



# Атлас современных МОЛЛЮСКОВ СЕВЕРНОЙ ЕВРАЗИИ

## Guide to Recent molluscs of northern Eurasia

### 3. Annotated and illustrated catalogue of species of the family Lymnaeidae (Gastropoda Pulmonata Lymnaeiformes) of Palaearctic and adjacent river drainage areas

#### Part 1

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The present paper is the result of long-term study by the authors (together with their students) on the taxonomic revision of one of the most species-rich and diverse families of freshwater Pulmonata — Lymnaeidae. The revision is based on the biological species concept [Mayr, 1963, 1970]. The main evidence for the specific status of two or more forms, according to this concept, is the presence of coexisted populations in the same area under conditions when all external obstacles to crossing are completely absent. To isolate such populations, we used the shell morphology and the anatomy of reproductive system. When the forms examined do not coexist (i.e. when their distribution areas are sharply separated geographically or ecologically), we used only the level of distinction and biogeographical typology of the areas.

We studied shells by comparatorial method (i.e. comparison of shells by the comparator — *camera lucida*). This method has been already described both in Russian [Izzatullaev, Starobogatov, 1984; Starobogatov, Tolstikova, 1986] and in English [Kruglov, Starobogatov, 1985 c]. Valiability of this method is in that it permits to compare the conspiral (=turbospiral) shells by each of Raup's [1966] parameters\* without use of computers.

\* In our opinion, they are not parameters in mathematical sense but complex equations with many parameters.

The reproductive system was studied in dissected molluscs under a stereoscopic microscope. We used the standard fixation, leading to maximum contraction of mollusc (live mollusc were put directly into 96 % alcohol), because the proportions of parts of reproductive system (especially those of copulative apparatus) depend on the degree of contraction of mollusc. The shell morphology and anatomy of reproductive system were described in Kruglov, 1975, 1980; Gundrizer, Starobogatov, 1979; Kruglov, Starobogatov, 1979, 1981, 1983 a, b, 1984 a, b, 1985 a-c, 1986, 1987, 1989 a, b; Davydov et al., 1981; Izzatullaev et al., 1983 a-c. Naturally, there are many works concerning the anatomy of Lymnaeidae species. The most important are those by Larambergue, 1928; Hubendick, 1951; Jackievicz, 1959; Lazareva, 1967 a, b. The main trouble with previous works is that many authors used the specific names in a broad sense, while some of the species accepted by respective authors appeared to consist of several different species. This leads to difficulties in evaluation to which species the anatomical description belongs. However, we used the data from the previous works in the cases when our own anatomical data are absent.

The morphology of egg clusters — syncapsules (often named "capsules" in the literature) also provides an important taxonomic informa-

tion. They were often described in the literature (see Beriozkina, Starobogatov, 1988 for review) but the descriptions were based on the traditional broad concept of species, and this prevents us from use of these data. The descriptions of syncapsules based on our understanding of species were given only in 8 recent works [Kruglov, Starobogatov, 1981, 1984 b, 1985 c, 1992; Davydov et al., 1981; Beriozkina, Starobogatov, 1981, 1988; Prozorova, 1992]. The syncapsules in the majority of cases were obtained in the experiments with precisely identified molluscs.

The method of experimental hybridization was used in the most difficult cases. Using this method, we studied the following pairs of forms: *Lymnaea stagnalis* — *L. fragilis* [Kruglov, 1976; Davydov et al., 1981; Kruglov, Starobogatov, 1985 c], *L. corvus* — *L. gueretiniana*, *L. atra* — *L. palustris*, *L. atra* — *L. callomphala* [Kruglov, 1987]. This allowed to obtain the data on the reproductive isolation in all cases studied.

Finally, we used the results of studies of specificity of infection of definite species of molluscs with trematode parthenites. To estimate the specificity of infection, molluscs of certain age (in days) were infected with miracidia of a species of trematodes. The infection exposition (in seconds) was also strictly regulated. After that the development of trematode parthenites was studied [Kruglov, 1983, 1984, 1986]. The difference in duration of parthenite development and the possibility of completing the trematode life cycle appeared to be very important for taxonomy. Thus we used a wide range of characters which provide the reliable elucidation of distinctions between species.

Recent Lymnaeidae are divided into several genera by majority of malacologists. On the contrary, Hubendick [1951] included all the species into a single genus *Lymnaea* which was not even divided into subgenera. Our position is an intermediate one due to the fact that the genus *Aenigmomphiscola* is well separated from all species of *Lymnaea* in its anatomy [Kruglov, Starobogatov, 1981]. We include all remaining species into the genus *Lymnaea* divided into 26 Recent subgenera and several sections. It should be mentioned, however, that *Aenigmomphiscola* does not differ from the subgenus *Omphiscola* of the genus *Lymnaea* in the shell shape in spite of clear differences in the reproductive system. Moreover, *A. kazakhstanica* does not differ from *Lymnaea glabra* in the shell shape even by using the comparative method.

As a result we list 145 species of Lymnaeidae. The reproductive system (or at least its more important for the taxonomy part) is known for 137 species, and the syncapsules — for 59. The areas of species and subspecies, as one may see from the data on distribution, agree quite well with the scheme of systematic-biogeographical division of northern Eurasia worked out by Starobogatov [1970, 1986] — see Fig. 1 (the scheme in

this figure contains some corrections in comparison with that of 1986).

For each species, the following data are given: references to the original description, to the description of reproductive system and syncapsules (when available), as well as geographical distribution and illustrations of the shell and reproductive system (as a rule without the gonad) or its distal parts. For the genus group names, the type species are indicated (the method of fixation is given in brackets: (M) — by monotypy, (OD) — by original designation, (SD and reference — by subsequent designation, (SM and reference — by subsequent monotypy, (T) — by tautonymy).

The paper is divided into two parts. The first one contains introduction and the list of species of the subgenera *Corvusiana*, *Lymnaea* s. str., *Polyrhynchus*, *Galba*, *Stagnicola*, *Omphiscola*, *Sibirigalba*, *Cerasina*, and *Radix* of the genus *Lymnaea* (a total of 84 species). A new section, *Kobellilymnaea* sect. nov., of the subgenus *Lymnaea* s. str. is also described. The second part will contain the list of species of the subgenera *Peregriana*, *Myxas*, *Pacifimyxas*, *Orientogalba* of the genus *Lymnaea* and the genus *Aenigmomphiscola* (a total of 61 species), supplement concerning the nomenclatural problems.

## Family LYMNAEIDAE Rafinesque, 1815

### Key for identification of Recent genera of the family Lymnaeidae

- 1(2) Copulative apparatus with glandular distal part of penis sheath and with sucker-like praeputial organ in praeputium  
*Aenigmomphiscola*\*
- 2(1) Copulative apparatus simple, without glandular parts and praeputial organ †  
*Lymnaea*

### Key for identification of Recent subgenera of the genus *Lymnaea*

- 1(2) Shell pale yellow, light brown or reddish brown, with unevenly increasing whorls. When the height of aperture is less than half of the shell height the spire is acute and subulate; when it exceeds half of the shell height, the shell is auriculate; in both cases the shell surface is covered by microsculpture of spiral rows of crescent wrinkles. Prostate internally with some branched folds  
*Lymnaea* s.str. (Europe, North America) p. 71
- 2(1) Shell turriculate, highly conical, brown, or ovate, spherical, auriculate or neritoid, as a rule pale. When the height of aperture is less than half of the shell height, the shell is dark brown; when it is more than half of the shell height, microsculpture of crescent wrinkles is absent. Prostate internally without folds, or with one fold, or with some unbranched folds, or only one of the folds is branched.

\*Species of the genus *Aenigmomphiscola* are very similar in shell shape to the species of *Lymnaea* (*Omphiscola*) and therefore cannot be distinguished from the latter genus by their shell outlines and even by the shell geometry. *Lymnaea* (*Omphiscola*) species are distributed in West Europe and in Russia only in the Baltic river basin and probably in the uppermost part of the Volga basin. All conchologically similar specimens found in Europe eastwards from the line Yaroslavl — Michurinsk and in the southern part of West Siberia and Kazakhstan doubtless belong to *Aenigmomphiscola*.

- 3(4) Shell large (more than 14 mm in height), turriculate, highly conical or ovate, dark; whorls either flat or strongly inflated, stepped. Prostate internally with several unbranched folds  
*Corusiana* (Europe, Kazakhstan) p. 69
- 4(3) Shell small (less than 13 mm in height) or large, ovate, spherical, auriculate or neritoid; if the shell is turriculate, highly conical or ovate-conical the whorls weakly or strongly inflated but not stepped; only small forms have stepped whorls. Prostate internally either without folds or with one or more folds; when it has several folds only one of them branched.
- 5(6) Shell ovate or ovate conical, with spire near to the regular cone and flat whorls; microsculpture of crescent wrinkles absent. Prostate internally with several folds only one of which is branched  
*Cerasina*  
(India, Burma, southern Central Asia) p. 85
- 6(5) Shell turriculate or highly conical, with microsculpture of crescent wrinkles, or ovate, auriculate or neritoid without microsculpture; if the shell is ovate or ovate-conical, the spire differs sharply from regular cone (as rule lower than it), and whorls weakly or strongly inflated. Prostate internally with one fold or without it
- 7(8) Shell sinistral. Prostate devoid of folds; penis sheath of almost the same width as praepitium  
*Pseudobulinus*  
(Hawaiian Islands)
- 8(7) Shell dextral. Prostate internally with one fold; if it devoid of folds, penis sheath narrower than praepitium, when equal to it in width, the shell neritoid
- 9(24) Shell small: its height not more than 10 mm, as an exception somewhat larger (but not more than 13 mm)
- 10(15) Shell almost spherical or shortly ovate, neritoid or involute. Prostate internally without folds
- 11(12) Shell involute, upper part of aperture slit-like  
*Limnobia* (Falkland Islands)
- 12(11) Shell with elevated spire or neritoid
- 13(14) Shell with elevated spire, spherical or ovate. Penis sheath equal in length to praepitium but narrower than it  
*Sphaerogalba* (USA and Mexico)
- 14(13) Shell neritoid. Penis sheath shorter than praepitium but nearly equal to it in width  
*Erinna* (Hawaiian Islands)
- 15(10) Shell ovate, conical, highly conical or turrited. Prostate internally always with one fold
- 16(17) Shell either ovate or turriculate. Reservoir of spermatheca lies near provagina  
*Orientogalba* (southern Siberia, East Asia, eastern Africa, New Zealand, Hawaiian Islands)
- 17(16) Shell conical or ovate-conical. Reservoir of spermatheca lies near pericardium
- 18(19) Whorls stepped or strongly inflated. Velum and sarcobellum fused together  
*Galba* (Europe, West Siberia, western and Central Asia) p. 73
- 19(18) Whorls moderately inflated. Velum and sarcobellum separated.
- 20(21) Penis sheath wide, more than 0.6 of the width of praepitium  
*Walterigalba* (Western part of USA)
- 21(20) Penis sheath narrow, not more than 0.5 of the width of praepitium
- 22(23) Length of penis sheath equal to 0.6-1.0 of the praepitium length  
*Pseudogalba* (North and South America)
- 23(22) Length of penis sheath either less than half of praepitium length or more than praepitium length  
*Sibirigalba*  
(Siberia, Central Asia, Amur drainage area, Russian Maritime Territory of the Far East, probably southern Alaska) p. 82
- 24(9) Shell large: its height not less than 15 mm, as an exception less (but not less than 11 mm)
- 25(32) Shell ovate-conical, high-conical or subulate. Width of penis sheath insignificantly less than width of praepitium; if the latter strongly inflated in its proximal part the width of penis sheath nearly equal to width of distal part of praepitium
- 26(27) Tangent-line of shell not straight; either excurved or incurved. Length of penis sheath equal to half of praepitium length or more  
*Polyrhysis* (North America, extreme east of Asia, Hawaiian Islands) p. 73
- 27(26) Tangent-line of shell straight or almost straight. Length of penis sheath less than half of praepitium length
- 28(29) Whorls extremely flat. Proximal part of praepitium strongly inflated and wider than penis sheath  
*Acella*  
(North America: region of Great Lakes)
- 29(28) Whorls weakly, moderately or strongly inflated. Proximal part of praepitium not wider than penis sheath
- 30(31) Whorls weakly or moderately inflated. Cusps of outer lateral teeth\* unequal. Penis sheath not narrows to praepitium; sarcobellum well developed  
*Walhiana*  
(Greenland and Canadian Arctic Archipelago)
- 31(30) Whorls strongly inflated. Cusps of outer lateral teeth\* equal to each other in size. Penis sheath narrows to praepitium; sarcobellum not developed  
*Pectinidens*  
(Southern half of South America)
- 32(25) Shell turriculate, conical, ovate, auriculate or neritoid. Width of penis sheath significantly less than that of praepitium
- 33(36) Height of aperture less than half of shell height
- 34(35) Shell turriculate or high-conical, with flat whorls. Prostate internally without folds  
*Omphiscola* (West Europe, Baltic drainage area, uppermost Volga drainage area) p. 82
- 35(34) Shell turriculate or highly conical but with weakly or strongly inflated whorls. Prostate internally with one fold  
*Stagnicola* (Northern Eurasia and North America) p. 76
- 36(33) Height of aperture more than half of shell height
- 37(38) Shell succinoid, with large ovate body whorl and acute spire. Prostate internally without folds  
*Pseudosuccinea*  
(Eastern part of North America, Central and South America, introduced into West Europe)
- 38(37) Shell conical, ovate or auriculate. Prostate internally with one fold
- 39(40) Shell firm-walled, dark, with inflated whorls; height of aperture insignificantly less than height of spire  
*Bulinna*  
(North America: northern part of the USA and southern part of Canada)
- 40(39) Shell thin-walled, pale or corneous; height of aperture significantly more than height of spire; if the height of aperture slightly more than height of spire, whorls absolutely flat
- 41(44) Shell surface dull. *Vas deferens* begins from prostate not terminally
- 42(43) Columella internally without canal. Reservoir of spermatheca lies near pericardium  
*Radix* (Europe, Asia, Africa) p. 85
- 43(42) Columella internally with canal. Reservoir of spermatheca lies near provagina  
*Peregriana*  
(Europe, northern Asia)
- 44(41) Shell surface glossy. *Vas deferens* begins from prostate terminally or almost terminally
- 45(46) Shell ovate, corneous brown, with elevated spire and clearly incurved tangent-line. Sarcobellum and velum weakly developed  
*Austropeplia* (Australia, New Guinea, New Zealand)
- 46(45) Shell ovate or spherical or involute, yellow; spire almost not elevated or, if elevated, the tangent-line of shell almost straight. Velum well developed
- 47(48) Shell elongate-ovate, involute or ovate, with elevated spire, in the latter case whorls almost flat. Outer lateral teeth with two cusps. Provagina shorter than uterus; spermatheca with well developed duct  
*Bullastra*  
(Philippines and Buru Island).
- 48(47) Shell almost spherical or ovate; if the shell is involute, it has short ovate outlines; if the spire is significantly elevated the whorls clearly inflated. Outer lateral teeth with many cusps. Provagina longer than uterus, if it is shorter, the spermathecal duct has shape of narrowing between its reservoir and vagina.
- 49(50) Shell almost spherical, with very weakly elevated spire, or involute. Inflated part of prostate delimited from band-shaped one  
*Myxas* (Europe, south-western Siberia, northern lowland part of Central Siberia)

\*These teeth are commonly regarded as marginal but they do not correspond to marginal teeth of Pectinibranchia

50(49) Shell ovate, with significantly elevated spire. Inflated part of prostate smoothly passes to band-shaped one  
*Pacificmyxas* (Northern shore of the Okhotsk Sea, upper Kolyma drainage area and western Alaska)

#### Key for identification of sections of the subgenus *Corvusiana*

- 1(2) Whorls strongly inflated, almost stepped. Spermathecal duct not dilated near its entrance to vagina; penis sheath wide and only slightly narrower than praeputium *Kazakhlymnaea*  
 2(1) Whorls flat or insignificantly inflated. Spermathecal duct funnel-shaped dilated near its entrance to vagina; penis sheath significantly narrower than praeputium *Corvusiana* s.str.

#### Key for identification of sections of the subgenus *Polyrhythis* represented in Asia

- 1(2) Whorls strongly inflated, almost stepped. Length of praeputium exceeds that of penis sheath by at least 2.4 times  
*Dallirhythis* p. 73  
 2(1) Whorls moderately and evenly inflated. Length of praeputium exceeds that of penis sheath by not more than 2 times  
*Pseudoisidora* p. 73

#### Key for identification of sections of the subgenus *Lymnaea* s.str.\*

- 1(4) Shell subulate or elongate-ovate, if the shell is auriculate, the spire shortly subulate, height of spire not less than 0.4 of the height of aperture. Diameter of spermathecal reservoir equal to about half of length of its duct.  
 2(3) Whorls flat; height of spire either more than width of body whorl measured above the aperture (i.e. without aperture) or significantly less than the latter but not equal to it. Pro vagina and uterus equal in length *Lymnaea* s.str. p. 71  
 3(2) Whorls weakly and evenly inflated; height of spire nearly equal to width of body whorl measured above the aperture (i.e. without aperture). Pro vagina significantly shorter than uterus  
*Kobeltilymnaea* sect. nov. p. 73  
 4(1) Shell auriculate, with small conical spire; height of spire not more than 0.3 of height of aperture. Diameter of spermathecal reservoir not more than 0.35 of length of its duct  
*Stagniana* p. 73

#### Key for identification of sections of the subgenus *Galba*

- 1(2) Whorls stepped. Velum and sarcobellum fused into circular fold in proximal part of praeputium  
*Galba* s.str. p. 76  
 2(1) Whorls inflated but not stepped. Velum and sarcobellum fused into velar tube protruded into praeputium  
*Montigalba* p. 76

#### Key for identification of sections of the subgenus *Stagnicola* represented in Eurasia

- 1(4) Whorls almost flat or weakly and evenly inflated; shell either turritid (in this case the height of penultimate whorl not more than 0.70 of height of the part of body whorl lying above aperture) or ovate-conical with straight tangent-line. Inflated part of prostate smoothly passes into band-shaped one  
 2(3) Columellar fold weakly developed and internal outlines of parietal and columellar borders of aperture form almost straight line. Length of praeputium equal to that of penis sheath or a little shorter or a little longer than it *Stagnicola* s.str. p. 76

3(2) Columellar fold well developed and internal outline of columellar border form almost straight line with columellar fold but not with parietal border. Praeputium two or more times shorter than penis sheath  
*Berlaniana* p. 76

4(1) Whorls strongly inflated and sometimes stepped; if flat or weakly inflated in turritid shell, then the height of penultimate whorl not less than 0.75 of height of part of body whorl lying above the aperture; if shell ovate-conical, the tangent-line clearly excurred. Inflated part of prostate sharply demarcated from band-shaped one

5(6) Whorls strongly inflated or stepped. Penis sheath clearly narrower than praeputium and club-shaped; provagina sharply demarcated from uterus  
*Fenziana* p. 79

6(5) Whorls weakly inflated or almost flat. Penis sheath a little narrower than praeputium and somewhat inflated at its proximal end; provagina not demarcated from uterus  
*Ladislavella* p. 79

#### Key for identification of sections of the subgenus *Radix* represented in northern Eurasia

1(14) Whorls flat or pear-shapedly inflated (i.e. inflated above suture and flat under it), if whorls evenly inflated, the columellar fold well developed or columella markedly bent to left in its lower part. Uterus clearly demarcated from provagina

2(3) Whorls evenly inflated; shell with elevated spire have oblique sutures and weakly developed columellar fold. Inflated part of prostate clearly demarcated from band-shaped one  
*Desertiradix* p. 88

3(2) Whorls flat or pear-shaped inflated, if evenly inflated the sutures are slightly oblique, and columellar fold is well developed. Inflated part of prostate smoothly passes to band-shaped one

4(7) Columella weakly twisted and not bent to left. Length of spermathecal duct equal to length of diameter of its reservoir; length of praeputium either not more than 1.1 or more than 1.8 of length of penis sheath

5(6) Columellar-parietal lapel narrow, columella almost not twisted and its fold poorly expressed. Pro vagina very short; its length not more than one third of that of uterus; penis sheath longer than praeputium  
*Okhotiradix* p. 92

6(5) Columellar-parietal lapel wide; columella moderately twisted, with evident fold. Length of provagina more than half of uterus length; penis sheath shorter than praeputium or equal to it  
*Pamiriradix* p. 88

7(4) Columella strongly twisted and bent to left in its lower part (as an exception not bent but in this case the twist of columella expressed very well). Spermathecal duct longer than diameter of its reservoir or, if equal to it, the length of praeputium from 1.12 to 1.38 of length of penis sheath

8(11) Whorls flat or pear-shaped inflated. Inflated part of prostate not longer than band-shaped one, if longer, either spermathecal duct exceeds maximum diameter of its reservoir by not more than 1.4 times, or praeputium longer than penis sheath by 1.7-1.8 times, and spermathecal duct longer than reservoir by not more than 2.1 times

9(10) Columellar-parietal lapel well developed and not transparent in adult specimens; columellar fold expressed moderately or weakly. Inflated part of prostate shorter than band-shaped one  
*Radix* s.str. p. 85

10(9) Columellar-parietal lapel weakly developed (although may be wide) and transparent in adult specimens; columellar fold strongly expressed. Inflated part of prostate longer than band-shaped one or equal to it  
*Ussuriradix* p. 92

11(8) Whorls evenly inflated. Inflated part of prostate longer than band-shaped one, and in this case the spermathecal duct exceeds the maximum diameter of its reservoir by not less than 1.5 times; if praeputium longer than penis sheath by 1.7-1.8 times, the spermathecal duct longer than its reservoir by 2.3-2.5 times

\*All Recent American species of subgenus belong to the section *Lymnaea* s.str.

12(13) Columella not bent to left; columellar-parietal lapel wide. Spermathecal duct exceeds maximum diameter of its reservoir by not more than 2 times, and in this case praeputium longer than penis sheath by 1.12-1.40 times; if spermathecal duct exceeds maximum diameter of its reservoir by 2 times the praeputium longer than penis sheath by 1.2 times

*Iraniradix* p. 88

13(12) Columella strongly bent to left in its lower part, if it is not so the columellar-parietal lapel narrow. Spermathecal duct exceeds maximum diameter of its reservoir by not less than 2.2 times; if less than 2.2 times, the length of praeputium is equal to 1.09 of that of penis sheath or longer than it by 1.7-1.8 times; if it is longer only 1.12-1.20 times, the length of spermathecal ducts exceeds diameter of its reservoir by 2.2-4.0 times

*Nipponiradix* p. 92

14(1) Whorls evenly and moderately inflated; columellar fold weakly developed, and columella almost not bent to left. Uterus not demarcated from provagina

*Thermoradix* p. 85

#### Key for identification of Recent sections of the subgenus *Peregriana*

1(4) Whorls strongly and evenly inflated, sometimes stepped and divided by very deep, not oblique sutures; auriculate shells have short spire and apex lower than upper part of aperture, whorls may be flat and divided by shallow sutures. Inflated part of prostatic clearly demarcated from band-shaped one and is equal to more than one third but not more than half of whole prostate length

2(3) Columella fold small, weakly developed. Spermathecal duct shorter than oval reservoir

*Cyphidiana*

3(2) Columellar fold well developed. Length of spermathecal duct equal to diameter of spherical reservoir

*Kamtschaticana*

4(1) Whorls moderately or weakly inflated or flat; if whorls evidently inflated the suture clearly oblique and deepened; spire in auriculate shells elevated over upper margin of aperture or lies at the same level. Inflated part of prostate smoothly passes into band-shaped one, if they are demarcated the inflated part either more than half of prostate length or only equal to one third of it

5(6) Whorls flat, divided by almost straight sutures. Spermathecal reservoir long, sausage-shaped

*Altailylnaeva*

6(5) Whorls weakly or moderately inflated, if they are flat, the suture oblique. Spermathecal reservoir spherical or ovate

7(10) Shell always ovate, with weakly and evenly inflated whorls; columellar fold almost invisible. Inflated part of prostate clearly delimited from band-shaped one

8(9) Suture moderately deepened, almost straight. Spermathecal duct significantly shorter than its reservoir

*Peregriana* s.str.

9(8) Suture strongly deepened and oblique. Spermathecal duct not shorter than its reservoir

*Biwakoia*

10(7) Shell ovate or auriculate, with pear-shaped or weakly inflated or flat whorls; columellar fold developed although it may be small. Inflated part of prostate smoothly passes into band-shaped one

11(16) Columellar fold well developed; suture almost not oblique. Uterus smoothly passes to provagina

12(13) Shell auriculate. Spermathecal reservoir lies at distal end of provagina

*Ochridlylnaeva*

13(12) Shell ovate. Spermatheca (reservoir together with duct) stretched along all provagina

14(15) Whorls weakly and evenly inflated; columellar fold small. Spermathecal reservoir elongate

*Sibirilylnaeva*

15(14) Whorls moderately inflated; columellar fold relatively large. Spermathecal reservoir spherical

*Amurilylnaeva*

16(11) Columellar fold small, when it is clearly developed the suture oblique. Uterus sharply delimited from provagina

17(18) Shell ovate, with moderately inflated whorls, or involute; suture almost straight, deepened. Provagina shorter than uterus

*Ampullaceana*

18(17) Shell ovate, with flat or unevenly inflated whorls (in the latter case they pear-shapedly inflated), or auriculate; suture not deepened, oblique (only in auriculate shells almost straight). Provagina and uterus almost equal in length

*Bouchardiana*

#### Key for identification of sections of the subgenus *Orientogalba* represented in northern Asia

1(2) Height of spire more than half of shell height. Spermathecal duct before its entrance into vagina dilated and equal in width to adjacent part of provagina

*Lenagalba*

2(1) Height of spire not more than 0.45 of shell height. Width of provagina significantly more than that of spermathecal duct along all its length

3(4) Whorls stepped: each whorl (especially the last one) has narrow horizontal shoulder. Provagina significantly narrower than uterus and clearly delimited from it; length of spermathecal duct less than diameter of its reservoir

*Orientogalba* s.str.

4(3) Whorls not stepped and devoid of shoulders. Provagina a little narrower than uterus and unclear delimited from it; length of spermathecal duct more than diameter of its reservoir

*Viridigalba*

#### Genus *LYMNAEA* Lamarck, 1799

Type species *Helix stagnalis* Linnaeus, 1758 (M)

#### Subgenus *CORVUSIANA* Servain, 1881

Type species *Helix corvus* Gmelin in Linnaeus, 1891 (SD Lazareva, 1958)

#### Section *Corvusiana* s.str.

#### 1. *L. corvus* (Gmelin, 1791) Fig. 2A

*Helix corvus* Gmelin in Linnaeus, 1791: 3665

REPRODUCTIVE SYSTEM: Kruglov, 1975; Kruglov, Starobogatov, 1984 b (41 specimens).

SYNAPSULES: Beriozkina, Starobogatov, 1981, 1988; Kruglov, Starobogatov, 1984 b.

DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages, north-western part of the Dnieper drainage area (right tributaries of the Pripyat' river).

#### 2. *L. gueretiniana* (Servain, 1881) Fig. 2B

*Limnaea gueretiniana* Servain, 1881: 76

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 b (42 specimens).

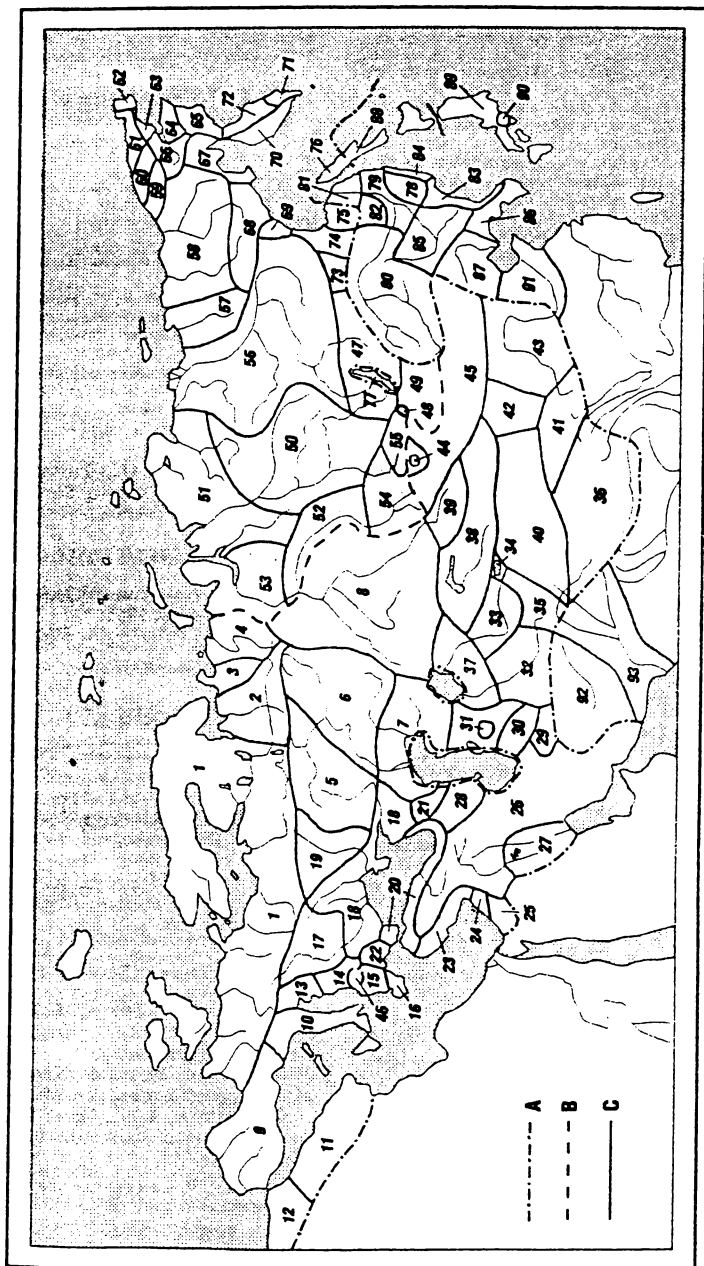
SYNAPSULES: Beriozkina, Starobogatov, 1981, 1988; Kruglov, Starobogatov, 1984 b.

DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages; Black and Azov seas drainages.

#### 3. *L. curtacorvus* Kruglov et Starobogatov, 1984 Fig. 2C

*Limnaea curtacorvus* Kruglov, Starobogatov, 1984 b: 65, fig. 1, 3; 2 v.vi.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 b (40 specimens).



DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages.

Section *Kazakhlymnaea* Kruglov et Starobogatov, 1984 b

Type species *Lymnaea palustris kazakensis* Mozley, 1934 (OD)

4. *L. kazakensis* Mozley, 1934 Fig. 2D

*Lymnaea palustris kazakensis* Mozley, 1934: 3, pl. 1, fig. 7.

REPRODUCTIVE SYSTEM: Lazareva, 1967 a; Kruglov, Starobogatov, 1984 b (25 specimens).

DISTRIBUTION: steppes of Kazakhstan.

Subgenus *Lymnaea* s.str.

Section *Lymnaea* s.str.

5. *L. fragilis fragilis* (Linnaeus, 1758)

Fig. 2E

*Helix fragilis* Linnaeus, 1758: 774.

REPRODUCTIVE SYSTEM: Davydov et al., 1981; Kruglov, Starobogatov, 1985 c (10 specimens).

DISTRIBUTION: North Europe, Siberia, eastward from the Yenisey drainage area.

5a. *L. fragilis producta* (Colbeau, 1859)

Fig. 2F

*Limnaea stagnalis* var. *producta* Colbeau, 1859: 10.

REPRODUCTIVE SYSTEM: Davydov et al., 1981; Kruglov, Starobogatov, 1985 c (70 specimens).

FIG. 1. Systematic-zoogeographical division of inland waters of northern Eurasia based on their malacofauna (after Starobogatov, 1986, corrected)

a-c — demarcations of regions, subregions and provinces respectively. Numbers — provinces.

PALAEARCTIC REGION. EUROPEAN-CENTRAL-ASIATIC SUBREGION.

North-European superprovince. Provinces: 1 — Baltic, 2 — North-Dvianian, 3 — Mezenian, 4 — Pechorian, 5 — Oka-Donian, 6 — Middle Volgan, 7 — Near-Caspian, 8 — Irtyshian.

West-Mediterranean superprovince. Provinces: 9 — Pyreneian, 10 — Apenninian, 11 — Algerian, 12 — Moroccan.

Dinarian superprovince. Provinces: 13 — Istrian, 14 — Montenegrin, 15 — Epian, 16 — Peloponnesian.

Circumpontian superprovince. Provinces: 17 — Middle-Danubian, 18 — North-Pontian, 19 — Middle-Dnieperian, 20 — South-Pontian, 21 — Terekian, 22 — Vardarian.

East-Mediterranean superprovince. Provinces: 23 — Cilician, 24 — Orontian, 25 — Jordanian.

Antior-Asiatic superprovince. Provinces: 26 — Iran-Anatolian, 27 — Mesopotamian, 28 — Cyrean, 29 — Khorasanian, 30 — Kopet-Daghian, 31 — Great-Balkhanian.

Sogd-Tibetan superprovince. Provinces: 32 — Sogdian, 33 — Ferghanian, 34 — Issyk-Kulian, 35 — Pamirian, 36 — Tibetan.

Central-Asiatic superprovince. Provinces: 37 — Near-Aralian, 38 — Balkhashian, 39 — Zaysanian, 40 — Tarimian, 41 — Qaidamian, 42 — Edzinian, 43 — Ordosian.

West-South-Mongolian superprovince. Provinces: 44 — Uvsunurian, 45 — Dzabkhanian.

46 — OHRIDAN SUBREGION with 3 provinces demarcated by isobathes not numbered: Ohrid shallow-water (depth 0-20 m), Ohrid sublittoral (depth 20-50 m), Ohrid profundal (depth more than 50 m).

SIBERIAN SUBREGION.

Central-Siberian superprovince. Provinces: 47 — Angarian, 48 — Holsgolian, 49 — Orkhonian, 50 — Middle-Yeniseyan, 51 — Lower-Yeniseyan, 52 — Middle-Obian, 53 — Lower-Obian, 54 — Altay-Sayanian, 55 — Tuvan, 56 — Lenan.

North-Eastern superprovince. Provinces: 57 — Yanan, 58 — Kolhymian, 59 — Chaunian, 60 — Amgumian, 61 — Koljuchinskian, 62 — Celenian, 63 — Krestovskian, 64 — Lower-Anadyrian, 65 — Koryakian, 66 — Upper-Anadyrian, 67 — Penzhinian, 68 — Tauian, 69 — Okhotian, 70 — West-Kamchatkian, 71 — Tumrokian, 72 — East-Kamchatkian, 73 — Upper-Zeyan, 74 — Udian, 75 — Tugurian, 76 — North-Sakhalinian.

77 — BAIKALIAN REGION (7 provinces demarcated by isobathes and by borders of parts of the lake).

SINO-INDIAN REGION. AMURIAN SUBREGION.

Amurian superprovince. Provinces: 78 — Ussurian, 79 — Khabarovskian, 80 — Argun'-Zeyan, 81 — Orelian, 82 — Amgunian.

Korean-Yellow-Sea superprovince. Provinces: 83 — Komarovian, 84 — Arsenievian, 85 — Sungarian, 86 — Korean, 87 — Liaohelian.

JAPANESE SUBREGION. Provinces: 88 — Aniwian, 89 — Honshuan, 90 — Biwan.

CHINESE SUBREGION. Province: 91 — Huang-Hean (remaining provinces not mentioned)

INDO-MALAYAN SUBREGION. Provinces: 92 — Hilmendian, 93 — Indusian (remaining provinces not mentioned).

Ponto-Caspian Brackish-water Region is not discussed

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988; Davydov et al., 1981; Kruglov, Starobogatov, 1985 c.

DISTRIBUTION: Europe, except for the northern part.

6. *L. stagnalis stagnalis* (Linnaeus, 1758)

Fig. 3A

*Helix stagnalis* Linnaeus, 1758: 774.

REPRODUCTIVE SYSTEM: Davydov et al., 1981; Kruglov, Starobogatov, 1985 c (80 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988; Davydov et al., 1981; Kruglov, Starobogatov, 1985 c.

DISTRIBUTION: Europe and North Asia (ponds).

6a. *L. stagnalis turgida* (Hartmann, 1840)

Fig. 3B

*Stagnicola vulgaris* var. *turgida* Hartmann, 1840: 20, pl. 8, 12.

REPRODUCTIVE SYSTEM: Davydov et al., 1981; Kruglov, Starobogatov, 1985 c (30 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: Europe, southern part of West Siberia, Altai (oligotrophic lakes).

7. *L. doriaana* (Bourguignat, 1862)

Fig. 3C

*Limnaea doriaana* Bourguignat, 1862 a: 60, 1862 b: 100, pl. 12, fig. 9, 10.

REPRODUCTIVE SYSTEM: Davydov et al., 1981; Kruglov, Starobogatov, 1985 c (30 specimens).

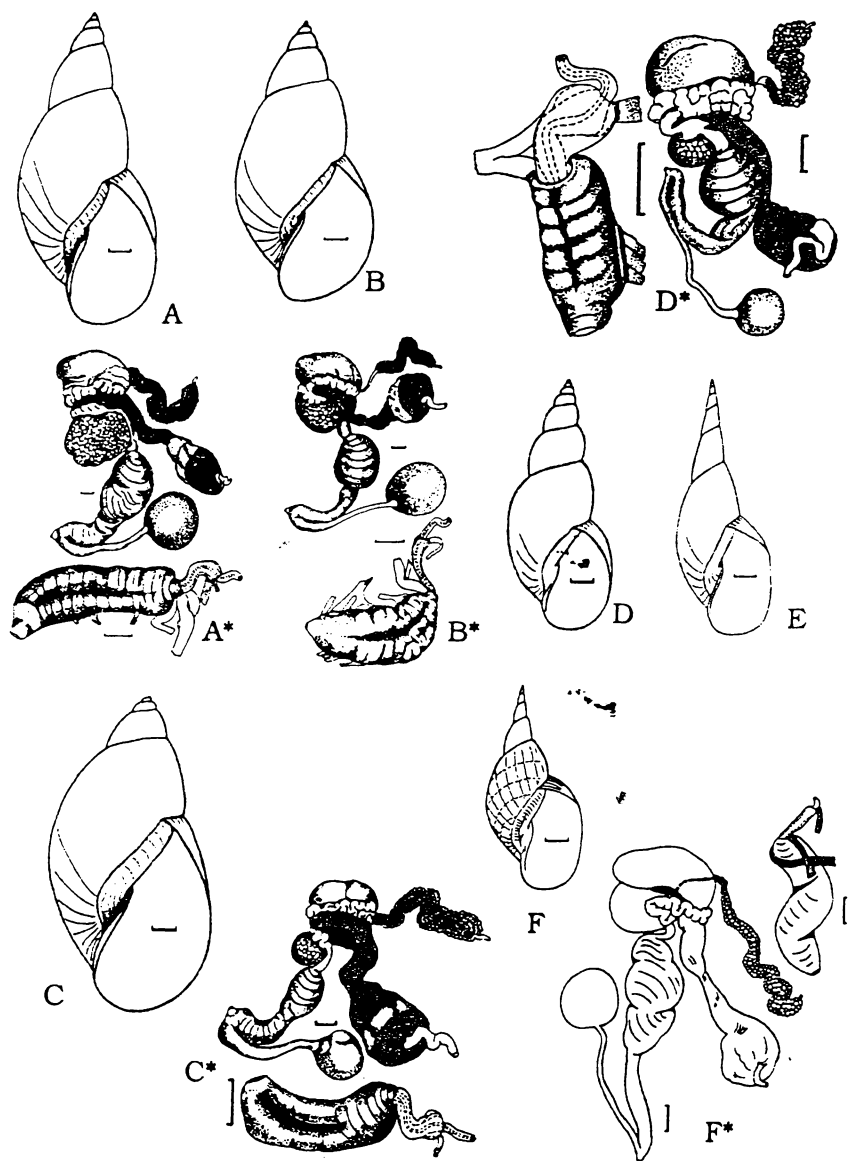


FIG. 2. Species of the subgenus *Corvusiana* (A-D) and of the subgenus *Lymnaea* s.str. (E-F): A — *L. corvus*, B — *L. gueretiniana*, C — *L. curtacorvus*, D — *L. kazakensis*, E — *L. fragilis fragilis*, F — *L. fragilis producta*. Scales: A-D — 2 mm, E-F = 5 mm.



SYNCAPSULES: Kruglov, Starobogotov, 1992.

DISTRIBUTION: West Europe, western part of East Europe, Caucasus, southern part of West Siberia, Altai, northern part of Kazakhstan.

Section *Kobeltilymnaea* Kruglov et Starobogotov, sect.nov.

Type species *Lymnaea araratensis* Kruglov et Starobogotov, 1985

Diagnosis. Shell ovate-conical, with evenly increasing whorls. The whorls are weakly inflated, divided by shallow moderately inclined sutures. The last whorl is ovate. Albumen gland is somewhat smaller than the labyrinth of the oviduct, the provagina is short.

8. *L. araratensis* Kruglov et Starobogotov, 1985 Fig. 3D

*Limnaea elophila* Kobelt, 1877: 35, pl. 128, fig. 1231 (non Bourguignat, 1862 a).

*Lymnaea omsiana* Hubendick, 1951: 44, fig. 29, 36 (non Locard, 1883).

*Lymnaea araratensis* Kruglov, Starobogotov, 1985 c: 26, fig. 1 d, 3 d.

REPRODUCTIVE SYSTEM: Hubendick, 1951; Davydov et al., 1981; Kruglov, Starobogotov, 1985 c (1 specimen).

DISTRIBUTION: Armenia, western Middle East, Kirghizstan (lake Son-Kul), Pamir [Hubendick, 1951].

Section *Stagnaliana* Servain, 1881

Type species *Limnaea stagnalis* var. *bodamica* Miller, 1873 (SD Kruglov, Starobogotov, 1992)

9. *L. bodamica* (Miller, 1873) Fig. 3E

*Limnaea stagnalis* var. *bodamica* Miller, 1873: 4, pl. 1, fig. 2.

REPRODUCTIVE SYSTEM: Davydov et al., 1981; Kruglov, Starobogotov, 1985 c (30 specimens).  
SYNCAPSULES: Kruglov, Starobogotov, 1992.

DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages.

10. *L. media* (Kobelt, 1877) Fig. 3F

*Limnaea stagnalis* var. *media* Kobelt, 1877: 35, pl. 128, fig. 1235.

REPRODUCTIVE SYSTEM: Davydov et al., 1981; Kruglov, Starobogotov, 1985 c (12 specimens).

DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages.

Subgenus *Polyrhytis* Meek, 1876

Type species *Lymnaea kingi* Meek, 1876 (M)

Section *Dallirhytis* Kruglov et Starobogotov, 1989

Type species *Lymnaea petersi* Dall, 1905 (OD).

11. *L. atkaensis* Dall, 1884 Fig. 4A

*Lymnaea ovata* var. *atkaensis* Dall, 1884: 34.

REPRODUCTIVE SYSTEM: Starobogotov, Budnikova 1976; Kruglov, Starobogotov, 1989 a (2 specimens).

DISTRIBUTION: Chukchi Peninsula (Amguema river drainage and eastwards), Arctic western North America.

12. *L. petersi* Dall, 1905 Fig. 4B

*Lymnaea petersi* Dall, 1905: 66, pl. 2, fig. 3.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1989 a (3 specimens).

DISTRIBUTION: Chukchi Peninsula (only extreme eastern part). Koryak mountains, Arctic western North America.

Section *Pseudosidora* Thiele, 1931

Type species *Lymnaea rubella* Lea, 1844 (M)

13. *L. nuttaliana* Lea, 1841 Fig. 4C

*Lymnaea nuttaliana* Lea, 1841: 33.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1989 a (3 specimens).

DISTRIBUTION: Eastern Kamchatka, Koryak mountains, eastern North America.

14. *L. kurenkovi* Kruglov et Starobogotov, 1989 Fig. 4D

*Lymnaea kurenkovi* Kruglov, Starobogotov, 1989 a: 18, fig. 1, 4.

DISTRIBUTION: south-eastern Kamchatka (thermal springs of Tumrok area).

15. *L. azabatschensis* Kruglov et Starobogotov, 1989 Fig. 4E

*Lymnaea azabatschensis* Kruglov, Starobogotov, 1989 a: 18, fig. 1, 5; 2, 4.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1989 a (2 specimens).

DISTRIBUTION: south-eastern Kamchatka.

16. *L. falsipalustris* Kruglov et Starobogotov, 1989 Fig. 4F

*Lymnaea falsipalustris* Kruglov, Starobogotov, 1989 a: 19, fig. 1, 6; 2, 5.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1989 a (1 specimen).

DISTRIBUTION: south-eastern Kamchatka.

Subgenus *Galba* Schranck, 1803

Type species *Galba pusilla* Schranck, 1803 = *Buccinum truncatum* Müller, 1774 (M).

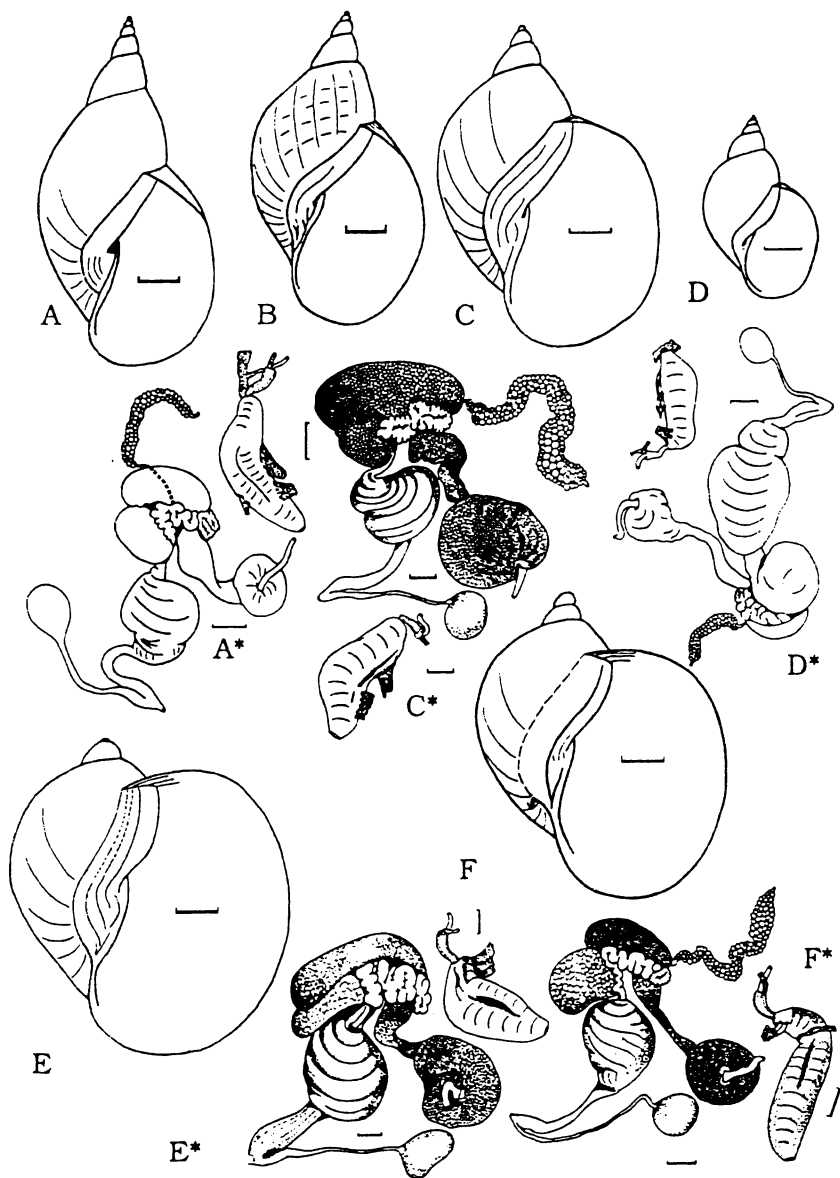


FIG. 3. Species and subspecies of the subgenus *Lymnaea* s.str.: A — *L. stagnalis stagnalis*, B — *L. stagnalis turgida*, C — *L. doriana*, D — *L. araratenensis*, E — *L. bodamica*, F — *L. media*. Scales = 5 mm.

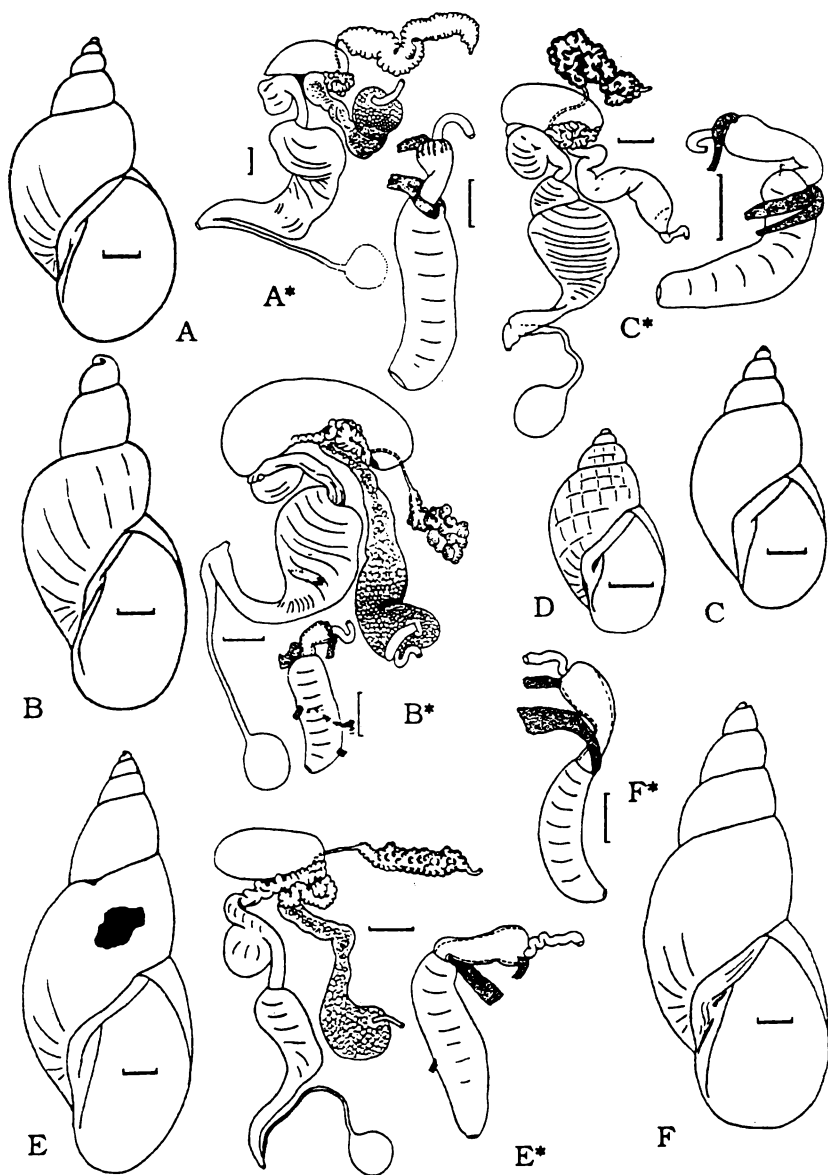


FIG. 4. Species of the subgenus *Polyrrhytis*: A — *L. atkaensis*, B — *L. petersi*, C — *L. nuttalliana*, D — *L. kurenkovi*, E — *L. azabatschensis*, F — *L. falsipalustris*. Scales = 1 mm.

Section *Galba* s.str.17. *L. oblonga* (Puton, 1847) Fig. 5A*Limnaea oblonga* Puton, 1847: 60.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 b; Kruglov, Starobogatov, 1985 b (4 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: West and South Europe, western Middle East, western Central Asia.

18. *L. goupili*  
(Moquin-Tandon, 1856) Fig. 5B*Limnaea truncatula* var. *goupili* Moquin-Tandon, 1856: 474.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 b; Kruglov, Starobogatov, 1985 b (4 specimens).

DISTRIBUTION: Europe (except for extreme north-east).

19. *L. truncatula* (Müller, 1774) Fig. 5C*Buccinum truncatum* Müller, 1774: 130.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 b; Kruglov, Starobogatov, 1985 b (10 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: Europe, West Siberia westward from the Baikal lake.

20. *L. subangulata* (Roffiaen, 1868)  
Fig. 5D*Limnaea truncatula* var. *ventricosa* Moquin-Tandon, 1856: 473, pl. 34, fig. 23 (non Hartmann, 1841).*Limnaea truncatula* var. *subangulata* Roffiaen, 1868: 78, pl. 1, fig. 9.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 b; Kruglov, Starobogatov, 1985 b (4 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: West and South Europe, Caucasus, western Central Asia.

21. *L. thiesseae* (Clessin, 1879) Fig. 5E*Limnaea truncatula* var. *thiesseae* Clessin, 1879: 4, pl. 1, fig. 2.*Limnaea shadini* Izzatullaev, Kruglov et Starobogatov, 1983 b: 396, fig. 1, 3-4.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 b; Kruglov, Starobogatov, 1985 b (2 specimens).

DISTRIBUTION: south-eastern Europe, western Middle East, western Central Asia.

22. *L. schirazensis* (Küster, 1862)  
Fig. 5F*Limnaeus schirazensis* Küster, 1862: 53, pl. 11, fig. 28-31.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 b; Kruglov, Starobogatov, 1985 b (2 specimens).

DISTRIBUTION: Iran, western Central Asia.

Section *Montigalba* Izzatullaev, Kruglov,  
Starobogatov, 1983Type species *Limnaea bowelli* Preston, 1909 (OD)23. *L. bowelli* (Preston, 1909) Fig. 6A*Limnaea bowelli* Preston, 1909: 115.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 a; Kruglov, Starobogatov, 1985 b (3 specimens).

DISTRIBUTION: mountain part of Central Asia.

24. *L. almaatina* Izzatullaev, Kruglov et  
Starobogatov, 1983 Fig. 6B*Limnaea almaatina* Izzatullaev et al., 1983 a: 323, fig. 1, 3-4.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 a; Kruglov, Starobogatov, 1985 b (2 specimens).

DISTRIBUTION: mountain part of Central Asia.

25. *L. tengriana* Izzatullaev, Kruglov  
et Starobogatov, 1983 Fig. 6C*Limnaea tengriana* Izzatullaev et al., 1983a: 323, fig. 1, 5

DISTRIBUTION: mountain part of Central Asia.

Subgenus *Stagnicola* Leach in Jeffreys,  
1830Type species *Stagnicola vulgaris* Leach in Jeffreys, 1830 (in syn.) = *Buccinum palustre* Müller, 1774 (M)Section *Stagnicola* s.str.26. *L. archangelica* Kruglov et  
Starobogatov, 1986 Fig. 6D*Limnaea archangelica* Kruglov, Starobogatov, 1986: 60, fig. 1, 1: 2, 2.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986.

DISTRIBUTION: northern part of East Europe, West Siberia.

27. *L. palustris palustris*  
(Müller, 1774) Fig. 6E*Buccinum palustre* Müller, 1774: 131.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (30 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, West Siberia.

27a. *L. palustris syriacus*  
(Mousson, 1861) Fig. 6F*Limnaeus syriacus* Mousson, 1861: 53.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (1 specimen).

DISTRIBUTION: western Middle East, Armenia.

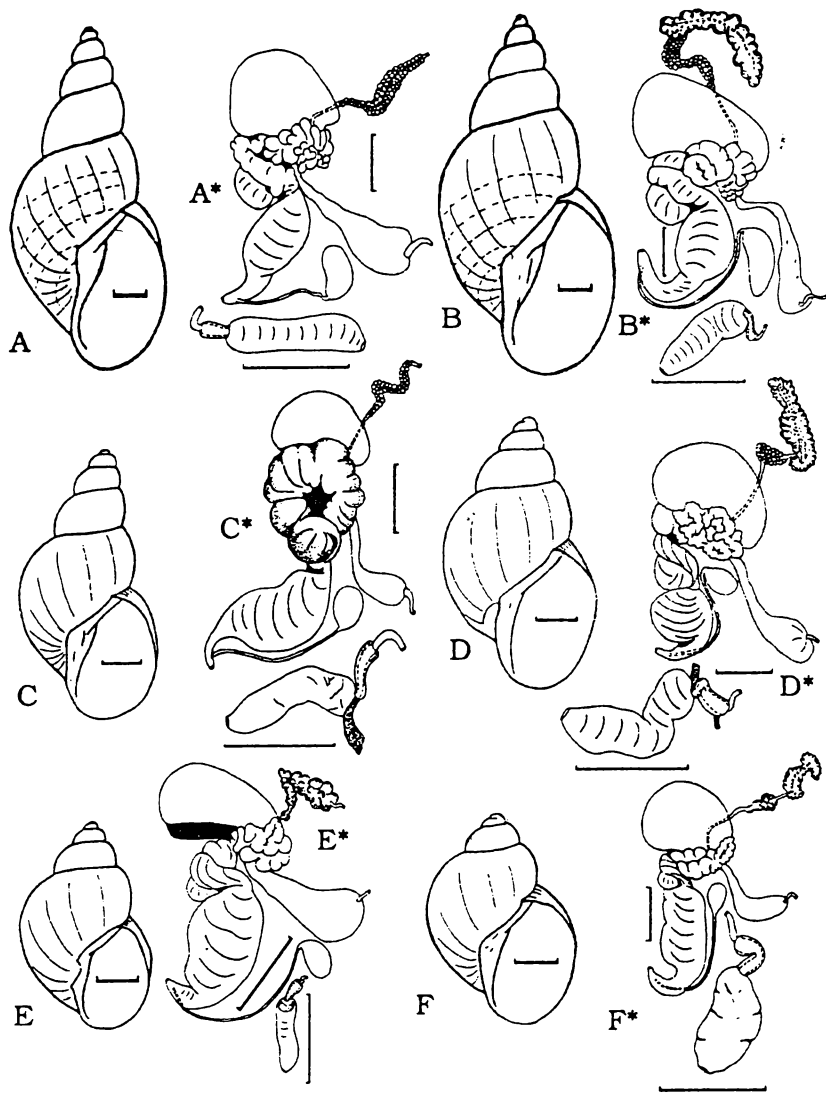


FIG. 5. Species of the section *Galba* s.str. of the subgenus *Galba*: A — *L. oblonga*, B — *L. goupili*, C — *L. truncatula*, D — *L. subanguata*, E — *L. thiesseae*, F — *L. schirazensis*. Scales = 1 mm.

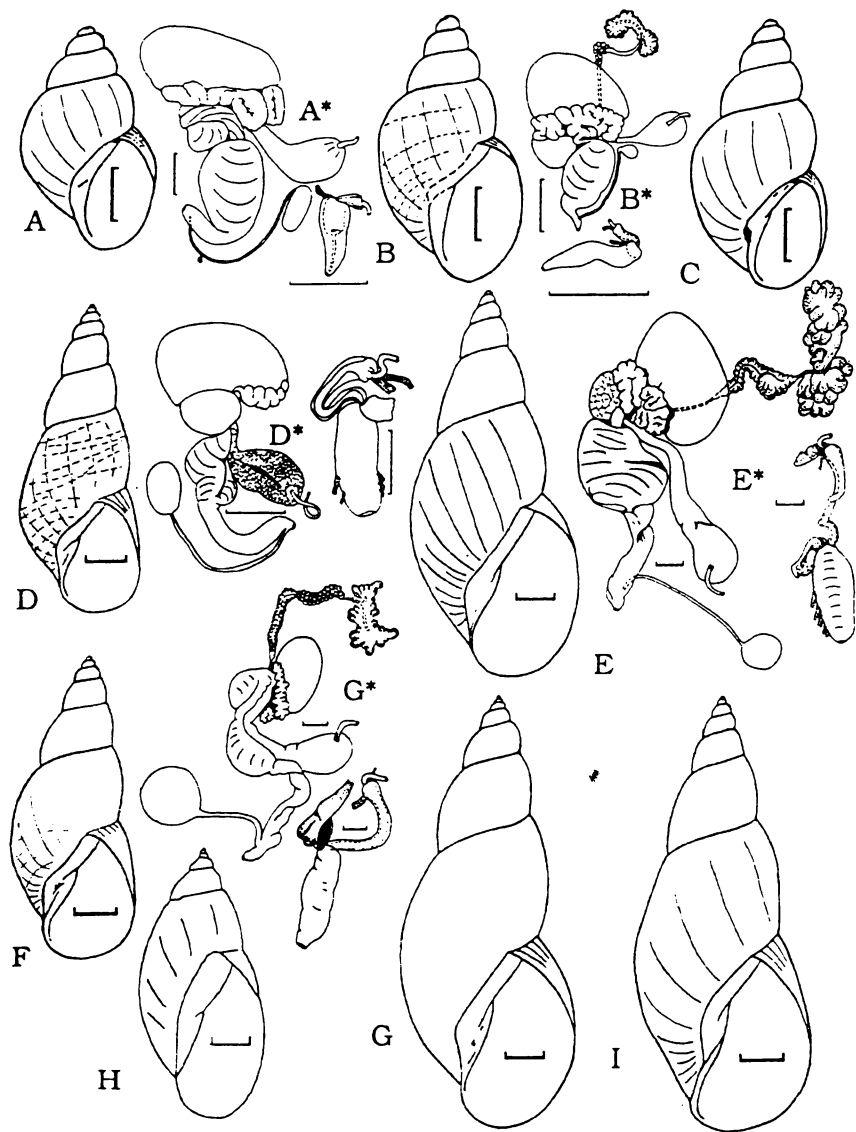


FIG. 6. Species of the section *Montigalba* of the subgenus *Galba* (A-C) and of the section *Stagnicola* s.str. of the subgenus *Stagnicola* (D-I): A — *L. bowelli*, B — *L. almaatina*, C — *L. tengriana*, D — *L. archangelica*, E — *L. palustris palustris*, F — *L. palustris syriacus*, G — *L. atra atra*, H — *L. atra zebrella*, I — *L. atra starobogotovi*. Scales = 1 mm.

28. *L. atra atra* (Schranck, 1803) Fig. 6G*Buccinum atrum* Schranck, 1803: 288.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (100 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe (excluding extreme north-eastern part).

28a. *L. atra zebrella*

(B. Dybowski, 1913)

Fig. 6H

*Costolimnaea zebrella* B. Dybowski, 1913: 186, pl. 4, fig. 10.

DISTRIBUTION: north eastern Europe, West Siberia, the Yenisey basin.

28b. *L. atra starobogatovi*

Lazareva, 1967

Fig. 6I

*Lymnaea starobogatovi* Lazareva, 1967 a: 1343, fig. 1, 2-2a, 2, 2-2a.

REPRODUCTIVE SYSTEM: Lazareva, 1967 a (25 specimens).

DISTRIBUTION: steppes of Kazakhstan and the Irtysh basin.

Sección *Fenziana* Servain, 1881Type species *Limnaea callomphala* Servain, 1881 (SD Kruglov et Starobogatov, 1986, because *L. fenziana* is *nomen nudum*).29. *L. callomphala* (Servain, 1881)

Fig. 7A

*Limnaea callomphala* Servain, 1881: 78.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (20 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: West Europe and western and southern parts of East Europe.

30. *L. turricula* (Held, 1836) Fig. 7B*Limnaea turricula* Held, 1836: 278.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (1 specimen).

DISTRIBUTION: Europe.

31. *L. fusca fusca*

(C. Pfeiffer, 1821)

Fig. 7C

*Lymnaeus fuscus* C. Pfeiffer, 1821: 92, pl. 4, fig. 25.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (7 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages.

31a. *L. fusca maritima*

(Clessin, 1878)

Fig. 7D

*Limnaea palustris* var. *maritima* Clessin, 1878: 76, pl. 3, fig. 17.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (1 specimen).

DISTRIBUTION: brackish waters of Baltic Sea.

32. *L. pachyta*

(Westerlund, 1885)

Fig. 7E

*Limnaea taurica* var. *pachyta* Westerlund, 1885: 48.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (1 specimen).

DISTRIBUTION: north only from Crimea and delta of the Volga.

Section *Ladislavella* B. Dybowski, 1913Type species *Ladislavella sorensis* B. Dybowski, 1913 = *Fossaria lindholmi* W. Dybowski, 1913 (OD)33. *L. liogyra* (Westerlund, 1897) Fig. 7F*Limnaea palustris* var. *liogyra* Westerlund, 1897: 125.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (2 specimens).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: the Amur drainage and Russian maritime Territory of the Far East.

34. *L. vulnerata* (Küster, 1862) Fig. 7G*Limnaeus vulneratus* Küster, 1867: 22, pl. 4, Fig. 13-15.*Galba occulta* Jackiewicz, 1959: 6, 39, pl. 3: 5 a, b; 6 c, 7 a; 8 f; 9 a, b; 10 a-d; 11 a, b, c; 14 a, b; 24; 25; 26.

REPRODUCTIVE SYSTEM: Jackiewicz, 1959; Kruglov, Starobogatov, 1986 (1 specimen).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: South Europe.

35. *L. terebra terebra*

(Westerlund, 1884)

Fig. 8A

*Limnaea attenuata* Westerlund, 1877: 50, pl., fig. 8, non Say, 1829.*Limnaea terebra* Westerlund, 1884: 155.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (2 specimens).

DISTRIBUTION: the Yenisey drainage area, except for its southern part.

35a. *L. terebra lindholmi*

(W. Dybowski, 1913)

Fig. 8B

*Fossaria lindholmi* W. Dybowski, 1913: 130, pl. 2, fig. 7.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (2 specimens).

DISTRIBUTION: southern part of the Yenisey drainage area.

35b. *L. terebra bolotensis*

Mozley, 1934

Fig. 8C

*Lymnaea bolotensis* Mozley, 1934: 5, pl. 1, fig. 3.

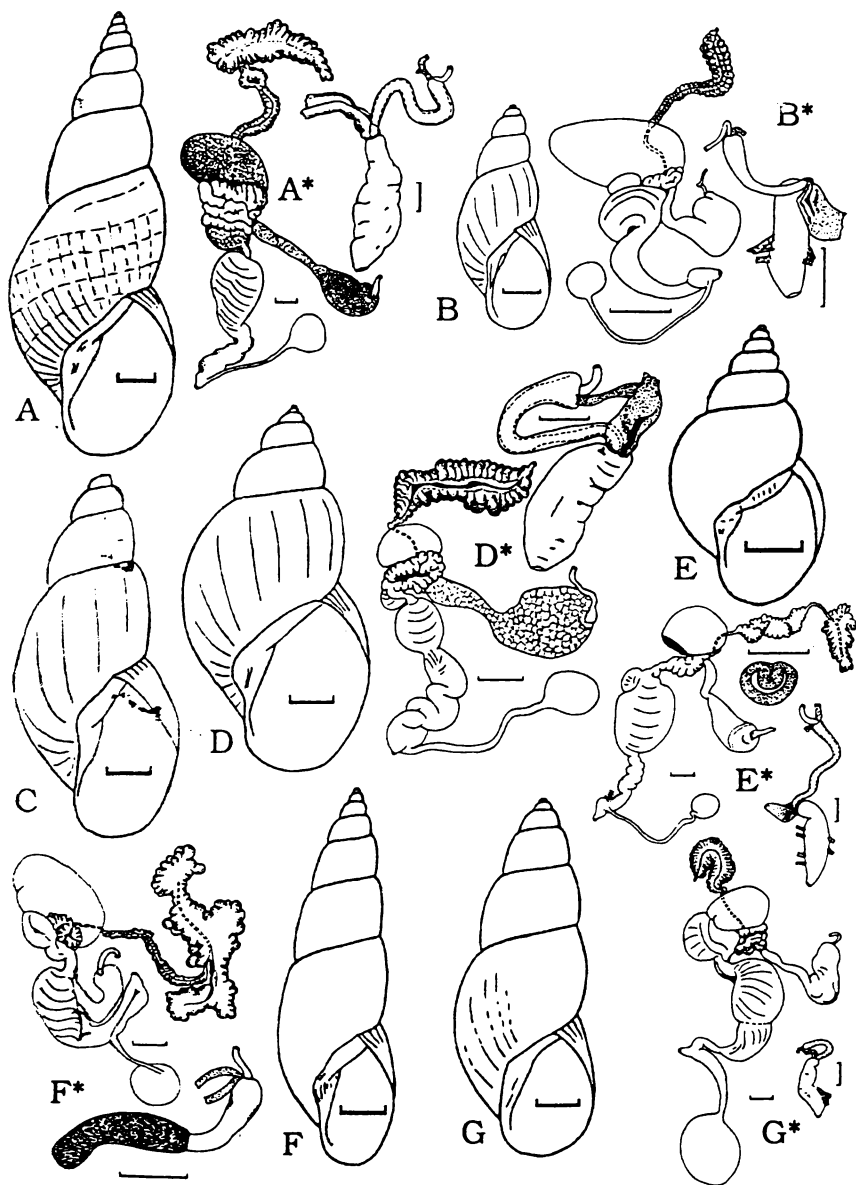


FIG. 7. Species and subspecies of the section *Fenziana* of the subgenus *Stagnicola* (A-E) and of the section *Ladislavella* of the subgenus *Stagnicola* (F-G): A — *L. callomphala*, B — *L. turricula*, C — *L. fusca fusca*, D — *L. fusca maritima*, E — *L. pachyta*, F — *L. liogrya*, G — *L. vulnerata*. Scales — 1 mm.



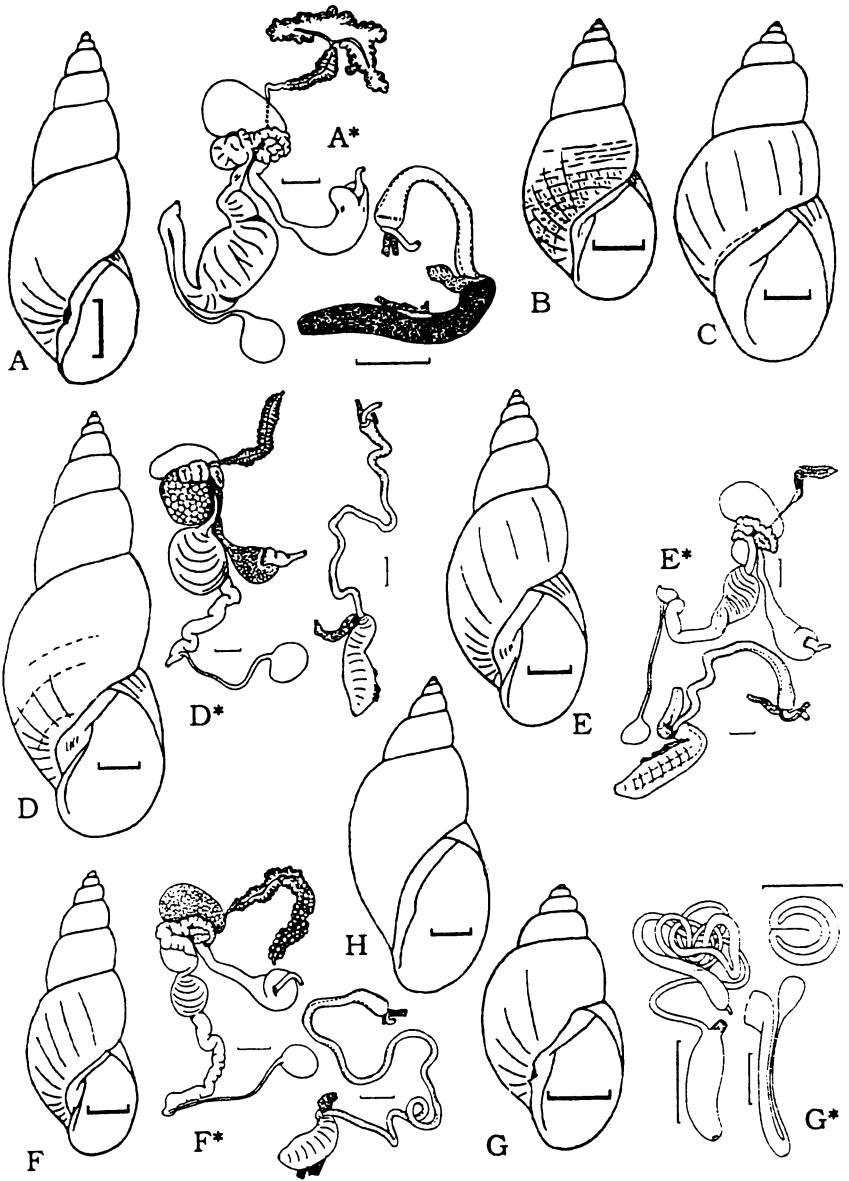


FIG. 8. Species and subspecies of the section *Ladislavella* of the subgenus *Stagnicola* (A-C) and of the section *Berlaniana* of the subgenus *Stagnicola* (D-H): A — *L. terebra terebra*, B — *L. terebra lindholmi*, C — *L. terebra bolotensis*, D — *L. danubialis*, E — *L. berlandi*, F — *L. iliensis*, G — *L. ventricosella* (distal genitalia after Hubendick, 1951), H — *L. sicala* (after Küster, 1867). Scales: A-G — 1 mm, H — 2 mm..

- REPRODUCTIVE SYSTEM: Lazareva, 1967 a; Kruglov, Starobogatov, 1986 (10 specimens).  
DISTRIBUTION: steppes of Kazakhstan.
- Section *Berlaniana* Kruglov et Starobogatov, 1986
- Type species *Limnaea berlani* Bourguignat, 1870 (OD)
36. *L. danubialis* (Schranck, 1803) Fig. 8D  
*Buccinum danubiale* Schrank, 1803: 286.  
*Limnophysa palustris* var. *cleissiniana* Hazay, 1881: 163; 1882, pl. 4, fig. 1  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (15 specimens).  
SYNCAPSULES: Hazay, 1881.  
DISTRIBUTION: South Europe.
37. *L. berlani* (Bourguignat, 1870) Fig. 8E  
*Limnaea berlani* Bourguignat, 1870: 44.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (15 specimens).  
DISTRIBUTION: South Europe. Transcaucasia.
38. *L. iliensis* Lazareva, 1967 Fig. 8F  
*Limnaea iliensis* Lazareva, 1967 a: 1347, fig. 1, 6-6a, 2, 6-6a.  
REPRODUCTIVE SYSTEM: Lazareva, 1967 a; Kruglov, Starobogatov, 1986 (50 specimens).  
DISTRIBUTION: Balkhash Lake drainage area.
33. *L. ventricosella* (W.) Dybowski, 1913 Fig. 8G  
*Fossaria ventricosella* W. Dybowski, 1913: 189, pl. 4, fig. 18.  
REPRODUCTIVE SYSTEM: Hubendick, 1951 (only fig. 203).  
DISTRIBUTION: the Yenisey drainage area.
40. *L. likharevi* Lazareva, 1967 Fig. 9A  
*Limnaea likharevi* Lazareva, 1967 a: 1346, fig. 1, 5-5a, 2, 5-5a  
REPRODUCTIVE SYSTEM: Lazareva, 1967 a; Kruglov, Starobogatov, 1986 (30 specimens).  
DISTRIBUTION: South-eastern part of E. European plain, southern part of West Siberia, Kazakhstan.
41. *L. sicula* (Küster, 1867) Fig. 8H  
*Limnaeus siculus* Küster, 1867: 22, pl. 4, fig. 16-17.  
DISTRIBUTION: known only from Sicily.
42. *L. badia* (Küster, 1867) Fig. 9B  
*Limnaeus badius* Küster, 1867: 23, pl. 4, fig. 18-19.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1986 (10 specimens).  
DISTRIBUTION: South Europe.
43. *Limnaea saridalensis* Mozley, 1934 Fig. 9C  
*Limnaea palustris saridalensis* Mozley, 1934: 2, pl. 1, fig. 1.  
REPRODUCTIVE SYSTEM: Lazareva, 1967 (50 specimens).  
DISTRIBUTION: southern part of West Siberia, Kazakhstan.
- Subgenus *Omphiscola* Rafinesque, 1819  
Type species *Buccinum glaber*, Müller, 1774 (SM Beck, 1838, because the other species included is *nomen nudum*)
44. *L. clavata* (Westerlund, 1885) Fig. 9D  
*Limnaea glabra* var. *clavata* Westerlund, 1885: 49.  
*Galba glabra* Jackiewicz, 1959: pl. 4, non Müller, 1774.  
REPRODUCTIVE SYSTEM: Jackiewicz, 1959.  
DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages.
45. *L. glabra* (Müller, 1774) Fig. 9E  
*Buccinum glaber* Müller, 1774: 135.  
REPRODUCTIVE SYSTEM: Larambergue, 1928.  
DISTRIBUTION: Baltic, North Sea and North Atlantic European drainage areas.
46. *L. gingivata* Goupil, 1835 Fig. 9F  
*Limnaea gingivata* Goupil, 1835: 63, pl. 1, fig. 8-10.  
DISTRIBUTION: a few localities in France, Denmark and Sweden (Baltic, North Sea and North Atlantic European drainage areas).
- Subgenus *Sibirigalba* Kruglov et Starobogatov, 1985b  
Type species *Limnaea truncatula* var. *sibirica* Westerlund, 1885 (OD)
47. *L. potanini* Kruglov et Starobogatov, 1985 Fig. 10A  
*Limnaea potanini* Kruglov, Starobogatov, 1985: 28, fig. 1, 2, 2, 2.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1985 (2 specimens)  
DISTRIBUTION: Xinjiang (western China).
48. *L. sibirica* (Westerlund, 1885) Fig. 10B  
*Limnaea truncatula* var. *sibirica* Westerlund, 1885: 52  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1985 (5 specimens).  
SYNCAPSULES: Prozorova, 1992.  
DISTRIBUTION: eastern part of West Siberia, East Siberia, the Amur basin, Russian Maritime

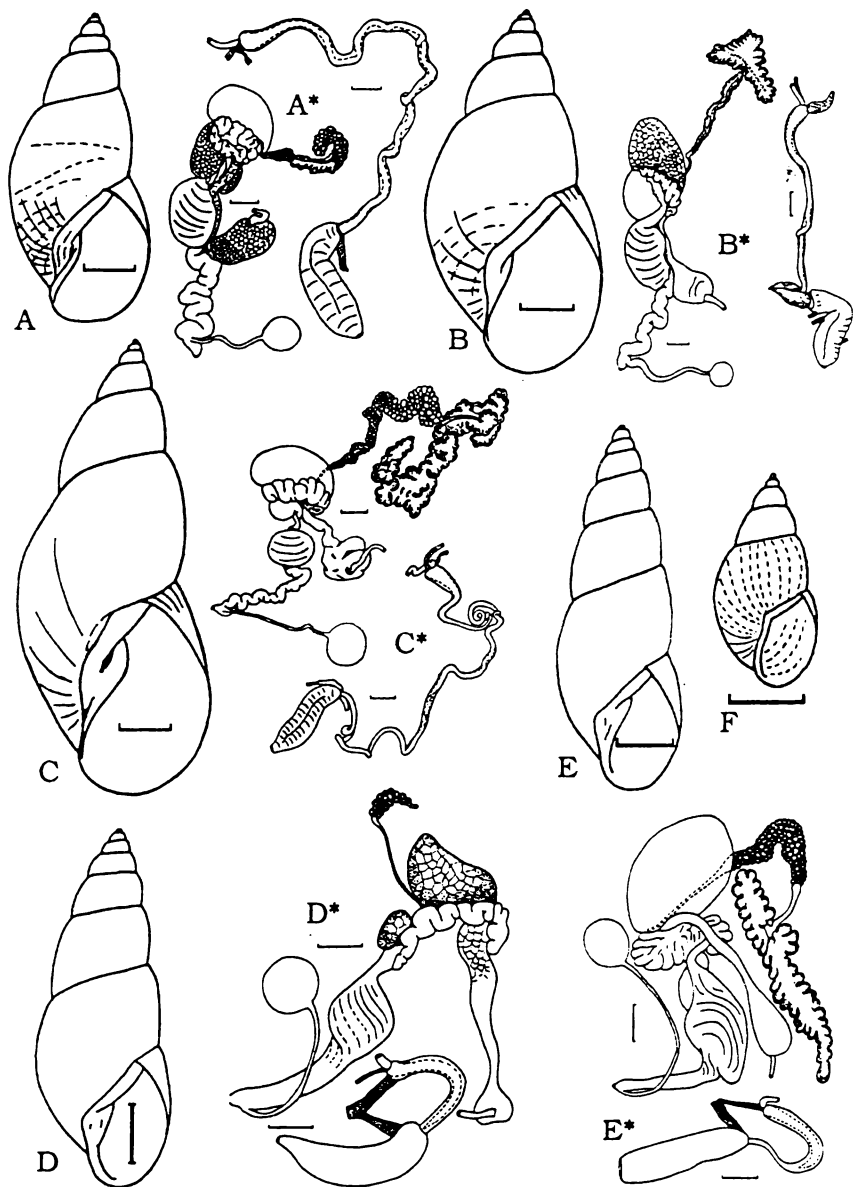


FIG. 9. Species of the section *Berliana* of the subgenus *Stagnicola* (A-C) and of the subgenus *Omphiscola* (D-F): A — *L. likharevi*, B — *L. badia*, C — *L. saridalensis*, D — *L. clavata* (reproductive system after Jackiewicz, 1959). E — *L. glabra* (reproductive system after Larambergue, 1928), F — *L. gingivata* (after Hubendick, 1951). Scales = 1 mm.

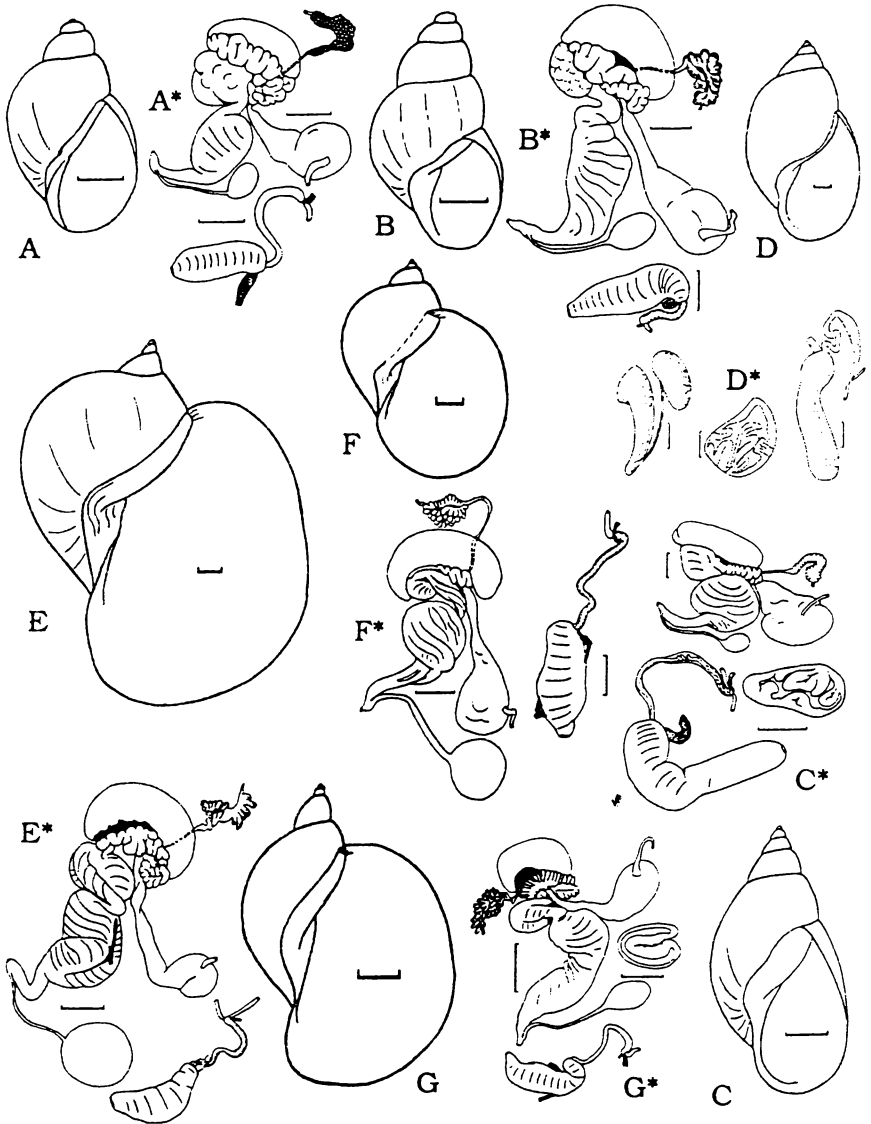


FIG. 10. Species of the subgenus *Sibirigalba* (A-B), of the subgenus *Cerasina* (C-D) and of the section *Radix* s.str. of the subgenus *Radix* (E-G): A — *L. potanini*, B — *L. sibirica*, C — *L. impura*, D — *L. luteola* (after Hubendick, 1951), E — *L. auricularia*, F — *L. intercisa*, G — *L. psilia psilia*. Scales: A-D — 1 mm, E-G — 2 mm.

Territory of the Far East, extreme north-eastern Asia, Southern Alaska, northern Japan.

### Subgenus *Cerasina* Kobelt, 1880

Type species *Limnaea bulla* Kobelt, 1830 (OD)

#### 49. *L. impura* (Troschel, 1837) Fig. 10C

*Limnaeus impurus* Troschel, 1837: 172.

REPRODUCTIVE SYSTEM: Fig. 10C (Kruglov, here, 1 specimen from Tajikistan).

DISTRIBUTION: India, Tajikistan, southern Uzbekistan.

#### 50. *L. luteola* Lamarck, 1822 Fig. 10D

*Limnaea luteola* Lamarck, 1822: 16e.

REPRODUCTIVE SYSTEM: Hubendick, 1951, fig. 33-35.

DISTRIBUTION: India.

### Subgenus *Radix* Montfort, 1810

Type species *Radix auriculatus* Montfort, 1810 = *Helix auricularia* Linnaeus, 1758 (OD)

#### Section *Radix* s. str.

#### 51. *L. auricularia* (Linnaeus, 1758) Fig. 10E

*Helix auricularia* Linnaeus, 1758: 774.

REPRODUCTIVE SYSTEM: Kruglov, 1975; Kruglov, Starobogatov, 1989 b (65 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, W. Middle East, Siberia.

#### 52. *L. intercisa* (Lindholm, 1909) Fig. 10F

*Limnaea auricularia* var. *intercisa* Lindholm, 1909: 5, pl. 1, fig. 72.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 c; Kruglov, Starobogatov, 1989 b (2 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: southern part of Central Siberia, north-eastern Kazakhstan.

#### 53. *L. gebleri* (Middendorff, 1851) Fig. 11A

*Limnaeus gebleri* Middendorff, 1851: 292, pl. 30, fig. 1-3.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: Altay.

#### 54. *L. psilia psilia* (Bourguignat, 1862) Fig. 10G

*Limnaea psilia* Bourguignat, 1862 a: 61; 1862 b: 101, pl. 11, fig. 7-10.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (25 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, Siberia.

#### 54a. *L. psilia clessini* (Neumayer, 1897) Fig. 11B

*Limnaea clessini* Neumayr, 1897: 778, pl. 4, fig. 7.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

DISTRIBUTION: western China.

#### Section *Thermoradix* Kruglov et Starobogatov, 1989

Type species *Limnaea hakusyensis* Kruglov et Starobogatov, 1989 (OD).

#### 55. *L. alticola* Izzatullaev, Kruglov et Starobogatov, 1983 Fig. 11C

*L. alticola* Izzatullaev et al., 1983 c: 53, fig. 1-2.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 c; Kruglov, Starobogatov, 1989 (4 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: mountains of Central Asia (thermal springs).

#### 56. *L. hadutkae* Kruglov et Starobogatov, 1989 Fig. 11D

*Limnaea hadutkae* Kruglov, Starobogatov, 1989b: 22, fig. 1, 12; 2, 7.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (5 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: eastern Kamchatka, thermal springs.

#### 57. *L. thermobaicalica* Kruglov et Starobogatov, 1989 Fig. 11E

*Limnaea thermobaicalica* Kruglov, Starobogatov, 1989 b: 20, fig. 1, 10; 2, 8.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: eastern shore of Baikal, thermal springs.

#### 58. *L. thermokamtschatica* Kruglov et Starobogatov, 1989 Fig. 11F

*Limnaea thermokamtschatica* Kruglov, Starobogatov, 1989 b: 22, fig. 1, 9; 2, 9.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (4 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: eastern Kamchatka, thermal springs.

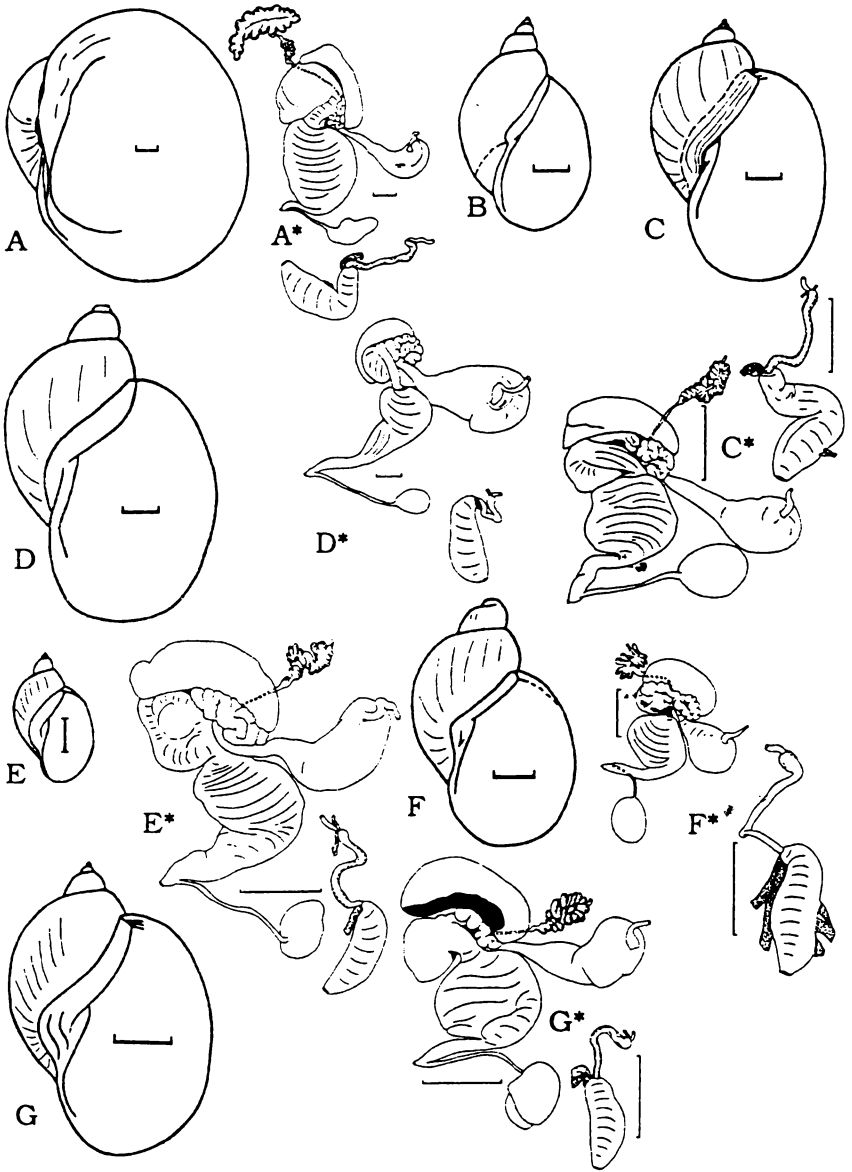


FIG. 11. Species and subspecies of the section *Radix* s.str. (A-B) and of the section *Thermoradix* (C-G) of the subgenus *Radix*: A — *L. gebleri*, B — *L. psilia clessini*, C — *L. alticola*, D — *L. haduikae*, E — *L. thermobaicalica*, F — *L. thermokamtschatka*, G — *L. hakusensis*. Scales = 2 mm.

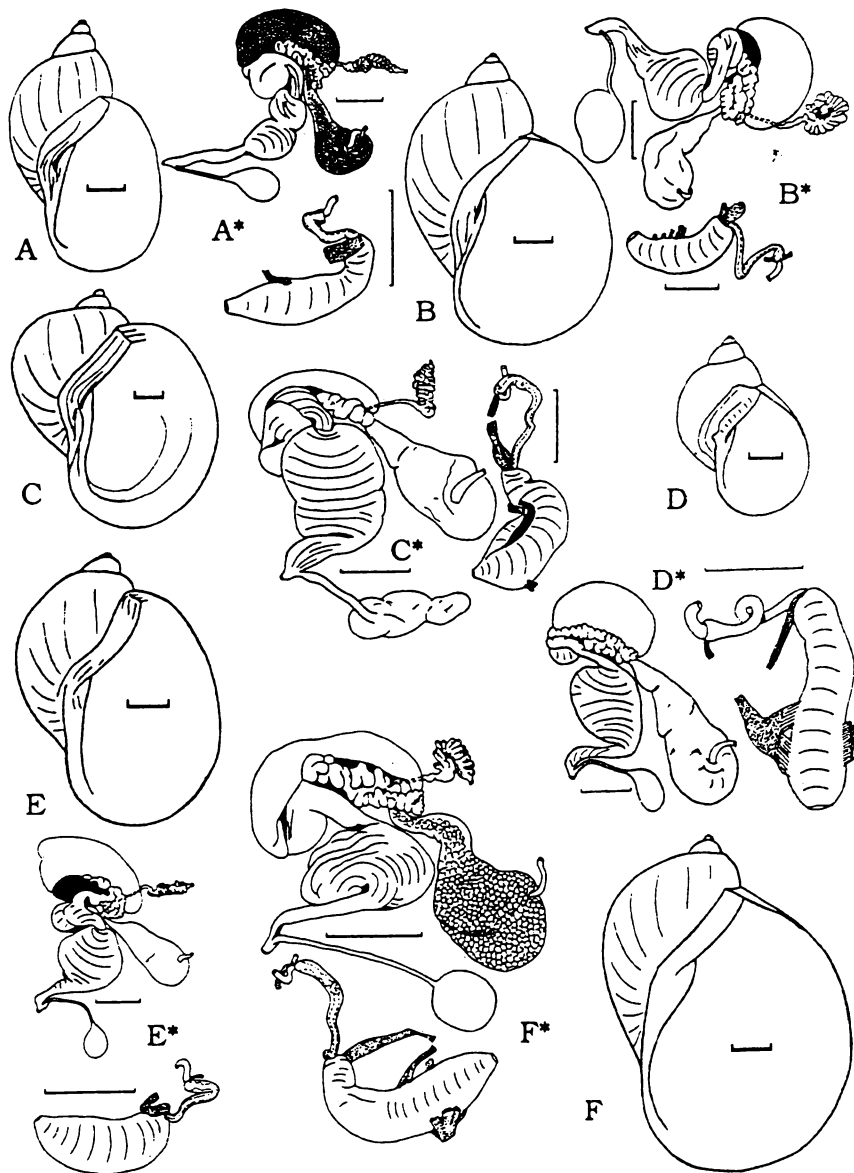


FIG. 12. Species of the sections *Pamirradix* (A-C) and *Iraniradix* (D-F) of the subgenus *Radix*: A — *L. sirikulensis*, B — *L. solidissima*, C — *L. narzykulovi*, D — *L. tenera*, E — *L. persica*, F — *L. euphratica*. Scales = 2 mm.

59. *L. hakusyensis* Kruglov  
et Starobogatov, 1989 Fig. 11G

*Limnaea hakusyensis* Kruglov, Starobogatov, 1989 b: 20.  
fig. 1, 8; 2, 6.

REPRODUCTIVE SYSTEM: Kruglov, Staroboga-  
tov, 1989 b (1 specimen).

DISTRIBUTION: eastern shore of Baikal, ther-  
mal springs.

Section *Pamiriradix*  
Kruglov et Starobogatov, 1989

Type species *Limnaea defilippi* var. *sirikulensis*  
Nevill, 1878 (OD)

60. *L. sirikulensis* (Nevill, 1878) Fig. 12A

*Limnaea defilippi* var. *sirikulensis* Nevill, 1878: 7.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983  
c; Kruglov, Starobogatov, 1989 b (3 specimens).

DISTRIBUTION: Pamir (in particular, the lake  
Zorkul = "Sirikul"), Himalaya.

61. *L. solidissima* (Kobelt, 1872)  
Fig. 12B

*Limnaea lagotis* var. *solidissima* Kobelt, 1872: 77.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983  
c; Kruglov, Starobogatov, 1989 b (2 specimens).

DISTRIBUTION: Pamir, Himalaya.

62. *L. narzykulovi* Izzatullaev, Kruglov  
et Starobogatov, 1983 Fig. 12C

*Limnaea narzykulovi* Izzatullaev et al., 1983 c: 55, fig. 3-4.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983  
c; Kruglov, Starobogatov, 1989 b (5 specimens).

DISTRIBUTION: Pamir.

Section *Iraniradix*  
Kruglov et Starobogatov, 1989

Type species *Limnaeus tenera* Küster, 1862 (OD)

63. *L. tenera* (Küster, 1862) Fig. 12D

*Limnaeus tenera* Küster, 1862: 54, pl. 12, fig. 1-2.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983  
c; Kruglov, Starobogatov, 1989 b (1 specimen).

DISTRIBUTION: western Middle East, Tajikis-  
tan, southern Uzbekistan.

64. *L. persica* (Issel, 1865) Fig. 12E

*Limnaea auricularia* var. *persica* Issel, 1865: 47.

REPRODUCTIVE SYSTEM: Kruglov, Staroboga-  
tov, 1989 b (2 specimens).

DISTRIBUTION: Iran, Southern Azerbaijan,  
Afghanistan.

65. *L. euphratica* (Mousson, 1874)  
Fig. 12F

*Limnaea euphratica* Mousson, 1874: 40.

REPRODUCTIVE SYSTEM: Kruglov, Staroboga-  
tov, 1989 b (2 specimens).

DISTRIBUTION: western Middle East, southern  
Daghestan, Azerbaijan, Tajikistan, Uzbekistan,  
Turkmenistan.

Section *Desertiradix*  
Kruglov et Starobogatov, 1989

Type species: *Limnaea lagotis* var. *subdisjuncta*  
Nevill, 1878 (OD)

66. *L. subdisjuncta* (Nevill, 1878)  
Fig. 13A

*Limnaea lagotis* var. *subdisjuncta* Nevill, 1878: 9.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1989  
b; Kruglov, Starobogatov, 1989 b (12 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: desert and semidesert regions  
of Central Asia, to Inner Mongolia in the east.

67. *L. obliquata* (Martens, 1864) Fig. 13B

*Limnaeus obliquatus* Martens, 1864: 116.

REPRODUCTIVE SYSTEM: Izzatullaev et al.,  
1983 c; Kruglov, Starobogatov, 1989 b (3 speci-  
mens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: Lake Issyk-Kul, Mongolia,  
desert regions of China.

68. *L. cucunorica*  
(Mollendorff, 1902) Fig. 13C

*Radix cucunorica* Mollendorff, 1902: 393.

REPRODUCTIVE SYSTEM: Kruglov, Staroboga-  
tov, 1989 b (1 specimen).

DISTRIBUTION: western China.

69. *L. arachleica* Kruglov  
et Starobogatov, 1989 Fig. 13D

*Limnaea arachleica* Kruglov, Starobogatov, 1989 b: 23.  
fig. 1, 6; 2, 2.

REPRODUCTIVE SYSTEM: Kruglov, Staroboga-  
tov, 1989 b.

DISTRIBUTION: Lake Arakhley (Transbaikalia).

70. *L. mongolica* (Yen, 1939) Fig. 13E

*Pseudosuccinea mongolica* Yen, 1939: 68, pl. 15, fig. 54.

REPRODUCTIVE SYSTEM: Fig. 13E (Prozorova,  
here, 3 specimens from lowland near southern  
shore of Khanka Lake, Russian Far East).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: Inner Mongolia, Khanka Lake  
valley.

71. *L. bactriana* (Hutton, 1849) Fig. 13F

*Limnaea bactriana* Hutton, 1849: 656.



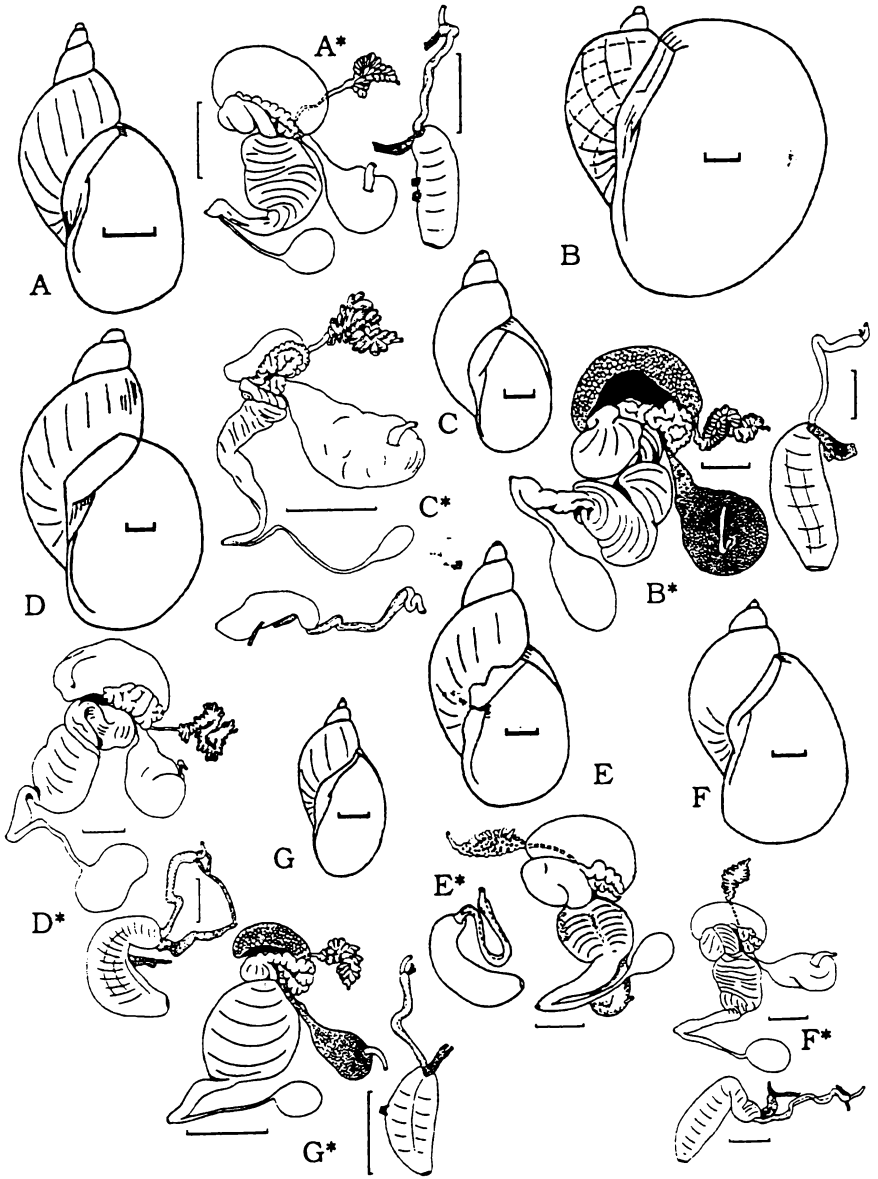


FIG. 13. Species of the section *Desertiradix* of the subgenus *Radix*: A — *L. subdisjuncta*, B — *L. obliquata*, C — *L. cucunorica*, D — *L. arachleica*, E — *L. mongolica* (shell after Yen's, 1939 photo), F — *L. bactriana*, G — *L. rectilabrum*. Scales = 2 mm.

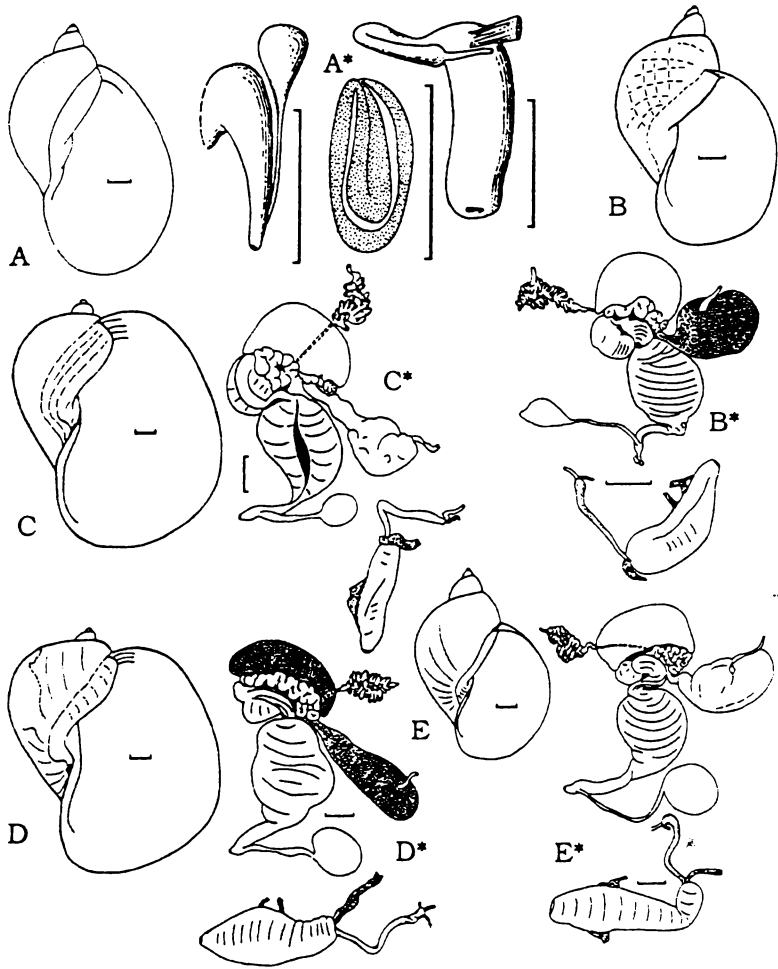


FIG. 14. Species of the section *Desertiradix* (A) and of the section *Ussuriradix* of the subgenus *Radix*: A — *L. gedrosiana* (shell from southern Tajikistan, distal genitalia after Hubendick, 1951), B — *L. schubinae*, C — *L. coreana*, D — *L. pacifampla*, E — *L. ussuriensis*. Scales — 2 mm..

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1989 b (10 specimens).

SYNCAPSULES: Kruglov, Starobogotov, 1992.

DISTRIBUTION: western Middle East, eastern Transcaspia, Central Asia, Mongolia.

DISTRIBUTION: western Middle East, Tajikistan, southern Uzbekistan, Turkmenistan (waterbodies of Kopet-Dagh).

73. *L. gedrosiana* (Annandale et Prasad, 1919)

Fig. 14A

*Limnaea gedrosiana* Annandale, Prasad, 1919: 48, pl.7, fig. 2-4.

REPRODUCTIVE SYSTEM: Hubendick, 1951, fig. 165.

DISTRIBUTION: Afghanistan, south-eastern Iran, southern Tajikistan.

72. *L. rectilabrum* (Annandale et Prasad, 1919) Fig. 13G

*Limnaea gedrosiana* var. *rectilabrum* Annandale, Prasad, 1919: 49, pl. 6, fig. 1-6.

REPRODUCTIVE SYSTEM: Izzatullaev et al., 1983 c; Kruglov, Starobogotov, 1989 b (5 specimens).

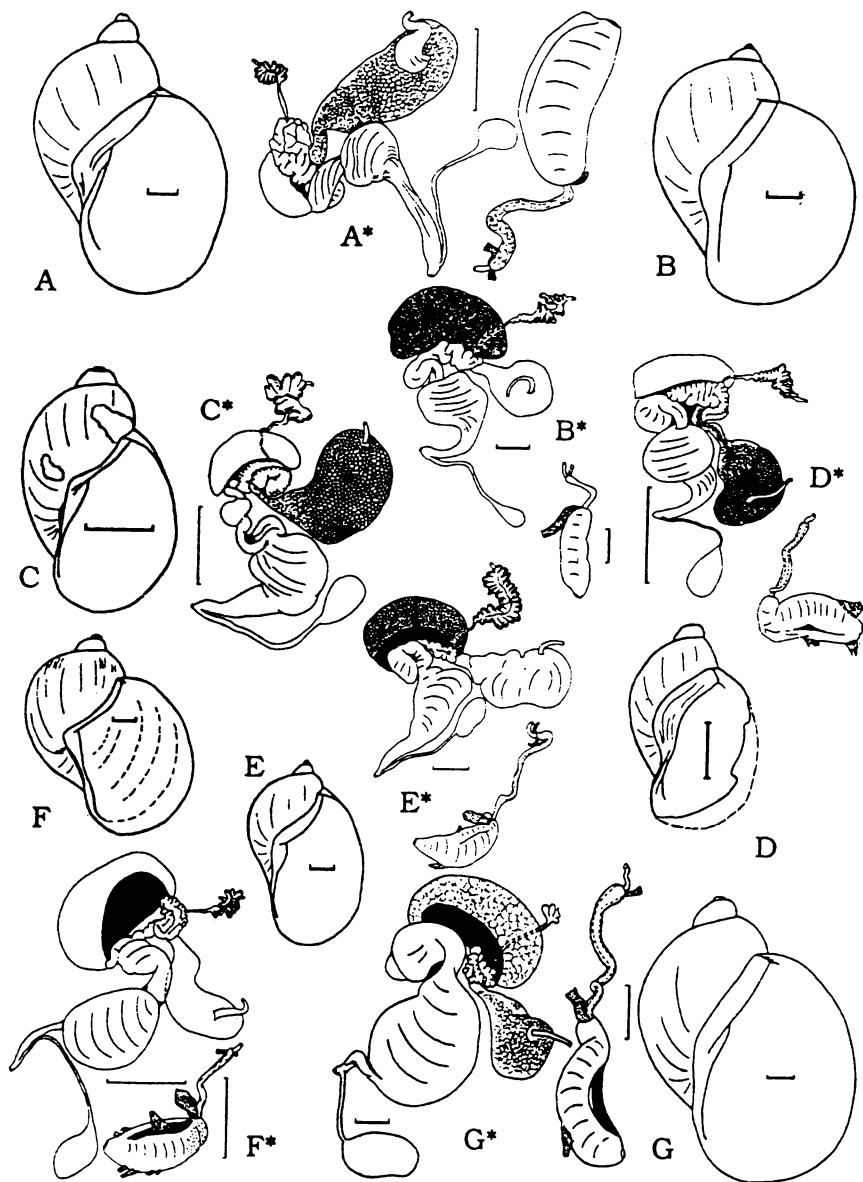


FIG. 15. Species of the sections *Nipponiradix* (A-F) and *Okhotiradix* (G): A — *L. japonica*, B — *L. chereshevni*, C — *L. zarenkovi*, D — *L. kunashirica*, E — *L. kurilensis*, F — *L. iturupica*, G — *L. schelechovi*. Scales = 2 mm.

Section *Ussuriradix*  
Kruglov et Starobogatov, 1989

Type species *Limnaea auricularia* var. *coreana* Martens, 1886 (OD)

74. *L. schubinae* Kruglov, Starobogatov et Zatravkin in Kruglov et Starobogatov, 1989 Fig. 14B

*Limnaea schubinae* Kruglov, Starobogatov et Zatravkin in Kruglov, Starobogatov, 1989 b: 24, fig. 1, 16: 2, 14.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: the Amur basin and Russian Maritime Territory of the Far East.

75. *L. coreana* (Martens, 1886) Fig. 14C

*Limnaea auricularia* var. *coreana* Martens, 1886: 80.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

SYNCAPSULES: Prozorova, 1992; Kruglov, Starobogatov, 1992.

DISTRIBUTION: the Amur basin, Russian Maritime Territory of the Far East, Korea.

76. *L. pacifampla* Kruglov et Starobogatov, 1989 Fig. 14D

*Limnaea pacifampla* Kruglov, Starobogatov, 1989 b: 25, fig. 1, 17: 2, 15.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: Russian Maritime Territory of the Far East.

77. *L. ussuriensis* Kruglov et Starobogatov, 1989 Fig. 14E

*Limnaea ussuriensis* Kruglov, Starobogatov, 1989 b: 24, fig. 1, 15: 2, 13.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (3 specimens).

SYNCAPSULES: Prozorova, 1992; Kruglov, Starobogatov, 1992.

DISTRIBUTION: the Amur basin and Russian Maritime Territory of the Far East.

Section *Nipponiradix*  
Kruglov et Starobogatov, 1989

Type species *Limnaea japonica* Jay, 1856 (OD)

78. *L. japonica* Jay, 1856 Fig. 15A

*Limnaea japonica* Jay, 1856: 294.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (1 specimen).

DISTRIBUTION: Japan, South Kurile Islands

79. *L. chereshevi* Kruglov et Starobogatov, 1989 Fig. 15B

*Limnaea chereshevi* Kruglov, Starobogatov, 1989 b: 27, fig. 1, 24: 2, 22.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (1 specimen).

DISTRIBUTION: western Kamchatka.

80. *L. zarenkovi* Kruglov et Starobogatov, 1989 Fig. 15C

*Limnaea zarenkovi* Kruglov, Starobogatov, 1989 b: 26, fig. 1, 23: 2, 18.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

DISTRIBUTION: Iturup Island.

81. *L. kunashirica* Kruglov et Starobogatov, 1989 Fig. 15D

*Limnaea kunashirica* Kruglov, Starobogatov, 1989 b: 27, fig. 1, 22: 2, 1.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (1 specimen).

DISTRIBUTION: Kunashir Island.

82. *L. kurilensis* Kruglov et Starobogatov, 1989 Fig. 15E

*Limnaea kurilensis* Kruglov, Starobogatov, 1989 b: 26, fig. 1, 21: 2, 20.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

DISTRIBUTION: Iturup Island.

83. *L. iturupica* Kruglov et Starobogatov, 1989 Fig. 15F

*Limnaea iturupica* Kruglov, Starobogatov, 1989 b: 26, fig. 1, 20: 2, 17.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

DISTRIBUTION: Iturup Island.

Section *Okhoitradix*  
Kruglov et Starobogatov, 1989

Type species *Limnaea schelechovi* Kruglov et Starobogatov, 1989 (OD)

84. *L. schelechovi* Kruglov et Starobogatov, 1989 Fig. 15G

*Limnaea schelechovi* Kruglov, Starobogatov, 1989 b: 28, fig. 1, 25: 2, 16.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1989 b (2 specimens).

DISTRIBUTION: western river drainages of Schelekhov bay (the Okhoisk Sea).

(To be continued)



# Атлас современных МОЛЛЮСКОВ СЕВЕРНОЙ ЕВРАЗИИ

## Guide to Recent molluscs of northern Eurasia

### 3. Annotated and illustrated catalogue of species of the family Lymnaeidae (Gastropoda Pulmonata Lymnaeiformes) of Palaearctic and adjacent river drainage areas Part 2

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This paper is a final part of the revised list of Lymnaeidae living in northern Eurasia. It contains the list of species of the subgenera *Peregriana*, *Myxas*, *Pacifimyxas*, *Orientogalba* of the genus *Lymnaea* and the genus *Aenigmomphiscola* (in all 61 species), the supplements concerning type species of genus-group names introduced within the genus *Lymnaea* by Servain in 1881, the list of Recent subgenera of the genus *Lymnaea* and bibliographic references. Besides, the diagnoses of the new genus-group taxa are given: *Ohridlymnaea* sect. nov. (of the subgenus *Lymnaea* s. str.) and *Pseudobulinus* subgen. nov. (in the supplement II).

Genus *LYMNAEA* Lamarck, 1799  
(continued)

Subgenus *Peregriana* Servain, 1881

Type species *Buccinum peregrum* Müller, 1774  
SD Starobogatov et Budnikova, 1976).

*Peregriana* s.str.

85. *L. blaureri* (Küster, 1862). Fig. 1A

*Limnaeus blaureri* Küster, 1862: 56, pl. 12, fig. 7-8.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (4 specimens).

DISTRIBUTION: southern Europe, Caucasus.

86. *L. peregra* (Müller, 1774) Fig. 1B

*Buccinum peregrum* Müller, 1774: 130.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (25 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe

87. *L. bakowskyana* (Clessin, 1879)

Fig. 1C

*Limnaea peregra* var. *bakowskyana* Clessin, 1879: 12, pl. 1, fig. 8.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (3 specimens).

DISTRIBUTION: western and southern Europe, Caucasus.

88. *L. gibilmannica* (O.G.Costa, 1839)

Fig. 1D

*Limnaeus gibilmannicus* O.G.Costa, 1839: 163.

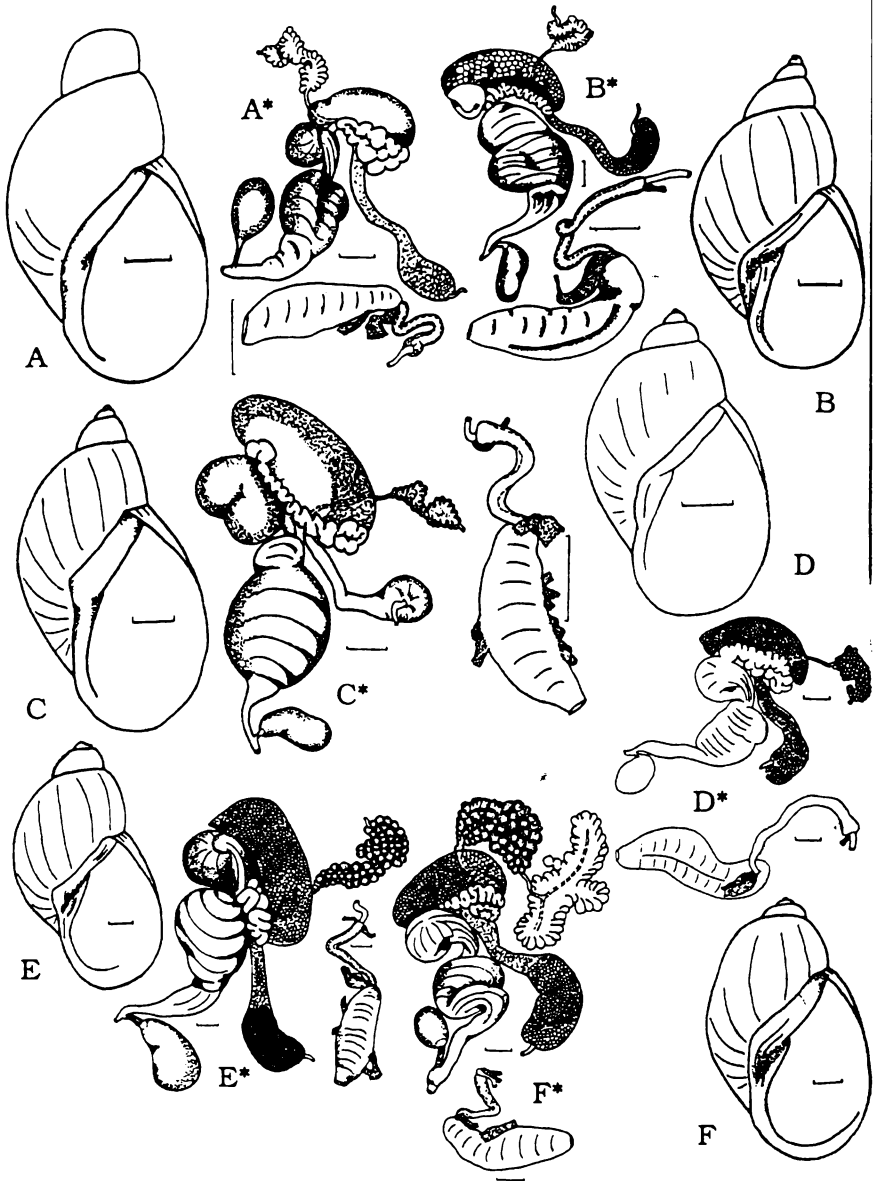


FIG. 1. Species of the section *Peregriana* s. str. (A-D) and of the section *Cyphideana* (E-F) of the subgenus *Peregriana*: A — *L. blaueri*, B — *L. peregra*, C — *L. bakowskyana*, D — *L. gibilmannica*, E — *L. fulva*, F — *L. careilica*. Scale bar — 2 mm for shells of A-D, and 1 mm for shells of E-F, 1 mm for reproductive systems.

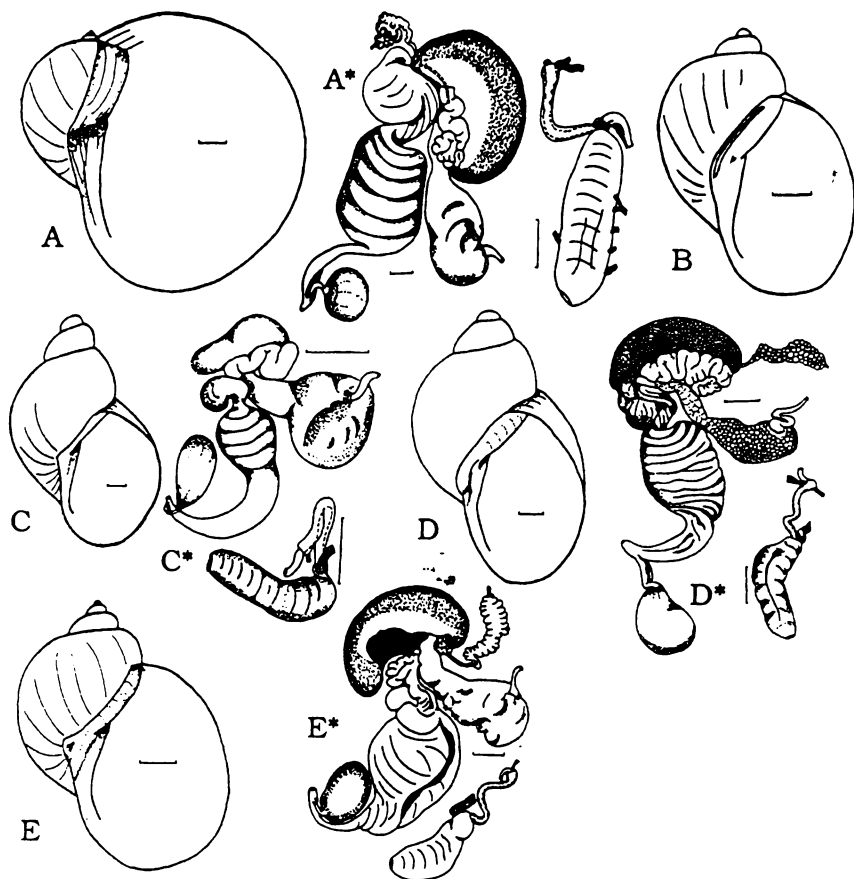


FIG. 2. Species of the section *Cyphideana* of the subgenus *Peregriana*: A — *L. monnardi*, B — *L. dipkunensis*, C — *L. teletzkiana*, D — *L. sazurnensis*, E — *L. mucronata*. Scale bar — 2 mm for shells, 1 mm for reproductive systems.

REPRODUCTIVE SYSTEM: Kruglov, here (3 specimens from northern Czechia).

DISTRIBUTION: southern Europe (excluding its eastern part).

Section *Cyphideana* Servain, 1881

Type species *Limnaea mucronata* Held, 1836 (SD Kruglov, Starobogotov, 1983 b).

89. *L. fulva* (Küster, 1862) Fig. 1E

*Limnaeus fulva* Küster, 1862: 16, pl. 4, fig. 19-21.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1983 b (22 specimens).

SYNCAPSULES: Kruglov, Starobogotov, 1992.

DISTRIBUTION: southern Europe, Caucasus.

90. *L. carelica*

Kruglov et Starobogotov, 1983 Fig. 1F

*Limnaea carelica* Kruglov et Starobogotov, 1983 b: 1467, fig. 2.6; 3.5.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1983 b (15 specimens).

SYNCAPSULES: Kruglov, Starobogotov, 1992.

DISTRIBUTION: Karelia (Baltic drainage area)

91. *L. monnardi*

(Hartmann, 1841)

Fig. 2A

*Gulnaria monnardi* Hartmann, 1841: 71, pl. 18 (= pl. 6).

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1983 b (15 specimens).

- SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.  
DISTRIBUTION: Europe
92. *L. dipkunensis* Gundrizer et Starobogatov, 1979 Fig. 2B  
*Lymnaea dipkunensis* Gundrizer et Starobogatov, 1979: 1134, fig. 1, 4.  
DISTRIBUTION: northern part of Central Siberia.
93. *L. teletzkiana* Kruglov et Starobogatov, 1984 Fig. 2C  
*L. teletzkiana* Kruglov, Starobogatov, 1984 a: 25, fig. 1, 2; 2.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (1 specimen).  
DISTRIBUTION: Altay.
94. *L. zazurnensis* Mozley, 1934 Fig. 2D  
*Lymnaea zazurnensis* Mozley, 1934: 6, pl. 1, fig. 2  
REPRODUCTIVE SYSTEM: Starobogatov, Budnikova, 1976; Kruglov, Starobogatov, 1984 a (6 specimens).  
SYNCAPSULES: Kruglov, Starobogatov, 1992.  
DISTRIBUTION: throughout the northern Siberia (from Ural mountains to Chukchi Peninsula), Altay, mountain parts of Transbaikalia, northern part of Amur drainage.
95. *L. mucronata* (Held, 1836) Fig. 2E.  
*Limnaea mucronata* Held, 1836: 278.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (3 specimens).  
DISTRIBUTION: Baltic, North Sea and north Atlantic European drainages.  
Section *Kamtschaticana* Kruglov et Starobogatov, 1984  
Type species *Limnaeus kamtschaticus* Middendorff, 1851 (OD).
96. *L. kamtschatica* (Middendorff, 1851) Fig. 3A  
*Limnaeus kamtschaticus* Middendorff, 1851: 295, pl. 30, fig. 11-12.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (5 specimens).  
DISTRIBUTION: eastern Kamchatka, Chukchi Peninsula.
97. *L. jacutica* Starobogatov et Streletzkaia, 1967 Fig. 3B  
*Lymnaea jacutica* Starobogatov, Streletzkaia, 1967: 233, fig. 27.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (5 specimens).  
SYNCAPSULES: Kruglov, Starobogatov, 1992.
- DISTRIBUTION: northern Siberia from Ural mountains to Kolyma drainage.
98. *L. juribeica* Kruglov et Starobogatov, 1984 Fig. 3C  
*L. juribeica* Kruglov, Starobogatov, 1984 a: 32, fig. 1, 17.  
DISTRIBUTION: Yamal Peninsula.
99. *L. middendorffi* (W.Dybowski, 1903) Fig. 3D  
*Limnaea peregra* var. *middendorffi* W.Dybowski, 1903: 52, fig. 7.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (3 specimens).  
DISTRIBUTION: eastern Kamchatka, northern and western shores of the Okhotsk Sea.
100. *L. aberrans* (Westerlund, 1897) Fig. 3E  
*Limnaea ovata* var. *aberrans* Westerlund, 1897: 125.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (3 specimens).  
DISTRIBUTION: eastern Kamchatka, northern and western shores of the Okhotsk Sea.
101. *L. kafanovi* Kruglov et Starobogatov, 1984 Fig. 3F  
*Lymnaea kafanovi* Kruglov, Starobogatov, 1984 a: 31, fig. 1, 20; 2, 6.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (2 specimens).  
DISTRIBUTION: northern Sakhalin.  
Section *Añailymnaea* Kruglov et Starobogatov, 1983  
Type species *Lymnaea gundrizeri* Kruglov et Starobogatov, 1983 (OD).
102. *L. gundrizeri* Kruglov et Starobogatov, 1983 Fig. 5A  
*Lymnaea gundrizeri* Kruglov, Starobogatov, 1983 a: 141.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 a, 1984 a (1 specimen).  
DISTRIBUTION: Altay (probably in western Mongolia).
103. *L. ulaganica* Kruglov et Starobogatov, 1983 Fig. 5B  
*Lymnaea ulaganica* Kruglov, Starobogatov, 1983 a: 141.  
REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 a, 1984 a (1 specimen).  
DISTRIBUTION: Altay (probably in western Mongolia).  
Section *Ampullaceana* Servain, 1881  
Type species *Limnaeus ampullaceus* Rossmäslers, 1835 (SD Kruglov, Starobogatov, 1983 b).



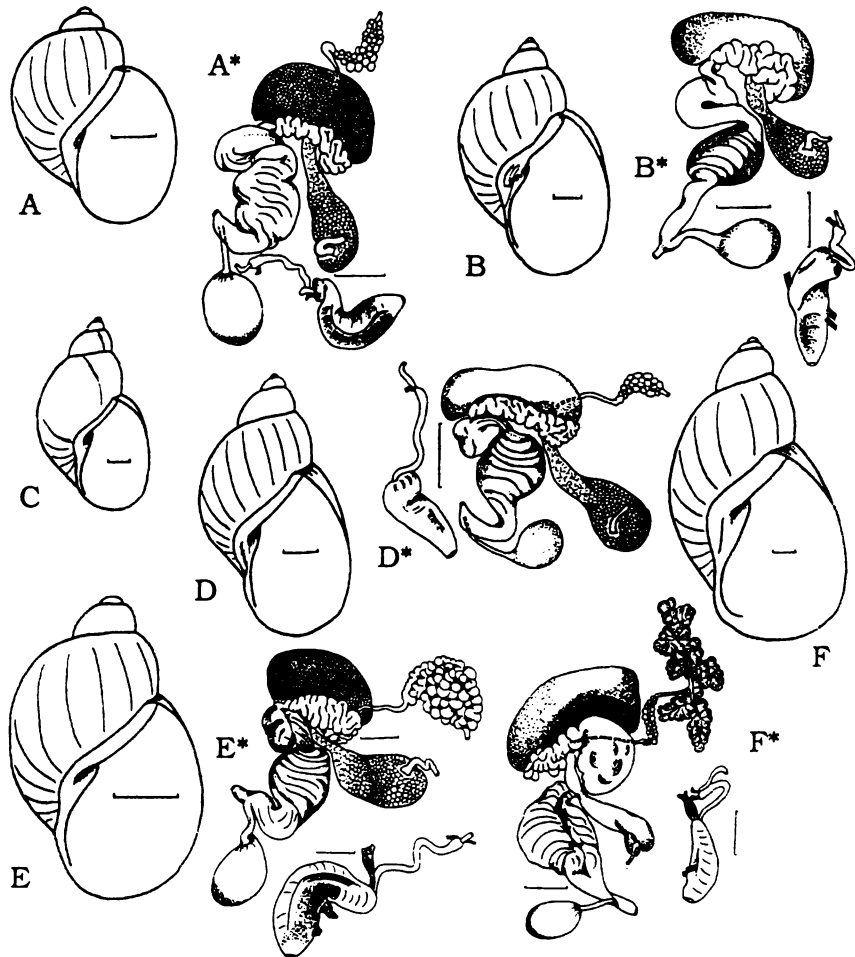


FIG. 3. Species of the section *Kamtschaticana* of the subgenus *Peregriana*: A — *L. kamschaticana*, B — *L. jacutica*, C — *L. juribeica*, D — *L. middendorffi*, E — *L. aberrans*, F — *L. kafanovi*. Scale bar — 1 mm.

104. *L. ampullacea* (Rossmässler, 1835)  
Fig. 4A

*Limnaeus ampullaceus* Rossmassler, 1836: 19, pl. 7, fig. 124.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1983 b (20 specimens).

SYNCAPSULES: Beriozkina, Starobogotov, 1981, 1988.

DISTRIBUTION: Europe, southern Siberia (eastward to Baikal Lake).

105. *L. intermedia* Lamarck, 1822  
Fig. 4B

*Lymnaea intermedia* Lamarck, 1822: 162.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1983 b (15 specimens).

SYNCAPSULES: Beriozkina, Starobogotov, 1981, 1988.

DISTRIBUTION: Europe, Siberia.

106. *L. balthica* (Linnaeus, 1758)  
Fig. 4C

*Helix balthica* Linnaeus, 1758: 775 (neotype: Kruglov, Starobogotov, 1983 b).

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1983 b (20 specimens).

SYNCAPSULES: Beriozkina, Starobogotov, 1981, 1988.

DISTRIBUTION: Europe, southern Siberia.

107. *L. burnetti* (Alder, 1848) Fig. 4D

*Limnaea burnetti* Alder, 1848: 396 pl. 11, fig. 1.

REPRODUCTIVE SYSTEM: Hubendick, 1951 fig. 124.

DISTRIBUTION: Scotland.

108. *L. ovata* (Draparnaud, 1805) Fig. 4E

*Limnaeus ovatus* Draparnaud, 1805: 50, pl. 2, fig. 30-31.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (15 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, Siberia.

109. *L. igarkae* Gundrizer et Starobogatov, 1979 Fig. 4F

*Lymnaea igarkae* Gundrizer, Starobogatov, 1979: 1133, fig. 1, 3; 2, 3.

REPRODUCTIVE SYSTEM: Gundrizer, Starobogatov, 1979 (1 specimen).

DISTRIBUTION: northern part of Central Siberia.

Section *Ohridymnaea* Kruglov et Starobogatov sect. nov.

Type species *Radix relictica* Polinski, 1929.

Diagnosis. Shell ear-shaped with giant body whorl and very short spira. Aperture with almost straight upper part of palatal margin. Columella straight, sharply twisted. Albumen gland is not more than 1.5 times longer than labyrinth of oviduct. Provagina is wide and long: its width is more than half of the width of uterus. Penis shape almost cylindrical.

110. *L. relictica* (Polinski, 1929) Fig. 5C

*Radix relictica* Polinski, 1929: 158, pl. 2, fig. 21.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (1 specimen).

DISTRIBUTION: lake Ohrid (Balkan Peninsula).

Section *Bouchardiana* Servain, 1881

Type species *Limnaea bouchardiana* Servain, 1881 = *Buccinum lagotis* Schranck, 1803(T).

111. *L. lagotis* (Schranck, 1803) Fig. 6A

*Buccinum lagotis* Schranck, 1803: 290.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (20 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, West Siberia.

112. *L. fontinalis* (Studer, 1820) Fig. 6B

*Limnaeus fontinalis* Studer, 1820: 93.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (30 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, Siberia.

113. *L. torquilla* (Westerlund, 1877) Fig. 6C

*Limnaea peregra* var. *torquilla* Westerlund, 1877: 55, pl. fig. 11.

DISTRIBUTION: northern part of Central Siberia.

114. *L. patula* (E.M.Costa, 1778) Fig. 6D

*Turbo patula* E.M.Costa, 1778: 95, pl. 5, fig. 7.

*Lymnaea tobolica* Lazareva, 1967 b: 200, fig. 4, 8.

REPRODUCTIVE SYSTEM: Lazareva, 1967 b; Kruglov, Starobogatov, 1983 b (46 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, Kazakhstan, southern part of West Siberia.

115. *L. obensis* Kruglov et Starobogatov, 1984 Fig. 6E

*Lymnaea obensis* Kruglov, Starobogatov, 1984 a: 25, fig. 1, 5.

DISTRIBUTION: middle part of the Ob' drainage.

116. *L. hartmanni* (Studer, 1820) Fig. 6F

*Limnaeus hartmanni* Studer, 1820: 93.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (8 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe.

117. *L. tumida* (Held, 1836) Fig. 6G

*Limnaea tumida* Held, 1836: 278.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 b (15 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, South Siberia eastward to Baikal Lake and north Siberia near Noril'sk.

Section *Sibirilymnaea* Kruglov et Starobogatov, 1983

Type species *Lymnaea novikovi* Kruglov et Starobogatov, 1983 a (OD).

\* Another undescribed species of this section was found in shore springs of the Lake Ohrid [Burch. Hadzisce, 1974].

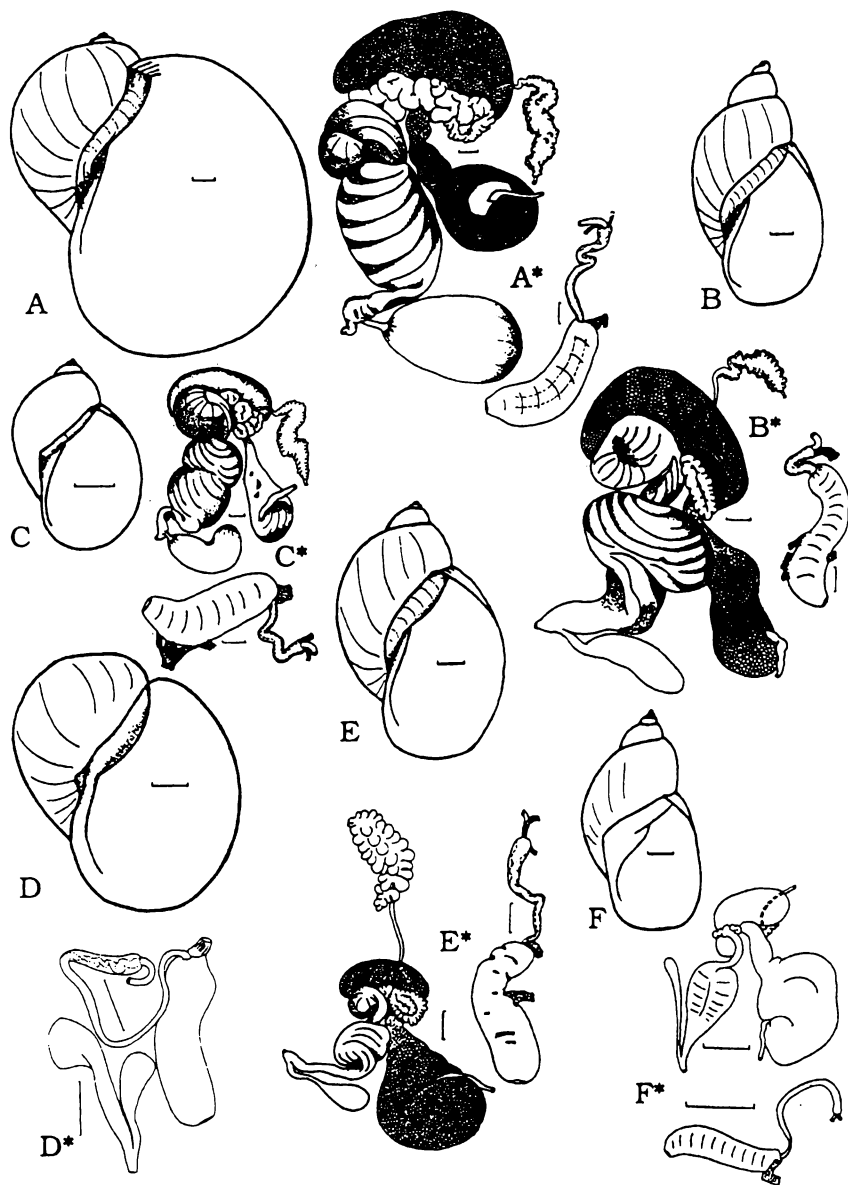


FIG. 4. Species of the section *Ampullacea* of the subgenus *Peregrina*: A — *L. ampullacea*, B — *L. intermedia*, C — *L. balthica*, D — *L. burnetti* (shell after Boycott's [1938] photo, distal genitalia after Hubendick, 1951), E — *L. ovata*, F — *L. igarkae*. Scale bar — 2 mm for shells of A-B, D-F and reproductive system of F, 1 mm for shell of C and reproductive systems of A-E.

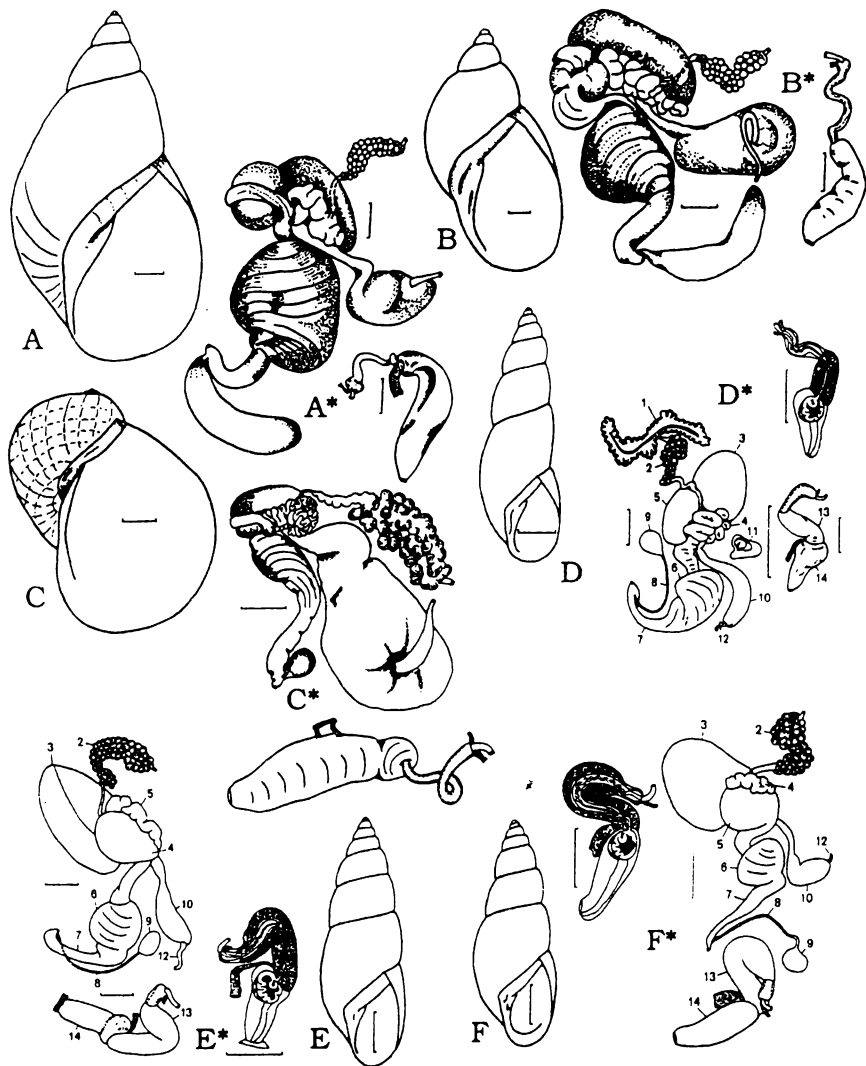


FIG. 5. Species of the section *Altailymaea* (A-B), section *Ohridilymaea* (C) of the subgenus *Peregriana* and species of the genus *Aenigmomphiscola* (D-F): A — *L. gundrizeri*, B — *L. ulaganica*, C — *L. relicta*, D — *Ae. europaea*, E — *Ae. uvalievae*, F — *Ae. kazakhstanica*. Scale bar — 1 mm, 2 mm for shells of C-F.

118. *L. nogoonica* Kruglov et Starobogatov, 1983

Fig. 7A

*Lymnaea nogoonica* Kruglov, Starobogatov, 1983 a: 140.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 a, 1984 a (1 specimen).

DISTRIBUTION: western Mongolia, eastern Altay.

119. *L. novikovi* Kruglov et Starobogatov, 1983

Fig. 7B

*Lymnaea novikovi* Kruglov, Starobogatov, 1983 a: 139.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 a, 1984 a (2 specimens).

DISTRIBUTION: south-eastern part of West Siberia.

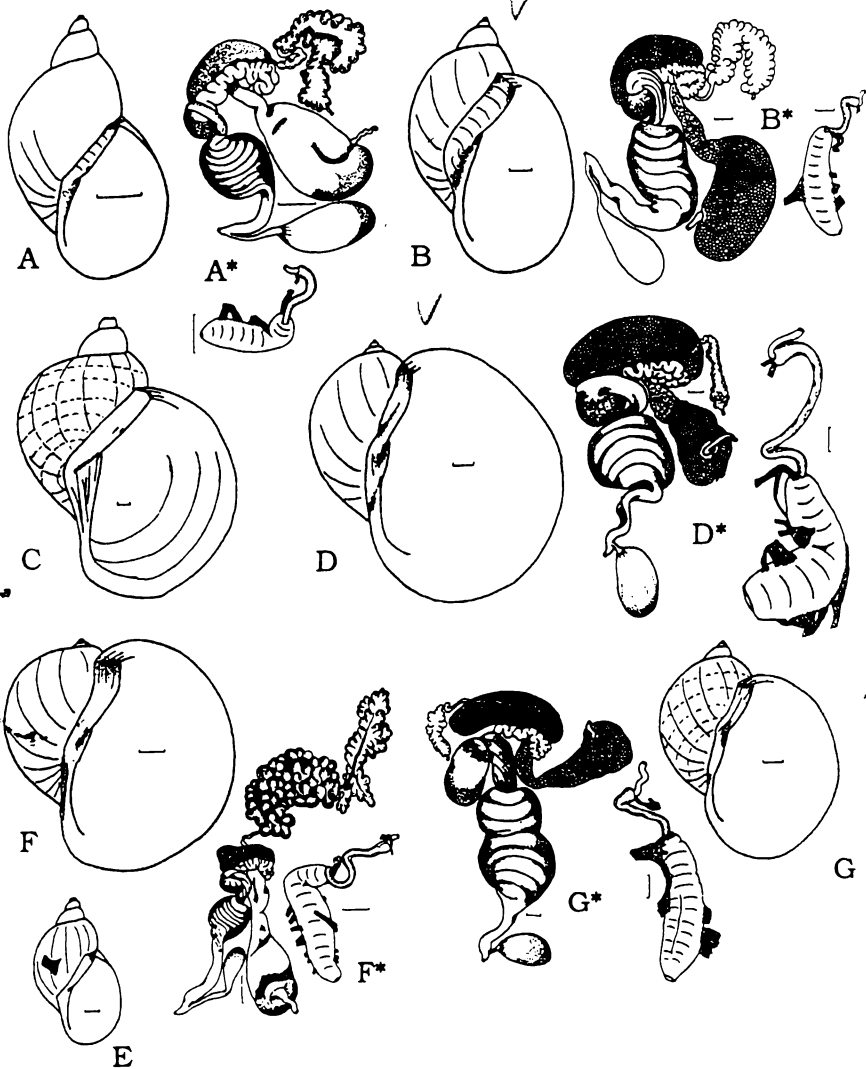


FIG. 6. Species of the section *Bouchardiana* of the subgenus *Peregriana*: A — *L. lagotis*, B — *L. fontinalis*, C — *L. torquilla*, D — *L. patula*, E — *L. obensis*, F — *L. hartmanni*, G — *L. tumida*. Scale bar — 2 mm for shells of A,B,D,F,G, 1 mm for shells of C,E and reproductive systems.

120. *L. napsica* Kruglov et  
Starobogatov, 1983

Fig. 7C

*Lymnaea napsica* Kruglov, Starobogatov, 1983 a: 140.

DISTRIBUTION: middle part of the Ob' drainage.

121. *L. tsalolikhini* Kruglov et  
Starobogatov, 1983 a

Fig. 7D

*Lymnaea tsalolikhini* Kruglov, Starobogatov, 1983 a: 140.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 a, 1984 a (5 specimens).

DISTRIBUTION: western Mongolia.

122. *L. mongolitumida* Kruglov et  
Starobogatov, 1983 a

Fig. 7E

*Lymnaea mongolitumida* Kruglov, Starobogatov, 1983 a: 140.

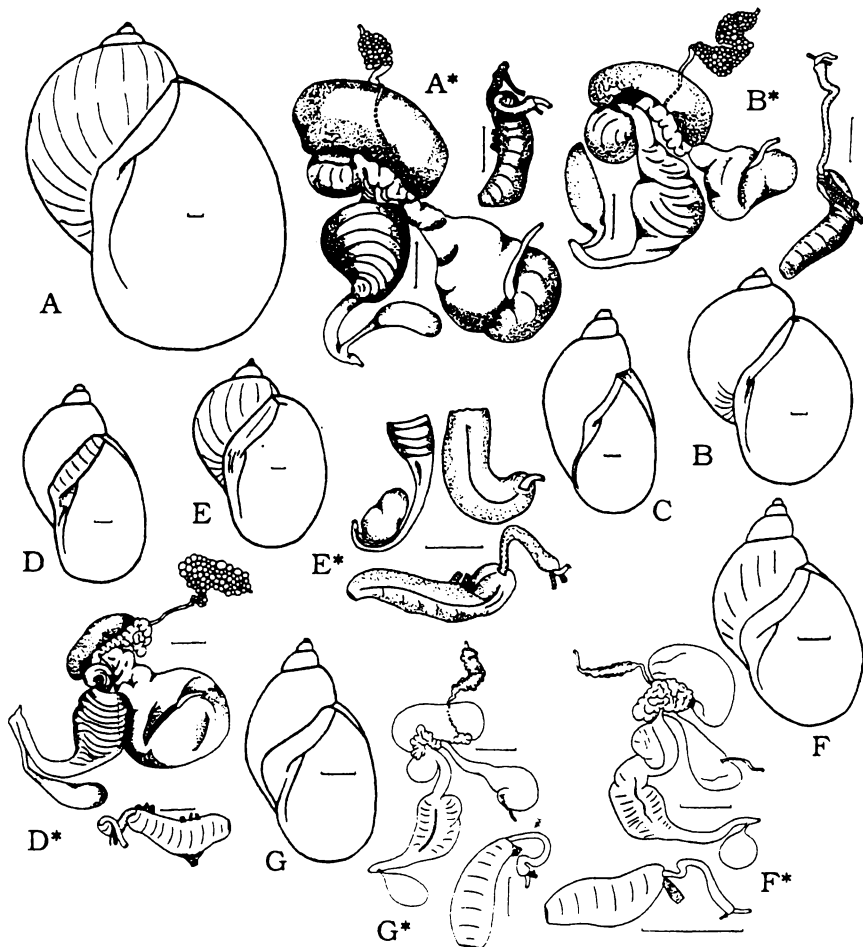


FIG. 7. Species of the section *Sibirlymnaea* of the subgenus *Peregriana*: A — *L. nogoonica*, B — *L. novikovi*, C — *L. napasitica*, D — *L. tsalolikhini*, E — *L. mongolitumida*, F — *L. kurejkae*, G — *L. dolgini*. Scale bars — 2 mm for reproductive systems of F, G, 1 mm — for the rest.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1983 a, 1984 a (1 specimen).  
DISTRIBUTION: western Mongolia.

**123. *L. kurejkae* Gundrizer et Starobogatov, 1979** Fig. 7F

*Lymnaea kurejkae* Gundrizer, Starobogatov, 1979: 1131, fig. 1, f; 2, 1.

REPRODUCTIVE SYSTEM: Gundrizer, Starobogatov, 1979 (1 specimen).

DISTRIBUTION: northern part of Central Siberia, western Mongolia.

**124. *L. dolgini* Gundrizer et Starobogatov, 1979** Fig. 7G

*Lymnaea dolgini* Gundrizer, Starobogatov, 1979: 1132, fig. 1, 2; 2, 2.

REPRODUCTIVE SYSTEM: Gundrizer, Starobogatov, 1979 (1 specimen).

DISTRIBUTION: middle part of the Ob' drainage.

**Section *Amurlymnaea* Kruglov et Starobogatov, 1984**

Type species *Lymnaea amurensis* Kruglov, Moskvicheva et Starobogatov in Kruglov et Starobogatov, 1984 a (OD).

125. *L. amurensis* Kruglov, Moskvicheva et Starobogatov in Kruglov et Starobogatov, 1984 Fig. 8A

*Lymnaea amurensis* Kruglov, Moskvicheva et Starobogatov in Kruglov et Starobogatov, 1984 a: 28, fig. 1, 12; 2, 14.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (10 specimens).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: Amur drainage, Russian Maritime region of the Far East.

126. *L. manomaensis* Kruglov, Starobogatov et Zatravkin in Kruglov et Starobogatov, 1984 Fig. 8B

*Lymnaea manomaensis* Kruglov, Starobogatov et Zatravkin in Kruglov et Starobogatov, 1984 a: 29, fig. 1, 13; 2, 15.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (2 specimens).

DISTRIBUTION: Amur drainage, Russian Maritime region of the Far East.

127. *L. dvoriadkini* Kruglov et Starobogatov, 1984 Fig. 8C

*Lymnaea dvoriadkini* Kruglov, Starobogatov, 1984 a: 29, fig. 1, 14; 2, 17.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a (10 specimens).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: Amur drainage, Russian Maritime region of the Far East.

128. *L. sihotealinica* Kruglov et Starobogatov, 1984 Fig. 8D

*Lymnaea sihotealinica* Kruglov, Starobogatov, 1984 a: 30, fig. 1, 15; 2, 16.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1984 a.

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: Amur drainage, Russian Maritime region of the Far East.

Section *Biwakoia* Burch et Habe, 1969

Type species *Limnaea onychia* Westerlund, 1883 (OD).

129. *L. onychia* (Westerlund, 1883) Fig. 8E

*Limnaea onychia* Westerlund, 1883: 52.

REPRODUCTIVE SYSTEM: Burch, Habe, 1969.

DISTRIBUTION: lake Biwa (Japan).

130. *L. hamadai* (Habe, 1968) Fig. 8F

*Radix hamadai* Habe, 1968: 78, fig. 1.

REPRODUCTIVE SYSTEM: Burch, Habe, 1969.

DISTRIBUTION: Honshu Island (Japan).

Subgenus *Myxas* Sowerby, 1822

Type species *Buccinum glutinosum* Müller, 1774 (M).

131. *L. mabillei* (Locard, 1893) Fig. 9A

*Amphipelea mabillei* Locard, 1893: 47.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1985 a (1 specimen).

DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages.

132. *L. glutinosa* (Müller, 1774) Fig. 9B

*Buccinum glutinosum* Müller, 1774: 129.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1985 a (41 specimens).

SYNCAPSULES: Beriozkina, Starobogatov, 1981, 1988.

DISTRIBUTION: Europe, south part of West Siberia, northern part of Central Siberia, Kazakhstan.

133. *L. involuta* (Thompson in Thompson et Goodsir, 1840) Fig. 9C

*Limnaeus involutus* Thompson in Thompson, Goodsir, 1840: 22, pl. 1, fig. 2 (shell).

REPRODUCTIVE SYSTEM: Thompson, Goodsir, 1840.

DISTRIBUTION: Ireland.

134. *L. dupuyi* (Locard, 1893) Fig. 9D

*Amphipelea dupuyi* Locard, 1893: 47.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1985 a (2 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: Baltic, North Sea and North Atlantic European drainages.

Subgenus *Pacifimyxas* Kruglov et Starobogatov, 1985

Type species *Lymnaea magadanensis* Kruglov et Starobogatov, 1985 (OD).

135. *L. magadanensis* Kruglov et Starobogatov, 1985 Fig. 9E

*Lymnaea magadanensis* Kruglov et Starobogatov, 1985 a: 76, fig. 1, 5; 2, 4.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1985 a (3 specimens).

SYNCAPSULES: Kruglov, Starobogatov, 1992.

DISTRIBUTION: northern shore of Okhotsk Sea and upper part of Kolyma drainage.

136. *L. streletzkae* Kruglov et Starobogatov, 1985 Fig. 9F

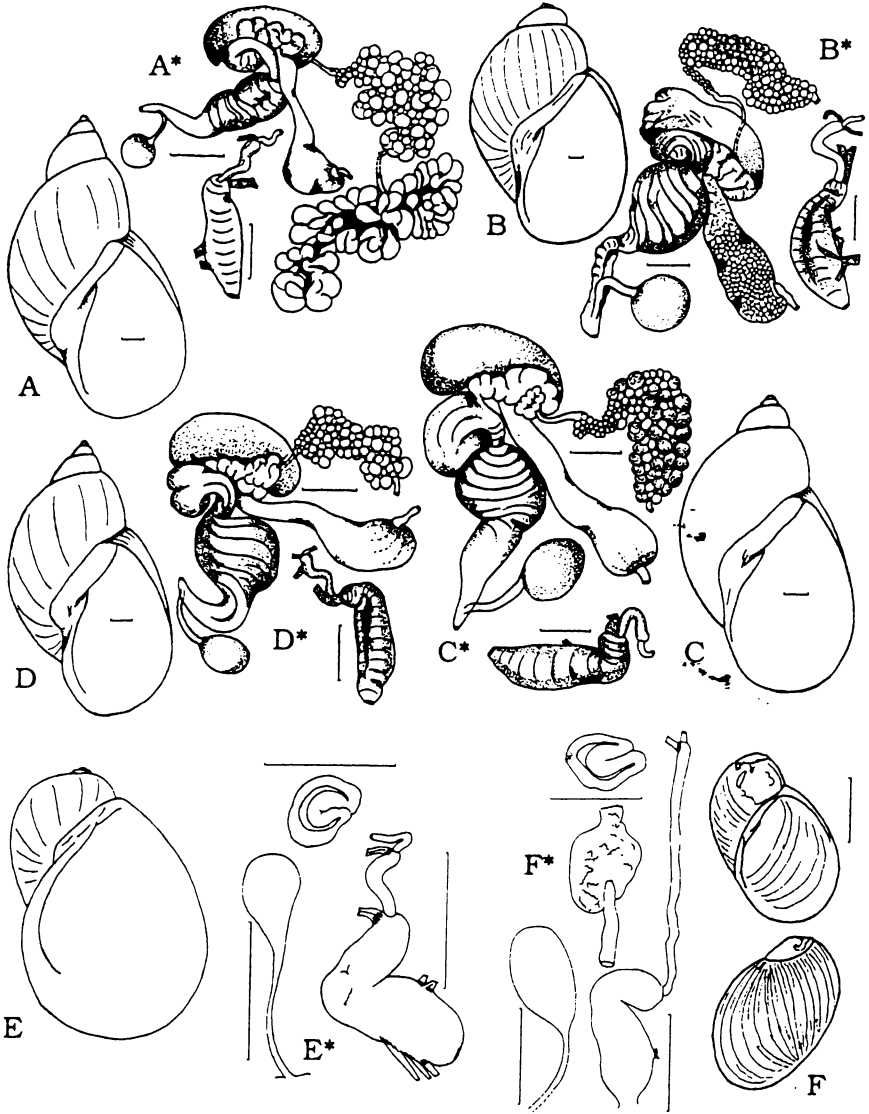


FIG. 8. Species of the section *Amurlymnaea* (A-D) and section *Biwakoia* (E-F) of the subgenus *Peregriana*. A — *L. amurensis*, B — *L. manomaensis*, C — *L. dvoriadkini*, D — *L. sikhotealinica*, E — *L. onychia* (distal genitalia after Burch, Habe, 1969), F — *L. hamadai* (shell and distal genitalia after Burch, Habe, 1969) Scale bar — 2 mm for shell of F, 1 mm — for the rest.



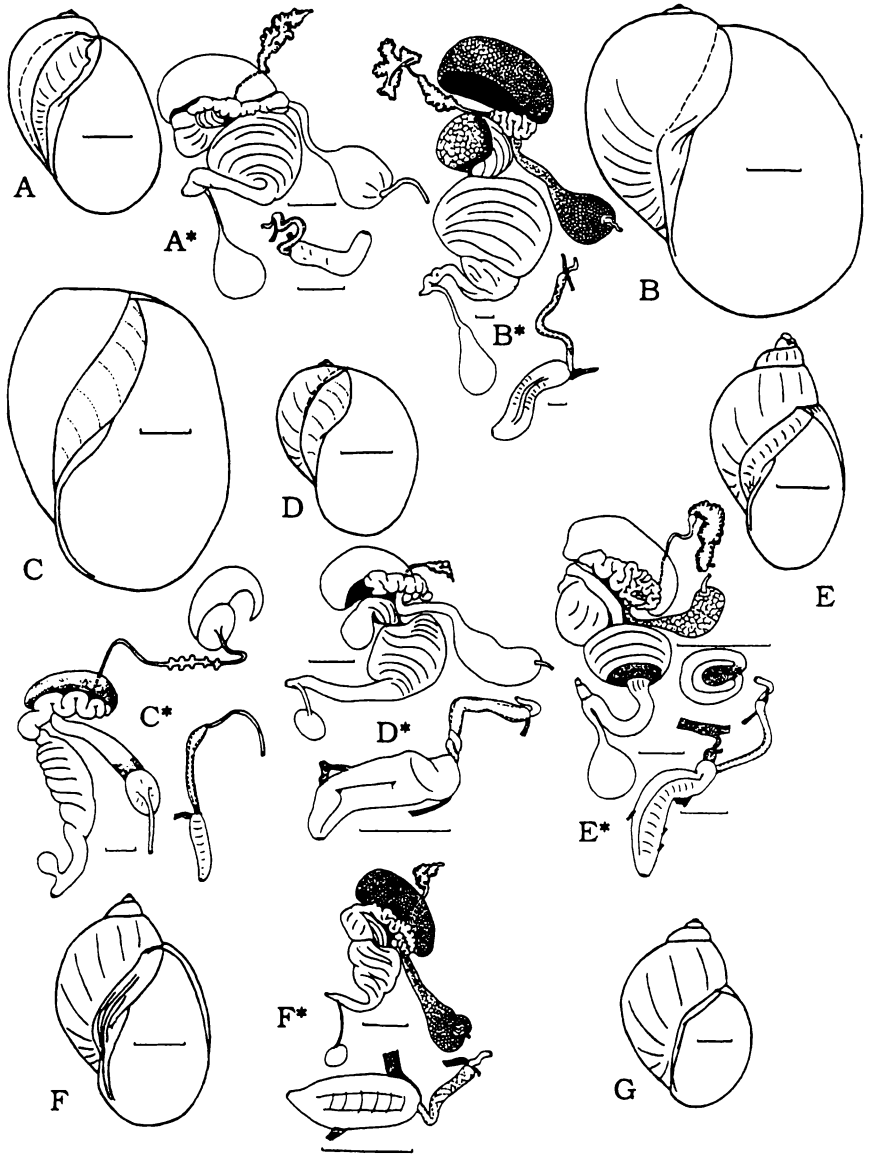


FIG. 9. Species of the subgenera *Myxas* (A-D) and *Pacifimyx* (E-G). A — *L. mabillei*, B — *L. glutinosa*, C — *L. involuta* (shell after Boycott's [1938] photo, reproductive system after Thompson, Goodsir, 1840, corrected — perhaps not full-grown specimen), D — *L. dupuyi*, E — *L. magadanensis*, F — *L. streletzkaiae*, G — *L. perpolita* (after Dall, 1905). Scale bar — 2 mm for shells and 1 mm for reproductive systems.

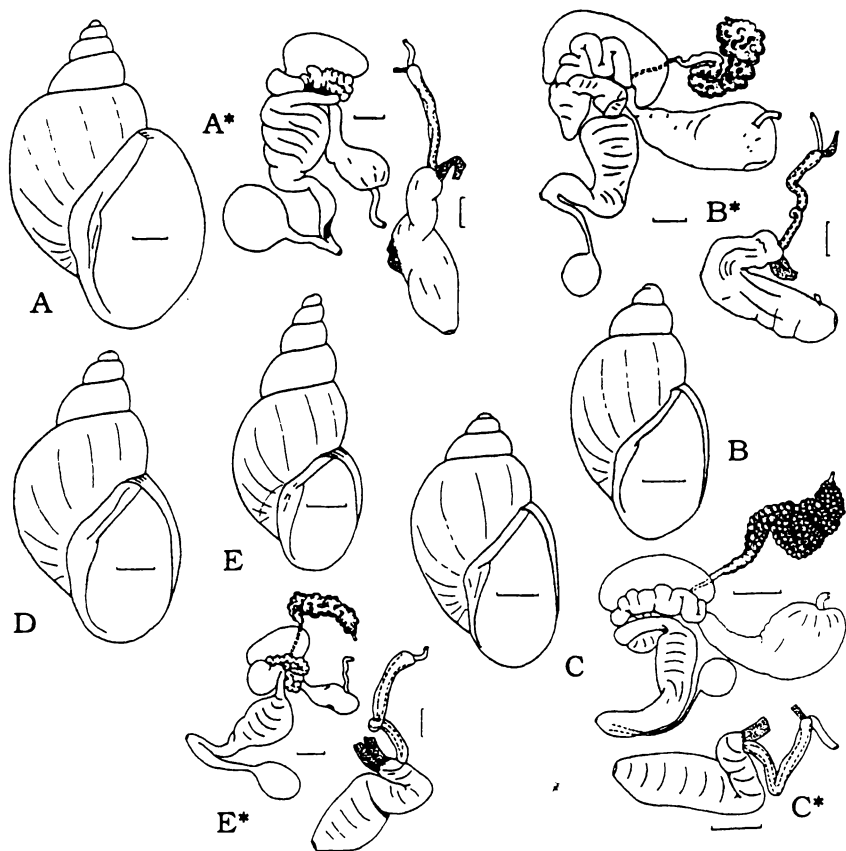


FIG. 10. Species of the subgenus *Orientogalba*. A — *L. hookeri*, B — *L. viridis*, C — *L. ollula*, D — *L. tumrokensis*, E — *L. lenaensis*. Scale bar — 1 mm for shells and 0.5 mm for reproductive systems.

*Lymnaea streletskaiae* Kruglov, Starobogatov, 1985 a: 76, fig. 1, 6; 2, 5.

REPRODUCTIVE SYSTEM: Kruglov, Starobogatov, 1985 a (2 specimens).

DISTRIBUTION: northern shore of Okhotsk Sea and upper part of Kolyma drainage.

137. *L. perpolita* Dall, 1905 Fig. 9G

*Lymnaea perpolita* Dall, 1905: 78, pl. 2, fig. 6, 8.

DISTRIBUTION: shore of Bristol Bay, Alaska, probably will be found in Chukchi Peninsula.

**Subgenus *Orientogalba* Kruglov et Starobogatov, 1985**

Type species *Lymnaea heptapotamica* Lazareva, 1967 = *L. hookeri* Reeve, 1850 (OD).

**Section *Orientogalba* s.str.**

138. *L. hookeri* Reeve, 1850 Fig. 10 A

*Lymnaea hookeri* Reeve, 1850: 49, fig.

*Lymnaea heptapotamica* Lazareva, 1967 b: 198, fig. 1.

REPRODUCTIVE SYSTEM: Lazareva, 1967 b; Kruglov, Starobogatov, 1985 a (10 specimens).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: eastern central Asia, Mongolia, Transbaikalia, Amur drainage.

Section *Viridigalba* Kruglov et Starobogatov, 1985 b.

Type species *Lymnaea viridis* Quoy et Gaimard, 1833 (OD).

139. *L. viridis* Quoy et Gaimard, 1833 Fig. 10B

*Lymnaea viridis* Quoy et Gaimard, 1833: 204, pl. 58, fig. 16-18.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1985 b (1 specimen).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: East Asia, Micronesia.

140. *L. ollula* (Gould, 1859) Fig. 10C

*Limnaea ollula* Gould, 1859: 40.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1985 b (1 specimen).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: East Asia.

141. *L. tumrokensis* Kruglov et Starobogotov, 1985 Fig. 10D

*Lymnaea tumrokensis* Kruglov, Starobogotov, 1985 b: 30, fig. 1, 6.

DISTRIBUTION: south eastern Kamchatka (thermal sources of Tumrok range).

Section *Lenagalba* Kruglov et Starobogotov, 1985 b.

Type species *Lymnaea lenaensis* Kruglov et Starobogotov, 1985 (OD).

142. *L. lenaensis* Kruglov et Starobogotov, 1985 Fig. 10E

*Lymnaea lenaensis* Kruglov et Starobogotov, 1985 b: 31, fig. 1, 7; 2, 8.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1985 b (2 specimens).

SYNCAPSULES: Prozorova, 1992.

DISTRIBUTION: Central Siberia, Amur drain-

age, Russian Maritime Territory of the Far East.

Genus *AENIGMOPHISCOLA*  
Kruglov et Starobogotov, 1981

Type species *Aenigmomphiscola europaea* Kruglov et Starobogotov, 1981 (OD).

143. *Ae. europaea* Kruglov et Starobogotov, 1981 Fig. 5D

*Aenigmomphiscola europaea* Kruglov, Starobogotov, 1981: 969, fig. 1, 1, 7, 12; 3 A; 4A.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1981 (2 specimens).

DISTRIBUTION: eastern part of East Europe.

144. *Ae. uvalievae* Kruglov et Starobogotov, 1981 Fig. 5E

*Aenigmomphiscola uvalievae* Kruglov, Starobogotov, 1981: 971, fig. 1, 2, 2, 8, 13; 2; 3B; 4B; 5.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1981 (2 specimens).

SYNCAPSULES: Kruglov, Starobogotov, 1981.

DISTRIBUTION: eastern part of East Europe, Ural, Kazakhstan.

145. *Ae. kazakhstanica* Kruglov et Starobogotov, 1981 Fig. 5F

*Aenigmomphiscola kazakhstanica* Kruglov, Starobogotov, 1981: 973, fig. 1, 3, 9, 14; 3 B; 4B.

REPRODUCTIVE SYSTEM: Kruglov, Starobogotov, 1981 (2 specimens).

DISTRIBUTION: Kazakhstan.

## SUPPLEMENTS

I. Type species of genus-group names introduced by Servain within the genus *Lymnaea*

Servain [1881] introduced 20 rankless genus-group names within the genus *Lymnaea* without fixation of type species (excluding one case of monotypy, one case of tautonymy and one case of original designation). Some of them have been used as valid names of subgenera and sections by Lazareva [1967 a], Starobogotov, Budnikova [1976], Kruglov, Starobogotov [1983 b; 1986; 1992] and here in both parts of the present paper. They are subgenus *Corvusiana*, section *Stagnaliana* of the subgenus *Lymnaea* s.str., section *Fenziana* of the subgenus *Stagnicola*, sections *Cyphidaeana*, *Ampullaceana*, *Bouchardiana* of the subgenus *Pe-regriana*. Another 13 names are the following.

*Auriculariana* — type species *Helix auricularia* Linnaeus, 1758 (SD here) — junior objective synonym of *Radix* Montfort, 1810.

*Biformiana* — type species *Limnaeus biformis* Küster, 1862 = *Limnaeus fontinalis* Studer, 1820 (SD Kruglov, Starobogotov, 1983 b) — junior subjective synonym of *Bouchardiana* Servain, 1881.

*Caenisiana* (without included available specific names) — type and sole subsequently included species *Limnaea caenisia* Locard, 1893 = *Limnaeus fontinalis* Studer, 1820 (SD and included Kruglov, Starobogotov, 1983 b) — junior subjective synonym of *Bouchardiana* Servain, 1881.

*Effusiana* — type species *Limnaeus effusus* Küster, 1862 = *Buccinum lagotis* Schranck, 1803 (SD Kruglov, Starobogotov, 1983 b) — junior objective synonym of *Bouchardiana* Servain, 1881.

*Glabriana* — type species *Buccinum glabrum* Müller, 1774 (SD here) — junior objective synonym of *Omphiscola* Rafinesque, 1819.

*Ligericiana* (combined description of infra-generic taxon and sole species) — type species

*Limnaea ligerica* Servain, 1881 = *Limnaea turricula* Held, 1836 (M) — junior subjective synonym of *Fenziana* Servain, 1881.

*Limosiana* — type species *Limnaea limosa* Moquin-Tandon, 1855 non Linnaeus, 1758 = *Limnaeus ovatus* Draparnaud, 1805 (SD Kruglov, Starobogatov, 1983 b) — junior subjective synonym of *Ampullaceana* Servain, 1881.

*Nivalisiana* — type species *Limnaea navalis* Bourguignat, 1880 = *Limneus fontinalis* Studer, 1820 (SD Kruglov, Starobogatov, 1983 b) — junior subjective synonym of *Bouchardiana* Servain, 1881.

*Palustriana* — type species *Buccinum palustre* Müller, 1774 (SD here) — junior objective synonym of *Stagnicola* Leach in Jeffreys, 1830.

*Psiliana* — type species *Limnaea psilia* Bourguignat, 1862 (SD here) — junior subjective synonym of *Radix* Montfort, 1810.

*Rochiana* — type species *Limnaeus roseus* Gassenstein, 1852 = *Limnaea mucronata* Held, 1836 (SD Kruglov, Starobogatov, 1983 b) — junior objective synonym of *Cyphidaeana* Servain, 1881.

*Truncatuliana* — type species *Buccinum truncatum* Müller, 1774 (SD here) — junior objective synonym of *Galba* Schranck, 1803.

*Walhiana* — type species *Lymnaea walhii* Möller, 1842 = *Lymnaea vahlii* Möller, 1842 (OD) — separate subgenus of the genus *Lymnaea*.

## II. Recent subgenera of the genus *Lymnaea*

We group the Recent species of the genus *Lymnaea* into 26 subgenera, one of which is noninotypical one and remaining are the following.

1. *Corvusiana* Servain, 1881. Type species *Helix corvus* Gmelin in Linnaeus, 1891 (SD Lazareva, 1967 a).

2. *Pseudosuccinea* Baker, 1908. Type species *Lymnaea columella* Say, 1817 (OD).

3. *Acella* Haldeman, 1841. Type species *Lymnaea gracilis* Jay, 1839 non Zieten, 1832 = *Limnaea haldemani* Binney, 1867 (M).

4. *Polyrhysis* Meek, 1876. Type species *Lymnaea kingi* Meek, 1876 (M).

5. *Pseudobulinus* Kruglov et Starobogatov subgen. nov. Type species *Physa reticulata* Gould, 1847.

Dianose: shell sinistral, elongate-oval with relatively short spira. Prostate without inner fold. Penis sheath only slightly narrower than praeputium. Sarcobellum and velum well developed.

6. *Erinna* H.Adams et A.Adams, 1855. Type species *Erinna newcombi* H.Adams et A.Adams, 1855 (OD).

7. *Galba* Schranck, 1803. Type species *Galba pusilla* Schranck, 1803 = *Buccinum truncatum* Müller, 1774 (M).

8. *Stagnicola* Leach in Jeffreys, 1830. Type species *Stagnicola vulgaris* Leach in Jeffreys, 1830 (in syn.) = *Buccinum palustre* Müller, 1774 (M).

9. *Omphiscola* Rafinesque, 1819. Type species *Buccinum glaber* Müller, 1774 (SM Beck, 1838).

10. *Sibirigalba* Kruglov et Starobogatov, 1985 b. Type species *Limnaea truncatula* var. *sibirica* Westerlund, 1885 (OD).

11. *Walhiana* Servain, 1881. Type species *Lymnaea walhii* Moller, 1842 = *Lymnaea vahlii* Moller, 1842 (OD).

12. *Walterigalba* Kruglov et Starobogatov, 1985 b. Type species *Galba montanensis* Baker, 1913 (OD).

13. *Pseudogalba* Baker, 1911. Type species *Lymnaea humilis* Say, 1822 (OD).

14. *Spaerigalba* Kruglov et Starobogatov, 1985 b. Type species *Lymnaea bulimoides* Lea, 1841 (OD).

15. *Pectinidens* Pilsbry, 1911. Type species *Limnaea diaphana* King et Broderip, 1830 (OD).

16. *Bulimnea* Haldeman, 1841. Type species *Lymnaeus megasoma* Say, 1824 (M).

17. *Cerasina* Kobelt, 1880. Type species *Limnaea bulla* Kobelt, 1880 (OD).

18. *Radix* Montfort, 1810. Type species *Radix auriculatus* Montfort, 1810 = *Helix auricularia* Linnaeus, 1758 (OD).

19. *Peregrina* Servain, 1881. Type species *Buccinum peregrum* Müller, 1774 (SD Starobogatov, Budnikova, 1976).

20. *Myxas* Sowerby, 1822. Type species *Buccinum glutinosum* Müller, 1774 (M).

21. *Pacifimyxas* Kruglov et Starobogatov, 1985 a. Type species *Lymnaea magadanensis* Kruglov et Starobogatov, 1985 a (OD).

22. *Austropeplea* Cotton, 1942. Type species *Lymnaea aruntalis* Cotton et Godfrey, 1938 = *Succinea tomentosa* L.Pfeifer, 1855 (OD).

23. *Bullastra* Bergh, 1901. Type species *Bullastra velutinoides* Bergh, 1901 = *Amphipeplea cumingiana* L. Pfiffer, 1845 (M).

24. *Limnobulla* Kruglov et Starobogatov, 1985 a. Type species *Lymnaea peculiaris* Hubendick, 1951 (OD).

25. *Orientogalba* Kruglov et Starobogatov, 1985 b. Type species *Lymnaea heptapotamica* Lazareva, 1967 b = *Lymnaea hookeri* Reeve, 1850 (OD).

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