

Supplementary online material of the Journal of the European Mosquito Control Association
DOI: <https://doi.org/10.52004/2054930X-20241010>

A survey targeting exotic *Aedes* mosquito species in Central Europe, summer 2023, reveals the extensive occurrence of *Aedes japonicus* in Poland

F. Schaffner, M. Kwaśnik, Ł. Myczko, W. Rożek, R. Eritja, S. Lippert, A. Weigand, D. Werner, H. Kampen, I. Rudolf, S. Šikutová, V. Čabanová, G.R.W. Wint and J. Leszczyńska




Figure S1. Photo posted on iNaturalist platform on 02/01/2022 and taken at Bytom, 13/10/2021, with mosquito adult female identified as *Aedes japonicus/koreicus*. Photo source: iNaturalist, Adrian Tync, <https://creativecommons.org/licenses/by/4.0/>, modified.



Table S1. List of *Anopheles* specimens with ITS2 sequences deposited to GenBank and results of molecular taxonomic assignment, collection site and date. F: Adult female; L: Larva; all obtained from larval sampling.

Molecular assignment	Collection site, locality and NUTS3	Stage	Collection date	GenBank accession number
<i>Anopheles claviger s.s.</i>	PL007, Pilce, Wałbrzyski	L4	21/06/2023	PP898970
<i>Anopheles claviger s.s.</i>	PL061, Biłgoraj, Chełmsko-zamojski	F	02/10/2023	PP898977
<i>Anopheles daciae</i>	PL050.1, Stadła, Nowosądecki	F	01/10/2023	PP898974
<i>Anopheles maculipennis s.s.</i>	PL035, Łódź, Miasto Łódź	L4	27/09/2023	PP898972
<i>Anopheles maculipennis s.s.</i>	PL050.2, Stadła, Nowosądecki	L3	01/10/2023	PP898975
<i>Anopheles maculipennis s.s.</i>	PL051, Trzcínica, Krośńieński	L4	01/10/2023	PP898976
<i>Anopheles maculipennis s.s.</i>	PL089, Równa, Legnicko-głogowski	L4	05/10/2023	PP898978
<i>Anopheles messeae</i>	PL030, Swietoszowka, Bielski	L3	25/06/2023	PP898971
<i>Anopheles petragani</i>	PL043, Kielce, Kielecki	L3	30/09/2023	PP898973

Table S2. Data from Mosquito Alert (MA) reports and species diagnostics for Poland, 2023. Reports #1–4 had 3 photos each; here we show one for each report. Photos source: Mosquito Alert © Creative Commons CC-BY, modified.

Report #1		
Report MA ID	6N8O	
Date and time	22.08.2023	
Geo coordinates	20.111105 E, 49.876650 N	
Species diagnostic	Consensus: Probably <i>Aedes japonicus</i>	
Report #2		
Report MA ID	977	
Date and time	19.10.2023	
Geo coordinates	20.110980 E , 49.876589 N	
Species diagnostic	Consensus: Probably <i>Aedes japonicus</i>	
Report #3		
Report MA ID	jyW1	
Date and time	06.10.2023	
Geo coordinates	20.110888 E, 49.877021 N	
Species diagnostic	Consensus: Probably <i>Aedes japonicus</i>	



Report #4		
Report MA ID	Ycat	
Date and time	09.10.2023	
Geo coordinates	20.110890 E, 49.877016 N	
Species diagnostic	Consensus: Probably <i>Aedes japonicus</i>	
Report #5		
Report MA ID	1380	
Date and time	04.11.2023	
Geo coordinates	21.785679 E 49.632202 N	
Species diagnostic	Consensus: <i>Culiseta annulata</i>	

Table S3. Detailed sampling effort per admin units in our snapshot mosquito field study in Central Europe, 2023.

Countries (in grey) and admin units NUTS3	Number of locations	Number of samples	Number of negative immature samplings	Number of positive immature samplings	Number of human landing catches	Number of resting catches	Number of adult trappings
Czech Republic	5	5	2	3			
Moravskoslezsko							
Karlovarský kraj	1	1	1	-	-	-	-
Moravskoslezský kraj	1	1	-	1	-	-	-
Severozápad							
Ústecký kraj	3	3	1	2	-	-	-
Germany	9	10	1	9			
Dresden							
Dresden, Kreisfreie Stadt	1	2	-	2	-	-	-
Görlitz	2	2	-	2	-	-	-
Sächsische Schweiz-Osterzgebirge	4	4	-	4	-	-	-
Oberfranken							
Wunsiedel i. Fichtelgebirge	2	2	1	1	-	-	-
Poland	96	118	16	82	13	2	33
Dolnośląskie							
Jeleniogórski	5	7	-	6	1	-	-
Legnicko-głogowski	5	6	1	3	1	1	-
Wałbrzyski	4	4	1	3	-	-	-
Wrocławski	1	1	-	1	-	-	-
Łódzkie							
Łódzki	1	1	-	1	-	-	-
Piotrkowski	3	2	-	1	1	-	-
Sieradzki	4	4	1	3	-	-	-
Skierniewicki	3	5	3	2	-	-	-
Lubelskie							
Chełmsko-zamojski	2	2	-	2	-	-	-
Lubelski	4	4	1	3	-	-	-
Puławski	4	30	1	2	-	-	27
Lubuskie							
Zielonogórski	2	2	2	-	-	-	-
Małopolskie							
Krakowski	1	1	-	1	-	-	-
Miasto Kraków	1	1	-	1	-	-	-
Nowosądecki	2	3	-	3	-	-	-
Nowotarski	1	1	-	1	-	-	-
Oświęcimski	1	1	-	1	-	-	-
Tarnowski	2	2	-	2	-	-	-

Mazowiecki regionalny							
Radomski	3	5	-	4	1	-	-
Żyrardowski	2	2	1	1	-	-	-
Miasto Łódź							
Miasto Łódź	5	12	-	4	2	-	6
Opolskie							
Nyski	1	1	-	1	-	-	-
Opolski	2	3	-	1	1	1	-
Podkarpackie							
Krośnieński	2	3	-	3	-	-	-
Przemyski	3	5	-	5	-	-	-
Rzeszowski	1	1	-	1	-	-	-
Tarnobrzewski	4	5	1	4	-	-	-
Śląskie							
Bielski	2	2	-	2	-	-	-
Bytomski	2	2	-	2	-	-	-
Częstochowski	3	5	-	3	2	-	-
Gliwicki	1	1	-	1	-	-	-
Katowicki	1	1	-	1	-	-	-
Rybnicki	3	5	1	3	1	-	-
Sosnowiecki	4	4	-	2	2	-	-
Świętokrzyskie							
Kielecki	1	2	-	2	-	-	-
Sandomiersko-jędrzejowski	3	3	-	2	1	-	-
Wielkopolskie							
Kaliski	3	3	3	-	-	-	-
Leszczyński	3	3	-	3	-	-	-
Miasto Poznań	1	1		1			
Slovakia							
	1	1		1			
Stredné Slovensko							
Žilinský kraj	1	1	-	1	-	-	-
Grand Total	111	162	19	95	13	2	33

Table S4. Number of locations positive for a mosquito species per admin unit in our snapshot mosquito field study in Central Europe, 2023.

Countries (grey), admin units NUTS2 (bold) and NUTS3	<i>Aedes (Aedes) cinereus/geminus</i>	<i>Aedes (Aed.) geminus</i>	<i>Aedes (Aedimorphus) vexans</i>	<i>Aedes (Dahlia) geniculatus</i>	<i>Aedes (Hulecoeteomyia) japonicus</i>	<i>Aedes (Ochlerotatus) annulipes/cantans</i>	<i>Aedes (Och.) sticticus</i>	<i>Anopheles (Anopheles) claviger s.s.</i>	<i>Anopheles (Ano.) daciae</i>	<i>Anopheles (Ano.) messeae</i>	<i>Anopheles (Ano.) maculipennis s.l.</i>	<i>Anopheles (Ano.) maculipennis s.s.</i>	<i>Anopheles (Ano.) petragani</i>	<i>Anopheles (Ano.) plumbeus</i>	<i>Coquillettidia (Coquillettidia) richiardii</i>	<i>Culex (Culex) pipiens</i>	<i>Culex (Cux.) pipiens/torrentium</i>	<i>Culex (Cux.) torrentium</i>	<i>Culex (Maillotia) hortensis</i>	<i>Culex (Neoculex) territans</i>	<i>Culiseta (Culiseta) annulata</i>	<i>Culiseta (Cus.) glaphyoptera</i>	Number of observed taxa
Czech Republic	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Moravskoslezsko																							
Moravskoslezský kraj	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Severozápad																							
Ústecký kraj	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Germany	-	-	-	2	1	-	-	-	-	-	-	-	-	2	-	1	5	3	-	-	1	-	7
Dresden																							
Dresden, Kreisfreie Stadt	-	-	-	1	1	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	4
Görlitz	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	3
Sächsische Schweiz-Osterzgebirge	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	3	1	-	-	-	-	4
Oberfranken																							
Wunsiedel i. Fichtelgebirge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	2
Poland	7	1	7	10	21	7	6	11	1	1	1	4	1	16	2	23	36	2	1	4	11	1	22
Dolnośląskie																							
Jeleniogórski	-	-	-	2	-	-	-	1	-	-	-	-	-	3	-	2	3	-	-	-	-	1	6
Legnicko-głogowski	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	2	1	-	-	1	-	-	5
Wałbrzyski	-	-	-	2	1	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	4
Wrocławski	-	-	-	-	1	-	-	1	-	-	-	-	-	1	-	-	1	-	-	-	-	-	4
Łódzkie																							
Łódzki	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2
Piotrkowski	2	-	2	-	-	1	-	1	-	-	-	-	-	-	-	1	-	-	-	-	1	-	6
Sieradzki	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
Skierniewicki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	2
Lubelskie																							
Chełmsko-zamojski	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	1	-	-	3
Lubelski	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	3	-	-	-	1	-	4
Puławski	-	-	1	-	-	-	-	-	-	-	1	-	-	1	-	1	1	-	-	-	1	-	6
Małopolskie																							
Krakowski	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Miasto Kraków	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	2
Nowosądecki	-	1	1	-	1	-	-	2	1	-	-	1	-	1	-	-	-	-	-	-	-	-	6
Nowotarski	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Oświęcimski	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2

Tarnowski	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	1	-	6
Mazowiecki regionalny																							
Radomski	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	1	2	-	1	-	1	-	6
Żyrardowski	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Miasto Łódź																							
Miasto Łódź	-	-	1	-	1	-	-	-	-	-	-	1	-	1	-	4	2	-	-	1	2	-	8
Opolskie																							
Nyski	-	-	-	1	1	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	5
Opolski	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	1	-	5
Podkarpackie																							
Krośnieński	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	3
Przemyski	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	3	-	-	-	-	-	3
Rzeszowski	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tarnobrzski	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	1	-	3
Śląskie																							
Bielski	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	3
Bytomski	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
Częstochowski	2	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	4
Gliwicki	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Katowicki	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2
Rybnicki	-	-	-	1	1	1	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5
Sosnowiecki	2	-	1	-	1	2	3	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	7
Świętokrzyskie																							
Kielecki	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	1	1	-	-	-	-	-	4
Sandomiersko-jędrzejowski	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	3
Wielkopolskie																							
Leszczyński	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	1	-	2
Miasto Poznań	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	2
Slovakia																							
Stredné Slovensko																							
Žilinský kraj	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Total number of sites per species	7	1	7	13	24	7	6	11	1	1	1	4	1	18	2	24	42	5	1	4	12	1	22

NUTS2: government regions (Regierungsbezirke) or equivalent in Germany; cohesion region (region soudržnosti) in Czech Republic; regions/Voivodeship (province) in Poland, with one exception (Mazovian Voivodeship) which is split into two NUTS2 units; oblasti (oblasti) in Slovakia.

NUTS3: districts (Kreise) in Germany; region (kraj) in Czech Republic; subregions in Poland; regions (kraje) in Slovakia.

Table S5. Number of species/NUTS3 combinations in our snapshot mosquito field study in Central Europe, 2023.

	Czech Republic	Germany	Poland	Slovakia	Total
<i>Aedes (Aedes) cinereus/geminus</i>			4		4
<i>Aedes (Aed.) geminus</i>			1		1
<i>Aedes (Aedimorphus) vexans*</i>			6		6
<i>Aedes (Dahlia) geniculatus</i>	1	2	7		10
<i>Aedes (Hulecoeteomyia) japonicus*</i>	2	1	21		24
<i>Aedes (Ochlerotatus) annulipes/cantans</i>			5		5
<i>Aedes (Och.) sticticus</i>			4		4
<i>Anopheles (Anopheles) claviger s.s.*</i>			10		10
<i>Anopheles (Ano.) daciae</i>			1		1
<i>Anopheles (Ano.) maculipennis s.l.*</i>			1		1
<i>Anopheles (Ano.) maculipennis s.s.*</i>			4		4
<i>Anopheles (Ano.) messeae*</i>			1		1
<i>Anopheles (Ano.) petragani</i>			1		1
<i>Anopheles (Ano.) plumbeus*</i>		2	13		15
<i>Coquillettidia (Coquillettidia) richiardii*</i>			1		1
<i>Culex (Culex) pipiens*</i>		1	16		17
<i>Culex (Cux.) pipiens/torrentium*</i>		3	20	1	24
<i>Culex (Cux.) torrentium*</i>		3	2		5
<i>Culex (Maillotia) hortensis</i>			1		1
<i>Culex (Neoculex) territans</i>			4		4
<i>Culiseta (Culiseta) annulata*</i>		1	10		11
<i>Culiseta (Cus.) glaphyoptera</i>			1		1
Total	3	13	134	1	151
Additional NUTS3 sampled but without any species detected	1		2		3

* VectorNet priority species