

VEuPathDB

Dan Lawson & Sam Rund
February 2020

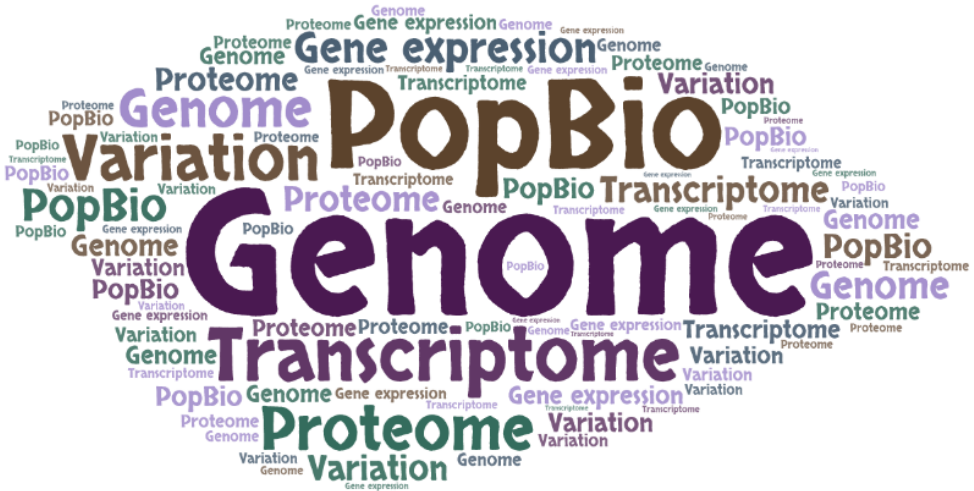
What is VEuPathDB?



NIH-NIAID Bioinformatic Resource Centers

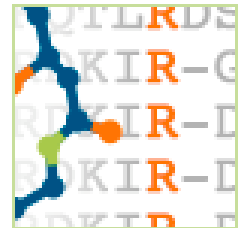


But we still will do the same things



'Omics in VectorBase

- Home of 43 genomes comprising *Aedes* (2 spp), *Anopheles* (19), *Glossina* (6), sand flies (2), a *Culex* mosquito, (intermediate host) snail, bedbug, tick, body louse, kissing bug, mites and biting flies.
- Assembled transcriptomes for 20 species
- RNA-Seq data (or non-assembled transcriptomes) are available for 34 species
- Transcript data obtained under *different experimental conditions* for 19 species, with 40+ each for *Ae. aegypti* and *An. gambiae*
- Several proteomic experiments



VectorBase still exists but
is part of a larger project

Expect similar data types
across the sites

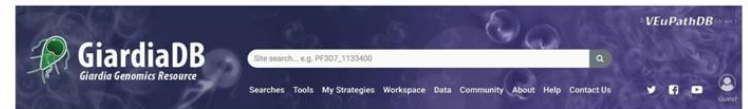
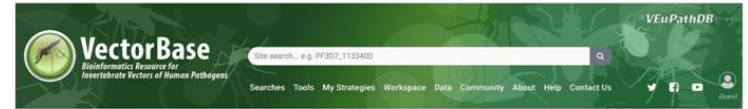
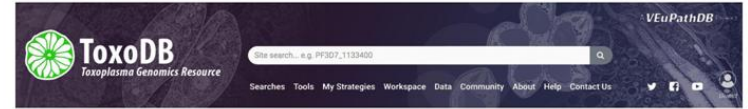


Image gallery



VectorBase
Bioinformatics Resource for Invertebrate Vectors of Human Pathogens

Advanced Search Switch Search Type





We are excited to announce that VectorBase and EuPathDB are now one bioinformatic resource center. See the [press release](#) and our [letter to the community](#) to learn more.


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Home » Image Gallery

Images

Most of these photographs were taken by James Gathany, Scientific Photographer for the Center for Disease Control. Many of them can be found in the Public Health Image Library (PHIL) provided by the CDC. Follow this link for a YouTube video of his life and work.

 <p>Aedes Species</p>	 <p>Anopheles Species</p>	 <p>Armigeres subalbatus</p>	 <p>Biomphalaria glabrata</p>	 <p>Cimex Species</p>	 <p>Culex Species</p>
 <p>Dermacentor variabilis</p>	 <p>Glossina morsitans</p>	 <p>Ixodes Species</p>	 <p>Lutzomyia longipalpis</p>	 <p>Ochlerotatus triseriatus</p>	 <p>Ornithodoros turicata</p>
 <p>Pediculus humanus</p>	 <p>Phlebotomus papatasi</p>	 <p>Rhipicephalus sanguineus</p>	 <p>Rhodnius prolixus</p>	 <p>Sarcoptes scabiei</p>	 <p>Simulium Species</p>
					



VectorBase
Bioinformatics Resource for Invertebrate Vectors of Human Pathogens


















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Home » Image Gallery » Aedes Species » A. albopictus

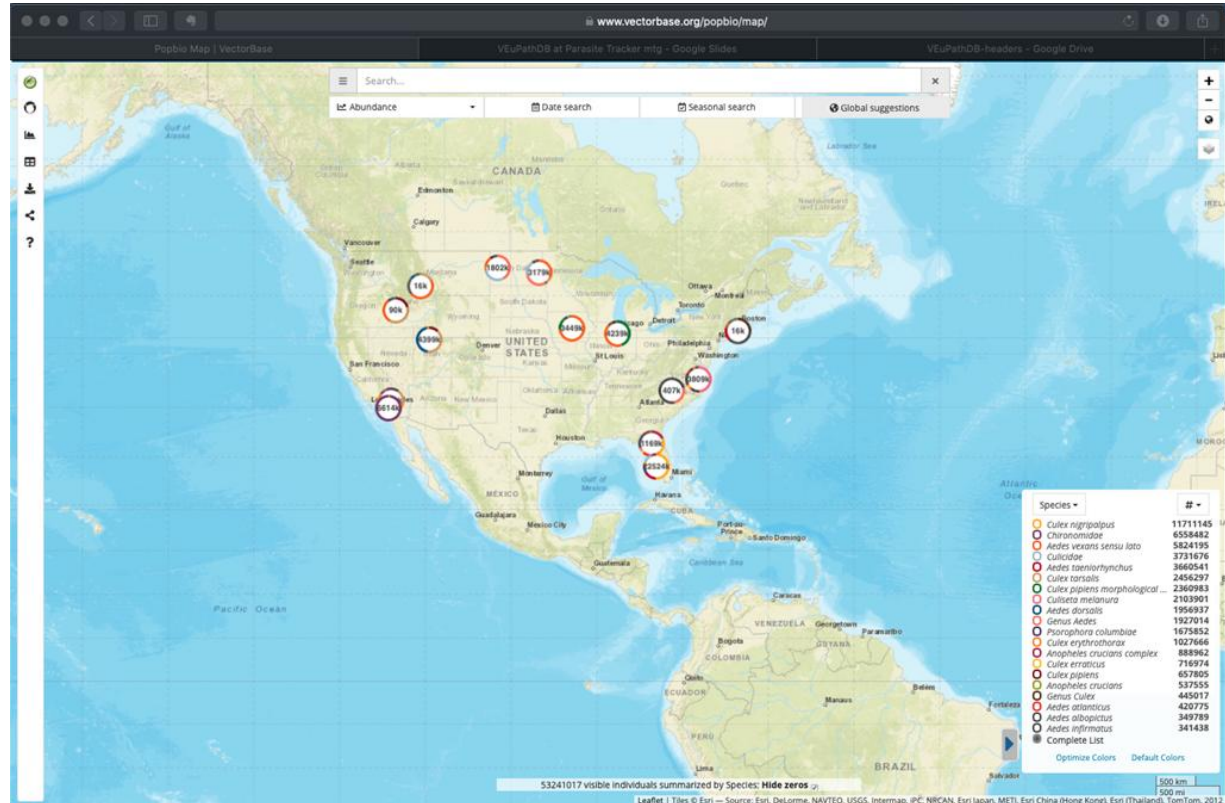
Images

 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>
 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>
 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	 <p>A. albopictus</p>	

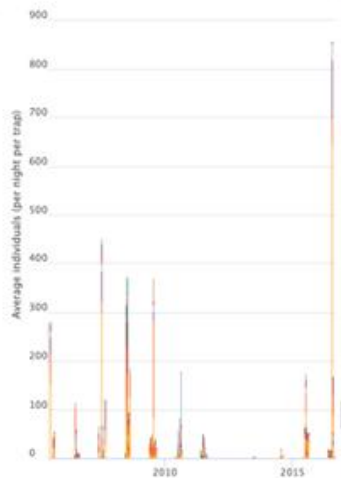
MapVEu

<http://www.vectorbase.org/popbio/map>

PopBio → MapVEu



Population abundance



- Genus *Aedes*
- Culicidae
- *Aedes vexans sensu lato*
- *Culex tarsalis*
- Genus *Culex*
- Genus *Anopheles*
- Genus *Culiseta*
- *Culex salinarius*

Limit Species

All categories shown

On

Temporal Resolution

Yearly Monthly **EpiWeekly** Daily

North Dakota Department of Health

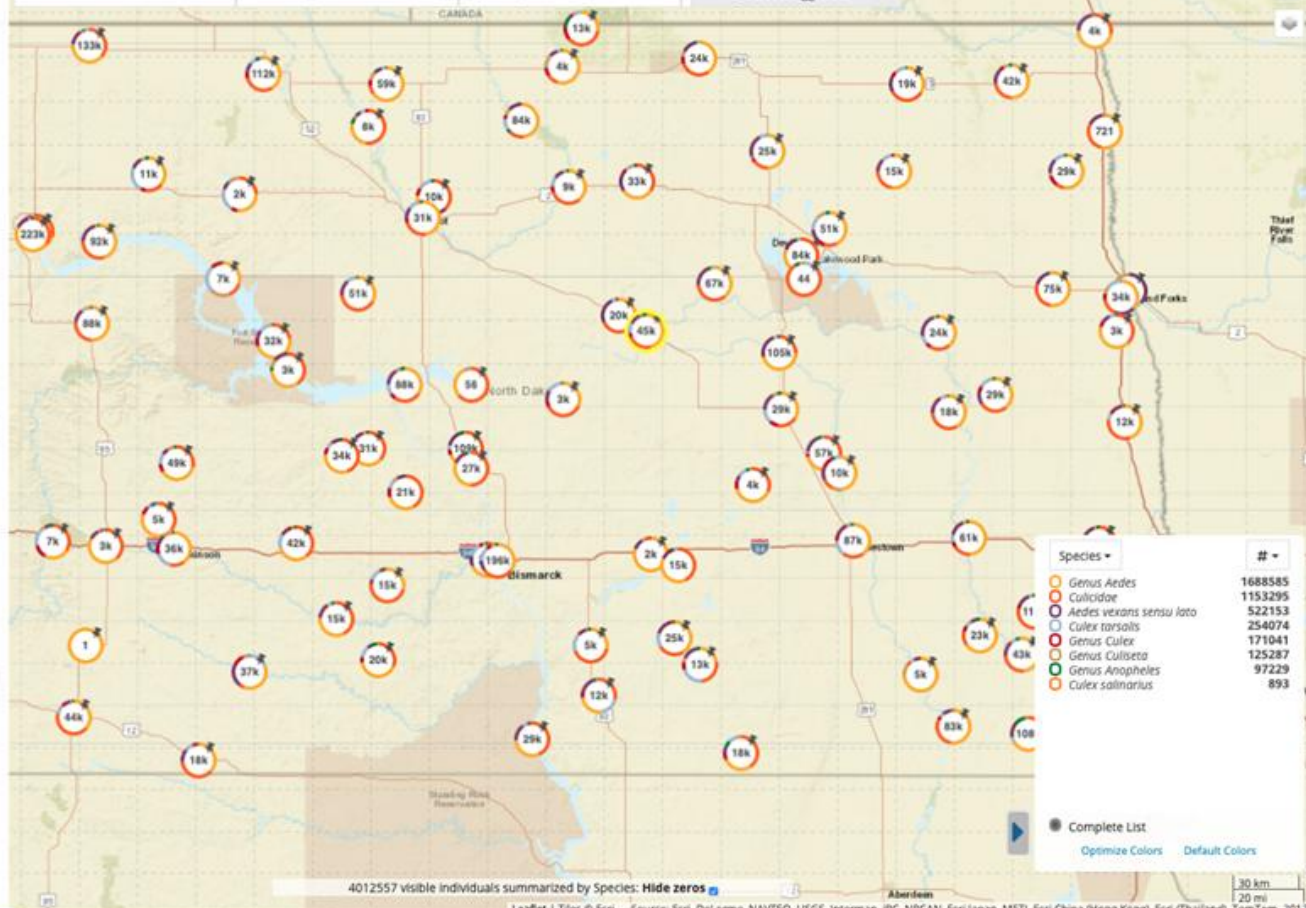
Search...

Abundance

Date search

Seasonal search

Global suggestions



Species

- Genus *Aedes*
- Culicidae
- *Aedes vexans sensu lato*
- *Culex tarsalis*
- Genus *Culex*
- Genus *Culiseta*
- Genus *Anopheles*
- *Culex salinarius*

#

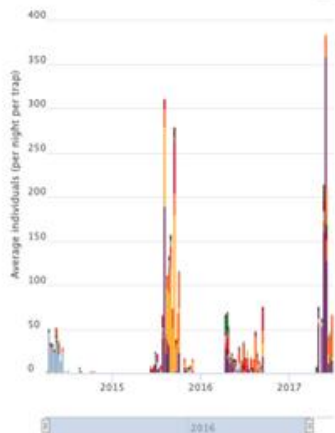
- 1688585
- 1153295
- 522153
- 254074
- 171041
- 125287
- 97229
- 893

Complete List

[Optimize Colors](#) [Default Colors](#)

4012557 visible individuals summarized by Species: [Hide zeros](#)

Population abundance



- *Aedes infirmatus*
- *Culex nigripalpus*
- *Psorophora ferox*
- *Anopheles crucians complex*
- *Culex erraticus*
- *Uranotaenia sapphirina*
- *Coquillettidia perturbans*
- *Anopheles quadrimaculatus*
- *Anopheles perplexens*
- *Culex quinquefasciatus*
- *Aedes vexans sensu lato*
- *Mansonia trillians*
- *Culex coronator*
- *Anopheles punctipennis*
- nothing collected

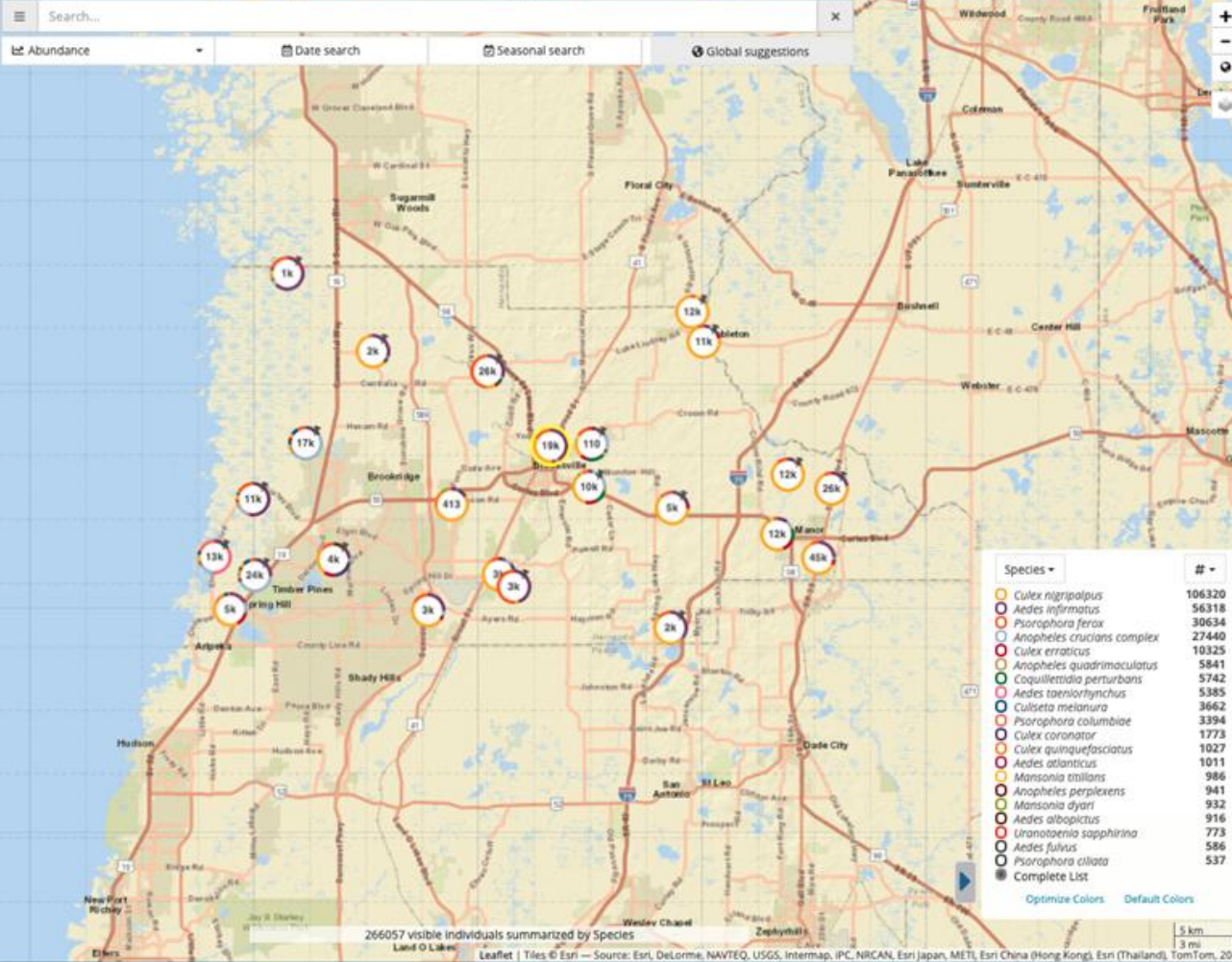
Limit Species

Top 14 (of 42) categories shown

On

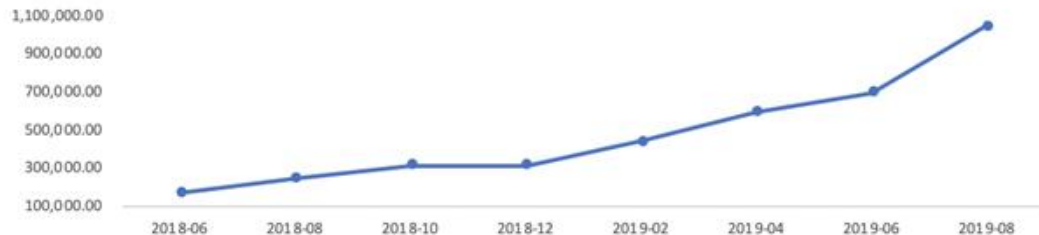
Temporal Resolution

Yearly Monthly **EpiWeekly** Daily

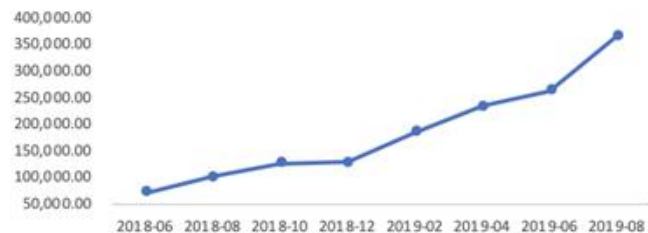


266057 visible individuals summarized by Species

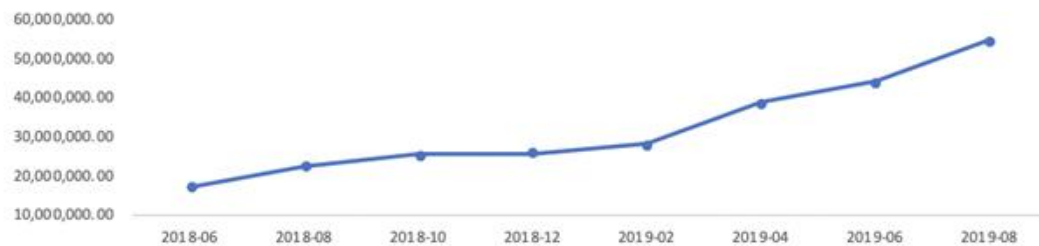
Occurrence Records



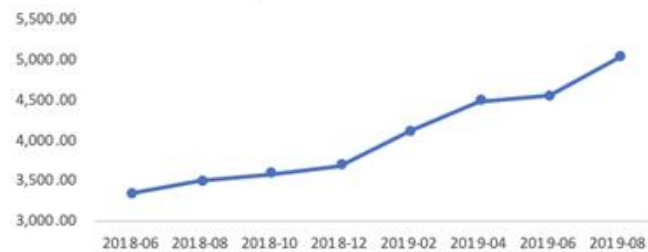
Collection Events



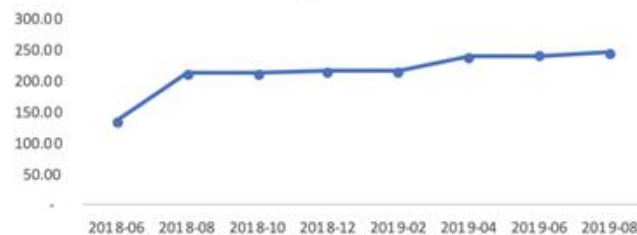
Animals Collected



Unique Collection Sites



Species



Abundance data growth
on our VectorBase
platform

Animals Collected	54,722,462
Collection Events	366,478
Occurrence Records	1,048,697
Unique Collection Sites	5,033
Species	247
Citation Lines	60
Records (zeros included)	20,310,080

genus Anopheles

VbSp: 00001

Anopheles gambiae

VbSp: 00002

genus Anopheles

VbSp: 00001

Anopheles gambiae *species complex*

VbSp: 00002

Anopheles gambiae s.s.

VbSp: 00003

Anopheles arabiensis

VbSp: 00004

genus Anopheles

VbSp: 00001

Anopheles gambiae species complex

VbSp: 00002

Anopheles gambiae s.s.

VbSp: 00003

M-Form

VbSp: 00005

Anopheles arabiensis

VbSp: 00004

genus Anopheles

VbSp: 00001

Anopheles gambiae species complex

VbSp: 00002

Anopheles gambiae s.s.

VbSp: 00003

Anopheles coluzzii

VbSp: 00005

Anopheles arabiensis

VbSp: 00004

Ontology Browser



Tool

Please select an ontology:

Vectorbase CV

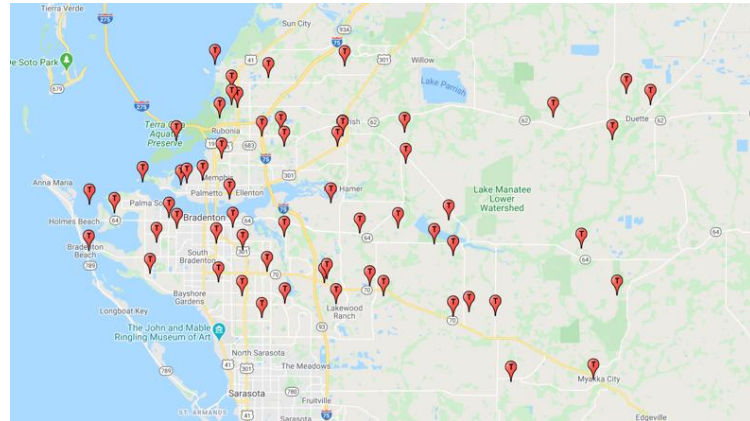
Search:

pippins

- Culex pipiens
- Culex pipiens complex
- Culex pipiens group (Bartholom...
- Culex pipiens molestus
- Culex pipiens morphological group**

- Culex pipiens morphological group**
 - Culex pipiens complex
 - Culex australicus
 - Culex pipiens
 - Culex pipiens molestus
 - Culex pipiens pallens
 - Culex pipiens pipiens
 - Culex pipiens pipiens x Culex pipiens
 - Culex quinquefasciatus
 - Culex restuans
 - Culex salinarius

Term information	
ID	VBsp:0003847
Name	Culex pipiens morphological group
Definition	Moprphologically indistinguishable group
Source	N/A
Comment	
Relationship(s)	<i>is_a</i> Culex
Domain	Population Biology
Hits	1466567



[-] Culex pipiens morphological group	
[-] Culex pipiens complex	IC
Culex australicus	N
[-] Culex pipiens	D
Culex pipiens molestus	S
Culex pipiens pallens	C
Culex pipiens pipiens	R
Culex pipiens pipiens x Culex pipie	
Culex quinquefasciatus	
Culex restuans	
Culex salinarius	Pr



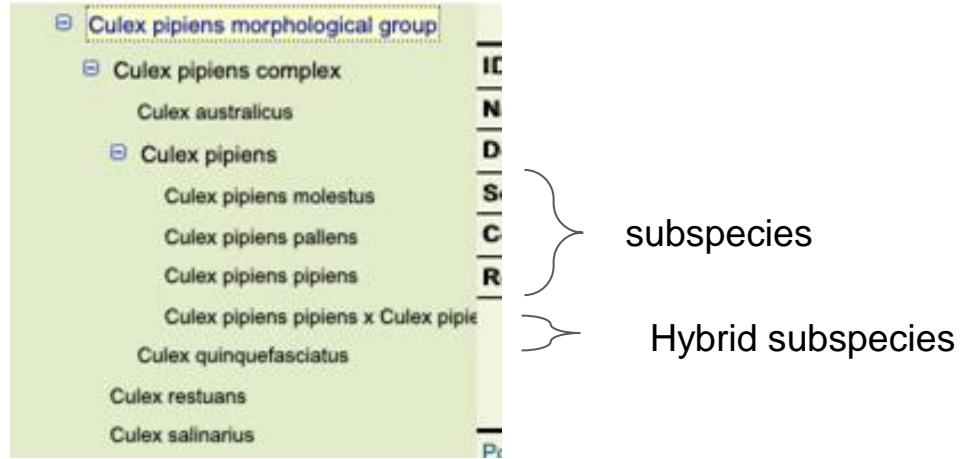
Morphological group

[-] Culex pipiens morphological group	
[-] Culex pipiens complex	IC
Culex australicus	N
[-] Culex pipiens	D
Culex pipiens molestus	S
Culex pipiens pallens	C
Culex pipiens pipiens	R
Culex pipiens pipiens x Culex pipie	
Culex quinquefasciatus	
Culex restuans	
Culex salinarius	Pr



Complex

Other species many surveillance groups lump together



How do we want to reflect complexes, groups, & subspecies?

Orgins of VectorBase species ontology



The screenshot shows the top navigation bar of the Mosquito Taxonomic Inventory website. It features a blue background with the site title 'Mosquito Taxonomic Inventory' on the left, a search bar with a 'SEARCH' button on the right, and a row of menu items: 'CULICIDAE', 'FOSSIL CULICIDAE', 'AEDINI (TRADITIONAL)', 'CLASSIFICATIONS', 'MORPHOLOGY', 'ANATOMICAL GLOSSARY', 'LITERATURE', 'VALID SPECIES', and 'WHAT'S NEW?'. There are also links for 'Contact us', 'Report abuse', and 'Log in' in the top right corner.

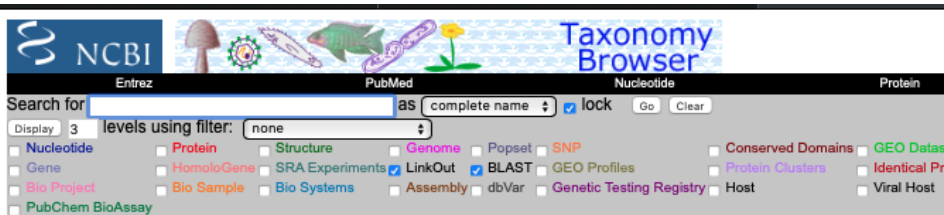
Welcome to Mosquito Taxonomic Inventory

The **Mosquito Taxonomic Inventory (MTI)** aims to provide an up-to-date, authoritative resource on the global diversity of family Culicidae. The classification used on this site aims to be a natural classification of mosquitoes. It includes all formally established taxa based on the results of objective phylogenetic analyses, together with those taxa based on intuitive interpretation of morphological data that have yet to be investigated using such methods. The results of such phylogenetic analyses often show that currently recognised nominal taxa are polyphyletic and unnatural, so if the classification is to reflect evolutionary history, with the formal naming of taxa based on monophyletic groups of equivalent rank, then nomenclatural changes will be inevitable. Retaining taxa based solely on convenience or past usage, when there is published evidence to the contrary, is not an option. However, it must also be recognised that all patterns of relationship are hypotheses, to be tested with new data and methods, and so further changes will doubtless be forthcoming from future studies.

Visit [What's New?](#) to see a list of information that has been added most recently; visit [Valid Species](#) to see a complete



Other government taxon keys



Lineage (full): [cellular organisms](#); [Eukaryota](#); [Opisthokonta](#); [Metazoa](#); [Eumetazoa](#); [Bilateria](#); [Protostomia](#); [Ecdysozoa](#); [Culicoidea](#); [Culicidae](#); [Anophelinae](#); [Anopheles](#); [Cellia](#); [Pyrethorus](#)

o [gambiae species complex](#) [LinkOut](#) *Click on organism name to get more information.*

- [Anopheles arabiensis](#) [LinkOut](#) [BLAST page](#)
- [Anopheles bwambae](#) [LinkOut](#)
- [Anopheles coluzzii](#) [LinkOut](#)
- [Anopheles coluzzii x Anopheles gambiae](#)
- [Anopheles fontenillei](#)
- o [Anopheles gambiae](#) (African malaria mosquito) [LinkOut](#) [BLAST page](#)
 - [Anopheles gambiae str. PEST](#) [LinkOut](#)
- [Anopheles gambiae x Anopheles arabiensis](#)
- [Anopheles gambiae x Anopheles merus](#)
- [Anopheles melas](#) [LinkOut](#)
- [Anopheles merus](#) [LinkOut](#)
- [Anopheles merus x Anopheles coluzzii](#)
- o [Anopheles quadriannulatus](#) [LinkOut](#)
 - [Anopheles quadriannulatus A](#)
 - [Anopheles quadriannulatus B](#)



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Anopheles gambiae

Taxonomic Serial No.: 125987

[Download TWB](#) [Download Dwc-A](#) [\(Download Help\)](#) *Anopheles gambiae* TSN 125987

Taxonomy and Nomenclature

Kingdom: Animalia
Taxonomic Rank: Species
Synonym(s):
Common Name(s):

Taxonomic Status:

Current Standing: valid

Data Quality Indicators:

Record Credibility Rating: unverified

Taxonomic Hierarchy

Kingdom	Animalia – Animal, animaux, animals
Subkingdom	Bilateria
Infra kingdom	Protostomia
Superphylum	Ecdysozoa
Phylum	Arthropoda – Artrópode, arthropodes, arthropods
Subphylum	Hexapoda – hexapods
Class	Insecta – insects, hexapoda, inseto, insects
Subclass	Pterygota – insects ailés, winged insects
Infraclass	Neoptera – modern, wing-folding insects
Superorder	Holometabola
Order	Diptera – mosca, mosquito, gnats, mosquitoes, true flies
Suborder	Nematocera – long-horned flies
Infraorder	Culicomorpha
Family	Culicidae – mosquitoes, maringouins, moustiques
Subfamily	Anophelinae
Genus	Anopheles Meigen, 1818
Species	Anopheles gambiae