,17	RAL-801	*P-element*	negative	5	20,57	26,67	RAL-820	*1360*	negative	6	26,96	27,59
RAL-801	*Idefix*	negative	5	20,06	26,67	RAL-801	*P-element*	negative	6	20,17	26,42	RAL-820	*1360*	negative	7	27,38	28,05
RAL-801	*Idefix*	negative	6	20,08	26,42	RAL-801	*P-element*	negative	7	20,43	25,66	RAL-820	*1360*	negative	8	27,88	28,20
RAL-801	*Idefix*	negative	7	20,41	25,66	RAL-801	*P-element*	negative	8	20,17	26,29	RAL-820	*1360*	positive	1	26,82	26,59
RAL-801	*Idefix*	negative	8	20,25	26,29	RAL-801	*P-element*	positive	1	20,08	25,52	RAL-820	*1360*	positive	2	27,17	27,30
RAL-801	*Idefix*	positive	1	19,75	25,52	RAL-801	*P-element*	positive	2	20,38	25,52	RAL-820	*1360*	positive	3	26,88	27,39
RAL-801	*Idefix*	positive	2	19,60	25,52	RAL-801	*P-element*	positive	3	20,29	25,67	RAL-820	*1360*	positive	4	26,99	27,75
RAL-801	*Idefix*	positive	3	19,32	25,67	RAL-801	*P-element*	positive	4	20,36	25,65	RAL-820	*1360*	positive	5	26,71	27,74
RAL-801	*Idefix*	positive	4	19,74	25,65	RAL-801	*P-element*	positive	5	20,01	25,93	RAL-820	*1360*	positive	6	27,02	28,05
RAL-801	*Idefix*	positive	5	19,58	25,93	RAL-801	*P-element*	positive	6	20,07	25,60	RAL-820	*1360*	positive	7	26,40	26,85
RAL-801	*Idefix*	positive	6	19,90	25,60	RAL-801	*P-element*	positive	7	20,10	25,47	RAL-820	*1360*	positive	8	26,81	27,32
RAL-801	*Idefix*	positive	7	20,11	25,47	RAL-801	*P-element*	positive	8	20,14	26,10	RAL-820	*blastopia*	negative	1	27,15	29,02
RAL-801	*Idefix*	positive	8	20,75	26,10	RAL-801	*pogo*	negative	1	19,73	26,01	RAL-820	*blastopia*	negative	2	27,74	28,91

RAL-820	*blastopia*	negative	3	26,71	28,46	RAL-820	*gypsy5*	negative	4	30,26	28,29	RAL-820	*opus*	positive	3	30,09	27,67
RAL-820	*blastopia*	negative	4	26,67	28,29	RAL-820	*gypsy5*	negative	5	29,03	27,59	RAL-820	*opus*	positive	4	30,24	27,95
RAL-820	*blastopia*	negative	5	27,80	28,77	RAL-820	*gypsy5*	negative	6	29,90	28,05	RAL-820	*opus*	positive	5	29,69	27,76
RAL-820	*blastopia*	negative	6	25,53	27,59	RAL-820	*gypsy5*	negative	7	29,72	28,20	RAL-820	*opus*	positive	6	30,24	28,26
RAL-820	*blastopia*	negative	7	26,27	28,05	RAL-820	*gypsy5*	positive	1	27,28	26,59	RAL-820	*opus*	positive	7	28,80	26,88
RAL-820	*blastopia*	negative	8	26,19	28,20	RAL-820	*gypsy5*	positive	2	28,83	27,30	RAL-820	*opus*	positive	8	28,59	27,13
RAL-820	*blastopia*	positive	1	25,81	26,59	RAL-820	*gypsy5*	positive	3	29,08	27,39	RAL-820	*P-element*	negative	1	24,70	29,22
RAL-820	*blastopia*	positive	2	26,06	27,30	RAL-820	*gypsy5*	positive	4	29,49	27,75	RAL-820	*P-element*	negative	2	24,89	29,05
RAL-820	*blastopia*	positive	3	25,81	27,39	RAL-820	*gypsy5*	positive	5	28,98	27,74	RAL-820	*P-element*	negative	3	24,15	28,51
RAL-820	*blastopia*	positive	4	25,71	27,75	RAL-820	*gypsy5*	positive	6	29,50	28,05	RAL-820	*P-element*	negative	4	24,39	29,27
RAL-820	*blastopia*	positive	5	25,35	27,74	RAL-820	*gypsy5*	positive	7	28,42	26,85	RAL-820	*P-element*	negative	5	22,87	27,80
RAL-820	*blastopia*	positive	6	25,97	28,05	RAL-820	*gypsy5*	positive	8	28,75	27,32	RAL-820	*P-element*	negative	6	23,35	28,20
RAL-820	*blastopia*	positive	7	25,03	26,85	RAL-820	*Idefix*	negative	1	27,00	29,22	RAL-820	*P-element*	negative	7	23,69	28,55
RAL-820	*blastopia*	positive	8	25,32	27,32	RAL-820	*Idefix*	negative	2	26,53	29,05	RAL-820	*P-element*	positive	1	23,61	26,49
RAL-820	*blood*	negative	1	24,18	29,02	RAL-820	*Idefix*	negative	3	25,84	28,51	RAL-820	*P-element*	positive	2	23,60	27,17
RAL-820	*blood*	negative	2	23,70	28,91	RAL-820	*Idefix*	negative	4	26,56	29,27	RAL-820	*P-element*	positive	3	22,96	27,67
RAL-820	*blood*	negative	3	23,89	28,46	RAL-820	*Idefix*	negative	5	24,80	27,80	RAL-820	*P-element*	positive	4	23,92	27,95
RAL-820	*blood*	negative	4	23,81	28,29	RAL-820	*Idefix*	negative	6	25,57	28,20	RAL-820	*P-element*	positive	5	23,28	27,76
RAL-820	*blood*	negative	5	24,23	28,77	RAL-820	*Idefix*	negative	7	25,81	28,55	RAL-820	*P-element*	positive	6	23,48	28,26
RAL-820	*blood*	negative	6	22,35	27,59	RAL-820	*Idefix*	positive	1	24,45	26,49	RAL-820	*P-element*	positive	7	22,73	26,88
RAL-820	*blood*	negative	7	22,99	28,05	RAL-820	*Idefix*	positive	2	24,72	27,17	RAL-820	*P-element*	positive	8	23,10	27,13
RAL-820	*blood*	negative	8	23,30	28,20	RAL-820	*Idefix*	positive	3	24,20	27,67	RAL-820	*pogo*	negative	1	24,58	29,22
RAL-820	*blood*	positive	1	23,22	26,59	RAL-820	*Idefix*	positive	4	24,60	27,95	RAL-820	*pogo*	negative	2	23,38	29,05
RAL-820	*blood*	positive	2	23,06	27,30	RAL-820	*Idefix*	positive	5	24,23	27,76	RAL-820	*pogo*	negative	3	24,20	28,51
RAL-820	*blood*	positive	3	22,40	27,39	RAL-820	*Idefix*	positive	6	24,78	28,26	RAL-820	*pogo*	negative	4	23,64	29,27
RAL-820	*blood*	positive	4	22,95	27,75	RAL-820	*Idefix*	positive	7	23,69	26,88	RAL-820	*pogo*	negative	5	23,12	27,80
RAL-820	*blood*	positive	5	22,61	27,74	RAL-820	*Idefix*	positive	8	24,07	27,13	RAL-820	*pogo*	negative	6	23,85	28,20
RAL-820	*blood*	positive	6	22,70	28,05	RAL-820	*Juan*	negative	1	28,74	29,22	RAL-820	*pogo*	negative	7	23,97	28,55
RAL-820	*blood*	positive	7	22,18	26,85	RAL-820	*Juan*	negative	2	28,00	29,05	RAL-820	*pogo*	positive	1	23,51	26,49
RAL-820	*blood*	positive	8	22,56	27,32	RAL-820	*Juan*	negative	3	27,60	28,51	RAL-820	*pogo*	positive	2	23,44	27,17
RAL-820	*copia*	negative	1	19,97	29,02	RAL-820	*Juan*	negative	4	28,13	29,27	RAL-820	*pogo*	positive	3	23,04	27,67
RAL-820	*copia*	negative	2	20,37	28,91	RAL-820	*Juan*	negative	5	26,30	27,80	RAL-820	*pogo*	positive	4	23,64	27,95
RAL-820	*copia*	negative	3	19,32	28,46	RAL-820	*Juan*	negative	6	27,04	28,20	RAL-820	*pogo*	positive	5	23,03	27,76
RAL-820	*copia*	negative	4	19,46	28,29	RAL-820	*Juan*	negative	7	27,34	28,55	RAL-820	*pogo*	positive	6	23,27	28,26
RAL-820	*copia*	negative	5	20,23	28,77	RAL-820	*Juan*	positive	1	26,48	26,49	RAL-820	*pogo*	positive	7	22,57	26,88
RAL-820	*copia*	negative	6	18,30	27,59	RAL-820	*Juan*	positive	2	26,84	27,17	RAL-820	*pogo*	positive	8	23,05	27,13
RAL-820	*copia*	negative	7	18,97	28,05	RAL-820	*Juan*	positive	3	26,09	27,67	RAL-820	*Quasimodo*	negative	1	28,12	29,22
RAL-820	*copia*	negative	8	18,57	28,20	RAL-820	*Juan*	positive	4	26,70	27,95	RAL-820	*Quasimodo*	negative	2	28,03	29,05
RAL-820	*copia*	positive	1	19,30	26,59	RAL-820	*Juan*	positive	5	26,29	27,76	RAL-820	*Quasimodo*	negative	3	27,23	28,51
RAL-820	*copia*	positive	2	19,16	27,30	RAL-820	*Juan*	positive	6	26,98	28,26	RAL-820	*Quasimodo*	negative	4	28,61	29,27
RAL-820	*copia*	positive	3	18,54	27,39	RAL-820	*Juan*	positive	7	25,87	26,88	RAL-820	*Quasimodo*	negative	5	26,65	27,80
RAL-820	*copia*	positive	4	19,27	27,75	RAL-820	*Juan*	positive	8	26,29	27,13	RAL-820	*Quasimodo*	negative	6	27,37	28,20
RAL-820	*copia*	positive	5	18,93	27,74	RAL-820	*mdg1*	negative	1	23,52	29,22	RAL-820	*Quasimodo*	negative	7	27,09	28,55
RAL-820	*copia*	positive	6	19,10	28,05	RAL-820	*mdg1*	negative	2	23,24	28,51	RAL-820	*Quasimodo*	positive	1	26,00	26,49
RAL-820	*copia*	positive	7	18,02	26,85	RAL-820	*mdg1*	negative	3	24,41	29,27	RAL-820	*Quasimodo*	positive	2	26,41	27,17
RAL-820	*copia*	positive	8	18,37	27,32	RAL-820	*mdg1*	negative	4	21,90	27,80	RAL-820	*Quasimodo*	positive	3	26,73	27,67
RAL-820	*Cr1a*	negative	1	26,42	29,02	RAL-820	*mdg1*	negative	5	22,46	28,20	RAL-820	*Quasimodo*	positive	4	26,94	27,95
RAL-820	*Cr1a*	negative	2	26,24	28,91	RAL-820	*mdg1*	negative	6	22,62	28,55	RAL-820	*Quasimodo*	positive	5	26,18	27,76
RAL-820	*Cr1a*	negative	3	25,83	28,46	RAL-820	*mdg1*	positive	1	24,78	26,49	RAL-820	*Quasimodo*	positive	6	26,84	28,26
RAL-820	*Cr1a*	negative	4	25,88	28,29	RAL-820	*mdg1*	positive	2	24,87	27,17	RAL-820	*Quasimodo*	positive	7	25,74	26,88
RAL-820	*Cr1a*	negative	5	27,00	28,77	RAL-820	*mdg1*	positive	3	23,77	27,67	RAL-820	*Quasimodo*	positive	8	26,06	27,13
RAL-820	*Cr1a*	negative	6	25,09	27,59	RAL-820	*mdg1*	positive	4	24,61	27,95	RAL-855	*412*	negative	1	21,47	25,33
RAL-820	*Cr1a*	negative	7	25,48	28,05	RAL-820	*mdg1*	positive	5	22,60	27,76	RAL-855	*412*	negative	2	20,93	24,69
RAL-820	*Cr1a*	negative	8	26,02	28,20	RAL-820	*mdg1*	positive	6	22,94	28,26	RAL-855	*412*	negative	3	21,25	25,16
RAL-820	*Cr1a*	positive	1	25,09	26,59	RAL-820	*mdg1*	positive	7	23,44	26,88	RAL-855	*412*	negative	4	21,09	24,67
RAL-820	*Cr1a*	positive	2	25,61	27,30	RAL-820	*mdg1*	positive	8	22,83	27,13	RAL-855	*412*	negative	5	20,45	25,34
RAL-820	*Cr1a*	positive	3	25,36	27,39	RAL-820	*opus*	negative	1	31,27	29,22	RAL-855	*412*	negative	6	21,30	24,93
RAL-820	*Cr1a*	positive	4	25,91	27,75	RAL-820	*opus*	negative	2	26,70	29,05	RAL-855	*412*	negative	7	21,56	25,11
RAL-820	*Cr1a*	positive	5	25,47	27,74	RAL-820	*opus*	negative	3	31,47	28,51	RAL-855	*412*	negative	8	21,57	24,81
RAL-820	*Cr1a*	positive	6	25,66	28,05	RAL-820	*opus*	negative	4	31,96	29,27	RAL-855	*412*	positive	1	21,95	25,55
RAL-820	*Cr1a*	positive	7	24,55	26,85	RAL-820	*opus*	negative	5	29,46	27,80	RAL-855	*412*	positive	2	21,98	25,73
RAL-820	*Cr1a*	positive	8	24,81	27,32	RAL-820	*opus*	negative	6	30,15	28,20	RAL-855	*412*	positive	3	20,90	25,51
RAL-820	*gypsy5*	negative	1	31,18	29,02	RAL-820	*opus*	negative	7	28,84	28,55	RAL-855	*412*	positive	4	21,21	25,77
RAL-820	*gypsy5*	negative	2	30,13	28,91	RAL-820	*opus*	positive	1	29,05	26,49	RAL-855	*412*	positive	5	21,27	25,34
RAL-820	*gypsy5*	negative	3	29,58	28,46	RAL-820	*opus*	positive	2	29,80	27,17	RAL-855	*412*	positive	6	21,17	25,94

RAL-855	*412*	positive	7	21,39	25,05	RAL-855	*copia*	positive	8	19,21	25,31	RAL-855	*mdg1*	negative	2	22,85	24,41
RAL-855	*412*	positive	8	21,67	25,07	RAL-855	*Cr1a*	negative	1	23,56	25,05	RAL-855	*mdg1*	negative	3	23,36	25,07
RAL-855	*1360*	negative	1	25,54	25,05	RAL-855	*Cr1a*	negative	2	21,94	24,66	RAL-855	*mdg1*	negative	4	23,10	24,58
RAL-855	*1360*	negative	2	24,99	24,66	RAL-855	*Cr1a*	negative	3	23,55	25,11	RAL-855	*mdg1*	negative	5	23,37	25,35
RAL-855	*1360*	negative	3	25,72	25,11	RAL-855	*Cr1a*	negative	4	23,43	24,66	RAL-855	*mdg1*	negative	6	23,62	25,41
RAL-855	*1360*	negative	4	25,15	24,66	RAL-855	*Cr1a*	negative	5	22,67	25,42	RAL-855	*mdg1*	negative	7	23,35	25,08
RAL-855	*1360*	negative	5	25,14	25,42	RAL-855	*Cr1a*	negative	6	23,54	25,32	RAL-855	*mdg1*	negative	8	23,84	25,19
RAL-855	*1360*	negative	6	25,58	25,32	RAL-855	*Cr1a*	negative	7	23,04	24,98	RAL-855	*mdg1*	positive	1	23,97	25,58
RAL-855	*1360*	negative	7	25,72	24,98	RAL-855	*Cr1a*	negative	8	23,94	25,19	RAL-855	*mdg1*	positive	2	23,67	25,24
RAL-855	*1360*	negative	8	26,13	25,19	RAL-855	*Cr1a*	positive	1	23,86	25,71	RAL-855	*mdg1*	positive	3	23,21	25,04
RAL-855	*1360*	positive	1	26,12	25,71	RAL-855	*Cr1a*	positive	2	23,54	25,37	RAL-855	*mdg1*	positive	4	22,99	25,59
RAL-855	*1360*	positive	2	25,76	25,37	RAL-855	*Cr1a*	positive	3	23,29	25,17	RAL-855	*mdg1*	positive	5	22,99	25,28
RAL-855	*1360*	positive	3	25,37	25,17	RAL-855	*Cr1a*	positive	4	23,54	25,46	RAL-855	*mdg1*	positive	6	23,28	25,81
RAL-855	*1360*	positive	4	25,45	25,46	RAL-855	*Cr1a*	positive	5	23,68	25,23	RAL-855	*mdg1*	positive	7	23,33	25,07
RAL-855	*1360*	positive	5	25,44	25,23	RAL-855	*Cr1a*	positive	6	23,63	25,82	RAL-855	*mdg1*	positive	8	24,03	25,34
RAL-855	*1360*	positive	6	25,81	25,82	RAL-855	*Cr1a*	positive	7	23,71	25,10	RAL-855	*opus*	negative	1	24,67	25,11
RAL-855	*1360*	positive	7	25,96	25,10	RAL-855	*Cr1a*	positive	8	24,26	25,31	RAL-855	*opus*	negative	2	23,05	24,41
RAL-855	*1360*	positive	8	26,52	25,31	RAL-855	*gypsy5*	negative	1	23,99	25,05	RAL-855	*opus*	negative	3	24,63	25,07
RAL-855	*blastopia*	negative	1	23,57	25,05	RAL-855	*gypsy5*	negative	2	23,58	24,66	RAL-855	*opus*	negative	4	24,29	24,58
RAL-855	*blastopia*	negative	2	22,42	24,66	RAL-855	*gypsy5*	negative	3	24,00	25,11	RAL-855	*opus*	negative	5	23,95	25,35
RAL-855	*blastopia*	negative	3	23,28	25,11	RAL-855	*gypsy5*	negative	4	23,52	24,66	RAL-855	*opus*	negative	6	24,76	25,41
RAL-855	*blastopia*	negative	4	22,92	24,66	RAL-855	*gypsy5*	negative	5	24,05	25,42	RAL-855	*opus*	negative	7	24,22	25,08
RAL-855	*blastopia*	negative	5	23,08	25,42	RAL-855	*gypsy5*	negative	6	24,02	25,32	RAL-855	*opus*	negative	8	25,06	25,19
RAL-855	*blastopia*	negative	6	23,77	25,32	RAL-855	*gypsy5*	negative	7	24,08	24,98	RAL-855	*opus*	positive	1	24,91	25,58
RAL-855	*blastopia*	negative	7	23,26	24,98	RAL-855	*gypsy5*	negative	8	24,00	25,19	RAL-855	*opus*	positive	2	24,41	25,24
RAL-855	*blastopia*	negative	8	23,60	25,19	RAL-855	*gypsy5*	positive	1	24,43	25,71	RAL-855	*opus*	positive	3	24,57	25,04
RAL-855	*blastopia*	positive	1	23,66	25,71	RAL-855	*gypsy5*	positive	2	24,49	25,37	RAL-855	*opus*	positive	4	24,56	25,59
RAL-855	*blastopia*	positive	2	23,47	25,37	RAL-855	*gypsy5*	positive	3	24,04	25,17	RAL-855	*opus*	positive	5	24,69	25,28
RAL-855	*blastopia*	positive	3	23,35	25,17	RAL-855	*gypsy5*	positive	4	24,03	25,46	RAL-855	*opus*	positive	6	25,04	25,81
RAL-855	*blastopia*	positive	4	23,06	25,46	RAL-855	*gypsy5*	positive	5	24,32	25,23	RAL-855	*opus*	positive	7	24,68	25,07
RAL-855	*blastopia*	positive	5	23,01	25,23	RAL-855	*gypsy5*	positive	6	24,11	25,82	RAL-855	*opus*	positive	8	25,04	25,34
RAL-855	*blastopia*	positive	6	23,46	25,82	RAL-855	*gypsy5*	positive	7	23,42	25,10	RAL-855	*P-element*	negative	1	21,56	25,11
RAL-855	*blastopia*	positive	7	23,49	25,10	RAL-855	*gypsy5*	positive	8	24,24	25,31	RAL-855	*P-element*	negative	2	20,91	24,41
RAL-855	*blastopia*	positive	8	23,93	25,31	RAL-855	*Idefix*	negative	1	23,99	25,11	RAL-855	*P-element*	negative	3	21,65	25,07
RAL-855	*blood*	negative	1	21,80	25,05	RAL-855	*Idefix*	negative	2	23,27	24,41	RAL-855	*P-element*	negative	4	21,58	24,58
RAL-855	*blood*	negative	2	21,32	24,66	RAL-855	*Idefix*	negative	3	23,87	25,07	RAL-855	*P-element*	negative	5	21,80	25,35
RAL-855	*blood*	negative	3	21,94	25,11	RAL-855	*Idefix*	negative	4	23,44	24,58	RAL-855	*P-element*	negative	6	21,97	25,41
RAL-855	*blood*	negative	4	22,03	24,66	RAL-855	*Idefix*	negative	5	23,63	25,35	RAL-855	*P-element*	negative	7	21,44	25,08
RAL-855	*blood*	negative	5	22,19	25,42	RAL-855	*Idefix*	negative	6	24,09	25,41	RAL-855	*P-element*	negative	8	21,43	25,19
RAL-855	*blood*	negative	6	22,26	25,32	RAL-855	*Idefix*	negative	7	24,00	25,08	RAL-855	*P-element*	positive	1	21,99	25,58
RAL-855	*blood*	negative	7	22,19	24,98	RAL-855	*Idefix*	negative	8	24,07	25,19	RAL-855	*P-element*	positive	2	21,78	25,24
RAL-855	*blood*	negative	8	22,24	25,19	RAL-855	*Idefix*	positive	1	24,64	25,58	RAL-855	*P-element*	positive	3	20,88	25,04
RAL-855	*blood*	positive	1	22,40	25,71	RAL-855	*Idefix*	positive	2	24,00	25,24	RAL-855	*P-element*	positive	4	21,30	25,59
RAL-855	*blood*	positive	2	22,14	25,37	RAL-855	*Idefix*	positive	3	23,34	25,59	RAL-855	*P-element*	positive	5	21,30	25,28
RAL-855	*blood*	positive	3	21,73	25,17	RAL-855	*Idefix*	positive	4	23,59	25,28	RAL-855	*P-element*	positive	6	21,21	25,81
RAL-855	*blood*	positive	4	21,84	25,46	RAL-855	*Idefix*	positive	5	24,03	25,81	RAL-855	*P-element*	positive	7	21,13	25,07
RAL-855	*blood*	positive	5	21,92	25,23	RAL-855	*Idefix*	positive	6	23,69	25,07	RAL-855	*P-element*	positive	8	21,72	25,34
RAL-855	*blood*	positive	6	21,82	25,82	RAL-855	*Idefix*	positive	7	24,22	25,34	RAL-855	*pogo*	negative	1	22,91	25,11
RAL-855	*blood*	positive	7	21,94	25,10	RAL-855	*Juan*	negative	1	21,65	25,11	RAL-855	*pogo*	negative	2	22,22	24,41
RAL-855	*blood*	positive	8	22,61	25,31	RAL-855	*Juan*	negative	2	21,04	24,41	RAL-855	*pogo*	negative	3	22,77	25,07
RAL-855	*copia*	negative	1	18,72	25,05	RAL-855	*Juan*	negative	3	21,90	25,07	RAL-855	*pogo*	negative	4	22,84	24,58
RAL-855	*copia*	negative	2	18,47	24,66	RAL-855	*Juan*	negative	4	21,42	24,58	RAL-855	*pogo*	negative	5	22,87	25,35
RAL-855	*copia*	negative	3	19,03	25,11	RAL-855	*Juan*	negative	5	21,54	25,35	RAL-855	*pogo*	negative	6	22,98	25,41
RAL-855	*copia*	negative	4	18,92	24,66	RAL-855	*Juan*	negative	6	21,84	25,41	RAL-855	*pogo*	negative	7	22,64	25,08
RAL-855	*copia*	negative	5	19,25	25,42	RAL-855	*Juan*	negative	7	21,77	25,08	RAL-855	*pogo*	negative	8	22,92	25,19
RAL-855	*copia*	negative	6	19,21	25,32	RAL-855	*Juan*	negative	8	22,23	25,19	RAL-855	*pogo*	positive	1	22,48	25,58
RAL-855	*copia*	negative	7	18,06	24,98	RAL-855	*Juan*	positive	1	21,95	25,58	RAL-855	*pogo*	positive	2	22,61	25,24
RAL-855	*copia*	negative	8	19,00	25,19	RAL-855	*Juan*	positive	2	21,91	25,24	RAL-855	*pogo*	positive	3	22,66	25,04
RAL-855	*copia*	positive	1	18,65	25,71	RAL-855	*Juan*	positive	3	21,50	25,04	RAL-855	*pogo*	positive	4	23,10	25,59
RAL-855	*copia*	positive	2	18,24	25,37	RAL-855	*Juan*	positive	4	21,46	25,59	RAL-855	*pogo*	positive	5	23,15	25,28
RAL-855	*copia*	positive	3	18,66	25,17	RAL-855	*Juan*	positive	5	21,47	25,28	RAL-855	*pogo*	positive	6	22,99	25,81
RAL-855	*copia*	positive	4	18,75	25,46	RAL-855	*Juan*	positive	6	21,81	25,81	RAL-855	*pogo*	positive	7	22,71	25,07
RAL-855	*copia*	positive	5	18,68	25,23	RAL-855	*Juan*	positive	7	22,36	25,07	RAL-855	*pogo*	positive	8	23,02	25,34
RAL-855	*copia*	positive	6	18,76	25,82	RAL-855	*Juan*	positive	8	22,40	25,34	RAL-855	*Quasimodo*	negative	1	24,65	25,11
RAL-855	*copia*	positive	7	19,03	25,10	RAL-855	*mdg1*	negative	1	23,12	25,11	RAL-855	*Quasimodo*	negative	2	23,58	24,41

RAL-855	*Quasimodo*	negative	3	24,41	25,07	RAL-882	*blood*	negative	4	23,19	27,29	RAL-882	*Idefix*	negative	5	24,26	27,18
RAL-855	*Quasimodo*	negative	4	24,19	24,58	RAL-882	*blood*	negative	5	23,32	27,27	RAL-882	*Idefix*	negative	6	24,08	27,05
RAL-855	*Quasimodo*	negative	5	24,20	25,35	RAL-882	*blood*	negative	6	22,92	27,25	RAL-882	*Idefix*	negative	8	24,92	27,88
RAL-855	*Quasimodo*	negative	6	24,65	25,41	RAL-882	*blood*	negative	7	23,04	27,12	RAL-882	*Idefix*	positive	1	24,18	26,47
RAL-855	*Quasimodo*	negative	7	24,28	25,08	RAL-882	*blood*	negative	8	23,06	27,96	RAL-882	*Idefix*	positive	2	23,41	26,38
RAL-855	*Quasimodo*	negative	8	24,78	25,19	RAL-882	*blood*	positive	1	22,21	26,94	RAL-882	*Idefix*	positive	3	23,66	26,69
RAL-855	*Quasimodo*	positive	1	24,74	25,58	RAL-882	*blood*	positive	2	22,29	26,68	RAL-882	*Idefix*	positive	4	23,82	26,97
RAL-855	*Quasimodo*	positive	2	24,61	25,24	RAL-882	*blood*	positive	3	22,57	27,07	RAL-882	*Idefix*	positive	5	23,78	26,81
RAL-855	*Quasimodo*	positive	3	24,40	25,04	RAL-882	*blood*	positive	4	22,51	27,20	RAL-882	*Idefix*	positive	6	24,22	27,27
RAL-855	*Quasimodo*	positive	4	24,58	25,59	RAL-882	*blood*	positive	5	22,72	27,16	RAL-882	*Idefix*	positive	7	24,50	27,14
RAL-855	*Quasimodo*	positive	5	24,69	25,28	RAL-882	*blood*	positive	6	22,49	27,54	RAL-882	*Idefix*	positive	8	24,71	27,09
RAL-855	*Quasimodo*	positive	6	24,61	25,81	RAL-882	*blood*	positive	7	22,96	27,45	RAL-882	*Juan*	negative	1	22,98	26,15
RAL-855	*Quasimodo*	positive	7	24,48	25,07	RAL-882	*blood*	positive	8	22,81	27,27	RAL-882	*Juan*	negative	2	23,12	26,89
RAL-855	*Quasimodo*	positive	8	24,99	25,34	RAL-882	*copia*	negative	1	15,20	26,60	RAL-882	*Juan*	negative	3	23,19	26,95
RAL-882	*412*	negative	1	19,41	26,60	RAL-882	*copia*	negative	2	15,33	27,12	RAL-882	*Juan*	negative	4	23,14	27,22
RAL-882	*412*	negative	2	19,15	27,12	RAL-882	*copia*	negative	3	15,54	27,10	RAL-882	*Juan*	negative	5	22,72	27,18
RAL-882	*412*	negative	3	19,37	27,10	RAL-882	*copia*	negative	4	15,62	27,29	RAL-882	*Juan*	negative	6	22,83	27,05
RAL-882	*412*	negative	4	18,92	27,29	RAL-882	*copia*	negative	5	15,49	27,27	RAL-882	*Juan*	negative	7	23,12	26,87
RAL-882	*412*	negative	5	18,99	27,27	RAL-882	*copia*	negative	6	15,21	27,25	RAL-882	*Juan*	negative	8	23,06	27,88
RAL-882	*412*	negative	6	18,89	27,25	RAL-882	*copia*	negative	7	15,31	27,12	RAL-882	*Juan*	positive	1	22,93	26,47
RAL-882	*412*	negative	7	19,03	27,12	RAL-882	*copia*	negative	8	15,30	27,96	RAL-882	*Juan*	positive	2	22,55	26,38
RAL-882	*412*	negative	8	19,01	27,96	RAL-882	*copia*	positive	1	15,06	26,94	RAL-882	*Juan*	positive	3	22,56	26,69
RAL-882	*412*	positive	1	19,12	26,94	RAL-882	*copia*	positive	2	14,91	26,68	RAL-882	*Juan*	positive	4	22,65	26,97
RAL-882	*412*	positive	2	18,63	26,68	RAL-882	*copia*	positive	3	15,11	27,07	RAL-882	*Juan*	positive	5	22,68	26,81
RAL-882	*412*	positive	3	18,65	27,07	RAL-882	*copia*	positive	4	15,30	27,20	RAL-882	*Juan*	positive	6	22,88	27,27
RAL-882	*412*	positive	4	18,54	27,20	RAL-882	*copia*	positive	5	15,33	27,16	RAL-882	*Juan*	positive	7	23,32	27,14
RAL-882	*412*	positive	5	18,55	27,16	RAL-882	*copia*	positive	6	14,92	27,54	RAL-882	*Juan*	positive	8	23,00	27,09
RAL-882	*412*	positive	6	18,61	27,54	RAL-882	*copia*	positive	7	15,60	27,45	RAL-882	*mdg1*	negative	1	23,25	26,15
RAL-882	*412*	positive	7	19,19	27,45	RAL-882	*copia*	positive	8	15,52	27,27	RAL-882	*mdg1*	negative	2	23,29	26,89
RAL-882	*412*	positive	8	19,53	27,27	RAL-882	*Cr1a*	negative	1	24,73	26,60	RAL-882	*mdg1*	negative	3	23,54	26,95
RAL-882	*1360*	negative	1	25,90	26,60	RAL-882	*Cr1a*	negative	2	23,43	27,12	RAL-882	*mdg1*	negative	4	23,44	27,22
RAL-882	*1360*	negative	2	25,87	27,12	RAL-882	*Cr1a*	negative	3	24,55	27,10	RAL-882	*mdg1*	negative	5	23,20	27,18
RAL-882	*1360*	negative	3	26,04	27,10	RAL-882	*Cr1a*	negative	4	24,23	27,29	RAL-882	*mdg1*	negative	6	23,09	27,05
RAL-882	*1360*	negative	4	25,75	27,29	RAL-882	*Cr1a*	negative	5	24,73	27,27	RAL-882	*mdg1*	negative	7	23,49	26,87
RAL-882	*1360*	negative	5	25,63	27,27	RAL-882	*Cr1a*	negative	6	22,93	27,25	RAL-882	*mdg1*	negative	8	23,65	27,88
RAL-882	*1360*	negative	6	25,50	27,25	RAL-882	*Cr1a*	negative	7	24,35	27,12	RAL-882	*mdg1*	positive	1	22,78	26,47
RAL-882	*1360*	negative	7	25,91	27,12	RAL-882	*Cr1a*	negative	8	24,57	27,96	RAL-882	*mdg1*	positive	2	22,93	26,38
RAL-882	*1360*	negative	8	26,23	27,96	RAL-882	*Cr1a*	positive	1	24,13	26,94	RAL-882	*mdg1*	positive	3	23,14	26,69
RAL-882	*1360*	positive	1	25,55	26,94	RAL-882	*Cr1a*	positive	2	23,11	26,68	RAL-882	*mdg1*	positive	4	22,75	26,97
RAL-882	*1360*	positive	2	25,19	26,68	RAL-882	*Cr1a*	positive	3	24,50	27,07	RAL-882	*mdg1*	positive	5	22,78	26,81
RAL-882	*1360*	positive	3	25,37	27,07	RAL-882	*Cr1a*	positive	4	24,16	27,20	RAL-882	*mdg1*	positive	6	23,06	27,27
RAL-882	*1360*	positive	4	25,15	27,20	RAL-882	*Cr1a*	positive	5	24,53	27,16	RAL-882	*mdg1*	positive	7	23,50	27,14
RAL-882	*1360*	positive	5	25,49	27,16	RAL-882	*Cr1a*	positive	6	23,98	27,54	RAL-882	*mdg1*	positive	8	23,53	27,09
RAL-882	*1360*	positive	6	25,28	27,54	RAL-882	*Cr1a*	positive	7	24,51	27,45	RAL-882	*opus*	negative	1	27,64	26,15
RAL-882	*1360*	positive	7	25,92	27,45	RAL-882	*Cr1a*	positive	8	24,78	27,27	RAL-882	*opus*	negative	2	25,35	26,89
RAL-882	*1360*	positive	8	26,33	27,27	RAL-882	*gypsy5*	negative	1	29,22	26,60	RAL-882	*opus*	negative	3	27,00	26,95
RAL-882	*blastopia*	negative	1	28,31	26,60	RAL-882	*gypsy5*	negative	2	28,88	27,12	RAL-882	*opus*	negative	4	26,61	27,22
RAL-882	*blastopia*	negative	2	26,12	27,12	RAL-882	*gypsy5*	negative	3	29,28	27,10	RAL-882	*opus*	negative	5	27,35	27,18
RAL-882	*blastopia*	negative	3	27,29	27,10	RAL-882	*gypsy5*	negative	4	29,07	27,29	RAL-882	*opus*	negative	6	24,93	27,05
RAL-882	*blastopia*	negative	4	26,79	27,29	RAL-882	*gypsy5*	negative	5	29,30	27,27	RAL-882	*opus*	negative	7	27,16	26,87
RAL-882	*blastopia*	negative	5	27,53	27,27	RAL-882	*gypsy5*	negative	6	28,49	27,25	RAL-882	*opus*	negative	8	27,49	27,88
RAL-882	*blastopia*	negative	6	25,46	27,25	RAL-882	*gypsy5*	negative	7	29,42	27,12	RAL-882	*opus*	positive	1	26,47	26,47
RAL-882	*blastopia*	negative	7	27,67	27,12	RAL-882	*gypsy5*	negative	8	28,88	27,96	RAL-882	*opus*	positive	2	25,20	26,38
RAL-882	*blastopia*	negative	8	27,32	27,96	RAL-882	*gypsy5*	positive	1	28,72	26,94	RAL-882	*opus*	positive	3	27,91	26,69
RAL-882	*blastopia*	positive	1	27,23	26,94	RAL-882	*gypsy5*	positive	2	28,49	26,68	RAL-882	*opus*	positive	4	26,72	26,97
RAL-882	*blastopia*	positive	2	25,98	26,68	RAL-882	*gypsy5*	positive	3	29,10	27,07	RAL-882	*opus*	positive	5	27,49	26,81
RAL-882	*blastopia*	positive	3	28,12	27,07	RAL-882	*gypsy5*	positive	4	29,00	27,20	RAL-882	*opus*	positive	6	26,44	27,27
RAL-882	*blastopia*	positive	4	27,17	27,20	RAL-882	*gypsy5*	positive	5	29,32	27,16	RAL-882	*opus*	positive	7	27,16	27,14
RAL-882	*blastopia*	positive	5	27,70	27,16	RAL-882	*gypsy5*	positive	6	29,15	27,54	RAL-882	*opus*	positive	8	27,62	27,09
RAL-882	*blastopia*	positive	6	27,05	27,54	RAL-882	*gypsy5*	positive	7	29,02	27,45	RAL-882	*P-element*	negative	1	21,26	26,15
RAL-882	*blastopia*	positive	7	27,93	27,45	RAL-882	*gypsy5*	positive	8	28,23	27,27	RAL-882	*P-element*	negative	2	21,23	26,89
RAL-882	*blastopia*	positive	8	27,69	27,27	RAL-882	*Idefix*	negative	1	24,28	26,15	RAL-882	*P-element*	negative	3	21,68	26,95
RAL-882	*blood*	negative	1	23,18	26,60	RAL-882	*Idefix*	negative	2	24,37	26,89	RAL-882	*P-element*	negative	4	21,60	27,22
RAL-882	*blood*	negative	2	23,07	27,12	RAL-882	*Idefix*	negative	3	24,65	26,95	RAL-882	*P-element*	negative	5	21,57	27,18
RAL-882	*blood*	negative	3	23,02	27,10	RAL-882	*Idefix*	negative	4	24,55	27,22	RAL-882	*P-element*	negative	6	21,25	27,05

RAL-882	*P-element*	negative	7	21,33	26,87
RAL-882	*P-element*	negative	8	21,00	27,88
RAL-882	*P-element*	positive	1	20,75	26,47
RAL-882	*P-element*	positive	2	20,86	26,38
RAL-882	*P-element*	positive	3	21,10	26,69
RAL-882	*P-element*	positive	4	21,14	26,97
RAL-882	*P-element*	positive	5	21,16	26,81
RAL-882	*P-element*	positive	6	21,32	27,27
RAL-882	*P-element*	positive	7	21,50	27,14
RAL-882	*P-element*	positive	8	20,79	27,09
RAL-882	*pogo*	negative	1	23,51	26,15
RAL-882	*pogo*	negative	2	23,62	26,89
RAL-882	*pogo*	negative	3	23,97	26,95
RAL-882	*pogo*	negative	4	23,95	27,22
RAL-882	*pogo*	negative	5	23,95	27,18
RAL-882	*pogo*	negative	6	23,35	27,05
RAL-882	*pogo*	negative	7	23,74	26,87
RAL-882	*pogo*	negative	8	23,84	27,88
RAL-882	*pogo*	positive	1	23,24	26,47
RAL-882	*pogo*	positive	2	23,24	26,38
RAL-882	*pogo*	positive	3	23,62	26,69
RAL-882	*pogo*	positive	4	23,55	26,97
RAL-882	*pogo*	positive	5	23,56	26,81
RAL-882	*pogo*	positive	6	23,45	27,27
RAL-882	*pogo*	positive	7	23,80	27,14
RAL-882	*pogo*	positive	8	23,90	27,09
RAL-882	*Quasimodo*	negative	1	26,28	26,15
RAL-882	*Quasimodo*	negative	2	25,85	26,89
RAL-882	*Quasimodo*	negative	3	26,32	26,95
RAL-882	*Quasimodo*	negative	4	26,04	27,22
RAL-882	*Quasimodo*	negative	5	26,45	27,18
RAL-882	*Quasimodo*	negative	6	25,06	27,05
RAL-882	*Quasimodo*	negative	7	26,43	26,87
RAL-882	*Quasimodo*	negative	8	26,43	27,88
RAL-882	*Quasimodo*	positive	1	25,69	26,47
RAL-882	*Quasimodo*	positive	2	25,16	26,38
RAL-882	*Quasimodo*	positive	3	26,13	26,69
RAL-882	*Quasimodo*	positive	4	25,88	26,97
RAL-882	*Quasimodo*	positive	5	26,09	26,81
RAL-882	*Quasimodo*	positive	6	26,09	27,27
RAL-882	*Quasimodo*	positive	7	26,37	27,14
RAL-882	*Quasimodo*	positive	8	26,22	27,09

Supplementary Table S2.3: Statistical significance of TE expression differences with *Wolbachia*				
TE	**DGRP**	**ANOVA (F-value)**	**ANOVA (p-value)**	**Kurskal-Wallis (p-value)**
412	RAL-136	1,219	0,290	0,083
412	RAL-142	3,418	0,086	0,059
412	RAL-149	3,339	0,095	0,063
412	RAL-181	5,786	0,031	0,027
412	RAL-21	7,363	0,018	0,037
412	RAL-237	0,932	0,351	0,916
412	RAL-280	1,535	0,236	0,529
412	RAL-320	2,595	0,130	0,036
412	RAL-321	0,159	0,696	0,916
412	RAL-338	0,01	0,923	0,916
412	RAL-352	3,494	0,083	0,142
412	RAL-370	0,875	0,365	0,529
412	RAL-374	0,214	0,651	1,000
412	RAL-440	2,832	0,116	0,133
412	RAL-441	1,202	0,291	0,294
412	RAL-535	2,567	0,131	0,115
412	RAL-595	0,751	0,401	0,294
412	RAL-69	0,414	0,530	0,600
412	RAL-712	7,522	0,016	0,012
412	RAL-737	13,14	0,003	0,001
412	RAL-738	2,97	0,107	0,142
412	RAL-801	0,046	0,833	0,916
412	RAL-820	3,602	0,079	0,046
412	RAL-855	0,871	0,366	0,462
412	RAL-882	0,704	0,416	0,462
1360	RAL-136	0,547	0,474	0,302
1360	RAL-142	0,035	0,854	0,753
1360	RAL-149	1,109	0,315	0,668
1360	RAL-181	13,42	0,003	0,009
1360	RAL-21	9,22	0,009	0,009
1360	RAL-237	0,525	0,481	0,529
1360	RAL-280	0,628	0,443	0,338
1360	RAL-320	0,566	0,464	0,916
1360	RAL-321	1,421	0,256	0,225
1360	RAL-338	2,416	0,144	0,165
1360	RAL-352	3,669	0,076	0,074
1360	RAL-370	1,098	0,314	0,418
1360	RAL-374	2,256	0,155	0,142
1360	RAL-440	0,379	0,548	0,462
1360	RAL-441	0,045	0,835	0,834
1360	RAL-535	0,005	0,946	0,753
1360	RAL-595	0,124	0,730	0,600
1360	RAL-69	0,009	0,925	1,000
1360	RAL-712	9,113	0,009	0,012
1360	RAL-737	10,94	0,005	0,012
1360	RAL-738	1,993	0,180	0,345
1360	RAL-801	1,261	0,280	0,345
1360	RAL-820	3,819	0,071	0,115
1360	RAL-855	0,079	0,783	0,462
1360	RAL-882	1,825	0,198	0,345
blastopia	RAL-136	0,359	0,559	0,817
blastopia	RAL-142	0,108	0,748	0,729
blastopia	RAL-149	1,496	0,245	0,482
blastopia	RAL-181	33,35	0,000	0,001
blastopia	RAL-21	2,186	0,161	0,172
blastopia	RAL-237	0,486	0,497	0,248
blastopia	RAL-280	0,068	0,798	0,674

blastopia	RAL-320	0,026	0,874	0,462
blastopia	RAL-321	11,81	0,004	0,005
blastopia	RAL-338	12,51	0,003	0,009
blastopia	RAL-352	0,106	0,750	0,908
blastopia	RAL-370	0,168	0,688	1,000
blastopia	RAL-374	0	0,995	0,674
blastopia	RAL-440	3,82	0,073	0,083
blastopia	RAL-441	1,03	0,327	0,401
blastopia	RAL-535	0,258	0,620	0,401
blastopia	RAL-595	3,587	0,081	0,133
blastopia	RAL-69	30,12	0,000	0,002
blastopia	RAL-712	6,82	0,021	0,005
blastopia	RAL-737	0,164	0,692	1,000
blastopia	RAL-738	0,012	0,913	0,674
blastopia	RAL-801	0,762	0,399	0,563
blastopia	RAL-820	0,171	0,686	0,529
blastopia	RAL-855	0,874	0,366	0,294
blastopia	RAL-882	0,659	0,430	0,345
blood	RAL-136	1,993	0,186	0,199
blood	RAL-142	5,936	0,029	0,036
blood	RAL-149	3,155	0,101	0,110
blood	RAL-181	3,757	0,073	0,115
blood	RAL-21	13,34	0,003	0,009
blood	RAL-237	3,813	0,071	0,345
blood	RAL-280	0,667	0,428	0,916
blood	RAL-320	3,576	0,080	0,046
blood	RAL-321	6,269	0,025	0,027
blood	RAL-338	0,737	0,406	0,355
blood	RAL-352	0,571	0,462	0,462
blood	RAL-370	3,852	0,070	0,003
blood	RAL-374	1,937	0,186	0,172
blood	RAL-440	3,1	0,104	0,110
blood	RAL-441	0,383	0,546	0,674
blood	RAL-535	0,119	0,735	0,529
blood	RAL-595	30,79	0,000	0,001
blood	RAL-69	0,128	0,726	0,817
blood	RAL-712	9,342	0,009	0,015
blood	RAL-737	0,386	0,546	0,949
blood	RAL-738	2,08	0,171	0,294
blood	RAL-801	0,109	0,746	0,834
blood	RAL-820	0,657	0,431	0,674
blood	RAL-855	3,552	0,080	0,074
blood	RAL-882	8,462	0,011	0,009
copia	RAL-136	0,133	0,722	0,488
copia	RAL-142	1,573	0,230	0,248
copia	RAL-149	1,83	0,201	0,110
copia	RAL-181	2,986	0,106	0,115
copia	RAL-21	0,419	0,529	0,355
copia	RAL-237	0	0,988	0,093
copia	RAL-280	0,011	0,916	0,643
copia	RAL-320	0,889	0,362	0,529
copia	RAL-321	1,065	0,320	0,345
copia	RAL-338	4,693	0,048	0,046
copia	RAL-352	0,918	0,354	0,401
copia	RAL-370	1,06	0,321	1,000
copia	RAL-374	1,786	0,204	0,298
copia	RAL-440	3,419	0,087	0,083
copia	RAL-441	0,715	0,412	0,401
copia	RAL-535	0,275	0,608	0,834
copia	RAL-595	1,467	0,246	0,294
copia	RAL-69	0,556	0,468	0,600
copia	RAL-712	14,03	0,002	0,005
copia	RAL-737	13,69	0,002	0,005

copia	RAL-738	1,42	0,253	0,248
copia	RAL-801	0,049	0,827	0,834
copia	RAL-820	3,57	0,080	0,059
copia	RAL-855	5,242	0,038	0,093
copia	RAL-882	0,434	0,521	0,208
Cr1a	RAL-136	6,023	0,029	0,028
Cr1a	RAL-142	4,99	0,042	0,027
Cr1a	RAL-149	0,741	0,406	0,482
Cr1a	RAL-181	31,8	0,000	0,001
Cr1a	RAL-21	6,37	0,024	0,036
Cr1a	RAL-237	1,267	0,279	0,093
Cr1a	RAL-280	0,434	0,521	0,674
Cr1a	RAL-320	0,264	0,616	0,462
Cr1a	RAL-321	11,77	0,004	0,005
Cr1a	RAL-338	6,879	0,020	0,021
Cr1a	RAL-352	1,09	0,314	0,248
Cr1a	RAL-370	0,923	0,354	0,298
Cr1a	RAL-374	0,711	0,413	0,674
Cr1a	RAL-440	2,14	0,167	0,247
Cr1a	RAL-441	0,043	0,839	0,753
Cr1a	RAL-535	1,082	0,316	0,401
Cr1a	RAL-595	3,252	0,093	0,046
Cr1a	RAL-69	0,036	0,851	1,000
Cr1a	RAL-712	6,821	0,021	0,005
Cr1a	RAL-737	0,165	0,690	0,600
Cr1a	RAL-738	0,264	0,616	0,817
Cr1a	RAL-801	0,277	0,607	0,916
Cr1a	RAL-820	4,444	0,054	0,036
Cr1a	RAL-855	0,262	0,617	0,916
Cr1a	RAL-882	0,057	0,815	0,916
gypsy5	RAL-136	0,005	0,947	0,366
gypsy5	RAL-142	2,664	0,125	0,046
gypsy5	RAL-149	0,11	0,746	0,848
gypsy5	RAL-181	22,97	0,000	0,002
gypsy5	RAL-21	7,644	0,016	0,011
gypsy5	RAL-237	0	0,997	0,529
gypsy5	RAL-280	12,03	0,004	0,003
gypsy5	RAL-320	2,896	0,113	0,133
gypsy5	RAL-321	3,773	0,074	0,105
gypsy5	RAL-338	9,555	0,008	0,012
gypsy5	RAL-352	3,216	0,095	0,093
gypsy5	RAL-370	0,387	0,545	0,817
gypsy5	RAL-374	0,266	0,614	0,674
gypsy5	RAL-440	1,4	0,260	0,338
gypsy5	RAL-441	0,142	0,712	0,834
gypsy5	RAL-535	0,4	0,538	0,488
gypsy5	RAL-595	0,92	0,354	0,294
gypsy5	RAL-69	0,805	0,385	0,401
gypsy5	RAL-712	0,58	0,459	0,294
gypsy5	RAL-737	6,492	0,023	0,036
gypsy5	RAL-738	0,21	0,654	0,729
gypsy5	RAL-801	0	0,999	0,418
gypsy5	RAL-820	0,861	0,370	0,563
gypsy5	RAL-855	1,012	0,331	0,529
gypsy5	RAL-882	0,324	0,578	0,600
Idefix	RAL-136	0,352	0,562	0,916
Idefix	RAL-142	0,775	0,394	0,208
Idefix	RAL-149	1,635	0,222	0,248
Idefix	RAL-181	10,26	0,007	0,015
Idefix	RAL-21	7,072	0,020	0,021
Idefix	RAL-237	0,018	0,896	0,916
Idefix	RAL-280	0,048	0,829	0,401
Idefix	RAL-320	0,115	0,740	0,753

Idefix	RAL-321	7,156	0,020	0,039
Idefix	RAL-338	0,816	0,382	0,600
Idefix	RAL-352	0,088	0,771	1,000
Idefix	RAL-370	1,795	0,202	0,036
Idefix	RAL-374	0,009	0,926	0,834
Idefix	RAL-440	2,031	0,178	0,133
Idefix	RAL-441	2,531	0,134	0,172
Idefix	RAL-535	0,099	0,757	0,600
Idefix	RAL-595	0,003	0,956	0,749
Idefix	RAL-69	1,286	0,276	0,345
Idefix	RAL-712	1,353	0,264	0,294
Idefix	RAL-737	10,64	0,006	0,012
Idefix	RAL-738	0,02	0,889	0,753
Idefix	RAL-801	0,015	0,905	0,753
Idefix	RAL-820	5,006	0,043	0,064
Idefix	RAL-855	1,817	0,201	0,298
Idefix	RAL-882	1,453	0,249	0,105
Juan	RAL-136	0,005	0,947	0,462
Juan	RAL-142	0,745	0,404	0,563
Juan	RAL-149	7,74	0,016	0,011
Juan	RAL-181	0,242	0,630	0,834
Juan	RAL-21	7,201	0,018	0,021
Juan	RAL-237	0,096	0,761	0,753
Juan	RAL-280	0,002	0,964	0,674
Juan	RAL-320	0,139	0,715	0,753
Juan	RAL-321	0,208	0,657	0,606
Juan	RAL-338	0,129	0,724	0,674
Juan	RAL-352	0,178	0,680	0,916
Juan	RAL-370	1,378	0,260	0,401
Juan	RAL-374	3,187	0,096	0,093
Juan	RAL-440	5,446	0,036	0,064
Juan	RAL-441	0,307	0,588	0,600
Juan	RAL-535	0,103	0,754	1,000
Juan	RAL-595	0,188	0,671	0,834
Juan	RAL-69	0,287	0,601	0,345
Juan	RAL-712	9,667	0,008	0,016
Juan	RAL-737	0,417	0,529	0,916
Juan	RAL-738	0,158	0,697	0,916
Juan	RAL-801	1,023	0,329	0,248
Juan	RAL-820	0,025	0,876	0,908
Juan	RAL-855	0,536	0,476	0,345
Juan	RAL-882	0,028	0,868	0,674
mdg1	RAL-136	0,001	0,980	0,600
mdg1	RAL-142	2,3	0,153	0,203
mdg1	RAL-149	1,596	0,227	0,208
mdg1	RAL-181	6,807	0,021	0,021
mdg1	RAL-21	14,68	0,002	0,003
mdg1	RAL-237	0,424	0,526	0,208
mdg1	RAL-280	0,068	0,798	1,000
mdg1	RAL-320	0,104	0,752	0,462
mdg1	RAL-321	10,65	0,006	0,005
mdg1	RAL-338	0,007	0,936	0,834
mdg1	RAL-352	0,419	0,528	0,834
mdg1	RAL-370	4,744	0,047	0,005
mdg1	RAL-374	3,081	0,101	0,115
mdg1	RAL-440	5,08	0,042	0,028
mdg1	RAL-441	1,599	0,227	0,208
mdg1	RAL-535	0,022	0,885	0,834
mdg1	RAL-595	0,594	0,454	0,462
mdg1	RAL-69	0,61	0,449	0,298
mdg1	RAL-712	7,658	0,016	0,015
mdg1	RAL-737	0,48	0,500	0,643
mdg1	RAL-738	6,065	0,027	0,027

mdg1	RAL-801	2,369	0,146	0,115
mdg1	RAL-820	12,35	0,004	0,007
mdg1	RAL-855	1,762	0,206	0,345
mdg1	RAL-882	0,447	0,514	0,529
opus	RAL-136	0,109	0,746	0,600
opus	RAL-142	5,712	0,033	0,037
opus	RAL-149	0,396	0,539	0,753
opus	RAL-181	1,659	0,219	0,208
opus	RAL-21	6,745	0,022	0,037
opus	RAL-237	0,585	0,457	0,115
opus	RAL-280	11,41	0,005	0,016
opus	RAL-320	5,609	0,033	0,036
opus	RAL-321	15,88	0,001	0,002
opus	RAL-338	0,638	0,438	0,529
opus	RAL-352	0,589	0,456	0,674
opus	RAL-370	0,948	0,347	0,529
opus	RAL-374	1,292	0,276	0,488
opus	RAL-440	0,944	0,348	0,208
opus	RAL-441	0,438	0,519	0,462
opus	RAL-535	0,192	0,668	0,600
opus	RAL-595	4,743	0,047	0,059
opus	RAL-69	0,155	0,700	1,000
opus	RAL-712	3,599	0,079	0,036
opus	RAL-737	0,293	0,597	0,462
opus	RAL-738	0,318	0,582	0,674
opus	RAL-801	0,186	0,673	0,753
opus	RAL-820	1,464	0,248	0,643
opus	RAL-855	0,163	0,692	1,000
opus	RAL-882	0,534	0,477	0,600
P-element	RAL-136	1,724	0,210	0,142
P-element	RAL-142	0,087	0,772	0,462
P-element	RAL-149	3,926	0,068	0,046
P-element	RAL-181	6,405	0,024	0,021
P-element	RAL-21	22,29	0,000	0,002
P-element	RAL-237	0,307	0,588	0,753
P-element	RAL-280	1,365	0,262	0,345
P-element	RAL-320	0,029	0,866	0,115
P-element	RAL-321	14,04	0,002	0,009
P-element	RAL-338	1,632	0,222	0,462
P-element	RAL-352	1,164	0,299	0,248
P-element	RAL-370	2,658	0,125	0,074
P-element	RAL-374	0,915	0,355	0,462
P-element	RAL-440	3,288	0,093	0,083
P-element	RAL-441	0,61	0,448	0,345
P-element	RAL-535	21	0,000	0,002
P-element	RAL-595	0,149	0,705	0,916
P-element	RAL-69	0,075	0,788	0,600
P-element	RAL-712	25,25	0,000	0,002
P-element	RAL-737	1,097	0,313	0,462
P-element	RAL-738	1,679	0,216	0,142
P-element	RAL-801	0,906	0,357	0,345
P-element	RAL-820	3,309	0,092	0,049
P-element	RAL-855	8,21	0,012	0,027
P-element	RAL-882	0,404	0,536	0,172
pogo	RAL-136	1,163	0,299	0,046
pogo	RAL-142	0,045	0,835	0,165
pogo	RAL-149	1,574	0,230	0,172
pogo	RAL-181	4,178	0,060	0,074
pogo	RAL-21	27,02	0,000	0,001
pogo	RAL-237	0,002	0,969	0,834
pogo	RAL-280	0,678	0,424	0,834
pogo	RAL-320	0,215	0,650	0,834
pogo	RAL-321	2,185	0,163	0,133

pogo	RAL-338	0,937	0,350	0,248
pogo	RAL-352	0,911	0,356	0,345
pogo	RAL-370	5,254	0,038	0,093
pogo	RAL-374	6,547	0,023	0,012
pogo	RAL-440	1,768	0,208	0,338
pogo	RAL-441	0,203	0,659	0,674
pogo	RAL-535	0,471	0,504	0,600
pogo	RAL-595	0,84	0,375	0,345
pogo	RAL-69	0,032	0,805	0,401
pogo	RAL-712	8,519	0,011	0,027
pogo	RAL-737	0,516	0,484	0,345
pogo	RAL-738	2,517	0,135	0,172
pogo	RAL-801	0,708	0,414	0,401
pogo	RAL-820	3,318	0,092	0,203
pogo	RAL-855	3,584	0,079	0,115
pogo	RAL-882	0,04	0,845	0,753
Quasimodo	RAL-136	11,3	0,005	0,003
Quasimodo	RAL-142	5,764	0,032	0,015
Quasimodo	RAL-149	0,393	0,541	0,462
Quasimodo	RAL-181	0,219	0,647	1,000
Quasimodo	RAL-21	11,98	0,004	0,005
Quasimodo	RAL-237	2,094	0,170	0,036
Quasimodo	RAL-280	0,203	0,659	0,834
Quasimodo	RAL-320	2,75	0,120	0,172
Quasimodo	RAL-321	11,05	0,005	0,002
Quasimodo	RAL-338	5,687	0,032	0,046
Quasimodo	RAL-352	0,107	0,749	0,674
Quasimodo	RAL-370	0,2	0,662	0,753
Quasimodo	RAL-374	0,812	0,383	0,674
Quasimodo	RAL-440	3,36	0,088	0,093
Quasimodo	RAL-441	2,05	0,174	0,093
Quasimodo	RAL-535	0,207	0,656	0,834
Quasimodo	RAL-595	8,024	0,013	0,009
Quasimodo	RAL-69	0,262	0,618	0,247
Quasimodo	RAL-712	1,007	0,333	0,834
Quasimodo	RAL-737	1,297	0,274	0,208
Quasimodo	RAL-738	0,001	0,973	0,834
Quasimodo	RAL-801	0,039	0,846	0,248
Quasimodo	RAL-820	0	0,986	1,000
Quasimodo	RAL-855	0,093	0,765	0,916
Quasimodo	RAL-882	0,004	0,952	0,834

Supplementary Table S2.4: Primers				
TE	**Forward primer (5' – 3')**	**Reverse primer (5' – 3')**	**Reference**	**Efficiency (%)**
412	TCATAACGGACATGGGAACA	CCAACTGTCTGGTGGTGATG	designed in Primer3	100,67748
1360	TCTAGCACAACACGCACACT	GTGACGGCCAAAATTGCTGT	designed in Primer3	93,28801353
blastopia	GAGCAGTCAATCGTCCGTAA	TCTATAGTCCACGCAAACGC	Chen et al. 2016	98,65437494
blood	AACAATAGAAAGAAGCCACCGAA	AGTCATGGACTATTGAGGGTGTT	Handler et al. 2011	96,64238427
copia	TGCCAGAGAGCAAGTTCAGA	GCAAACCCAATTTGTCTCGT	designed in Primer3	100,2605663
Cr1a	TGGCCGTACAAGTGATGACC	TCATCTCGTTCGCAACCACA	designed in Primer3	97,33446929
gypsy 5	GCCCAGAGACAACGACAGAA	CTGTCTTTGCTGTCCCGGAT	designed in Primer3	95,32455343
H-element	CATTAAGTCGGAAGGCCAAA	CTTGCTCTTCCGCTATCCAC	designed in Primer3	NA (not used in qPCR/Pfaffl method)
Idefix	CGCTCTAGTGGACAGAACCA	TGAAATGAGGCATTTGGGTA	Chen et al. 2016	104,9522518
jockey	GCGGATTAACAAGGGGCTCT	CCTGGGAGATAGATGCGCTG	designed in Primer3	NA (not used in qPCR/Pfaffl method)
Juan	GGGGCAAAATTCTCAATGAA	GCGGAATATATGTGGGTTGC	designed in Primer3	104,4958212
mdg1	GTCAGAAGGAGGCCATTCAGGAA	GTTGCTGGCGGTTTCTGTTATTG	Navarro et al. 2009	91,87285071
opus	CGAGGAGTGGGGAGAGATT	TGCGAAAATCTGCCTGAACC	Specchia et al. 2010	101,4399028
P-element	TGAGTGCTCGCAACCTTATG	TTTGAAATGGGAGCCTTTTG	designed in Primer3	94,08570477
pogo	CCAGCGATAACGAAGAAAGC	GCTGCAAACCCATCCTTAAA	designed in Primer3	105,4403078
Quasimodo	TCTACAGTGCCATCGAGAGG	TAGTTCAGCCCAAGTGTTGC	Chen et al. 2016	100,8172005
Gene				
actin	GCGTCGGTCAATTCAATCTT	AAGCTGCAACCTCTTCGCA	Ponton et al. 2011	NA (not used in qPCR/Pfaffl method)
EF1	GCGTGGGTTTGTGATCAGTT	GATCTTCTCCTTGCCCATCC	Ponton et al. 2011	98,0965242
RPL32	ATGCTAAGCTGTCGCACAAATG	GTTCGATCCGTAACCGATGT	designed in Primer3	NA (not used in qPCR/Pfaffl method)
wsp	TGGTCCAATAAGTGATGAAGAAAC	AAAAATTAAACGCTACTCCA	Teixeira et a. 2008	NA (not used in qPCR/Pfaffl method)

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Supplementary Table S2.5: Effect size								
DGRP	**TE**	**raw Effect Size**	**DGRP**	**TE**	**raw Effect Size**	**DGRP**	**TE**	**raw Effect Size**
RAL-136	*blastopia*	0,101443112	RAL-21	*Idefix*	1,324265324	RAL-321	*pogo*	0,378251948
RAL-136	*blood*	-0,250562851	RAL-21	*juan*	1,131695752	RAL-321	*Quasimodo*	1,398504502
RAL-136	*copia*	0,069917289	RAL-21	*mdg1*	1,552316362	RAL-321	*1360*	0,32374483
RAL-136	*Cr1a*	0,384201296	RAL-21	*opus*	1,396077224	RAL-321	*412*	0,078806914
RAL-136	*gypsy5*	0,010550238	RAL-21	*P-element*	1,449273232	RAL-338	*blastopia*	0,411263508
RAL-136	*Idefix*	0,084705924	RAL-21	*pogo*	1,096255552	RAL-338	*blood*	0,176482543
RAL-136	*juan*	0,010304004	RAL-21	*Quasimodo*	1,529078183	RAL-338	*copia*	0,612773247
RAL-136	*mdg1*	0,004587436	RAL-21	*1360*	1,277477145	RAL-338	*Cr1a*	-0,319548837
RAL-136	*opus*	0,046447613	RAL-21	*412*	1,163191756	RAL-338	*gypsy5*	0,936497934
RAL-136	*P-element*	-0,245109375	RAL-237	*blastopia*	0,339182474	RAL-338	*Idefix*	0,249991902
RAL-136	*pogo*	-0,19569933	RAL-237	*blood*	-0,548438686	RAL-338	*juan*	0,077200129
RAL-136	*Quasimodo*	0,533220774	RAL-237	*copia*	-0,010466674	RAL-338	*mdg1*	0,019300348
RAL-136	*1360*	-0,147424419	RAL-237	*Cr1a*	0,535998797	RAL-338	*opus*	0,131843099
RAL-136	*412*	-0,250170113	RAL-237	*gypsy5*	-0,001123997	RAL-338	*P-element*	-0,259048377
RAL-142	*blastopia*	-0,057745933	RAL-237	*Idefix*	0,076768056	RAL-338	*pogo*	0,209375141
RAL-142	*blood*	-0,345026391	RAL-237	*juan*	-0,063122779	RAL-338	*Quasimodo*	-0,337692439
RAL-142	*copia*	-0,258478201	RAL-237	*mdg1*	0,196911988	RAL-338	*1360*	-0,261406279
RAL-142	*Cr1a*	-0,251194232	RAL-237	*opus*	0,279228088	RAL-338	*412*	0,022191719
RAL-142	*gypsy5*	-0,220196058	RAL-237	*P-element*	-0,148015451	RAL-352	*blastopia*	-0,042949791
RAL-142	*Idefix*	-0,226329443	RAL-237	*pogo*	-0,010708638	RAL-352	*blood*	-0,214480852
RAL-142	*juan*	-0,240167995	RAL-237	*Quasimodo*	0,728562516	RAL-352	*copia*	-0,270025892
RAL-142	*mdg1*	-0,327785396	RAL-237	*1360*	0,208862552	RAL-352	*Cr1a*	-0,143886274
RAL-142	*opus*	-0,25674625	RAL-237	*412*	-0,376699122	RAL-352	*gypsy5*	-0,229852009
RAL-142	*P-element*	-0,074412563	RAL-280	*blastopia*	-0,043094074	RAL-352	*Idefix*	-0,048539249
RAL-142	*pogo*	-0,042758888	RAL-280	*blood*	-0,237975032	RAL-352	*juan*	-0,074562369
RAL-142	*Quasimodo*	-0,46138521	RAL-280	*copia*	-0,042004704	RAL-352	*mdg1*	0,193907149
RAL-142	*1360*	-0,036180339	RAL-280	*Cr1a*	-0,116956177	RAL-352	*opus*	0,126480668
RAL-142	*412*	-0,371646881	RAL-280	*gypsy5*	-0,634859345	RAL-352	*P-element*	-0,35499911
RAL-149	*blastopia*	0,002652112	RAL-280	*Idefix*	-0,047987318	RAL-352	*pogo*	-0,209094854
RAL-149	*blood*	-0,533053076	RAL-280	*juan*	0,010529382	RAL-352	*Quasimodo*	-0,032679884
RAL-149	*copia*	-0,677636392	RAL-280	*mdg1*	-0,073027465	RAL-352	*1360*	-0,306010546
RAL-149	*Cr1a*	-0,127299045	RAL-280	*opus*	-0,49786044	RAL-352	*412*	-0,493893429
RAL-149	*gypsy5*	-0,034126861	RAL-280	*P-element*	-0,306039281	RAL-370	*blastopia*	0,095495475
RAL-149	*Idefix*	-0,348204962	RAL-280	*pogo*	-0,27257497	RAL-370	*blood*	0,872440345
RAL-149	*juan*	-0,828470424	RAL-280	*Quasimodo*	-0,097172325	RAL-370	*copia*	0,610859005
RAL-149	*mdg1*	-0,53640127	RAL-280	*1360*	-0,17121676	RAL-370	*Cr1a*	0,243624984
RAL-149	*opus*	0,08243548	RAL-280	*412*	-0,327640641	RAL-370	*gypsy5*	-0,05893098
RAL-149	*P-element*	-0,651955983	RAL-320	*blastopia*	0,048686759	RAL-370	*Idefix*	-0,495832361
RAL-149	*pogo*	-0,412781464	RAL-320	*blood*	-0,838274204	RAL-370	*juan*	0,402641753
RAL-149	*Quasimodo*	-0,125310355	RAL-320	*copia*	-0,63358083	RAL-370	*mdg1*	1,216529816
RAL-149	*1360*	-0,117195696	RAL-320	*Cr1a*	0,129550413	RAL-370	*opus*	0,246442943
RAL-149	*412*	-0,746808625	RAL-320	*gypsy5*	0,272516376	RAL-370	*P-element*	0,556940698
RAL-181	*blastopia*	-0,691641911	RAL-320	*Idefix*	-0,084620093	RAL-370	*pogo*	0,333083561
RAL-181	*blood*	-0,370890357	RAL-320	*juan*	-0,079397525	RAL-370	*Quasimodo*	0,08454899
RAL-181	*copia*	-0,344338241	RAL-320	*mdg1*	-0,140985822	RAL-370	*1360*	0,176306677
RAL-181	*Cr1a*	-0,611399831	RAL-320	*opus*	-0,493677368	RAL-370	*412*	0,37243468
RAL-181	*gypsy5*	-0,441345278	RAL-320	*P-element*	0,076880775	RAL-374	*blastopia*	-0,001093386
RAL-181	*Idefix*	-0,720518314	RAL-320	*pogo*	-0,126156242	RAL-374	*blood*	0,155278541
RAL-181	*juan*	-0,104976599	RAL-320	*Quasimodo*	-0,314294705	RAL-374	*copia*	0,247798912
RAL-181	*mdg1*	-0,385950118	RAL-320	*1360*	-0,222239188	RAL-374	*Cr1a*	-0,123891688
RAL-181	*opus*	0,105799405	RAL-320	*412*	-0,885751638	RAL-374	*gypsy5*	0,068550535
RAL-181	*P-element*	-0,377677397	RAL-321	*blastopia*	1,863115394	RAL-374	*Idefix*	0,017217208
RAL-181	*pogo*	-0,241815256	RAL-321	*blood*	0,435344524	RAL-374	*juan*	0,229569099
RAL-181	*Quasimodo*	-0,037828408	RAL-321	*copia*	-0,178048962	RAL-374	*mdg1*	-0,243739724
RAL-181	*1360*	-0,405610897	RAL-321	*Cr1a*	1,429115422	RAL-374	*opus*	0,332288747
RAL-181	*412*	-0,488413251	RAL-321	*gypsy5*	0,645915494	RAL-374	*P-element*	0,165881224
RAL-21	*blastopia*	0,671260946	RAL-321	*Idefix*	0,391916301	RAL-374	*pogo*	0,428664532
RAL-21	*blood*	0,983976016	RAL-321	*juan*	-0,065924704	RAL-374	*Quasimodo*	0,1826005
RAL-21	*copia*	-0,240247491	RAL-321	*mdg1*	0,633655156	RAL-374	*1360*	0,20199572
RAL-21	*Cr1a*	1,02066854	RAL-321	*opus*	1,764103321	RAL-374	*412*	-0,081028688
RAL-21	*gypsy5*	1,101821405	RAL-321	*P-element*	0,363820844	RAL-440	*blastopia*	1,257082003

RAL-440	*blood*	0,77556764	RAL-69	*opus*	0,04593987	RAL-820	*blood*	0,19358481
RAL-440	*copia*	0,99410903	RAL-69	*P-element*	-0,05824848	RAL-820	*copia*	0,45689026
RAL-440	*Cr1a*	0,9953542	RAL-69	*pogo*	-0,02881788	RAL-820	*Cr1a*	0,34739415
RAL-440	*gypsy5*	0,82503124	RAL-69	*Quasimodo*	-0,0775143	RAL-820	*gypsy5*	-0,16669187
RAL-440	*Idefix*	0,8572808	RAL-69	*1360*	0,02368065	RAL-820	*Idefix*	-0,50601387
RAL-440	*juan*	0,81108417	RAL-69	*412*	-0,16324303	RAL-820	*juan*	0,03843914
RAL-440	*mdg1*	0,87756977	RAL-712	*blastopia*	1,04238641	RAL-820	*mdg1*	1,82347163
RAL-440	*opus*	0,99442565	RAL-712	*blood*	0,99737247	RAL-820	*opus*	0,80663683
RAL-440	*P-element*	0,49862429	RAL-712	*copia*	1,13680102	RAL-820	*P-element*	0,49665278
RAL-440	*pogo*	0,51818684	RAL-712	*Cr1a*	0,95356125	RAL-820	*pogo*	0,57532381
RAL-440	*Quasimodo*	1,13488984	RAL-712	*gypsy5*	0,22111675	RAL-820	*Quasimodo*	-0,00282957
RAL-440	*1360*	0,23131016	RAL-712	*Idefix*	0,49268868	RAL-820	*1360*	0,39373224
RAL-440	*412*	0,69688816	RAL-712	*juan*	0,83670309	RAL-820	*412*	0,50437621
RAL-441	*blastopia*	-0,19209435	RAL-712	*mdg1*	1,01722453	RAL-855	*blastopia*	-0,15682449
RAL-441	*blood*	-0,32032835	RAL-712	*opus*	0,57112903	RAL-855	*blood*	-0,29395275
RAL-441	*copia*	0,54310568	RAL-712	*P-element*	1,28675615	RAL-855	*copia*	-0,43124759
RAL-441	*Cr1a*	-0,05108393	RAL-712	*pogo*	1,00964735	RAL-855	*Cr1a*	0,12467529
RAL-441	*gypsy5*	-0,0712164	RAL-712	*Quasimodo*	0,25547911	RAL-855	*gypsy5*	-0,1229962
RAL-441	*Idefix*	-0,37587172	RAL-712	*1360*	0,71872103	RAL-855	*Idefix*	-0,24365221
RAL-441	*juan*	-0,2315141	RAL-712	*412*	0,91471122	RAL-855	*juan*	-0,14770969
RAL-441	*mdg1*	-0,56341765	RAL-737	*blastopia*	0,08017277	RAL-855	*mdg1*	-0,23811277
RAL-441	*opus*	-0,12169179	RAL-737	*blood*	-0,11039264	RAL-855	*opus*	0,0767166
RAL-441	*P-element*	-0,32457691	RAL-737	*copia*	-0,84291813	RAL-855	*P-element*	-0,47942747
RAL-441	*pogo*	-0,17855575	RAL-737	*Cr1a*	0,10107889	RAL-855	*pogo*	-0,26072873
RAL-441	*Quasimodo*	-0,37350206	RAL-737	*gypsy5*	0,54093507	RAL-855	*Quasimodo*	-0,03985541
RAL-441	*1360*	-0,0579602	RAL-737	*Idefix*	0,53892994	RAL-855	*1360*	-0,05352299
RAL-441	*412*	-0,54246491	RAL-737	*juan*	0,12804789	RAL-855	*412*	-0,23774888
RAL-535	*blastopia*	-0,06059845	RAL-737	*mdg1*	0,14472726	RAL-882	*blastopia*	0,34448323
RAL-535	*blood*	-0,05714347	RAL-737	*opus*	-0,08618673	RAL-882	*blood*	-0,46885016
RAL-535	*copia*	0,09845406	RAL-737	*P-element*	0,26962535	RAL-882	*copia*	-0,10909239
RAL-535	*Cr1a*	-0,13164777	RAL-737	*pogo*	-0,16069582	RAL-882	*Cr1a*	0,07212756
RAL-535	*gypsy5*	0,10049749	RAL-737	*Quasimodo*	0,28826042	RAL-882	*gypsy5*	-0,13061247
RAL-535	*Idefix*	-0,05120898	RAL-737	*1360*	0,46581583	RAL-882	*Idefix*	-0,23144493
RAL-535	*juan*	0,04644811	RAL-737	*412*	-1,38224052	RAL-882	*juan*	-0,03427274
RAL-535	*mdg1*	-0,01804811	RAL-738	*blastopia*	0,01797336	RAL-882	*mdg1*	-0,12152321
RAL-535	*opus*	0,04892905	RAL-738	*blood*	-0,30481434	RAL-882	*opus*	0,35772714
RAL-535	*P-element*	-1,58992346	RAL-738	*copia*	-0,30986343	RAL-882	*P-element*	-0,14158842
RAL-535	*pogo*	0,10008463	RAL-738	*Cr1a*	0,22798909	RAL-882	*pogo*	-0,033982
RAL-535	*Quasimodo*	0,05708923	RAL-738	*gypsy5*	0,14649121	RAL-882	*Quasimodo*	0,01502149
RAL-535	*1360*	-0,00990052	RAL-738	*Idefix*	0,04778698	RAL-882	*1360*	-0,25279237
RAL-535	*412*	-0,26053377	RAL-738	*juan*	-0,06900409	RAL-882	*412*	-0,19614089
RAL-595	*blastopia*	0,28399959	RAL-738	*mdg1*	-0,51911753			
RAL-595	*blood*	-2,25856134	RAL-738	*opus*	0,26483808			
RAL-595	*copia*	-0,3971191	RAL-738	*P-element*	-0,31557977			
RAL-595	*Cr1a*	0,32717135	RAL-738	*pogo*	-0,42354896			
RAL-595	*gypsy5*	0,18404511	RAL-738	*Quasimodo*	-0,00901912			
RAL-595	*Idefix*	0,02276326	RAL-738	*1360*	-0,3064802			
RAL-595	*juan*	-0,09695882	RAL-738	*412*	-0,30255704			
RAL-595	*mdg1*	-0,2408775	RAL-801	*blastopia*	0,27788594			
RAL-595	*opus*	0,36289527	RAL-801	*blood*	0,05899816			
RAL-595	*P-element*	0,1125652	RAL-801	*copia*	-0,04553644			
RAL-595	*pogo*	0,19919803	RAL-801	*Cr1a*	0,17887285			
RAL-595	*Quasimodo*	0,41401811	RAL-801	*gypsy5*	0,00053371			
RAL-595	*1360*	0,10860713	RAL-801	*Idefix*	-0,02641484			
RAL-595	*412*	-0,27520776	RAL-801	*juan*	0,19340633			
RAL-69	*blastopia*	0,67950351	RAL-801	*mdg1*	0,33412083			
RAL-69	*blood*	-0,10343809	RAL-801	*opus*	0,17469172			
RAL-69	*copia*	-0,15528084	RAL-801	*P-element*	0,17712062			
RAL-69	*Cr1a*	-0,02428537	RAL-801	*pogo*	0,14987251			
RAL-69	*gypsy5*	-0,1559792	RAL-801	*Quasimodo*	-0,08082859			
RAL-69	*Idefix*	-0,18989881	RAL-801	*1360*	0,20337236			
RAL-69	*juan*	-0,12028938	RAL-801	*412*	-0,05297094			
RAL-69	*mdg1*	-0,1911809	RAL-820	*blastopia*	-0,09412851			

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CHAPTER 3

Wolbachia proliferation and effects on host fitness vary between *Drosophila melanogaster* genotypes

Author contributions

Anna Le Breton performed the experiment for *Wolbachia* titre with temperature and body parts, and Alexandre Couëtoux performed the experiment for *Wolbachia* titre with temperature and age. Ana Eugénio designed the experiments, performed the experiments for *Wolbachia* titre with age and *Wolbachia* effects on fecundity and survival, did the statistical analysis, and wrote this chapter. Patrícia Beldade revised the scientific content and writing.

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Abstract

Wolbachia pipientis is the most prevalent endosymbiont in arthropods. Increasing evidence has been showing that *Wolbachia* is capable of manipulating the reproductive system of some hosts and have other effects, such as providing resistance against RNA arboviruses. These effects are highly dependent on *Wolbachia*'s proliferation inside the host, with a higher titre usually corresponding to a stronger effect. *Wolbachia* titres in turn can be affected by multiple factors, both within and exterior to hosts. Based on our previous study showing that *Drosophila melanogaster* host genotypes can differ in their *Wolbachia* loads, we explored other factors that may impact this endosymbiont's proliferation. Overall, *Wolbachia* titres increased with hosts' age, and were affected by its localization within host and by ambient temperature. Furthermore, we investigated the effect of *Wolbachia*'s presence in the fitness of different genotypes, by measuring the fecundity and survival of *Wolbachia*-infected host lines paired with corresponding *Wolbachia*-free lines. In some lines, *Wolbachia* affected the production and sex of offspring, and it mostly did not affect survival. Our data showed that *Wolbachia* proliferation varies in a host-dependent manner and can be affected by both interior and exterior factors. Importantly, this endosymbiont was shown to impact fecundity, underscoring its importance in host's fitness.

Introduction

Wolbachia pipientis is a maternally transmitted Gram-negative bacterium, considered to be the most prevalent endosymbiont in arthropods (Werren et al. 2008; Weinert et al. 2015; Lefoulon et al. 2016). Studies on *Wolbachia* have shown that this bacterium is capable of affecting hosts' reproduction, enhancing or reducing fertility and fecundity traits (Snook et al. 2000; Gruntenko et al. 2019; Zhang et al. 2021). It is also known to manipulate the reproductive system of some hosts by: 1) inducing the developmental feminization of infected genetic males (Kern et al. 2015; Badawi et al. 2018), 2) killing infected males during developmental stages (Arai et al. 2020; Hill et al. 2022), 3) parthenogenesis of infected virgin mothers, which produce female offspring (Lindsey et al. 2016; Ning et al. 2019), 4) cytoplasmic incompatibility, in which crosses between uninfected females and infected males, or when each parent carries a different *Wolbachia* strain, results in embryonic lethality (Bagheri et al. 2019; Namias et al. 2022). Furthermore, over the last decade, *Wolbachia* has also been a research target of interest due to its ability to confer resistance to RNA arboviruses in some insect hosts, which makes it a potential tool to reduce vector-borne arboviral infections in humans, such and dengue and Zika (O'Neill 2018; Araújo et al. 2022).

Wolbachia's effects on host fitness are highly dependent on its load, of which a higher titre usually corresponds to a stronger intensity of the effect. For example, a higher *Wolbachia* proliferation has been shown to affect hosts' gene expression (Baião et al. 2019) and recombination landscape (Bryant & Newton 2020), and mediate antiviral protection (Lu et al. 2012; Osborne et al. 2012). It is, therefore, crucial to take bacterial load into consideration when analysing *Wolbachia* effects, and to assess which internal host factors, such as body parts where *Wolbachia* is located (Toomey & Frydman 2014; Kaur et al. 2020), age (Unckless et al. 2009; Kaur et al. 2020), or external factors, such as ambient temperature (Mouton et al. 2006; Strunov et al. 2013; Lau et al. 2020) can affect *Wolbachia* titres. However, we still know surprisingly little about the dynamics of *Wolbachia* proliferation inside host cells, and how different host genetic backgrounds and other environmental factors can affect load. There is also, to the best of our knowledge, no systematic investigation on the effect of *Wolbachia*'s presence on fecundity and survival traits across multiple host genotypes.

Here, we assessed *Wolbachia* proliferation across different *Drosophila melanogaster* genotypes. In particular, we measured *Wolbachia* loads across different timepoints on adult female flies from the *Drosophila melanogaster* Genetic Reference Panel (DGRP), a panel of fully-sequenced isogenic lines derived from a natural population which includes several lines that are naturally infected with *Wolbachia* (Mackay et al. 2012).

We observed significant differences in *Wolbachia* proliferation between genotypes, and an overall increase of titer with age. We also used DGRP lines to show that *Wolbachia* load can differ between hosts' body parts and under different ambient temperatures. Furthermore, we compared the fecundity and survival in the DGRP host lines for which we measured *Wolbachia* loads across age (*Wolbachia*-positive) with versions of the same lines in which *Wolbachia* has been removed (*Wolbachia*-negative), and observed that *Wolbachia* infection status can affect these traits, albeit only for some genotypes.

Results & Discussion

To assess *Wolbachia* proliferation, we focused on ten *Drosophila melanogaster* DGRP genotypes that are naturally infected with this endosymbiont (Wolb+; Mackay et al. 2012), and measured this bacterium's titer in whole body of females at different timepoints (Fig. 3.1). We then studied the effects of *Wolbachia*'s presence on fecundity, by generating a corresponding panel of ten genotypes from which *Wolbachia* was removed (Wolb-). We measured fecundity of individual couples of the Wolb+ and Wolb- lines (Fig. 3.2), also following the survival of the parental flies throughout the duration of the experiment (Fig. 3.3).

Host genotypes differ in *Wolbachia* titre with age

For each of the ten Wolb+ genotypes, we measured *Wolbachia* load in six individual adult females, across eight timepoints (days 1, 5, 10, 15, 20, 25, 30 and 35) post pupal eclosion. To do this, we used quantitative-real time PCR (qPCR) with primers for a *Wolbachia*-specific gene (*wsp*) and for a host-specific gene (*actin*), to estimate the number of bacterial cells per number of host cells.

Across the 425 individual flies assayed, *Wolbachia* loads varied between a minimum of 1.6 *Wolbachia* copies per host cell (RAL-136 on day 1) and a maximum of 41.7 *Wolbachia* copies per host cell (RAL-712 on day 25). We observed differences in *Wolbachia* loads between genotypes (ANOVA, $F_{9,347}$= 28.6; P < 2e-16), days (ANOVA, $F_{7,347}$= 39.4; P < 2e-16) and the interaction between genotypes and days (ANOVA, $F_{61,347}$= 3.4; P = 2.6e-13), and estimated broad-sense heritability (H2) of 0.34 for day 1 (among-line variance = 10.78, within-line variance = 20.61) and of 0.43 for day 30 (among-line variance = 26.57, within-line variance = 35.78). Within genotypes (except for RAL-440), we observed significant differences in *Wolbachia* load across timepoints (ANOVA, Table S3.1), showing the tendency of this bacteria to proliferate with age (Fig. 3.1). Our observation that *Wolbachia* load can be higher in older flies is in accordance with other studies that report similar results (Kaur et al. 2020; Shropshire et al. 2021).

We then furthered our study on *Wolbachia* loads by collecting data at different ambient temperatures, either for different host body parts (Fig. S3.1), or for different host ages (Fig. S3.2). To measure *Wolbachia* loads in different host body parts and at different temperatures, we selected two DGRP lines (RAL-320 and RAL-352) from the panel used in Chapter 2, to measure this endosymbiont's proliferation in heads, thoraxes and abdomens of five pools of six females each, reared at three different temperatures (20ºC, 25ºC and 30ºC) for five days (from day four post pupal hatching to day nine; *Wolbachia* loads measured on day nine).

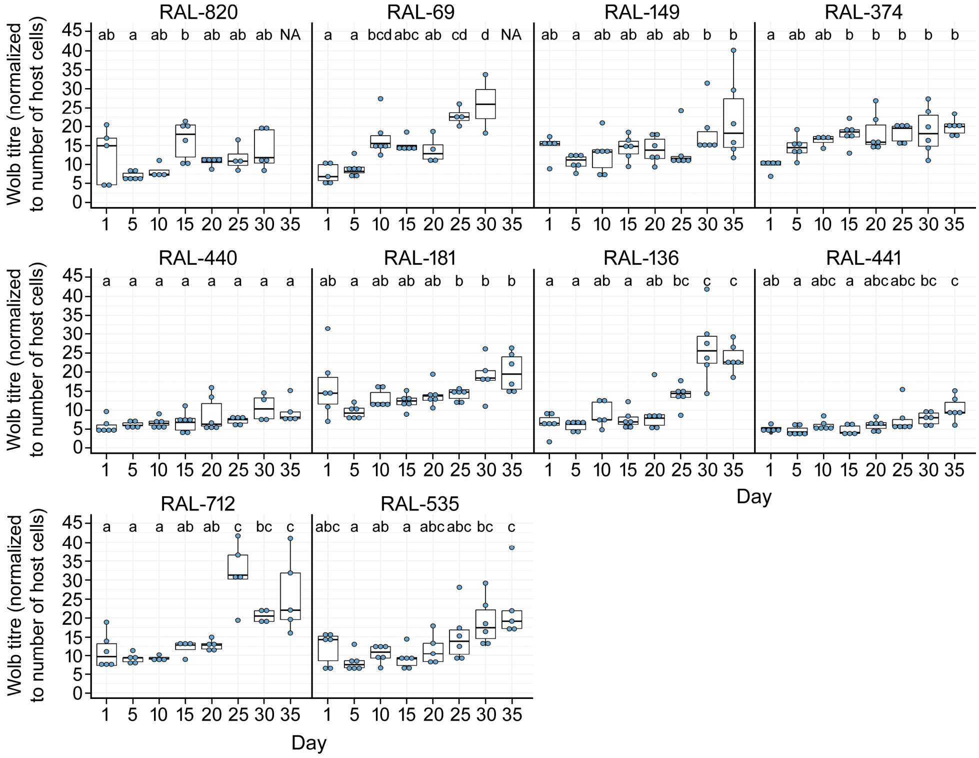


Fig. 3.1 Characterization of ten DGRP host genotypes in relation to *Wolbachia* titre (y-axis), from day one to day 35 post pupal hatching (x-axis), in individual female flies. Genotype plots are organized in order of the median value of total fecundity (see Fig. 3.2 A). Each blue dot is a biological replicate and represents one single female. Minor-case letters above each boxplot are a display for equivalent (same letter) or significantly different (different letter) *Wolbachia* loads between days, and were obtained by performing pairwise comparisons between Estimated Marginal Means (see Materials and Methods). “NA” in the plots for genotypes RAL-69 and RAL-820 represents missing data for *Wolbachia* loads on day 35, as all flies were dead by this time.

The preliminary results from this experiment showed that *Wolbachia* loads significantly differed between genotypes (ANOVA, $F_{1,62}$= 693.8; P < 2e-16), body parts (ANOVA, $F_{2,62}$= 13.8; P = 1.1e-05), and temperatures (ANOVA, $F_{2,62}$= 7.9; P = 0.0009), with all interactions also affecting loads significantly. One of the clearest differences in *Wolbachia* proliferation was a ten-fold higher expression level in RAL-352 than in RAL-320. In RAL-320, *Wolbachia* load differed between body parts (ANOVA, $F_{2,28}$= 29.9; P = 1.12e-07), tending to be lower in heads, and higher in abdomens. Loads also differed with temperature (ANOVA, $F_{2,28}$= 11.7; P = 0.0002), being lower at 20ºC and equivalent between 25 and 30ºC, within each body part (Fig. S3.1). In RAL-352, we observed significant differences in *Wolbachia* load for distinct body parts (ANOVA, $F_{2,34}$= 9.9; P = 0.0004) and for the interaction between body part and temperature (ANOVA, $F_{4,34}$= 4.3; P = 0.006). Interestingly, only abdomens showed a different *Wolbachia* load with temperature, namely higher at 20ºC and lower at 30ºC, which is the opposite tendency observed in RAL-320 (Fig. S3.1).

We also collected data on *Wolbachia* loads in whole bodies at different temperatures, across different life stages and ages. We selected three DGRP lines (RAL-21, RAL-142, and RAL-181) from the panel used in Chapter 2 to measure *Wolbachia* loads in six individual females per genotype, across six timepoints (pupal stage ~11 and adult age on days 1, 10, 15, 20 and 30), that were reared in adult stages at two different temperatures (18ºC and 25ºC). The preliminary data showed that *Wolbachia* load was significantly different across genotypes (ANOVA, $F_{2,139}$= 125.5; P < 2e-16), temperatures (ANOVA, $F_{1,139}$= 42.4; P = 1.26e-09), age (ANOVA, $F_{5,139}$= 14.4; P = 2.25e-11), and interactions, except for the interaction between genotype and age (ANOVA, $F_{10,139}$=1.51; P = 0.14). We observed similar results for the three genotypes: *Wolbachia* loads were mostly consistent across timepoints for flies reared at 18ºC, and increased with age at 25ºC (Fig. S3.2). These results at 25ºC are consistent with what is observed in Fig. 3.1. While just preliminary data, the results of these two experiments seem to indicate that *Wolbachia*, although being maternally transmitted (Werren et al. 2008), is not necessarily more prevalent in abdomens, where ovaries are located, as compared to thoraxes and heads. Furthermore, *Wolbachia* proliferation seems to increase in older flies and at our higher temperatures, which is in accordance with other studies on these factors (Mouton et al. 2006, Unckless et al. 2009; Kaur et al. 2020; Lau et al. 2020). However, and how other studies have noted (Kaur et al. 2020), there also seems to be a relevant impact of the host's genotype in regulating the effect of these factors on *Wolbachia* titers.

Differences in fecundity with host genotype and *Wolbachia* presence

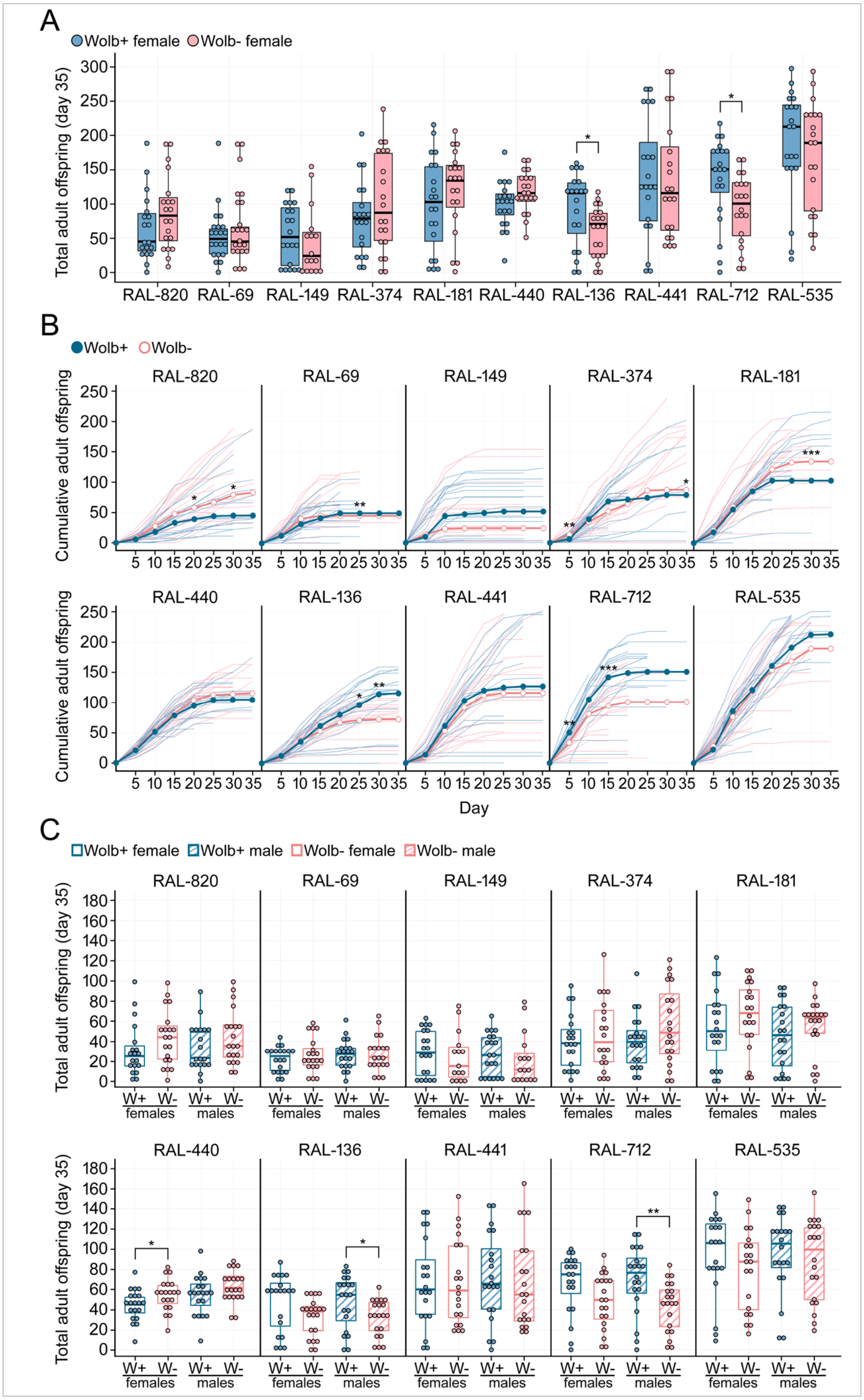
We paired the ten genotypes for which we measured *Wolbachia* load with age (Wolb+; Fig. 3.1), with versions of the genotypes in which *Wolbachia* was removed (Wolb-). We then sampled and isolated 395 couples from each of the Wolb+ and Wolb- genotypes, measuring their fecundity (counting adult offspring) every five days, for a total of 35 days. Of the couples assayed, 3.8%, across different genotypes and *Wolbachia* statuses (positive or negative) did not lay eggs. From the couples that successfully reproduced (96.2%), the minimum total adult offspring for a couple during this time period was one fly, in RAL-69 Wolb- and RAL-181 Wolb-, and the maximum total adult offspring for a couple was 297 individuals, in RAL-535 Wolb+. Total fecundity (i.e., number of adult offspring obtained by day 35) was dependent on genotype (ANOVA, $F_{9,750}$ = 33.61, P < 2e-16), and the interaction between genotype and *Wolbachia* status (ANOVA, $F_{9,750}$ = 3.25, P = 0.0007).

We found differences in total offspring between the original *Wolbachia*-positive genotypes (ANOVA, $F_{9,378}$ = 20.83, P < 2e-16), with RAL-820 Wolb+ being the least and RAL-535 Wolb+ the most fecund (blue boxplots in Fig. 3.2 A), with a median number of total offspring per couple of 45 and 212.5, respectively.

Relative to the previous experiment on *Wolbachia* loads for the same genotypes (see Fig. 3.1), there seems to be a negative correlation between *Wolbachia* load and the number of offspring produced for an interval of time (Kendall Rank Correlation; correlation coefficient = -0.26, Z = -2.99; P = 0.003). Namely higher *Wolbachia* loads correspond to lower host fecundities. Further experiments to directly test this possible causality are still necessary.

We also observed differences in fecundity between the *Wolbachia*-negative genotypes (ANOVA, $F_{9,372}$ = 16.04, P < 2e-16), with RAL-149 Wolb- and RAL-535 Wolb- being the least (median offspring per couple of 24 individuals) and the most (median offspring per couple of 189 individuals) fecund, respectively (pink boxplots in Fig. 3.2 A). Relative to another study, that measured lifetime fecundity for various DGRP lines from which they cleared *Wolbachia* and included nine of our ten targeted genotypes (excluded RAL-535) (Durham et al. 2014), we observed overall higher fecundities in our study. For the same particular lines, they obtained mean lifetime fecundity values ranging from 30 individuals in RAL-181 to 64 individuals in RAL-374, while we observed median fecundity values ranging from 45 individuals in RAL-69 and RAL-820 to 178 in RAL-181 (and 250 individuals in RAL-535). An important difference between their study and ours is that while we paired flies in which both female and male were from the same DGRP line, they mated females from different DGRPs to males from RAL-774, hinting at the potential impact of specific paternal contribution towards fecundity. Another aspect that can possibly explain these differences relates to distinct fly food recipes, which could greatly impact general number of offspring.

When comparing fecundity between the paired Wolb+/Wolb- lines for each genotype, we observed that genotype (ANOVA, $F_{9,770}$ = 34.16, P < 2.2e-16) and the interaction between genotype and *Wolbachia* status (ANOVA, $F_{9,770}$ = 3.30, P = 0.0006) have an effect in total fecundity, but *Wolbachia* removal only affected total fecundity in two of the ten tested genotypes, RAL-136 and RAL-712 (Fig. 3.2 A, Table S3.2). Nonetheless, we saw occasional differences for other genotypes when we considered the dynamics of offprint production, i.e., when comparing offspring produced for each of five consecutive day intervals (Fig. 3.2 B, Table S3.3). We also observed that most lines, both with and without *Wolbachia*, tended to have maximum offspring production between days five and fifteen, with fecundity then decreasing over time (Fig. S3.3). Besides RAL-136 and RAL-712, other lines showed a trend for total higher fecundity in Wolb+ lines (RAL-149 and RAL-535) or total higher fecundity in Wolb- lines (RAL-181, and RAL-820), but differences were not statistically significant, probably due to the high variance in the number of offspring produced between couples within the same genetic background. Furthermore, we observed that *Wolbachia* removal seems to only affect differently the sex of offspring in three genotypes, specifically RAL-440 (more females in Wolb-), in RAL-136 (more males in Wolb+), and in RAL-712 (more males in Wolb+) (Fig. 3.2 C, Table S3.4).



A
Wolb+ female
Wolb- female
Total adult offspring (day 35)
RAL-820
RAL-69
RAL-149
RAL-374
RAL-181
RAL-440
RAL-136
RAL-441
RAL-712
RAL-535
B
Wolb+
Wolb-
Cumulative adult offspring
Day
C
Wolb+ female
Wolb+ male
Wolb- female
Wolb- male
W+
W-
females
males

Fig. 3.2 Fecundity of *Drosophila melanogaster* couples (one female plus one male) from ten DGRP genotypes, with (blue; Wolb+/W+) versus without (pink; Wolb-/W-) *Wolbachia*. Genotypes are organized from left to right in order of median fecundity of Wolb+ couples. Statistical significance for fecundity differences between Wolb+ and Wolb- flies is shown as * for $P < 0.05$, ** for $P < 0.01$, and *** for $P < 0.001$ (see Material and Methods and Table S3.6, S3.7, and S3.8). (A) Total number of offspring produced after 35 days post pupal eclosion (y-axis). Each dot represents the total offsprig from a single couple. *Wolbachia* had an effect in fecundity in the Wolb+/Wolb- pairs for RAL-136 (ANOVA; $F_{1,38} = 4.44$, $P = 0.04$) and for RAL-712 (ANOVA; $F_{1,38} = 6.00$, $P = 0.02$). (B) Cumulative offspring across day intervals (y-axis). Days in which adult offspring was counted are displayed in the x-axis (every five-day interval, from pupal eclosion to day 35). Thin lines represent individual biological replicates (cumulative offspring coming from a single couple), and the thicker lines represent the median of offspring from Wolb+ (blue) and Wolb- (pink) couples. Asterisks represent day intervals for which there are statistically significant differences (Zero-Inflated models; statistics on non-cumulative count data) in the number of offspring between Wolb+ and Wolb-: we observed significant differences in RAL-69 (day 25: $Z = -2.65$, $P = 0.008$), RAL-136 (day 25: $Z = 2.28$, $P = 0.02$; day 30: $Z = 2.9$, $P = 0.004$), RAL-181 (day 30: $Z = 4.39$, $P = 1.16e-05$), RAL-374 (day 5: $Z = -2.69$, $P = 0.007$; day 35: $Z = -2.17$, $P = 0.03$), RAL-712 (day 5: $Z = 3.24$, $P = 0.0012$; day 15: $Z = 4.03$, $P = 5.62e-05$), and RAL-820 (day 20: $Z = -2.23$, $P = 0.03$). (C) Total number of adult offspring produced after 35 days (y-axis) for each sex (x-axis). Each dot in the boxplots represent progeny from a single couple. We observed significant differences (ANOVA) in RAL-136 (males: $F_{1,38} = 4.84$, $P = 0.03$), in RAL-440 (females: $F_{1,38} = 4.45$, $P = 0.04$), and in RAL-712 (males: $F_{1,38} = 7.96$, $P = 0.008$).

Wolbachia mostly does not affect survival

For the couples in which we measured fecundity, we also annotated if and when their death occurred, from pupal hatching until day 35. Overall, we observed significant differences between sexes (Hazard $\text{Ratio}_{males}= 0.51$, $P = 3.04e-10$), but no significant differences due to *Wolbachia* status (Wolb+ versus Wolb-; Hazard $\text{Ratio}_{Wolb+}= 0.84$, $P = 0.07$), which is consistent with the results found in another study on the longevity of the DGRP lines (Ivanov et al. 2015). We observed differences in survival for females versus males in three out of the ten genotypes (RAL-69, RAL-181, and RAL-712), and an effect of the interaction between *Wolbachia* and sex for one genotype (RAL-712) (Table S3.5). In RAL-69 and RAL-181, females overall died faster and the most, and in RAL-712, Wolb- males died the fastest and the most, while Wolb+ males died the least (Fig. 3.3). Even though we only measured survival for the first 35 days, we can observe that the lifespan of flies from some lines in our study (Fig. 3.2 B) was generally shorter than the longevity observed in other studies. For example, Wolb+ females from our RAL-712 averaged a lifespan of 16 to 20 days, versus the 38.92 observed in Ivanov et al. (2015), and Wolb- females from the same line in our study also averaged a lifespan of 16 to 20 days, versus the 46.37 days observed in Durham et al. (2014). We wonder if this discrepancy might be explained by in-line variation for this trait, or by differences in the experimental setup. For example, in Ivanov et al. (2015), they measured the fecundity of virgin females which were reared in groups of five, while our flies were mated and reared in individual couples of one female plus one male. On the other hand, in Durham et al. (2014), the experimental protocol was very similar to ours, so differences are probably due to other factors.

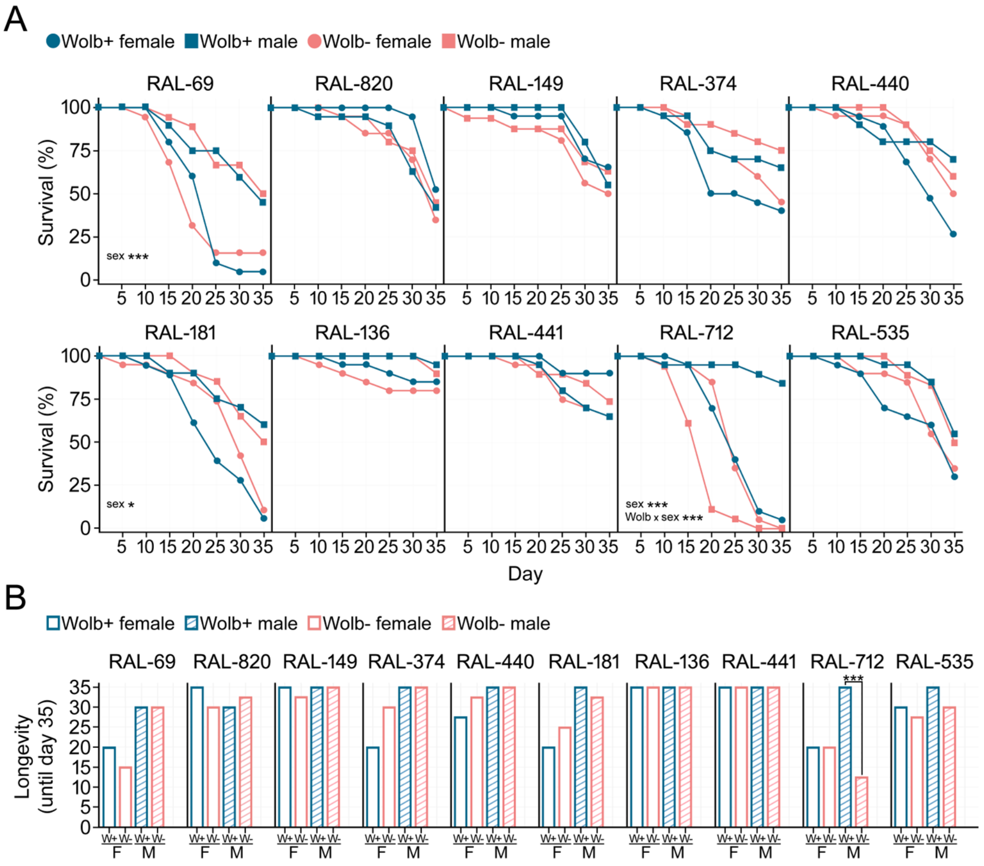


Fig. 3.3 Survival of *Drosophila melanogaster* couples until day 35, for ten DGRP genotypes, with (blue; Wolb+/W+) versus without (pink; Wolb-/W-) *Wolbachia*. Genotypes are organized from left to right in order of median fecundity of Wolb+ couples (see Fig. 3.2 A). Statistical significance for fecundity differences between Wolb+ and Wolb- flies is shown as * for p<0.05, ** for p<0.01, and *** for p<0.001 (Cox Proportional-Hazards Model, see Material and Methods). (A) Percentage of survival (y-axis), throughout the experimental period (from day zero to day 35, post pupal hatching; x-axis). Lines represent mean survival of 20 females (circles) or 20 males (squares) biological replicates. We observed differences in sex for RAL-69 (Hazard Ratio$_{male}$= 0.25, P < 0.001), RAL-181 (Hazard Ratio$_{male}$= 0.36, P = 0.012), and RAL-712 (Hazard Ratio$_{male}$= 3.72, P < 0.001). For this last genotype, we also observed differences in the interaction between *Wolbachia* and sex (Hazard Ratio$_{Wolb+ * males}$= 0.02, P < 0.001). (B) Mean longevity of flies up to day 35 (y-axis), divided by sex (x-axis). Blank bar plots represent females (F) and striped bar plots represent males (M). We observed differences in longevity in males on RAL-712 (Hazard Ratio$_{Wolb+ * male}$= 0.02, P = 8.33e-06).

Conclusion

Wolbachia is a maternally transmitted endosymbiotic bacterium that can impact its hosts in a multitude of ways, and especially on their reproductive system (Badawi et al. 2018; Gruntenko et al. 2019; Ning et al. 2019; Zhang et al. 2021; Hill et al. 2022). These effects can depend on *Wolbachia*'s titre, with a higher load usually corresponding to stronger effects (Osborne et al. 2012; Baião et al. 2019; Bryant and Newton, 2020). It has been observed that *Wolbachia*'s proliferation can differ amongst genotypes of the same host (Serbus et al. 2015; Kaur et al. 2020), and be affected by both within-host and exterior factors (Toomey & Frydman 2014; Ye et al. 2017; Linchao Hu et al. 2019; Stuckert & Matute 2022). In this study, we investigated the dynamics of *Wolbachia* proliferation inside multiple host genotypes of *Drosophila melanogaster*, and how this can vary with age and temperature, as well as the hypothesis of a relationship between *Wolbachia* infection and host fitness traits, namely fecundity and survival.

We first measured *Wolbachia* loads in 10 different isogenic genotypes of *Drosophila melanogaster* from the DGRP (Mackay et al. 2012), in whole bodies of female flies of different ages. We also presented data for *Wolbachia* loads at different temperatures and in different body parts. To measure proliferation, we used qPCR to quantify *wsp* absolute copy number, a *Wolbachia*-specific gene which quantification is commonly used as a proxy for *Wolbachia*'s presence and cell number (Xi et al. 2008; Newton et al. 2015; Christensen et al. 2019), with effort put into carrying out and explaining in detail the data structure, quality control, and analyses (see Materials and Methods). We observed that *Wolbachia* proliferation varied across hosts' genotypes, was predominantly affected by age, and could also vary with host's body part, and ambient temperature.

We then tested if *Wolbachia* infection had an effect in fecundity, for the same 10 genotypes in which we measured *Wolbachia* loads with age (*Wolbachia*-positive), and for versions of the same lines in which *Wolbachia* had been removed (*Wolbachia*-negative). To do so, we counted the number of living adult offspring from individual couples every five days until day 35, by which only 14.7% of the couples assayed were still laying eggs. For this period of time, we observed that *Wolbachia* infection seemed to positively affect the fecundity of two out of ten paired genotypes, and that there was a considerable variance on fecundity between couples of most genotypes, both with and without *Wolbachia*. When looking at parental survival during this experiment, *Wolbachia* presence positively affected the males in one line, with no other significant effects.

It is common to remove *Wolbachia* from infected individuals in comparative studies between multiple host genetic lines, in order to remove a possible confounding effect of among-line variation due to this endosymbiont (Clark et al. 2005; Durham et al. 2014; Wilches et al. 2021). Our experiments reenforce that is practice has merit and remains important for studies in *Drosophila melanogaster* as *Wolbachia* affected, albeit in only some genotypes, a fundamental fitness trait like fecundity.

Finally, even though we observed a statistically significant negative correlation between *Wolbachia* load and fecundity, we expect host's age to be an important confounding factor and experiments that measure *Wolbachia* load and fecundity in the same flies will be necessary before further conclusions on this subject.

We expect future studies to provide further insight about how different factors, especially age, affect *Wolbachia* loads, and how these higher loads can affect hosts' fitness, evidencing the importance of this endosymbiont as an evolutionary driving force.

Materials & Methods

Fly lines and husbandry

We chose ten DGRP lines described to be infected with *Wolbachia* (Wolb+; Mackay et al. 2012) and generated a *Wolbachia*-free (Wolb-) version for each of them, cf. Eugénio et al. (2023). In short, flies were rid of *Wolbachia* by feeding on food supplemented with tetracycline antibiotic (0.05mg/mL) for two generations. Then, we restored their gut flora by sterilizing the eggs (10 min in 50% bleach followed by washing in sterilized water) and then placing them on food supplemented with a bacterial inoculum from the untreated version (Wolb+) of each line (150µL of a mix prepared by mixing 2mL of sterile water with 1g of a month-old food filtered to remove eggs and larvae). We waited at least five generations after the flies were free of *Wolbachia* and gut microbiota-homogenized before starting the experiments.

Flies were reared at 25°C and kept on a 12h:12h light:dark cycle, in vials with cornmeal-agar food (45g/L molasses, 75g/L white sugar, 70g/L corn flour, 20g/L yeast extract, 10g/L agar-agar and 25mL Nipagin at 10%) and in similar density conditions.

Wolbachia presence and loads

We confirmed that the tetracycline treatment to remove *Wolbachia* in the Wolb- lines was efficient in 10µL PCR reactions, containing 0.4ng gDNA template, 0.25U GoTaq (Promega), 1.5mM MgCl2, and 0.5µM of each primer (against the *Wolbachia*-specific gene *wsp*; cf. Eugénio et al. 2023). gDNA was extracted (QIAGEN's DNeasy Blood & Tissue Kit, following manufacturer's indications) from three pools of ten females (of mixed ages) from each of the ten Wolb- lines, homogenized using QIAGEN Tissue Lyser II (2 min at 23s/f). As positive controls, we extracted gDNA from the Wolb+ lines (using the same protocol) and used those samples as template. Thermal cycle was 4 min at 95°C; 35 cycles of 95°C for 30 sec, 60°C for 1 min and 72°C for 30 sec; 5 min at 72Cº. PCR amplicons were checked by electrophoresis gel (1% agarose) and we confirmed the successful removal of *Wolbachia* (no amplicon) in all target DGRP lines.

We measured *Wolbachia* loads in whole bodies of six individual females from each of the ten target Wolb+ lines (every five days, from day one to day 35; Fig. 3.1). Flies were homogenized in QIAGEN ATL Buffer in 96 well-plates with a sterile glass bead per well on a Tissue Lyser II (QIAGEN) at 23s/f for 2 minutes, before DNA extraction using the Quick-DNA™ 96 Kit (Zymo Research), following manufacturer's instructions. DNA was eluted in 200µL Buffer AE from the kit, diluted to 1:10, and stored at -20ºC until qPCR, which was run using primers (sequences in Table S3.6) for either a *Wolbachia* gene (*wsp*; proxy for *Wolbachia* load) or for a host gene (*actin*, proxy for number of host cells).

For two DGRP lines (Fig. S3.1), we also measured *Wolbachia* loads, in heads, thoraxes, and abdomens of five pools of six 9-days old adult female flies, reared after pupal hatching at either 20ºC, 25ºC, or 30ºC. Flies were dissected in ice-cold PBS 1x, before homogenization of the pooled body parts in Genomic Lysis Buffer from the Quick-DNA™ 96 Kit (Zymo Research), with a sterile glass bead per well on a Tissue Lyser II (QIAGEN) at 23s/f for 2 minutes, and stored at -20ºC, until gDNA extraction, using the protocol described above. For three DGRP lines (Fig. S3.2), we also measured *Wolbachia* loads in whole bodies of six individual female pupae (~stage 11) and adults on days 1, 10, 15, 20 and 30, with adult flies reared at either 18ºC and 25ºC. Flies were homogenized and stored at -20ºC until gDNA extraction, using the protocols described above.

Fecundity and survival measurements

We sampled and isolated 17 to 20 individual adult couples in vials with fresh food (zero to eight hours old flies; one virgin female and one virgin male per vial), for the ten Wolb+ and Wolb- paired DGRP genotypes, moving flies, without anaesthesia, to new fresh food every five days. We measured fecundity (Figs. 3.2 and S3.3) by letting flies lay eggs inside the vials and counting the number of adult offspring for each timepoint (from day five to day 35). We annotated parental survival or death on days in which flies were transferred to new food (Fig. 3.3), and we only considered offspring coming from eggs in vials where parents were still alive. Between the 395 couples assayed, 15 couples across different genotypes and *Wolbachia* status did not lay eggs. On day 35, 151 vials still had both living parental flies, but only 58 were still laying eggs.

qPCR with standard curves

We used qPCR to measure *Wolbachia* loads using gDNA template, and primers for the *Wolbachia*-specific gene *wsp* and for the host-specific gene *actin* (Table S3.6). DNA template preparation is described above.

In all experiments, for each biological replicate sample (either individual fly or pooled), we ran two technical replicate reactions in an QuantStudioTM 7 Flex Real-Time PCR System (Applied Biosystems™). We used 4µL of genomic template, 0.5µL of each primer (0.2µM) and 5µL of SYBR Green I® (Bio Rad), and the following thermal cycling conditions: 2 min at 50°C; 10 min at 95°C; 40 cycles of 95°C for 30 sec, 60°C for 1 min and 72°C for 30 sec. We discarded biological replicates for which the standard deviation between Cq values of the two technical replicates was greater than 0.5 and, for the remainder, we calculated the mean Cq value between technical replicates for each biological replicate.

We performed absolute quantification of *Wolbachia* loads, by using the mean Cq values of each biological sample, and the standard curves for *wsp* and *actin* genes to determine the quantity of each of the genes in the sample used as template: quantity=10((Cq-b)/m), where b is the intercept and m is the slope of the equation. We estimated the quantity of *wsp* and *actin* in all samples and calculated the ratio between the two (quantity of *wsp* / quantity of *actin*) as a measurement of *Wolbachia* load relative to number of host cells.

Statistical analysis

Statistical analyses were performed in R Statistical Software (version 4.3.1), using Rstudio (version 2022.07.2).

We estimated broad sense heritability (H2) for *Wolbachia* loads for days 1 and 30 as H2=σ2A/(σ2A + σ2W), where σ2A is the among-lines variance and σ2W is the within-line variance. Variance components were extracted using the VCA R package (Schuetzenmeister and Dufey 2020).

We tested for differences between the target Wolb+ DGRP lines for *Wolbachia* load with age using ANOVA, with genotype and day as fixed factors: aov(*Wolbachia* load ~ genotype*day) in R syntax. For differences in *Wolbachia* load with age, within each individual Wolb+ line (Fig. 3.1), we used Aligned Rank Transform (ARTool R package; Wobbrock et al. 2011, Elkin et al. 2011, Kay et al. 2021) and respective contrast tests (Elkin et al. 2021), with day as fixed factor: art.con(art(*Wolbachia* load ~ day), adjust="Bonferroni") in R syntax. For measuring *Wolbachia* load with body parts and temperature in each genotype (Fig. S3.1), we used ANOVA and Estimated Marginal Means for multiple pairwise comparisons, with body parts and temperature as fixed factors: emmeans(aov(*Wolbachia* load ~ body part*temperature), spec=~ body part+temperature, adjust="Bonferroni") in R syntax. For measuring *Wolbachia* load with age and temperature (Fig. S3.2), we used ANOVA and Estimated Marginal Means for pairwise comparisons, with day and temperature as fixed factors: emmeans(aov(*Wolbachia* load ~ day*temperature), spec=~ day+temperature, adjust="Bonferroni") in R syntax (emmeans R package from Lenth 2022). We checked the assumptions for ANOVA using Shapiro–Wilk tests for normality and Levene's tests for common variance (car R package; Fox and Weisberg, 2019).

The correlation between *Wolbachia* loads and number of offspring produced was verified using the Kendall Rank Correlation test: cor.test(dataset $ *Wolbachia* load, dataset $ offspring number, method="kendall"), in R syntax.

To measure differences in fecundity, we first tested if our count data followed a Poison distribution, by checking for overdispersion (performance R package; Lüdecke et al. 2021). To correct for the observed overdispersion, we assumed fecundity distributions to be either Quasi-Poisson (total fecundity; Generalized Linear Models) or Negative Binomial (number of offspring per timepoint, Zero Inflated models).

We tested for difference in total fecundity (total number of adult offspring after 35 days), using ANOVA for a Generalized Linear Model fit, with *Wolbachia* status (Wolb+/Wolb-), genotype, and sex of the offspring as fixed factors: aov(glm(total fecundity ~ *Wolbachia* status * genotype * sex, family=quasipoisson) in R syntax. We then tested for differences in total fecundity separately for Wolb+ and Wolb- lines, using ANOVA for a Generalized Linear Model fit, with genotype as fixed factor: aov(glm(total fecundity ~ genotype, family=quasipoisson)) in R syntax. We then tested for differences between Wolb+ and Wolb- within each DGRP genotype in: 1) total fecundity (Fig. 3.2 A), using ANOVA for a Generalized Linear Model fit, with *Wolbachia* status as fixed factor: aov(glm(total fecundity for a DGRP genotype ~ *Wolbachia* status, family=quasipoisson)) in R syntax; 2) total fecundity divided by sex (total number of female or male progeny; Fig. 3.2 C), using ANOVA for a Generalized Linear Model fit, with *Wolbachia* as fixed factor: aov(glm(total number of female offspring ~ *Wolbachia* status, family=quasipoisson)) and aov(glm(total number of male offspring ~ *Wolbachia* status, family=quasipoisson)), in R syntax; 3) number of offspring in each specific timepoint (number of adult offspring from eggs laid during a consecutive 5-day period until day 35; Fig. 3.2 B), fitting a Zero-Inflated model to a negative binomial distribution to the count data (pscl R package, Zeileis et al. 2008; Jackman 2020), jointly with a binomial distribution for the zeros data, with *Wolbachia status* as fixed factor: summary(zeroinfl(number of offspring ~ *Wolbachia* status| *Wolbachia* status, dist='negbin')) in R syntax.

Within each DGRP genotype, and separately for Wolb+ and Wolb- couples, we tested the differences in number of offspring between timepoints (comparing offspring coming from each consecutive 5-days periods until day 35; Fig. S3.3), fitting a Zero-Inflated model to a negative binomial distribution to count data, with a binomial distribution for zeros data, and Estimated Marginal Means for pairwise comparisons, with day (timepoint) as fixed factor: emmeans((zeroinfl(number of offspring ~ day) | day), spec= ~day, mode="count", lin.pred=TRUE, p.adj="tukey") and emmeans((zeroinfl(number of offspring ~ day) | day), spec= ~day, mode="zero", lin.pred=TRUE, p.adj="tukey"), in R syntax.

Finally, we measured the survival of the couples for which we counted fecundity, and tested for differences between Wolb+ and Wolb- flies from each DGRP genotype during the 35 day-period (7 checks, every 5 days; Fig. 3.3), using a Cox Proportional-Hazards Model (survival R package; Therneau and Grambsch 2000, Therneau 2022) with *Wolbachia* status and sex as fixed factors: coxph(Surv(time period, survival status) ~ *Wolbachia* status*sex) in R syntax.

If the proportional hazards assumptions for a Cox regression model fit were not met for a factor (tested with cox.zph function, survival R package), that factor was stratified. We then separately tested for differences in parental survival in the fecund period for each sex (Fig. 3.2 B), using a Cox Proportional-Hazards Model, with *Wolbachia* status as fixed factor: coxph(Surv(time period, survival status for females) ~ *Wolbachia* status) and coxph(Surv(time period, survival status for males) ~ *Wolbachia* status), in R syntax.

Supplementary Material

Supplementary Figures

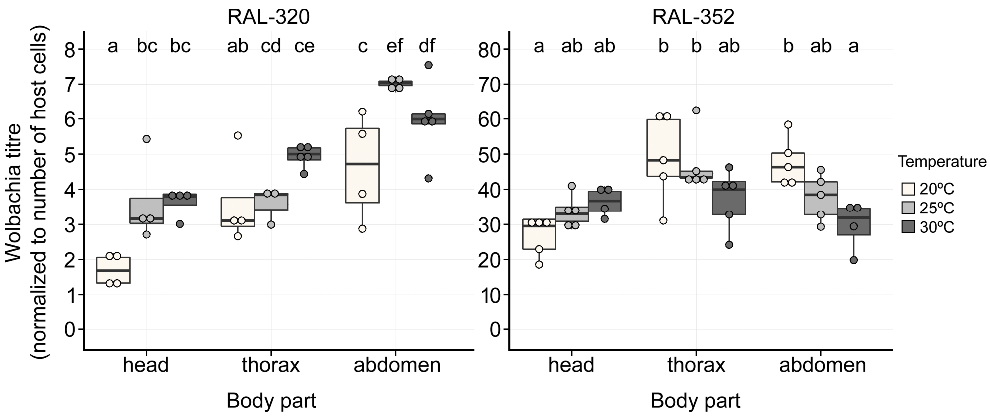


Fig. S3.1 Characterization of two DGRP host genotypes in relation to *Wolbachia* titre (y-axis), in heads, thoraxes and abdomens (x-axis), at three different temperatures (20°C: white, 25°C: light grey, 30°C: dark grey), in pooled female flies. Each dot is a biological replicate and represents one pool of six females. Minor-case letters above each boxplot are a display for equivalent (same letter) or significantly different (different letter) *Wolbachia* loads between combinations of body part x temperature, and were obtained by performing multiple pairwise comparisons between Estimated Marginal Means (see Materials and Methods).

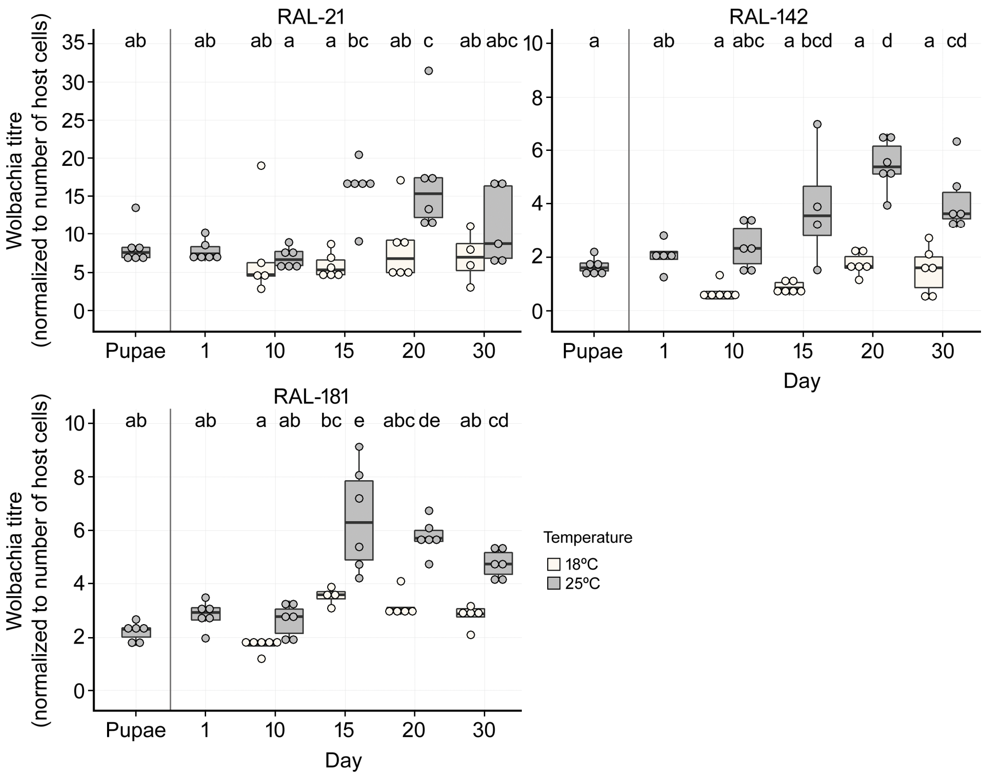
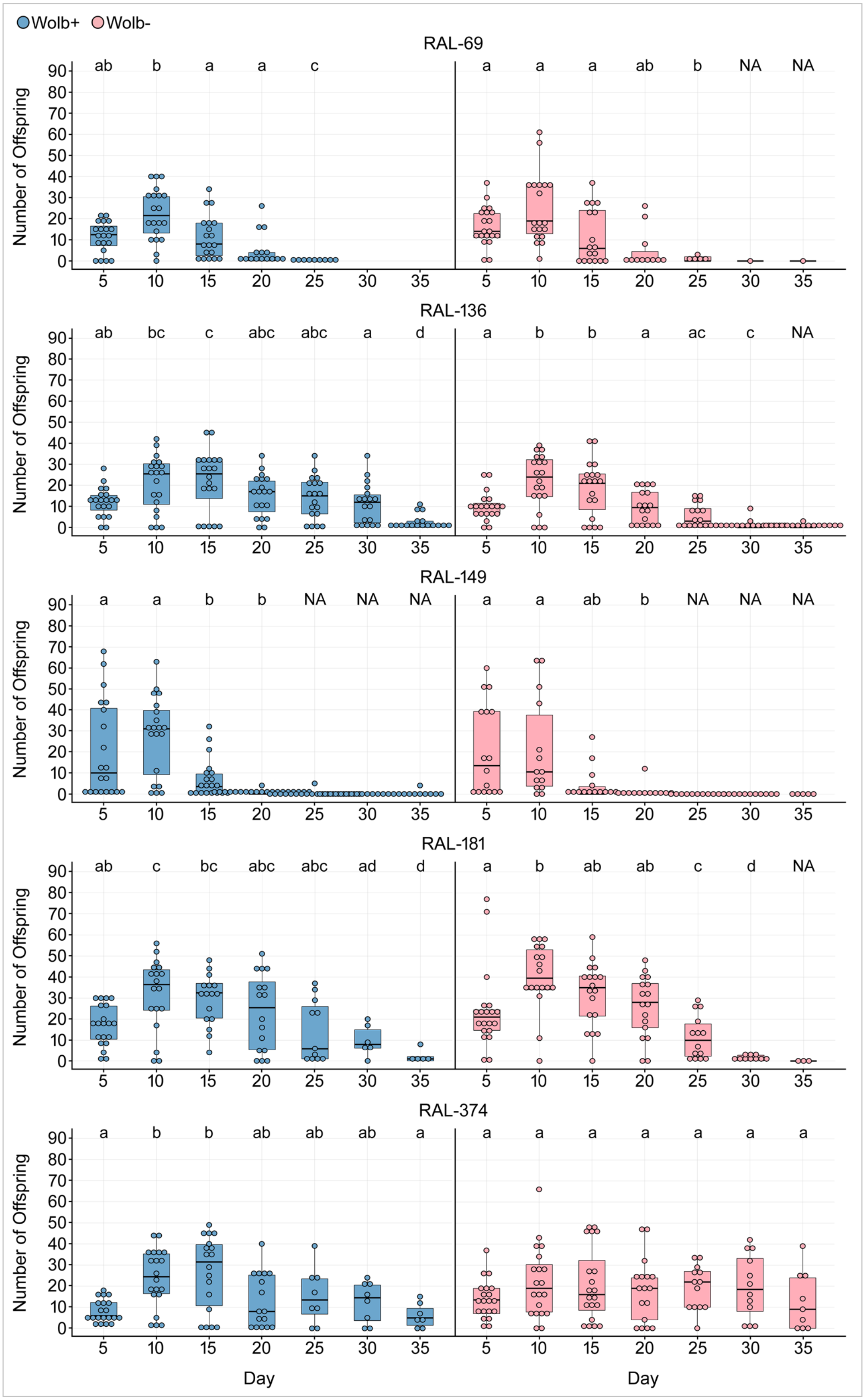


Fig. S3.2 Characterization of three DGRP host genotypes in relation to *Wolbachia* titre (y-axis), in pupae (~stage 11) and adult timepoints (x-axis), and at two different temperatures (18°C: white, 25°C: light grey) in individual female flies. Each dot is a biological replicate and represents one female. Minor-case letters above each boxplot are a display for equivalent (same letter) or significantly different (different letter) *Wolbachia* loads between combinations of timepoint * temperature, and were obtained by performing multiple pairwise comparisons between Estimated Marginal Means (see Materials and Methods).


Wolb+
Wolb-
RAL-69
ab b a a c
a a a ab b NA NA
RAL-136
ab bc c abc abc a d
a b b a ac c NA
RAL-149
a a b b NA NA NA
a a ab b NA NA NA
RAL-181
ab c bc abc abc ad d
a b ab ab c d NA
RAL-374
a b b ab ab ab a
a a a a a a a
Number of Offspring
Day
Day

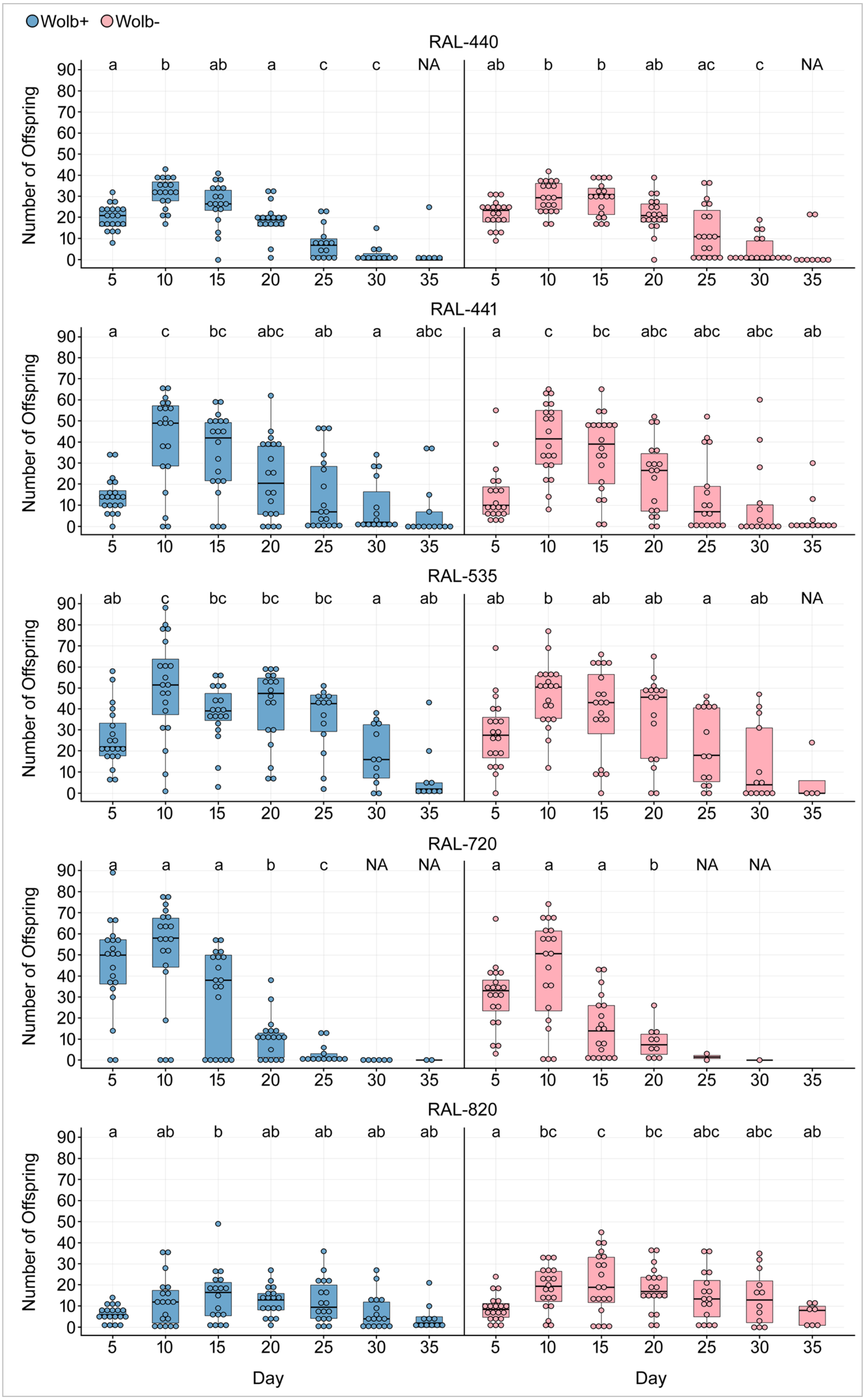

Wolb+
Wolb-
RAL-440
a b ab a c c NA ab b b ab ac c NA
RAL-441
a c bc abc ab a abc a c bc abc abc abc ab
RAL-535
ab c bc bc bc a ab ab b ab ab a ab NA
RAL-720
a a a b c NA NA a a a b NA NA
RAL-820
a ab b ab ab ab ab a bc c bc abc abc ab
Number of Offspring
0
10
20
30
40
50
60
70
80
90
5
10
15
20
25
30
35
Day

Fig. S3.3 Fecundity of *Drosophila melanogaster* couples from ten DGRP genotypes, with (blue; Wolb+) and without (pink; Wolb-) *Wolbachia*. Each dot in a boxplot represents the number of living adult offspring (y-axis) produced by a single couple in a time period of five days, which was measured every five days until day 35 (x-axis). Minor-case letters above each boxplot are a display for equivalent (same letter) or significantly different (different letter) *Wolbachia* loads between five day-intervals (separately for either Wolb+ or Wolb- couples), for count data from Zero Inflated models after performing multiple pairwise comparisons between Estimated Marginal Means (see Materials and Methods). "NA" represents that there was no statistical count data available for that timepoint.

Supplementary Tables

Supplementary Table S3.1: Statistical significance of *Wolbachia* loads wih age

DGRP	ART ANOVA (F-value)	ART ANOVA (P-value)
RAL-136	14.689	3.4211e-09
RAL-149	2.6044	0.026345
RAL-181	4.6572	0.00072579
RAL-374	4.5054	0.0010895
RAL-440	2.1278	0.066199
RAL-441	4.8727	0.00054032
RAL-535	6.0195	9.2228e-05
RAL-69	15.106	3.0367e-07
RAL-712	15.375	2.3234e-08
RAL-820	3.5313	0.0099468

Supplementary Table S3.2: Statistical significance of total fecundity (by day 35) with *Wolbachia* status

DGRP	ANOVA (F-value)	ANOVA (P-value)
RAL-136	4.443	0.0417
RAL-149	0.606	0.442
RAL-181	1.042	0.314
RAL-374	1.26	0.269
RAL-440	3.399	0.073
RAL-441	0.024	0.877
RAL-535	0.675	0.416
RAL-69	0.243	0.625
RAL-712	6.003	0.019
RAL820	0.604	0.442

Supplementary Table S3.3: Statistical significance for number of offspring (for 5-day intervals) with Wolb status									
DGRP	**Day**	**Model coefficient**	**ANOVA (F-value)**	**ANOVA (P-value)**	**DGRP**	**Day**	**Model coefficient**	**ANOVA (F-value)**	**ANOVA (P-value)**
RAL-136	5	Count	1.130	0.259	RAL-136	5	Zero-Inflated	0.006	0.99539
RAL-136	10	Count	-0.253	0.801	RAL-136	10	Zero-Inflated	0.00	0.99992
RAL-136	15	Count	0.479	0.632	RAL-136	15	Zero-Inflated	-0.489	0.6247
RAL-136	20	Count	1.497	0.13431	RAL-136	20	Zero-Inflated	-0.920	0.3573
RAL-136	25	Count	2.277	0.0228	RAL-136	25	Zero-Inflated	-1.564	0.118
RAL-136	30	Count	2.901	0.00372	RAL-136	30	Zero-Inflated	-1.876	0.0606
RAL-136	35	Count	0.714	0.475	RAL-136	35	Zero-Inflated	-1.169	0.242
RAL-149	5	Count	0.123	0.902	RAL-149	5	Zero-Inflated	0.338	0.7351
RAL-149	10	Count	0.668	0.504	RAL-149	10	Zero-Inflated	-0.345	0.7300
RAL-149	15	Count	-0.183	0.855	RAL-149	15	Zero-Inflated	-1.646	0.0999
RAL-149	20	Count	-0.642	0.521	RAL-149	20	Zero-Inflated	0.184	0.854
RAL-149	25	Count	NA	NA	RAL-149	25	Zero-Inflated	-0.002	0.998
RAL-149	30	Count	NA	NA	RAL-149	30	Zero-Inflated	-0.002	0.998
RAL-149	35	Count	NA	NA	RAL-149	35	Zero-Inflated	-0.002	0.998
RAL-181	5	Count	-1.78	0.0751	RAL-181	5	Zero-Inflated	-0.027	0.97869
RAL-181	10	Count	-1.285	0.199	RAL-181	10	Zero-Inflated	0.592	0.5539
RAL-181	15	Count	-0.923	0.356	RAL-181	15	Zero-Inflated	-0.002	0.9981
RAL-181	20	Count	-0.122	0.903	RAL-181	20	Zero-Inflated	0.555	0.57899
RAL-181	25	Count	1.127	0.260	RAL-181	25	Zero-Inflated	0.090	0.928
RAL-181	30	Count	4.385	1.16e-05	RAL-181	30	Zero-Inflated	-0.272	0.786
RAL-181	35	Count	NA	NA	RAL-181	35	Zero-Inflated	-0.020	0.984
RAL-374	5	Count	-2.692	0.007103	RAL-374	5	Zero-Inflated	-0.002	0.998
RAL-374	10	Count	-0.072	0.9429	RAL-374	10	Zero-Inflated	-0.003	0.99781
RAL-374	15	Count	1.094	0.27397	RAL-374	15	Zero-Inflated	0.150	0.88078
RAL-374	20	Count	-1.141	0.25368	RAL-374	20	Zero-Inflated	0.085	0.9324
RAL-374	25	Count	-0.104	0.917	RAL-374	25	Zero-Inflated	1.048	0.2948
RAL-374	30	Count	-1.16	0.2461	RAL-374	30	Zero-Inflated	0.447	0.655
RAL-374	35	Count	-2.168	0.0301	RAL-374	35	Zero-Inflated	-0.249	0.804
RAL-440	5	Count*	0.831	0.368	RAL-440	5	Zero-Inflated	NA	NA
RAL-440	10	Count*	0.853	0.362	RAL-440	10	Zero-Inflated	NA	NA
RAL-440	15	Count	-0.328	0.743	RAL-440	15	Zero-Inflated	0.003	0.998
RAL-440	20	Count	-1.297	0.194	RAL-440	20	Zero-Inflated	-0.002	0.99801
RAL-440	25	Count	-1.452	0.147	RAL-440	25	Zero-Inflated	-0.054	0.9571
RAL-440	30	Count	-1.723	0.0848	RAL-440	30	Zero-Inflated	-0.607	0.544
RAL-440	35	Count	-0.644	0.520	RAL-440	35	Zero-Inflated	-0.484	0.628
RAL-441	5	Count	0.193	0.847163	RAL-441	5	Zero-Inflated	0.002	0.999
RAL-441	10	Count	0.724	0.469	RAL-441	10	Zero-Inflated	0.003	0.998
RAL-441	15	Count	0.506	0.613	RAL-441	15	Zero-Inflated	1.006	0.31431
RAL-441	20	Count	0.244	0.80739	RAL-441	20	Zero-Inflated	0.741	0.45851
RAL-441	25	Count	-0.045	0.964	RAL-441	25	Zero-Inflated	-0.239	0.811
RAL-441	30	Count	-0.951	0.342	RAL-441	30	Zero-Inflated	-0.981	0.327
RAL-441	35	Count	1.104	0.270	RAL-441	35	Zero-Inflated	0.201	0.841
RAL-535	5	Count*	0.14	0.71	RAL-535	5	Zero-Inflated	NA	NA
RAL-535	10	Count*	0.386	0.538	RAL-535	10	Zero-Inflated	NA	NA
RAL-535	15	Count	-0.388	0.698	RAL-535	15	Zero-Inflated	-0.003	0.99790
RAL-535	20	Count	0.020	0.984	RAL-535	20	Zero-Inflated	-0.003	0.9978
RAL-535	25	Count	1.149	0.25052	RAL-535	25	Zero-Inflated	-0.002	0.9981
RAL-535	30	Count	-0.360	0.7187	RAL-535	30	Zero-Inflated	-1.521	0.128
RAL-535	35	Count	-0.473	0.6359	RAL-535	35	Zero-Inflated	-0.765	0.444
RAL-69	5	Count	-1.230	0.219	RAL-69	5	Zero-Inflated	1.331	0.18325
RAL-69	10	Count	-0.325	0.745	RAL-69	10	Zero-Inflated	0.003	0.998
RAL-69	15	Count	-1.074	0.283	RAL-69	15	Zero-Inflated	-1.562	0.118
RAL-69	20	Count	-0.658	0.510262	RAL-69	20	Zero-Inflated	-0.899	0.369
RAL-69	25	Count	-2.650	0.00806	RAL-69	25	Zero-Inflated	-0.042	0.966
RAL-712	5	Count	3.241	0.00119	RAL-712	5	Zero-Inflated	0.003	0.998
RAL-712	10	Count	1.510	0.131	RAL-712	10	Zero-Inflated	0.475	0.6346
RAL-712	15	Count	4.028	5.62e-05	RAL-712	15	Zero-Inflated	0.358	0.7200
RAL-712	20	Count	1.347	0.178015	RAL-712	20	Zero-Inflated	0.466	0.6415
RAL-712	25	Count	0.954	0.340	RAL-712	25	Zero-Inflated	0.420	0.674
RAL-820	5	Count	-1.909	0.0563	RAL-820	5	Zero-Inflated	-0.009	0.99276
RAL-820	10	Count	-1.437	0.151	RAL-820	10	Zero-Inflated	0.544	0.5867
RAL-820	15	Count	-1.714	0.0865	RAL-820	15	Zero-Inflated	-0.889	0.37383
RAL-820	20	Count	-2.226	0.026	RAL-820	20	Zero-Inflated	-0.003	0.99797
RAL-820	25	Count	-1.220	0.2225	RAL-820	25	Zero-Inflated	-1.003	0.3160
RAL-820	30	Count	-2.01	0.0444	RAL-820	30	Zero-Inflated	-0.239	0.811
RAL-820	35	Count	-0.223	0.823	RAL-820	35	Zero-Inflated	0.692	0.489

Supplementary Table S3.4: Statistical significance of total fecundity (by day 35) with *Wolbachia* status, divided by offspring sex			
DGRP	**Offspring sex**	**ANOVA (F-value)**	**ANOVA (P-value)**
RAL-136	females	3.974	0.0534
RAL-136	males	4.84	0.034
RAL-149	females	0.671	0.418
RAL-149	males	0.519	0.476
RAL-181	females	1.124	0.296
RAL-181	males	0.865	0.358
RAL-374	females	0.446	0.508
RAL-374	males	2.284	0.139
RAL-440	females	4.448	0.0416
RAL-440	males	2.143	0.151
RAL-441	females	0.075	0.786
RAL-441	males	0.078	0.782
RAL-535	females	1.339	0.254
RAL-535	males	0.21	0.649
RAL-69	females	0.67	0.418
RAL-69	males	0	0.984
RAL-712	females	3.835	0.0576
RAL-712	males	7.96	0.00756
RAL-820	females	1.979	0.168
RAL-820	males	1.479	0.232

Supplementary Table S3.5 : Hazard Ratios for Parental Survival (35 days)				
DGRP	Characteristic	Hazard Ratio	95% Confidence Interval	P-value
RAL-136	Wolb+	0.70	0.16, 3.13	0.6
RAL-136	Male	0.44	0.08, 2.38	0.3
RAL-136	Wolb+ * Male	0.71	0.04, 12.0	0.8
RAL-149	Wolb+	0.70	0.27, 1.81	0.5
RAL-149	Male	0.75	0.27, 2.08	0.6
RAL-149	Wolb+ * Male	1.06	0.26, 4.27	>0.9
RAL-181	Wolb+	1.60	0.82, 3.11	0.2
RAL-181	Male	0.36	0.16, 0.80	0.012
RAL-181	Wolb+ * Male	0.47	0.15, 1.49	0.2
RAL-374	Wolb+	1.34	0.59, 3.05	0.5
RAL-374	Male	0.39	0.13, 1.11	0.078
RAL-374	Wolb+ * Male	1.34	0.33, 5.34	0.7
RAL-440	Wolb+	2.18	0.94, 5.05	0.069
RAL-440	Male	0.87	0.34, 2.25	0.8
RAL-440	Wolb+ * Male	0.33	0.09, 1.29	0.11
RAL-441	Wolb+	0.21	0.05, 1.00	0.051
RAL-441	Male	0.61	0.20, 1.88	0.4
RAL-441	Wolb+ * Male	6.41	0.93, 44.2	0.059
RAL-535	Wolb+	1.07	0.50, 2.27	0.9
RAL-535	Male	0.52	0.21, 1.25	0.14
RAL-535	Wolb+ * Male	0.78	0.23, 2.68	0.7
RAL-69	Wolb+	0.96	0.49, 1.87	0.9
RAL-69	Male	0.25	0.11, 0.57	<0.001
RAL-69	Wolb+ * Male	1.23	0.41, 3.73	0.7
RAL-712	Wolb+	0.82	0.43, 1.55	0.5
RAL-712	Male	3.72	1.90, 7.29	<0.001
RAL-712	Wolb+ * Male	0.02	0.01, 0.08	<0.001
RAL-820	Wolb+	0.53	0.22, 1.28	0.2
RAL-820	Male	0.90	0.41, 1.97	0.8
RAL-820	Wolb+ * Male	2.28	0.69, 7.50	0.2

Supplementary Table S3.6 : Primers			
Gene	Forward primer (5' – 3')	Reverse primer (5' – 3')	Reference
actin	GCGTCGGTCAATTCAATCTT	AAGCTGCAACCTCTTCGCA	Ponton et al. 2011
wsp	TGGTCCAATAAGTGATGAAGAAAC	AAAAATTAAACGCTACTCCA	Teixeira et a. 2008

Primer sequence references:

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CHAPTER 4

General Discussion

Author contributions

Ana Eugénio wrote this chapter.

Discussion & Perspectives

In this thesis, our primary objective was to test the hypothesis that the endosymbiont *Wolbachia* could affect the activity of transposable elements in *Drosophila melanogaster* hosts. This hypothesis was built upon hints of this relationship coming from other studies (Riegler et al. 2005; Kraaijeveld & Bast 2012; Mayoral et al. 2014; Touret et al. 2014). To the best of our knowledge, this would be the first study to apply a systematic approach to answer this question, focusing on multiple TEs and host genotypes.

In **Chapter 1**, I framed our research by reporting on the state-of-the-art regarding TEs and *Wolbachia* as important and prevalent symbionts of a variety of host species, capable of inducing both positive (Teixeira et al. 2008; Casacuberta & González 2013; Liu et al. 2022) and deleterious (Ni et al. 2017; Payer & Burns 2019; Namias et al. 2022) effects on hosts, and ultimately contribute to shaping the evolution of their populations. Despite being known for some decades, it seems that the intricacies of TEs and *Wolbachia*'s dynamics within hosts only recently began being unveiled, as more studies have been focusing on these symbionts, and with the crucial new advancements in technological and genetic manipulation tools allowing for their better detection and tracking (Shahid & Slotkin 2020). In this chapter, I also mentioned the relevant studies that found potential interactions between TEs and *Wolbachia*, and made a case on why *Drosophila melanogaster*, and in particular the *Drosophila melanogaster* Genetic Reference Panel (DGRP; Mackay et al. 2012), would be a good model to study our hypothesis, both due to the general characteristics that make this species a great study system (sequenced and extensively annotated genome, sophisticated genetic tools available, fast life cycle, etc.), and in particular the DGRP lines for being isogenic and fully-sequenced, having information available for TE insertions and identity, and with multiple lines naturally infected with *Wolbachia*.

In **Chapter 2**, we aimed at testing our hypothesis that *Wolbachia* infection could affect TE activity. We started by characterizing 25 isogenic genotypes of *Drosophila melanogaster* from the DGRP for *Wolbachia* titers, and observed significant differences between genotypes, albeit within the same order of magnitude. Studies have shown that a higher *Wolbachia* load can imply stronger potential effects (Osborne et al. 2012; Baião et al. 2019; Bryant & Newton 2020), and this experiment was performed with the expectation that higher *Wolbachia* loads could correlate to stronger effects on TE expression. Overall, we did not see a correlation between *Wolbachia* load and effects on TE expression, although two DGRP lines, RAL-21 and RAL-712, stand out for showing both a negative *Wolbachia* effect across most TEs and some of the highest *Wolbachia* loads observed.

We also characterized the DGRP lines for the number of insertions called "novel" in Mackay et al. 2012 (i.e., insertions not present in the Release 5 of the *Drosophila melanogaster*'s reference genome) for 14 different TEs, using data from the TIDAL-FLY v1.0 tool of Rahman et al. (2015), and observed significant variation in number of novel TE insertions between genotypes. We decided to focus on novel insertions with the reasoning that these insertions were more likely to still be active today, and expecting to see differences in TE expression between our chosen TEs, i.e., the TEs with lower number of novel insertions, such as *Cr1a*, *Idefix* and *gypsy 5*, would have lower expression compared to TEs with higher number of novel insertions, such as the DNA transposons from our list, *1360*, *P-element* and *pogo*. Our qPCR results for TE expression did not confirm this hypothesis, with TEs' expression levels mostly depending on the DGRP genotypes.

qPCR is a crucial tool in molecular biology, allowing for highly sensitive and specific detection and quantification of nucleic acid sequences. However, it is also an expensive technique that requires careful optimization for robust and trustworthy results. I consider the optimization of the protocol for the quantification of TE transcripts to have been the most challenging part of this project. Our main concern was due to the Cqs for TE transcripts bordering on the threshold of detection for the qPCR machine (around 31-34), that did not lower sufficiently with the most obvious attempts to increase volume or concentration of cDNA templates. The optimized protocol for this experiment can be found in the Materials & Methods section of Chapter 2, but in short, the most crucial steps that together greatly improved our protocol were: 1) the addition of chloroform and collection of the aqueous phase containing the RNA, before proceeding with the instructions from the RNA extraction kit; 2) the choice on the cDNA synthesis kit (NZY First-Strand cDNA Synthesis Kit by NZYTech), which is designed to provide high yields of full-length cDNA products and increase sensitivity in qPCR; 3) the change to the QuantStudio™ 7 Flex Real-Time PCR System (Applied Biosystems™) from a previous more outdated and less sensitive qPCR machine.

In the study on the effect of *Wolbachia* presence in the expression of the 14 TEs, in the 25 paired *Wolbachia*-positive (Wolb+) / *Wolbachia*-negative (Wolb-) genotypes, we found significant differences in levels of TE transcript in 21.1% of the 350 TE-genotype combinations. Although I believe our approach to include multiple TE-host genotype combinations was important to test our hypothesis, I also recognize that a limitation of this method is the possible statistical issues arising from multiple testing, namely the appearance of false positive significant results. To account for this, we underlined the significant differences that remained after a Benjamini-Hochberg correction for multiple comparisons in Fig.2.2 C, to decrease the false discovery rate (significant results become 2.86% of the 350 TE-genotype combinations). An independent repetition of this study for the significant results will be invaluable to confirm our conclusions.

These results confirm our hypothesis that *Wolbachia* infection can have an effect on TE expression. However, because the effects seem to be specific for just a few DGRP-TE combinations, and because we found the dependency of *Wolbachia*'s effects on host genotype to be interesting, we decided to switch focus on **Chapter 3**, and further explore the relationship between *Wolbachia* and its host. In particular, we aimed at studying *Wolbachia* loads in different host genotypes, and *Wolbachia* effect on fitness traits.

First, we measured *Wolbachia* titers every five days until day 35, on a subset of 10 DGRP Wolb+ genotypes from the original set from Chapter 2, and observed significant differences between lines, with titers generally increasing with age, which is in accordance with other studies (Kaur et al. 2020; Shropshire et al. 2021). We also collected preliminary datasets on proliferation of *Wolbachia* located in different host body parts and at different ambient temperatures, observing that both factors can also affect this endosymbiont's proliferation. The experiments for these two projects focused on factors affecting *Wolbachia* loads (temperature plus body part, and temperature plus age) were developed by the master students doing internships in our lab, Anna Le Breton and Alexandre Couëtoux, and were originally designed to include more DGRP genotypes. This would allow for better assessment and more robust conclusions for the potential differences on *Wolbachia* loads between host genotypes. Despite being cut short due to the pandemic, I believe they are interesting datasets that should be taken into consideration. I am particularly curious about the seeming consistent result of *Wolbachia* proliferation increasing with age under the ambient temperature of 25°C, but not at 18°C, and wonder if that is a general effect across genotypes of *Drosophila melanogaster*, and what could be potential seasonal consequences in natural environments.

In our next experiment, we focused on two crucial fitness traits – fecundity and survival. We counted the number of living adult offspring every five days until day 35 as a measured of fecundity for couples from the ten Wolb+/Wolb- DGRP paired lines for which we measured *Wolbachia* loads with age. We also annotated if and when parental death occurred. We observed that *Wolbachia* infection could affect, albeit in only a few host genotypes, fecundity, offspring sex ratios, and survival. This shows that, for our group of DGRP lines, *Wolbachia* effects on these fitness traits appears to be mild.

Overall, our work showed that the endosymbiont *Wolbachia* can indeed affect transposable element dynamics and fitness of *Drosophila melanogaster* hosts, albeit being highly dependent on host genotype. More studies are needed to understand the mechanisms on which these effects occur, and within-host and external factors that can affect them. Below I highlight what I believe could be useful studies to complement and/or improve the findings in this thesis.

The first experiment would be based on our observation that *Wolbachia* loads increased with age for our DGRP genotypes (Chapter 3) and the knowledge from other studies documenting stronger *Wolbachia* effects with higher loads (Unckless et al. 2009; Osborne et al. 2012; Baião et al. 2019). In our study on the effect of *Wolbachia* infection on TE expression (Chapter 2), the flies were 10-days old and we observed an overall mild effect of *Wolbachia* infection on TE expression. We also did not see a clear effect of *Wolbachia* loads. I think it would be valuable to repeat this experiment in flies at later adult ages, wondering if *Wolbachia* effects would then be more pronounced. This could reveal a possible impact of the interaction between host age and *Wolbachia* infection on TE mobilization. Furthermore, I think that both *Wolbachia* loads and TE expression should be assessed from the same flies, implying the extraction of both DNA and RNA from the same individuals, which would establish a better possible correlation between *Wolbachia* load and TE expression.

Second, we measured expression as a proxy for TE activity (e.g., Becking et al. 2020; Torres et al. 2021), reasoning that higher expression creates more opportunities for new insertions. Measuring TE expression with qPCR is common but not without its own limitations and a complementary study could be measuring TE expression using another technique such as RNA-seq (Lanciano & Cristofari 2020; Deininger et al. 2017). Also, transcription is only one step in TE mobilization, and *Wolbachia* may impact TE integration post-transcriptionally. It would be valuable to also measure the number of TE insertions, possibly by qPCR. However, because per generation the number of new insertions is presumably low (around 10^{-9} per TE insertion site per host generation, cf. Adrion et al. 2017), this should be done across a large number of generations.

Third, I think that a crucial follow-up study after ours will be the search for possible mechanisms by which *Wolbachia* might affect TE dynamics. One possible approach would be to test if *Wolbachia* effects on TE expression are mediated by *Wolbachia* effects on piRNA production, since piRNAs are known to repress TEs (Tóth et al. 2016; Wu et al. 2020). piRNA expression in pairs of Wolb+ and Wolb- genotypes differing in TE expression could be quantified using NGS technology. Another possible approach would be to use a Genome-Wide Association Study (GWAS) approach to identify which SNPs associated with differences in TE expression between Wolb+ and Wolb- genotypes. Even though the DGRPs have been developed specifically for allowing GWAS-based identification of genes contributing to inter-genotype differences in a variety of phenotypes, us only following 25 DGRP genotypes precluded a meaningful GWAS analysis, and therefore more genotypes would need to be included.

Forth, I am curious about whether *Wolbachia* would also affect TE expression in male flies. Our measurements of TE expression were performed in females, and we based our choice on *Wolbachia* being maternally transmitted and studying effects on TEs in females could be interesting from an evolutionary perspective.

However, we know *Wolbachia* can have important effects in males, such as in mate competition and mating rate (De Crespigny et al. 2006; Rohrscheib et al. 2015). It would be interesting to see if they also affect TE expression in a similar or different way than in females. Furthermore, our studies on TE expression were performed in whole bodies, as *Wolbachia* is present across the germline and multiple somatic tissues in *Drosophila* (Pietri et al. 2016), and I think it would be valuable to test if there are differences in *Wolbachia* loads and effects on TEs expressed in different body parts or organs, including the brain, as studies on *Wolbachia* have shown its effects on behaviour and sensorial traits (Vala et al. 2004; Peng & Wang 2009; Truitt et al. 2019).

Finally, a note on the importance of genotype. Our studies underscore the importance of analysing multiple genotypes to better understand biological phenomena. In our experiments, we observed significant differences between genotypes in all our datasets, sometimes displaying opposite results (for example, higher or lower TE expression in the presence of *Wolbachia*). I became convinced that most experiments should take genotype into consideration, either by using enough individuals from an outbred and genetically variable population, or by considering individuals from multiple genotypes or populations. It is possible that studies focused on a single or a few genotypes can miss or misrepresent general properties.

With this work, I believe we have contributed to the growing body of knowledge regarding TEs and *Wolbachia*, offering first systematic approaches that also underscore the importance of taking host genotype into consideration. I look forward to see further new studies on these symbionts, their effects on hosts, and their role on the evolution of populations.

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