

## THE MOSQUITO (DIPTERA: CULICIDAE) FAUNA OF TATA AND ITS ENVIRONS

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## TATA ÉS KÖRNYÉKÉNEK CSÍPŐSZÚNYOG-FAUNÁJA

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**KIVONAT:** Jelen munka Tata és környékének csípőszúnyog faunájának összefoglaló bemutatása 2004 és 2006 közötti gyűjtések, valamint a korábbi irodalmi adatok felhasználásával. A területen 6 új fajt találtunk, ezzel Tata és környékének csípőszúnyog faunája 25 fajra emelkedett. Meghatározó fajok: *Aedes vexans*, *Ochlerotatus annulipes*, *Ochlerotatus cantans*, *Ochlerotatus sticticus*, *Culex pipiens pipiens*, *Culiseta annulata*. Ritka fajok: *Anopheles hyrcanus*, *Ochlerotatus refiki*, *Ochlerotatus pulchritarsis*, *Uranotaenia unguiculata*. További előkerült fajok: *Anopheles claviger*, *Anopheles plumbeus*, *Anopheles maculipennis*, *Aedes cinereus*, *Aedes rossicus*, *Ochlerotatus caspius*, *Ochlerotatus cataphylla*, *Ochlerotatus dorsalis*, *Ochlerotatus excrucians*, *Ochlerotatus flavescens*, *Ochlerotatus geniculatus*, *Ochlerotatus rusticus*, *Culex modestus*, *Culex territans*, *Culiseta morsitans*.

**ABSTRACT:** This work is the summary of the mosquito fauna of Tata and its environs, based on the collections between 2004 and 2006 and using the former data. We found 6 new species in this area and the number of the known mosquito species in Tata and its environs increased from 19 to 25. Dominant species: *Aedes vexans*, *Ochlerotatus annulipes*, *Ochlerotatus cantans*, *Ochlerotatus sticticus*, *Culex pipiens pipiens*, *Culiseta annulata*. Rare species: *Anopheles hyrcanus*, *Ochlerotatus refiki*, *Ochlerotatus pulchritarsis*, *Uranotaenia unguiculata*. Other found species: *Anopheles claviger*, *Anopheles plumbeus*, *Anopheles maculipennis*, *Aedes cinereus*, *Aedes rossicus*, *Ochlerotatus caspius*, *Ochlerotatus cataphylla*, *Ochlerotatus dorsalis*, *Ochlerotatus excrucians*, *Ochlerotatus flavescens*, *Ochlerotatus geniculatus*, *Ochlerotatus rusticus*, *Culex modestus*, *Culex territans*, *Culiseta morsitans*.

**Key words:** Culicidae, mosquito, fauna, Hungary, Tata

## Introduction

Faunistical investigations are very important in Hungary because of the significance of mosquitoes on public health (mosquitoes are vectors for diseases). Better cognition of the distribution of Hungarian species is indispensable due to the aspect of cutting implementation. Although Tata and its environs are notable touristical, conservational and economical areas, the fauna of this region was studied by only a few researchers.

In the summary work of the Hungarian mosquito fauna (TÓTH 2004b) 9 species mentioned from this area: *Anopheles claviger* (Tata), *Anopheles maculipennis* (Tata), *Aedes vexans* (Tata), *Ochlerotatus annulipes* (Tata), *Ochlerotatus cantans* (Tata), *Ochlerotatus caspius* (Tata), *Ochlerotatus pulchritarsis* (Vértesszőlős), *Ochlerotatus sticticus* (Tata), *Culiseta annulata* (Tata). Most data came from the collection of Sándor Tóth from the year 1994 and 1996. There is only one exception, *Ochlerotatus cantans* was collected by Ferenc Mihályi in 1959.

The morphometric study of BOGYÓ and SZABÓ (2005) provides the occurrence of *Culex pipiens pipiens* in Tatabánya (Felsőgalla) as sparse data. Our goal was a systematic 2-years survey on the fauna within the city precincts of Tata. The results of this study supplemented with phenological data were published by BOGYÓ and SZABÓ (2006). This work mentions 9 new species: *Anopheles plumbeus*, *Aedes cinereus*, *Aedes rossicus*, *Ochlerotatus cataphylla*, *Ochlerotatus flavescens*, *Ochlerotatus refiki*, *Ochlerotatus rusticus*, *Culex territans*, *Culiseta morsitans*.

## Materials and methods

In 2005 and 2006 samplings were carried out in every two weeks at 5 sampling sites in Tata:

- Cseke-tó (Lake Cseke): the sampling site was a little wetland near the southeast coast of the lake. A few samples were taken in other areas close to the Cseke-tó: a dendrotelma (treehole) on the coast of the lake and a gutter from a park east to the lake.
- Öreg-tó (Lake Öreg): the sampling site was a wetland near the southeast coast of the lake with fluctuating water-level (from the end of autumn to the beginning of spring the place desiccates).
- Angolkert (English Garden): the samplings were made in the lake of the garden and around its coast.
- Által-ér: the sampling site was a section of the river in the downtown at Testvérvárosok Parkja.
- Réti-halastavak (Réti fishponds): the sampling site was an agricultural gutter with quickly changing water-level near the Réti-fishponds.

Sparse samplings were also carried out in other sites of Tata (2005-2006 - flood area of Által-ér and the gutter of Új út), in Tatabánya (2004 - Bánhidai lakótelep), in Naszály (2005 - Ferencmajor fishponds) and in Vértesszőlős (2006 - forest near Simon halála).

Larvae were captured with the standard mosquito larval dipper (MIHÁLYI and GULYÁS 1963) with a diameter of 18 cm. The captured larvae were conserved in 80% ethanol. Female imagines biting humans and flying to human bodies were

collected with aspirator tubes (MIHÁLYI and GULYÁS 1963). Identification of collected specimens was made with Olympus SD 30 stereo microscope using the works of MIHÁLYI and GULYÁS (1963), MOHRIG (1969) and TÓTH (2004a). The nomenclature follows BECKER et al. (2003).

The biogeographical division of the species is based on MIHÁLYI and GULYÁS (1963) and in the case of *Anopheles claviger* it is based on TÓTH (2004b).

## Results and discussion

During our work we found 6 new species of this area: *Anopheles hyrcanus*, *Ochlerotatus dorsalis*, *Ochlerotatus excrucians*, *Ochlerotatus geniculatus*, *Culex modestus*, *Uranotaenia unguiculata*. Summarizing present investigations and the former data (TÓTH 2004b; BOGYÓ and SZABÓ 2005, 2006), the number of known mosquito species increased from 19 to 25 (Table 1). This number is 51% of the recent Hungarian mosquito fauna (48 species + 1 subspecies) and 6 of the 8 Hungarian genus were found.

13 species occurred in both imago and larva forms, 10 species occurred only in larva form, and 2 species occurred only in imago form (*Anopheles hyrcanus*, *Aedes rossicus*). The fauna of the area includes mainly Holarctic and European species.

Holarctic species are *Anopheles maculipennis*, *Aedes cinereus*, *Aedes vexans*, *Ochlerotatus cataphylla*, *Ochlerotatus dorsalis*, *Ochlerotatus excrucians*, *Ochlerotatus flavescens*, *Ochlerotatus sticticus*, *Culex pipiens pipiens*, *Culex territans*, *Culiseta morsitans* (11 species).

European species are *Anopheles claviger*, *Anopheles plumbeus*, *Ochlerotatus annulipes*, *Ochlerotatus cantans*, *Ochlerotatus caspius*, *Ochlerotatus geniculatus*, *Ochlerotatus rusticus*, *Culiseta annulata* (8 species).

Mediterranean species are *Anopheles hyrcanus*, *Aedes rossicus*, *Ochlerotatus pulchritarsis*, *Ochlerotatus refiki*, *Culex modestus*, *Uranotaenia unguiculata* (6 species).

There are 6 different landscape-types (steppe, marshes and forests of plains and wolds, flood areas, lower highlands, highlands, water bodies around human houses) concerning the community of mosquito species of Hungary (MIHÁLYI and GULYÁS 1963). The fauna of this area is very similar to the community of mosquito species of marshes and forests of plains and wolds.

Interesting and rare species:

*Anopheles hyrcanus*: this species is moderately common in Hungary and there were no former data from county Komárom–Esztergom (TÓTH 2004b).

*Anopheles plumbeus*: the larva of this species grows up nearly alone in treeholes (MIHÁLYI 1963), but we found it in a little wetland (near Cseke-tó).

*Ochlerotatus refiki*: this species is moderately common in Hungary (TÓTH 2004b).

*Ochlerotatus pulchritarsis*: in Hungary there were found only 17 specimens, from which one larva occurred in Vértesszőlős, in a treehole of *Carpinus betulus* (TÓTH 2004b).

*Culex pipiens pipiens*: it is interesting that we found the larva of this species in a treehole of *Platanus hybrida* (in the coast of Cseke-tó).

*Uranotaenia unguiculata*: this species is moderately common in Hungary and there were no former data from county Komárom–Esztergom (TÓTH 2004b).

To sum up, the mosquito fauna of Tata is relatively well explored, although presumably further rare species would occur in the future. On the other hand the mosquito fauna of the environs of Tata are not so well known, further investigations are necessary.

Table 1. The recent mosquito fauna of Tata (■ = own collection; ▲ = collection of Sándor Tóth)

Species	Cséke-tó (Tata)		Ángolkert (Tata)		Óreg-tó (Tata)		Által-ér (Tata)		Rét-halastavak (Tata)		River meadow (Tata)		Új-átgáther (Tata)		Ferenccsatorna (Naszály)		Vérszőlős		Tatabánya		
	La.	Im.	La.	Im.	La.	Im.	La.	Im.	La.	Im.	La.	Im.	La.	Im.	La.	Im.	La.	Im.	La.	Im.	
1. <i>Anopheles claviger</i> (Meigen, 1804)	■				▲				■												
2. <i>Anopheles hyrcanus</i> (Pallas, 1771)																■					
3. <i>Anopheles plumbeus</i> Stephens, 1828																					
4. <i>Anopheles maculipennis</i> Meigen, 1818	▲					▲			■												
5. <i>Aedes cinereus</i> Meigen, 1818	■								■												
6. <i>Aedes rossicus</i> Dolbeshkin, Goritzkaja & Mitrofanova, 1930									■												
7. <i>Aedes vexans</i> (Meigen, 1830)									■												
8. <i>Ochlerotatus annulipes</i> (Meigen, 1830)									■												
9. <i>Ochlerotatus cantans</i> (Meigen, 1818)									■												
10. <i>Ochlerotatus caspius</i> (Pallas, 1771)									■												
11. <i>Ochlerotatus cataphylla</i> (Dyax, 1916)									■												
12. <i>Ochlerotatus dorsalis</i> (Meigen, 1830)									■												
13. <i>Ochlerotatus excrucians</i> (Walker, 1856)									■												
14. <i>Ochlerotatus flavescens</i> (Müller, 1764)									■												
15. <i>Ochlerotatus geniculatus</i> (Olivier, 1791)									■												
16. <i>Ochlerotatus veflii</i> (Möschler, 1928)									■												
17. <i>Ochlerotatus pulcherrimus</i> (Rondani, 1872)																					
18. <i>Ochlerotatus rusticus</i> (Rossi, 1790)									■												
19. <i>Ochlerotatus sticticus</i> (Meigen, 1838)									■												
20. <i>Culex pipiens pipiens</i> Linnaeus, 1758									■												
21. <i>Culex modestus</i> Ficalbi, 1890									■												
22. <i>Culex territans</i> Walker, 1856									■												
23. <i>Culiseta annulata</i> (Schröckh, 1776)									■												
24. <i>Culiseta morsitans</i> (Theobald, 1901)									■												
25. <i>Uranotaenia unguiculata</i> Edwards, 1913									■												
	Σ	17	13	0	5	11	10	4	3	15	9	4	0	2	0	0	5	1	4	0	1

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