

Supplementary material to

Three new species of the genus *Liobaicalia* (Caenogastropoda: Truncatelloida: Baicaliidae) with corkscrew-shaped shell, and close related species of normal coiled whorls

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Table S1. Information on the snails and their sequences used in the phylogenetic analyses.

Таблица. S1. Информация о гастроподах и их последовательностях, использованных для анализа.

Locality number (Fig. 1)	Species/Labels	Sample code	GenBank accession numbers, this investigation	
			<i>COI</i>	<i>ATPsa</i>
3	<i>Liobaicalia stiedae</i> Kultuk Bay, near Utulik River, depth of 13–19 m, coarse and fine sand, 25 July 2018, leg. M. Kovalenkova (dredge)	U1L male (Fig. 3Ad) U2L female U3L female U4L female U5L female (Fig. 3Ae) U6L male U7L female U8L female	PP784470 PP784471 PP784472 PP784473 PP784474 PP784476 PP784475	PP795605- PP795606 PP795597 PP795607- PP795608 PP795598 PP795603- PP795604
5	<i>Liobaicalia stiedae</i> Murinskaya Bank, depth of 18.9–20.4 m, coarse sand, iron-manganese concretions, 20 July 2018, leg. M. Kovalenkova (dredge)	M1L female (Fig. 3Af) M2L male M3L male (Fig. 3Ag)	PP784478 PP784477	 PP795599
7	<i>Liobaicalia sidelevae</i> sp. nov. Near Babushkin city, depth of 33–45 m, gas bubbles, coarse sand, pebbles with sponges, 18 July 2018, leg. T. Sitnikova (dredge); depth of 25 m, yellow coarse sand, iron-manganese concretions, 18 June 2023, leg. M. Kovalenkova (dredge)	B1L male B2L female B3L female B4L female B5L female (Fig. 3Bd) B6L female B7L male (Fig. 3Be) B8L male B9L male	PP784456 PP784463 PP784457 PP784460 PP784461 PP784458 PP784462 PP784459	PP795615- PP795616 PP795611- PP795612 PP795613- PP795614 PP795600 PP795609- PP795610
15	<i>Liobaicalia karabanovi</i> sp. nov. Bolshie Koty Bay, depth of 20–25 m, sand, 28 Aug. 2020, leg. I. Khanaev (scuba diver), T. Sitnikova	K1L female (Fig. 3Dc) K2L female (Fig. 3Dd) K3L female K4L female (Fig. 3De)	PP784464 PP784466 PP784465	PP795595 PP795596
9	<i>Liobaicalia riedeli</i> sp. nov. Posolskaya Bank, depth of 37.3–39 m, coarse and fine sand, iron-manganese concretions, 27 July 2018, leg. M. Kovalenkova (dredge)	P1L female (Fig. 3Eb) P2L female P4L male (Fig. 3Ee)	PP784467 PP784469 PP784468	PP795601, PP795602
	Species/Baikal region	GenBank accession numbers, published data		
		authors	<i>COI</i>	<i>ATPsa</i>

15	<i>Liobaicalia "stiedae"</i> Bolshie Koty Bay	Zubakov <i>et al.</i> , 1997	Z92985	-
19	<i>Korotnewia cf. angigyra</i> (Lindholm, 1909) Barguzin Bay (juvenile)	Kovalenkova <i>et al.</i> , 2020a	KT808647	KF201706
20	<i>Korotnewia korotnewi</i> (Lindholm, 1909) Maloe More strait	Kovalenkova <i>et al.</i> , 2020a	KT885119	KT885113, MT261207- MT261210
20	<i>Pseudobaikalia zachvatkini</i> Kozhov, 1936 Maloe More strait	Kovalenkova <i>et al.</i> , 2020a	KT885130	KT885095, MT261213- MT261215
15	<i>Maackia herderiana</i> (Lindholm, 1909), southern of Bolshie Koty Bay, Listvenichnyi Bay	Fazalova <i>et al.</i> , 2010; Kovalenkova <i>et al.</i> , 2020a	HM543406, HM559316	KF201699

Table S2 Additional studied material and references on records of *Liobaicalia stiedae*

Locality number (Fig. 1)	Locality, depth, sediments, data of samples	N collection or references	Number of individuals
1	Shaman Cape, 51°40'N 103°41'E, 18 m, 1954, leg. M. Beckman	LIN No.672	36 (dry)
1	near Shaman Cape, 51°41'28.85"N 103°42'08.62"E, 18–20 m, silted sand with detritus, 1998, leg. P. Röpstorf, scuba diver	LIN B1223	2 (dry), 3 dissected, 18 (in alcohol)
1	near Slyudyanka city, 51°40'N 103°43'E, 10–20 m, sand	[Kozhov, 1936]	
2	Kultuk Bay, near Kultuk settlement, 51°43' N 103°43'E, 25–30 m, BEAN (Baikal expedition of the Academy of Science), 1926, det. M. Kozhov	LIN (without number).	3 (dry)
2	Kultuk Bay, near Kultuk settlement, 51°43'N 103°43'E, 9 fathoms (about 16.4 m), sand, Korotneff exp.	[Lindholm, 1909] (No 4 ZIN)	15 (dry)
2	Near Suhkoy Stream, 51°38'N 103°45'E, 27 m, 1958, leg. M. Beckman	LIN (without number)	5 (dry)
3	Kultuk Bay, near Utulik River, 51°33'17.0"N 104°03'55.3"E, 13–19 m, coarse and fine sand, 2.07. 2018, leg. M. Kovalenkova, dredge	LIN B1227	15(in alcohol)
3	The same locality, 30 m, 9.10.1990 Sitnikova T., dredge	LIN No. 535	4 (dry)
4	Near the Solsan River, 50 m, sand, 10.10.1990, leg. Sitnikova T. (dredge)	LIN No. 528	7 (in alcohol))
4	Baikalsk city, Nemchinova Cape, 51°31'N 104°09'E, ~20–100 m, sand	[Slugina, 1983]	
5	Murinskaya Bank (51°31'N 104°30'E), 53 m, sand	[Kozhov, 1936]	
5	Murinskaya Bank, 100 m, sand, iron-manganese nodules, 1990, leg. T. Sitnikova, dredge.	LIN (without number)	5 (in alcohol)
6	Near Snezhnaya River (51°28'53"N 104°40'34"E), 12–25 m, boulders with sponges, silted sand, 18.06.2023, leg. M. Kovalenkova, dredge.	LIN (without number)	3 (in alcohol)
14	Near Maritui settl., 51°47' N, 104°12'E, 144 m, sand, silt, BEAN, st. 1629, 27.06.1925; det. M. Kozhov	LIN (without number)	1 (dry)

Table S3 Additional studied material of *Liobaicalia* spp. nov.

Locality number (Fig. 1)	Locality, depth, sediments, data of samples	N collection or references	Number of individuals
<i>Liobaicalia sidelevae</i> Sitnikova et Kovalenkova sp. nov.			
7	Near Babushkin city, 51°44'59.4"N 105°50'07.8"E, 25 m, yellow coarse sand, iron-manganese nodules, 18.06.2023, leg. M. Kovalenkova, dredge.	(LIN without number)	4 (in alcohol), 3 dissected
7	near Babushkin city, 51°45'01.9"N 105°50'11.0"E, 30–20 m, coarse yellow sand, 24.06. 2020, leg. Sitnikova T., dredge.	LIN No. B1235	15 (in alcohol)
7	near Babushkin city, without exact coordinates, 40 m, sand, silt, 16.08.2007, bottom grab, leg. unknown	LIN No. B1221	1 (in alcohol)
8	Near Boyarskaya	[Kozhov, 1936]	?
13	Talanka Bay, east of the central Baikal basin, 51°44'05"N 105°49'05"E, 7 m, brown sand, 28.09.1988, leg. Proviz L.I., dredge	LIN No. B1040	3 (dry)
13	Talanka Bay, 52°44'17"N 107°45'24"E, 30–34 m, coarse yellow sand, 02.08.2024, leg. Kovalenkova M., dredge	(LIN without number)	1 (in alcohol)
<i>Liobaicalia riedeli</i> Sitnikova et Kovalenkova sp. nov.			
9	Posolskaya Bank, 52°03' N 105°53' E, 40–73 m, leg. T. Sitnikova, dredge, 8.07.2003	LIN No. B1226	2 (in alcohol)

10	Transect Krestovyi – Kukui, 460 m, 22.07.1974, leg. M. Beckman trawl	LIN No. B1212	2 (dry)
10	Delta Selenga River, 100 mud, 17.07.1925, BEAS, det Lindholm, coll. M.Kozhov	LIN B1241 [Kozhov, 1936]	2 (dry)
10	Selenga shallow, open Baikal, 14–.80 m, silty-sand, silt	[Bazikalova, 1977]	
11	near Enkhaluk settlement, 52°28' N, 106°52' E, 40 m, BEAS, 18.07.1925	LIN B1242 [Kozhov, 1936]	1 (dry)
12	near Sukhaya, 52°32' N 107°04' E, 16 m, mud, BEAS, 18.07.1925	LIN B1243 [Kozhov, 1936]	2 (dry)
	<i>Liobaicalia karabanovi</i> Sitnikova et Kovalenkova sp. nov.		
15	Bolshie Koty, near former glass factory, 51°54' 10.34" N 105°04' 20.48"E, 5–22, leg. T. Peretolchina, 12.06.2003, dredge	LIN B1228	1 (dry)
15	Bolshie Koty, near IGU pier, 51°54' 10.08" N 105°04' 08.03"E, 20 m, sand, scuba diver, 04.10.2015	LIN B1229	3 (in alcohol)
15	near Bolshie Koty River 51°54' 12" N 105°04' 34.05"E, 42 m, sand, detritus, leg I. Khanaev, scuba diver, 21.06.2019	LIN B1231	4 (in alcohol)
16	Near Goloustnoe settlement, 52°00'58"N, 105°24'45"), 47 m, silted yellow sand, <i>Thioploca</i> , 20.06.2010, leg. T. Sitnikova, box-corer	LIN B1224	2 (in alcohol)
17	near Nizhnie Khomuty settlement, 52°02' N 105°34' E, 33 m, sand, mud, BEAS, 1925, coll. Kozhov	LIN B1245	1 (dry)
18	Peschana Bay, without coordinates, 100–120 v, silted-up sand and stones, 06.09.1967, LIN leg. M. Beckman	LIN B1246	11 (dry)
18	Peschanaya Bay, 52°15'28"N, 105°42'15"E, near Arca cape, 130 m, silted sand, 16.08.1998, leg. Sitnikova, dredge	LIN B1244	1 (dry)

Table S4. Number of the binary and asymmetric molecular unique characters to distinguish *Liobaicalia* based on COI and ITS1 sequences, calculated according to [Hütter *et al.*, 2020].

Species	COI		ITS1	
	Binary	Asymmetric	Binary	Asymmetric
<i>L. karabanovi</i> sp. nov.	5	0	3	2
<i>L. riedeli</i> sp. nov.	4	0	7	1
<i>L. sidelevae</i> sp. nov.	11	1	0	1
<i>L. stiedae</i>	7	1	0	0

Note: binary signature shows one state in all individuals of the discriminated species and a different state (also only one) in the compared species. Asymmetric signature shows one state in all individuals of the discriminated species but two or more different states in the compared species [Hütter *et al.*, 2020].