

Supplementary material.

Table S1. Sampling localities, number of obtained sequences and GenBank accession numbers.

Species	Locality	Coordinates	GenBank accession numbers			
			COI	N of seq	ITS/18S	N of seq
<i>Attheyella crassa</i>	Lake Geneva, Switzerland	46°27'N, 06°31'E	MH477669-MH477671	3	MN038095-MN038096	2
	Lake Pääjärvi, Finland	61°04'N, 25°08'E	MH477643-MH477645	3	MN038090	1
	Creek Hiiu, Estonia	59°38'N, 24°67'E	MH477651	1	MN038083-MN038085	3
	Lake Sognefjell, Norway	59°58'N, 10°43'E	MH477663-MH477668	6	MN038098-MN038099	2
	Stora Le, Norway	59°18'N, 11°46'E	-	-	MN038100	1
	Lake Vänern, Sweden	58°55'N, 13°30'E	MH477652, MH477653	2	MN038094	1
	Nyuvchim reservoir, Komi, Russia	61°39'N, 50°74'E	MH477638-MH477639	2	MN038088-MN038089	2
	Pechora River, Nenetsia, Russia	68°18'N, 54°22'E	MH477650	1	MN038091	1
	Karkalai Creek, Udmurtia, Russia	56°98'N, 52°40'E	MH477654, MH477655	2	MN038086	1
	Lake Narach, Belarus	54°87'N, 26°69'E	MH477646-MH477649	4	MN038087	1
	Rybinsk reservoir, Russia	58°08'N, 38°28'E	MH477640-MH477642, MH477656-MH477662	10	MN038092-MN038093, MN038096	3
	Vychegda river, Komi, Russia	61°69'N, 50°87'E	MW844032	1	-	-
	Lake Glubokoe, Moscow region, Russia	55°75'N, 36°50'E	MW844033	1	-	-
<i>Canthocamptus staphylinus</i>	Lake Geneva, Switzerland	46°27'N, 06°31'E	MG209733-MG209737, MN737556-MN737558	8	MN061654, MN061655	2
	Lake Zurich, Switzerland	47°14'N, 08°40'E	MN737564	1	-	-
	Lake Pääjärvi, Lammi, Finland	61°04'N, 25°08'E	KP974713-KP974729; MG209708-MG209711	11	MN061649-MN061652	4
	Lake Võrtsjärv, Estonia	57°40'N, 26°40'E	MG209728-MG209732	5	MN061657, MN061658	2
	Lake Vänern, Sweden	58°55'N, 13°30'E	MG209712-MG209720	9	MN061653	1
	Lake Narach, Belarus	54°87'N, 26°69'E	MN737559-MN737563	5	MN061659	1

	Orlov pond, St. Petersburg, Russia	59°51'N, 30°02'E	MG209721-MG209727, KC627284-KC627286	10	MN061656	1
	Northern Germany		MF077881	1	-	-
	Lake Plau am see, Germany	53°49'N, 12°37'E	MN737568-MN737569	2	-	-
	Lake Stechlin, Germany	53°14'N, 13°03'E	MN737571-MN737572	2	-	=
	Lake Fernsteinsee, Austria	47°34'N, 10°81'E	MN737567	1	-	-
	Lake Zell am see, Austria	47°33'N, 10°81'E	MN737565-MN737566	2	-	-
	Lake Hallstatt, Austria	47°55'N, 13°65'E	MN737570	1	-	-
<i>Eucyclops serrulatus</i>	Orlov pond, St. Petersburg, Russia	59°51'N, 30°02'E	KC627302-KC627306	5	MK185423-MK185431	9
	Pond in the Tauride Garden, St. Petersburg, Russia	59°56'N, 30°22'E	KC627297-KC627320	4	MK185433	1
	Lake Creteil, Paris, France	48°50'N, 2°20'E	KC627310-KC627311	2	-	-
	Italy, Florence	43°47'N, 11°15'E	KC986941-KC986942	2	-	-
	Pond in Oslo, Norway	59°54'N, 10°45'E	KC627317-KC627319	3	-	-
	Pond of Golubinoe village, Zakarpattia, Ukraine	48°25'N, 23°17'E	KC627298-KC627301, KC627321	5	-	-
	Dniester Liman, Odesskii region, Ukraine	46°15'N, 30°21'E	KC627313-KC627316, KC627322	5	-	-
	River Karkalai, Udmurtia, Russia	57°42'N, 52°29'E	KC627312, MN256869-MN256873	6	MK185432	1
	River Severnaya Dvina, Arkhangelsk, Russia	64°33'N, 40°32'E	MN256867	1	-	-
	River Lena, Yakutia, Russia	72°38'N, 128°52'E	MN256868	1	-	-
<i>Nitokra hibernica</i>	Lake Narach, Belarus	54°87'N, 26°69'E	MT477895-MT477897	3	-	-
	Lake Võrtsjärv, Estonia	57°40'N, 26°40'E	MT477898-MT477899	2	-	-
	Lake Pyhäjärvi, Finland	63°35'N, 25°57'E	MT477893-MT477894	2	-	-
	Lake Hallstatt, Austria	47°55'N, 13°65'E	MT477902	1	-	-
	Lake Müritz, Germany	53°25'N, 12°41'E	MT477900-MT477901	2	-	-

Table S2. Primer sequences for PCR amplification and sequencing.

Gene region	Primers name	Direction	Sequence (5'-3')	Reference
COI	HCO 2198	Forward	TAAACTTCAGGGTGACCAAAAAATCA	[1]
	LCO1490	Reverse	GGTCAACAAATCATAAAGATATTGG	
	ZplankF1_t1	Forward	TGTAAAACGACGGCCAGTTCTASWAATCATAARGATATTGG	[2]
	ZplankR1_t1	Reverse	CAGGAAACAGCTATGACTTCAGGRTGRCCRAARAATCA	
ITS	ITS-4	Forward	TCCTCCGCTTATTGATATGC	[3]
	ITS-5	Reverse	GGAAGTAAAAGTCGTAACAAGG	
18S	18Sf	Forward	TACCTGGTTGATCCTGCCAG	[4]
	614r	Reverse	TCCAACCTACGAGCTTTTAAACC	
	554f	Forward	AAGTCTGGTGCCAGCAGCCGC	
	1282r	Reverse	TCACTCCACCAACTAAGAACGGC	
	1150f	Forward	ATTGACGGAAGGGCACCACCAG	
	18Sr	Reverse	TAATGATCCTTCCGCAGGTTAC	

1. Folmer O, Black M, Hoeh W, Lutz R, Vrijenhoek R. DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. *Mol Mar Biol Biotechnol.* 1994, 3(5), 294-9. PMID: 7881515.
2. Prosser, S., Martínez-Arce, A., Elías-Gutiérrez, M. A new set of primers for COI amplification from freshwater microcrustaceans. *Mol Ecol Resour* **2013**, 13, 1151-1155. <https://doi.org/10.1111/1755-0998.12132>
3. White, T.J. Amplification and Direct Sequencing of Fungal Ribosomal RNA Genes for Phylogenetics. In: *PCR Protocols, a Guide to Methods and Applications* **1990**, 315-322.
4. Huys R, Mackenzie-Dodds J, Llewellyn-Hughes J. Cancrincolidae (Copepoda, Harpacticoida) associated with land crabs: a semiterrestrial leaf of the ameerid tree. *Mol Phylo Evol.* **2009**, 51,143-155.

Table S3. Analysis of molecular variance (AMOVA) of the studied species among different populations.

species	gene	Percentage of variation		Φ value	p-value	Percentage of variation		Φ value	p-value
		Among populations	Within populations			Among clades	Within clades		
<i>Attheyella crassa</i>	COI	64.1	35.8	0.64	p<0.01	99.3	0.7	0.99	p<0.01
	ITS	64.2	35.7	0.64	p=0.041	97.2	2.8	0.97	p<0.01
<i>Canthocamptus</i>	COI	99.4	0.5	0.99	p<0.01	96.8	3.2	0.97	p<0.01
<i>staphylinus</i>	18S	46.2	53.7	0.46	p=0.057	7.6	92.4	0.07	p=0.141
<i>Eucyclops</i>	COI	64.9	35.1	0.65	p<0.01	99.5	0.5	0.99	p<0.01
<i>serrulatus</i>	ITS	66.2	33.6	0.66	p=0.097	59.6	40.4	0.59	p<0.01
<i>Nitokra hibernica</i>	COI	99.5	0.49	0.99	p<0.01	61.3	38.7	0.61	p<0.01