

'Reverse' identification key for mosquito species



More and more people are getting involved in the **surveillance of invasive mosquito species in the EU/EEA**, not just professionals with formal training in entomology. There are many taxonomic keys available for identifying mosquitoes of medical and veterinary importance, but they are almost all designed for professionally trained entomologists.

The current identification key aims to provide non-specialists with a simple mosquito recognition tool for distinguishing between invasive mosquito species and native ones. On the 'female' illustration page ([p. 4](#)) you can select the species that best resembles the specimen. On the species-specific pages you will find additional information on those species that can easily be confused with that selected, so you can check these additional pages as well.

This key provides the non-specialist with **reference material to help recognise an invasive mosquito species** and gives details on the morphology (in the species-specific pages) to help with verification and the compiling of a final list of candidates. The key displays six invasive mosquito species that are present in the EU/EEA or have been intercepted in the past. It also contains nine native species. The native species have been selected based on their morphological similarity with the invasive species, the likelihood of encountering them, whether they bite humans and how common they are.

If you want to further develop your identification skills, you can consult 'Mosquitoes - Identification, Ecology and Control. Third Edition' [1] or identification tools available online, such as MosKeyTool: <https://www.medilabsecure.com/moskeytool.html>.

Different scientific names are available for the species included in this key. Table 1 provides an overview of the scientific names used in the key [2] and names based on the revisions made by Reinert and colleagues [3-7] that can be found in scientific literature. We hope that this will aid communication between health professionals and scientists.

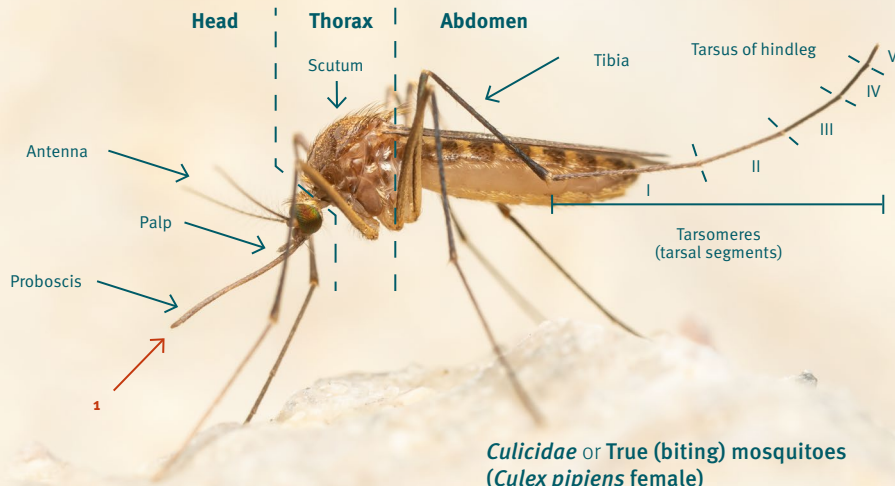
Species name used in the key	Synonyms	Common name
<i>Aedes aegypti</i>	<i>Stegomyia aegypti</i>	Yellow fever mosquito
<i>Aedes albopictus</i>	<i>Stegomyia albopicta</i>	Tiger mosquito
<i>Aedes japonicus japonicus</i>	<i>Hulecoeteomyia japonica japonica</i>	Asian bush or rock pool mosquito
<i>Aedes koreicus</i>	<i>Hulecoeteomyia koreica</i>	
<i>Aedes triseriatus</i>	<i>Ochlerotatus triseriatus</i>	American Eastern tree hole mosquito
<i>Aedes atropalpus</i>	<i>Georgecraigius atropalpus</i>	American rock pool mosquito
<i>Aedes cretinus</i>	<i>Stegomyia cretina</i>	
<i>Aedes geniculatus</i>	<i>Dahlia geniculata</i>	
<i>Aedes communis</i>	<i>Ochlerotatus communis</i>	Snowpool mosquito
<i>Culiseta annulata</i>		
<i>Culiseta longiareolata</i>		
<i>Aedes vexans</i>	<i>Aedimorphus vexans</i>	
<i>Culex pipiens</i>		House mosquito, Northern house mosquito
<i>Aedes cantans</i>	<i>Ochlerotatus cantans</i>	
<i>Aedes caspius</i>	<i>Ochlerotatus caspius</i>	Salt marsh mosquito

What is/is not a mosquito?

Scientific classification of mosquitoes

Kingdom	Phylum	Class	Order	Suborder	Family	Genus	Species
Animalia	Arthropoda	Insecta	Diptera	Nematocera	Culicidae	e.g. <i>Aedes</i>	e.g. <i>albopictus</i>

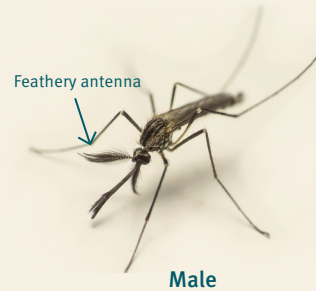
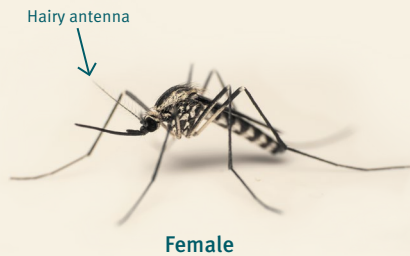
Body structures



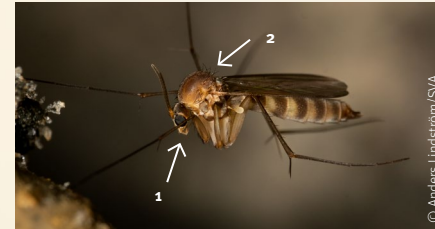
Culicidae or True (biting) mosquitoes (*Culex pipiens* female)

Females with elongated 'needle-like' mouth parts [1]; wings with scales; long legs; size of mosquito 3–6mm;

Female vs male mosquitoes



Diptera that look similar to Culicidae



Mycetophilidae or Fungus gnats

Short mouth parts [1]; markedly humped thorax [2]; 2–14mm



Limoniidae or Crane flies

Short mouth parts [1]; very long legs [2]; slender body [3]; 2–11mm



Ceratopogonidae or Biting midges

Short proboscis, not needle-like [1]; hooped thorax [2]; wing without scales [3]; 1–3mm



Chironomidae or Chironomids or Non-biting midges

Short mouth parts [1]; no scales on wing [2]; shape of thorax, 'hooped' [3]; ~10mm



Anisopodidae or Wood gnats

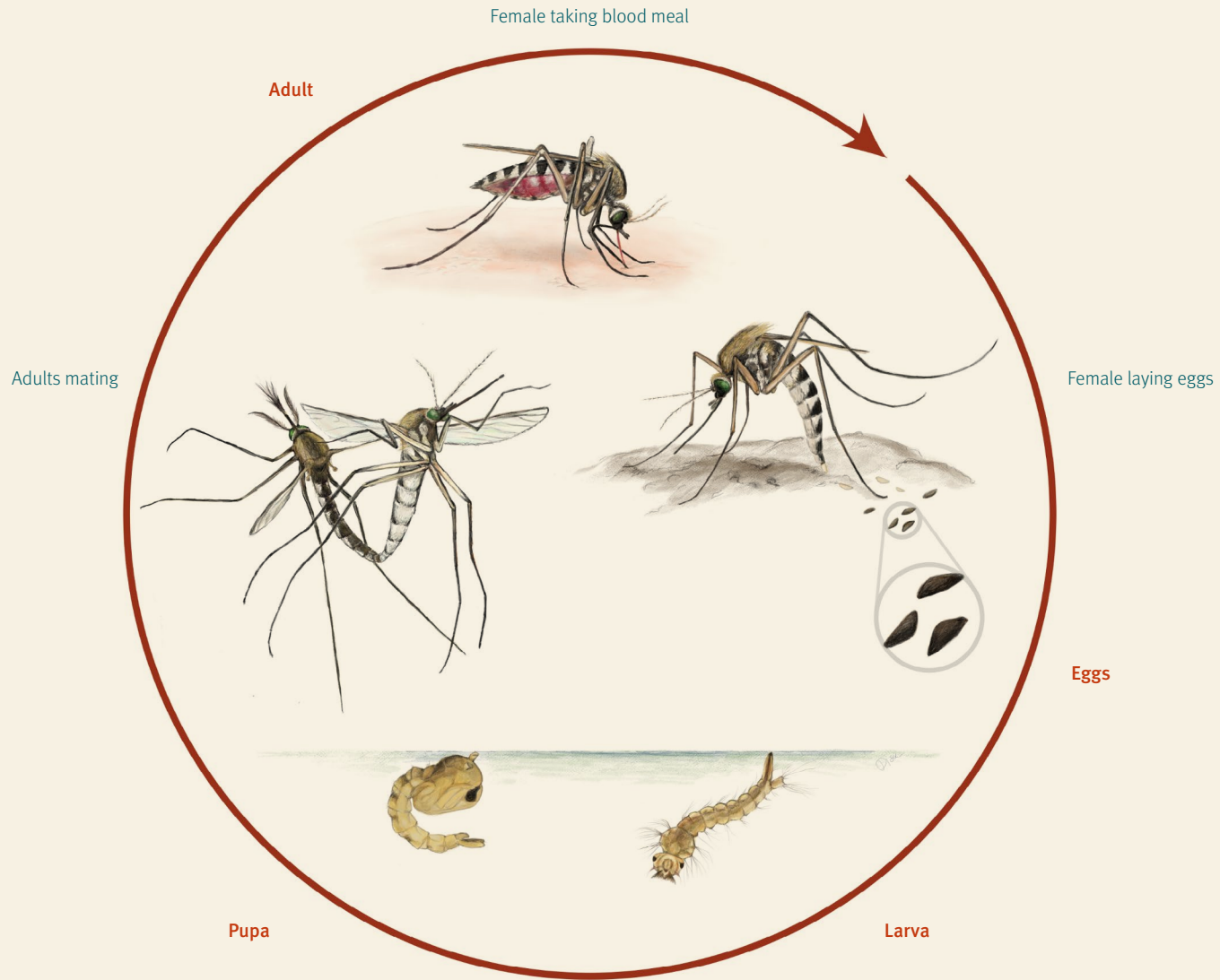
Short mouth parts [1]; ~4–12 mm



Tipulidae or Crane flies

No needle-like proboscis; looks like an oversized mosquito; slender body [1]; stilt-like legs [2]; wing span 1–6.5 cm

Life cycle of an *Aedes* mosquito



Female mosquitoes

Aedes aegypti
p.6



Aedes albopictus
p.7



Aedes japonicus
p.8



Aedes koreicus
p.9



Aedes triseriatus
p.10



Aedes atropalpus
p.11



Aedes cretinus
p.12



Aedes geniculatus
p.13



Aedes communis
p.14



Aedes cantans
p.15



Aedes vexans
p.16



Aedes caspius
p.17



Culex pipiens
p.18



Culiseta longiareolata
p.19



Culiseta annulata
p.20



- Invasive
- Native



Male mosquitoes

Aedes aegypti
p.6



Aedes albopictus
p.7



Aedes japonicus
p.8



Aedes koreicus
p.9



Aedes triseriatus
p.10



Aedes atropalpus
p.11



0 1.25 2.5 mm

A horizontal scale bar with three segments. The first segment is dark teal and labeled '0'. The second segment is white with a dark teal border and labeled '1.25'. The third segment is white with a dark teal border and labeled '2.5 mm'.

 Invasive



Yellow fever mosquito

Aedes aegypti

Stegomyia aegypta



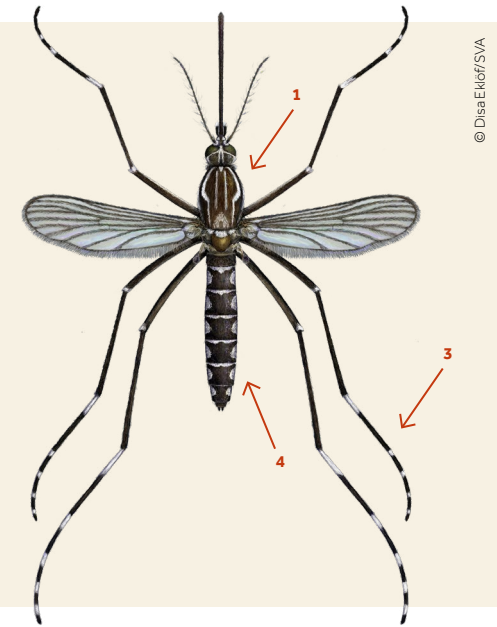
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Morphological characteristics

1. Scutum (dorsal part of the thorax) has silver scales in the shape of a lyre on a black background.
2. Medium size.
3. Contrasting black-and-white colouration.
4. Silvery-white markings on legs and abdomen.



Easily-confused species

Aedes albopictus; *Aedes cretinus*

Status in Europe

- Exotic, invasive
- Origin: Tropical Africa

Distribution



<https://bit.ly/3lucnDG>

Likely point of entry

International trade and travel, airports.

Ecology (habitat, breeding sites)

- Originally *Aedes aegypti* was found in forested areas, using tree holes as habitats. The species is now commonly found in tropical and sub-tropical areas, in close proximity to humans. It thrives well in urban and peri-urban environments.

- In Europe, female *Aedes aegypti* will lay their eggs in artificial water containers, much like *Aedes albopictus*. Suitable habitats include earthenware pots and water tanks, uncovered cisterns, empty cans, flower pots, broken bottles or discarded tyres.
- On the island of Madeira, *Aedes aegypti* is active throughout the year, with a peak in abundance from August to October.
- The eggs are resistant to desiccation. Unlike *Aedes albopictus*, *Aedes aegypti* cannot produce diapausing eggs resistant to frost.

Biting habits

- Human, occasionally other mammals.
- The females feed predominantly during the day in shaded places and only occasionally during the night in lit rooms.
- Females can feed multiple times between egg laying.

(Asian) tiger mosquito

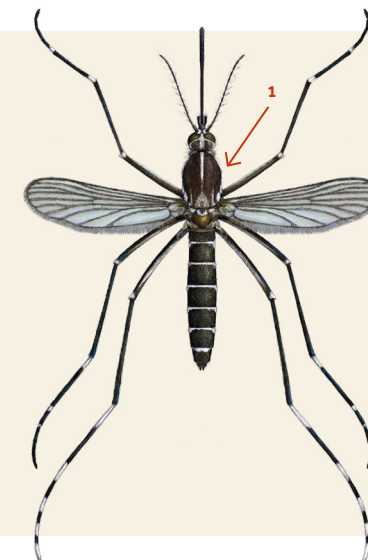
Aedes albopictus

Stegomyia albopicta



Morphological characteristics

1. Diagnostic characteristic: scutum (dorsal part of the thorax) with a median silver-scale line on a black background.
2. Medium size.
3. White stripes beside the median white line on the scutum do not reach the middle of the scutum.



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Easily-confused species

Aedes cretinus, *Aedes aegypti*

Status in Europe

- Exotic, invasive
- Origin: Asia

Distribution



<https://bit.ly/38RKu3F>

Likely point of entry

Eggs of *Aedes albopictus* are often imported in used tyres or hydroponic plant containers. Other ways of introduction include vehicles in which adult *Aedes albopictus* individuals can 'hitchhike' across borders.

Ecology (habitat, breeding sites)

- In Europe *Aedes albopictus* prefers urban and suburban habitats.
- In a temperate climate *Aedes albopictus* has

been shown to be most active during the period May-September.

- Adult *Aedes albopictus* females can produce eggs able to survive periods of frost during the winter (diapausing eggs).
- Diapausing eggs of European *Aedes albopictus* have been shown to be able to survive a cold spell of -10°C , whereas eggs of tropical *Aedes albopictus* can only survive -2°C .
- Larvae develop in natural or artificial water containers. Artificial aquatic habitats include tyres, barrels, rainwater gully catch basins and drinking troughs. Natural habitats are places where terrestrial plants harbour water e.g. tree holes.

Biting habits

- Adult females bite aggressively, usually during the day outdoors, but also during the night indoors.
- *Aedes albopictus* feeds on humans, domestic and wild animals, reptiles, birds and amphibians, depending on host availability.

Asian bush or rock pool mosquito

Aedes japonicus japonicus

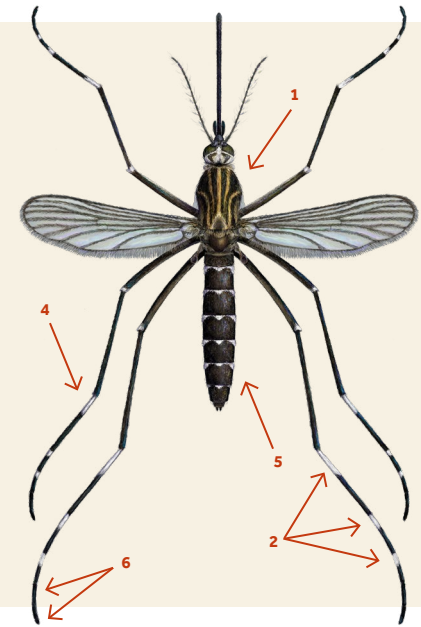
Ochlerotatus japonicus japonicus, *Hulecoeteomyia japonica japonica*


Invasive



Morphological characteristics

1. The main diagnostic characteristic is a scutum (dorsal part of the thorax) with several lines of yellowish scales on a black background.
2. Only three white scale patches on hind legs (different from *Aedes koreicus*).
3. Relatively large.
4. White scale patches on black legs.
5. Dorsal plates of the abdomen have lateral and median pale patches at the base of each segment that do not form complete bands.
6. Tarsus 4 and 5 of hind legs almost entirely dark.



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Easily-confused species

Aedes koreicus

Status in Europe

- Exotic, invasive
- Origin: Asia

Distribution



<https://bit.ly/3oRxd6E>

Likely point of entry

Can be imported by international tyre trade.

Ecology (habitat, breeding sites)

- Adults are often found in forested areas. They are active during the daytime and the twilight period.
- *Aedes japonicus* prefers shady rock holes but

can develop in a large range of both natural and artificial aquatic container habitats including tree holes, tyres, bird baths, and all breeding sites rich in organic matter.

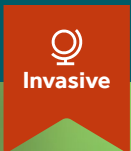
- *Aedes japonicus* can produce freeze- and desiccation-resistant diapausing eggs that can remain dormant over winter and hatch once environmental conditions become favourable.

Biting habits

- *Aedes japonicus* females feed mainly on mammals.
- Female *Aedes japonicus* feed during the day. This species is an aggressive biter and will readily bite humans outside —mainly in forested areas, but occasionally also inside houses.

Aedes koreicus

Ochlerotatus koreicus, *Hulecoeteomia koreica*



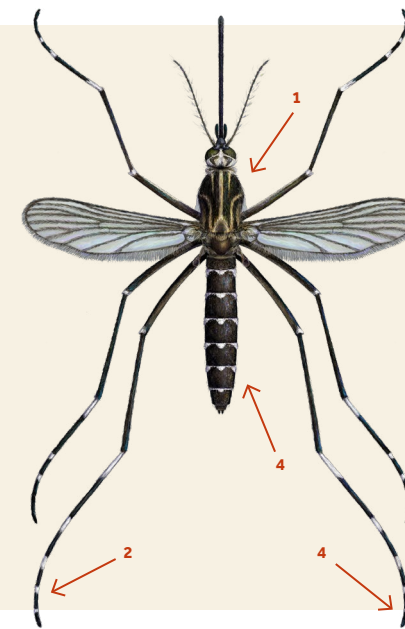
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Morphological characteristics

1. Strongly resembles *Aedes japonicus* in that it also has clear longitudinal lines on the scutum (dorsal part of the thorax).
2. The presence of a complete 4th basal band on hind-tarsomere distinguishes the species from *Aedes japonicus*.
3. Relatively large.
4. Can have an incomplete pale band at the base of hind tarsomere 5.



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Easily-confused species

Aedes japonicus

Status in Europe

- Exotic, invasive
- Origin: Asia

Distribution



<https://bit.ly/30TeZ4y>

Likely point of entry

International trade routes, although for several established populations in Europe the introduction pathway is not clear.

Ecology (habitat, breeding sites)

- *Aedes koreicus* overwinters as eggs and hatches during spring. Adults are most active between May and October.
- The species survives in the same manner as *Aedes japonicus* - freeze- and desiccation-resistant eggs that are dormant during winter and hatch once environmental conditions become favourable.
- Larvae of *Aedes koreicus* can be found in both natural and artificial water containers such as garden ponds, water drums and other vessels and unused metal construction equipment. Natural sites include tree holes and stone cavities containing rain water and decaying tree leaves.

Biting habits

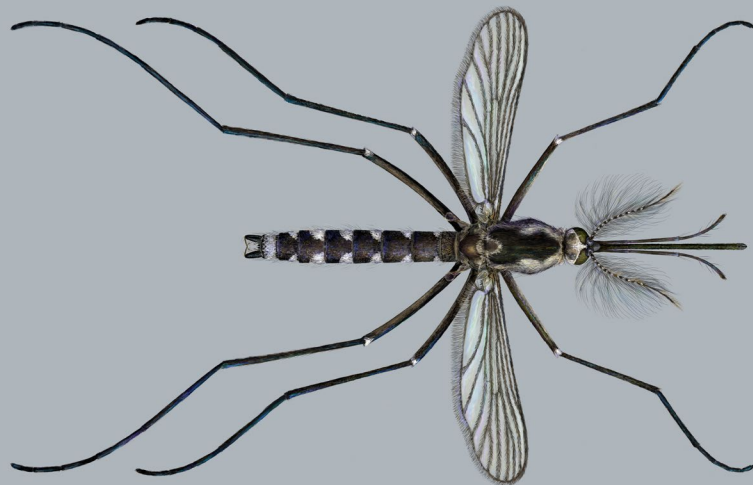
- *Aedes koreicus* bites humans both during the day and at night.
- Hosts are humans and animals.

American Eastern tree hole mosquito

Aedes triseriatus

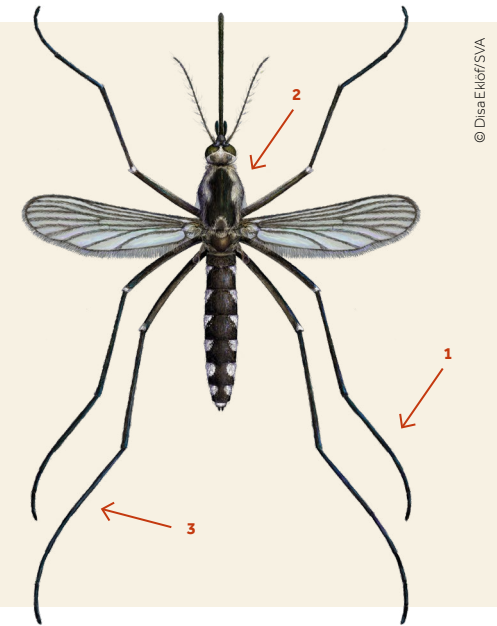
Ochlerotatus triseriatus


Invasive



Morphological characteristics

1. Diagnostic characteristics: absence of pale bands on the legs.
2. Presence of two pale-scaled stripes on the sides of the scutum (dorsal part of the thorax).
3. Dark legs.



Easily-confused species

Aedes geniculatus

Status in Europe

- Exotic
- Origin: North America

Distribution

Not introduced into Europe in the last five years.

Likely point of entry

International tyre trade.

Ecology (habitat, breeding sites)

- In its native range of North America, *Aedes triseriatus* is widely distributed. *Aedes triseriatus* breeds in tree-holes, tyres and other artificial containers. Adults are commonly encountered in forested areas.
- Hatching is thought to be dependent upon

flooding and may be staggered, resulting in only a proportion of an egg batch hatching in response to a particular flooding event at a certain time. This allows *Aedes triseriatus* to survive in a variety of environments across its range.

- Eggs can survive prolonged periods without water. The species overwinters by diapausing eggs.

Biting habits

- *Aedes triseriatus* feeds on a multitude of hosts (birds, mammals, reptiles) and readily bites humans.
- Females mostly bite during the day in shaded areas.

American rock pool mosquito

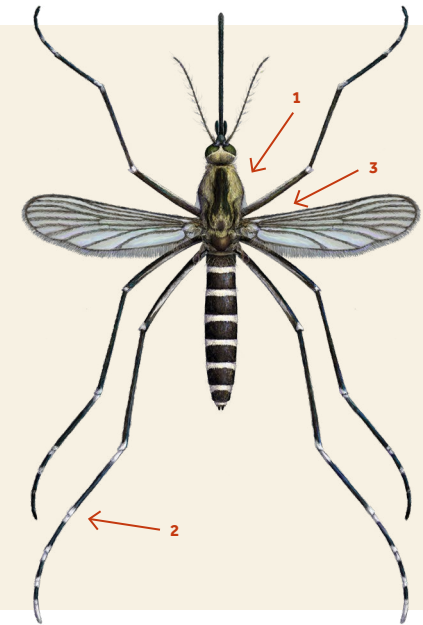
Aedes atropalpus

Georceraigius atropalpus



Morphological characteristics

1. Diagnostic characteristics: presence of two lateral lines of pale scales on a black background on the scutum (dorsal part of the thorax).
2. Legs have inter-articular pale rings.
3. Wings have a patch or short line of pale scales at the base of the first principal, longitudinal vein of the wing (costa)



Easily-confused species

Aedes caspius

Status in Europe

- Exotic
- Origin: North and Central America

Distribution



<https://bit.ly/2P53XGS>

Likely point of entry

International used tyre trade.

Ecology (habitat, breeding sites)

- *Aedes atropalpus* appear early in the season.
- Females can lay their first eggs without taking a bloodmeal (autogenous egg production).
- *Aedes atropalpus* larvae are most often associated with soft water rock pool habitats along mountain streams in North America. The

species is also known to breed in a variety of artificial containers, especially discarded tyres and other man-made water collectors such as concrete septic tanks.

- Eggs are desiccation-resistant and can therefore survive outside of water until conditions are suitable for them to hatch.

Biting habits

- *Aedes atropalpus* will readily bite humans and the species has a preference for mammalian hosts.
- Females bite at night and during the day and are known to be a pest in the vicinity of aquatic habitats.

Aedes cretinus

Ochlerotatus cretinus, *Stegomyia cretina*

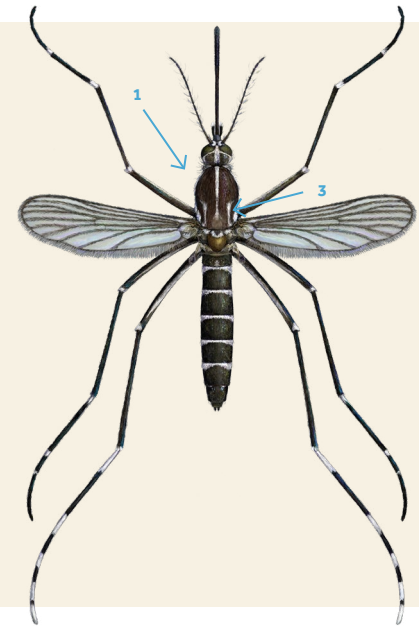


Native



Morphological characteristics

1. Scutum has a central narrow white stripe which forks at the end.
2. The scutum is bordered by a fine line of white scales, with a minute break at the scutal angle.
3. Resembles *Aedes albopictus* but differs through the longer lateral white lines on the scutum.



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Easily-confused species

Aedes albopictus, *Aedes aegypti*

Status in Europe

Native

Distribution

Aedes cretinus is found in Cyprus, Greece, Crete and Turkey.

Ecology (habitat, breeding sites)

Larvae can be found in tree holes, used tyres and, atypically for container-breeding mosquitoes, in small ground pools with thick vegetation.

Biting habits

Females are aggressive human biters during the day, both in shaded and open places.

Aedes geniculatus

Dahlia geniculata



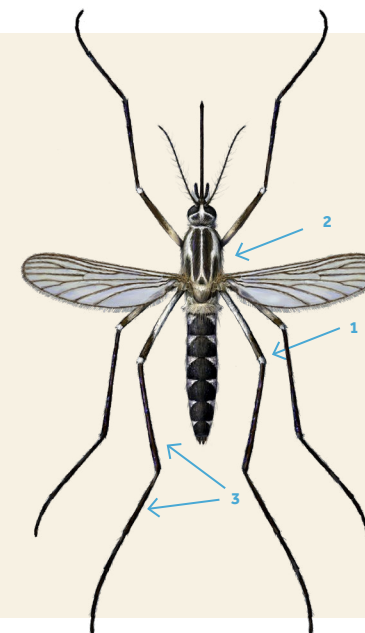
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Morphological characteristics

1. Conspicuous white knee spots.
2. Scutum has two central black stripes, sometimes fused into one, otherwise completely separated by a pale acrostichal stripe.
3. Tibiae and tarsi are entirely black-scaled.



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Easily-confused species

Aedes triseriatus

Status in Europe

Native

Distribution

Europe

Ecology (habitat, breeding sites)

- Adult *Aedes geniculatus* are mainly found in deciduous or mixed forests, rarely in conifer forests. Although they can be a nuisance to humans they rarely enter urban areas.
- The species mainly lays eggs in tree holes and open tree stumps, but can also colonise artificial containers, such as tyres. Breeding sites are usually rich in organic matter and tannins.
- Eggs are resistant to both frost and desiccation. *Aedes geniculatus* hibernates as eggs in northern climates and as larvae in southern climates.

Biting habits

- Feeds on various mammals, including humans and cattle, but also on birds and reptiles.
- Females bite during daytime and during twilight hours. In south-eastern Europe, the species can be a nuisance for humans in forested areas.

Snowpool mosquito

Aedes communis

Ochlerotatus communis



Native



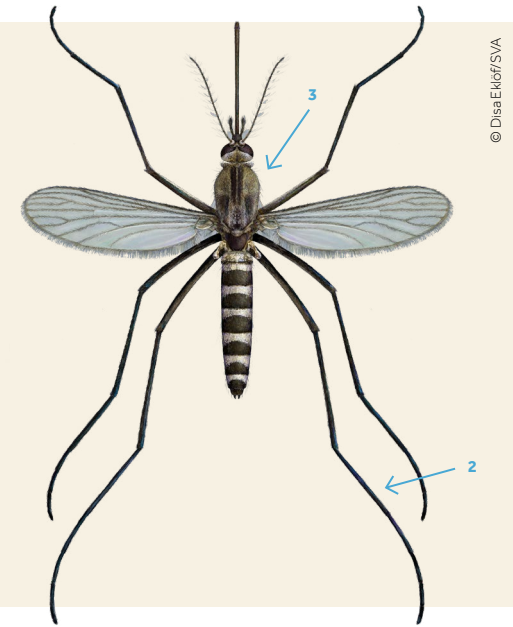
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© Anders Lindström/SVA

Morphological characteristics

1. Medium size.
2. Dark-scaled tarsi.
3. Scutum has yellow or golden scales.



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Easily-confused species

- This species is part of the *communis* group. The members of this group are morphologically difficult to distinguish. The most common species in this group are *Aedes cataphylla*, *Aedes detritus*, *Aedes punctor* and *Aedes sticticus*.
- This species is generally not confused with any of the current invasive mosquito species in Europe.

Status in Europe

Native

Distribution

In Europe the species is found from the northern European region to the Mediterranean.

Ecology (habitat, breeding sites)

- *Aedes communis* only completes one generation per year and is mainly found in swampy forests. The species prefers breeding in acid waterbodies, filled with water from melting snow or spring rainfall.
- Larvae can be found in small water bodies without vegetation, but with a dense layer of dead leaves. They can be found in strongly acidic waters with a pH as low as three.
- *Aedes communis* larvae can hatch in temperatures of little more than 0°C.

Biting habits

- Hosts are warm-blooded forest inhabitants.
- Females are most active during the twilight period.

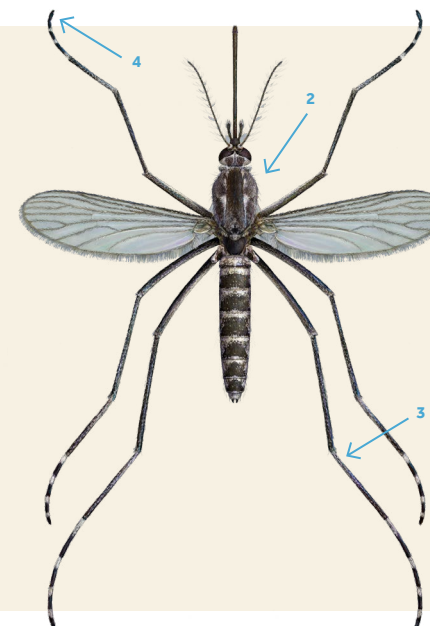
Aedes cantans

Ochlerotatus cantans



Morphological characteristics

1. Dark blackish-brown scaling with scattered white or yellow scales on body and wings.
2. Scutum covered with dark-brown or bronze-brown scales and the lateral parts with greyish-white or creamy scales.
3. Tarsomere I (tarsomere is the individual sub-segment of a tarsus) of all the legs has more or less mixed scales.
4. Tarsomeres II–V have moderately broad white basal rings, except for Tarsomere V of the fore legs which is entirely dark-scaled.



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Easily-confused species

- *Culiseta annulata*.
- *Aedes cantans* are part of the *annulipes* group: This group includes *Aedes annulipes*, *Aedes behningi*, *Aedes cantans*, *Aedes cyprius*, *Aedes euedes*, *Aedes excrucians*, *Aedes flavescens*, *Aedes mercurator*, *Aedes riparius* and *Aedes surcoufi*.
- This species is generally not confused with any of the current invasive mosquito species in Europe.

Ecology (habitat, breeding sites)

- *Aedes cantans* only produces one generation (or in some cases two) per year. After this the species hibernates as larval eggs.
- The larval habitat of *Aedes cantans* is meadow or forest pools without much vegetation but with a layer of organic material at the bottom.

Biting habits

Females feed on mammals and occasionally on birds.

Status in Europe

Native

Distribution

The species is widespread in Europe.



Aedes vexans

Aedimorphus vexans



Native



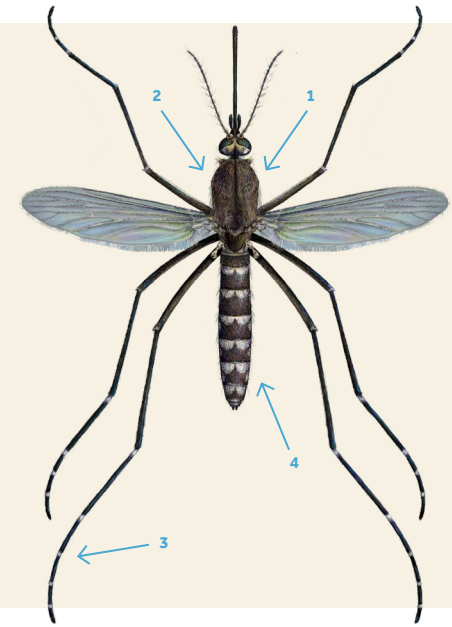
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Morphological characteristics

1. Scutum has an indefinite pattern.
2. Yellowy-cream-coloured scales on scutum.
3. Tarsi have tiny pale basal rings.
4. Dorsal plates of the abdomen have pale bi-lobed basal bands.



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Status in Europe

Native

Distribution

Aedes vexans is widely distributed and can be found in nearly every country in Europe.

Ecology (habitat, breeding sites)

- Adults can migrate long distances from breeding sites, up to 15 km, entering human settlements in mass groups.
- This species breeds mostly on flood plains, exhibiting fast larval development. It is often found on flood plains or in lakes with fluctuating water levels.

Biting habits

Feeds aggressively on humans and cattle during the daytime.

Salt marsh mosquito

Aedes caspius

Ochlerotatus caspius

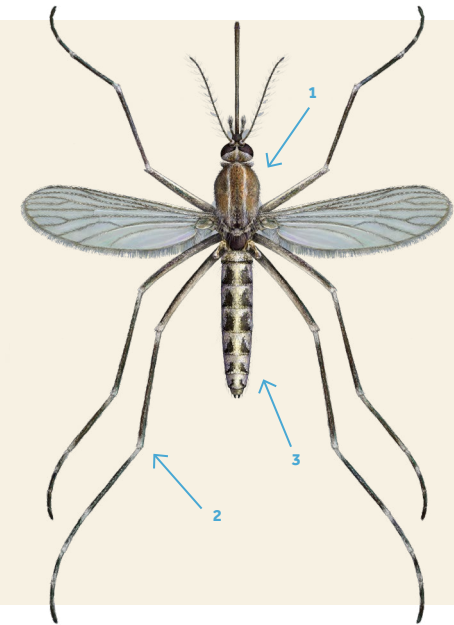


Native



Morphological characteristics

1. Scutum is covered with yellow scales and has two dorsocentral white stripes.
2. Legs have inter-articular pale rings.
3. Dorsal plates of the abdomen have yellowish bands at the base and end of each plate and these are widest in the middle.



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Easily-confused species

- *Aedes atropalpus*
- *Aedes caspius* is part of the *caspius* group. Members of this group are difficult to distinguish based on morphology. Species included in this group are *Aedes berlandi*, *Aedes caspius*, *Aedes dorsalis*, *Aedes mariaae*, *Aedes phoeniciae*, *Aedes pulcritarsis* and *Aedes zammitii*.

Status in Europe

Native

Distribution



<https://bit.ly/3qYCzrr>

Ecology (habitat, breeding sites)

- Adult *Aedes caspius* can be found in any habitats since they disperse over long distances from the larval habitat.
- Larvae develop mainly in coastal marshes (brackish water) with intermediate flooding. They can also be found in rice fields or meadows that flood with fresh water. They can withstand substantial salt concentrations of up to 150g/L.
- The species overwinters as diapausing eggs.

Biting habits

- Females feed mostly outside, but can be found indoors if there are large swarms. They feed both during the day and at night and are most active around dusk.
- Hosts are both humans and animals.

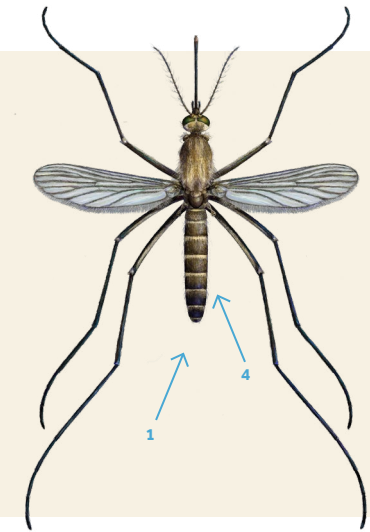


House mosquito, Northern house mosquito *Culex pipiens*



Morphological characteristics

1. The genus *Culex* has a rounded abdomen whereas the genus *Aedes* has a pointy abdomen.
2. Brownish-yellow.
3. No obvious pattern.
4. Dorsal segments bearing yellowish basal bands.



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Easily-confused species

- *Culex pipiens* is part of a group of species which are very hard to distinguish based on morphological characteristics. For more information see [Culex pipiens - Factsheet for experts](#).
- *Culex pipiens* is hard to confuse with any of the current invasive mosquito species in Europe.

Status in Europe

Native

Distribution



<https://bit.ly/3vDi6fz>

Ecology (habitat, breeding sites)

- *Culex pipiens* can inhabit nearly every type of water source. The larvae of *Culex pipiens* can be found in temporary or (semi-)permanent water sources, ponds with vegetation, rice fields, along river edges in still zones, in areas prone to flooding, in puddles and ruts and occasionally even in water-filled tree-holes. The larvae are also frequently found in man-made water bodies, such as flooded cellars, construction sites, road drains and pits, water barrels, metal tanks, ornamental ponds and various types of container (e.g. in gardens or cemeteries). They can breed in clear water but

- also in water polluted with organic matter, and can even tolerate a small amount of salinity (e.g. coastal marshes or rock pools).
- Females overwinter in frost-free shelters, such as cellars, caves, bunkers, or ground burrows. Diapausing/overwintering females are reactivated in spring when temperature and light exposure increase.
- Females lay their eggs on water surfaces in batches as egg rafts of around 200 eggs. These eggs are non-dormant and the larvae hatch rapidly as soon as the embryonic development is completed (around 24 hours). Larval development up to adult emergence takes between six and 24 days, depending on the temperature.
- Larvae can be found from mid-spring until the first frosts. In summer and autumn *Culex pipiens* can be found in abundance.

Biting habits

- Females of the *Culex pipiens form pipiens* mainly bite birds (ornithophilic), feed outdoors (exophagic) and rest outdoors (exophilic).
- The *Culex pipiens form molestus* is characterised by females that mainly bite humans and other mammals indoors (endophagic) or occasionally outdoors. They frequently rest indoors (endophilic). They can lay a batch of eggs without a bloodmeal (autogenous).
- They are most active after dusk and before dawn.

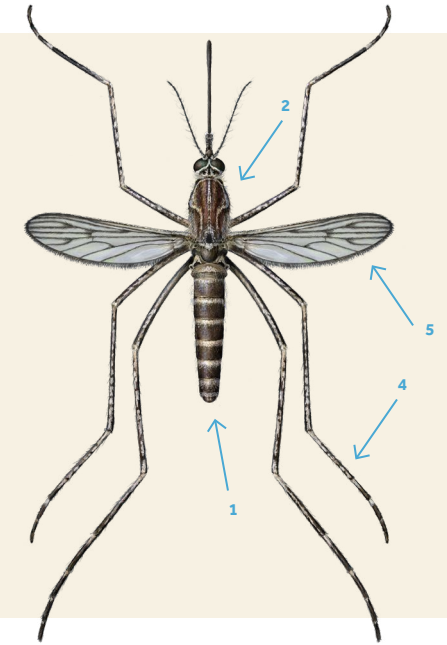
Culiseta longiareolata


Native



Morphological characteristics

1. The genus *Culiseta* has a rounded abdomen, whereas the genus *Aedes* has a pointy abdomen.
2. Generally large mosquitoes.
3. Lines on scutum.
4. White spots on legs.
5. Wing veins covered with dark scales.



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Easily-confused species

Culiseta annulata

Status in Europe

Native

Distribution

In Europe the species is widely distributed in the Mediterranean region.

Ecology (habitat, breeding sites)

- Breeding occurs in rock holes, wooden barrels, concrete tanks, wells and other artificial containers.
- Larvae are rarely found in natural water bodies such as ditches or drain canals. Larvae are able to survive in conditions of high salinity or even polluted waters.
- Hibernation takes place during the larval stage.

Biting habits

Culiseta longiareolata do not enter human dwellings and rarely bite humans.



Culiseta annulata



Native



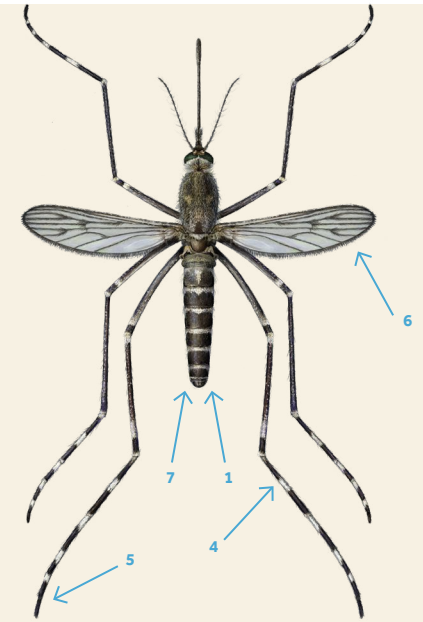
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Morphological characteristics

1. The genus *Culiseta* has a rounded abdomen whereas the genus *Aedes* has a pointy abdomen.
2. The mosquitoes are generally large.
3. Dark brown with whitish markings.
4. Tarsomere (the individual sub-segment of a tarsus) I has a noticeable white ring in the middle and there are also white rings at the bases of Tarsomeres II–IV.
5. Tarsomeres V of all the legs are entirely dark-scaled.
6. The wings are largely covered with scales, some of which are clustered, forming distinct dark spots.
7. The dorsal plates of the abdomen have whitish basal bands.



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Easily-confused species

Culiseta longiareolata, *Aedes cantans*

Status in Europe

Native

Distribution

Occurs throughout Europe, but is more common in the North than in the South, where it is largely replaced by *Culiseta longiareolata*.

Ecology (habitat, breeding sites)

- This species hibernates at the adult stage in the cellars or attics of dwellings or in domestic animal sheds, where it can be a nuisance even during the winter.
- Eggs are laid on water surfaces in stagnant pools, ponds, ditches, water troughs and other artificial containers, such as rainwater

collection barrels. Manure basins can also act as a larval habitat. The larvae can even survive in water with a high level of salinity.

- Eggs are laid in rafts, like *Culex pipiens*.
- Adults can be encountered from early spring, with the population peak occurring in September.

Biting habits

- Humans, indoors and outdoors. Occasionally also birds.
- The species bites during the night.

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