GEPHE SUMMARY

Gephebase Gene
para (kdr) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^para (kdr)^#gephebase-summary-title)

GepheID
GP00002469

Entry Status
Published

Main curator
Courtier

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Xenobiotic resistance (insecticide) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (insecticide)^#gephebase-summary-title)

Trait State in Taxon A
Phlebotomus argentipes susceptible

Trait State in Taxon B
Phlebotomus argentipes resistant

Ancestral State
Taxon A

Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name
Phlebotomus argentipes (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Phlebotomus argentipes^#gephebase-summary-title)

Common Name
-

Synonyms
Phlebotomus (Euphlebotomus) argentipes; Phlebotomus argentipes Annandale & Brunetti, 1908

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Diptera; Nematocera; Psychodomorpha; Psychodoidea; Psychodidae; Phlebotominae; Phlebotomus; Euphlebotomus

Parent
Euphlebotomus () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 94468)

NCBI Taxonomy ID
94469 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 94469)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Phlebotomus argentipes (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Phlebotomus argentipes^#gephebase-summary-title)

Common Name
-

Synonyms
Phlebotomus (Euphlebotomus) argentipes; Phlebotomus argentipes Annandale & Brunetti, 1908

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Diptera; Nematocera; Psychodomorpha; Psychodoidea; Psychodidae; Phlebotominae; Phlebotomus; Euphlebotomus

Parent
Euphlebotomus () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 94468)

NCBI Taxonomy ID
94469 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 94469)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
para

Synonyms
bas; bss; CG9907; Dmel\CG9907; DmNav; DmNav1; DmNa[[v]]; DmNa[[V]]; DmNa[[v]]1; l(1)14Da; l(1)ESHS48; lincRNA.S9469; Nav1; Ocd; olfD; par; sbl; sbl-1; Shu; Shudderer

String
7227.FBpp0303597 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 7227.FBpp0303597)

Sequence Similarities
Belongs to the sodium channel (TC 1.A.1.10) family. Para subfamily.

GO - Molecular Function
GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)
GO:0005244 : voltage-gated ion channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005244)
GO:0005248 : voltage-gated sodium channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005248)

UniProtKB Drosophila melanogaster
P35500 (http://www.uniprot.org/uniprot/P35500)

GenebankID or UniProtKB
()

GO:0005272 : sodium channel activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0005272)

GO - Biological Process

GO:0045433 : male courtship behavior, veined wing generated song production
(https://www.ebi.ac.uk/QuickGO/term/GO:0045433)
GO:0001666 : response to hypoxia (https://www.ebi.ac.uk/QuickGO/term/GO:0001666)
GO:0009612 : response to mechanical stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:0009612)
GO:0034765 : regulation of ion transmembrane transport
(https://www.ebi.ac.uk/QuickGO/term/GO:0034765)
GO:0035725 : sodium ion transmembrane transport
(https://www.ebi.ac.uk/QuickGO/term/GO:0035725)
GO:0007638 : mechanosensory behavior
(https://www.ebi.ac.uk/QuickGO/term/GO:0007638)
GO:0060078 : regulation of postsynaptic membrane potential
(https://www.ebi.ac.uk/QuickGO/term/GO:0060078)

GO - Cellular Component

GO:0005887 : integral component of plasma membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0005887)
GO:0001518 : voltage-gated sodium channel complex
(https://www.ebi.ac.uk/QuickGO/term/GO:0001518)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title)

Aberration Type

SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=^SNP^#gephebase-summary-title)

SNP Coding Change

-

Molecular Details of the Mutation

L1014S

Experimental Evidence

Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)

	Taxon A	Taxon B	Position
Codon	TTA	TCA	-
Amino-acid	Leu	Ser	1014

Main Reference

Chemical control and insecticide resistance status of sand fly vectors worldwide. (2021) (https://pubmed.ncbi.nlm.nih.gov/34383751)

Authors

Balaska S; Fotakis EA; Chaskopoulou A; Vontas J

Abstract

Phlebotomine sand flies are prominent vectors of Leishmania parasites that cause leishmaniasis, which comes second to malaria in terms of parasitic causative fatalities globally. In the absence of human vaccines, sand fly chemical-based vector control is a key component of leishmaniasis control efforts.

We performed a literature review on the current interventions, primarily, insecticide-based used for sand fly control, as well as the global insecticide resistance (IR) status of the main sand fly vector species. Indoor insecticidal interventions, such as residual spraying and treated bed nets are the most widely deployed, while several alternative control strategies are also used in certain settings and/or are under evaluation. IR has been sporadically detected in sand flies in India and other regions, using non-standardized diagnostic bioassays. Molecular studies are limited to monitoring of known pyrethroid resistance mutations (kdr), which are present at high frequencies in certain regions.

As the leishmaniasis burden remains a major problem at a global scale, evidence-based rational use of insecticidal interventions is required to meet public health demands. Standardized bioassays and molecular markers are a prerequisite for this task, albeit are lagging behind. Experiences from other disease vectors underscore the need for the implementation of appropriate IR management (IRM) programs, in the framework of integrated vector management (IVM). The implementation of alternative strategies seems context- and case-specific, with key eco-epidemiological parameters yet to be investigated. New biotechnology-based control approaches might also come into play in the near future to further reinforce sand fly/leishmaniasis control efforts.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^94469^/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^94469^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS