

Three lymnaeid species (Gastropoda: Lymnaeidae) new for the Irtysh River basin (Western Siberia)

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Three species of the family Lymnaeidae (Gastropoda: Pulmonata) are registered for the first time from the waterbodies belonging to the Irtysh River basin (Western Siberia). These are: *Lymnaea (Stagnicola) iliensis* Lazareva, 1967, *L. (Peregriana) dolgini* Gundrizer et Starobogatov, 1979, and *L. (P.) ulaganica* Kruglov et Starobogatov, 1983. Species accounts, including descriptions of diagnostic characters, outlines of species ranges and bionomics, are provided as well as some data on variation of their shells and copulative organs.

Три новых для бассейна Иртыша (Западная Сибирь) вида прудовиков (Gastropoda: Lymnaeidae)

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Три вида пресноводных моллюсков семейства Lymnaeidae (Gastropoda: Pulmonata) впервые отмечаются в водоемах бассейна р. Иртыш (Западная Сибирь): *Lymnaea (Stagnicola) iliensis* Lazareva, 1967, *L. (Peregriana) dolgini* Gundrizer et Starobogatov, 1979 и *L. (P.) ulaganica* Kruglov et Starobogatov, 1983. Приводятся видовые очерки, включающие описание диагностических признаков указанных видов, их географического распространения и экологии. Приведены некоторые сведения об изменчивости раковин и копулятивных органов.

Nearly 35 species of the family Lymnaeidae Rafinesque, 1815 have been reported from waterbodies belonging to the Irtysh drainage basin since 1885 when C.A. Westerlund [1885] published his review of the Siberian continental mollusks known by the end of XIX century. The most important faunistic and taxonomic studies of Lymnaeidae of the region are those by A. Mozley [1934, 1936], A.I. Lazareva [1967a, b; 1968], L.V. Krivosheina [1979], and E.S. Frolova [1984].

All the data concerning the Lymnaeidae of the Irtyshian malacofaunistic province are summed up in my PhD thesis [Vinarski, 2003] and, quite independently, by N.D. Kruglov [2005], who made a comprehensive survey of all Palaearctic lymnaeid species known to the date.

However, it is still unknown how many species of the family are there in the Irtysh River basin. For example, N.D. Kruglov [2005, p. 424] enumerates only 24 species in his check-list of the

Irtysian lymnaeids, whereas Vinarski et al. [2007] list as many as 32 species. Such an increase in species richness is mainly a result of thorough faunistic investigations that were carried out in Western Siberia during the last decade and are continuing at present. In this publication, I present data on three species of Lymnaeidae, which are recorded for the first time in the waterbodies of the Irtys River basin. These are: *Lymnaea (Stagnicola) iliensis* Lazareva, 1967, *L. (Peregriana) dolgini* Gundrizer et Starobogatov, 1979, and *L. (P.) ulaganica* Kruglov et Starobogatov, 1983.

The materials for this study, except for the type series of all species, were taken

from the collection of the Museum of Siberian Aquatic Mollusks (Omsk State Pedagogical University, MSAM hereafter), including samples gathered by me during 2001–2007 in the waterbodies of Western Siberia and adjacent regions (Urals, Central Kazakhstan). Type series of all species under discussion are housed in the Zoological Institute of the Russian Academy of Sciences (Saint-Petersburg, ZIN hereafter). Dissections of snails and measurements of the reproductive system parts were made after standard scheme [Kruglov, 2005], and the «index of the copulative apparatus» (ICA, hereafter) was calculated as a ratio between lengths of praeputium and penis sheath.

Accounts of newly registered species

1. *Lymnaea (Stagnicola) iliensis*

Lazareva, 1967

Tables 1, 2, Figs. 1–3

Lymnaea iliensis Lazareva, 1967a, p. 1347, figs. 1, 6b, 6a; 2, 6, 6a.

Lymnaea (Stagnicola) iliensis Lazareva, 1967: Kruglov, Starobogatov, 1986, p. 69, figs 1, 17; 2, 16; Kruglov, Starobogatov, 1993a, p. 82, fig. 8F; Kruglov, 2005, p. 226, figs. 115, 3, 118.

Type locality. Southern Kazakhstan, Ili River basin, a «swamp-lake» near Ilijsk Settlement.

Material studied. 221 specimens from waterbodies situated in Novosibirsk Region and Northern Kazakhstan. The type series has been examined as well.

Characteristic features. Shell of high-turriculate shape with relatively oblong spire and weakly inflated body whorl. Whorls number up to 7.5. Columellar fold usually well developed. Penis sheath very long and narrow; ICA values vary from 0.11 to 0.18 (Table 2). Prevalgina relatively long and clearly twisted

(Fig. 1C). Prevaginal duct well swollen in its basal part.

Range of distribution. Hitherto, the species was recorded from a few localities in Southern Kazakhstan (the Balkhash Lake basin).

New localities. *L. iliensis* was found in four waterbodies situated in Russia (Novosibirsk Region) and Northern Kazakhstan (Fig. 2):

1. Novosibirsk Region, an unnamed brook near 76th kilometer of the Kujbyshev–Severnoje Road (56°12' N, 78°28' E). 17.08.2005. Coll. N.I. Andreyev, A.V. Karimov and M.V. Vinarski. 7 spec.

2. Novosibirsk Region, a brook connecting the Kargat River and the Malaja Chicha Lake (54°41' N, 78°34' E). 16.08.2005 Coll. N.I. Andreyev, A.V. Karimov and M.V. Vinarski. 172 spec.

3. Akmola Region, Mnogosopochnoye Lake (52°47' N, 69°40' E). 22.07.1986. Coll. S.I. Andreyeva and N.I. Andreyev. 36 spec.

Table 1

Morphometric characteristics of shells of the three species of *Lymnaea*

Character (index)	Mean	Limits	Standard deviation (σ)	Variation coefficient, %
<i>Lymnaea iliensis</i> , a brook near the Kujbyshev–Severnoje Road, n=7				
Whorls number	6.09	5.87–6.37	0.17	2.8
Shell height (SH), mm	13.1	12.0–14.3	1.0	7.6
Shell width (SW), mm	5.9	5.4–6.6	0.5	8.5
Spire height (SpH), mm	7.9	6.9–8.8	0.7	8.9
Body whorl height (BWH), mm	9.1	8.2–11.0	1.0	11.0
Aperture height (AH), mm	5.2	4.5–5.8	0.5	9.6
Aperture width (AW), mm	3.9	3.5–4.4	0.3	7.6
SW/SH	0.45	0.43–0.47	0.02	4.4
SpH/SH	0.60	0.58–0.63	0.02	3.3
BWH/SH	0.69	0.65–0.77	0.04	5.8
AH/SH	0.40	0.36–0.43	0.03	7.5
AW/AH	0.76	0.69–0.84	0.07	9.2
<i>L. ulaganica</i> , a puddle near Severnoje–Biaza Road, n=12				
Whorls number	4.08	3.75–4.50	0.18	4.41
SH, mm	8.6	6.8–10.0	1.0	11.6
SW, mm	5.0	3.9–6.2	0.7	14.0
SpH, mm	3.6	2.8–4.1	0.4	11.1
BWH, mm	6.8	6.8–8.1	0.9	13.2
AH, mm	5.2	4.0–6.3	0.8	15.4
AW, mm	3.6	2.6–5.3	0.8	22.2
SW/SH	0.57	0.52–0.63	0.04	7.0
SpH/SH	0.42	0.38–0.47	0.03	7.1
BWH/SH	0.80	0.71–0.83	0.03	3.8
AH/SH	0.60	0.56–0.66	0.03	5.0
AW/AH	0.69	0.59–0.88	0.08	11.6
<i>L. dolgini</i> , floodplain of the Kargat River, n=30				
Whorls number	4.59	4.25–4.87	0.14	3.1
SH, mm	15.9	13.9–18.3	1.2	7.5
SW, mm	9.9	8.6–11.7	0.9	9.1
SpH, mm	5.1	4.1–6.5	0.5	9.8
BWH, mm	13.6	12.2–16.0	1.0	7.4
AH, mm	10.9	9.5–12.9	0.8	7.3
AW, mm	8.7	7.1–10.5	0.8	9.2
SW/SH	0.62	0.55–0.70	0.03	4.8
SpH/SH	0.32	0.29–0.36	0.02	6.3
BWH/SH	0.86	0.84–0.88	0.01	1.2
AH/SH	0.69	0.65–0.73	0.02	2.9
AW/AH	0.80	0.70–0.86	0.05	6.3

4. Northern Kazakhstan Region, Zhaksy-Zhangistau Lake (52°38' N, 68°10' E). 17.07.1986. Coll. S.I. Andreyeva and N.I. Andreyev. 6 spec.

The latter two samples are presented by dried shells only, whereas the two former includes both fixed specimens and empty shells, therefore I had an opportunity to dissect snails and to determine anatomical traits having a diagnostic value. Conchological traits of the Western Siberian snails coincide with those of the holotype and paratypes (Fig. 3).

Thus, this species seems to be widely distributed in Southern, Eastern and Northern Kazakhstan and adjacent parts of Western Siberian forest-steppe zone.

Bionomics. Both two findings of *L. iliensis* in Novosibirsk Region are made from small shallow brooks with a relatively speed current. Habitat conditions of the two lakes in Northern Kazakhstan are not available from the original labels.

2. *Lymnaea (Peregriana) ulaganica*

Kruglov et Starobogatov, 1983

Tables 1, 2, Figs. 1, 2

Lymnaea (Peregriana) ulaganica Kruglov, Starobogatov, 1983, p. 141.

Lymnaea (Peregriana) ulaganica Kruglov et Starobogatov, 1983: Kruglov, Starobogatov, 1984, p. 26, figs. 1, 4; 2, 9; Kruglov, Starobogatov, 1993b, p. 164, fig. 5B; Starobogatov et al., 2004, p. 321, pl. 136, fig. 5; Kruglov, 2005, p. 335, figs. 220, 2; 222.

Type locality. Altay Mountains, Ulagan District, a temporary waterbody (spring) near Surulu-Kol' Lake.

Material studied. 91 specimens from waterbodies situated in the southern part of Western Siberia. The type series has been examined as well.

Characteristic features. Shell ovate-conical, relatively small (up to

12 mm height), slender, fragile, with high and narrow spire. Whorls number up to 4.5. Body whorl ovate, moderately inflated. Columellar lip thin, semi-transparent. The reproductive system is of typical for the subgenus *Peregriana* structure. ICA varies from 0.75 to 1.06 (Table 2). ICA of the holotype was equal to 0.88 [Kruglov, 2005].

Range of distribution. Judging from the Kruglov's [2005] monograph and the catalogue of the ZIN collection, the species is still known from nowhere except of its type locality.

New localities. *L. ulaganica* was found in seven waterbodies situated in Novosibirsk and Omsk Regions (Fig. 2):

1. Novosibirsk Region, an unnamed pool near Severnoje-Biaza Road (56°23' N, 78°15' E). 17.08.2005. Coll. N.I. Andreyev, A.V. Karimov and M.V. Vinarski. 13 spec.

2. Omsk Region, Krivoye Lake near Atak Village (56°46' N, 74°37' E). 02.07.2002; 15.05.2004. Coll. A.V. Karimov and E.A. Lazutkina. 9 spec.

3. Omsk Region, pools in a wet meadow in the Irtysh River floodplain near Chernoluchye Village (55°16' N, 73°00' E). 28.06.2004. Coll. M.V. Vinarski. 1 spec.

4. Omsk Region, pools in the Irtysh River floodplain near Kachesovo Village (56°03' N, 74°45' E). 07.07.2000; 10.07.2000. Coll. M.V. Vinarski and A.V. Karimov. 4 spec.

5. Omsk Region, a lake in the Irtysh River floodplain near Beregovoye Village (53°56' N, 74°56' E). 15.08.2001. Coll. M.V. Vinarski and A.V. Karimov. 33 spec.

6. Omsk Region, a pool in the Irtysh River floodplain in the northern outskirts of Omsk City (55°09' N, 73°13' E). 20.05.2002. Coll. M.V. Vinarski. 1 spec.

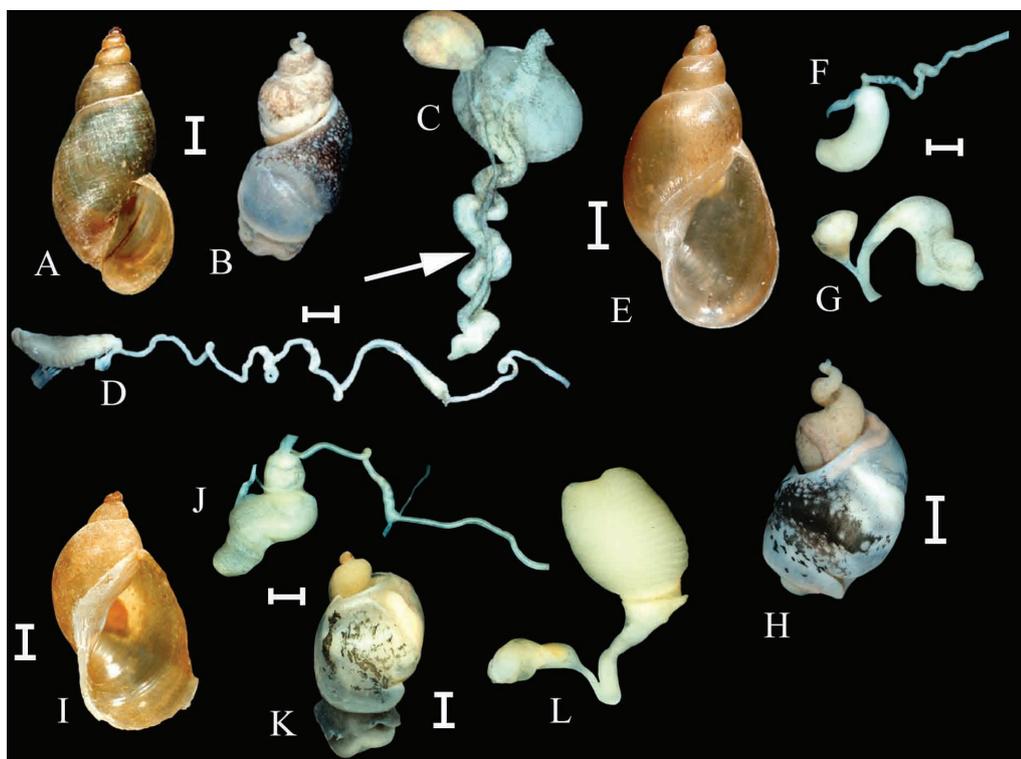


Fig. 1. Lymnaeid species newly registered in the Irtysh basin. **A–D.** *Lymnaea iliensis*: **A** – shell; **B** – soft body; **C** – organs of the female reproductive tract; **D** – copulative apparatus. An arrow indicates twisted prevagina. **E–H.** *L. ulaganica*: **E** – shell; **F** – copulative apparatus; **G** – proximal part of the female reproductive tract; **H** – soft body. **I–L.** *L. dolgini*. **I** – shell (embryonic whorls are corroded); **J** – copulative apparatus; **K** – soft body; **L** – proximal part of the female reproductive tract. Photo and dissections by Peter Glöer. Scale bars: 1 mm (for genitals), 2 mm (for shells and intact soft bodies).

Table 2

Proportions of the copulative organs of the three lymnaeid species

Species, locality, number of animals dissected (n)	Mean praeputium length (\pm SE) and limits of variation	Mean penis sheath length (\pm SE) and limits of variation	Mean ICA (\pm SE)
<i>Lymnaea iliensis</i> , a brook near Kujbyshev–Severnoje Road (n=6)	4.4 ± 0.7 (3.5–5.1)	34.0 ± 7.9 (23.8–45.6)	0.13 ± 0.02 (0.11–0.16)
<i>Lymnaea iliensis</i> , a brook between Kargat River and Malaja Chicha Lake (n=11)	5.8 ± 0.8 (3.0–7.0)	40.1 ± 6.2 (18.0–48.2)	0.15 ± 0.02 (0.11–0.18)
<i>Lymnaea ulaganica</i> , a puddle near Severnoje–Biaza Road (n=6)	4.2 ± 0.5 (3.5–4.8)	4.6 ± 1.0 (3.3–6.0)	0.94 ± 0.12 (0.75–1.06)
<i>Lymnaea dolgini</i> , a swamp near Ananjevskoje Lake (n=18)	5.9 ± 0.7 (4.5–7.8)	5.8 ± 0.8 (4.4–7.4)	1.05 ± 0.11 (0.88–1.27)



Fig. 2. Distribution of the newly registered species of *Lymnaea* in the Irtysh River basin.

7. Omsk Region, a wet shore of the Tevriz River (57°30' N, 72°24' E). 15.07.2000. Coll. M.V. Vinarski and A.V. Karimov. 30 spec.

Most probably, the range of *L. ulaganica* distribution covers all the southern part of the Western Siberian Plain east of the Irtysh riverbed, and Altay Mountains.

Bionomics. Apparently, *L. ulaganica* is restricted to temporary waterbodies of different type. Most findings in Omsk Region were made in small floodplain waterbodies (pools, lakes and so on). Alive specimens of the species were found by me in August 2005 in a very small shallow puddle situated near road Kujbyshév–Severnoje in Novosibirsk Region. Animals were sitting in several centimeters off the puddle shore on sandy bottom and macrophytes.

3. *Lymnaea (Peregriana) dolgini*

Gundrizer et Starobogatov, 1979

Tables 1, 2, Figs. 1, 2

Lymnaea dolgini Gundrizer, Starobogatov, 1979, p. 1132, figs. 1, 2; 2, 2.

Lymnaea (Peregriana) dolgini Gundrizer et

Starobogatov, 1979: Kruglov, Starobogatov, 1993b, p. 170, fig. 7G; Starobogatov et al., 2004, p. 321, pl. 136, fig. 9; Kruglov, 2005, p. 363, figs. 247, 7; 253.

Type locality. Krasnojarsk Region, a small lake in the floodplain of the Kurejka River, 20 km above its mouth.

Material studied. 166 specimens from waterbodies situated in Novosibirsk and Omsk Regions. The type series has been examined as well.

Characteristic features. Shell ovate-conical, medium-sized (height up to 18 mm), fragile. Whorls number up to 5.5. Spire of regularly-conical shape. Body whorl high and somewhat inflated. Columellar lip thin, whitish and relatively wide. The reproductive system is of typical for the subgenus *Peregriana* structure. ICA varies from 0.88 to 1.27 (Table 2). According to the N.D. Kruglov's [2005] data, ICA values in *L. dolgini* lie between 1.15 and 1.25.

New localities. *L. dolgini* was found in eight waterbodies situated in Novosibirsk and Omsk Regions (Fig. 2):

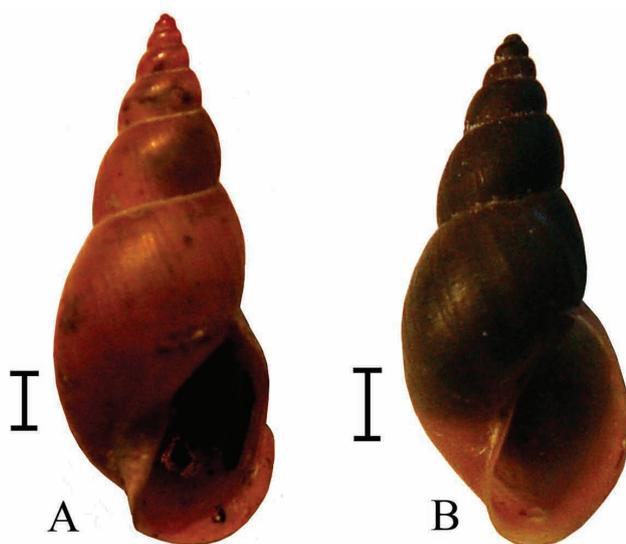


Fig. 3. *L. iliensis* shells. **A.** Paratype. Floodplain of the Ili River near Ilijsk town, Southern Kazakhstan (ZIN). **B.** A brook near Kujbyshév-Severnoje Road, Novosibirsk Region. Scale bars – 2 mm.

1. Novosibirsk Region, a swamp in the Kargat River floodplain (54°36' N, 78°13' E). 09.10.2002. Coll. M.V. Vinarski. 51 spec.

2. Omsk Region, a brook inflowing into the Krivoye Lake near Atak Village (56°46' N, 74°37' E). 26.08.2006. Coll. A.V. Karimov and M.V. Vinarski. 49 spec.

3. Omsk Region, a wet shore of the Tevriz River (57°30' N, 72°24' E). 15.07.2000. Coll. M.V. Vinarski and A.V. Karimov. 4 spec.

4. Omsk Region, Trauly Lake (56°09' N, 72°03' E). 24.07.2002. Coll. M.V. Vinarski. 5 spec.

5. Omsk Region, Kabankul' Lake (56°08' N, 72°01' E). 20.07.2002. Coll. M.V. Vinarski. 10 spec.

6. Omsk Region, a swamp near Ananjevskoje Lake (56°48' N, 74°36' E). 07.06.2004. Coll. A.V. Karimov and M.V. Vinarski. 23 spec.

7. Omsk Region, a wet meadow near Kalugino Village (56°03' N, 71°47' E). 09.07.2001. Coll. M.V. Vinarski. 19 spec.

8. Omsk Region, a marshland near Malaya Buturla Lake (55°20' N, 71°43' E). 16.07.2005. Coll. A.V. Karimov and M.V. Vinarski. 5 spec.

In addition to these samples, there are several *L. dolgini* lots from Tyumen', Tomsk and Irkutsk Regions in the MSAM collection. Thus, the species inhabits almost all Western Siberia and is known from some points within East Siberia (Lower Yenisei basin, vicinity of Kirensk Town). Future investigations would expand our knowledge on its range.

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