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Revision of the Serbian terrestrial gastropods: Ellobioidea, Achatinoidea, Oleacinoidea, Succineoidea, Chondrinoidea, Pupilloidea, Punctoidea, and Discoidea

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Abstract. In this paper, land-snail species belonging to the superfamilies Ellobioidea, Achatinoidea, Chondrinoidea, Pupilloidea, Punctoidea, Discoidea, Oleacinoidea, and Succineoidea are reviewed with regard to their historic and recent distribution in Serbia. The most important literature data related to species' distribution belonging to aforementioned groups are summarized. Distribution maps, based on both literature and newly collected data, are provided for each species. Besides, more detailed data on all up-to-date known localities in Serbia are provided. Photographs of shells are provided for each species. The latest checklist of Serbian gastropods is revised, and five species are reported for the first time from Serbia: *Chondrula microtragus* (Rossmässler, 1839), *Ena subtilis* (Rossmässler, 1837), *Gonyodiscus rotundatus* (O.F. Müller, 1774), *Paralaoma servilis* (Shuttleworth, 1852), and *Lucilla singleyana* (Pilsbry, 1889). The presence of *Pupilla sterrii* (Voith, 1840) in Serbia is confirmed after almost 70 years, and the presence of *Gittenbergia sororcula* (Benoit, 1859) in Serbia is also confirmed.

Key words. Allochthonous species, Balkans, distribution, limestone, microsnails, morphology, native species.

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Introduction

Some of the earliest data on terrestrial gastropods of Serbia can be traced to the works of Pfeiffer (1853, 1856), Möllendorff (1873), and Kobelt (1872, 1906). The first comprehensive study of recent terrestrial gastropods of Serbia was published by Pavlović (1912), who described several new taxa from the territory of Serbia and provided many new localities for previously described species. Following Pavlović's work, additional studies were published, offering further sampling sites from Serbia and describing new taxa (e.g. Jaeckel & Meise 1956; Jaeckel *et al*. 1958; Nordsieck 1971, 1973, 1977; Jovanović 1985, 1990, 1993, 1996, 1997a, 1997b; Karaman 2012; Subai 2008, 2011). During the 2020s, several efforts were made to enrich the knowledge of the terrestrial gastropod fauna of Serbia by providing new distribution records (e.g. Gojšina *et al*. 2024a; Vujić & Gojšina 2025) and by describing new species (Gojšina *et al*. 2024b). Since Pavlović (1912), no comprehensive works on Serbian terrestrial gastropods have been published, highlighting the need for a thorough summary of the gastropod fauna of Serbia. The present paper is the fourth in a series on this fauna. The three previous works in this series already published are: Gojšina *et al*. (2024b) on the genus *Vitrea* Fitzinger, 1833, Gojšina *et al*. (2025) on the superfamily Helicoidea, and Gojšina *et al*. (2026) on the slugs.

The superfamilies Ellobioidea, Achatinoidea, Oleacinoidea, Succineoidea, Chondrinoidea, Pupilloidea, Punctoidea, and Discoidea comprise a significant portion of the terrestrial gastropod fauna of Serbia (Pavlović 1912; Kara-

man 2007; Welter-Schultes 2012). Apart from the faunistic contributions mentioned above, only a few comprehensive revisions of some representatives of these groups have been published to date. Most data on these superfamilies can be found in the publication by Pavlović (1912), but Nordsieck (1970) revised the genus *Chondrina* Reichenbach, 1828, and Subai (2008, 2011) revised the genus *Agardhiella* P. Hesse, 1923. Furthermore, various European gastropod taxa have been recently revised, and these revisions are relevant to the Serbian fauna—see Nekola *et al.* (2025b) on the genus *Vallonia* Risso, 1826 and Horsák *et al.* (2026) on the genus *Pyramidula* Fitzinger, 1833.

In the present work, 52 species of Serbian land snail from the aforementioned superfamilies are reviewed based on all available literature data and a substantial amount of newly collected material. Five species are reported for the first time from Serbia. Photographs of shells and distribution maps are presented for all 52 species. All species are compared with their closest relatives. For each species, habitats in Serbia are additionally provided.

Material and methods

Terrestrial gastropods were collected from throughout Serbia for this study. Our sampling included both known localities previously studied by Petar S. Pavlović and those previously unsampled. The autonomous province of Vojvodina (Pannonian Plain) in northern Serbia was less extensively sampled due to its predominantly agricultural landscape and lack of diverse habitats. We gave special attention to numerous limestone habitats in eastern and western Serbia (Fig. 1). Snails were collected both by hand and by sampling soil. Soil samples were bagged, then later floated in water to collect specimens.

We include in the synonym lists only names under which a particular species is reported from Serbia.

Shells were photographed using a Nikon SMZ800N stereomicroscope with a Nikon DS-Fi2 camera (Belgrade, Serbia) and a Nikon SMZ25 digital microscope with Nikon Nis-Elements software (Budapest, Hungary). To ensure accurate measurements, a Nikon DS-L3 control unit was used to set scale bars. Genitalia of dissected *Succinella oblonga* were mounted on a microscopic slide and photographed under a Leica DMLB light microscope (Leica Microsystems) equipped with Leica DFC295 camera. Additionally, a part of the collection of Petar S. Pavlović, housed in the HNHM and NHMBEO collections, was examined, as were several type specimens in the SMF collection. The nomenclature follows MolluscaBase (https://molluscabase.org/). Differential diagnoses were prepared using available identification guides (Welter-Schultes 2012; Horsák *et al.* 2013) and taxonomic revisions (Schileyko 1999, 2000, 2007; Subai 2008, 2011; Nekola *et al.* 2025a, 2025b). All specimens collected by us are stored in private collection of V. Gojšina.

Abbreviations

HNHM	Hungarian Natural History Museum (Budapest, Hungary)
NHM	The Natural History Museum (London, UK)
NHMBEO	The Museum of Natural History (Belgrade, Serbia)
NHMUK	When citing lots deposited in the NHM
SMF	Senckenberg Forschungsinstitut und Naturmuseum (Frankfurt am Main, Germany)

Results

Superorder Eupulmonata Haszprunar & Huber, 1990

Order Ellobida Van Mol, 1967

Superfamily Ellobioidea L. Pfeiffer, 1854 (1822)

Remarks. The superfamily Ellobioidea mainly comprises gastropods of the intertidal zone, supratidal zone, and muddy coasts in tropical regions (Martins 1996). True terrestrial representatives are rare and are represented in Europe by the genera *Carychium* O.F. Müller, 1773 (inhabiting epigeic, moist habitats, mostly in the leaf litter of deciduous forests, bogs, and wetlands) and *Zospeum* Bourguignat, 1856 (found in caves) (Welter-Schultes 2012). In Serbia, this group is represented only by the genus *Carychium*, which includes two species: *C. minimum* O.F. Müller, 1774 and *C. tridentatum* (Risso, 1826).

Family Ellobiidae L. Pfeiffer, 1854 (1822)

Subfamily Carychiinae Jeffreys, 1830

Genus *Carychium* O.F. Müller, 1773

Type species. *Carychium minimum* O.F. Müller, 1774, by subsequent monotypy.

Carychium minimum O.F. Müller, 1774

Figures 2A–D, I, 3

Carychium minimum O.F. Müller 1774: 125.

Carychium minimum—Pavlović 1912: 113; Hesse 1929: 232; Tomić 1959: 48; Jovanović 1997b: 231; Sólymos *et al.* 2004: 152; Karaman 2007: 134.

Carychium (*Carychium*) *minimum*—Karaman 2012: 17.

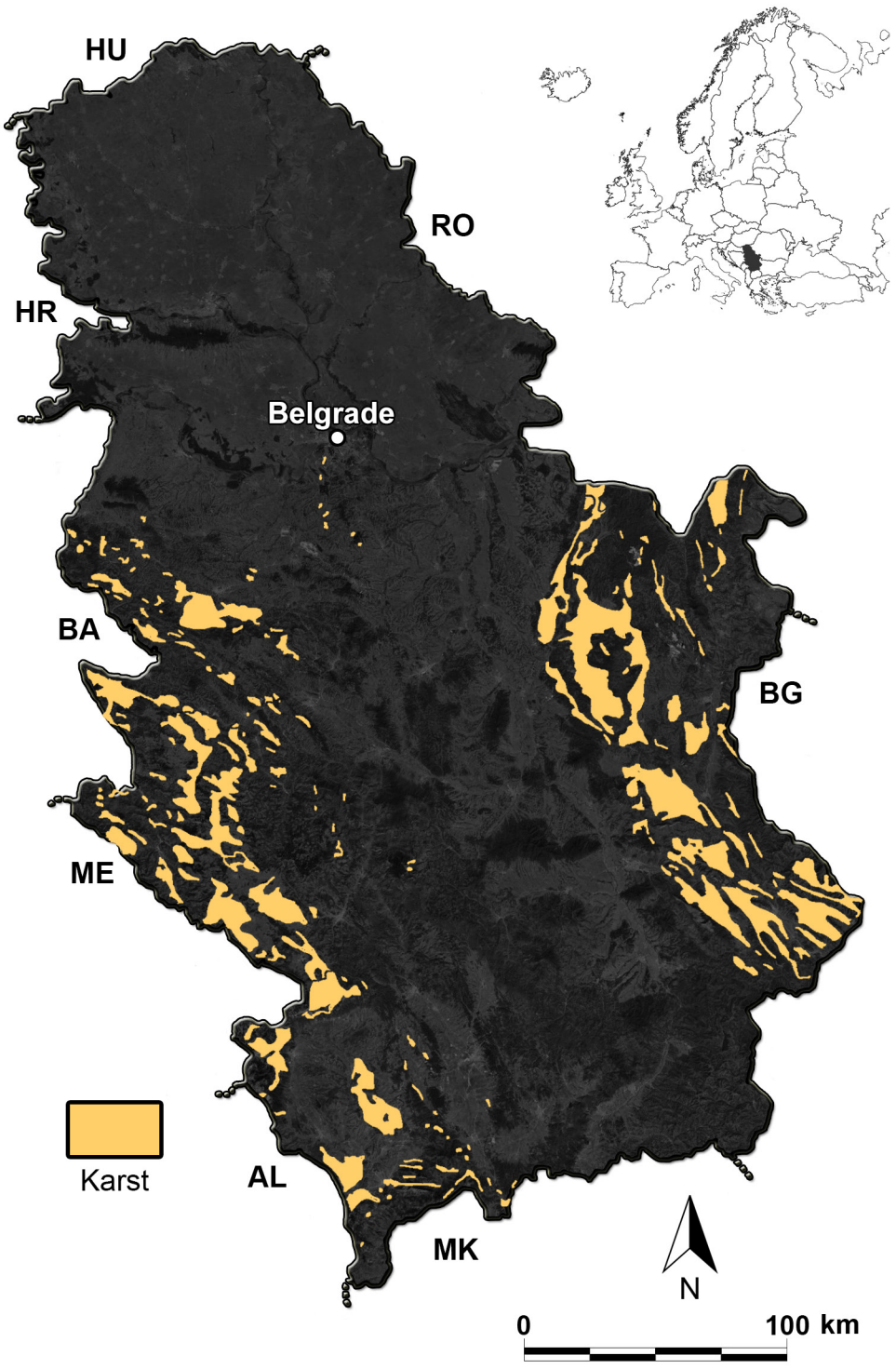

Figure 1. Map of karst in Serbia (modified after Vesović *et al.* 2024).

Material examined. Town of Kovin, Kovinski Dunavac locality, *leg.* V. Gojšina, 04 Oct. 2020, 8 specimens (44° 43′37.42″N, 020° 58′40.94″E); village of Deliblato, Obzovik locality, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44° 51′06.69″N, 021° 00′36.16″E); town of Bela Crkva, near river Nera, *leg.* V. Gojšina, 3 specimens (44° 52′22.74″N, 021° 25′33.44″E); Mt. Beljanica, ancient beech forest "Vinatovača", *leg.* Gojšina, Vujić, Vesović, 02 May 2023, 7 specimens (44° 04′24.58″N, 021° 45′31.70″E); town of Mačvanska Mitrovica, Special Nature Reserve "Zasavica",

leg. V. Gojšina, 06 May 2022, 1 specimen (44° 56′ 51.61″N, 019° 29′ 54.13″E); city of Belgrade, Grocka municipality, settlement of Vrčin, *leg.* M. Vujić, 25 Apr. 2023, 2 specimens (44° 39′ 37.21″N, 020° 35′ 41.73″E); Deliblato settlement, Kraljevac lake, *leg.* V. Gojšina, 04 May 2021, 1 specimen (44° 50′ 33.11″N, 021° 01′ 45.39″E); Đerdap National Park, near village of Dobra, *leg.* V. Gojšina, M. Vujić, N. Vesović, 04 May 2023, 4 specimens (44° 38′ 07.33″N, 021° 56′ 18.23″E); village of Bečej, near Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 2 specimens (45° 36′ 41″N, 020° 04′ 10″E); village of Gradište near city of Pirot, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Nov. 2022, 1 specimen (43° 03′ 45.46″N, 022° 41′ 44.59″E); Mačva district, behind Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 1 specimen (44° 16′ 05.50″N, 019° 25′ 48.44″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, hundreds of specimens mixed with *C. tridentatum* (43° 28′ 20.53″N, 022° 05′ 46.77″ E); Mt. Kopaonik, Metođe, road from spring Devojačke suze towards geyser, *leg.* V. Gojšina, M. Vujić, N. Vesović, 31 Jul. 2024, 2 specimens (43° 18′ 30.47″N, 020° 50′ 49.56″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; town of Bajina Bašta; village of Beljina near city of Belgrade; Mt. Beljanica; Mt. Vujan near town of Gornji Milanovac; village of Gornje Košlje; Grza river gorge; river Dubočica near town of Raška; Mt. Tara (Drundebo, Krstača hill, Kamenova Kosa, village of Perućac); Mt. Čemernica, Zečki Vrh; Mt. Javor; Jelašnica gorge near city of Niš; Kruš hill (?); Mt. Kablar; Stara planina Mts., village of Kalna; village of Lisa near town of Ivanjica; village of Lunjevica near town of Gornji Milanovac; Mt. Medvednik; Monastery Manasija near town of Despotovac; Mt. Kopaonik (Metođe, Radmanov Kamen); Murtenica mountain massif, Mt. Zlatibor; Moravica gorge; village of Negbina near town of Kokin Brod; Mt. Ovčar; Svrljiške planine Mts. (Sirinjava Duvka, village of Periš); village of Rti near town of Lučani; Rgotski Kamen near city of Bor; Mt. Rtanj; Sv. Azosim near town of Golubac; Mt. Suva planina; Stenka peak; Mt. Tupižnica; city of Užice; Crni Vrh near city of Jagodina; Crnica river gorge near town of Paraćin; Stara planina Mts., Široke Luke. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1997b)**: Mt. Tara. **After Sólymos *et al.* (2004) and Karaman (2012)**: Mt. Fruška Gora, around Dobri and Veliki streams.

Differential diagnosis. See *C. tridentatum*.

Distribution and habitats in Serbia. This is a quite common and widespread species in Serbia, occurring in virtually all localities where adequate habitat exists. It is found in wet habitats (wetter than those of *C. tridentatum*), usually next to bodies of water. It is often found in moist moss near springs, in moist detritus, or on saturated soil. It is not bound to limestone. Usually abundant in habitats with moist soil overgrown by mosses or *Carex* leaf litter. Near the village of Dobra (Đerdap = Iron Gates) and in Niševac gorge it was found in river alluvium.

Carychium tridentatum (Risso, 1826)

Figures 2E–H, J, 3

Saraphia tridentata Risso 1826: 84.
Carychium tridentatum—Hesse 1929: 232; Maassen 1988: 37; Sólymos *et al.* 2004: 152.
Carychium (*Saraphia*) *tridentatum*—Karaman 2012: 18.

Material examined. Mt. Suva Planina, village of Gornja Studena, Bojanine vode locality, *leg.* V. Gojšina, 31 May 2022, 5 specimens (43° 13′ 13.06″N, 022° 06′ 52.36″E); town of Tutin, Smolućka cave, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2023, 7 specimens (43° 02′ 43.84″N, 020° 21′ 40.00″E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 2 specimens (43° 38′ 08.31″N, 021° 53′ 18.21″E); hill above rock quarry "Kitka" near Pirot town, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr. 2023, 1 specimen (43° 10′ 30.45″N, 022° 38′ 32.03″E); town of Vrnjačka Banja, *leg.* V. Gojšina, 24 Mar. 2023, 2 specimens (43° 35′ 19″N, 020° 54′ 25″E); village of Dobri Do near city of Pirot, *leg.* V. Gojšina, M. Vujić, N. Vesović, 29 Apr 2023, 2 specimens (43° 12′ 33.38″N, 022° 38′ 14.60″E); city of Belgrade, Stepin lug forest, *leg.* V. Gojšina, M. Vujić, N. Vesović, 04 Apr. 2022, 4 specimens (44° 45′ 00.00″N, 020° 31′ 39.77″E); Đerdap National Park, near village of Dobra, *leg.* V. Gojšina, M. Vujić, N. Vesović, 04 May 2023, 5 specimens (44° 38′ 07.33″N, 021° 56′ 18.23″E); Đerdap National Park, village of Brnjica, *leg.* V. Gojšina, M. Vujić, N. Vesović, 05 May 2023, 2 specimens (44° 38′ 17.04″N, 021° 44′ 50.01″E); village of Resnik near town of Sokobanja, next to a spring, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 19 specimens (43° 37′ 57.69″N, 021° 48′ 55.78″E); Mt. Golija, village of Bogutovac, near Lopatnica river, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 08 Jul. 2024, 3 specimens (43° 39′ 15.67″N, 020° 32′ 40.85″E); Đerdap National Park, village of Dobra, valley of Dobranska River, *leg.* V. Gojšina, N. Vesović, 04 May 2023, 1 specimen (44° 36′ 35.22″N, 021° 53′ 39.81″E); Stara planina Mts., village of Temska, *leg.* V. Gojšina, M. Vujić, 23 Mar. 2024, 47 specimens (43° 15′ 43.24″N, 022° 32′ 56.67″E); Uvac region, near Potpećko lake, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 28 May 2025, 2 specimens (43° 29′ 22.92″N,

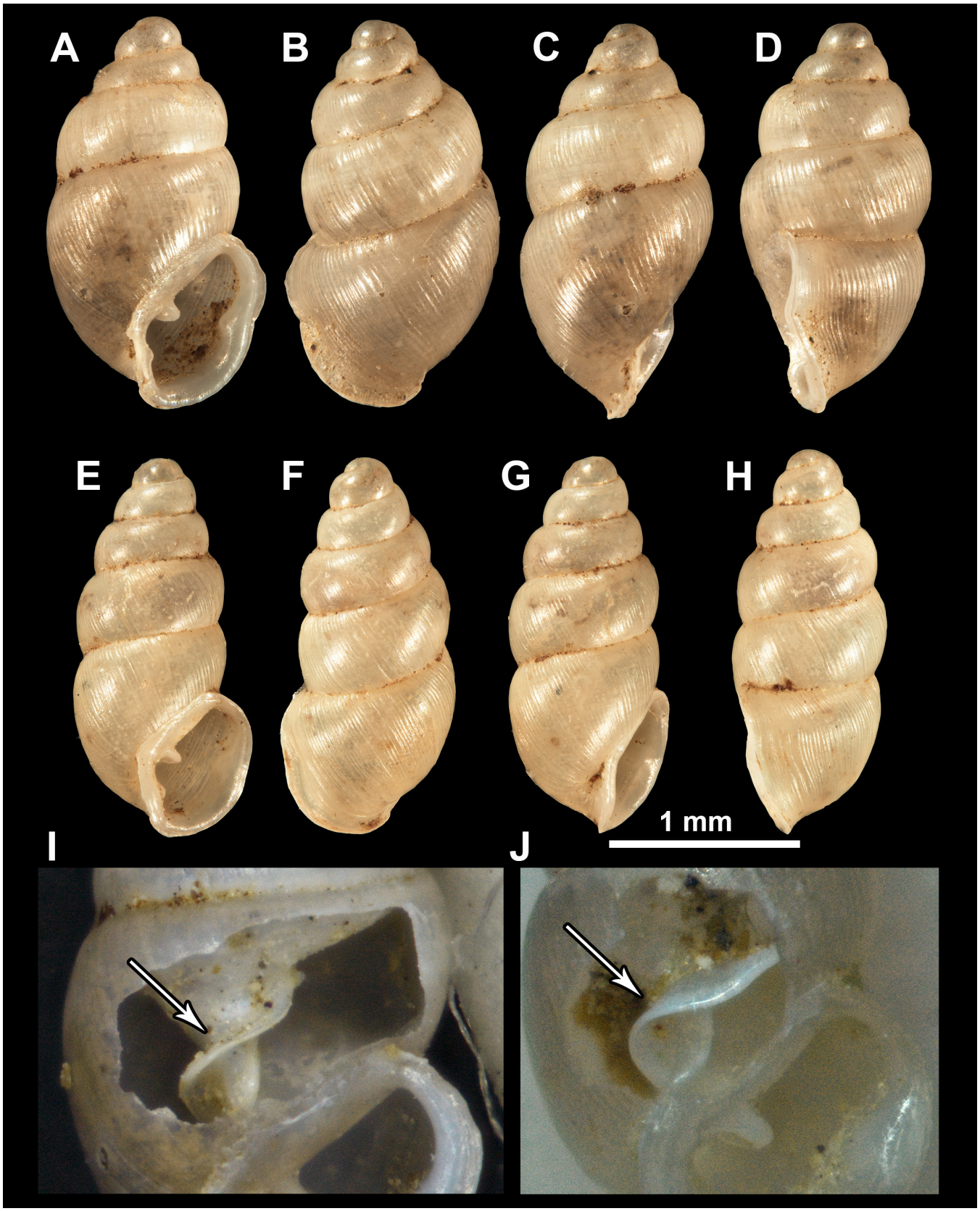

Figure 2. *Carychium* spp. in Serbia. **A**–**D**, **I**, *C. minimum* from the Niševac gorge. **E**–**H**, *C. tridentatum* from the Niševac gorge. **J**, *C. tridentatum* from the village of Dobra. Arrows point to the lamella and its smoothly spiral *vs* wavy descent.

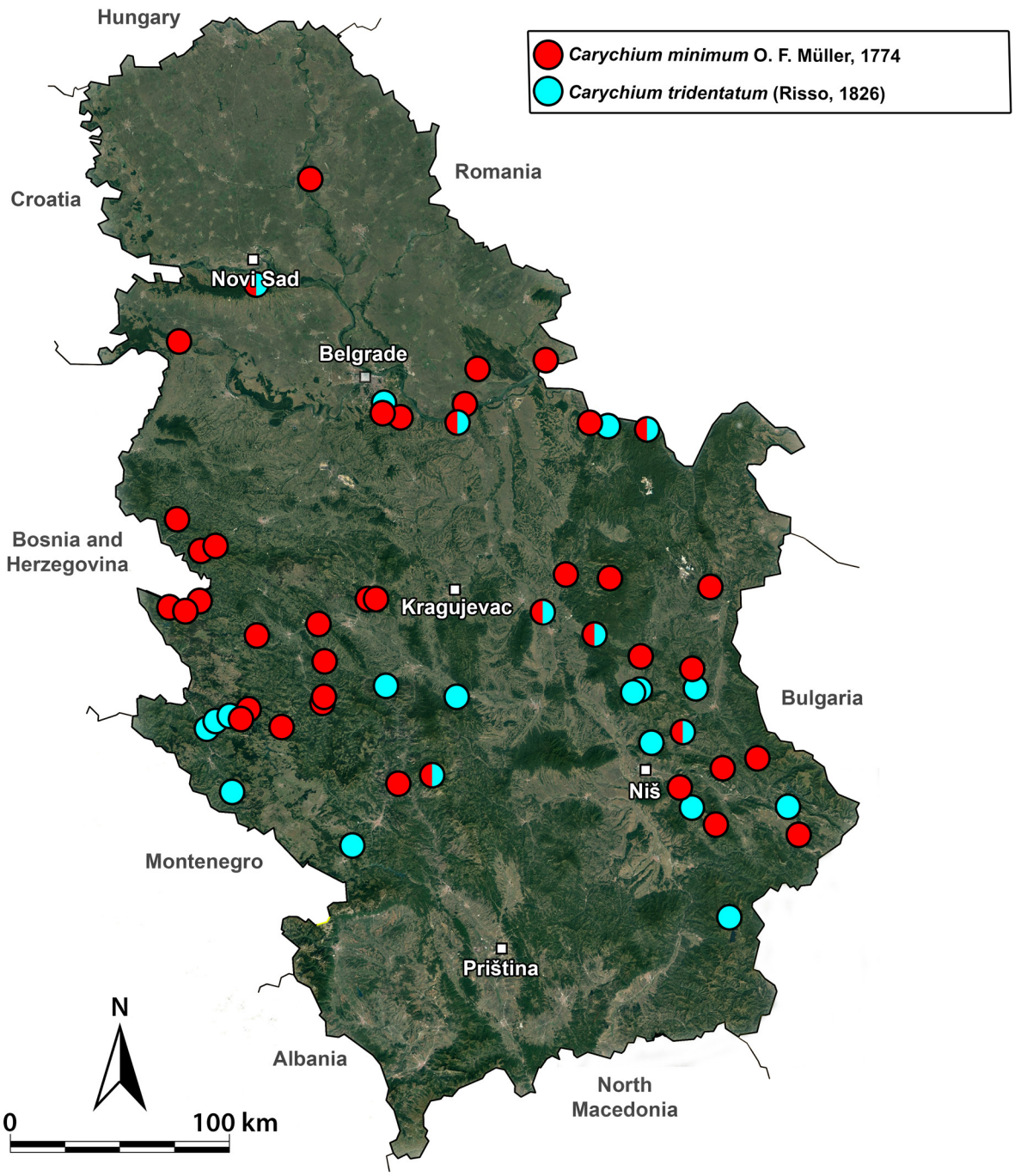

Figure 3. Distribution map of *Carychium* species in Serbia.

019° 36′ 40.35″ E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43° 31′ 25.25″ N, 019° 39′ 39.60″ E); Mt. Jadovnik, canyon at foot of mountain, *leg.* V. Gojšina, M. Vujić, N. Vesović. 28 Jun. 2025, 1 specimen (43° 14′ 04.99″ N, 019° 44′ 46.25″ E); beech forest on road before hamlet of Kovačevići near town of Kokin Brod, *leg.* V. Gojšina, D. Stojanović, M. Šćiban, 04 Jun. 2024, 1 specimen (43° 32′ 45.66″ N, 019° 41′ 56.91″ E); Mt. Kopaonik, Jelak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Aug. 2024, 7 specimens (43° 18′ 17″ N, 020° 51′ 36″ E); village of Cerje, in front of Cerjanska cave, *leg.* V. Gojšina, 18 May 2024, 1 specimen (43° 25′ 48.72″ N, 021° 56′ 23.36″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Goj-

šina, M. Vujić, 06 Aug. 2024, hundreds of specimens mixed with *C. minimum* (43°28′20.53″N, 022°05′46.77″E); Mt. Kopaonik, Metođe, limestone rocks next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 1 specimen (43°18′02.81″N, 020°51′05.34″E); Landscape of Outstanding Features "Vlasina", Polom peat bog, *leg.* M. Vujić, 06 Oct. 2023, 3 specimens (42°45′34.90″N, 022°19′28.05″E); Mt. Tara, village of Lukino selo, *leg.* D. Antić, M. Šević, D. Pavićević, I. Karaman, 06 Oct. 2023, 4 specimens (43°50′51.37″N, 019°23′48.62″E).

Sites in Serbia from the literature. After Hesse (1929): river Danube, near city of Smederevo; Velika Morava River, near town of Ćuprija; river Ravanica, tributary of Velika Morava River. **After Maassen (1988)**: Grza near Paraćin. **After Sólymos *et al.* (2004) and Karaman (2012)**: Mt. Fruška Gora, around Veliki stream.

Differential diagnosis. The shell is slenderer than *C. minimum*, with its width/height ratio >2 (<2 in *C. minimum*; see Welter-Schultes 2012). Also, these two species can be separated by the appearance of the internal lamella when the last whorl is broken above the aperture. This lamella in *C. minimum* is less twisted, descending as a simple spiral, while in *C. tridentatum* the lamella is more twisted and descending more abruptly, with the top surface of the lamella almost flat. For other interpretations of this character, see Welter-Schultes (2012) and Horsák *et al.* (2013).

Distribution and habitats in Serbia. This species is found usually in leaf litter of deciduous forests, next to brooks, and among rocks. It is not strictly bound to limestone but clearly is more frequent there. Its occurrence near the village of Dobra (Đerdap = Iron Gates) and in Niševac gorge is from river alluvium. It has been recorded even in acidic peat bogs (e.g. *Spaghnum* bogs on the Vlasina plateau).

Remarks. Generally, *C. tridentatum* inhabits similar, but less wet habitats than *C. minimum*, and sometimes they occur together.

Order Stylommatophora A. Schmidt, 1855

Suborder Achatinina Schileyko, 1979

Superfamily Achatinoidea Swainson, 1840

Remarks. Allochthonous species of Achatinoidea are frequently recorded from greenhouses in large European cities (Manganelli *et al.* 2024), and this can be expected for Serbia in the future. The superfamily is currently represented in Serbia solely by the genera *Cecilioides* A. Férussac, 1814 and *Rumina* Risso, 1826, each represented by a single species.

Family Ferussaciidae Bourguignat, 1883

Genus *Cecilioides* A. Férussac, 1814

Type species. *Buccinum acicula* O.F. Müller, 1774, by monotypy.

Cecilioides acicula (O.F. Müller, 1774)

Figures 4, 7

Buccinum acicula O.F. Müller 1774: 150–151.
Caecilianella acicula—Pavlović 1912: 63.
Caecilioides acicula—Hesse 1929: 235.
Caecilianella acicula—Tomić 1959: 32.
Cecilioides acicula—Jovanović 1985: 42; Maassen 1988: 38; Jovanović 1990: 24; Karaman 2007: 136.
Cecilioides (*Cecilioides*) *acicula*—Karaman 2012: 22.

Material examined. Deliblato settlement, Obzovik, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44°51′09.23″N, 021°00′39.94″E); Deliblato settlement, Kraljevac lake, *leg.* V. Gojšina, 11 Oct. 2020, 1 specimen (44°50′33.11″N, 021°01′45.39″E); Deliblato settlement, near ditch, *leg.* V. Gojšina, 25 Sept. 2021, 1 specimen (44°49′08.87″N, 021°01′26.87″E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 3 specimens (43°38′08.42″N, 021°53′18.21″E); city of Pirot, Pirot castle (Momčilov grad), *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 May 2023, 1 specimen (43°09′33.60″N, 022°34′52.40″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 71 specimens (43°28′20.53″N, 022°05′46.77″E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 1 specimen (43°38′02″N, 022°09′55″E); Belgrade, Jevremovac Botanical Garden, *leg.* V. Gojšina, 14 Jan. 2022, 1 specimen (44°48′58″N, 020°28′23″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): city of Belgrade; town of Bela Palanka; Jelašnica gorge near city of Niš; Jevik hill near city of Knjaževac; city of Kragujevac; Rgotski Kamen near city of Bor; Svrljig gorge; Sićevo gorge near city of Niš. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1985)**: Mt. Avala near city of Belgrade. **After Maassen (1988)**: Monastery Manasija near Despotovac. **After Jovanović (1990)**: Deliblato sandland, villages of Banatski Karlovac and Kajtasovo.

Differential diagnosis. Due to its very minute, spindle-shaped shell, this species cannot be confused with any other Serbian terrestrial gastropod. Other two similar species, *C. veneta* (Strobel, 1855) and *C. tumulorum* (Bourguignat,

Figure 4. *Cecilioides acicula* from the Niševac gorge. **A**–**D**, specimen 1. **E**–**H**, specimen 2.

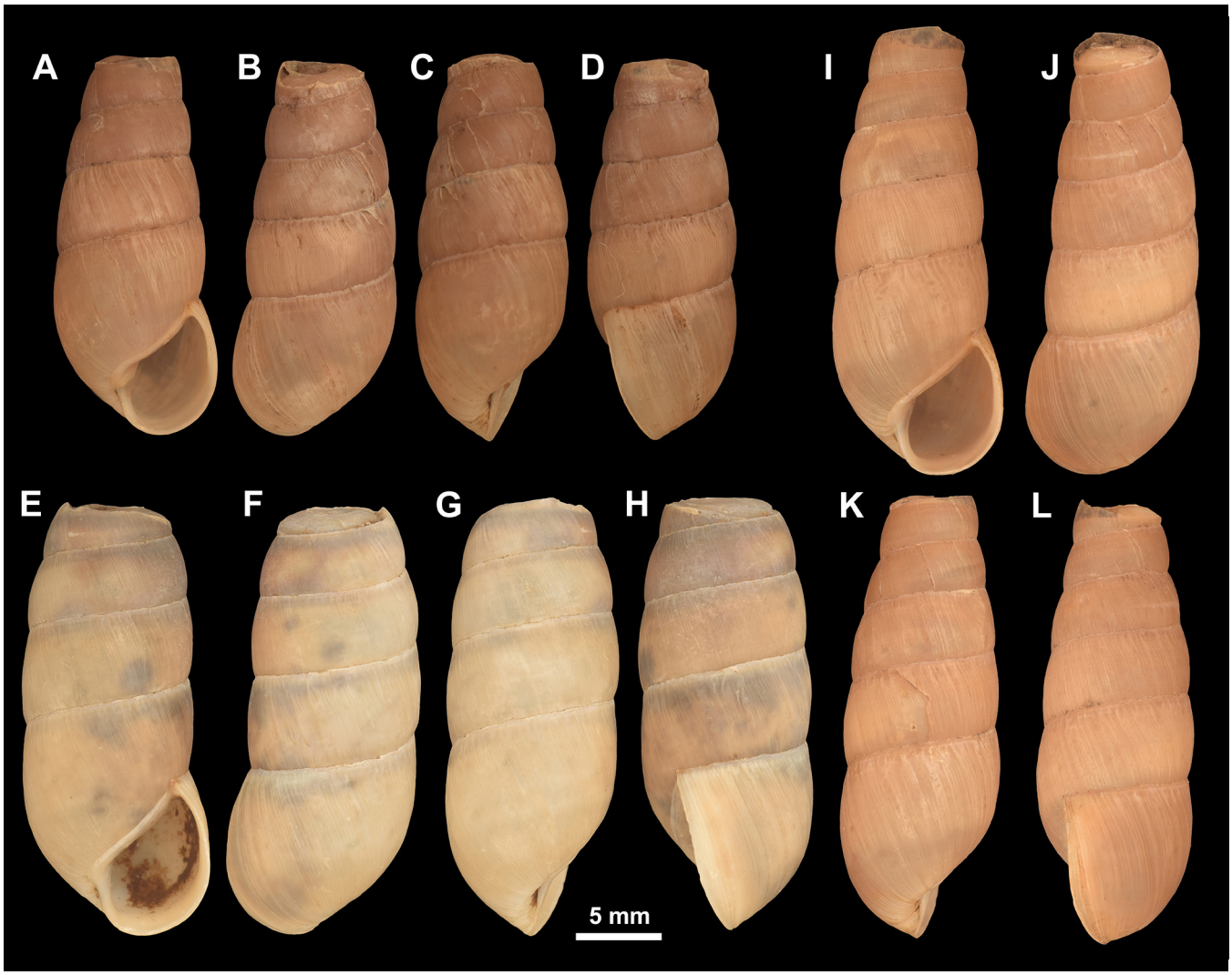

Figure 5. *Rumina decollata* from the city of Belgrade. **A–D**, specimen 1. **E–H**, specimen 2. **I–L**, specimen 3.

1856) are both larger than *C. acicula* and not known to occur in Serbia (Welter-Schultes 2012).

Distribution and habitats in Serbia. This is a subterranean species living in deep soil or in rock crevices. Although most often recorded on the karstified limestone substrate, it is not strictly bound to it, and it can occur in lowland sandlands. It also lives inside the desert dome of the greenhouse in Jevremovac Botanical Garden. Records of this species are scarce in Serbia due to its hidden lifestyle, and it is certainly more widespread than the distribution data suggest.

Family Achatinidae Swainson, 1840

Subfamily Rumininae Wenz, 1923

Genus *Rumina* Risso, 1826

Type species. *Helix decollata* Linnaeus, 1758, by monotypy.

Rumina decollata (Linnaeus, 1758)

Figures 5, 6A, B, 7

Helix decollata Linnaeus 1758: 773.
Rumina decollata—Vujić & Gojšina 2025: 461–467, figs 1, 2.

Material examined. City of Pančevo, Kotež 2 part, Stevana Šupljikca St., *leg.* V. Gojšina, M. Vujić, 24 Sept. 2024, 49 specimens (44° 53′05.5″N, 020° 38′49.2″E); city of Belgrade, Novi Beograd part, Block 30, *leg.* V. Gojšina, M. Vujić, 03 Jul. 2025, 25 specimens (44° 49′07″N, 020° 25′11″E); city of Belgrade, Surčin part, Vizantijska street, specimen observed and photographed by citizen scientist (approximate coordinates: 44° 47′48″N, 020° 18′29″E).

Sites in Serbia from the literature. After Vujić & Gojšina (2025): city of Pančevo, Kotež 2 part, Stevana Šupljikca St. (44° 53′05.5″N, 020° 38′49.2″E).

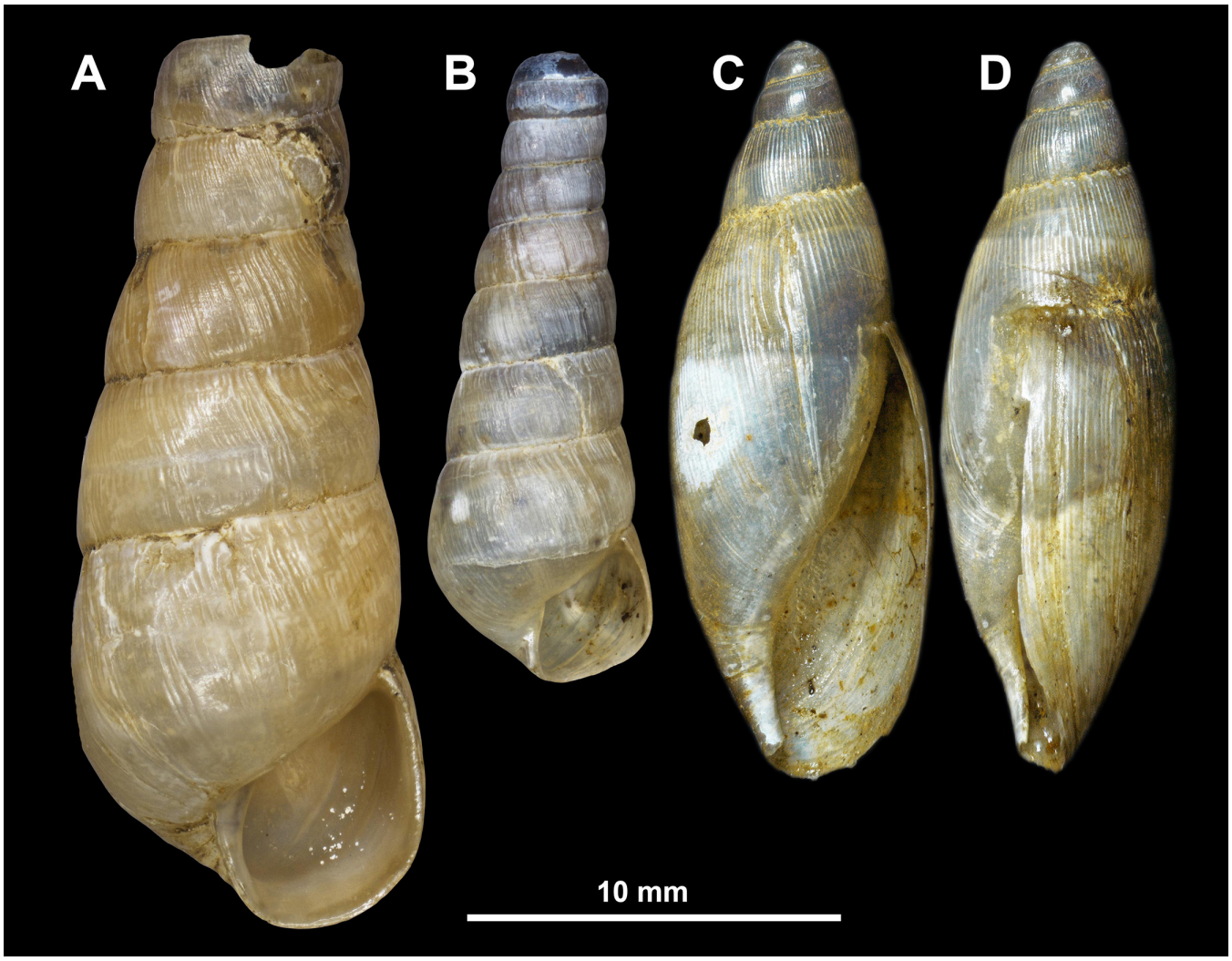

Figure 6. A, **B**, *Rumina decollata* from the city of Pančevo (from Vujić & Gojšina, 2025). **C**, **D**, *Poiretia cornea* from Mt. Tara, canyon of the river Derventa.

Differential diagnosis. Due to its large, decollated shell, this species is not similar to any other Serbian terrestrial gastropod. *Rumina saharica* Pallary, 1901 is usually slenderer and has straight longitudinal lamellae inside the vagina, which in *R. decollata* are crenulated (Carr 2002).

Distribution and habitats in Serbia. Apart from the city of Pančevo (Vujić & Gojšina 2025), this species is now also reported from the city of Belgrade (Novi Beograd and Surčin parts). At these localities, *R. decollata* was found among plants near a building.

Remarks. This is an allochthonous species of Mediterranean origin. A photograph of *R. decollata* was posted in the Facebook group "Divlji Beograd" from the municipality of Surčin, part of Belgrade. Surčin is the third known site for this species in Serbia.

Suborder Helicina Rafinesque, 1815

Superfamily Oleacinoidea H. Adams & A. Adams, 1855

Remarks. This superfamily is represented in Serbia by a single species, *Poiretia cornea* (Brumati, 1838).

Family Spiraxidae H.B. Baker, 1939

Genus *Poiretia* P. Fischer, 1883

Type species. *Bulimus algirus* Bruguière, 1792, by monotypy.

Poiretia cornea (Brumati, 1838)

Figures 6C, D, 7

Achatina cornea Brumati 1838: 35, figure 5.
Glandina algira—Möllendorff 1873: 130.

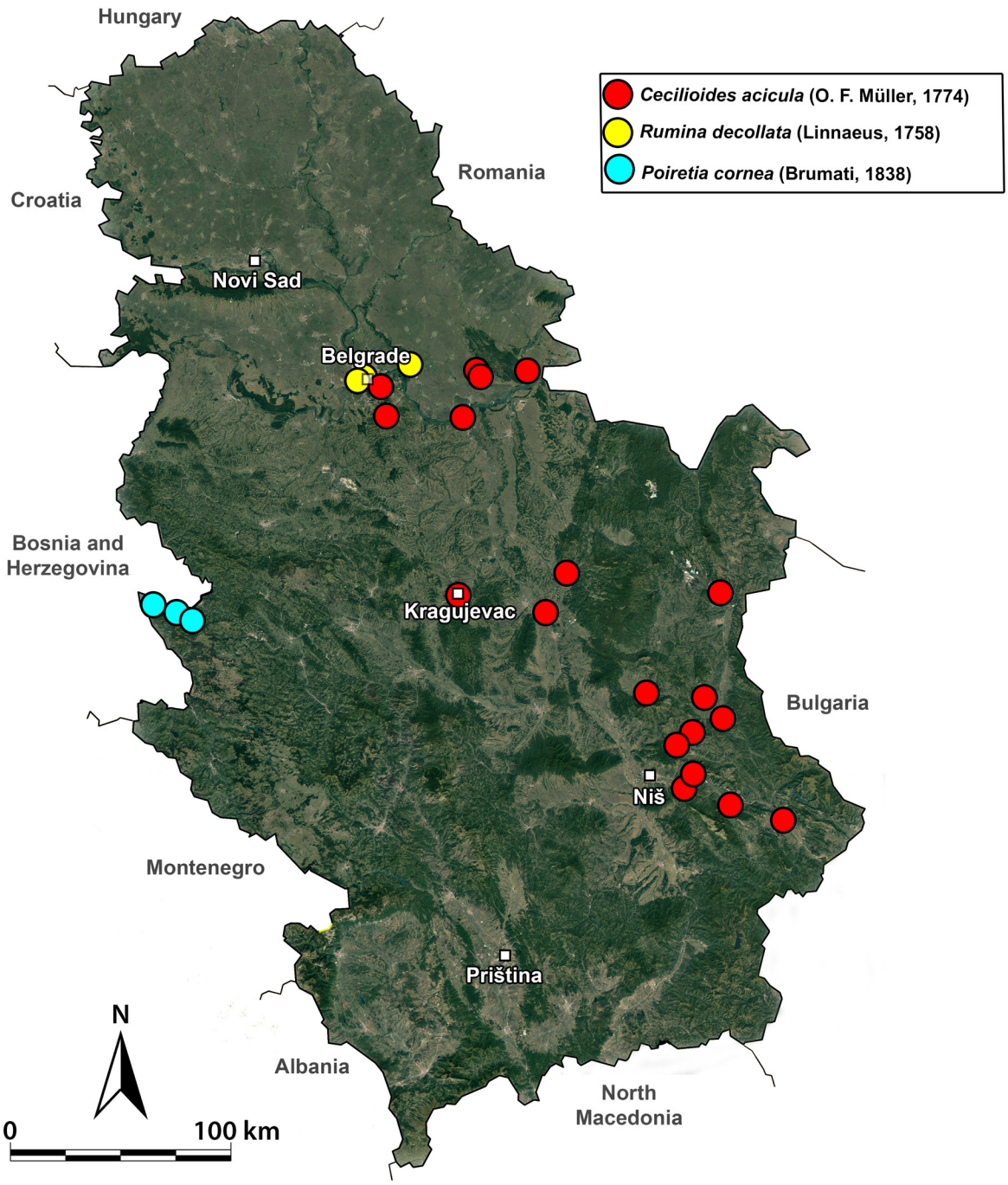

Figure 7. Distribution map of *Cecilioides*, *Rumina* and *Poiretia* in Serbia.

Glandina poireti—Westerlund 1886: 11.
Glandina algira var. *poireti*—Pavlović 1912: 18–19.
Glandina algira—Tomić 1959: 8.
Poiretia algira—Jovanović 1997b: 232.
Poiretia cornea—Karaman 2007: 148.

Material examined. Mt. Tara, canoyn of river Derventa, *leg.* V. Gojšina, J. Grego, 12 Aug. 2023, 3 specimens (43° 57′41.37″N, 019° 21′28.33″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Tara, above spring in village of Perućac; Mt. Tara, Drundebo; Mt. Tara, canyon of river Derventa; Mt. Tara, Vrujce spring; Mt. Zvijezda, Žitna cave near Gubavo Točilo; Mt. Tara, Kamenova Kosa; Mt. Tara, Prijedov (Predov) krst. **After Möllendorff (1873)**: Mt. Tara, canyon of river Derventa. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species cannot be confused with any other Serbian gastropod due to the large, spindle-shaped shell with high aperture.

Distribution and habitats in Serbia. This species inhabits areas of karstified limestone and is only found around Mt. Tara in western Serbia. These Serbian localities are among the easternmost occurrences at the edge of the species' geographic range.

Remarks. Pavlović (1912) noted that this species very frequently feeds on *Pomatias elegans* (O.F. Müller, 1774) and *Herilla ziegleri* (Küster, 1845).

Superfamily Succineoidea H. Beck, 1837

Remarks. This superfamily is distributed worldwide (Patterson 1971) and in Serbia is represented by three genera: *Oxyloma* Westerlund, 1885, *Succinea* Draparnaud, 1801, and *Succinella* Mabille, 1871. Succineids are characterised by their simple shells, which usually have few or no distinctive morphological features. Genera and species usually differentiated by the characteristics of the genitalia (Patterson 1971).

Family Succineidae H. Beck, 1837

Genus *Succinea* Draparnaud, 1801

Type species. *Helix putris* Linnaeus, 1758, by subsequent designation (Fleming 1822).

Succinea putris (Linnaeus, 1758)

Figures 8, 11

Helix putris Linnaeus 1758: 774.
Succinea putris—Gojšina *et al.* 2024a: 193.

Material examined. Village of Opovo, near Tamiš River, *leg.* V. Gojšina, 21 Apr. 2019, 1 specimen (45° 03′ 14.69″ N, 020° 25′ 00.03″ E); town of Kovin, next to Danube river, *leg.* V. Gojšina, 01 Dec. 2019, 3 specimens (44° 43′ 39.33″ N, 020° 58′ 41.48″ E); village of Jabuka near city of Pančevo, next to Tamiš river, *leg.* V. Gojšina, N. Vesović, 27 Mar. 2021, 2 specimens (44° 56′ 40.19″ N, 020° 35′ 47.53″ E); village of Šalinac, Šalinački lug, *leg.* V. Gojšina, 21 Jul. 2021, 1 specimen (44° 42′ 05.24″ N, 021° 02′ 50.03″ E); village of Staničenje, *leg.* V. Gojšina, 07 Sept. 2022, 1 specimen (43° 12′ 16.26″ N, 022° 30′ 32.67″ E); canyon of river Jerma, *leg.* V. Gojšina, 08 Sept. 2022, 1 specimen (42° 59′ 33.80″ N, 022° 37′ 55.17″ E); village of Banatska Palanka, Labudovo okno, *leg.* V. Gojšina, N. Vesović, M. Vujić, 10 Dec. 2022, 3 specimens (44° 50′ 03.84″ N, 021° 18′ 39.82″ E); village of Bečej, near Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 3 specimens (45° 36′ 41″ N, 020° 04′ 10″ E); town of Senta, close to Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 1 specimen (45° 56′ 3.31″ N, 020° 05′ 23.16″ E); village of Ada near Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 1 specimen (45° 47′ 04″ N, 020° 09′ 01″ E); surrounding of city of Valjevo, *leg.* V. Gojšina, M. Vujić, 15 Jun. 2023, 1 specimen (44° 20′ 11″ N, 020° 04′ 24″ E); city of Belgrade, settlement of Vinča, confluence of rivers Bolečica and Danube, *leg.* V. Gojšina, M. Vujić, 03 Feb. 2024, 3 specimens (44° 45′ 28.75″ N, 020° 37′ 33.95″ E); city of Aleksinac, bank of Južna Morava river, *leg.* V. Gojšina, M. Vujić, 03 Aug. 2024, 39 specimens (43° 31′ 38.83″ N, 021° 42′ 36.76″ E).

Sites in Serbia from the literature. After Gojšina *et al.* (2024a): Vojvodina province, village of Ada (45° 47′ 04.0″ N, 020° 09′ 01.0″ E); Vojvodina province, town of Senta (45° 56′ 11.5″ N, 020° 05′ 26.4″ E).

Differential diagnosis. See *O. elegans*.

Distribution and habitats in Serbia. Even though records of this species are scarce in Serbia, we assume that it is quite common along the shores of rivers and lakes especially in the northern, lowland part of the country. This species is exclusively associated with moist alluviums next to rivers and lakes, where it can be found on moist soil and mud, as well as resting on the leaves of hygrophilic plants, such as reed, burreed, and cattail. Locally, it reaches high abundance.

Remarks. The scarcity of literature data for this species can be explained by its preference for wetland habitats,which usually is not within the primary focus of studies on terrestrial molluscs.

Genus *Succinella* Mabille, 1871

Type species. *Succinea oblonga* Draparnaud, 1801, by monotypy.

Succinella oblonga (Draparnaud, 1801)

Figures 9, 11

Succinea oblonga Draparnaud 1801: 56.
Succinea oblonga—Pavlović 1912: 113; Hesse 1929: 235; Jaeckel *et al.* 1958: 145; Tomić 1959: 48.
Succinella oblonga—Maassen 1988: 37; Karaman 2007: 148; Gojšina *et al.* 2024a: 193.

Material examined. Village of Opovo, near Tamiš River, *leg.* V. Gojšina, 21 Apr. 2019, 1 specimen (45° 03′ 14.69″ N, 020° 25′ 00.03″ E); town of Kovin, next to Danube river, *leg.* V. Gojšina, 01 May 2019, 1 specimen (44° 43′ 39.33″ N, 020° 58′ 41.48″ E); village of Malo Bavanište, Raj beach, *leg.* V. Gojšina, 29 Jun. 2019, 1 specimen (44° 44′ 40.97″ N, 021° 06′ 49.74″ E); village of Deliblato, Obzovik, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44° 51′ 09.23″ N, 021°

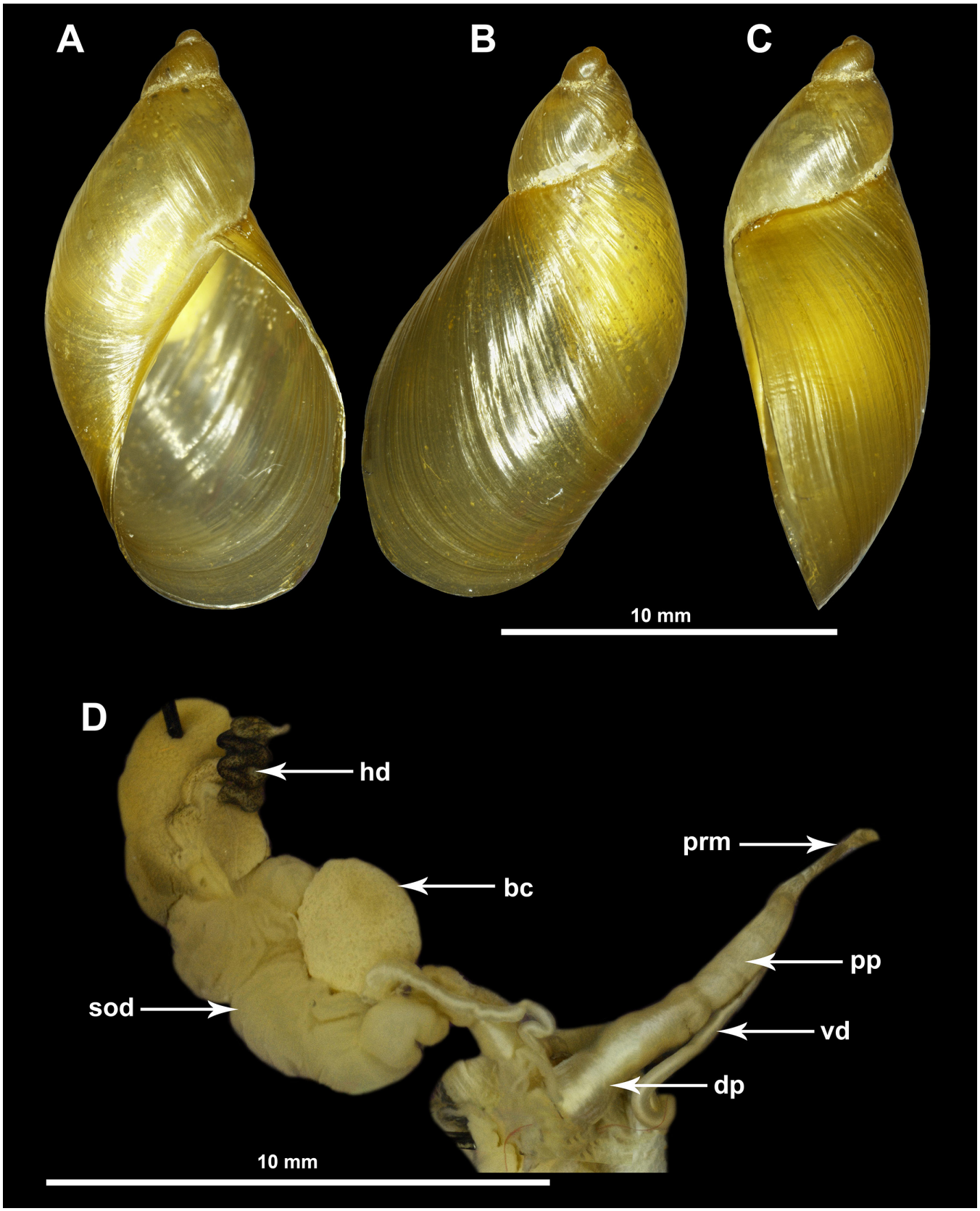

Figure 8. *Succinea putris* from the city of Aleksinac. **A**–**C**, shell. **D**, genitalia. Abbreviations: bc, bursa copulatrix. dp, distal penis. hd, hermaphroditic duct. pp, proximal penis. prm, penial retractor muscle. sod, spermoviduct. vd, vas deferens.

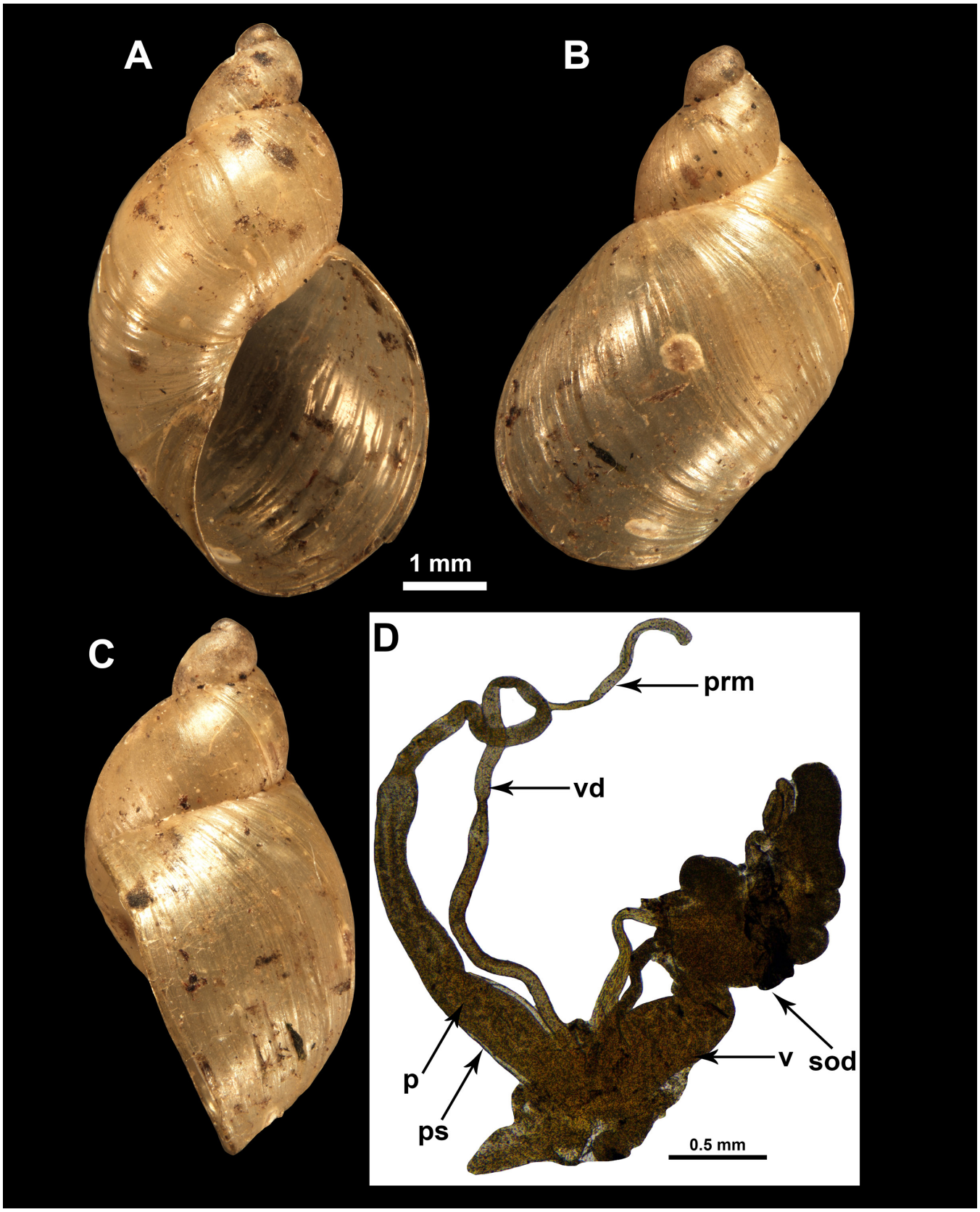

Figure 9. A–C, *Succinella oblonga* from the village of Đala. **D**, genitalia of *S. oblonga* from the city of Belgrade, settlement of Vrčin. Abbreviations: p, penis. prm, penial retractor muscle. ps, penial sheath. sod, spermoviduct. v, vagina. vd, vas deferens.

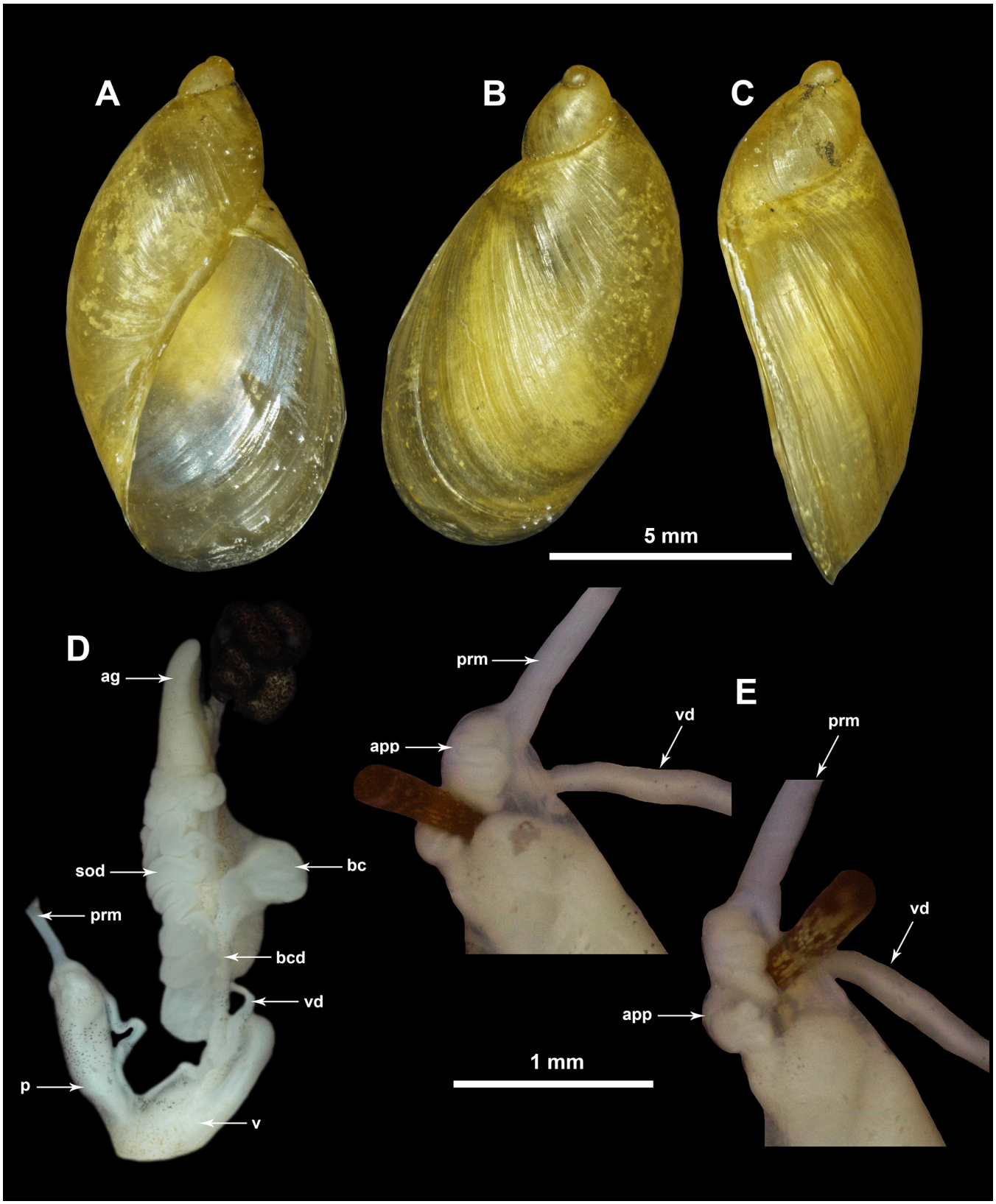

Figure 10. *Oxyloma elegans* from the city of Belgrade, near Kalemegdan fortress. **A**–**C**, shell. **D**, whole genitalia. **E**, penial appendix. Abbreviations: ag, albuminous gland. app, penial appendix. bc, bursa copulatrix. bcd, duct of the bursa copulatrix. p, penis. prm, penial retractor muscle. sod, spermoviduct. v, vagina. vd, vas deferens.

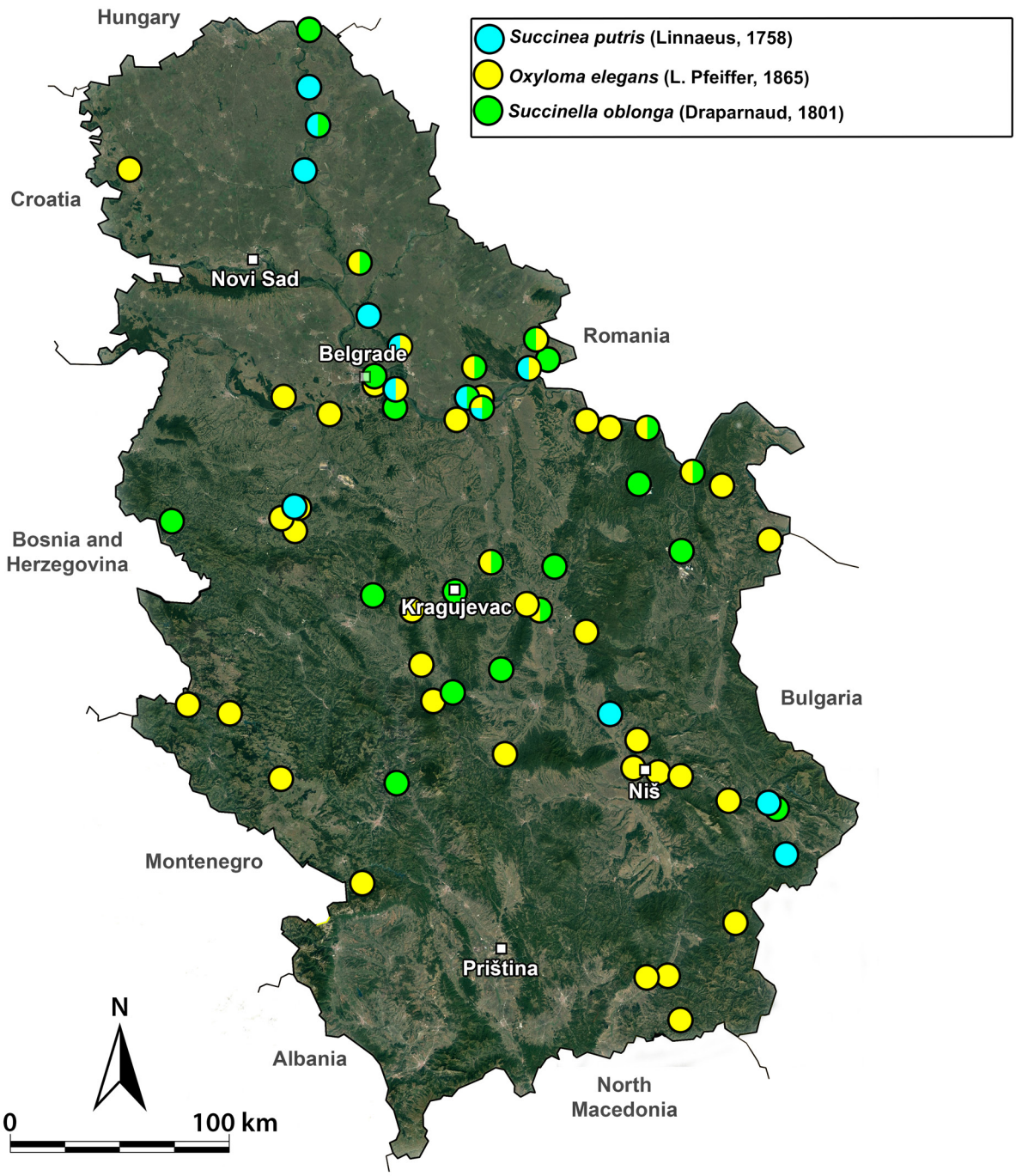

Figure 11. Distribution map of Succineidae in Serbia.

00′39.94″E); village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 11 Oct. 2020, 1 specimen (44°50′33.11″N, 021°01′45.39″E); Landscape of Outstanding Features "Karaš-Nera", *leg.* V. Gojšina, 14 Oct. 2020, 1 specimen (44°52′22.33″N, 021°25′33.23″E); city of Belgrade, Kalemegdan forterss, *leg.* M. Vujić, 21 Apr. 2021, 1 specimen (44°49′26.67″N, 020°27′02.24″E); city of Belgrade, settlement of Vrčin, Grocka municipality, *leg.* M. Vujić, 14 May 2021, 1 specimen (44°40′39.61″N, 020°36′20.22″E); village of Krivelj, towards Veliki Krš mountain, *leg.* V. Gojšina, 19 Jun. 2022, 1 specimen (44°08′48.35″N, 022°06′40.15″E); village of Ada, next to Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 1 specimen (45°47′04″N, 020°09′01″E); town of Despotovac, old watermill, *leg.* M.

Vujić, 25 Feb. 2023, 1 specimen (44° 05′ 46.19″ N, 021° 26′ 11.47″ E); Đerdap National Park, near village of Dobra, *leg.* V. Gojšina, M. Vujić, N. Vesović, 04 May 2023, 1 specimen (44° 38′ 07.35″ N, 021° 56′ 18.13″ E); village of Češko Selo, *leg.* M. Vujić, 04 Apr. 2024, 5 specimens (44° 57′ 23.39″ N, 021° 21′ 15.32″ E); village of Đala near town of Novi Kneževac, *leg.* V. Gojšina, M. Vujić, 25 Sept. 2024, 1 specimen (46° 10′ 05.98″ N, 020° 05′ 16.80″ E); Mačva district, rocks around Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 1 specimen (44° 16′ 13.33″ N, 019° 25′ 38.93″ E); city of Belgrade, settlement of Vrčin, Grocka municipality, house yard, *leg.* M. Vujić, 12 Oct. 2025, 119 specimens (44° 40′ 37.55″ N, 020° 36′ 27.19″ E);

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): city of Belgrade; village of Blagojev Kamen near town of Kučevo; Vrba near city of Kraljevo; Mt. Goč; city of Gornji Milanovac; city of Kragujevac; village of Lunjevica near city of Gornji Milanovac; city of Kragujevac; river Dubočica near town of Raška; town of Donji Milanovac; village of Poljna near city of Kruševac; Rogot near town of Lapovo. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river near town of Ćuprija; river Jezava ("Jesova" in Hesse 1929) near city of Smederevo **After Maassen (1988)**: Pirot, surroundings of Pirot castle **After Gojšina *et al.* (2024a)**: Vojvodina province, village of Ada (45° 47′ 04.0″ N, 020° 09′ 01.0″ E).

Differential diagnosis. This species can be separated from other succineids by the much deeper suture, which make the whorls more convex and bulging.

Distribution and habitats in Serbia. This species tolerates drier habitats than *Oxyloma* and *Succinea* species. Records in Serbia are scattered, but *S. oblonga* is probably much more widespread. It inhabits a variety of habitats, from moist, swampy areas to drier, ruderal areas.

Remarks. It is a relatively common species associated with horticulture. It is often found in plant nurseries and gardens, which certainly contributes to its spread.

Genus *Oxyloma* Westerlund, 1885

Type species. *Succinea dunkeri* L. Pfeiffer, 1865, by subsequent desigantion (Westerlund 1903).

Oxyloma elegans (Risso, 1826)

Figures 10, 11

Succinea elegans Risso 1826: 59.

Succinea elegans—Pavlović 1912: 112; Hesse 1929: 235; Tomić 1959: 47.

Oxyloma elegans—Karaman 2007: 148.

Material examined. Village of Kupinovo, Obedska Bara oxbow lake, *leg.* V. Gojšina, 28 Apr. 2019, 1 specimen (44° 44′ 12.40″ N, 019° 59′ 20.87″ E); town of Kovin, Šljunkara lake, *leg.* V. Gojšina, 01 May. 2019, 1 specimen (44° 43′ 55.70″ N, 021° 00′ 38.82″ E); village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 09 May 2020, 6 specimens (44° 50′ 31.32″ N, 021° 01′ 50.49″ E); village of Perlez, Carska Bara oxbow lake, *leg.* V. Gojšina, 20 Oct. 2019, 1 specimen (45° 15′ 25.09″ N, 020° 24′ 10.70″ E); town of Donji Milanovac, Poreč bay, *leg.* V. Gojšina, 11 Jun. 2020, 1 specimen (44° 27′ 41.38″ N, 022° 10′ 14.74″ E); settlement of Jabuka near city of Pančevo, *leg.* V. Gojšina, 27 Mar. 2021, 4 specimens (44° 56′ 16.31″ N, 020° 34′ 33.80″ E); Landscape of Outstanding Features "Vlasina", village of Vlasina Rid, Vlasina lake, *leg.* M. Vujić, 30 May 2021, 2 specimens (42° 44′ 08.12″ N, 022° 20′ 02.32″ E); village of Vratna near city of Negotin, Vratna limestone gates in canyon of Vratna river, *leg.* V. Gojšina, 24 Mar. 2022, 1 specimen (44° 22′ 59.97″ N, 022° 20′ 12.63″ E); village of Čedovo near town of Sjenica, *leg.* V. Gojšina, 26 Jul. 2022, 7 specimens (43° 18′ 25.54″ N, 020° 00′ 46.94″ E); village of Banatska Palanka, Labudovo okno, *leg.* V. Gojšina, N. Vesović, M. Vujić, 10 Dec. 2022, 2 specimens (44° 50′ 03.84″ N, 021° 18′ 39.82″ E); city of Obrenovac, Zabran, *leg.* V. Gojšina, 20 Apr. 2020, 3 specimens (44° 40′ 06.55″ N, 020° 14′ 17.90″ E); village of Donja Trnica, Vražji Kamen, *leg.* V. Gojšina, M. Vujić, N. Vesović, 17 May 2023, 5 specimens (42° 22′ 59.25″ N, 022° 03′ 05.57″ E); town of Vranjska Banja, *leg.* V. Gojšina, M. Vujić, N. Vesović, 17 May 2023, 6 specimens (42° 32′ 43.88″ N, 022° 00′ 27.29″ E); town of Mionica, village of Brežđe, Šalitrena cave, *leg.* M. Vujić, 04 Aug. 2023, 1 specimen (44° 11′ 26.76″ N, 020° 04′ 42.29″ E); Đerdap National Park, village of Brnjica, *leg.* V. Gojšina, M. Vujić, N. Vesović, 05 May 2023, 2 specimens (44° 38′ 17.04″ N, 021° 44′ 49.98″ E); village of Brzi Brod near city of Niš, *leg.* V. Gojšina, M. Vujić, N. Vesović, 08 May 2023, 4 specimens (43° 18′ 57.64″ N, 021° 58′ 0.81″ E); Đerdap National Park, between villages of Kožica and Dobra, *leg.* V. Gojšina, M. Vujić, N. Vesović, 04 May 2023, 1 specimen (44° 37′ 57.66″ N, 021° 56′ 20.59″ E); town of Golubac, near Danube river, *leg.* V. Gojšina, 02 Nov. 2022, 1 specimen (44° 39′ 18.01″ N, 021° 37′ 21.85″ E); city of Belgrade, settlement of Vinča, confluence of rivers Boleč-ica and Danube, *leg.* V. Gojšina, M. Vujić, 03 Feb. 2024, 2 specimens (44° 45′ 28.75″ N, 020° 37′ 33.95″ E); village of Češko Selo, *leg.* M. Vujić, 04 Apr. 2024, 5 specimens (44° 57′ 23.39″ N, 021° 21′ 15.32″ E); below Monastery of St. Joakim and Ana, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 02 Jun. 2024, 2 specimens

(43° 32′ 38.33″N, 019° 43′ 11.64″E); town of Brus, Ćelije lake, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Aug. 2024, 4 specimens (43° 23′ 20.67″N, 021° 09′ 35.90″E); village of Sonta, plant nursery, *leg.* M. Vujić, Dec. 2024, 18 specimens (45° 36′ 08.12″N, 019° 05′ 26.52″E); village of Velepolje, Banja Topilo, 08 Aug. 2024, *leg.* V. Gojšina, M. Vujić, 1 specimen (43° 26′ 52.74″N, 021° 52′ 40.79″E); town of Bela Crkva, near Nera river, *leg.* V. Gojšina, 14 Oct. 2020, 10 specimens (44° 52′ 23.62″N, 021° 25′ 31.41″E); city of Niš, Trupale, *leg.* B. Novaković, 17 Oct. 2024, 1 specimen (43° 20′ 20″N, 021° 48′ 55″E); Kolubara district, village of Mrčić, *leg.* B. Novaković, 30 Jul. 2024, 3 specimens (44° 16′ 46″N, 019° 59′ 09″E); confluence of Boracka river into Gruža reservoir, Radmilović, *leg.* B. Novaković, 07 Sept. 2024, 1 specimen (43° 56′ 08″N, 020° 40′ 10″E); Kolubara district, Slovac, *leg.* B. Novaković, 30 Jul. 2024, 1 specimen (44° 20′ 19″N, 020° 05′ 23″E); Zapadna Morava river, Sirča, *leg.* B. Novaković, 29 Jul. 2024, 2 specimens (43° 44′ 12″N, 020° 43′ 09″E); Lim river near town of Priboj, lefg. B. Novaković, 15 Aug. 2024, 1 specimen (43° 34′ 53″N, 019° 31′ 25″E); Ibar river, Batrage, *leg.* B. Novaković, 23. Jul. 2024, 1 specimen (42° 56′ 03″N, 020° 24′ 12″E); Zapadna Morava river near city of Kraljevo, *leg.* B. Novaković, 29 Jul. 2024, 2 specimens (43° 43′ 51″N, 020° 44′ 39″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): city of Belgrade, Danube river, close to slaughterhouse; Monastery Sv. Petka in Grza river gorge; Paraćinska and Rakitovačka ponds near city of Jagodina; Rogot near town of Batočina, Moravište; Mt. Goč, Dobra Voda; village of Barje near city of Pirot; Krupačko blato peat bog near city of Pirot; Sićevo gorge near city of Niš; Negotinsko blato near city of Negotin; city of Vranje. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river near town of Ćuprija.

Differential diagnosis. This species differs from *S. putris* in its usually smaller size, straighter shell outline (see Horsák *et al.* 2013: fig. 203), and less smooth, less densely radially sculptured, and matte shell surface. Also, *S. putris* has its penis divided into proximal and distal portions, which are not distinguishable in *O. elegans* (Schileyko 2007). *Oxyloma* species have a coiled penial appendix inside the penis, which is absent in *Succinea* (Schileyko 2007). Differential characters between this species and *O. dunkeri* are uncertain (see Remarks).

Distribution and habitats in Serbia. Alongside different water bodies, usually found on plants. Found across Serbia, but clearly more frequent than currently presented.

Remarks. Identifications by Pavlović (1912) were most probably based on empty shells which is why the presence and true distribution of this genus in Serbia yet has to be proven. *Oxyloma dunkeri* (L. Pfeiffer, 1865) (reported in Pavlović (1912) under *Succinea hungarica* Hazay, 1880) is of uncertain taxonomic status. Allegedly, important taxonomic traits lie in the shape and length of the penial appendix (short and pointed in *O. elegans* and long and sphaerical in *O. dunkeri* (see Grossu 1987), but contradictory literature data exist since Schileyko & Likharev (1986) showed the opposite appearance of this trait for these species. Georgiev (2006) mentioned the following anatomical characters that could distinguish *O. elegans* and *O. dunkeri*: i) broader vagina in *O. dunkeri*; ii) thicker penial retractor muscle in *O. dunkeri* which is clearly longer than the penis (thin and almost equally long as the penis in *O. elegans*). We cannot comment extensively on the importance of taxonomic traits mentioned by Georgiev (2006), but we consider the appearance of the penial retractor muscle less likely to be a stable character useful to distinguish the two species. Georgiev (2006) did not note whether the penial appendix was considered during identification. Due to the mentioned taxonomic incertainties, we exclude *O. dunkeri* from the fauna of Serbia.

Superfamily Chondrinoidea Steenberg, 1925

Remarks. Chondrinoidea are in Serbia represented by both the Chondrinidae and the Truncatellinidae. Truncatellinidae are represented by the genera *Columella* Westerlund, 1878 (one species in Serbia) and *Truncatellina* R. T. Lowe, 1852, while Chondrinidae are represented by *Chondrina* Reichenbach, 1828 (two species) and *Granaria* Held, 1838 (one species).

Family Truncatellinidae Steenberg, 1925

Genus *Columella* Westerlund, 1878

Type species. *Pupa inomata* Michaud, 1831, by monotypy.

Columella edentula (Draparnaud, 1805)

Figures 12, 14

Pupa edentula Draparnaud 1805: 59.
Sphyradium edentula—Pavlović 1912: 30.
Columella edentula—Jaeckel *et al.* 1958: 146.
Edentulina edentula—Tomić 1959: 15.
Columella edentula—Jovanović 1997b: 231; Karaman 2007: 147.

Material examined. Pešter plateau, Đerekarska River, *leg.* V. Gojšina, 27 Jul. 2022, 1 specimen; village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 1 specimen (42° 59′ 24.05″N, 020° 07′ 51.61″E); Mt. Kopaonik, Metođe, limestone rocks

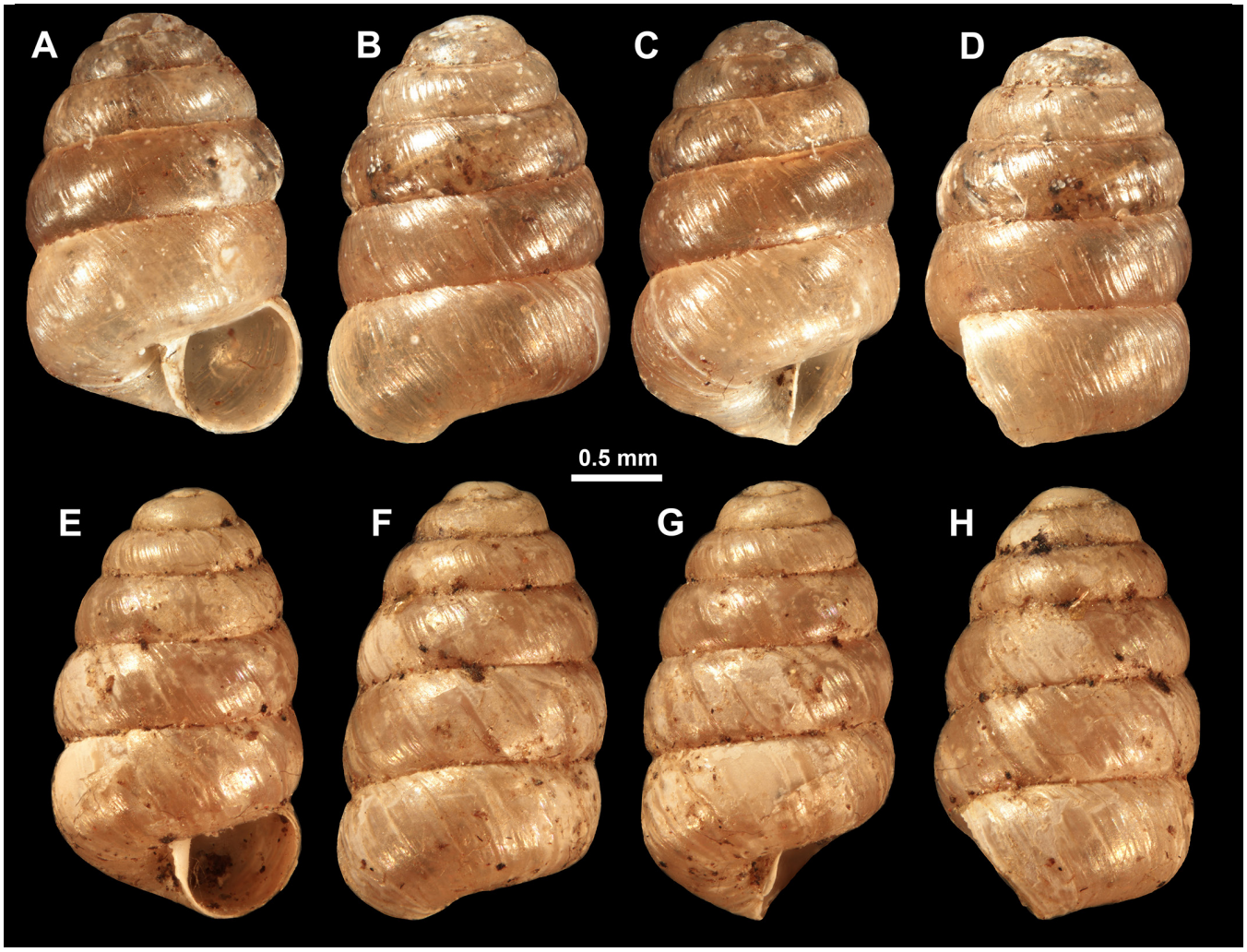

Figure 12. *Columella edentula.* **A**–**D**, from Mt. Kopaonik (Metođe). **E**–**H**, from the banks of the Rutoška river.

next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 2 specimens (43° 18′ 02.81″ N, 020° 51′ 05.34″ E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43° 31′ 25.18″ N, 019° 39′ 39.54″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Velika Tisnica river gorge (near town of Žagubica); Veliki Rzav river; Mt. Tara (canyon of river Derventa, Krstača hill); village of Lunjevica near town of Gornji Milanovac; Mt. Medvednik, Malo Platno; Mt. Povlen; Stara planina Mts., Široke Luke. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species differs from *Pupilla* species by its slenderer shell and toothless aperture with a thinner peristome. See also *T. cylindrica*.

Distribution and habitats in Serbia. Records are scarce in Serbia, and this species' distribution in the country is not well known. *Columella edentula* prefers calcareous substrate where it can be found in wet habitats.

Genus *Truncatellina* R.T. Lowe, 1852

Type species. *Pupa linearis* R.T. Lowe, 1852, by monotypy.

Truncatellina claustralis (Gredler, 1856)

Figures 13A–D, I, J, 14

Pupa claustralis Gredler 1856: 116–118.
Isthmia salurensis—Pavlović 1912: 75–77.
Truncatellina claustralis—Jaeckel *et al.* 1958: 146; Jovanović 1997b: 231; Karaman 2007: 147.
Isthmia salurensis—Tomić 1959: 38.

Material examined. Jelašnica gorge near city of Niš, on a limestone next to road, *leg.* V. Gojšina, 28 May 2022, 15 specimens (43° 16′ 48.96″ N, 022° 03′ 46.18″ E); canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 25 specimens (42° 56′ 03.06″ N, 020° 24′ 02.88″ E); limestone cliffs near

Monastery of St. Joakim and Ana, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 25 Apr. 2024, 8 specimens (43° 31′ 45.41″ N, 019° 43′ 26.19″ E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43° 31′ 25.25″ N, 019° 39′ 39.60″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 184 specimens (mixture with *T. cylindrica*) (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 2 specimens (43° 04′ 29″ N, 022° 47′ 46″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): village of Gornje Košlje; Zabučje near city of Užice; Mt. Tara (Krstača hill, village of Perućac, Vrujce spring, canyon of river Derventa); Gradac (possibly referring to Monastery Gradac on Mt. Golija); Jelašnica gorge near city of Niš; Mt. Vidlič near city of Pirot; village of Basara near city of Pirot; Sićevo gorge near city of Niš; village of Crnoljevica near town of Svrljig; Stara planina Mts., village of Kalna; Sv. Stevan monastery near city of Aleksinac; Ripaljka waterfall near town of Sokobanja; Monastery Suvodol near village of Minićevo; Rgotski Kamen near city of Bor; Mt. Stol near city of Bor. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. *Truncatellina callicratis* (still not reported from Serbia) has its palatal plica shallower within the aperture and, thus, it is visible in standard view (Welter-Schultes 2012). See also *T. cylindrica*.

Distribution and habitats in Serbia. This is a little-known species in Serbia. It inhabits dry limestone areas in western and eastern Serbia.

Remarks. *Truncatellina claustralis* frequently occurs syntopically with *T. cylindrica*.

Truncatellina cylindrica (J.B. Férussac, 1807)

Figures 13E–H, K, 14

Vertigo cylindrica J.B. Férussac 1807: 52.
Pupa minutissima—Möllendorff 1873: 134.
Isthmia minutissima—Pavlović 1912: 74–75
Truncatellina cylindrica—Hesse 1929: 233; Jaeckel *et al.* 1958: 146.
Isthmia (*Pupa*) *minutissima*—Tomić 1959: 37–38.
Truncatellina cylindrica—Jovanović 1985: 41; Maassen 1988: 37; Jovanović 1990: 24; Jovanović 1993: 239; Jovanović 1996: 218; Jovanović 1997b: 231; Karaman 2007: 147; Karaman 2012: 21.

Material examined. Village of Opovo, near Tamiš River, *leg.* V. Gojšina, 21 Apr. 2019, 3 specimens (45° 03′ 14.69″ N, 020° 25′ 00.03″ E); village of Deliblato, Obzovik, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44° 51′ 09.23″ N, 021° 00′ 39.94″ E); town of Kovin, next to Danube river, *leg.* V. Gojšina, 01 May 2019, 3 specimens (44° 43′ 39.33″ N, 020° 58′ 41.48″ E); town of Majdanpek, Radenkova bina, close to Rajkova cave, *leg.* V. Gojšina, 23 Mar. 2022, 3 specimens (44° 26′ 33.77″ N, 021° 57′ 11.89″ E); village of Vratna, Vratna gates in canyon of river Vratna, *leg.* V. Gojšina, 24 Mar. 2022, 1 specimen (44° 22′ 57.03″ N, 022° 20′ 16.42″ E); village of Plavna, canyon of Zamna river, Rajska prerast limestone gate, *leg.* V. Gojšina, 25 Mar. 2022, 2 specimens (44° 18′ 04.51″ N, 022° 16′ 44.58″ E); village of Rudna Glava, Valja prerast limestone gate, *leg.* V. Gojšina, 26 Mar. 2022, 1 specimen (44° 21′ 43.21″ N, 021° 59′ 30.62″ E); town of Bosilegrad, Milevska planina mountain, *leg.* V. Gojšina, 06 Jun. 2022, 1 specimen (42° 31′ 03.66″ N, 022° 28′ 26.94″ E); village of Donja Glama, Svrljiške planine mts., *leg.* V. Gojšina, 04 Aug. 2022, 1 specimen (43° 16′ 21.58″ N, 022° 22′ 07.28″ E); Stara planina mts., towards village of Oreovica, *leg.* M. Šćiban 30 Apr. 2012; Pešter plateau, village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 1 specimen (42° 59′ 24.05″ N, 020° 07′ 51.61″ E); Pešter plateau, spring of river Vapa, *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43° 14′ 12.56″ N, 020° 06′ 00.23″ E); Pešter plateau, village of Doliće, Hotel Pešter, among rocks, *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43° 06′ 01.83″ N, 020° 00′ 17.06″ E); city of Belgrade, Kalemegdan fortress, *leg.* M. Vujić, 28 Dec. 2022, 1 specimen (44° 49′ 26.67″ N, 020° 27′ 02.24″ E); Stara planina mts., village of Temska, *leg.* V. Gojšina, 30 May 2022, 2 specimens (43° 15′ 45.96″ N, 022° 33′ 03.31″ E); town of Despotovac, road towards Resavska cave, *leg.* V. Gojšina, M. Vujić, 25 Feb. 2023, 1 specimen (44° 06′ 06.92″ N, 021° 33′ 37.67″ E); Jelašnica gorge near city of Niš, on a limestone next to road, *leg.* V. Gojšina, 28 May 2022, 5 specimens (43° 16′ 48.96″ N, 022° 03′ 46.18″ E); city of Pirot, hill above rock quarry "Kitka", *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr. 2023, 1 specimen (43° 10′ 30.45″ N, 022° 38′ 32.03″ E); village of Resnik near town of Sokobanja, spring Vrelo, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 3 specimens (43° 37′ 57.49″ N, 021° 48′ 55.48″ E); town of Sokobanja, Lepterija locality, on limestone rocks, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 1 specimen (43° 38′ 10.38″ N, 021° 53′ 16.95″ E); town of Tutin, Smolućka cave, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2023, 5 specimens (43° 02′ 43.84″ N, 020° 21′ 40.00″ E); Braničevo district, village of Usije, *leg.* M. Vujić, 14 Jul. 2023, 4 specimens (44° 41′ 20.40″ N, 021° 23′ 46.72″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 184 specimens (mix with *T. claustralis*) (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); town of Preševo, Ilinska cave, *leg.* V. Gojšina, M. Vujić, 09 Oct. 2024, 21 spec-

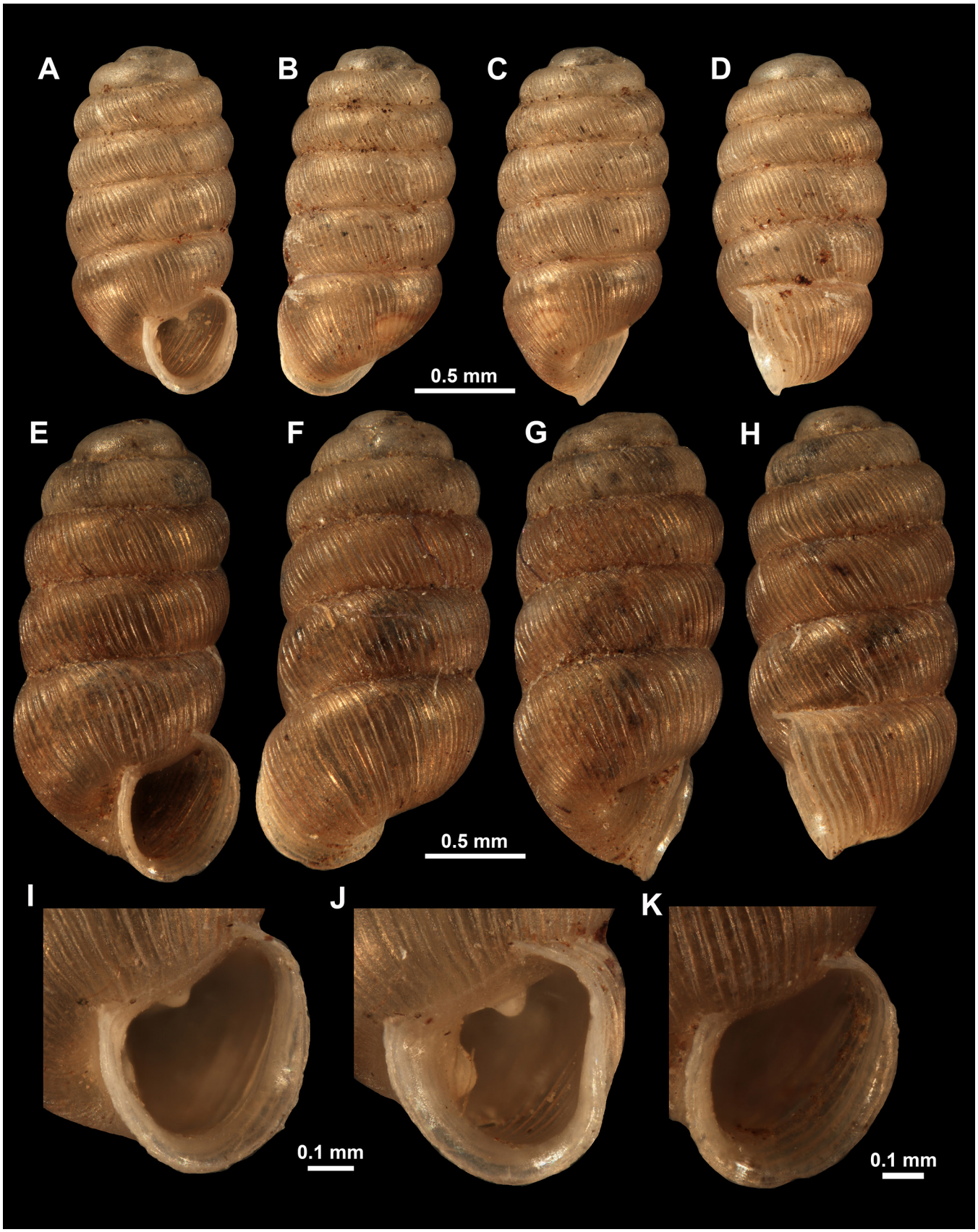

Figure 13. *Truncatellina* spp. in Serbia. **A**–**D**, **I**, **J**, *T. claustralis* from the Niševac gorge. **E**–**H**, **K**, *T. cylindrica* from the Ilinska cave.

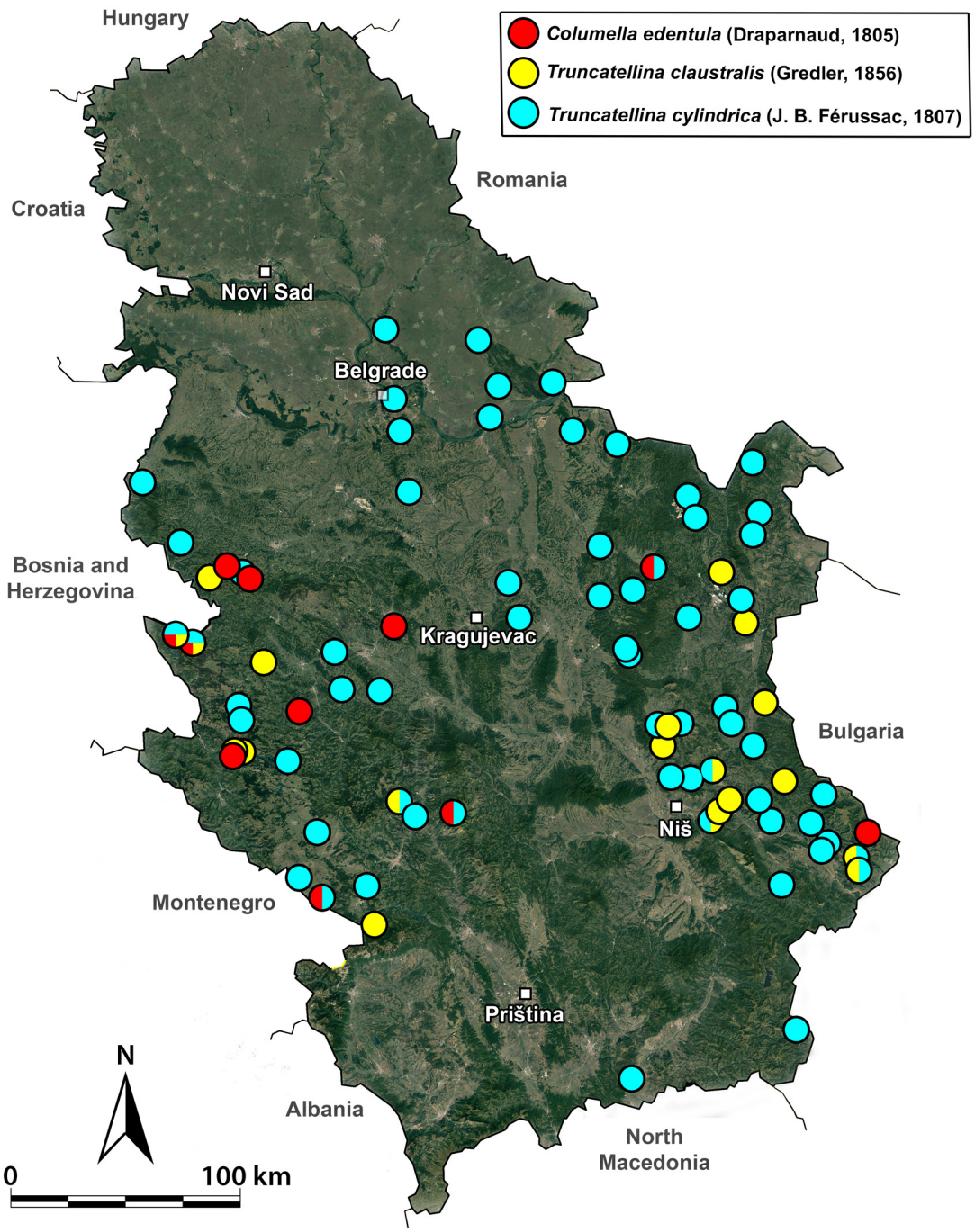

Figure 14. Distribution map of Truncatellinidae in Serbia.

imens (42°20′51.44″N, 021°35′55.62″E); Stara planina Mts., village of Temska, *leg.* V. Gojšina, M. Vujić, 23 Mar. 2024, 47 specimens (43°15′43.24″N, 022°32′56.67″E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 14 specimens (43°38′02″N, 022°09′55″E); village of Ljuberađa, Ljuberaško vrelo, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 8 specimens (43°01′48.90″N, 022°23′17.31″E); village of Periš, Periško vrelo, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 10 specimens (43°22′07.34″N, 022°18′57.74″E); village of Ljubreađa, limestone rocks, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 3 specimens (43°01′02.31″N, 022°21′59.77″E); city of Belgrade, settlement of Vrčin, house yard, *leg.* M. Vujić, 06 Aug. 2023, 11 specimens (44°40′35.87″N, 020°36′29.06″E);

limestone rocks around spring of river Grza, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 4 specimens (43° 53′ 56.92″ N, 021° 39′ 06.75″ E); village of Vladimirovac, *leg.* V. Gojšina, 18 May 2022, 2 specimens (45° 01′ 14.75″ N, 020° 52′ 09.7″ E); Mačva district, rocks around Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 13 specimens (44° 16′ 13.33″ N, 019° 25′ 38.93″ E); village of Velepolje, Banja Topilo, 08 Aug. 2024, *leg.* V. Gojšina, M. Vujić, 2 specimens (43° 26′ 52.74″ N, 021° 52′ 40.79″ E); Mt. Zlatibor, Crni Rzav, *leg.* V. Gojšina, M. Vujić, 21 Oct. 2025, 5 specimens (43° 40′ 00″ N, 019° 42′ 20″ E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 11 specimens (43° 4′ 29″ N, 022° 47′ 46″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; city of Belgrade; Stara planina Mts., Babin Zub peak; Mt. Belava; village of Basara near city of Pirot; village of Bučje near city of Knjaževac; Mt. Beljanica; Mt. Miroč, Brzec; Vujinovača near city of Valjevo; Volujačka Karaula on Mt. Zlatibor; Moravica gorge, Vrelo Banjica; Mt. Vidlič near city of Pirot; village of Vratna, near limestone gates and river gorge; Velika Tisnica gorge near town of Žagubica; Golubac fortress near town of Golubac; Gradašnica gorge; Gradac (possibly referring to a Monastery Gradac on Mt. Golija?); village of Gornje Košlje near town of Ljubovija; canyon of river Gradac near city of Valjevo; Mt. Gučevo; Monastery Gornjak near town of Žagubica; Grza river gorge; Mt. Tara (Drundebo, canyon of river Derventa, Krstača hill, village of Perućac); village if Dobroselica on Mt. Zlatibor; river Dubočica near town of Raška; village of Donja Bela Reka near city of Bor; Mt. Čemernica, Zečki Vrh peak; town of Batočina, Jerinin grad; Jevik near city of Knjaževac; Jelašnica gorge near city of Niš; Korenatac gorge near village of Kalna; village of Kopajkošara near town of Svrljig; Stara planina Mts., village of Kalna; Koprivštički Krst near city of Pirot; Kadijina Stena near Mt. Javor; Mt. Kablar; town of Krupanj; Kruš hill (?); Mt. Kosmaj; village of Ljuberađa near town of Babušnica; Mt. Miroč, Mali Štrbac; Svrljiške planine Mts., village of Periš (Modra Stena); Mt. Kopaonik (Majića Krš, Radmanov Kamen); Mt. Medvednik; Mt. Povlen, Mali Povlen peak; Monastery Manasija near town of Despotovac; village of Negbina near town of Kokin Brod; town of Žagubica, Potpeć; Mt. Povlen; Panica near town of Ivanjica; village of Poćuta near city of Valjevo (Monastery Pustinja); Petnica cave near city of Valjevo; Proslop (?); Monastery Ravanica in village of Senje near town of Ćuprija; village of Rti near town of Lučani; Stara planina Mts., village of Rsovci; Ripaljka waterfall near town of Sokobanja; Rgotski Kamen near city of Bor; Sićevo gorge near city of Niš; Mt. Stol near city of Bor; Sv. Azosim near town of Golubac; Mt. Starica near town of Majdanpek; Monastery Suvodol near village of Minićevo; Monastery Sv. Stevan near city of Aleksinac; village of Svinjište near town of Preševo; Svrljig gorge; Sarlak (?); Monastery Studenica; Mt. Suva planina; Mt. Bobija, Tornička Bobija peak; Taor, near city of Valjevo; Stara planina Mts., village of Topli Do; Mt. Tumba near town of Svrljig; Mt. Tupižnica; city of Užice; Crna Gora near city of Bor; village of Crnoljevica; Crnica river gorge near city of Paraćin; Crni Vrh near city of Jagodina. **After Möllendorff (1873)**: Svrljiške planine Mts., Pleš. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1985)**: Mt. Avala near city of Belgrade. **After Jovanović (1990)**: Deliblato sandland: Devojački bunar, village of Dubovac, village of Kajtasovo, Korn, Mala Tilva, Flamunda, Čardak. **After Maassen (1988)**: 1 km from Monastery Manasija towards Despotovac; Sokobanja near Aleksinac; Pirot, surroundings of Pirot castle. **After Jovanović (1993)**: city of Bor, village of Zlot, Velja Mikulj. **After Jovanović (1996)**: Mt. Stol near city of Bor. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species differs from *T. claustralis* and *T. callicratis* by the absence of apertural barriers. It is smaller, slenderer, and clearly more strongly ribbed than *C. edentula*.

Distribution and habitats in Serbia. A common species (also noted by Pavlović 1912), frequent in dry areas. Quite common on limestone rocks but clearly not limited to these kinds of habitats. Tolerant towards anthropogenic habitats and often recorded in gardens. Present, and even abundant, in sandlands.

Remarks. This species frequently co-occurs with *T. claustralis*. Jaeckel *et al.* (1958) mentions *T. laeviuscula* (Küster, 1850) as well as present in Serbia. The taxonomic status of *T. laeviuscula* is uncertain and this record of Jaeckel *et al.* (1958) could actually refer to *T. cylindrica*.

Family Chondrinidae Steenberg, 1925

Remarks. Pfeiffer (1853: 186) mentioned "*Pupa triticum*", which may refer to *Chondrina* spp. or *Granaria frumentum*.

Subfamily Chondrininae Steenberg, 1925

Genus *Chondrina* Reichenbach, 1828

Type species. *Bulimus avenaceus* Bruguière, 1792, by subsequent monotypy (Reichenbach 1836).

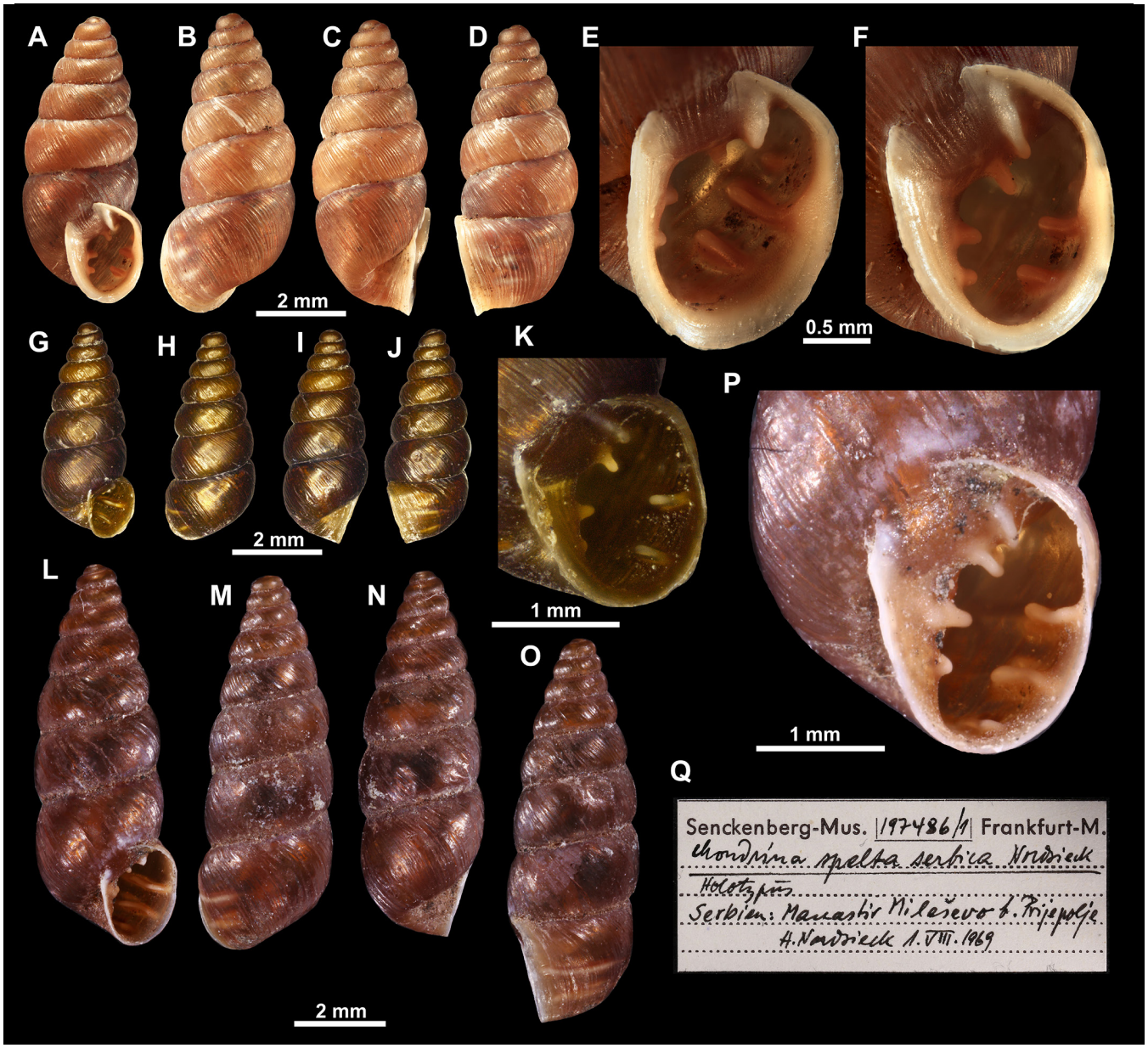

Figure 15. *Chondrina* spp. in Serbia. **A**–**F**, *C. arcadica* from Radenkova bina. **G**–**K**, *C. spelta* from the canyon of the river Sućeska. **L**–**P**, holotype of *C. spelta serbica* (SMF 197486). **Q**, original label of the holotype of *C. spelta serbica*.

***Chondrina arcadica* (Reinhardt, 1881)**

Figures 15A–F, 16

Torquilla avenacea var. *arcadica* Reinhardt 1881: 137.
Pupa hordeum—Pfeiffer 1853: 146.
Pupa avenacea—Pfeiffer 1856: 182; Kreglinger 1870: 197.
Alloglossa avenacea—Möllendorff 1873: 134.
Modicella avenacea—Pavlović 1912: 71.
Modicella avenacea var. *subhordeum*—Pavlović 1912: 71–72.
Modicella avenacea var. *clienta*—Pavlović 1912: 72.
Chondrina avenacea—Jaeckel *et al.* 1958: 145; Jovanović 1997b: 231.
Chondrina clienta—Jaeckel *et al.* 1958: 145; Maassen 1988: 37.
Modicella (*Pupa*) *avenacea*—Tomić 1959: 35–36.
Chondrina clienta clienta—Nordsieck 1970: 258; Jovanović 1997b: 231; Karaman 2007: 146.

Material examined. Mt. Tara, canyon of Derventa river, *leg.* V. Gojšina, 02 Jun. 2021, 1 specimen (43°57′23.02″N, 019°21′20.94″E); town of Majdanpek, near Rajkova cave, Radenkova bina, *leg.* V. Gojšina, 23 Mar. 2022, 6 specimens (44°26′28″N, 022°16′44″E); village of Vratna, Vratna limestone gates, *leg.* V. Gojšina, 24 Mar. 2022, 12 specimens (44°22′57.03″N, 022°20′16.42″E); village of

Plavna, river Zamna, Rajska prerast limestone gate, *leg.* V. Gojšina, 25 Feb. 2022, 3 specimens (44° 18′ 04.27″ N, 022° 16′ 44.51″ E); village of Rudna Glava, Valja prerast (Šuplja stena) limestone gate, *leg.* V. Gojšina, 26 Mar. 2022, 1 specimen (44° 21′ 42.79″ N, 021° 59′ 32.13″ E); village of Duboka near town of Kučevo, Dubočka cave, *leg.* V. Gojšina, 26 Mar. 2022, 5 specimens (44° 33′ 03.33″ N, 021° 45′ 57.42″ E); village of Mokranje, Mokranjske stene locality, *leg.* V. Gojšina, 25 Mar. 2022, 3 specimens (44° 09′ 40.24″ N, 022° 32′ 11.50″ E); village of Krivelj, road towards Mts. Veliki Krš and Stol, *leg.* V. Gojšina, 19 Jun. 2022, 2 specimens (44° 10′ 11.46″ N, 022° 06′ 22.42″ E); town of Bela Palanka, settlement of Čiflik, near Sinjac Monastery, *leg.* V. Gojšina, 05 Aug. 2022, 1 specimen (43° 13′ 03.62″ N, 022° 24′ 54.45″ E); canyon of river Jerma, *leg.* V. Gojšina, M. Vujić, N. Vesović, 08 Sept. 2022, 4 specimens (42° 59′ 25.56″ N, 022° 37′ 51.58″ E); village of Vlasi, Vetrena Dupka cave (in front), *leg.* V. Gojšina, M. Vujić, N. Vesović, 08 Sept. 2022, 3 specimens (43°00′ 00.40″ N, 022° 38′ 09.84″ E); Mt. Beljanica, *leg.* M. Vujić, 24 Jun. 2022, 3 specimens (44° 08′ 02.38″ N, 021° 40′ 01.74″ E); Jelašnica Gorge near city of Niš, on limestone rocks, *leg.* V. Gojšina, 04 Jun. 2019, 4 specimens, 28 May 2022, 6 specimens (43° 16′ 45.82″ N, 022° 03′ 49.59″ E); on road towards Resavska cave from Despotovac, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Feb. 2023, 15 specimens (44° 06′ 06.98″ N, 021° 33′ 38.32″ E); town of Despotovac, canyon of river Suvaja, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Feb. 2023, 7 specimens (44° 05′ 03″ N, 021° 38′ 06″ E); town of Despotovac, canyon of river Suvaja, Izviđačka cave, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Feb. 2023, 1 specimen; city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 1 specimen (43° 11′ 19.65″ N, 022° 38′ 47.14″ E); town of Mionica, village of Brežđe, Šalitrena cave, *leg.* M. Vujić, 04 Aug. 2023, 3 specimens (44° 11′ 26.76″ N, 020° 04′ 42.29″ E); town of Mionica, village of Paštrić, in front of Vrbnička cave, *leg.* D. Stojanović, M. Šević, 05 Aug. 2023, 3 specimens (44° 12′ 11.32″ N, 020° 05′ 41.03″ E); village of Kupuzište, Gabrovička cave, 3 specimens (44° 26′ 38.58″ N, 022° 24′ 27.35″ E); NP Kučaj-Beljanica, canyon towards Vinatovača primeval beech forest, *leg.* V. Gojšina, M. Vujić, N. Vesović, 02 May 2023, 7 specimens (44° 04′ 19.25″ N, 021° 44′ 44.76″ E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 4 specimens (43° 38′ 08.33″ N, 021° 53′ 18.21″ E); Ovčar-Kablar gorge, *leg.* V. Gojšina, M. Vujić, 17 Jul. 2023, 17 specimens (43° 54′ 20.22″ N, 020° 11′ 45.45″ E); city of Pirot, Pirot castle (Momčilov grad), *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 May 2023, 14 specimens (43° 09′ 33.60″ N, 022° 34′ 52.40″ E); village of Zlot, Vernjikica cave, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 3 specimens (44° 01′ 34.42″ N, 021° 56′ 56.29″ E); Mt. Povlen, *leg.* V. Gojšina, M. Vujić, N. Vesović, 15 Jun. 2023, 7 specimens (44° 08′ 27.41″ N, 019° 42′ 55.58″ E); Mt. Devica, Mala Propast pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 4 specimens; road towards city of Ivanjica, *leg.* V. Gojšina, M. Vujić, 17 Jul. 2023, 1 specimen (43° 40′ 08.19″ N, 020° 06′ 02.70″ E); Mt. Devica, Jama pod Oštrom Čukom pit, *leg.* V. Gojšina, 12 Aug. 2022, 4 specimens (43° 35′ 38.48″ N, 021° 53′ 54.97″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 3 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); Sićevo gorge, dry limestone rocks at entrance to village of Sićevo, *leg.* V. Gojšina, 24 May 2024, 7 specimens (43° 20′ 11.84″ N, 022° 04′ 34.20″ E); Đerdap gorge, village of Tekija, limestone rocks next to road, *leg.* V. Gojšina, M. Vujić, 13 Oct. 2024, 40 specimens (44° 39′ 53.61″ N, 022° 20′ 20.90″ E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 61 specimens (43° 38′ 02″ N, 022° 09′ 55″ E); village of Prekonoga near town of Svrljig, Prekonoška cave, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 2 specimens (43° 22′ 46.95″ N, 022° 06′ 08.02″ E); village of Periš near city of Niš, Periško vrelo spring, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 8 specimens (43° 22′ 07.62″ N, 022° 18′ 57.77″ E); surroundings of village of Miljkovac, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 5 specimens (43° 26′ 00.61″ N, 021° 52′ 11.24″ E); limestone rocks around spring of river Grza, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 12 specimens (43° 53′ 56.92″ N, 021° 39′ 06.75″ E); Stara planina Mts., village of Basara, hiking road towards Basarski kamen locality, *leg.* V. Gojšina, M. Vujić, 13 Aug. 2025, 7 specimens (43° 10′ 27.65″ N, 022° 41′ 33.09″ E); village of Velepolje, Banja Topilo, 08 Aug. 2024, *leg.* V. Gojšina, M. Vujić, 24 specimens (43° 26′ 52.74″ N, 021° 52′ 40.79″ E); Mt. Jadovnik, near Fiulj viewpoint, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Jun. 2025, 3 specimens (43° 15′ 31.08″ N, 019° 48′ 21.66″ E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 4 specimens (43° 04′ 29″ N, 022° 47′ 46″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Monastery Gornjak near town of Žagubica; Monastery Manasija near town of Despotovac; village of Jelovac near town of Despotovac; Monastery Ravanica near town of Ćuprija; Crnica river gorge near city of Paraćin; Sibnički grad in Pomoravlje district; Mt. Gučevo near city of Loznica; Proslop (?); Taor, near city of Valjevo; Mt. Povlen, Mali and Veliki Povlen; Monastery Pustinja near city of Valjevo; village of Vujinovača near city of Valjevo; Mt. Medvednik, Malo Platno; village of Gornje Košlje near

town of Ljubovija; Mt. Kablar; Zabučje near city of Užice; Mt. Tara (village of Perućac; canyon of river Derventa; Predov Krst); river Prištavica near Mt. Zlatibor; Rćanska cave near Dragačevo; village of Burađa near Zlatar lake; Kadijina Stena near Mt. Javor; Mt. Čemernica, Zečki Vrh; village of Panica near town of Ivanjica; river Dubočica near town of Raška; Mt. Kopaonik (Majića Krš; Radmanov Kamen); village of Ljuberađa near town of Babušnica; Sarlak (?); Mt. Belava near city of Pirot; town of Bela Palanka; Jelašnica gorge near city of Niš; Mt. Vidlič near town of Pirot; village of Basara near town of Pirot; Gradašnica gorge; Koprivštički Krst near city of Pirot; village of Temska near city of Pirot; village of Sićevo near city of Niš; Mt. Tumba near town of Svrljig; Pernat (?); Svrljiške planine Mts. (Pleš; Milenkova Stena; village of Periš); village of Crnoljevica near town of Svrljig; village of Prekonoga near town of Svrljig; village of Kopajkošara near town of Svrljig; Svrljig gorge near town of Svrljig; village of Kalna, Korenatac gorge; Jevik hill near city of Knjaževac; Sv. Stevan Monastery near town of Aleksinac; Ripaljka waterfall near town of Sokobanja; Mt. Tupižnica, Glogovački vrh peak; Mt. Rtanj; Rgotski kamen near city of Bor; village of Zlot; village of Donja Bela Reka near city of Bor; Crna Gora near city of Bor; Mt. Stol near city of Bor; Mt. Vizak near city of Bor; village of Vratna and near Vratna river gorge near city of Negotin; Mt. Miroč, Mali Štrbac; Dubočka in village of Duboka, near town of Kučevo; town of Majdanpek; Mt. Starica near town of Majdanpek; Velika Tisnica river gorge near town of Žagubica; Mt. Beljanica; Gornjak gorge, Mt. Vukan; Grza river gorge near city of Paraćin; village of Negbina near town of Kokin Brod; village of Senište near river Uvac; village of Rsovci near city of Pirot; village of Lepena near city of Knjaževac; Monastery Jošanica. **After Möllendorff (1873)**: Mt. Medvednik; Mt. Tara, canyon of river Derventa; Mt. Kopaonik, Radmanov Kamen. **After Nordsieck (1970)**: Mt. Tara, canyon of river Derventa; Mt. Tara, village of Perućac; Rača (monastery?) near town of Bajina Bašta; city of Užice; village of Čestobrodica near city of Požega; town of Ovčar Banja near city of Čačak; village of Bačevci near city of Valjevo; village of Mačkat near Čajetina; village of Burađa. **After Pfeiffer (1856)**: Mt. Medvednik. **After Maassen (1988)**: Pobrđe near Novi Pazar; Monastery Manasija near Despotovac; Grza near Paraćin; 5 km from Sv. Petka near Paraćin; Mt. Rtanj; Sokobanja near Aleksinac; 8 k from Sićevo towards Bela Palanka; Čiflik near Bela Palanka. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. See *C. spelta*.

Distribution and habitats in Serbia. Typical inhabitant of limestone cliffs where it is usually found climbing. Found throughout the country. In the southwest, it can co-occur with *C. spelta* (see Nordsieck 1970).

Remarks. This species co-occurs on Mt. Tara with *C. spelta bosnica* (Nordsieck, 1970).

Chondrina spelta (H. Beck, 1837)

Figures 15G–Q, 16

Torquilla spelta Beck 1837: 86.
Chondrina spelta serbica Nordsieck 1970: 254–255, 257, figs 18, 19.
Chondrina spelta bosnica—Nordsieck 1970: 256; Jovanović 1997b: 231; Karaman 2007: 146.
Chondrina spelta—Jaeckel *et al.* 1958: 145; Jovanović 1997b: 231.
Chondrina spelta serbica—Gittenberger 1973: 164; Jovanović 1997b: 231; Karaman 2007: 146.
Chondrina spelta spelta—Karaman 2007: 146.

Type material examined. Holotype of *Chondrina spelta serbica* (SMF 197486).

Additional material examined. Village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 5 specimens (42° 59′ 25.32″ N, 020° 07′ 49.94″ E); spring of river Vapa, Pešter plateau, *leg.* V. Gojšina, 26 Jul. 2022., 1 specimen (43° 14′ 12.56″ N, 020° 06′ 00.23″ E); Pešter plateau, village of Doliće, Hotel Pešter, among rocks, *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43° 06′ 01.83″ N, 020° 00′ 17.06″ E); town of Sjenica, spring of river Grabovica (aka Sjenička Vrela), *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43° 14′ 55.05″ N, 019° 59′ 27.98″ E); canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 11 specimens (42° 56′ 03.02″ N, 020° 24′ 02.92″ E); village of Godovo near town of Tutin, Godovska cave, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 3 specimens (42° 56′ 47.37″ N, 020° 17′ 44.37″ E); Uvac region, rocks above monastery of Sv. Joakim and Ana, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 25 Apr. 2024, 9 specimens (43° 31′ 45.58″ N, 019° 43′ 26.12″ E); Uvac region, below monastery of Sv. Joakim and Ana, *leg.* V. Gojšina, M. Šćiban, D. Stojanović, 02 Jun. 2024, 1 specimen (43° 32′ 38.30″ N, 019° 43′ 11.65″ E); spring of river Raška, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jun. 2025, 1 specimen (43° 06′ 55.70″ N, 020° 22′ 12.69″ E); Mt. Jadovnik, near Fiulj viewpoint, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Jun. 2025, 2 specimens (43° 15′ 31.08″ N, 019° 48′ 21.66″ E); canyon of Sućeska River, *leg.* V. Gojšina, N. Vesović, M. Vujić, 29 Jun. 2025, 1 specimen (43° 28′ 44.29″ N, 019° 25′ 13.80″ E); Mt. Giljeva near town of Sjenica, *leg.* V. Gojšina, M. Vujić, 22 Oct. 2025, 6 specimens (43° 10′ 34″ N, 019° 54′ 17″ E).

Sites in Serbia from the literature. After Nordsieck (1970): *C. spelta bosnica*: Mt. Tara, village of Perućac near town of Bajina Bašta; Mt. Tara, canyon of river Derventa; town of Pri-

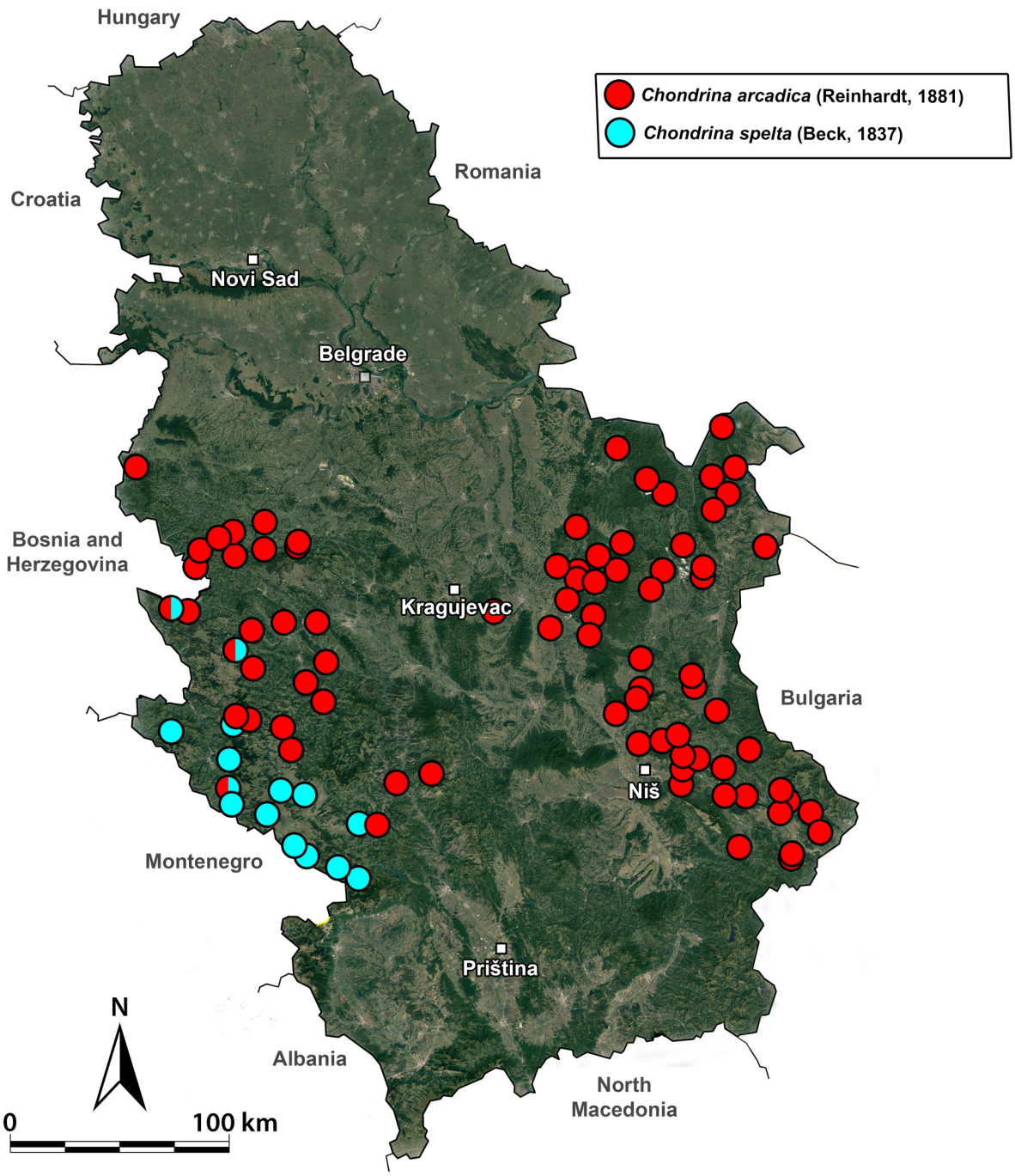

Figure 16. Distribution map of *Chondrina* spp. in Serbia.

boj; village of Burađa; *C. spelta serbica*: Mt. Zvijezda near Prijepolje; Monastery Mileševa near Prijepolje (type locality); village of Brodarevo near Prijepolje; village of Bare near town of Sjenica. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species can be separated from *C. arcadica* by the smaller number of apertural barriers, mainly those on the palatal side (*C. spelta* usually has only upper and lower palatal folds whereas *C. arcadica* has infrapalatal and suprapalatal as well). Also, apertural barriers are on average weaker in *C. spelta*.

Distribution and habitats in Serbia. Inhabits the same types of habitats as *C. arcadica*. *Chondrina arcadica* can occur

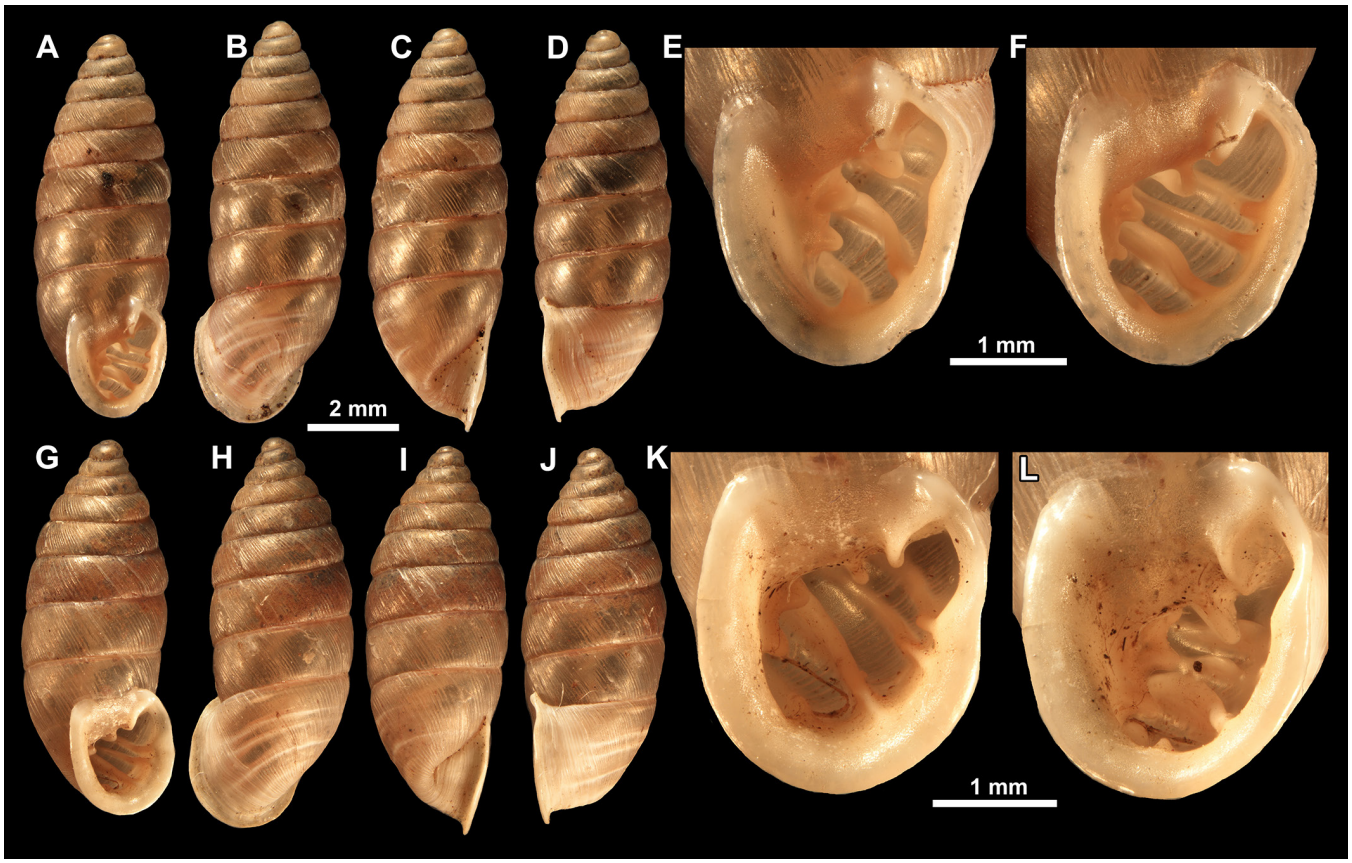

Figure 17. *Granaria frumentum* from the Niševac gorge. **A**–**F**, specimen 1. **G**–**L**, specimen 2.

syntopically with *C. spelta* in the western parts of the country.

Remarks. Most of our *C. spelta* specimens had only two palatal plicae and overall relatively weak apertural barriers which allowed us to separate it from *C. arcadica*. Only several specimens had vestigial remains of suprapalatal plica and even more rarely infrapalatal plica.

The subcolumellaris was usually present but quite weak, and rarely virtually absent.

Subfamily Granariinae Kokshoorn & E. Gittenberger, 2010

Genus *Granaria* Held, 1838

Type species. *Pupa frumentum* Draparnaud, 1801, by subsequent designation (Herrmannsen 1847).

Granaria frumentum (Draparnaud, 1801)

Figures 17, 18

Pupa frumentum Draparnaud 1801: 59.
Pupa frumentum—Pfeiffer 1853: 186; Kreglinger 1870: 194; Möllendorff 1873: 134.
Pupa secale—Möllendorff 1873: 134.
Pupa (*Torquilla*) *frumentum*—Westerlund 1887: 107.
Pupa frumentum—Pavlović 1912: 67–70.
Torquilla frumentum—Tomić 1959: 34–35.
Abida frumentum—Hesse 1929: 233; Jaeckel *et al.* 1958: 145.
Abida secale—Jaeckel *et al.* 1958: 145 ; Jovanović 1997b: 231.
Granaria frumentum—Karaman 2007: 146.
Granaria illyrica—Maassen 1988: 37; Jovanović 1997b: 231; Karaman 2007: 146.
Granaria frumentum frumentum—Fehér *et al.* 2010: 203.
Granaria frumentum hungarica—Fehér *et al.* 2010: 206.
Granaria frumentum atracta—Fehér *et al.* 2010: 211.

Material examined. Village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 30 Jan. 2021, 5 specimens (44°50′31.32″N, 021°01′50.49″E); city of Belgrade, Košutnjak forest, *leg.* V. Gojšina, 15 Feb. 2022, 1 specimen (44°45′45.23″N, 020°25′51.32″E); village of Deliblato, Deliblato sandland, *leg.* V. Gojšina, 15 May 2022, 34 specimens (44°51′35.32″N, 021°04′02.04″E); village of Banatska Palanka, Labudovo okno, *leg.* V. Gojšina, N. Vesović, M. Vujić, 10 Dec. 2022, 6 specimens (44°50′03.84″N, 021°18′39.82″E); Jelašnica Gorge near city of Niš, *leg.* V. Gojšina, 04 Jun. 2019, 10 specimens (43°16′45.82″N, 022°03′49.59″ E); village of Ovčar Banja, surroundings of Ovčar-Kablar gorge, *leg.* V. Gojšina, 10 Aug. 2020, 8 specimens (43°53′56.70″N, 020°11′17.33″

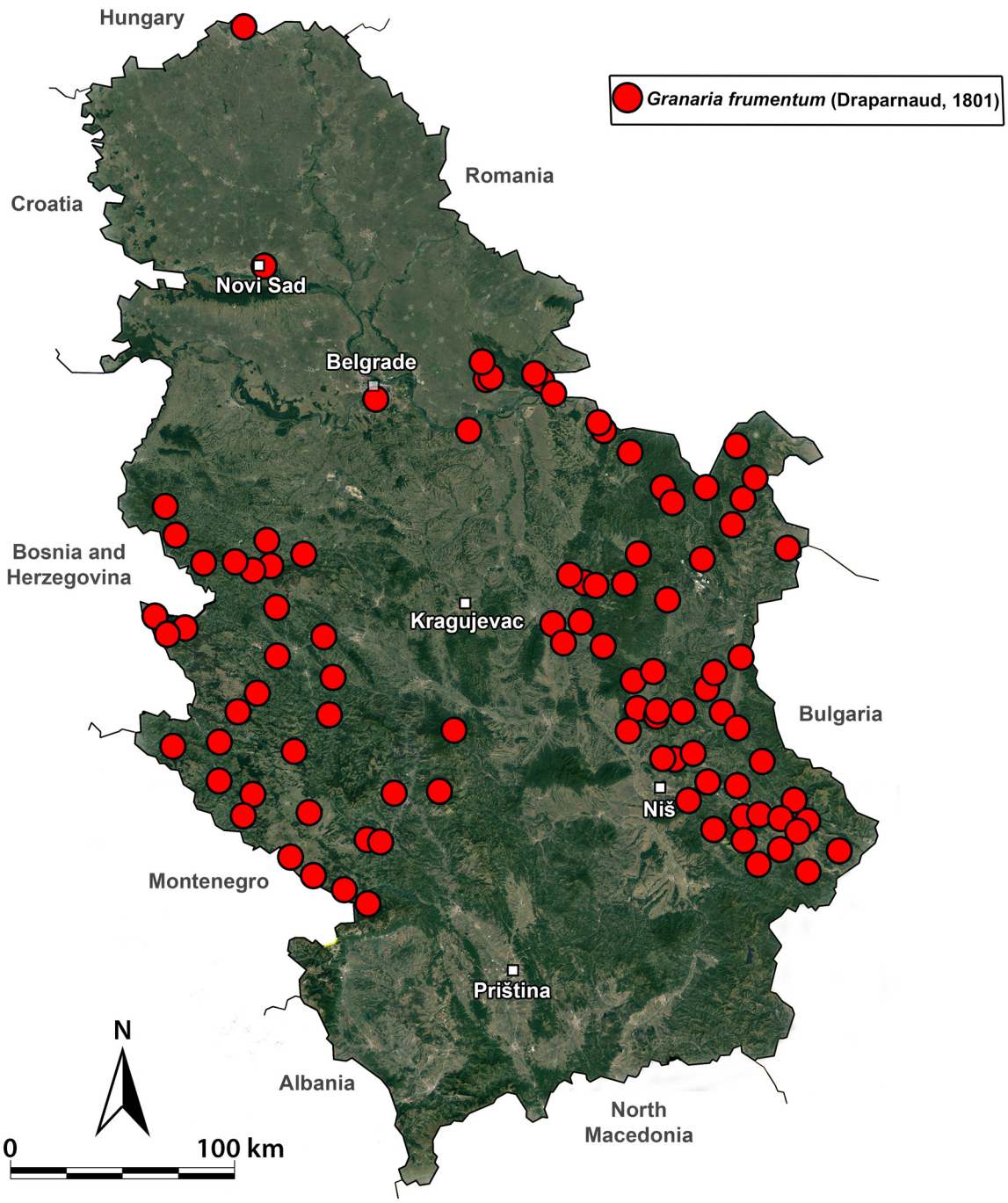

Figure 18. Distribution map of *Granaria frumentum* in Serbia.

E); Mt. Tara, road towards village of Jagoštica, *leg.* V. Gojšina, 02 Jun. 2021, 2 specimens (43°57′59.52″N, 019°17′3.08″E); town of Majdanpek, Paskova cave, *leg.* V. Gojšina, 23 Mar. 2022, 5 specimens (44°26′30.57″N, 021°57′06.54″E); town of Majdanpek, surroundings of Rajkova cave, Radenkova bina locality, *leg.* V. Gojšina, 23 Feb. 2022, 13 specimens (44°26′32.86″N, 021°57′17.97″E); village of Vratna, Vratna limestone gates, Mala prerast Gate, *leg.* V. Gojšina, 24 Mar. 2022, 7 specimens (44°22′57.03″N, 022°20′16.42″E); village of Plavna, river Zamna, Rajska prerast limestone gate, *leg.* V. Gojšina, 25 Feb. 2022, 3 specimens (44°18′04.27″N, 022°16′44.51″E); village of Rudna Glava, Valja prerast (Šuplja stena) limestone gate, *leg.* V. Gojšina, 26 Mar. 2022, 4 specimens (44°21′42.79″N, 021°59′

32.13″E); town of Bela Palanka, Vrelska cave, *leg.* D. Antić, 27 Oct. 2017; village of Duboka near town of Kučevo, Dubočka cave, *leg.* V. Gojšina, 26 Mar. 2022, 11 specimens (44° 33′03.33″N, 021° 45′57.42″E); city of Bor, Mt. Stol, *leg.* V. Gojšina, 18 Jun. 2022, 5 specimens (44° 10′17.00″N, 022° 07′40.53″E); town of Bela Palanka, settlement of Čiflik, near Sinjac Monastery, *leg.* V. Gojšina, 05 Aug. 2022, 1 specimen (43° 13′03.62″N, 022° 24′54.45″ E); Stara Planina Mts., village of Oreovica, *leg.* M. Šćiban, Apr. 2013; village of Temska, Krivi Vir gorge, *leg.* M. Šćiban, 03 Jun. 2022; surroundings of Mt. Vlaška and Mt. Padež, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Sept. 2022, 5 specimens (43° 05′21.92″N, 022° 31′12.40″E); village of Vlasi, Vetrena Dupka cave (in front), *leg.* V. Gojšina, M. Vujić, N. Vesović, 08 Sept. 2022, 6 specimens (43° 0′0.40″N, 022° 38′9.84″E); village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 2 specimens (42° 59′25.32″N, 020° 07′49.94″E); Pešter plateau, village of Doliće, Hotel Pešter, among rocks, *leg.* V. Gojšina, 26 Jul. 2022, 7 specimens (43° 06′01.83″N, 020° 00′17.06″E); village of Staničenje, *leg.* V. Gojšina, 07 Sept. 2022, 1 specimen (43° 12′16.26″N, 022° 30′32.67″E); spring of river Vapa, Pešter plateau, *leg.* V. Gojšina, 26 Jul. 2022, 4 specimens (43° 14′12.56″N, 020° 06′00.23″E); village of Temska, limestone rocks next to road, *leg.* V. Gojšina, 30 May 2022, 3 specimens (43° 15′43.33″N, 022° 32′ 56.45″E); on road towards Resavska cave from Despotovac, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Feb. 2023, 5 specimens (44° 06′06.98″N, 021° 33′38.32″E); town of Despotovac, canyon of river Suvaja, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Feb. 2023, 4 specimens (44° 05′03″N, 021° 38′06″E); road between town of Bela Palanka and village of Divljana, *leg.* V. Gojšina, 04 Aug. 2022, 3 specimens (43° 12′47.71″N, 022° 18′16.66″E); village of Temska, Begov Bridge, *leg.* V. Gojšina, 30 May 2022, 7 specimens (43° 12′57.07″N, 022° 31′09.97″E); village of Gornja Koritnica near town of Bela Palanka, on limestone rocks next to road, *leg.* V. Gojšina, 29 May 2022, 1 specimen (43° 08′32.98″N, 022° 19′32.53″E); village of Sićevo, Ogorelička cave, *leg.* V. Gojšina, M. Vujić, 27 Apr. 2023, 4 specimens (43° 20′53.3″N, 22° 05′38.8″E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 13 specimens (43° 11′19.65″N, 022° 38′47.14″ E); Kunovica near city of Niš, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Apr. 2023, 12 specimens (43° 18′36.99″N, 022° 05′20.07″E); close to spring of Moravica river, *leg.* V. Gojšina, 25 Jun. 2022, 16 specimens (43° 37′45.23″N, 021° 59′38.94″E); Mt. Zlatibor, town of Čajetina, village of Gostilje, Gostilje waterfalls, *leg.* V. Gojšina, 07 Aug. 2020, 10 specimens (approx. 43° 39′24.83″N, 019° 50′18.54″E); town of Sokobanja, Mt. Devica, Oštra Čuka peak, Jama pod Oštrom Čukom Pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 1 specimen (43° 35′38.48″N, 21° 53′54.97″ E); Mt. Jadovnik, Katunić peak, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 25 Jun. 2023, 2 specimens (43° 16′27.62″N, 019° 50′23.36″ E); town of Mionica, village of Brežđe, Šalitrena cave, *leg.* M. Vujić, 04 Aug. 2023, 5 specimens (44° 11′26.76″N, 020° 04′42.29″E); town of Mionica, village of Paštrić, in front of Vrbnička cave, *leg.* D. Stojanović, M. Šević, 05 Aug. 2023, 8 specimens (44° 12′11.39″N, 020° 05′40.99″E); city of Valjevo, village of Degurić, *leg.* V. Gojšina, M. Vujić, N. Vesović, 15 Jun. 2023, 1 specimen (44° 14′17″N, 019° 53′03″E); village of Kupuzište, Gabrovička cave, 6 specimens (44° 26′ 38.58″N, 022° 24′27.35″E); NP Kučaj-Beljanica, canyon towards Vinatovača primeval beech forest, *leg.* V. Gojšina, M. Vujić, N. Vesović, 02 May 2023, 1 specimen (44° 04′ 19.25″N, 021° 44′44.76″E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 11 specimens (43° 38′08.31″N, 021° 53′18.18″E); Ovčar-Kablar gorge, *leg.* V. Gojšina, M. Vujić, 17 Jul. 2023, 4 specimens (43° 54′20.24″N, 020° 11′45.45″E); city of Pirot, Pirot castle (Momčilov grad), *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 May 2023, 5 specimens (43° 09′33.60″N, 022° 34′52.40″E); village of Zlot, Vernjikica cave, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 13 Aug. 2022, 4 specimens (44° 01′34.39″N, 021° 56′56.26″E); Mt. Devica, Mala Propast pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 5 specimens; Mt. Devica, Velika Propast pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 45 specimens; Mt. Tara, village of Lukino selo, *leg.* D. Antić, M. Šević, D. Pavićević, I. Karaman, 06 Oct. 2023, 1 specimen (43° 50′51.42″N, 019° 23′48.49″ E); Vojvodina province, village of Mramorak, *leg.* M. Vujić, 01 May 2024 (44° 54′31.92″N, 020° 59′53.14″E); Vojvodina province, village of Čardak, *leg.* M. Vujić, 01 May 2024 (44° 51′51.15″N, 021° 03′33.84″E); Vojvodina province, village of Kajtasovo, *leg.* M. Vujić, 01 May 2024 (44° 52′30.95″N, 021° 14′38.60″E); Vojvodina province, Subotica sandland, *leg.* M. Vujić, 01 May 2024 (46° 09′43.38″N, 019° 43′07.95″E); canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 5 specimens (42° 56′03.02″N, 020° 24′02.88″E); village of Resnik near town of Sokobanja, next to a spring, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 4 specimens (43° 37′57.69″N, 021° 48′55.78″E); village of Godovo near town of Tutin, Godovska cave, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 5 specimens (42° 56′47.32″N, 020° 17′44.34″E); Mt. Devica near town of Sokobanja, *leg.* V. Gojšina, 25 Jun. 2022, 1 specimen; town of Sokobanja, Mt. Devica, Oštra Čuka peak, Jama pod Oštrom Čukom Pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 1 speci-

men (43° 35′ 38.48″ N, 021° 53′ 54.97″ E); village of Kelebija, Subotica sandland, *leg.* M. Vujić, 04 May 2024, 4 specimens (46° 09′ 13.26″ N, 019° 37′ 09.02″ E); village of Seništa, rock quarry, *leg.* D. Stojanović, D. Antić, M. Šević, 24 May 2024, 5 specimens (43° 31′ 28.01″ N, 019° 44′ 10.03″ E); Uvac region, Klak, *leg.* D. Stojanović, D. Antić, M. Šević, 23 May 2024, 4 specimens (43° 31′ 16.61″ N, 019° 44′ 01.06″ E); village of Radoševac near town of Golubac, *leg.* M. Vujić, 14 Jul. 2023, 7 specimens (44° 39′ 47.10″ N, 021° 36′ 32.64″ E); Vinci weekend settlement near town of Braničevo, *leg.* M. Vujić, 13 Jul. 2023, 1 specimen (44° 42′ 21.82″ N, 021° 35′ 36.36″ E); village of Ram, Ram sandland, *leg.* M. Vujić, 14 Jul. 2023, 9 specimens (44° 48′ 59.62″ N, 021° 20′ 38.13″ E); Mt. Kopaonik, Metođe, limestone rocks next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 15 specimens (43° 18′ 02.81″ N, 020° 51′ 05.34″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 43 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); limestone rocks on road to Grza river spring, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 8 specimens (43° 51′ 32.36″ N, 021° 37′ 18.35″ E); Monastery Manasija, courtyard and immediate surroundings, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 5 specimens (44° 06′ 02.48″ N, 021° 28′ 08.92″ E); Sićevo gorge, dry limestone rocks at entrance to village of Sićevo, *leg.* V. Gojšina, 24 May 2024, 35 specimens (43° 20′ 11.84″ N, 022° 04′ 34.20″ E); Đerdap gorge, village of Tekija, limestone rocks next to road, *leg.* V. Gojšina, M. Vujić, 13 Oct. 2024, 7 specimens (44° 39′ 53.61″ N, 022° 20′ 20.90″ E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 34 specimens (43° 38′ 02″ N, 022° 09′ 55″ E); village of Prekonoga near town of Svrljig, Prekonoška cave, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 15 specimens (43° 22′ 46.95″ N, 022° 06′ 08.02″ E); village of Ljuberađa, Ljuberaško vrelo, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 7 specimens (43° 01′ 48.90″ N, 022° 23′ 17.31″ E); village of Periš near city of Niš, Periško vrelo, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 11 specimens (43° 22′ 07.62″ N, 022° 18′ 57.77″ E); village of Kravlje near city of Niš, Kravljansko vrelo, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 3 specimens (43° 27′ 07.74″ N, 021° 55′ 19.86″ E); surroundings of village of Miljkovac, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 4 specimens (43° 26′ 00.61″ N, 021° 52′ 11.24″ E); village of Cerje near ciy of Niš, Cerjanska cave, rocks above, *leg.* V. Gojšina, 18 May 2024, 9 specimens (43° 25′ 47.93″ N, 021° 56′ 20.95″ E); road between villages of Cerje and Kamenica near city of Niš, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 18 May 2024, 14 specimens (43° 24′ 41.54″ N, 021° 55′ 39.01″ E); limestone rocks around spring of river Grza, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 25 specimens (43° 53′ 56.92″ N, 021° 39′ 06.75″ E); village of Miliva, Milivska cave, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 14 specimens (44° 08′ 12.91″ N, 021° 26′ 10.99″ E); Mačva district, behind Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 9 specimens (44° 16′ 05.50″ N, 019° 25′ 48.44″ E); Mačva district, rocks around Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 161 specimens (44° 16′ 13.33″ N, 019° 25′ 38.93″ E); Mt. Jadovnik, canyon at foot of mountain, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Jun. 2025, 3 specimens (43° 14′ 04.99″ N, 019° 44′ 46.25″ E); Suva planina Mt., below Devojački grob, *leg.* V. Gojšina, M. Vujić, 14 Aug. 2025, 2 specimens (43° 11′ 54.72″ N, 022° 08′ 35.46″ E); canyon of river Trešnjica, *leg.* V. Gojšina, M. Vujić, 22 Aug. 2025, 66 specimens (44° 08′ 25.57″ N, 019° 32′ 27.24″ E); spring of river Raška, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jun. 2025, 16 specimens (43° 06′ 55.70″ N, 020° 22′ 12.69″ E); Mt. Jadovnik, near Katunić peak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Jun. 2025, 7 specimens (43° 16′ 01.52″ N, 019° 48′ 46.04″ E); village of Velepolje, Banja Topilo, 08 Aug. 2024, *leg.* V. Gojšina, M. Vujić, 4 specimens (43° 26′ 52.74″ N, 021° 52′ 40.79″ E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 8 specimens (43° 04′ 29″ N, 022° 47′ 46″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): city of Belgrade, Topčider; town of Bela Palanka; Mt. Belava; city of Pirot, Zmijavica pond; village of Basara near city of Pirot; village of Bučje near city of Knjaževac; Mt. Miroč, Brzec; Mt. Beljanica, Vukan (?); Velika Tisnica gorge near town of Žagubica; village of Vratna, near limestone gates and river gorge; Vrška Čuka; Mt. Vidlič near city of Pirot; Vujinovača near city of Valjevo; city of Valjevo; Gornjak gorge near town of Žagubica; Grza gorge; village of Gornje Košlje near town of Ljubovija; Gradac gorge near city of Valjevo; Gradašnica gorge; Gradac (possibly referring to Monastery Gradac on Mt. Golija?); village of Grlište near city of Zaječar; village of Gornja Bela Reka between cities of Zaječar and Knjaževac; Glavičica near city of Knjaževac; Golubac fortress near town of Golubac; Dubočka cave in village of Duboka near town of Kučevo; town of Donji Milanovac; village of Donja Bela Reka near city of Bor; river Dubočica near town of Raška; Mt. Tara (canyon of river Derventa, Krstača hill, village of Perućac); Mt. Goč, Dobra Voda; Đeltene (?); village of Zlot; Mt. Čemernica, Zečki Vrh peak; village of Jelovac near town of Despotovac; village of Jošanica near town of Sokobanja; town of Batočina, Jerinin Grad; village of Jovanja near city of Valjevo; Jelašnica gorge near city of Niš; town of Sokobanja, Jezero; Jevik hill near city of Knjaževac; Komnenska

reka near town of Žagubica; Korenatac gorge near village of Kalna; Stara planina Mts., village of Kalna; village of Kopajkošara near town of Svrljig; Mt. Kopaonik; Koritničko brdo hill; Koprivštički Krst near city of Pirot; Mt. Kablar; town of Krupanj; Koviljača (town of Banja/Gornja Koviljača)?; village of Kotraža near town of Lučani; Kruš hill (?); village of Lepena, near town of Knjaževac; village of Ljuberađa near town of Babušnica; Monastery Manasija near town of Despotovac; Mt. Medvednik; Mt. Miroč, Mali Štrbac; Mt. Povlen, Mali Povlen peak; town of Majdanpek; village of Niška Banja near city of Niš; Ograđenica near Mokra Gora; Mt. Povlen; Proslop (?); Panica near town of Ivanjica; city of Pirot; Svrljiške planine Mts., village of Periš; town of Pirot, Provalija; village of Prekonoga; Svrljiške planine Mts., Pleš; village of Potpeće near city of Užice; Pogana Peć near town of Žagubica and spring of Komnenska reka river; village of Rajac near city of Negotin; Rgotski Kamen near city of Bor; Mt. Rtanj; Ripaljka waterfall near town of Sokobanja; village of Rti near town of Lučani; Rćanska cave near village of Rti; Mt. Kopaonik, Radmanov Kamen; Monastery Ravanica in village of Senje near town of Ćuprija; Sibnički grad, Levač region; village of Stapari near city of Užice; Straža near city of Užice; Mt. Suva planina; Stara planina Mts., Temska gorge, Stog; Sićevo gorge near city of Niš; Svrljig gorge; town of Sokobanja; Monastery Sv. Stevan near town of Aleksinac; Mt. Stol near city of Bor; Mt. Starica near town of Majdanpek; Monastery Tumane near town of Golubac; town of Svrljig (Tijevica); Turija near town of Kučevo; Mt. Tumba near town of Svrljig; Taor, near city of Valjevo; Mt. Bobija, Tornička Bobija peak; city of Užice; village of Poćuta near city of Valjevo (Monastery pustinja); Crnica river gorge near town of Paraćin; Mt. Čemernica. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river near town of Ćuprija. **After Maassen (1988)**: Pobrđe near Novi Pazar; road from Monastery Sopoćani towards Pobrđe; Monastery Manasija near Despotovac; Grza near Paraćin; 5 km from Sv. Petka near Paraćin; Mt. Rtanj; Sokobanja near Aleksinac; Sićevo gorge (Sićevo, Ostrovica and on 8 k from Sićevo towards Bela Palanka); Čiflik near Bela Palanka; Pirot, surroundings of Pirot castle; **After Jovanović (1997b)**: Mt. Tara. **After Fehér *et al.* (2010)**: *G. frumentum frumentum*: Petrovaradin, fortress, 45.2524° N, 019.8730° E (city of Novi Sad); *G. frumentum hungarica*: Glozanica E, roadside bush, 43° 37′ 30″ N, 022° 13′ 11″ E; Cerovica–Sastavci, gorge; Đerdap Mts., Golubinje N, quarry, 44° 34′ 09″ N, 022° 14′ 44″ E; Manasija monastery, E of Despotovac, 260 m a.s.l., 44° 06′ 00″ N, 021° 27′ 48″ E; Golubac, fortress, 44° 39′ 36″ N, 021° 38′ 17″ E; Gornjak monastery, Pirot, Gradišnička gorge, 400 m a.s.l., 43° 11′ 11″ N, 22° 35′ 48″ E; Grnčar (*ca* 25 km S of Bela Palanka), 370 m a.s.l., 43° 01′ 14″, 022° 21′ 51″ E, Niška Banja, Jelašnička gorge, 390 m a.s.l., 43° 16′ 53″ N, 022° 03′ 44″ E; Kalna N 1.5 km, 350 m a.s.l., 43° 25′ 45″ N, 022° 25′ 03″ E; E end of Mali Kazan gorge, 74 m a.s.l., 44° 36′ 49″ N, 022° 16′ 31″ E; Knjaževac S 5 km along road to Pirot, 260 m a.s.l., 43° 32′ 11″ N, 022° 17′ 07″ E; Levovik (near Soko Banja); Ljuberađa NE, along road to Gorčini, near spring, 460 m a.s.l., 43° 01′ 49″ N, 022° 23′ 20″ E, Luka, Stol Mt., 600 m a.s.l.; Pirot, fortress, 360 m a.s.l., 43° 09.558′ N, 022° 34.866′ E; 1 km W of Grza junction, along Paracin–Zaječar road, 280 m a.s.l., 43° 51.46′ N, 021° 36.87′ E; Batrage, 4 km along road to Ribarice; E of Rožaje, 1030 m a.s.l.; Sićevo, Nišava valley; Vratarnica S 1 km (near Zaječar), 43° 46′ 38″ N, 022° 18′ 47″ E, 26.07.1997; Stubic W, Kanyon Reke Zamne (*ca* 2 km E of Plavna), 44° 17′ 32″ N, 022° 16′ 39″ E; Užice S 2 km along road towards Nova Varoš, 514 m a.s.l., 43° 51.06′ N, 019° 49.24′ E; Zlot, Zlotska cave, 44° 01′ 48″ N, 21° 57′ 46″ E; Zlot NW, Lazareva cave, 260 m a.s.l., 44° 01′ 44″ N, 021° 57′ 28″ E; Pazarište W 1 km (near Novi Pazar), at Sebećevo junction, 588 m a.s.l., 43° 07.910′ N, 020° 24.963′ E; Požega N 13 km on road to Valjevo; Kosjerić SE 2 km, on Valjevo–Požega road, 390 m a.s.l., 43° 58.03′ N, 019° 57.67′ E; Bukovi S 1 km on Valjevo–Požega road; Bukovi N 1 km on Valjevo–Požega road, *ca* 400 m a.s.l., 44° 09.68′ N, 019° 52.90′ E; Valjevo S 14 km on road to Požega, 500 m a.s.l., 44° 10.787′ N, 19° 52.277′ E; Valjevo S 13 km on road to Požega, 420 m a.s.l., 44° 09.623′ N, 019° 52.985′ E; Nišava gorge, Oštravica E 1 km, 300 m a.s.l., 43° 20.141′ N, 022° 07.983′ E; transitional form to *G. frumentum frumentum*: Štrbac N 5 km (near Knjaževac), 43° 31′ 34″ N, 022° 17′ 20″ E; Zlot, Zlotska cave; Nišava gorge 3 km E of Sićevo, *ca* 300 m a.s.l., 43° 20.141′ N, 022° 07.983′ E; transitional form to *G. frumentum atracta*: Zlatibor Mts., between Dobroselica and Draglica, 43.60° N, 019.72° E; Velika Župa (S of Prijepolje), 43° 19′ 55″ N, 019° 39′ 05″ E; Bučje N 4 km on road to Hercegovačka Goleša, 650 m a.s.l., 43.49° N, 019.42° E; *G. frumentum atracta*: 2 km SW of Bistrica (along Nova Varoš–Prijepolje road, 1 km S of Priboj junction), 430 m a.s.l., 43° 28.64′ N, 019° 38.70′ E; Zlatar Mts., 7 km N of Prijepolje, 43° 28′ 02″ N, 019° 39′ 04″ E.

Differential diagnosis. This species has more apertural barriers and is larger and more barrel-shaped than *C. arcadica*.

Distribution and habitats in Serbia. This is a very common species in Serbia. It is frequently found in large numbers and is especially abundant on karstified limestone. It is also found in non-limestone areas such as Deliblato and Subotica sandlands.

Remarks. There are three subspecies of *G. frumentum* in Serbia: *G. frumentum frumentum*, *G. frumentum hungarica* (M. Kimakowicz, 1890) and *G. frumentum atracta* (Pilsbry, 1918).

Superfamily Pupilloidea W. Turton, 1831

Remarks. Pupilloidea in Serbia are very diverse and have representatives in 10 families (Agardhiellidae, Cochlicopidae, Enidae, Orculidae, Pagodulinidae, Pupillidae, Pyramidulidae, Spelaeodiscidae, Vallonidae, and Vertiginidae). First most comprehensive data on distribution of the Pupilloidea in Serbia can be found in Pavlović (1912), who listed a total of 21 species. Herein, we present 33 species of this group.

Family Cochlicopidae Pilsbry, 1900 (1879)

Genus *Cochlicopa* A. Férussac, 1821

Type species. *Helix lubrica* O.F. Müller, 1774, by subsequent designation (Westerlund 1903).

Remarks. Two very similar species of *Cochlicopa* occur in Serbia: *C. lubrica* and *C. lubricella*. Our identification of these taxa was based on two characters: shell diameter and general slenderness of the shell. According to Armbruster (1995), shell diameter and last whorl diameter are solid characters for separating *C. lubrica* from *C. lubricella*, showing only a 2% overlap between the two taxa. On the other hand, shell height was not considered useful due to the significant overlap (Armbruster 1995). Welter-Schultes (2012) also provided non-overlapping measurements for the shell diameter of two taxa. If the shell measurements and general shape (slenderer in *C. lubricella* due to the lower values of shell diameter) agreed with the values of *C. lubrica* or *C. lubricella* provided by Armbruster (1995) and Welter-Schulets (2012), our specimens were identified as such. *Cochlicopa nitens* (M. von Gallenstein, 1848) is still not confirmed in Serbia, although its presence is likely.

Cochlicopa lubrica (O.F. Müller, 1774)

Figures 19A–D, 20, 21

Helix lubrica O.F. Müller 1774: 104.

Cochlicopa lubrica—Pavlović 1912: 62–63; Hesse 1929: 233; Tomić 1959: 31–32; Jovanović 1990: 24; Jovanović 1993: 240; Jovanović 1997a: 355; Sólymos *et al.* 2004: 152; Karaman 2007: 139; Karaman 2012: 18–19.

Cionella lubrica—Möllendorff 1873: 146.

Cochlicopa lubrica—Jaeckel *et al.* 1958: 145; Maassen 1988: 37.

Cichlicopa lubrica [*sic*]—Jovanović 1996: 218.

Cochlicopa lubrica—Jovanović 1997b: 231; Gojšina *et al.* 2024a: 193.

Material examined. Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43° 31′ 25.25″ N, 019° 39′ 39.60″ E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 1 specimen (43° 38′ 02″ N, 022° 09′ 55″ E); village of Đala near town of Novi Kneževac, *leg.* V. Gojšina, M. Vujić, 25 Sept. 2024, 1 specimen (46° 10′ 05.98″ N, 020° 05′ 16.80″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 31 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); city of Belgrade, settlement of Vinča, confluence of rivers Bolečica and Danube, *leg.* V. Gojšina, M. Vujić, 03 Feb. 2024, 9 specimens (44° 45′ 28.75″ N, 020° 37′ 33.95″ E); city of Belgrade, settlement of Vrčin, Grocka municipality, *leg.* M. Vujić, 14 May. 2021, 1 specimen (44° 40′ 39.61″ N, 020° 36′ 20.22″ E); town of Kovin, next to Danube river, *leg.* V. Gojšina, 01 May. 2019, 7 specimens (44° 43′ 39.33″ N, 020° 58′ 41.48″ E); Landscape of Outstanding Features "Karaš-Nera", *leg.* V. Gojšina, 14 Oct. 2020, 1 specimen (44° 52′ 22.33″ N, 021° 25′ 33.23″ E); Belgrade, Jevremovac Botanical garden, *leg.* V. Gojšina, 14 Jan. 2022, 1 specimen (44° 48′ 54.69″ N, 020° 28′ 23.59″ E); Lepterija near town of Sokobanja, on surface of limestone rocks, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 2 specimens (43° 38′ 08.47″ N, 021° 53′ 18.46″ E); city of Belgrade, Mirijevo 1 part, *leg.* M. Vujić, 22 Aug. 2023; Senta settlement, next to Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 1 specimen (45° 56′ 03″ N, 020° 05′ 23″ E); Vrčin settlement, near small spring under rotten tree bark, *leg.* M. Vujić, 25 Apr. 2023, 4 specimens; Bečej settlement, in poplar plantage, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 5 specimens (45° 36′ 41″ N, 020° 04′ 10″ E); Ada settlement, next to Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 2 specimens (45° 47′ 04″ N, 020° 09′ 01″ E); Novi Sad city, next to Danube river, *leg.* M. Šćiban, 05 Apr. 2013; town of Mionica, village of Brežđe, Šalitrena cave, *leg.* M. Vujić, 04 Aug. 2023, 2 specimens (44° 11′ 26.76″ N, 020° 04′ 42.29″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; city of Belgrade; Barje near city of Pirot; Stara planina Mts., Babin Zub peak; Vrba near city of Kraljevo; Monastery Manasija near town of Despotovac; Monastery Ravanica in village of Senje near town of Ćuprija; Crnica river gorge near town of Žagubica; alluvium of Kalenovačka and Jošanička rivers near town of Žagubica; city of Gornji Milanovac; Rogot near town of Batočina; city of Čačak; city of Užice; Mt. Goč, Dobra Voda; Mt.

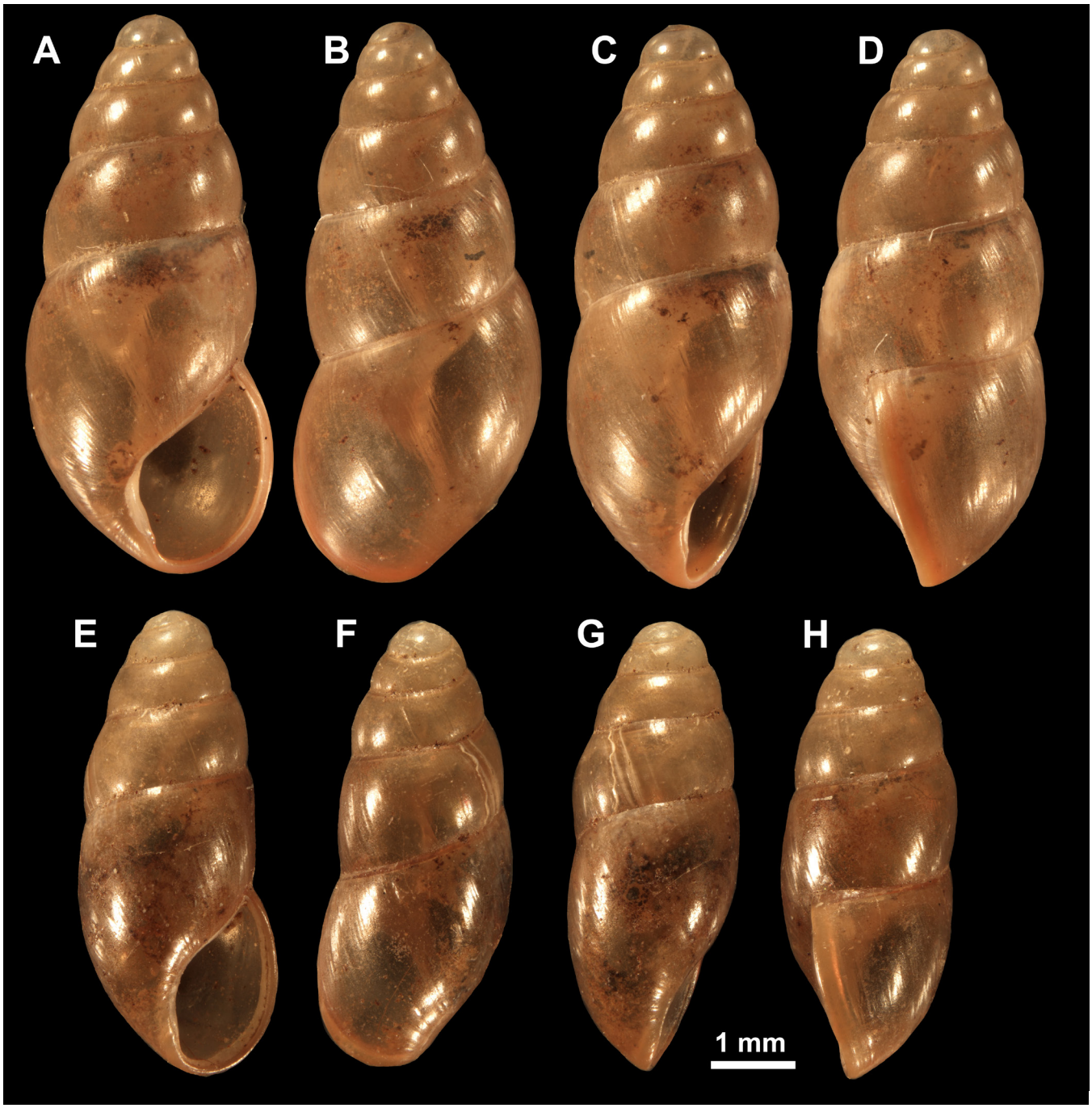

Figure 19. *Cochlicopa* spp. from the Niševac gorge. **A**–**D**, *C. lubrica*. **E**–**H**, *C. lubricella*.

Kopaonik, Srebrnac; village of Ljuberađa near town of Babušnica; Jelašnica gorge near city of Niš; Stara planina Mts., Široke Luke; town of Donji Milanovac. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1997b)**: Mt. Tara. **After Maassen (1988)**: 1 km from Monastery Manasija towards Despotovac; Pirot, surroundings of Pirot castle; Mt. Rtanj. **After Jovanović (1990)**: Deliblato sandland (Banatski Karlovac; Devojački Bunar; Dubovac; Mala Tilva; Flamunda; Čardak). **After Jovanović (1993)**: city of Bor; village of Zlot; Dubašnica; close to Vodena cave, Mikuljska river canyon, village of Zlot; village of Zlot, Lazarev canyon; Borsko lake. **After Jovanović (1997a)**: Mt. Vizak near city of Bor. **After Sólymos *et al.* (2004)**: Dobri stream on Mt. Fruška Gora.

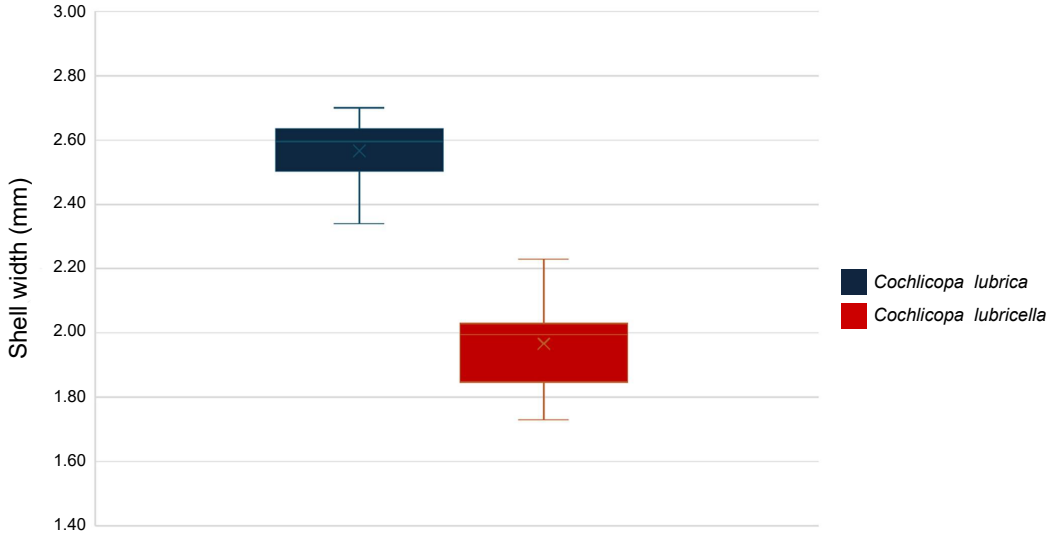

Figure 20. Box and whisker plot of shell-width dimensions of 20 randomly selected *Cochliocpa lubrica* and *C. lubricella*. Data used to create the plot are presented in Table 1.

Table 1. The dimensions of 20 randomly selected specimens of two the *Cochlicopa* species in Serbia.

Species	Locality	Specimen #	Shell width (mm)
C. lubricella	Periško vrelo	1	1.80
		2	1.78
		3	1.82
		4	1.96
		5	1.73
	Niševac	1	2.03
		2	1.96
		3	2.23
		4	1.84
		5	1.87
	Stogazovac	1	1.99
		2	2.13
	Tekija, Ploče	1	2.03
		2	2.00
		3	2.03
		4	2.11
		5	2.06
	Milevska planina	1	2.00
		2	2.02
		3	1.94
C. lubrica	Niševac	1	2.62
		2	2.51
		3	2.62
		4	2.59
		5	2.53
	Vrčin	1	2.56
		2	2.67
		3	2.64
		4	2.70
		5	2.50
	Mionica	1	2.45
		2	2.46
	Bečej	1	2.53
		2	2.66
		3	2.34
		4	2.64
	Stogazovac	1	2.60
	Bela Crkva	1	2.61
		2	2.60
		3	2.49

After Karaman (2012): Petrovaradinska tvrđava fortress, near abandoned railway tunned; Vrdnik, Mt. Fruška Gora. **After Jovanović (1996)**: Mt. Stol near city of Bor. **After Gojšina *et al.* (2024a)**: Vojvodina province, village of Ada (45°47′04.0″N, 020°09′01.0″E); Vojvodina province, town of Senta (45°56′11.5″N, 020°05′26.4″E).

Differential diagnosis. See *C. lubricella*.

Distribution and habitats in Serbia. A frequent species in Serbia, especially in meadows and valleys. Prefers slightly moister habitats than *C. lubricella* but the two species can occasionally be syntopic.

Remarks. Tolerant towards, and even able to reach high

abundance in gardens, parks, and pots. Tomić (1959) lumped the findings of this species with *C. lubricella*.

Cochlicopa lubricella (Porro, 1838)

Figures 19E–H, 20, 21

Bulimus lubricus var. *lubricella* Porro 1838: 53.
Cochlicopa lubrica var. *exigua*—Pavlović 1912: 63.
Cochlicopa lubrica exigua—Hesse 1929: 233.
Cochlicopa lubrica—Tomić 1959: 31–32.

Material examined. Belgrade, Kalemegdan forterss, *leg.* M. Vujić, 28 Dec. 2022, 1 specimen (44° 49′ 26.67″ N, 020° 27′ 02.24″ E); Mt. Kopaonik, Marinkovac hill, above Ciganska reka river, National Park Kopaonik, *leg.* D. Stojanović, 23 Sept. 2023, 1 specimen (43° 20′ 36.29″ N, 020° 51′ 51.56″ E); village of Ušće, Monastery Studenica, *leg.* V. Gojšina, M. Vujić, 17 Jul. 2023, 1 specimen (43° 29′ 16.30″ N, 020° 31′ 47.74″ E); Despotovac town, old watermill, *leg.* M. Vujić, 25 Feb. 2023, 1 specimen (44° 05′ 46.19″ N, 021° 26′ 11.47″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 15 specimens (43.472362° N, 022.096325° E); village of Vladimirovac near town of Alibunar, *leg.* V. Gojšina, 18 May 2022, 1 specimen (45° 01′ 14.75″ N, 020° 52′ 09.7″ E); village of Periš near city of Niš, Periško vrelo spring, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 14 specimens (43° 22′ 07.62″ N, 022° 18′ 57.77″ E); Mt. Troglav, village of Bogutovac, next to Lopatnica river, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 08 Jul. 2024, 2 specimens (43° 39′ 15.70″ N, 020° 32′ 40.92″ E); Vinci weekend settlement near town of Braničevo, *leg.* M. Vujić, 13 Jul. 2023, 1 specimen (44° 42′ 21.82″ N, 021° 35′ 36.36″ E); village of Ram, Ram sandland, *leg.* M. Vujić, 14 Jul. 2023, 2 specimens (44° 48′ 59.62″ N, 021° 20′ 38.13″ E); Mt. Jadovnik, village of Kaćevo, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 26 Apr. 2024, 1 specimen (43° 19′ 57.58″ N, 019° 45′ 47.90″ E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 2 specimens (43° 38′ 02″ N, 022° 09′ 55″ E); village of Deliblato, Obzovik, *leg.* V. Gojšina, 09 May. 2020, 1 specimen (44° 51′ 09.23″ N, 021° 00′ 39.94″ E); village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 11 Oct. 2020, 1 specimen (44° 50′ 33.11″ N, 021° 01′ 45.39″ E); Belgrade, Kalemegdan fortress, *leg.* M. Vujić, 21 Apr. 2021, 1 specimen (44° 49′ 26.67″ N, 020° 27′ 02.24″ E); near Bosilegrad town, Milevska planina mountain, *leg.* V. Gojšina, 06 Jun. 2022, 1 specimen (42° 31′ 03.66″ N, 022° 28′ 26.94″ E); Tara mountain, Rastište settlement, *leg.* V. Gojšina, 01 Jun. 2021, 1 specimen (43° 56′ 42.42″ N, 019° 21′ 21.90″ E); Tara mountain, Tošića livade, *leg.* V. Gojšina, 01 Jun. 2021, 1 specimen; town of Sokobanja, Mt. Devica, close to spring of Moravica river, *leg.* V. Gojšina, 26 Jun. 2022, 1 specimen (43° 37′ 45.23″ N, 021° 59′ 38.94″ E); town of Sokobanja, Mt. Devica, Čitlučka cave, *leg.* V. Gojšina, 26 Jun. 2022, 1 specimen (43° 37′ 45.81″ N, 021° 59′ 38.35″ E); Mt. Zlatibor, town of Čajetina, village of Gostilje, Gostilje waterfalls, *leg.* V. Gojšina, 07 Aug. 2020, 1 specimen (43° 39′ 24.83″ N, 019° 50′ 18.54″ E); village of Dobri Do near city of Pirot, *leg.* V. Gojšina, M. Vujić, N. Vesović, 29 Apr 2023, 3 specimens (43° 12′ 33.38″ N, 022° 38′ 14.60″ E); hill above rock quarry "Kitka" near Pirot town, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr. 2023, 1 specimen (43° 10′ 30.45″ N, 022° 38′ 32.03″ E); Mt. Povlen, *leg.* V. Gojšina, M. Vujić, N. Vesović, 15 Jun. 2023, 1 specimen (44° 08′ 27.39″ N, 019° 42′ 55.71″ E); Mt. Povlen, Pašna ravan, *leg.* V. Gojšina, 03 Jun. 2021, 1 specimen (44° 8′ 32.94″ N, 019° 40′ 6.14″ E); town of Mionica, village of Paštrić, deciduous forest, Hajdučka Česma well, *leg.* V. Gojšina, M. Vujić, D. Stojanović, M. Šević, 20 Jul. 2023, 1 specimen (approximate coordinates 44° 12′ 14.89″ N, 020° 05′ 37.95″ E); Đerekare village, *leg.* V. Gojšina, 25 Oct. 2022, 1 specimen (42° 59′ 24.05″ N, 020° 07′ 51.61″ E); village of Tekija, karst rocks below Ploče viewpoint, *leg.* V. Gojšina, M. Vujić, 13 Oct. 2024, 8 specimens (44° 36′ 49.24″ N, 022° 16′ 31.67″ E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 3 specimens (43° 04′ 29″ N, 022° 47′ 46″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): village of Basara near city of Pirot; Mt. Miroč, Brzec; Ravna Reka near village of Židilje, Vrtača; city of Gornji Milanovac; Mt. Gučevo near city of Loznica; Gradac (possibly referring to Monastery Gradac on Mt. Golija?); Mt. Avala; Mt. Kosmaj; Miljkov Monastery near town of Lapovo; Monastery Ravanica in village of Senje near town of Ćuprija; Crnica river gorge near city of Paraćin, alluvium of Jošanička reka river; town of Batočina (Jerinin Grad); Metino brdo; town of Krupanj; village of Poćuta near city of Valjevo (Monastery pustinja); city of Užice; Mt. Ovčar; Sjenište near river Uvac; village of Negbina near town of Kokin Brod; Kadijina stena near Mt. Javor; Đelteš near city of Pirot; Jelašnica gorge near city of Niš; Sićevo groge near city of Niš; Svrljiške planine Mts., village of Periš; village of Crnoljevica; Stara planina Mts., village of Kalna; city of Knjaževac, Glavičica; Sv. Stevan Monastery near city of Aleksinac; Mt. Rtanj, Crkva Lozica; Mt. Stol near city of Bor; town of Donji Milanovac; Golubac fortress near town of Golubac. **After Hesse (1929)**: Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river.

Differential diagnosis. This species is strikingly similar to

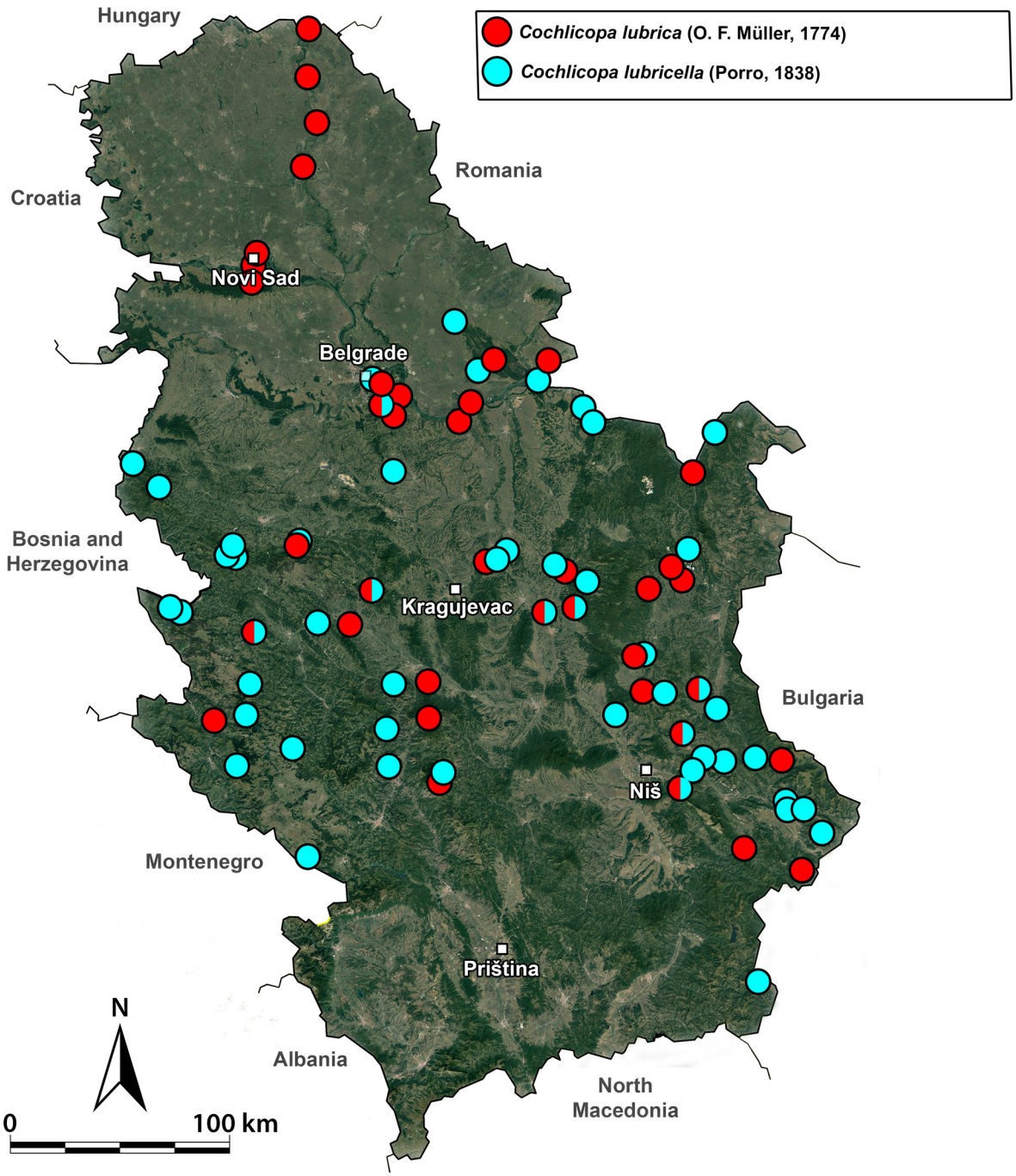

Figure 21. Distribution map of *Cochlicopa* spp. in Serbia.

C. lubrica. However, *C. lubricella* is smaller and slenderer than *C. lubrica* (Armbruster 1995; Welter-Schultes 2012).

Distribution and habitats in Serbia. Scarce findings in Serbia, insufficiently known. Occurs in slightly drier conditions than *C. lubrica* but the two species may sometimes be syntopic.

Remarks. This species has been mistakenly omitted in the checklist of Karaman (2007) even though it has been previously reported by Pavlović (1912). Tomić (1959) lumped the findings of this species with *C. lubrica*.

Family Vertiginidae Fitzinger, 1833

Subfamily Vertigininae Fitzinger, 1833

Genus *Vertigo* O.F. Müller, 1773

Type species. *Vertigo pusilla* O.F. Müller, 1774, by subsequent monotypy.

***Vertigo angustior* Jeffreys, 1830**

Figures 22A–D, E, 23

Vertigo angustior Jeffreys 1830: 361.
Vertigo angustior—Hesse 1929: 233.
Vertigo (*Vertigo*) *angustior*—Karaman 2007: 147.

Material examined. Village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 7 specimens (43°28′20.53″N, 022°05′46.77″E).

Sites in Serbia from the literature. After Hesse (1929): river Danube, near city of Smederevo.

Differential diagnosis. This is one of the two sinistral species in Serbia, along with *V. pusilla* and for differences, see under that species.

Distribution and habitats in Serbia. Only known from two localities in Serbia, Niševac Gorge near the village of Niševac (eastern Serbia, Svrljiški Timok river alluvium) and the Danube River near the city of Smederevo.

Remarks. Preferred habitat type in Serbia is not known due to scarcity of the records.

***Vertigo antivertigo* (Draparnaud, 1801)**

Figures 22F–I, J, 23

Pupa antivertigo Draparnaud 1801: 57.
Vertigo (*Alaea*) *antivertigo*—Pavlović 1912: 77.
Vertigo antivertigo—Jaeckel *et al.* 1958: 145; Tomić 1959: 38.
Vertigo (*Vertigo*) *antivertigo*—Karaman 2007: 147.

Material examined. Village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 11 Oct. 2020, 1 specimen (44°50′33.11″N, 021°01′45.39″E); town of Kovin, next to Danube river, *leg.* V. Gojšina, 01 May. 2019, 2 specimens (44°43′39.33″N, 020°58′41.48″E); village of Jabuka near city of Pančevo, next to Tamiš river, *leg.* V. Gojšina, N. Vesović, 27 Mar. 2021, 5 specimens (44°56′40.19″N, 020°35′47.53″E); Special Nature Reserve "Zasavica", Batar, *leg.* V. Gojšina, 04 Jun. 2021, 1 specimen; village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 1 specimen (43°28′20.53″N, 022°05′46.77″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): river Bitva near village of Glušci near town of Bogatić; Zmijavica pond near city of Pirot; village of Barje near city of Pirot.

Differential diagnosis. See *V. pygmaea* and *V. substriata*.

Distribution and habitats in Serbia. Found in quite wet habitats, fens and next to rivers. Especially associated with moist soil, soaked logs overgrown by mosses. Findings in Serbia scarce. Probably most common in Vojvodina province.

***Vertigo pusilla* O.F. Müller, 1774**

Figures 22K–N, O, 23

Vertigo pusilla O.F. Müller 1774: 124.
Vertigo (*Vertilla*) *pusilla*—Pavlović 1912: 78.
Vertigo pusilla—Jaeckel *et al.* 1958: 146; Tomić 1959: 39.
Vertigo pusila [*sic*]—Jovanović 1997b: 231.
Vertigo (*Vertigo*) *pusilla*—Karaman 2007: 147.

Material examined. Village of Deliblato, Obzovik, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44°51′09.23″N, 021°00′39.94″E); Mt. Tara, village of Perućac, near spring of river Vrelo, *leg.* V. Gojšina, J. Grego, Aug. 2023, 1 specimen (43°57′16″N, 019°25′33″E); canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 1 specimen (42°56′03.06″N, 020°24′02.92″E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43°31′25.18″N, 019°39′39.54″E); village of Ljuberađa, limestone cliff, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43°01′02.33″N, 022°21′59.74″E); Uvac region, above Potpećko lake, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 28 May 2025, 1 specimen (43°29′15.62″N, 019°36′59.20″E and 43°29′22.97″N, 019°36′40.40″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Gradac river valley near city of Valjevo; Mt. Povlen, Veliki and Mali Povlen; Mt. Medvednik, Malo Platno; village of Gornje Košlje near town of Ljubovija; Mt. Tara (Krstača hill near Rača Monastery, spring in village of Perućac, Drundebo, canyon of river Derventa); river Prištavica near Mt. Zlatibor; Mt. Čemernica, Zečki Vrh peak; river Dubočica near town of Raška; Svrljiške planine Mts., village of Periš; Sićevo gorge near city of Niš; Koprivštički Krst near city of Pirot. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This is one of the two sinistral species in Serbia, along with *V. angustior*. However, *V. angustior* is smaller and has a long palatal fold.

Distribution and habitats in Serbia. Usually found by soil sampling in limestone rich areas. Alongside *V. pygmaea*, virtually associated with drier habitats than other congenerics in Serbia. Also found in non-limestone areas such as the Deliblato sandland.

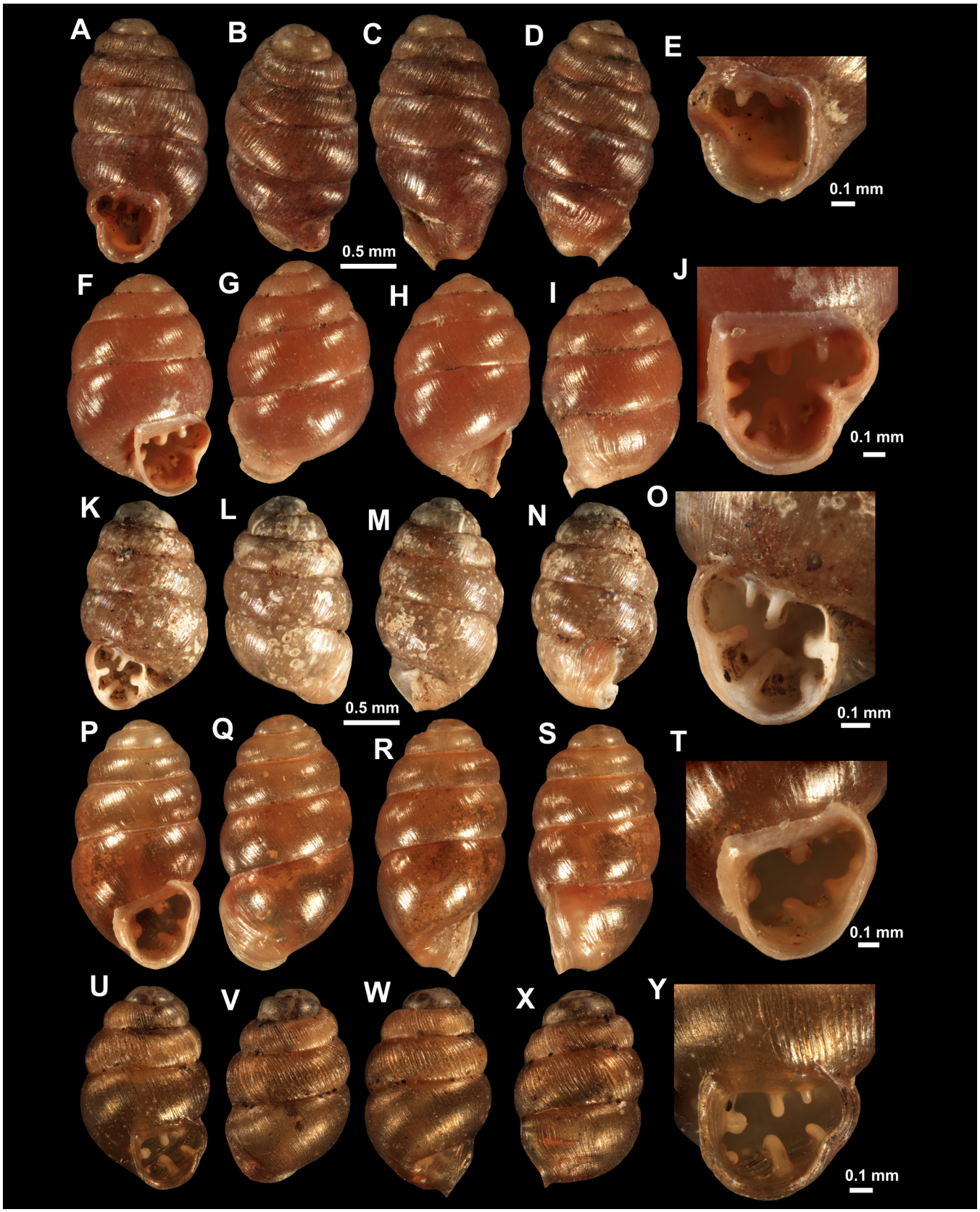

Figure 22. *Vertigo* spp. in Serbia. **A**–**E**, *V. angustior* from the Niševac gorge. **F**–**J**, *V. antivertigo* from the Niševac gorge. **K**–**O**, *V. pusilla* from the banks of the Rutoška river. **P**–**T**, *V. pygmaea* from the Niševac gorge. **U**–**Y**, *V. substriata* from Mt. Kopaonik, Jankove bare.

Vertigo pygmaea (Draparnaud, 1801)

Figures 22P–T, 23

Pupa pygmaea Draparnaud 1801: 57.
Vertigo (*Alaea*) *pygmaea*—Pavlović 1912: 77.
Vertigo (*Alaea*) *pygmaea* f. *quadridens*—Pavlović 1912: 77–78.
Vertigo pygmaea—Hesse 1929: 233; Jaeckel *et al.* 1958: 145; Tomić 1959: 38–39; Jovanović 1997b: 231.
Vertigo (*Vertigo*) *pygmaea*—Karaman 2007: 147.

Material examined. Landscape of Outstanding Features "Karaš-Nera", *leg.* V. Gojšina, 14 Oct. 2020, 1 specimen (44° 52′22.33″N, 021° 25′33.23″E); Pešter plateau, Đerekarska reka river, *leg.* V. Gojšina, 27 Jul. 2022, 1 specimen; village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 2 specimens (42° 59′24.05″N, 020° 07′51.61″E); village of Čedovo, *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43° 18′04.47″N, 020° 00′05.77″E); town of Sokobanja, Lepterija locality, on limestone rocks, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 1 specimen (43° 38′10.38″N, 021° 53′16.95″E); city of Belgrade, settlement of Vrčin, house yard, *leg.* M. Vujić, 1 specimen (44° 40′35.81″N, 020° 36′29.10″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 20 specimens (43° 28′20.53″N, 022° 05′46.77″E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 6 specimens (43° 38′02″N, 022° 09′55″E); Uvac region, above Potpećko lake, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 28 May 2025, 1 specimen (43° 29′22.97″N, 019° 36′40.40″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Crnica river gorge near city of Paraćin; Mt. Tara, canyon of river Derventa; between town of Bela Palanka and village of Mokra; Svrljig gorge near town of Svrljig; Taor, near city of Valjevo; Mt. Povlen; Mt. Medvdenik; Mt. Tara (Krstača hill near Rača Monastery, village of Perućac, canyon of river Derventa, Kamenova Kosa); Mt. Goč, Dobra Voda; Rćanska cave near Dragačevo; Mt. Zlatibor, Murtenica mountain massif; Mt. Čemernica, Zečki Vrh peak; Mt. Javor; Mt. Mučanj; Jelašnica gorge near city of Niš; Stara planina Mts., Babin Zub peak; Mt. Rtanj. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species differs from *V. antivertigo* by the less barrel-shaped shell, less numerous apertural barriers and not heart-shaped aperture. See also *V. substriata*.

Distribution and habitats in Serbia. We have usually found this species on limestone rocks by soil sampling. It has also been found in soil next to the Nera river, near the town of Bela Crkva (Vojvodina province). The small number of known localities are scattered, but this species is probably distributed across the whole of Serbia.

Vertigo substriata (Jeffreys, 1833)

Figures 22U–Y, 23

Alaea substriata Jeffreys 1833: 515.
Vertigo substriata—Maassen 1985a: 138; Maassen 1988: 37.

Material examined. Landscape of Outstanding Features "Vlasina", Polom peat bog, *leg.* M. Vujić, 06 Oct. 2023, 1 specimen (42° 45′34.90″N, 022° 19′28.05″E); Mt. Kopaonik, Jankove bare peat bog, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 5 specimens (43° 19′15.67″N, 020° 46′23.88″E).

Sites in Serbia from the literature. After Maassen (1985a, 1988): gorge near Grza, near Paraćin.

Differential diagnosis. This species can be distinguished from its congeners by the strong radial ribbing on the shell. *Vertigo pygmaea* has a single parietal lamella; *V. antivertigo* has more barrel-shaped shell, with a smoother surface, more apertural barriers, and a heart-shaped aperture.

Distribution and habitats in Serbia. In Serbia, has been found in acidic *Sphagnum* bogs: one on Mt. Kopaonik, south-central Serbia, and one on Vlasina plateau, south-eastern Serbia. Apart from these two localities, Maassen (1985a) reported this species from the vicinity of the Grza River near city of Paraćin.

Family Pupillidae W. Turton, 1831

Genus *Pupilla* J. Fleming, 1828

Type species. *Pupa marginata* Draparnaud, 1801, by monotypy.

Pupilla muscorum (Linnaeus, 1758)

Figures 24A–E, 25

Turbo muscorum Linnaeus 1758: 767.
Pupilla muscorum—Hesse 1929: 234; Pavlović 1912: 74; Tomić 1959: 36–37; Jovanović 1985: 41; Jovanović 1990: 24; Jovanović 1997a: 355; Jovanović 1996: 218.
Pupa muscorum—Möllendorff 1873: 134.
Pupilla cupa—Hesse 1929: 234.
Pupilla muscorum—Jaeckel *et al.* 1958: 146; Maassen 1988: 37.
Pupilla (*Pupilla*) *muscorum*—Karaman 2007: 147; Karaman 2012: 20.

Material examined. Village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 03 Jan. 2021, 2 specimens (44° 50′33.11″N, 021° 01′45.39″E); village of Deliblato, Obzovik, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44° 51′09.23″N, 021° 00′39.94″E); Mt. Golija, Golijska reka river, *leg.* D. Antić, 5 specimens; Mt. Beljanica, Rečke, *leg.* M. Vujić, 28 Jul. 2022, 1 specimen; city of Bor, Mt. Stol, *leg.* V. Gojšina, 18

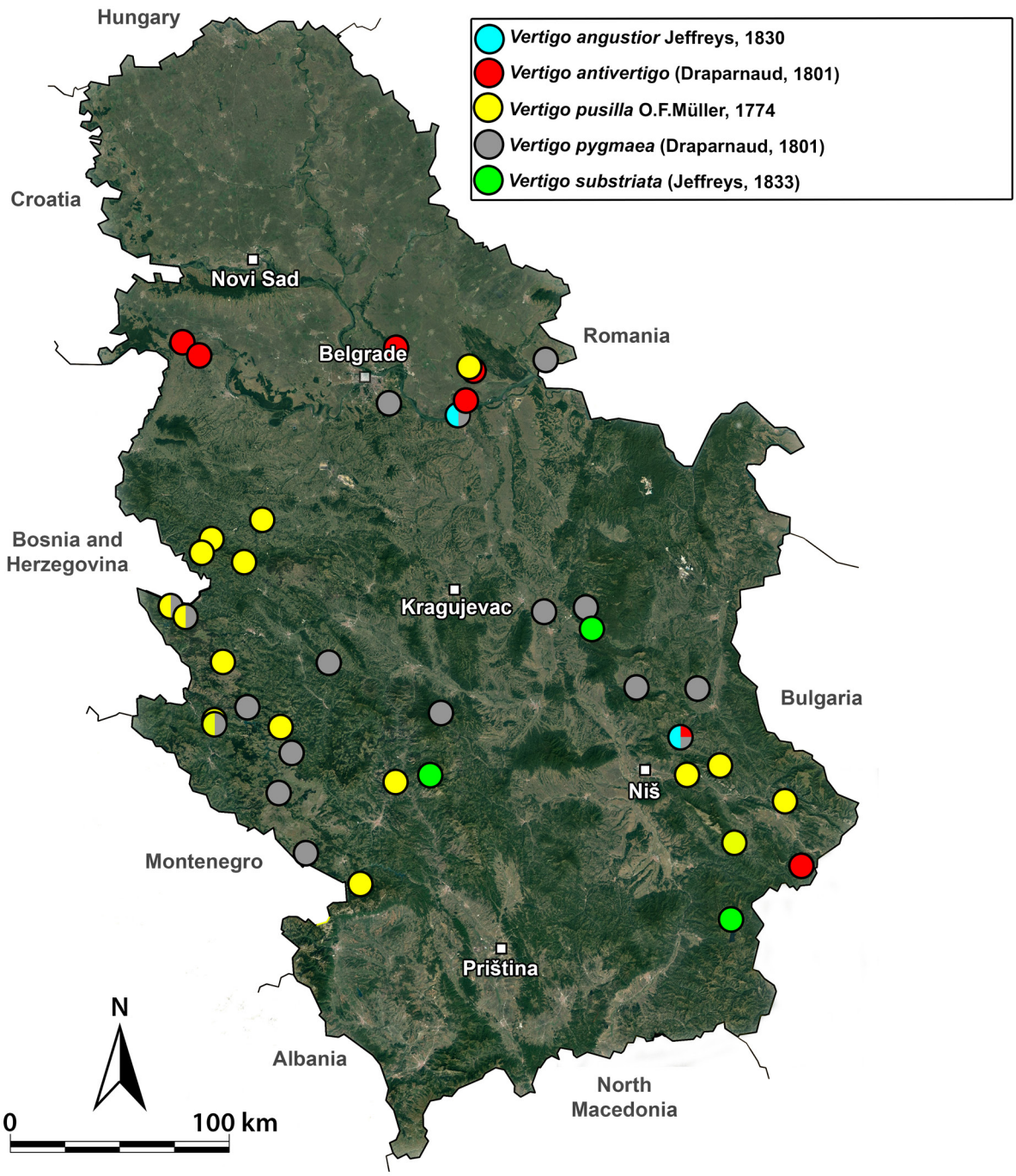

Figure 23. Distribution map of *Vertigo* spp. in Serbia.

Jun. 2022, 1 specimen (44°10′17.00″N, 022°07′40.53″E); village of Čiflik, next to Nišava river, *leg.* V. Gojšina, 05 Aug. 2022, 1 specimen (43°13′04.90″N, 022°24′47.93″E); village of Staničenje, *leg.* V. Gojšina, 07 Nov. 2022, 1 specimen (43°12′16.26″N, 022°30′32.67″E); Pešter plateau, Vapa river spring, *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43°14′12.08″N, 020°06′05.21″E); village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 1 specimen (42°59′24.05″N, 020°07′51.61″E); village of Čedovo village, *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43°18′04.47″N, 020°00′05.77″E); city of Belgrade, Kalemegdan forterss, *leg.* M. Vujić, 28 Dec. 2022, 1 specimen (44°49′26.67″N, 020°27′02.24″E); town of Despotovac, old watermill, *leg.* M. Vujić, 25 Feb. 2023, 2 specimens (44°05′46.19″N, 021°26′11.47″E); city

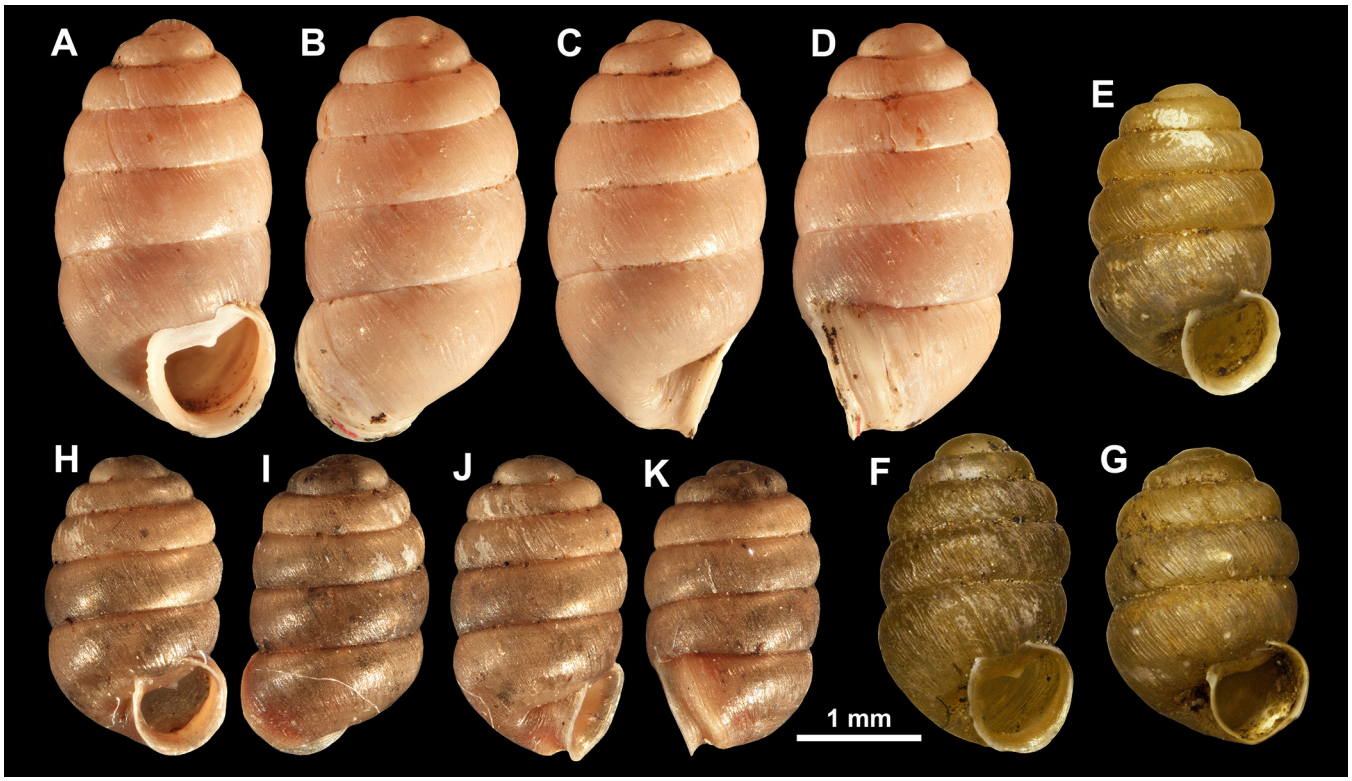

Figure 24. *Pupilla* spp. in Serbia. **A**–**D**, *P. muscorum* from the Niševac gorge. **E**, *P. sterrii* from Ljuberađa. **F**, *P. sterrii* from Mt. Stol. **G**, *P. sterrii* from the Niševac gorge. **H**–**K**, *P. triplicata* from the Niševac gorge.

of Valjevo, settlement of Petnica, Petnica research centre, 29 May 2023, *leg.* M. Vujić, 1 specimen (44° 14′ 46.15″ N, 019° 55′ 48.63″ E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 6 specimens (43° 38′ 08.32″ N, 021° 53′ 18.21″ E); town of Tutin, Smolućka cave, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2023, 27 specimens (43° 02′ 43.84″ N, 020° 21′ 40.00″ E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43° 31′ 25.18″ N, 019° 39′ 39.54″ E); village of Radoševac near town of Golubac, *leg.* M. Vujić, 14 Jul. 2023, 1 specimen (44° 39′ 47.10″ N, 021° 36′ 32.64″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 25 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 9 specimens (43° 38′ 02″ N, 022° 09′ 55″ E); city of Belgrade, settlement of Vinča, confluence of rivers Bolečica and Danube, *leg.* V. Gojšina, M. Vujić, 03 Feb. 2024, 1 specimen (44° 45′ 28.75″ N, 020° 37′ 33.95″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; village of Basara near city of Pirot; village of Barje near city of Pirot; city of Belgrade; village of Vratna and near Vratna river gorge near city of Negotin; Golubac fortress near town of Golubac; village of Donja Bela Reka near city of Bor; city of Pirot, Đelteš; Metino Brdo near city of Kragujevac; Mt. Zlatibor, Volujačka Karaula; Jelašnica gorge near city of Niš; Svrljig gorge near town of Svrljig; Korenatac gorge near village of Kalna; Jevik hill near city of Knjaževac; Rgotski kamen near city of Bor; Mt. Stol near city of Bor; Mt. Starica near town of Majdanpek. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija. **After Jovanović (1985)**: Mt. Avala near city of Belgrade. **After Maassen (1988)**: Pirot, surroundings of Pirot castle. **After Jovanović (1990)**: Deliblato sandland (village of Kajtasovo). **After Jovanović (1997a)**: Mts. Mali Krš and Vizak near city of Bor. **After Jovanović (1996)**: Mt. Stol near city of Bor. **After Karaman (2012)**: Petrovaradinska Tvrđava-fortress, near abandoned railway tunnel **After Möllendorff (1873)**: Svrljiške planine Mts., Pleš.

Differential diagnosis. This species is very similar to *P. alpicola* (Charpentier, 1837) (earlier reported also under its junior synonym, *P. pratensis* (Clessin, 1871), see Nekola et al. (2014)), which is still not known from Serbia. *Pupilla alpicola* is larger, its whorl converge more abruptly towards the

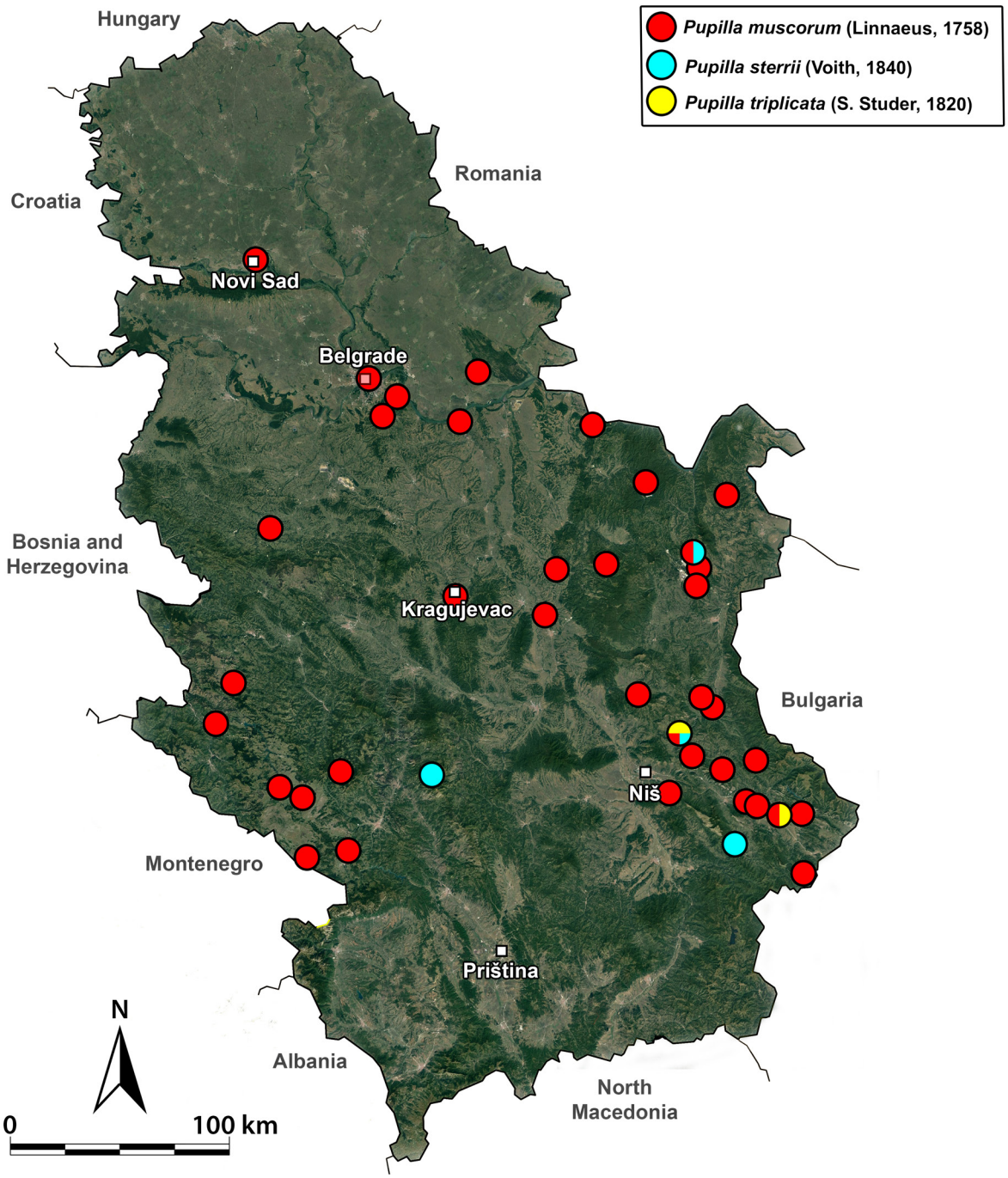

Figure 25. Distribution map of *Pupilla* spp. in Serbia.

apex and it is a typical inhabitant of calcareous fens (von Proschwitz *et al.* 2009; Horsák *et al.* 2010). See also *P. triplicata*.

Distribution and habitats in Serbia. Widespread, usual inhabitant of dry and open habitats. Not bound to limestone. Frequently in dry grasses, mosses, and even pots with dry soil.

Remarks. The similar *P. alpicola* is still not known from Serbia, although its presence is also likely. In this regard, paying special attention to calcareous fens—the typical habitat type for *P. alpicola*, see von Proschwitz *et al.* (2009) and Horsák *et al.* (2010)—may lead to the discovery of this species in Serbia. *Pupilla alpicola* inhabits northern and central Europe (Horsák *et al.* 2010), except Hungary, where it is expected but not reported. All "large" *Pupilla* species from Serbia are

currently assigned to *P. muscorum* since they all match the characters provided by von Proschwitz *et al.* (2009).

Pupilla sterrii (Voith, 1840)

Figures 24E–G, 25

Pupa sterri Voith in Foster 1840: 469.
Pupilla sterri—Jaeckel *et al.* 1958: 146.
Pupilla (*Pupilla*) *steri* [*sic*]—Karaman 2007: 147.

Material examined. Village of Ljuberađa, limestone cliff, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 3 specimens (43° 01′ 02.33″N, 022° 21′ 59.74″E); Mt. Stol near city of Bor, climb to peak, *leg.* V. Gojšina, 18 Jun. 2022, 9 specimens (44° 10′ 17.00″N, 022° 07′ 40.53″E); Mt. Kopaonik, Srebrnac, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jul. 2024, 6 specimens (43° 18′ 36.27″N, 020° 50′ 17.09″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 1 specimen (43° 28′ 20.53″N, 022° 05′ 46.77″E).

Differential diagnosis. This species is smaller than *P. muscorum* and has more convex whorls as well as distinct radial ribbing. See also *P. triplicata*.

Distribution and habitats in Serbia. The distribution of this species in Serbia is scattered and not well known. It is found in limestone rich areas.

Remarks. The presence of this species in Serbia has only been noted by Jaeckel *et al.* (1958), and its mention by Karaman (2007) is likely just a repetition of the data presented by these earlier authors. We can now confirm the presence of this species in Serbia after almost 70 years. Specimens from Serbia had only one apertural barrier or none, while the typical *P. sterrii* usually has two (Welter-Schultes 2012). However, due to the presence of characteristic membranous ribs (Horsák et al. 2013), we consider that specimens from Serbia belong to *P. sterrii*.

Pupilla triplicata (S. Studer, 1820)

Figures 24H–K, 25

Glischrus (*Pupa*) *triplicata* S. Studer 1820: 18.
Pupilla triplicata—Maassen 1988: 37.

Material examined. Village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 19 specimens (43° 28′ 20.53″N, 022° 05′ 46.77″E).

Sites in Serbia from the literature. After Maassen (1988): Pirot, surroundings of Pirot castle.

Differential diagnosis. This species is smaller than *P. muscorum* and usually has more apertural teeth and more convex whorls. It is also smaller than *P. sterrii*, which has pronounced radial ribbing.

Distribution and habitats in Serbia. This species is known from Svrljiški Timok deposits in Niševac gorge and at Pirot castle.

Remarks. Our specimens from Niševac show only a single parietal tooth within the aperture and lack the well-developed palatal plica typical of *P. triplicata.* We could not identify our specimens as *P. sterrii*, as they lack the characteristic radial ribbing present in this species and are slightly smaller than typical of *P. sterrii*. Therefore, we retain the identification as *P. triplicata* and note that specimens from Serbia are lacking the palatal plica. The lack of such plica is known to occur in *P. triplicata* (see images by Horsák *et al.* 2025).

Family Agardhiellidae Harl & Páll-Gergely, 2017

Genus *Agardhiella* P. Hesse, 1923

Type species. *Pupa truncatella* L. Pfeiffer, 1841, by monotypy.

Remarks. Jaeckel *et al.* (1958) reported "*Agardhia parreysii*" and "*Agardhia lamellata*" from Serbia. The identity of these has never been discussed and they might belong to several taxa already known from Serbia according to the revision of Subai (2011).

Agardhiella armata (Clessin, 1887)

Figures 26A–F, 30

Sphyradium parreyssii var. *armata* Clessin 1887: 247, fig. 148.
Agardhiella armata—Subai 2011: 81, fig. 3.

Material examined. Town of Preševo, Ilinska cave, *leg.* V. Gojšina, M. Vujić, 09 Oct. 2024, 9 specimens (42° 20′ 51.44″N, 021° 35′ 55.62″E); village of Periš, Periško vrelo, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 1 juvenile specimen (cf. *armata*) (43° 22′ 07.34″N, 022° 18′ 57.74″E).

Sites in Serbia from the literature. After Subai (2011): Jelašnica gorge near city of Niš; village of Prekonoga (30 km NE of city of Niš); village of Periš, Periško vrelo (*ca* 25 km N from town of Bela Palanka); Crni Vrh (Jošanica).

Differential diagnosis. See *A. serbica*.

Distribution and habitats in Serbia. This species occurs in eastern and south-eastern Serbia. It is limited to karstified limestone where it lives rather hidden, deep in rock crevices. One isolated population exists in the surroundings of Ilinska cave, in the village of Ilince near the town of Preševo. This is only karstic fragment in the immediate vicinity.

Remarks. Subai (2011) mentioned that Serbian forms of this species have somehow reduced apertural barriers, which is consistent with our observations.

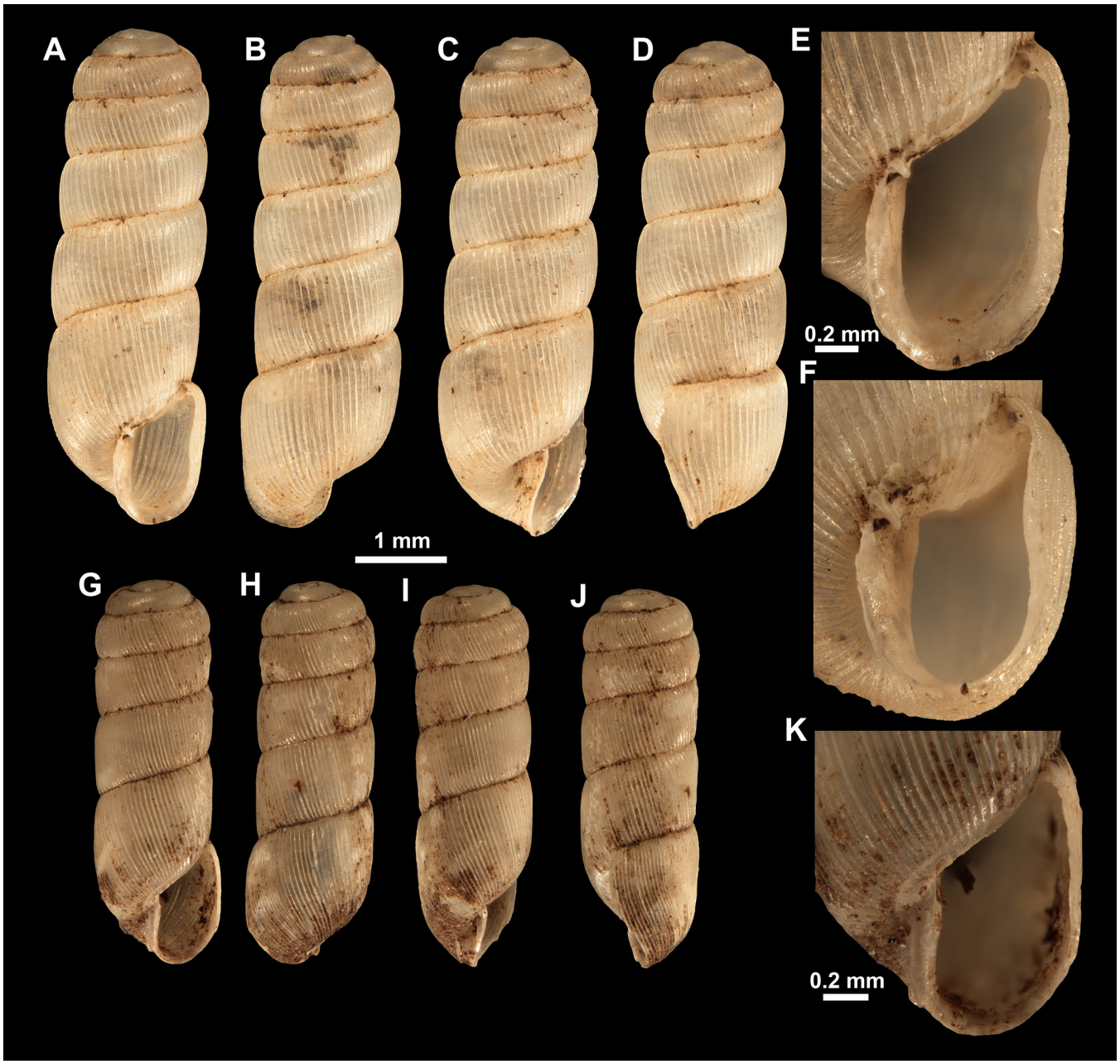

Figure 26. *Agardhiella* spp. in Serbia. **A**–**F**, *A. armata* from the Ilinska cave. **G**–**K**, *A. incerta* from the vicinity of the village of Tekija.

***Agardhiella incerta* Grossu, 1986**

Figures 26G–K, 30

Agardhiella incerta Grossu 1986: 251, fig. 144.
Agardhiella incerta—Subai 2011: 95.

Material examined. Đerdap gorge, village of Tekija, karst rocks below Ploče viewpoint, *leg.* V. Gojšina, M. Vujić, 13 Oct. 2024, 1 specimen (44° 36′ 49.24″ N, 022° 16′ 31.67″ E); **Đerdap gorge, village of Tekija, limestone rocks next to** road, *leg.* V. Gojšina, M. Vujić, 13 Oct. 2024, 3 specimens (44° 39′ 53.61″ N, 022° 20′ 20.90″ E).

Sites in Serbia from the literature. After Subai (2011): E boundary of Kazan Gorge, behind second tunnel, on limestone rocks close to road, *ca* 10–15 m from the Danube.

Differential diagnosis. This species is distinguished by its small shell size and an aperture completely devoid of barriers.

Distribution and habitats in Serbia. This species inhabits karstified limestone in the Iron Gates area (Kazan Gorge), north-eastern Serbia. It is known from only two nearby localities.

Agardhiella macrodonta (P. Hesse, 1916)

Figures 27A–F, 29A, B, 30

Agardhia macrodonta P. Hesse 1916: 116.
Agardhiella macrostoma [*sic*]—Karaman 2007: 146.
Agardhiella macrodonta—Subai 2011: 102; Welter-Schultes 2012: 138.

Material examined. Village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 20 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 4 specimens (43° 38′ 02″ N, 022° 09′ 55″ E); village of Vratarnica near city of Zaječar, limestone rocks, *leg.* M. Vujić, 16 Apr. 2026, 1 specimen (43° 47′ 09″ N, 022° 18′ 55″ E).

Sites in Serbia from the literature. After Subai (2011): Jelašnica gorge (E of Niška Banja); Mt. Belava (between Bela Palanka and Pirot); Gradišnička canyon at N boundary of Pirot, on limestone rocks; Koprivštički krst (*ca* 12 km N of Pirot); Rsovci (*ca* 20 km E of Pirot); Periško vrelo (25 km N of Bela Palanka); 5 km S of crossroads at Knjaževac (in direction to Pirot), on limestone rocks; Kalna; 1.5 km N of Kalna; limestone gorge S of Gornja Kamenica (20.7 km S of crossroads at Knjaževac, in direction to Pirot).

Differential diagnosis. This species can be readily recognized by the very strong palatal tooth.

Distribution and habitats in Serbia. *Agardhiella macrodonta* is found in eastern Serbia. This species is limited to karstified limestone, where it lives rather hidden, deep in rock crevices.

Agardhiella pirotana Subai, 2011

Figures 27G–K, 29C, D, 30

Agardhiella pirotana Subai 2011: 107–108, fig. 22.
Agardhiella parreyssii—Maassen 1985b: 4, fig. 4; Maassen 1988: 37.
Agardhiella pirotana—Welter-Schultes 2012: 139, fig. at top of page.

Type material examined. Paratype (SMF 335530).

Type locality. "Serbia, Castle of Pirot, UTM FN 27" (precise coordinates: 43° 09′ 33.33″ N, 022° 34′ 52.13″ E).

Additional Material examined. Village of Resnik near town of Sokobanja, next to a spring, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 8 specimen (43° 37′ 57.69″ N, 021° 48′ 55.78″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 24 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); village of Ljuberađa, Ljuberaško vrelo, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43° 01′ 48.90″ N, 022° 23′ 17.31″ E).

Sites in Serbia from the literature. After Maassen (1988): Pirot, surroundings of Pirot castle. **After Subai (2011)**: Pirot, ruins of castle and on limestone rocks; village of Grnčar (*ca* 25 km S of Bela Palanka), on limestone rocks close to road; NE boundary of Ljuberađa, on limestone rocks close to road; Gradašnička canyon (N boundary of Pirot). **After Welter-Schultes (2012)**: 25 km south of Bela Palanka.

Differential diagnosis. See *A. truncatella*.

Distribution and habitats in Serbia. *Agardhiella pirotana* is found in eastern Serbia, where it is limited to karstified limestone and it lives rather hidden, deep in rock crevices.

Agardhiella serbica Subai, 2011

Figures 28A–F, 29E–H, 30

Agardhiella serbica Subai 2011: 111, fig. 24.
Coryna parreyssi—Pavlović 1912: 64–65.
Agardhia lamellata—Hesse 1929: 234.
Agardhia parreyssi—Hesse 1929: 234.
Sphyradium parreyssi—Tomić 1959: 32.
Agardhiella serbica—Welter-Schultes 2012: 139, fig. in the middle.

Type material examined. Holotype (SMF 51740).

Type locality. "East Serbia, river debris of the Mirovačka at the upper foothills of Rtanj Planina at the station Mirovo close to Boljevac, UTM EP 74".

Additional material examined. Village of Vratna, Vratna limestone gates on canyon of river Vratna, *leg.* V. Gojšina, 24 Mar. 2022, 3 specimens (42° 22′ 59.55″ N, 022° 20′ 13.96″ E); village of Mokranje near town of Negotin, Mokranjske Stene, *leg.* V. Gojšina, 07 Jun. 2025, 1 specimen (44° 09′ 49″ N, 022° 31′ 30″ E); Đerdap gorge, limestone rocks near town of Golubac, *leg.* V. Gojšina, M. Vujić, 18 Nov. 2025, 1 specimen (44° 39′ 6″ N, 021° 43′ 1″ E).

Sites in Serbia from the literature. Material cited by **Pavlović (1912) and Tomić (1959)** was revised by Subai (2011), who changed the identification of some of Pavlović's material; the localities relevant to this species are included here under Subai (2011). **After Subai (2011)**: canyon 1.9 km E of Ravanica Monastery (= NE of Ćuprija), in forest, on limestone rocks close to road; Manasija Monastery (= E of Despotovac); 500 m W of Manasija Monastery, on limestone rocks close to road; near railway tunnel N of Zagradže village (= S of Donja Bela Reka, E of Bor), on limestone rocks; Stol (= Mt., *ca* 15 km N of Bor); Stol Mt. above Luka, in forest, on limestone rocks; Golubac (at Danube); "Sv. Azosim (Golubac)"; Majdanpek (S of Danube); canyon of river Zamna (*ca* 2 km E of Plavna), on limestone

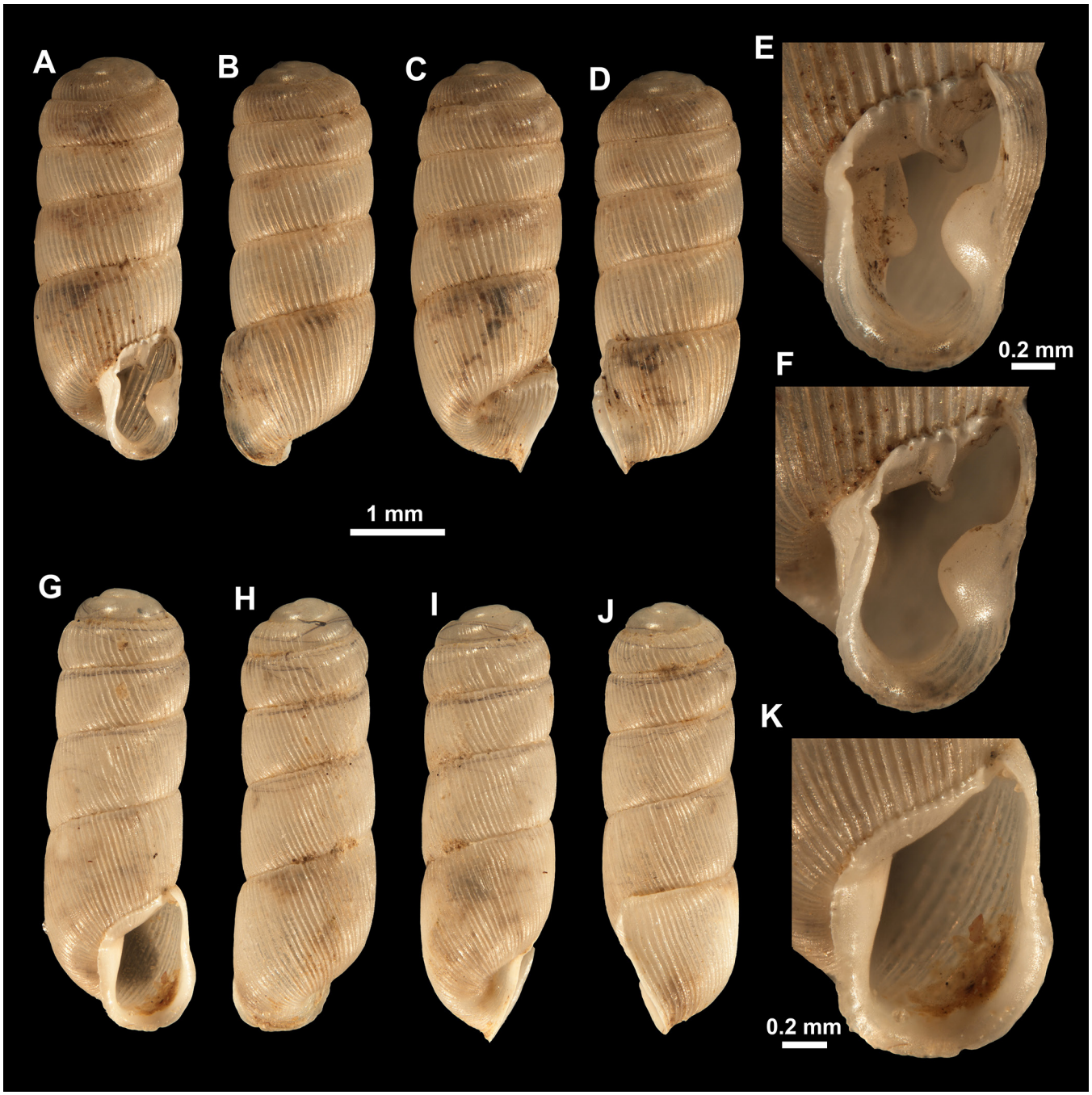

Figure 27. *Agardhiella* spp. in Serbia. **A**–**F**, *A. macrodonta* from the Niševac gorge. **G**–**K**, *A. pirotana* from the Niševac gorge.

rocks; Vratna (between Orsova and Negotin); canyon near Vratna Monastery (NW of Negotin), in forest, on limestone rocks; Rtanj Mountains; 2 km from road Paraćin-Zaječar in direction to Rtanj, in forest on NE slope of Rtanj Mts., on limestone rocks. **After Welter-Schultes (2012)**: Stol mountain near Luka.

Differential diagnosis. This species differs from *A. armata* in being smaller and in having a more strongly sinuated peristome on the palatal side.

Distribution and habitats in Serbia. *Agardhiella serbica* is found in eastern Serbia, where it is limited to karstified limestone. It lives rather hidden, deep in rock crevices.

Remarks. The extent to which the palatal lip in this species is swollen varies, and this should be interpreted as intraspecific variability. A specimen from Vratna (Fig. 28A–F) and the one from Mt. Stol figured by Welter-Schultes (2012)

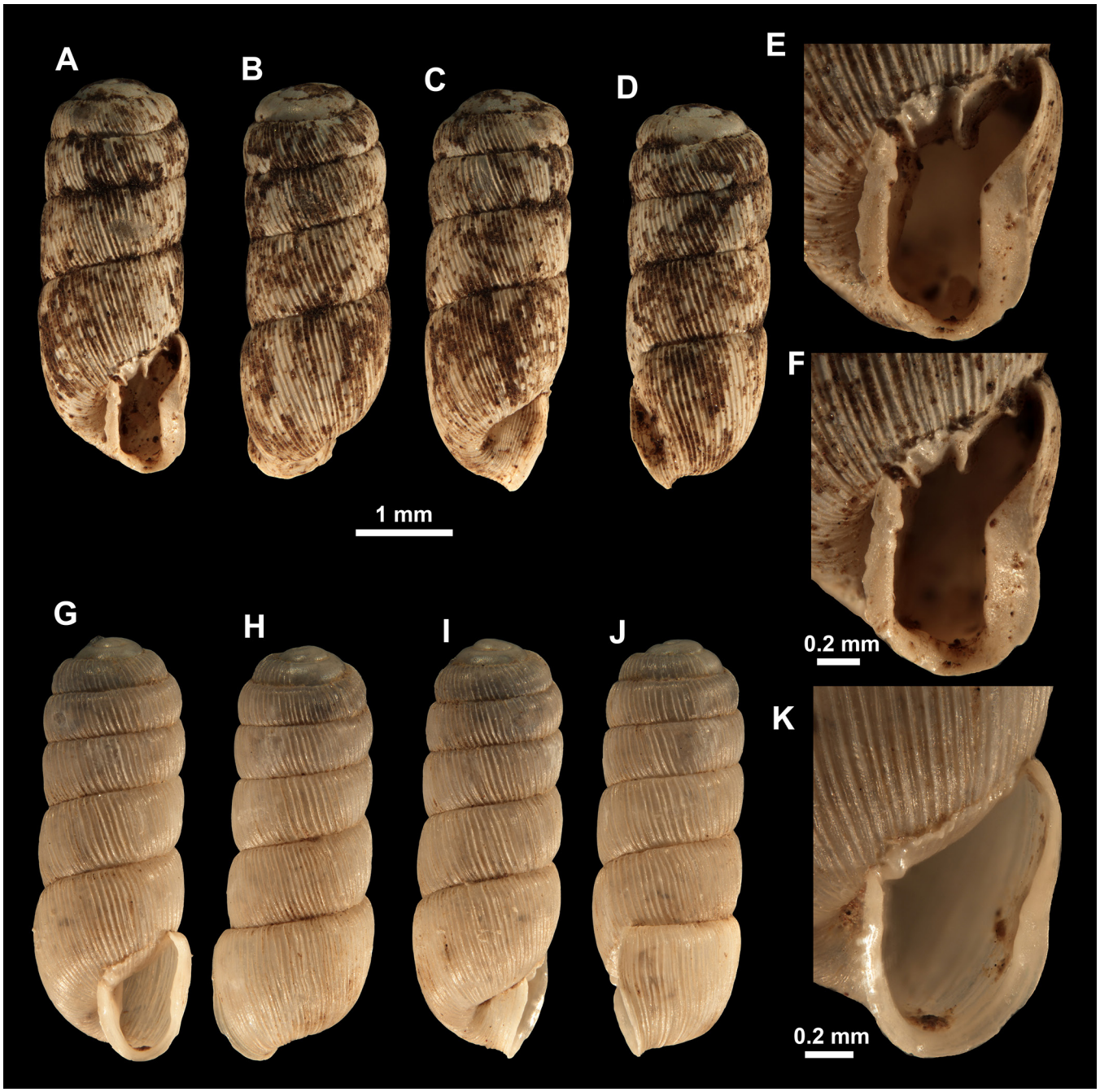

Figure 28. *Agardhiella* spp. in Serbia. **A–F**, *A. serbica* from the Vratna river gorge. **G–K**, *A. truncatella* from the village of Đerekare.

has the palatal lip much more swollen than in the holotype (Fig. 29G, H) and a specimen from Mokranjske stene (Fig. 29E, F).

Agardhiella truncatella (L. Pfeiffer, 1841)

Figures 28G–K, 30

Pupa truncatella L. Pfeiffer 1841: 46.
Coryna truncatella—Pavlović 1912: 63–64.
Agardhia truncatella—Hesse 1929: 234.
Sphyradium truncatella—Tomić 1959: 32.
Argna truncatella—Jovanović 1997b : 231.
Agardhiella truncatella truncatella—Karaman 2007: 146.
Agardhiella truncatella—Subai 2008: 82.

Material examined. Village of Đerekare, limestone rocks, *leg.* V. Gojšina, 25 Oct. 2022, 6 specimens (42° 59′ 25.32″ N, 020° 07′ 49.94″ E); canyon of river Trešnjica, *leg.* V. Gojšina, M. Vujić, 22 Aug. 2025, 1 specimen (44° 08′ 25.57″ N, 019° 32′ 27.24″ E); Uvac region, village of Seništa, Seništa

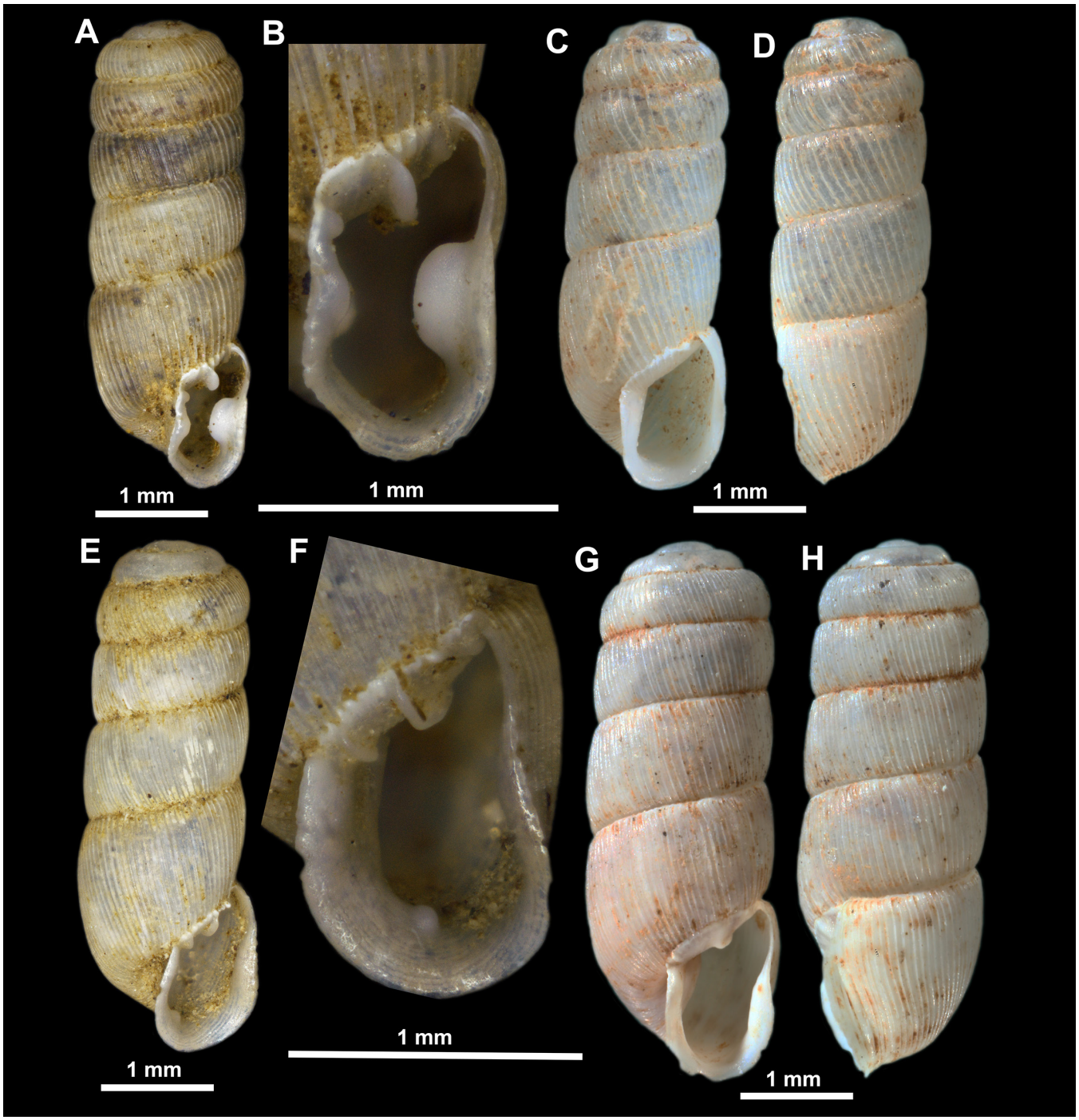

Figure 29. *Agardhiella* spp. in Serbia. **A**, **B**, *A. macrodonta* from Stogazovac. **C**, **D**, *A. pirotana*, paratype (SMF 335530). **E**, **F**, *A. serbica* from Mokranjske stene. **G**, **H**, *A. serbica*, holotype (SMF 51740).

Klak, *leg.* D. Stojanović, D. Antić, M. Šević, 22 May 2024, 1 specimen (43° 33′ 29.69″ N, 019° 42′ 15.37″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Maricéva stena near town of Krupanj; Mt. Povlen, Crkva Pustinja; Mt. Medvednik (Kučajna); city of Užice; Mt. Tara (Perućac, Drundebo); Mt. Javor (Kadijina Stena); Mt. Čemernica (Zečki Vrh). **After Jovanović (1997b)**: Mt. Tara. **After Subai (2008)**: Novi Pazar, gorge at path to monastery Sopoćani; Užice; Zlatibor Mountains, 1 km S of Užice; 2 km S of Užice (Užice-Nova Varoš country road); Vrelo Raške near Užice; Kosovo, Rugovska Gorge 2.5 km W of Kućište; Rugovska Gorge 5 km W of Peć.

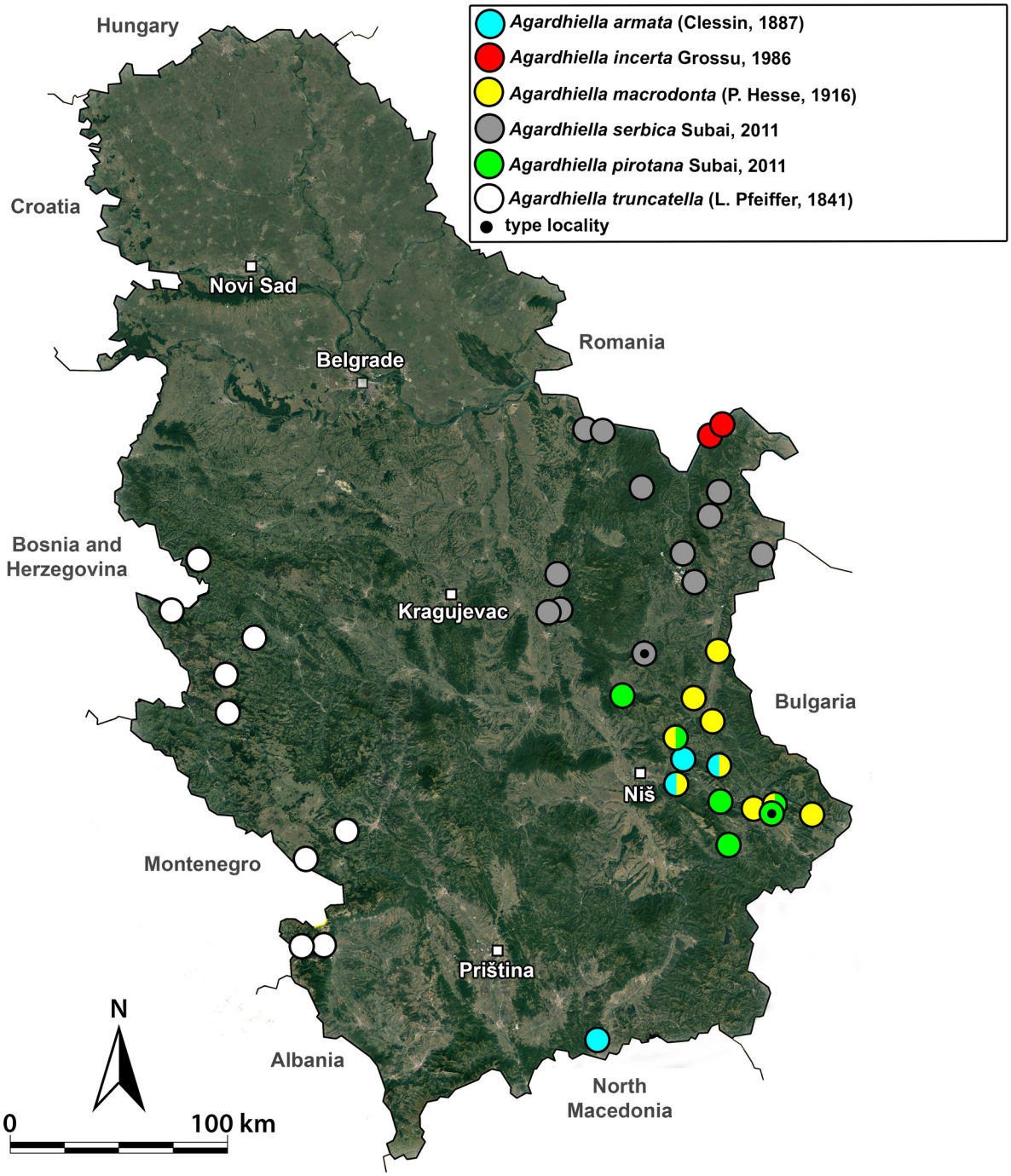

Figure 30. Distribution map of *Agardhiella* spp. in Serbia.

Differential diagnosis. *Agardhiella pirotana* has a small angular tooth, while *A. truncatella* can have an infraparietal as well.

Distribution and habitats in Serbia. This species occurs in western Serbia and is always found on karstified limestone.

Remarks. Shells from the village of Đerekare (Fig. 28G–K) are slenderer and more densely ribbed than specimens from other localities, which are more typical, as figured in Subai (2008). However, transitional forms between the two extremes are found, and these differences fall within the intraspecific variability of this species (Subai 2008).

Family Enidae B.B. Woodward, 1903 (1880)

Subfamily Eninae B.B. Woodward, 1903 (1880)

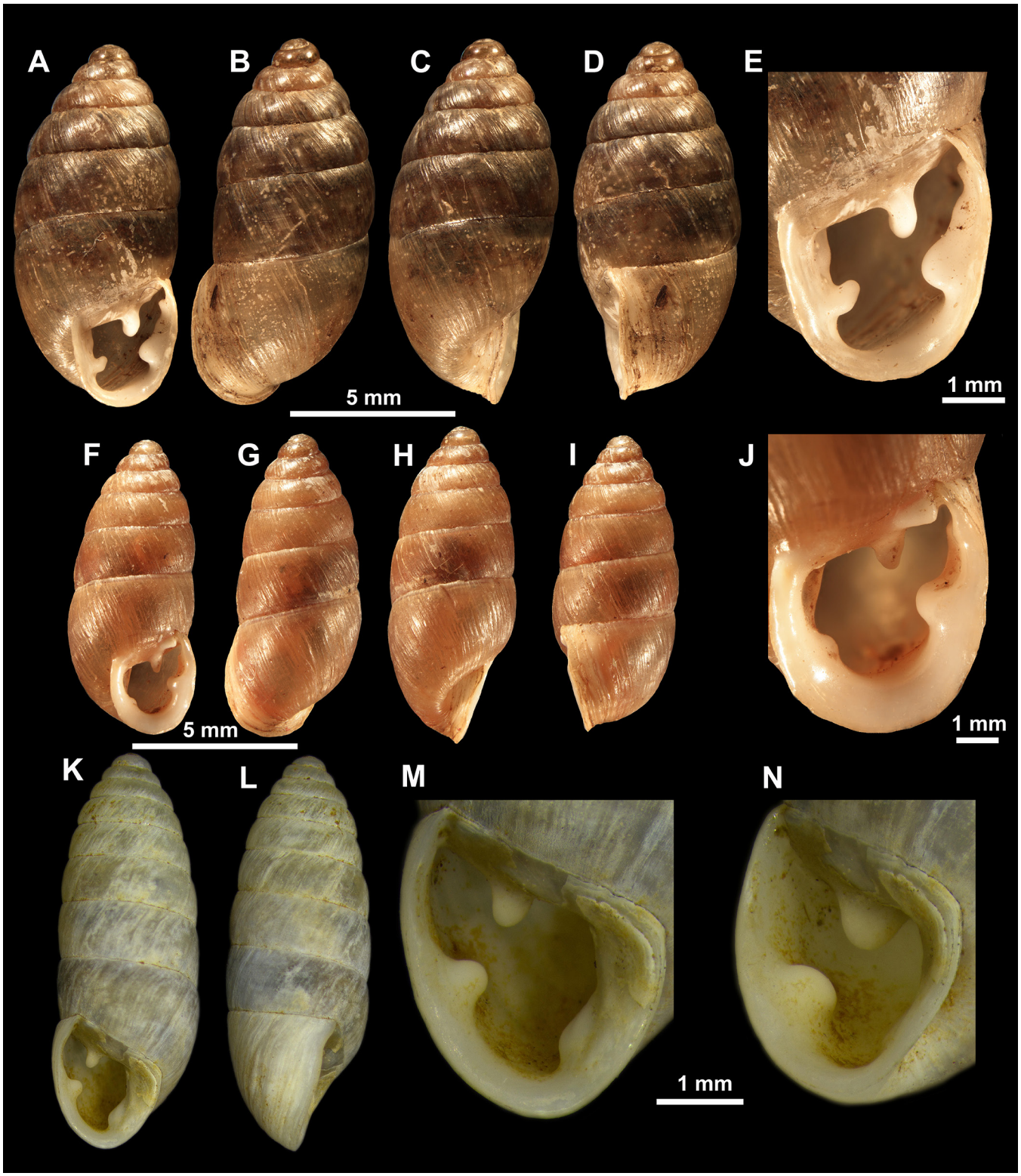

Figure 31. *Pseudojaminia seductilis* and *Chondrula* spp. in Serbia. **A**–**E**, *C. microtragus* from the Vražji Kamen, Pčinja region. **F**–**J**, *C. tridens* from near the village of Požeženo. **K**–**N**, *P. seductilis* from the Jelašnica gorge.

Genus *Chondrula* H. Beck, 1837

Type species. *Helix tridens* O.F. Müller, 1774, by subsequent designation (Herrmannsen 1846).

Chondrula microtragus (Rossmässler, 1839)

Figures 31A–E, 32

Pupa microtragus Rossmässler 1839: 30–31.

Material examined. Landscape of Outstanding Features "Dolina Pčinje", village of Donja Trnica, Vražji Kamen, *leg.* V. Gojšina, M. Vujić, N. Vesović, 17 May 2023, 28 specimens (42°22′59.25″N, 022°03′05.57″E); village of Gornje Žapsko, *leg.* M. Vujić, 01 Oct. 2021, 2 specimens (42°26′48.97″N, 021°55′40.34″E); village of Šaprance, *leg.* M. Vujić, 19 Apr. 2021, 1 specimen (42°23′07.19″N, 021°59′14.30″E); village of Strezovac near town of Preševo, *leg.* V. Gojšina, M. Vujić, 10 Oct. 2024, 31 specimens (42°16′30.74″N, 021°44′26.87″E).

Differential diagnosis. See *C. tridens*.

Distribution and habitats in Serbia. This species can be found in the far south-eastern Serbia in dry, open habitats. It is not bound to limestone. Since south-eastern Serbia is scarce in limestone, this species was recorded almost only on silicate substrate.

Remarks. Welter-Schultes (2012) mentions that the distribution of this species reaches Serbia. We were unable to find the exact sampling site and reference, which is why we treat our record as the first reliable for the country.

Chondrula tridens (O.F. Müller, 1774)

Figures 31F–J, 32

Helix tridens O.F. Müller 1774: 106.
Pupa tridens—Pfeiffer 1853: 146.
Buliminus tridens—Kreglinger 1870: 145.
Chondrula tridens—Pavlović 1912: 60–61; Hesse 1929: 234–235; Jaeckel *et al.* 1958: 148; Tomić 1959: 30; Jovanović 1985: 42; Maassen 1988: 37; Jovanović 1993: 240; Jovanović 1997a: 355–356; Jovanović 1997b: 231; Jovanović 1996: 218; Karaman 2012: 21.
Chondrula trindes [*sic*]—Jovanović 1990: 24.
Chondrula tridens tridens—Karaman 2007: 139.
Chondrula tridens albolimbata—Karaman 2007: 139.

Material examined. Town of Kovin, Kovinski Dunavac locality, *leg.* V. Gojšina, 04 Oct. 2020, 5 specimens (44°43′37.42″N, 020°58′40.94″E); village of Deliblato, Obzovik locality, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44°51′06.69″N, 021°00′36.16″E); village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44°50′31.32″N, 021°01′50.49″E); village of Klinci near city of Valjevo, Petnica cave, *leg.* V. Gojšina, 07 Jun. 2019, 1 specimen (44°14′43.54″N, 019°56′8.43″E); city of Belgrade, Grocka municipality, Gročanska ada, *leg.* V. Gojšina, 05 Aug. 2019, 1 specimen (44°40′26.37″N, 020°43′33.01″E); next to a fishpond Živača close to settlement of Boljevci, *leg.* V. Gojšina, 01 Mar. 2020, 1 specimen (44°44′06.20″N, 020°11′25.03″E); village of Ovčar Banja, surroundings of Ovčar-Kablar gorge, *leg.* V. Gojšina, 10 Aug. 2020, 1 specimen (43°53′56.70″N, 020°11′17.33″E); Mt. Tara, Rastište, *leg.* V. Gojšina, 01 Jun. 2021, 2 specimens (43°56′41.49″N, 019°21′21.76″E); village of Šalinac, Šalinački lug, *leg.* V. Gojšina, M. Vujić, N. Vesović, 21 Jun. 2021, 1 specimen (44°42′05.24″N, 021°02′50.03″E); town of Bela Crkva, near river Nera, *leg.* V. Gojšina, 14 Sept. 2020, 3 specimens (44°52′22.74″N, 021°25′33.44″E); city of Belgrade, settlement of Vrčin, *leg.* M. Vujić, 14 May 2021, 2 specimens (44°40′35.58″N, 020°36′29.08″E); Mt. Kosmaj, near car park, *leg.* V. Gojšina, 12 Aug. 2021, 1 specimen (44°28′19.49″N, 020°34′39.18″E); town of Titel, Titelski Breg, *leg.* M. Vujić, 16 May 2022, 2 specimens (45°13′22.45″N, 020°12′58.83″E); Svrljiške planine Mts., village of Donja Glama, *leg.* V. Gojšina, 04 Aug. 2022, 5 specimens (43°16′32.09″N, 022°22′11.20″E); village of Gradište near city of Pirot, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Nov. 2022, 2 specimens (43°03′45.46″N, 022°41′44.59″E); surroundings of Mt. Vlaška and Mt. Padež, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Sept. 2022, 1 specimen (43°05′21.83″N, 022°31′12.36″E); village of Vlasi, Vetrena Dupka cave (in front), *leg.* V. Gojšina, M. Vujić, N. Vesović, 08 Sept. 2022, 2 specimens (43°00′00.40″N, 022°38′9.84″E); city of Novi Sad, next to Danube river, *leg.* M. Šćiban, 05 Apr. 2013; village of Banatska Palanka, Labudovo okno, *leg.* V. Gojšina, N. Vesović, M. Vujić, 10 Dec. 2022, 4 specimens (44°50′03.84″N, 021°18′39.82″E); village of Deliblato, Deliblato sandland, *leg.* V. Gojšina, 15 May 2022, 10 specimens (44°51′35.32″N, 021°04′02.04″E); Ponjevica near city of Pančevo, *leg.* N. Vesović, 13 Jun. 2022; village of Divljana near town of Bela Palanka, *leg.* V. Gojšina, 28 May 2022, 1 specimen (43°10′42.74″N, 022°18′24.03″E); village of Šljivovik, towards Šljivovički Vis locality, *leg.* V. Gojšina, 29 May 2022, 3 specimens (43°08′32.47″N, 022°21′21.01″E); village of Sićevo, Ogorelička cave, *leg.* V. Gojšina, M. Vujić, 27 Apr. 2023, 1 specimen (43°20′53.3″N 22°05′38.8″E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 1 specimen (43°11′19.65″N, 022°38′47.14″E); Kunovica near city of Niš, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Apr. 2023, 10 specimens (43°18′36.99″N, 022°05′20.07″E); city of Kragujevac,

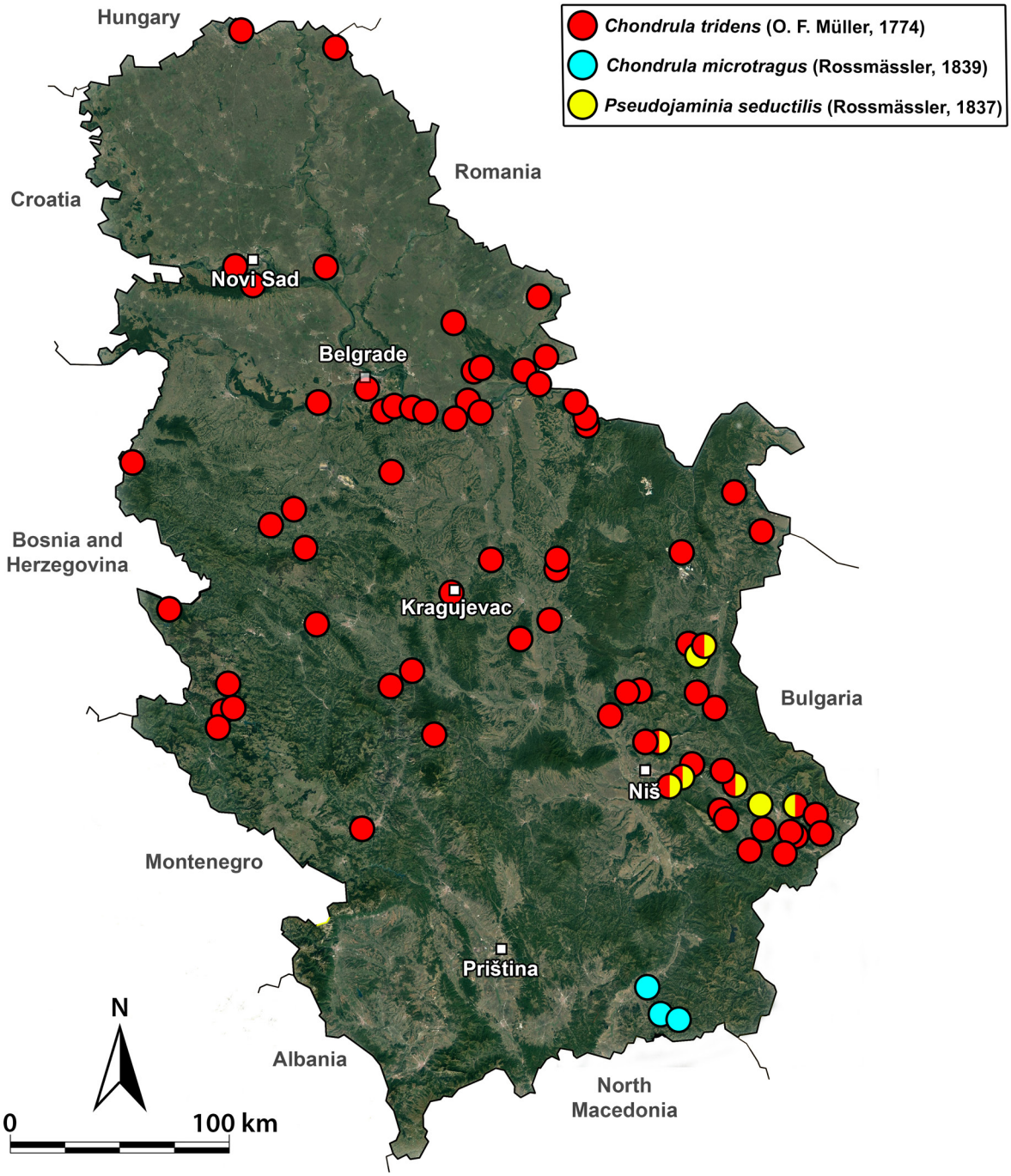

Figure 32. Distribution map of *Chondrula* and *Pseudojaminia* in Serbia.

Botanical garden, *leg.* M. Vujić, 20 Apr. 2023, 2 specimens (44° 1′22.80″N, 020° 53′10.85″E); surroundings of city of Valjevo, *leg.* V. Gojšina, M. Vujić, N. Vesović, 15 Jun. 2023, 2 specimens (44° 20′11″N, 020° 04′24″E); Mts. Vršačke planine, Široko Bilo locality, *leg.* V. Gojšina, M. Šević, D. Stojanović, K. Stojanović, 17 Jun. 2023, 1 specimen (45° 7′30.16″N, 021° 21′38.74″E); Lepterija near town of Sokobanja, on surface of limestone rocks, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 3 specimens (43° 38′08.33″N, 021° 53′18.21″E); Mt. Devica, Mala Propast pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 1 specimen; Mt. Devica, Velika Propast pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 12 specimens; city of Belgrade, Grocka municipality, settlement of Vrčin, *leg.* M. Vujić, 11 Apr.

2021, 1 specimen (44° 40′ 19.75″N, 020° 37′ 16.24″E); Vojvodina province, Subotica sandland, *leg.* M. Vujić, 01 May 2024 (46° 09′ 43.38″N, 019° 43′ 07.95″E); village of Resnik near town of Sokobanja, spring Vrelo, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 3 specimens (43° 37′ 57.49″N, 021° 48′ 55.48″E); Vojvodina province, village of Begeč, near fish pond, *leg.* M. Vujić, 05 May 2024, 6 specimens (45° 13′ 47.42″N, 019° 37′ 54.40″E); Uvac region, Pustinja viewpoint, *leg.* V. Gojšina, D. Stojanović, M. Šćiban, 04 Jun. 2024, 1 specimen (43° 32′ 58.25″N, 019° 41′ 37.15″E); Uvac region, Čelice, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 26 Apr. 2024, 2 specimens (43° 29′ 57.92″N, 019° 38′ 39.49″E); Uvac, village of Seništa, rocks on a dry meadow, 24 May 2024, *leg.* D. Stojanović, D. Antić, M. Šević, 4 specimens (43° 33′ 29.32″N, 019° 44′ 59.82″E); town of Braničevo, near military base, *leg.* M. Vujić, 15 Jul. 2023, 3 specimens (44° 42′ 53.28″N, 021° 33′ 37.28″E); village of Radoševac near town of Golubac, *leg.* M. Vujić, 14 Jul. 2023, 12 specimens (44° 39′ 47.10″N, 021° 36′ 32.64″E); between villages of Kusiće and Požeženo, *leg.* M. Vujić, 1 specimen (44° 44′ 04.27″N, 021° 33′ 40.20″E); Vinci weekend settlement near town of Braničevo, *leg.* M. Vujić, 13 Jul. 2023, 2 specimens (44° 42′ 21.82″N, 021° 35′ 36.36″E); village of Ram, Ram sandland, *leg.* M. Vujić, 14 Jul. 2023, 13 specimens (44° 48′ 59.62″N, 021° 20′ 38.13″E); Mt. Golija, village of Bogutovac, near Lopatnica river, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 08 Jul. 2024, 1 specimen (43° 39′ 15.67″N, 020° 32′ 40.85″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 15 specimens (43° 28′ 20.53″N, 022° 05′ 46.77″E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 6 specimens (43° 38′ 02″N, 022° 09′ 55″E); village of Kravlje, Kravljansko vrelo, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 1 specimen (43° 27′ 07.66″N, 021° 55′ 19.67″E); Vojvodina province, village of Siget, *leg.* V. Gojšina, M. Vujić, 25 Sept. 2024, 7 specimens (46° 04′ 31.85″N, 020° 13′ 43.74″E); village of Vladimirovac, *leg.* V. Gojšina, 18 May 2022, 14 specimens (45° 01′ 14.75″N, 020° 52′ 09.7″E); village of Miliva, Milivska cave, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 2 specimens (44° 08′ 12.91″N, 021° 26′ 10.99″E); city of Belgrade, settlement of Vrčin, house yard, *leg.* M. Vujić, 17 Sept. 2024, 1 specimen (44° 40′ 35.81″N, 020° 36′ 29.10″E); Mt. Zlatibor, Crni Rzav, *leg.* V. Gojšina, M. Vujić, 21 Oct. 2025, 7 specimens (43° 40′ 00″N, 019° 42′ 20″E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 13 specimens (43° 4′ 29″N, 022° 47′ 46″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): city of Belgrade (Topčider, Bulbulder); Mt. Avala near city of Belgrade; Mt. Kosmaj, Beli Kamen; Košutica (?); Monastery Manasija near town of Despotovac; village of Poljna near Mt. Juhor; Rogot near town of Batočina; town of Batočina, Jerinin grad; Metino Brdo near city of Kragujevac; Mt. Gučevo near city of Loznica; village of Struganik near town of Mionica; city of Kraljevo, Vrba; Mt. Željin; village of Masurovci near city of Pirot; village of Sukovo near city of Pirot; large spring in town of Bela Palanka near city of Pirot; Jelašnica gorge near city of Niš; Stara planina Mts., village of Rsovci near city of Pirot; village of Basara near city of Pirot; city of Pirot, Provalija; village of Temska near city of Pirot; Svrljiške planine Mts. (Pleš, village of Periš); Svrljig gorge near town of Svrljig; village of Kopajkošara near town of Svrljig; Monastery Sv. Stevan near city of Aleksinac; city of Knjaževac; Trnovac (eastern Serbia); village of Grlište near city of Zaječar; village of Vrbovac near city of Zaječar; village of Bačevica near town of Boljevac; town of Sokobanja; Mt. Stol near city of Bor; village of Vratna and near Vratna river gorge near city of Negotin; village of Trnjane near city of Aleksinac; Visoka (?) (eastern Serbia); city of Negotin; town of Golubac. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1985)**: Mt. Avala near city of Belgrade. **After Maassen (1988)**: road from Monastery Sopoćani towards Pobrđe, near Novi Pazar; Monastery Manasija near Despotovac. **After Jovanović (1993)**: city of Bor, village of Zlot, Lazarev canyon. **After Jovanović (1997a)**: Mts. Mali Krš and Vizak near city of Bor. **After Jovanović (1996)**: Mt. Stol near city of Bor. **After Jovanović (1997b)**: Mt. Tara. **After Karaman (2012)**: Mt. Fruška Gora, near Borkovački stream. **After Jovanović (1990)**: Deliblato sandland (Devojački bunar, Dubovac, Kajtasovo, Mala Tilva, Čardak, Šušara).

Differential diagnosis. This species differs from *C. microtragus* in its smaller size and less bulging whorls. The columellar tooth is usually blunter and less pointed. The palatal tooth sometimes forms a strong callus in *C. microtragus*.

Distribution and habitats in Serbia. This is widespread species inhabits open, dry habitats across Serbia. It is not bound to limestone.

Genus *Pseudojaminia* Páll-Gergely & Bank, 2016

Type species. *Bulimus blandus* L. Pfeiffer, 1853, by original designation.

Pseudojaminia seductilis (Rossmässler, 1837)

Figures 31K–N, 32

Pupa seductilis Rossmässler 1837: 10, figures 306, 307.

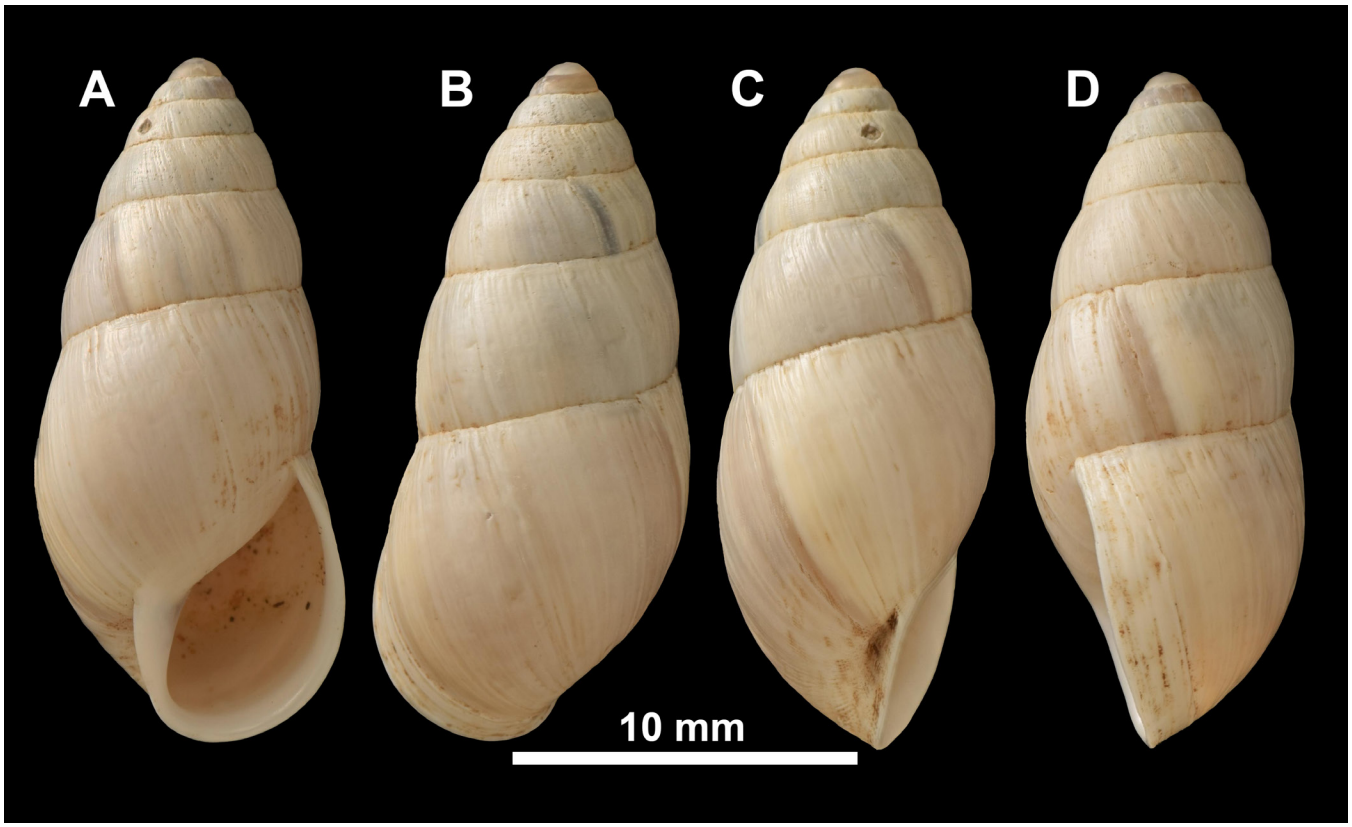

Figure 33. *Zebrina detrita* from Jelašnica gorge.

Chondrula seductilis—Pavlović 1912: 61; Tomić 1959: 30.
Imparietula seductilis—Jaeckel *et al.* 1958: 148; Karaman 2007: 139.

Material examined. Svrljiške planine Mts., village of Donja Glama, *leg.* V. Gojšina, 04 Aug. 2022, 3 specimens (43° 16′ 32.09″N, 022° 22′ 11.20″E); Jelašnica Gorge near city of Niš, *leg.* V. Gojšina, 28 May 2022, 4 specimens (43° 16′ 45.82″N, 022° 03′ 49.59″ E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 3 specimens (43° 11′ 19.65″N, 022° 38′ 47.14″ E); Kunovica near city of Niš, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Apr. 2023, 4 specimens (43° 18′ 36.99″N, 022° 05′ 20.07″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Jelašnica gorge near city of Niš; Mt. Belava near city of Pirot; Sarlak (?); Provalija near city of Pirot; Svrljig gorge near town of Niševac; village of Gornja Bela Reka near town of Zaječar; Razbiti Kamen in village of Grlište near city of Zaječar.

Differential diagnosis. The sinistral shell, in combination with an aperture equipped with teeth, easily distinguishes this species from other Serbian enids.

Distribution and habitats in Serbia. *Pseudojaminia seductilis* is frequently found in large numbers in dry, open, limestone habitats. It is known from eastern and south-eastern Serbia.

Genus *Zebrina* Held, 1838

Type species. *Helix detrita* O.F. Müller, 1774, by subsequent designation by Gray (1847).

Zebrina detrita (O.F. Müller, 1774)

Figures 33, 34

Helix detrita O.F. Müller 1774: 101.
Buliminus detritus—Möllendorff 1873: 134; Tomić 1959: 28–29.
Buliminus (*Zebrina*) *detritus*—Pavlović 1912: 57–59.
Zebrina detrita—Jaeckel *et al.* 1958: 149; Maassen 1988: 37; Jovanović 1997b: 231.
Zebrina (*Zebrina*) *detrita*—Karaman 2007: 140.

Material examined. Town of Sokobanja, Banjica creek, *leg.* T. Karan-Žnidaršič, 01 May 2019, 3 specimens; Jelašnica gorge near city of Niš, *leg.* V. Gojšina, 04 Jun. 2019 and 28 May 2022, 7 specimens (43° 16′ 45.82″N, 022° 03′ 49.59″ E); village of Šaprance, *leg.* M. Vujić, 19 Apr. 2021, 1 specimen (42° 23′ 07.19″N, 021° 59′ 14.30″E); village of Gornje Žap-

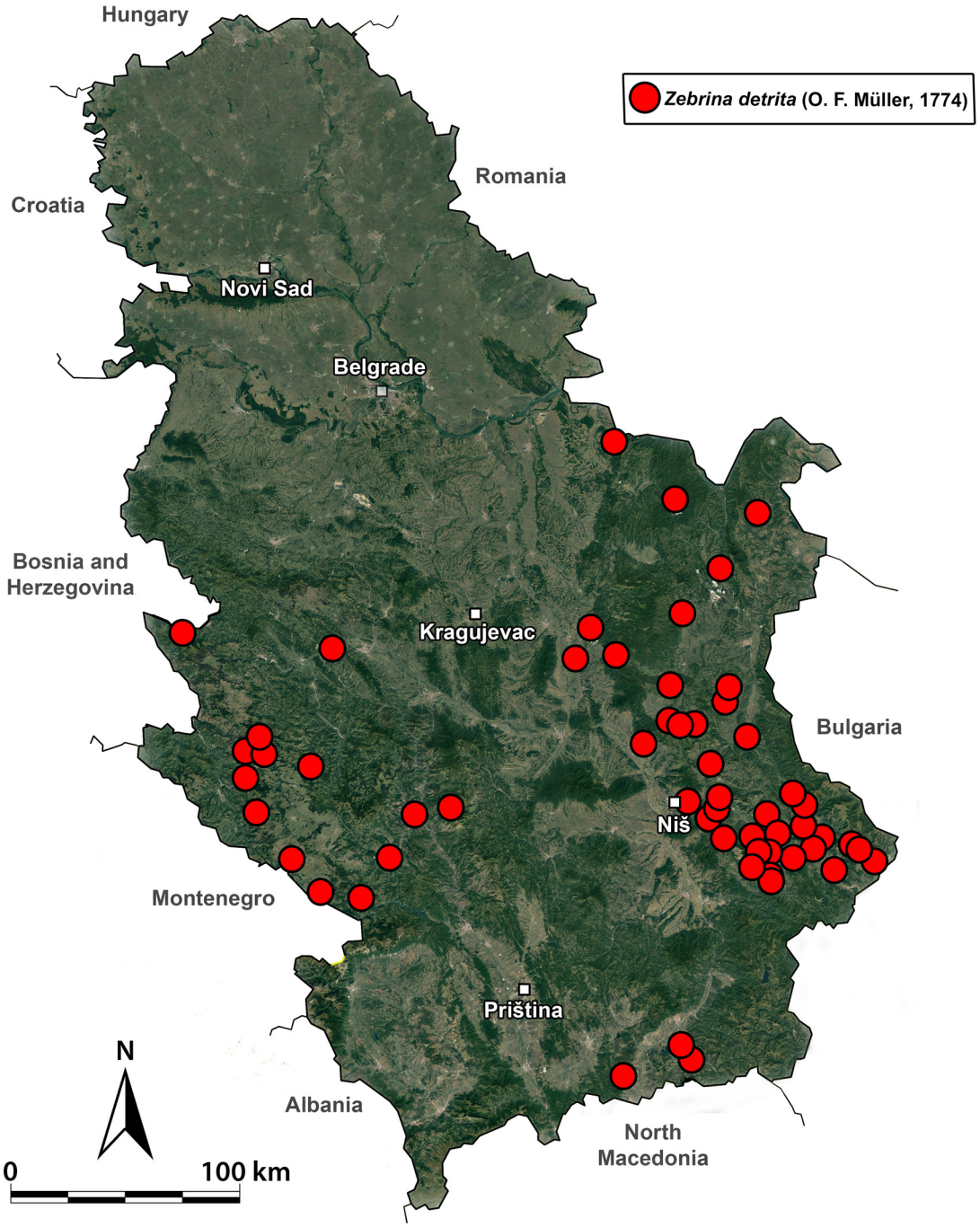

Figure 34. Distribution map of *Zebrina detrita* in Serbia.

sko, *leg.* M. Vujić, 01 Oct. 2021, 1 specimen (42° 26′ 48.97″ N, 021° 55′ 40.34″ E); village of Vratna near city of Negotin, Vratna limestone gates on canyon of Vratna river, *leg.* V. Gojšina, 24 Mar. 2022, 6 specimens (44° 22′ 59.97″ N, 022° 20′ 12.63″ E); Mt. Javor, village of Kušići, *leg.* D. Antić, 1 specimen; between villages of Vlkovija and Mojinci, *leg.* M. Vujić, 27 Jul. 2022, 1 specimen (43° 05′ 00.96″ N, 022° 54′ 23.40″ E); city of Bor, Mt. Stol, *leg.* V. Gojšina, 18 Jun. 2022, 1 specimen (44° 10′ 17.00″ N, 022° 07′ 40.53″ E); Svrljiške planine Mts., village of Donja Glama, *leg.* V. Gojšina, 04 Aug. 2022, 4 specimens (43° 16′ 32.09″ N, 022° 22′ 11.20″ E); town of Bela Palanka, settlement of Čiflik, near Sinjac Monastery, *leg.* V. Gojšina, 05 Aug. 2022, 2 specimens (43° 13′ 03.62″ N, 022° 24′ 54.45″ E); village of Rsovci

near town of Pirot, *leg.* V. Gojšina, 07 Sept. 2022, 1 specimen (43° 10′ 34.04″ N, 022° 46′ 27.77″ E); village of Gradište near city of Pirot, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Nov. 2022, 1 specimen (43° 03′ 45.46″ N, 022° 41′ 44.59″ E); Stara planina Mts., Oreovica, *leg.* M. Šćiban, Apr. 2013, 1 specimen; surroundings of Mt. Vlaška and Mt. Padež, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Sept. 2022, 1 specimen (43°05′ 21.80″ N, 022° 31′ 12.39″ E); village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 2 specimens (42° 59′ 25.32″ N, 020° 07′ 49.94″ E); Pešter plateau, village of Doliće, Hotel Pešter, among rocks, *leg.* V. Gojšina, 26 Jul. 2022, 5 specimens (43° 06′ 01.83″ N, 020° 00′ 17.06″ E); road between town of Bela Palanka and village of Divljana, *leg.* V. Gojšina, 04 Aug. 2022, 2 specimens (43° 12′ 47.71″ N, 022° 18′ 16.66″ E); village of Šljivovik, towards Šljivovički Vis locality, *leg.* V. Gojšina, 29 May 2022, 2 specimens (43° 08′ 32.47″ N, 022° 21′ 21.01″ E); village of Gornja Koritnica near town of Bela Palanka, on limestone rocks next to road, *leg.* V. Gojšina, 29 May 2022, 1 specimen (43° 08′ 32.98″ N, 022° 19′ 32.53″ E); village of Sićevo, Ogorelička cave, *leg.* V. Gojšina, M. Vujić, 27 Apr. 2023, 3 specimens (43° 20′ 53.3″ N 22° 05′ 38.8″ E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 1 specimen (43° 11′ 19.65″ N, 022° 38′ 47.14″ E); Kunovica near city of Niš, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Apr. 2023, 12 specimens (43° 18′ 36.99″ N, 022° 05′ 20.07″ E); Mt. Devica near town of Sokobanja, *leg.* V. Gojšina, 25 Jun. 2022, 1 specimen; town of Sokobanja, Mt. Devica, Oštra Čuka peak, Jama pod Oštrom Čukom Pit, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 12 Aug. 2022, 2 specimens (43° 35′ 38.48″ N, 021° 53′ 54.97″ E); Mt. Jadovnik, Katunić peak, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 25 Jun. 2023, 3 specimens (43° 16′ 27.62″ N, 019° 50′ 23.36″ E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 1 specimen (43° 38′ 08.33″ N, 021° 53′ 18.25″ E); city of Pirot, Pirot castle (Momčilov grad), *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 May 2023, 1 specimen (43° 09′ 33.60″ N, 022° 34′ 52.40″ E); village of Brzi Brod near city of Niš, *leg.* V. Gojšina, M. Vujić, N. Vesović, 08 May 2023, 1 specimen (43° 18′ 58.02″ N, 021° 57′ 59.57″ E); village of Zlot, Vernjikica cave, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 5 specimens (44° 01′ 34.44″ N, 021° 56′ 56.29″ E); village of Godovo near town of Tutin, Godovska cave, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 7 specimens (42° 56′ 47.26″ N, 020° 17′ 44.42″ E); village of Zlot, Lazareva cave, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 13 Aug. 2022, 4 specimens (44° 01′ 46.00″ N, 021° 57′ 43.95″ E); village of Sićevo n ear city of Niš, Sveta Petka monastery, *leg.* V. Gojšina, Mar. 2024, 3 specimens (43° 20′ 10.88″ N, 022° 07′ 51.73″ E); village of Radoinja near city of Novi Pazar, Radoinjsko lake, dam, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 25 Apr. 2024, 9 specimens (43° 31′ 18.37″ N, 019° 44′ 28.51″ E); Stara planina Mts., village of Rsovci, church of St. Peter and Paul, *leg.* V. Gojšina, 24 Mar. 2024, 1 specimen (43° 10′ 34.73″ N, 022° 46′ 27.75″ E); town of Bela Palanka, watermill, *leg.* M. Vujić, 26 Jun. 2023, 3 specimens (43° 12′ 53.41″ N, 022° 18′ 28.38″ E); Mt. Kopaonik, Srebrnac, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jul. 2024, 10 specimens (43° 18′ 36.27″ N, 020° 50′ 17.09″ E); Mt. Kopaonik, Metođe, limestone rocks next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 1 specimen (43° 18′ 02.81″ N, 020° 51′ 05.34″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 3 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); limestone rocks on road to Grza river spring, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 12 specimens (43° 51′ 32.36″ N, 021° 37′ 18.35″ E); town of Preševo, Ilinska cave, *leg.* V. Gojšina, M. Vujić, 09 Oct. 2024, 3 specimens (42° 20′ 51.44″ N, 021° 35′ 55.62″ E); town of Preševo, canyon of Preševska Moravica river, *leg.* V. Gojšina, M. Vujić, 10 Oct. 2024, 13 specimens (42° 20′ 51.34″ N, 021° 35′ 55.63″ E); village of Ljuberađa, Ljuberaško vrelo, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 2 specimens (43° 01′ 48.90″ N, 022° 23′ 17.31″ E); Suva planina Mt., below Devojački grob, *leg.* V. Gojšina, M. Vujić, 14. Aug. 2025, 1 specimen (43° 11′ 54.72″ N, 022° 08′ 35.46″ E); Mt. Jadovnik, near Katunić peak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Jun. 2025, 1 specimen (43° 16′ 01.52″ N, 019° 48′ 46.04″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Belava near city of Pirot; town of Bela Palanka near city of Pirot; village of Basara near city of Pirot; Monastery Ravanica near town of Ćuprija; Crnica river gorge near city of Paraćin; Mt. Ovčar; Ograđenica and Tusto Brdo near Mokra Gora; Sjenište near Uvac river; village of Negbina near town of Kokin Brod; Mt. Zlatibor, Murtenica mountain massif (Golo brdo); Mt. Zlatibor, Volujačka karaula; Mt. Zlatar, village of Burađa near Zlatar lake; Kadijina Stena near Mt. Javor; river Ibar near town of Raška, Koštur; Mt. Kopaonik (Metođe, Majića Krš, Ledencica, Bregovi, below Vojetin); town of Prokuplje, Hisar; village of Ljuberađa near town of Babušnica; village of Masurovci; village of Sukovo near city of Pirot; Sarlak (?); Mt. Suva planina; Jelašnica gorge near city of Niš; village of Rsovci near city of Pirot; Gradašnica gorge; Sićevo gorge near city of Niš;); Mt. Tumba near town of Svrljig; Pernat (?); Svrljig gorge near town of Svrljig; Stara planina Mts., village of Kalna; Korenatac gorge near village of Kalna; city of Knjaževac, Glavičica; town of Sokobanja; Ripaljka waterfall near town of Sokobanja; Monastery St. Stevan near

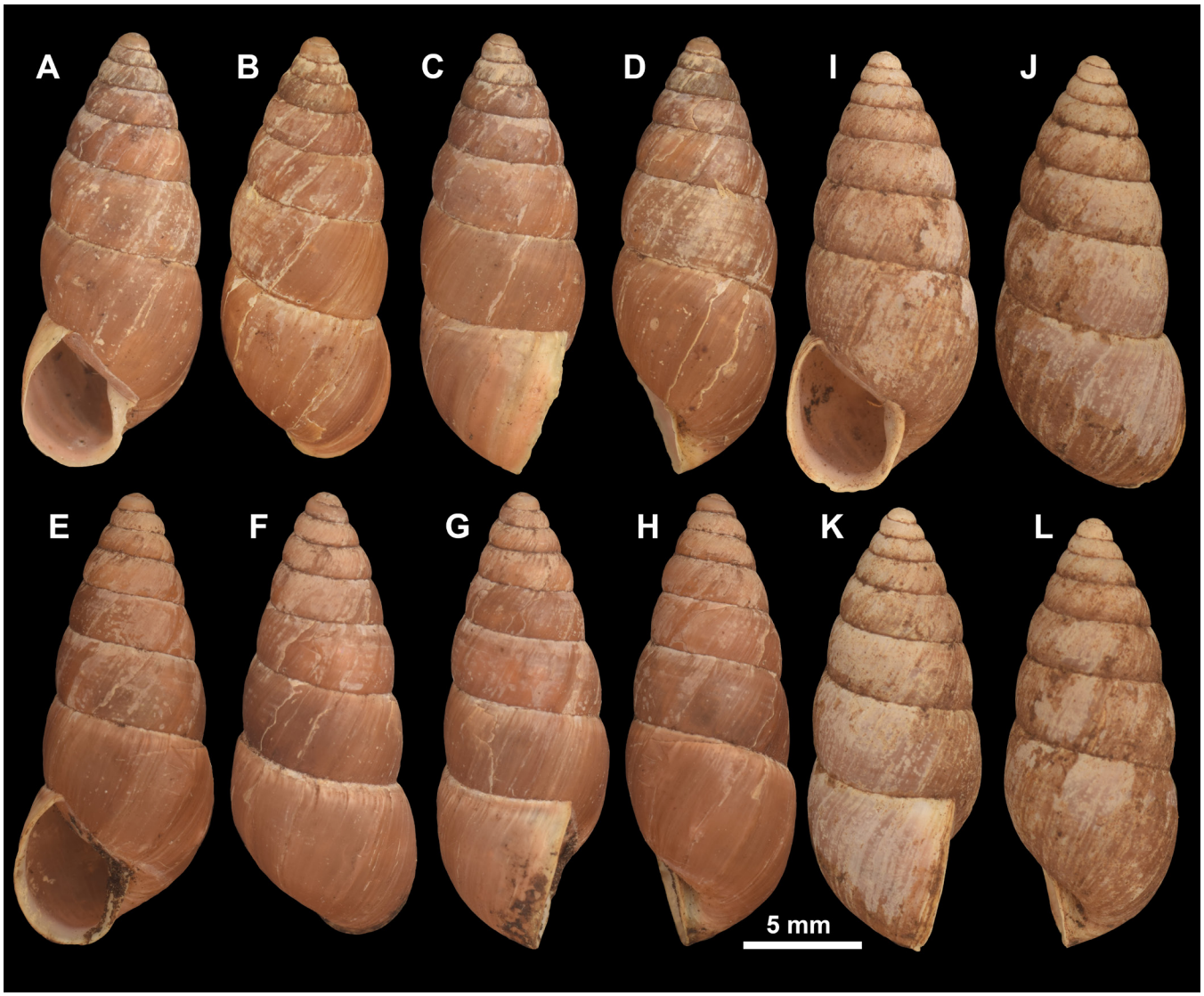

Figure 35. *Mastus venerabilis* from Mt. Suva planina, near the Devojački grob. **A**–**D**, specimen 1. **E**–**H**, specimen 2. **I**–**L**, specimen 3.

town of Aleksinac; village of Bučje near city of Knjaževac; Mt. Tupižnica, Glogovački vrh peak; Mt. Rtanj; village of Lukovo on Mt. Rtanj; Krivi Vir on Mt. Rtanj; village of Zlot; village of Gornja Bela Reka near city of Zaječar; Crna Gora near city of Bor; Mt. Stol near city of Bor; Mt. Vizak near city of Bor; village of Vratna and near Vratna river gorge near city of Negotin; village of Lepena near city of Knjaževac; town of Golubac; Mt. Starica near town of Majdanpek. **After Maassen (1988)**: Pobrđe, west of Novi Pazar; 5 km east of Sv. Petka, east of Paraćin; Mt. Rtanj; Sokobanja near Aleksinac; Sićevo gorge, Ostrovica and 8 km from Sićevo towards Bela Palanka; Čiflik near Bela Palanka; Pirot, surroundings of Pirot castle. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species is not like any other due to the large, high shell with an irregular brownish pattern.

Distribution and habitats in Serbia. *Zebrina detrita* is found in open, dry habitats and is frequent, widespread species in Serbia. It is usually abundant. *Zebrina detrita* is predominantly associated with limestone, but it also has been recorded on silicate substrate in the village of Šaprance.

Genus *Mastus* H. Beck, 1837

Type species. *Helix pupa* Linnaeus, 1758, by subsequent designation (Herrmannsen 1847).

Mastus venerabilis (L. Pfeiffer, 1853)

Figures 35, 38

Bulimus venerabilis L. Pfeiffer 1853: 352.
Chondrula (*Mastus*) *venerabilis*—Pavlović 1912: 61–62.
Mustus reversalis [*sic*]—Tomić 1959: 30.

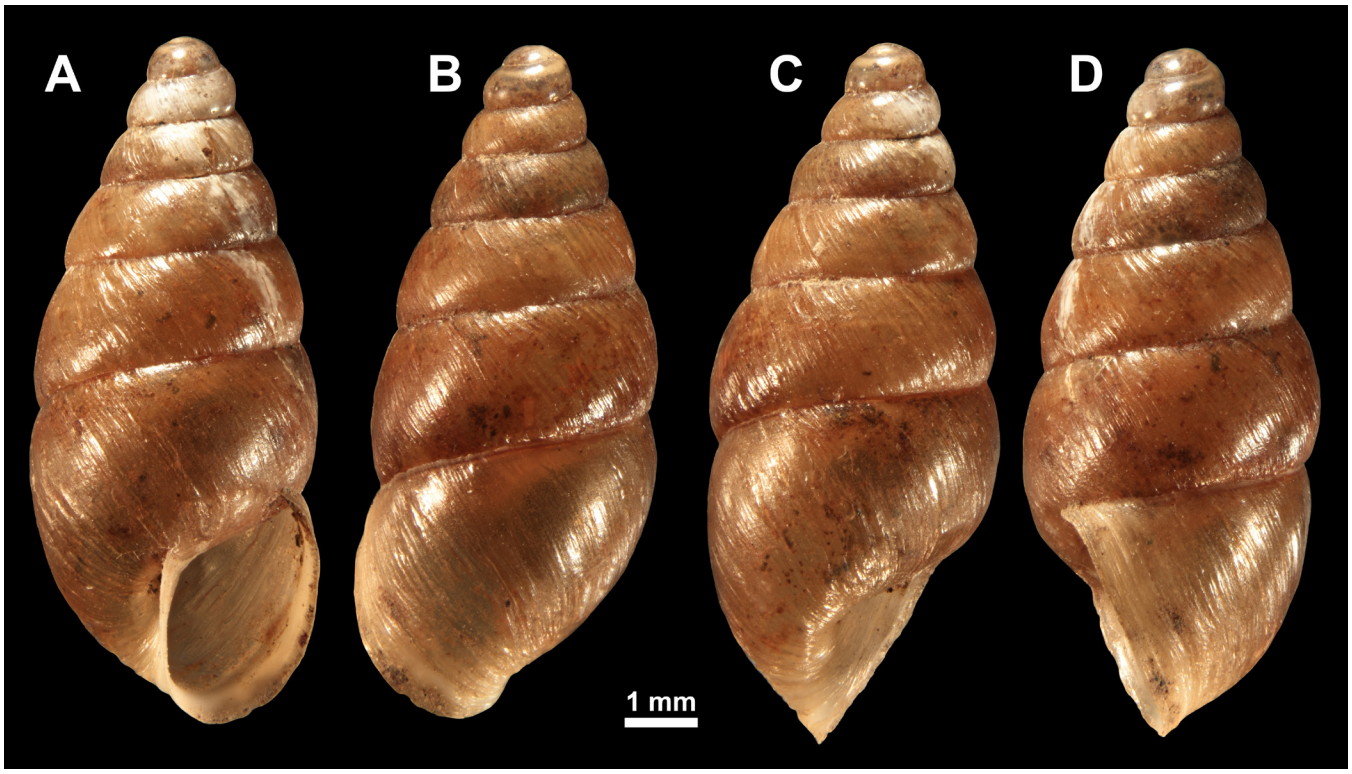

Figure 36. *Merdigera obscura* from the Milevska planina.

Mastus reversalis—Karaman 2007: 139.
Mastus venerabilis—Welter-Schultes 2012: 191.

NHMBEO material examined. Suva planina, grob (probably referring to Devojački grob), 13. Sept. 1909, 110 specimens (NHMBEO 1909); Suva planina mountain, Trem peak, *leg.* Ranojević, 07. Sept. 1907, 10 specimens (NHMBEO 1908).

Additional material examined. Suva planina Mt., below Devojački grob, *leg.* V. Gojšina, M. Vujić, 14 Aug. 2025, 54 specimens (43° 11′ 54.72″N, 022° 08′ 35.46″E); Stara planina Mts., beginning of hiking road towards Basarski Kamen locality, *leg.* V. Gojšina, M. Vujić, 13 Aug. 2025, 2 specimens (43° 10′ 47.54″N, 022° 41′ 21.66″E); Suva planina, 8 specimens (NHMUK 1921.9.6.436-443).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Svrljiške planine Mts. (Modra Stena, Pleš and village of Periš); Mt. Suva planina, Trem peak.

Differential diagnosis. This species can be separated from other *Mastus* and *Ena* species by its sinistral shell.

Distribution and habitats in Serbia. This species lives in deciduous beech forests on limestone substrate in eastern Serbia (Svrljiške planine Mts., Mt. Suva planina, Stara planina Mts.) where it can reach high abundance.

Genus *Merdigera* Held, 1838

Type species. *Helix obscura* O.F. Müller, 1774, by subsequent designation (Herrmannsen 1847).

Merdigera obscura (O.F. Müller, 1774)

Figures 36, 38

Helix obscura O.F. Müller 1774: 103.
Buliminus (*Ena*) *obscurus*—Pavlović 1912: 60.
Buliminus obscurus—Tomić 1959: 29.
Ena obscura—Hesse 1929: 234; Jaeckel *et al.* 1958: 149; Maassen 1988: 37.
Merdigera obscura—Karaman 2007: 139.

Material examined. Mt. Zlatibor, village of Dobroselica, Dobroselički prerast, *leg.* V. Gojšina, 05 Aug. 2020, 1 specimen (43° 37′ 26.43″N, 019° 41′ 53.69″E); Landscape of Outstanding features "Vlasina", Dejanova river, *leg.* M. Vujić, 31 May 2021, 1 specimen (42° 44′ 48.03″N, 022° 19′ 03.33″E); village of Vratna near city of Negotin, Vratna limestone gates in canyon of Vratna river, *leg.* V. Gojšina, 24 Mar. 2022, 1 specimen (44° 22′ 59.97″N, 022° 20′ 12.63″E); city of Bor, Mt. Stol, *leg.* V. Gojšina, 18 Jun. 2022, 1 specimen (44° 10′ 17.00″N, 022° 07′ 40.53″E); town of Bela Palanka, village of Čiflik, near Sinjac Monastery, *leg.* V. Gojšina, 05 Aug. 2022, 1 specimen (43° 13′ 03.62″N, 022° 24′ 54.45″E); Stara planina Mts., Krivi Vir gorge, *leg.* M. Šćiban, 03 May

2012, 1 specimen; surroundings of Mt. Vlaška and Mt. Padež, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Sept. 2022, 1 specimen (43° 05′ 21.78″ N, 022° 31′ 12.40″ E); village of Zlot, Vernjikica cave, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 1 specimen (44° 01′ 34.44″ N, 021° 56′ 56.29″ E); city of Belgrade, Stepin Lug, deciduous forest, *leg.* V. Gojšina, M. Vujić, 04 Apr. 2022, 1 specimen (44° 44′ 59.97″ N, 020° 31′ 40.22″ E); village of Staničenje, *leg.* V. Gojšina, 07 Sept. 2022, 1 specimen (43° 12′ 16.26″ N, 022° 30′ 32.67″ E); city of Belgrade, settlement of Vrčin, *leg.* M. Vujić, 21 Dec 2022, 1 specimen (44° 40′ 35.58″ N, 020° 36′ 29.08″ E); town of Masurica, Masurička reka river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Jun. 2022, 1 specimen (42° 39′ 39.10″ N, 022° 10′ 03.60″ E); village of Divljana near town of Bela Palanka, *leg.* V. Gojšina, 28 May 2022, 1 specimen (43° 10′ 42.74″ N, 022° 18′ 24.03″ E); village of Temska, limestone rocks next to road, *leg.* V. Gojšina, 30 May 2022, 1 specimen (43° 15′ 43.33″ N, 022° 32′ 56.45″ E); village of Sićevo, Ogorelička cave, *leg.* V. Gojšina, M. Vujić, 27 Apr. 2023, 1 specimen (43° 20′ 53.3″ N 22° 05′ 38.8″ E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 5 specimens (43° 11′ 19.65″ N, 022° 38′ 47.14″ E); Mt. Jadovnik, Studenac spring, *leg.* M. Vujić, 16 Jul. 2021, 1 specimen; Mt. Devica near town of Sokobanja, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 25. Jun. 2022, one specimen; Landscape of Outstanding Features "Dolina Pčinje", surroundings of Prohor Pčinjski monastery, *leg.* V. Gojšina, M. Vujić, N. Vesović, 16 May 2023, 1 specimen (42° 19′ 48.32″ N, 021° 53′ 37.59″ E); town of Vranjska Banja, *leg.* V. Gojšina, M. Vujić, N. Vesović, 17 May. 2023, 2 specimens (42° 32′ 43.88″ N, 022° 00′ 27.29″ E); Mt. Kozjak above Prohor Pčinjski monastery, *leg.* V. Gojšina, M. Vujić, N. Vesović, 18 May 2023, 2 specimens (42° 19′ 28.95″ N, 021° 54′ 45.30″ E); Lepterija near town of Sokobanja, on surface of limestone rocks, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 4 specimens (43° 38′ 8.32″ N, 021° 53′ 18.21″ E); Mt. Kopaonik, Jelak, next to river Gvozdac, beech-spruce forest, *leg.* D. Stojanović, 23 Sept. 2023, 1 specimen; canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 1 specimen (42° 56′ 03.06″ N, 020° 24′ 02.95″ E); Monastery Studenica, *leg.* V. Gojšina, M. Vujić, 17 Jul. 2023, 2 specimens (43° 29′ 16.33″ N, 020° 31′ 47.81″ E); village of Resnik near town of Sokobanja, spring Vrelo, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 1 specimen (43° 37′ 57.49″ N, 021° 48′ 55.48″ E); city of Novi Sad, Petrovaradin fortress, *leg.* V. Gojšina, 2023, 1 specimen (45° 15′ 07.71″ N, 019° 51′ 51.42″ E); town of Tutin, Smolućka cave, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2023, 4 specimens (43° 02′ 43.84″ N, 020° 21′ 40.00″ E); village of Radoinja near city of Novi Pazar, rocks next to Monastery of St. Joakim and Ana, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 25 Apr. 2024, 2 specimens (43° 31′ 45.41″ N, 019° 43′ 26.19″ E); limestone cliff next to Kosaćanka river close to Monastery Mileševa, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 3 specimens (43° 22′ 23.39″ N, 019° 42′ 36.80″ E); village of Radoinja near city of Novi Pazar, white alder flood forest, *leg.* D. Stojanović, D. Antić, M. Šević, 23 May 2024, 1 specimen (43° 31′ 51.42″ N, 019° 43′ 39.90″ E); Mt. Kopaonik, Jelak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Aug. 2024, 2 specimens (43° 18′ 17″ N, 020° 51′ 36″ E); Mt. Kopaonik, Metođe, limestone rocks next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 3 specimens (43° 18′ 02.81″ N, 020° 51′ 05.34″ E); village of Razbojna, unnamed brook, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Aug. 2024, 1 specimen (43° 20′ 11.27″ N, 021° 09′ 15.58″ E); town of Preševo, Ilinska cave, *leg.* V. Gojšina, M. Vujić, 09 Oct. 2024, 2 specimens (42° 20′ 51.44″ N, 021° 35′ 55.62″ E); village of Periš, Periško vrelo, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 3 specimens (43° 22′ 07.34″ N, 022° 18′ 57.74″ E); village of Kravlje near city of Niš, Kravljansko vrelo, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 1 specimen (43° 27′ 07.74″ N, 021° 55′ 19.86″ E); village of Cerje, in front of Cerjanska cave, *leg.* V. Gojšina, 18 May 2024, 3 specimens (43° 25′ 48.72″ N, 021° 56′ 23.36″ E); surroundings of village of Miljkovac, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 1 specimen (43° 26′ 00.61″ N, 021° 52′ 11.24″ E); Mačva district, rocks around Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 1 specimen (44° 16′ 13.33″ N, 019° 25′ 38.93″ E); Mt. Jadovnik, canyon at foot of mountain, *leg.* V. Gojšina, M. Vujić, N. Vesović. 28 Jun. 2025, 1 specimen (43° 14′ 04.99″ N, 019° 44′ 46.25″ E); Suva planina Mt., below Devojački grob, *leg.* V. Gojšina, M. Vujić, 14 Aug. 2025, 5 specimens (43° 11′ 54.72″ N, 022° 08′ 35.46″ E); Stara planina Mts., rocks on climb to Basarski Kamen, *leg.* V. Gojšina, M. Vujić, 13 Aug. 2025, 1 specimen (43° 10′ 27.70″ N, 022° 41′ 32.99″ E); spring of river Raška, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jun. 2025, 3 specimens (43° 06′ 55.70″ N, 020° 22′ 12.69″ E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 9 specimens (43° 4′ 29″ N, 022° 47′ 46″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; city of Čačak, settlement of Beljina; Mt. Belava near city of Pirot; village of Basara near city of Pirot; Monastery Vratna and near Vratna river gorge, near city of Negotin; Stara planina Mts., Vrška Čuka; Velika Tisnica river gorge near town of Žagubica; Vučje (?); Vratašnička klisura gorge (?) (probably refering to Vratarnička klisura on Stara planina Mts.);

Vrelo Banjica (south-western Serbia); Vujinovača near city of Valjevo; Gradac near village of Krepoljin; Golubac forterss near town of Golubac; next to river Dubočica near town of Raška; village of Zlot; Mt. Čemernica, Zečki vrh peak; village of Jelovac near town of Despotovac; Jošanička river near town of Žagubica; Mt. Javor; village of Čučale (Toplica district), Jankova gorge; Stara planina Mts., village of Kalna; village of Kopajkošara near town of Svrljig; Koprivštički krst near town of Pirot; Mt. Kopaonik; town of Krupanj; Mt. Kosmaj; Lozica near Krivi Vir on Mt. Rtanj; village of Lunjevica near town of Gornji Milanovac; village of Lepena near town of Knjaževac; village of Ljuberađa near town of Babušnica; Monastery Manasija near town of Despotovac; Mt. Zlatibor, Murtenica mountain massif; Mt. Mučanj; Mt. Kopaonik, Metođe; town of Majdanpek; village of Niška Banja near city of Niš; Ograđenica, Mokra Gora; Svrljiške planine Mts., Pleš; Svrljiške planine Mts., village of Periš; Potpeć near town of Žagubica; village of Prekonoga near town of Svrljig; village of Poćuta near city of Valjevo, Monastery Pustinja; Petnica cave near city of Valjevo; Pogana Peć near town of Žagubica; Monastery Ravanica near town of Ćuprija; Mt. Kopaonik, Radmanov Kamen; Mt. Rtanj; Rgotski kamen near city of Bor; Mt. Starica near town of Majdanpek; Monastery Suvodol near village of Minićevo; Svrljiške planine Mts., Sirinjava Duvka; Sićevo gorge near city of Niš; Mt. Suva planina; Sarlak (?); Sto near town of Pirot; "Stenka" near city of Paraćin; Crna Gora near city of Bor; Crni Vrh near Jošanica and Kalenovačka rivers and town of Žagubica. **After Hesse (1929)**: river Danube, near city of Smederevo. **After Maassen (1988)**: Sokobanja near Aleksinac.

Differential diagnosis. See *Ena montana*.

Distribution and habitats in Serbia. *Merdigera obscura* can be considered a habitat generalist. It is often associated with limestone but also occurs on other substrate types. It can be found in forests or in more open habitats, and also lives in gardens, parks, and other urban environments.

Remarks. This species is found relatively frequently but never in large numbers.

Genus *Ena* W. Turton, 1831

Type species. *Bulimus montanus* Draparnaud, 1801, by subsequent designation (Herrmannsen 1847).

Ena montana (Draparnaud, 1801)

Figures 37A–B, 38

Bulimus montanus Draparnaud 1801: 65.
Buliminus cefalonicus—Möllendorff 1873: 134.
Buliminus (*Ena*) *montanus*—Pavlović 1912: 59–60.
Buliminus montanus—Tomić 1959: 29.
Ena montana—Jovanović 1997b: 231; Karaman 2007: 139.

Material examined. Mt. Tara, Predov Krst locality, *leg.* V. Gojšina, 01 Jun. 2021, 1 specimen (43° 56′ 25.72″ N, 019° 18′ 31.99″ E); Mt. Tara, road towards village of Jagoštica, *leg.* V. Gojšina, 02 Jun. 2021, 1 specimen (43° 57′ 58.98″ N, 019° 17′ 11.52″ E).

Sites in Serbia from the literature. After Möllendorff (1873): Derventa, Košlje (probably referring to Gornje Košlje); Krstača, Rača, Mt. Zvijezda; Mt. Kablar. **After Pavlović (1912) and Tomić (1959)**: Mt. Čemernica, Zečki Vrh; Mt. Javor; Mt. Tara, Kamenova Kosa; Mt. Mučanj; Crni Vrh near city of Užice. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species is larger than *M. obscura*. *Mastus venerabilis* has a sinistral shell. See also *E. subtilis*.

Distribution and habitats in Serbia. *Ena montana* is known from western Serbia, where it usually is found in deciduous forests on soil and among rocks.

Ena subtilis (Rossmässler, 1837)

Figures 37C–R, 38

Bulimus subtilis Rossmässler 1837: 47.

Material examined. Mt. Jadovnik, near Fiulj viewpoint, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Jun. 2025, 6 specimens (43° 15′ 31.08″ N, 019° 48′ 21.66″ E); Peć district, Rugovo Gorge upper part, at Kućište border crossing point, 1200 m, limestone rocks, *leg.* Z.P. Erőss, Z. Fehér, J. Grego, M. Szekeres, 04 Jul. 2016, 2 specimens (42° 41′ 05″ N, 020° 03′ 16″ E) (HNHM 100450).

Previous records from Serbia. *Ena subtilis* has not been previously recorded from Serbia.

Differential diagnosis. This species shows the less prominent shell surface and more slender shell than *E. montana* (Welter-Schultes 2012).

Distribution and habitats in Serbia. *Ena subtilis* is known from near the summit of Mt. Jadovnik in south-western Serbia as well as from Peć district. On Mt. Jadovnik, it was found on a dry, rocky slope.

Family Orculidae Pilsbry, 1918

Genus *Orcula* Held, 1838

Type species. *Pupa dolium* Draparnaud, 1801, by subsequent desgination (Herrmannsen 1847).

Subgenus *Orcula* (*Illyriobanatica*) Páll-Gergely & Deli, 2013

Type species. *Pupa* (*Orcula*) *jetschini* M. Kimakowicz, 1883, by original designation.

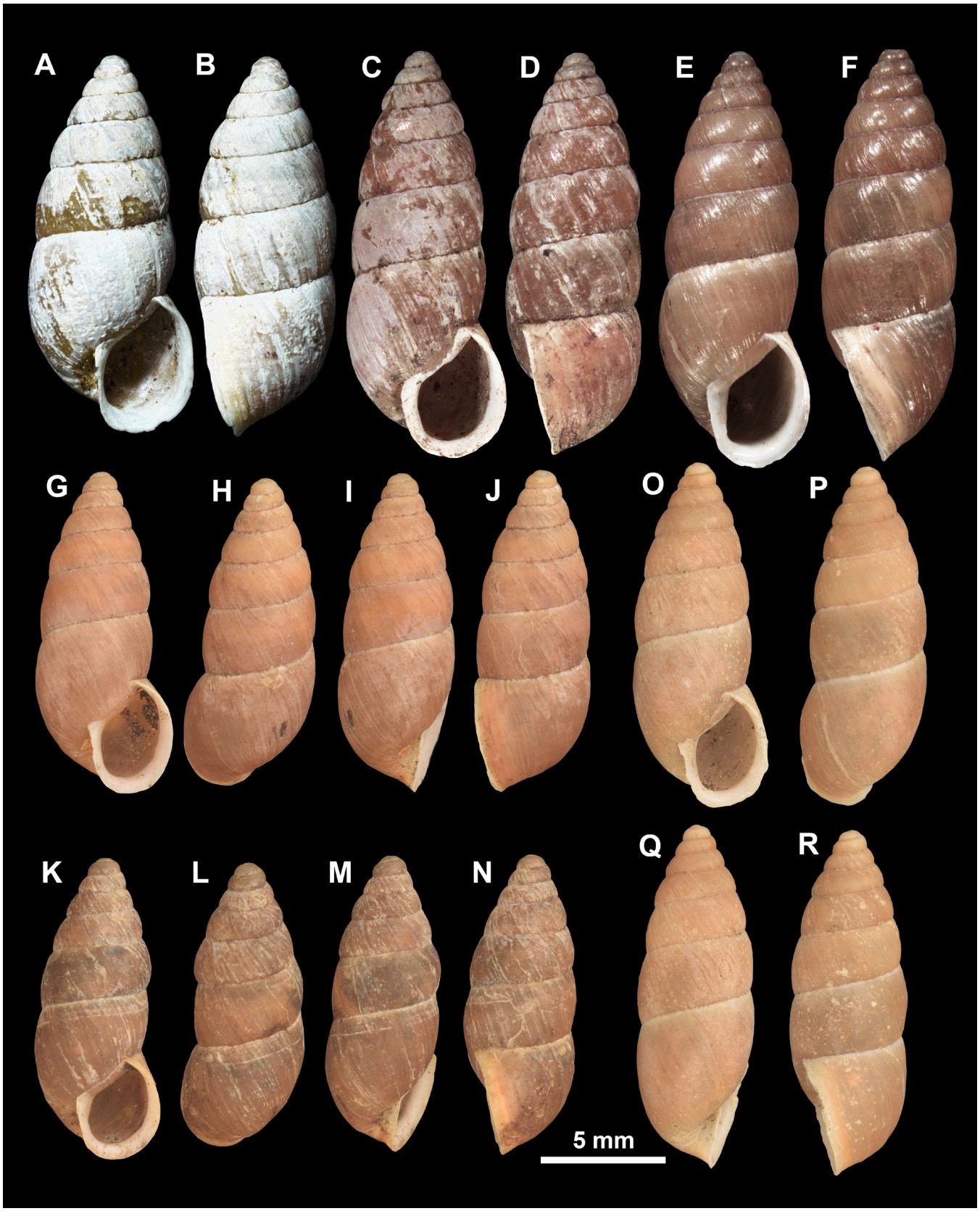

Figure 37. *Ena* spp. in Serbia. **A**, **B**, *Ena montana* from Mt. Tara near Jagoštica. **C**–**F**, *E. subtilis* from Peć district (HNHM 100450). **G**–**R**, *E. subtilis* from Mt. Jadovnik, near Fiulj viewpoint.

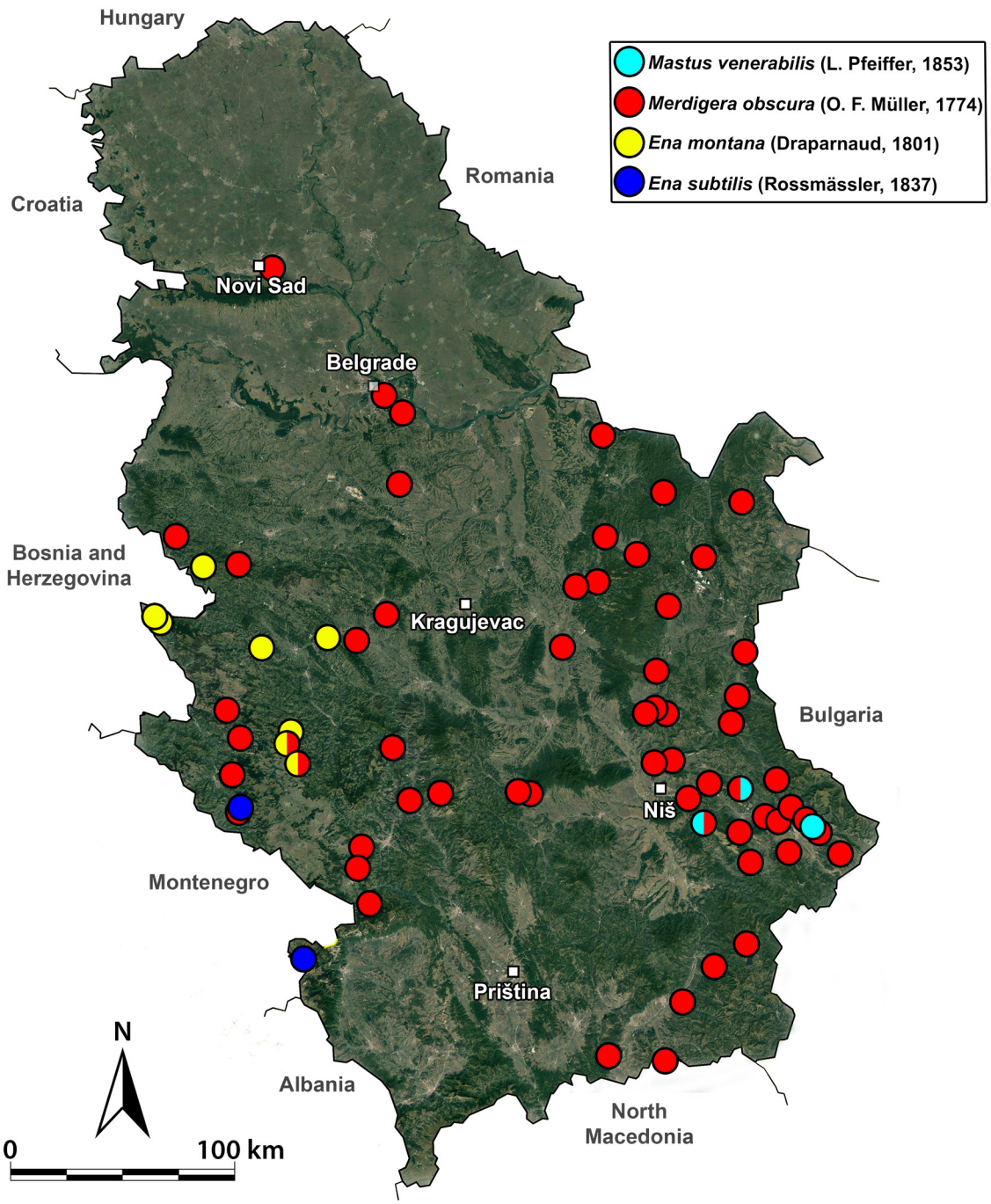

Figure 38. Distribution map of *Merdigera*, *Mastus*, and *Ena* in Serbia.

***Orcula* (*Illyriobanatica*) *wagneri* Sturany, 1914**

Figures 39, 43

Orcula wagneri Sturany *in* Sturany & Wagner 1914: 63.

Orcula wagneri—Welter-Schultes 2012: 146; Páll-Gergely *et al.* 2013: 41, fig. 9.

Material examined. Radevo (Radevc) 14 km NW of Rožaje, near Kula border station, 1350 m a.s.l., *leg.* T. Deli, Z.P. Erőss Z.P. Erőss, Z. Fehér, D. Murányi, 05 Oct. 2005, 1 specimen (42° 46′ 20″ N, 020° 16′ 46″ E) (HNHM 101565).

Sites in Serbia from the literature. See Remarks.

Differential diagnosis. See *S. doliolum*.

Distribution and habitats in Serbia. This species is known only from the western part of the Kosovo and Metohija province. It is bound to limestone rocks.

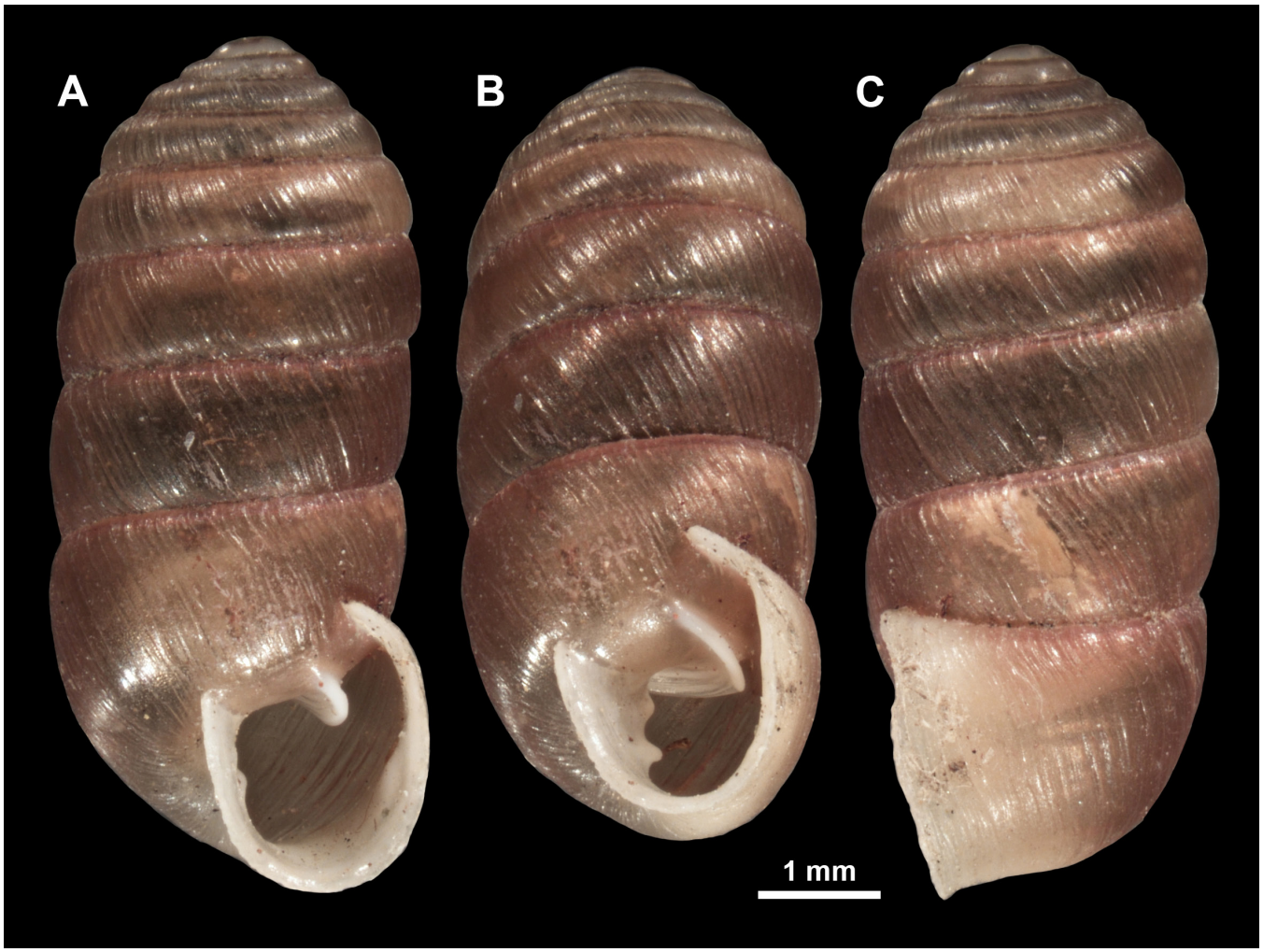

Figure 39. *Orcula wagneri* from Radevo, 14 km NW of Rožaje (HNHM 101565).

Remarks. Páll-Gergely *et al.* (2013) presented a map with sampling sites from Kosovo and Metohija province; however, they gave no precise locality data. Welter-Schultes (2012) also reported this species from Kosovo and Metohija but, again, without precise data.

Genus *Sphyradium* Charpentier, 1837

Type species. *Bulimus doliolum* Bruguière, 1792, by original designation.

Sphyradium doliolum (Bruguière, 1792)

Figures 40, 43

Bulimus doliolum Bruguière 1792: 351.
Pupa doliolum—Pfeiffer 1856: 182; Kreglinger 1870: 208; Möllendorff 1873: 134.
Orcula doliolum—Pavlović 1912: 66; Hesse 1929: 234; Tomić 1959: 33–34; Jovanović 1997b: 231.
Sphyradium doliolum—Maassen 1988: 37; Karaman 2007: 146.
Orcula dolium [*sic*]—Đuknić *et al.* 2010: 3.

Material examined. Mt. Zlatibor, town of Čajetina, village of Gostilje, Gostilje waterfalls, *leg.* V. Gojšina, 07 Aug. 2020, 1 specimen (43°39′24.83″N, 019°50′18.54″E); village of Potpeće, Potpećka cave, *leg.* V. Gojšina, 09 Aug. 2020, 1 specimen (43°47′47.39″N, 019°55′58.71″E); village of Ovčar Banja, surroundings of Ovčar-Kablar gorge, *leg.* V. Gojšina, 10 Aug. 2020, 6 specimens (43°53′56.70″N, 020°11′17.33″E); Mt. Tara, Rastište, *leg.* V. Gojšina, 01 Jun. 2021, 2 specimens (43°56′41.49″N, 019°21′21.76″E); town of Majdanpek, Paskova cave, *leg.* V. Gojšina, 23 Mar. 2022, 4 specimens (44°26′30.57″N, 021°57′06.54″E); village of Plavna, river Zamna, Rajska prerast limestone gate, *leg.* V. Gojšina, 25 Feb. 2022, 3 specimens (44°18′04.27″N, 022°16′44.51″E); village of Rudna Glava, Valja prerast (Šuplja stena) limestone gate, *leg.* V. Gojšina, 26 Mar. 2022, 1 specimen (44°21′42.79″N, 021°59′32.13″E); village of Krivelj, road towards Mts. Veliki Krš and Stol, *leg.* V. Gojšina, 19 Jun. 2022, 2 specimens (44°10′11.46″N, 022°06′22.42″

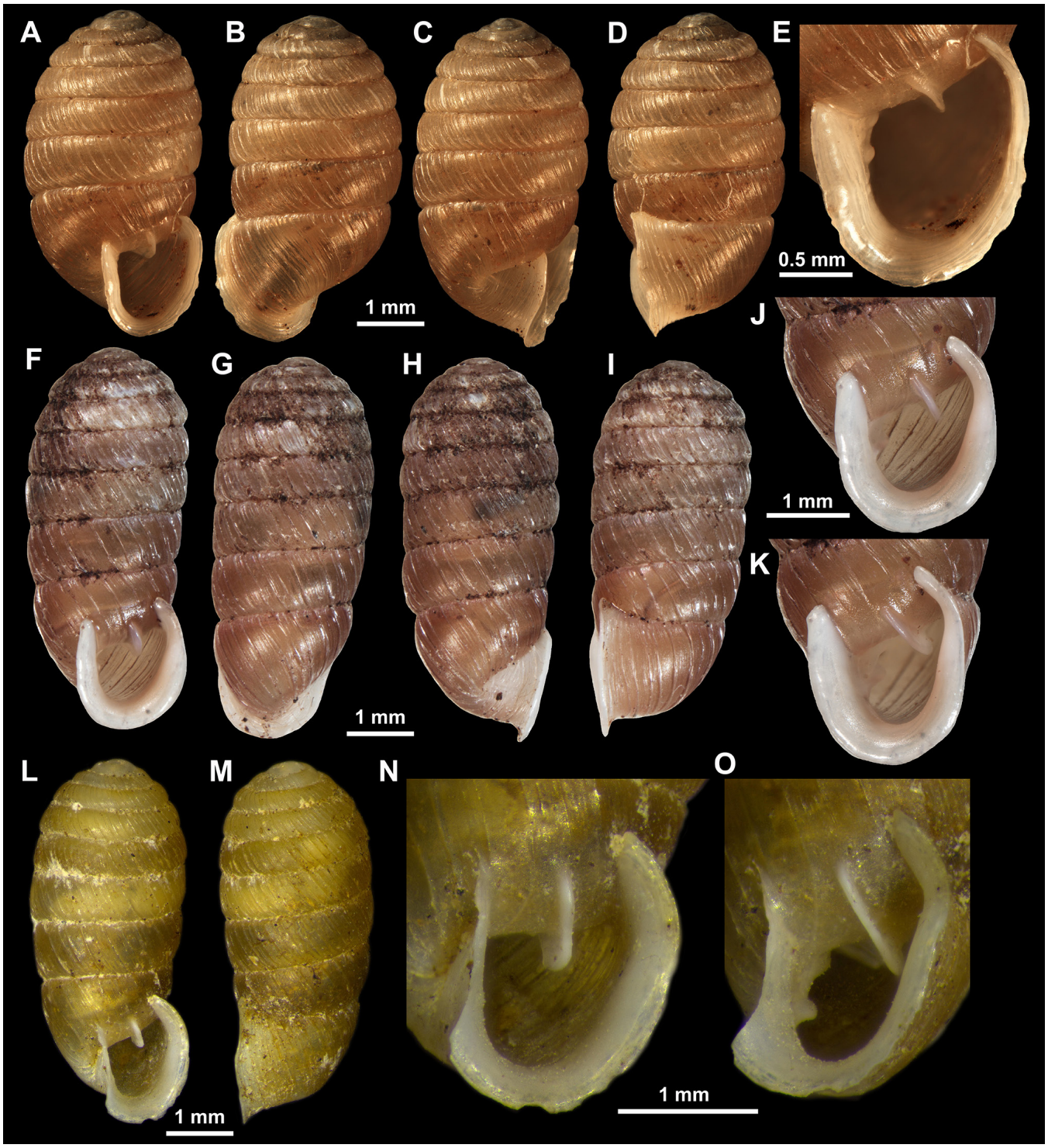

Figure 40. *Spyhradium doliolum* in Serbia. **A**–**E**, specimen from the Cerjanska cave. **F**–**K**, specimen from Mt. Tara, Lukino selo. **L**–**O**, specimen from Ovčar-Kablar gorge.

E); village of Gložje, next to road, *leg.* V. Gojšina, M. Vujić, N. Vesović, 07 Jun. 2022, 3 specimens (42°29′23.43″N, 022°24′06.65″E); Stara Planina Mts., Krivi Vir gorge, *leg.* M. Šćiban, 03 May 2012, 1 specimen; surroundings of Mt. Vlaška and Mt. Padež, *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 Sept. 2022, 2 specimens (43°05′21.83″N, 022°31′12.36″E); canyon of river Jerma, *leg.* V. Gojšina, M. Vujić, N. Vesović, 08 Sept. 2022, 2 specimens (42°59′25.56″N, 022°37′

51.58″E); Mt. Tara, village of Perućac, near spring of river Vrelo, *leg.* V. Gojšina, 26 Oct. 2022, 1 specimen (43° 57′ 16″N, 019° 25′ 33″E); village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 2 specimens (42° 59′ 25.32″N, 020° 07′ 49.94″E); town of Despotovac, canyon of river Suvaja, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Feb. 2023, 1 specimen (44° 05′ 03″N, 021° 38′ 06″E); town of Despotovac, canyon of river Suvaja, Izviđačka cave, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Feb. 2023, 2 specimens; village of Dobri Do near city of Pirot, *leg.* V. Gojšina, M. Vujić, N. Vesović, 29 Apr 2023, 3 specimens (43° 12′ 33.38″N, 022° 38′ 14.60″E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 1 specimen (43° 11′ 19.65″N, 022° 38′ 47.14″ E); village of Slavinja, Slavinjsko grlo (Rosomački lonci), *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr. 2023, 1 specimen (43° 09′ 1.13″N, 022° 51′ 19.50″E); town of Sokobanja, Mt. Devica, close to spring of Moravica river, *leg.* V. Gojšina, 26 Jun. 2022, 3 specimens (43° 37′ 45.23″N, 021° 59′ 38.94″E); town of Sokobanja, Mt. Devica, Čitlučka cave, *leg.* V. Gojšina, 26 Jun. 2022, 1 specimen (43° 37′ 45.81″N, 021° 59′ 38.35″E); Mt. Jadovnik, Katunić peak, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 25 Jun. 2023, 3 specimens (43° 16′ 27.62″ N, 019° 50′ 23.36″E); town of Mionica, village of Brežđe, Šalitrena cave, *leg.* M. Vujić, 04 Aug. 2023, 1 specimen (44° 11′ 26.76″N, 020° 04′ 42.29″E); town of Mionica, village of Paštrić, deciduous forest, Hajdučka Česma well, *leg.* V. Gojšina, M. Vujić, D. Stojanović, M. Šević, 20 Jul. 2023, 3 specimens (approximate coordinates 44° 12′ 14.89″N, 020° 05′ 37.95″E); Mt. Goč, Gočko oko lake, near playground, *leg.* V. Gojšina, 26 Mar. 2023, 1 specimen (43° 31′ 55″N, 020° 53′ 52″E); village of Resnik near town of Sokobanja, spring Vrelo, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 9 specimens (43° 37′ 57.49″N, 021° 48′ 55.48″E); NP Kučaj-Beljanica, canyon towards Vinatovača primeval beech forest, *leg.* V. Gojšina, M. Vujić, N. Vesović, 02 May 2023, 6 specimens (44° 04′ 19.25″N, 021° 44′ 44.76″E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 8 specimens (43° 38′ 08.33″N, 021° 53′ 18.25″E); Mt. Tara, village of Lukino selo, *leg.* D. Antić, M. Šević, D. Pavićević, I. Karaman, 06 Oct. 2023, 4 specimens (43° 50′ 51.42″N, 019° 23′ 48.62″E); canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 8 specimens (42° 56′ 03.06″N, 020° 24′ 02.95″E); village of Ušće, Monastery Studenica, *leg.* V. Gojšina, M. Vujić, 17 Jul. 2023, 4 specimens (43° 29′ 16.33″N, 020° 31′ 47.81″E); village of Godovo near town of Tutin, Godovska cave, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 8 specimens (42° 56′ 47.26″N, 020° 17′ 44.42″E); town of Tutin, Smolućka cave, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2023, 1 specimen (43° 02′ 43.84″N, 020° 21′ 40.00″E); Mt. Devica, Jama pod Oštrom Čukom pit, *leg.* V. Gojšina, 12 Aug. 2022, 5 specimens (43° 35′ 38.48″N, 021° 53′ 54.97″E); Uvac region, Seništa klak, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 25 Apr. 2024, 7 specimens (43° 33′ 03.95″N, 019° 42′ 09.86″E); below Monastery of St. Joakim and Ana, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 02 Jun. 2024, 10 specimens (43° 32′ 38.33″N, 019° 43′ 11.64″ E); Mt. Jadovnik, village of Kaćevo, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 26 Apr. 2024, 4 specimens (43° 19′ 57.51″N, 019° 45′ 47.96″E); Uvac region, oak forest, *leg.* V. Gojšina, D. Stojanović, M. Šćiban, 04 Jun. 2024, 1 specimen (43° 32′ 48.74″N, 019° 42′ 21.89″E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 8 specimens (43° 31′ 25.18″N, 019° 39′ 39.54″E); Uvac region, exit of Uvac river from its canyon, *leg.* D. Stojanović, D. Antić, M. Šević, 23 May 2024, 7 specimens (43° 32′ 38.01″N, 019° 43′ 13.45″E); Mt. Golija, village of Bogutovac, near Lopatnica river, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 08 Jul. 2024, 1 specimen (43° 39′ 15.67″N, 020° 32′ 40.85″E); Mt. Kopaonik, Jelak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Aug. 2024, 1 specimen (43° 18′ 17″N, 020° 51′ 36″E); Mt. Kopaonik, Metođe, limestone rocks next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 14 specimens (43° 18′ 02.81″N, 020° 51′ 05.34″E); Mt. Kopaonik, Srebrnac, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jul. 2024, 1 specimen (43° 18′ 36.27″N, 020° 50′ 17.09″E); Mt. Kopaonik, Srebrnac, below Bele Stene at edge of coniferous forest, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jul. 2024, 1 specimen (43° 16′ 43.97″N, 020° 48′ 46.97″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 12 specimens (43° 28′ 20.53″N, 022° 05′ 46.77″E); Monastery Manasija, courtyard and immediate surroundings, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 2 specimens (44° 06′ 02.48″N, 021° 28′ 08.92″E); town of Ovčar Banja in Ovčar-Kablar gorge, *leg.* D. Pavićević, 11 Jun. 1985, 1 specimen; village of Periš, Periško vrelo, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 9 specimens (43° 22′ 07.34″N, 022° 18′ 57.74″E); village of Ljuberađa, limestone cliff, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43° 01′ 02.33″N, 022° 21′ 59.74″E); village of Kravlje near city of Niš, Kravljansko vrelo, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 2 specimens (43° 27′ 07.74″N, 021° 55′ 19.86″E); village of Cerje, in front of Cerjanska cave, *leg.* V. Gojšina, 18 May 2024, 3 specimens (43° 25′ 48.72″N, 021° 56′ 23.36″E); village of Cerje near ciy of Niš, Cerjanska cave, rocks above, *leg.* V. Gojšina, 18 May 2024, 6 specimens (43° 25′ 47.93″N, 021° 56′ 20.95″E); limestone rocks around spring of river Grza, *leg.* V. Gojšina, M. Vujić,

18 Jul. 2024, 14 specimens (43°53′56.92″N, 021°39′06.75″E); Mačva district, rocks around Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 3 specimens (44°16′13.33″N, 019°25′38.93″E); Uvac region, near Potpećko lake, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 28 May 2025, 7 specimens (43°29′22.92″N, 019°36′40.35″E); Stara planina Mts., rocks on climb to Basarski Kamen, *leg.* V. Gojšina, M. Vujić, 13 Aug. 2025, 2 specimens (43°10′27.70″N, 022°41′32.99″E); canyon of river Trešnjica, *leg.* V. Gojšina, M. Vujić, 22 Aug. 2025, 1 specimen (44°08′25.57″N, 019°32′27.24″E); spring of river Raška, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jun. 2025, 5 specimens (43°06′55.70″N, 020°22′12.69″E); village of Velepolje, Banja Topilo, 08 Aug. 2024, *leg.* V. Gojšina, M. Vujić, 1 specimen (43°26′52.74″N, 021°52′40.79″E); Mt. Jadovnik, near Katunić peak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Jun. 2025, 6 specimens (43°16′01.52″N, 019°48′46.04″E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 10 specimens (43°04′29″N, 022°47′46″E).

Sites in Serbia from the literature. After Möllendorff (1873): Mt. Avala; Derventa river canyon on Mt. Tara; Monastery Rača on Mt. Tara; Burac (?) near Zlatibor. **After Pavlović (1912) and Tomić (1959)**: Mt. Avala near city of Belgrade; Moravica gorge, Banjica; village of Basara near city of Pirot; Mt. Belava near city of Pirot; Bela (?); Mt. Beljanica; village of Dobroselica on Mt. Zlatibor, Borova Glava; Vukan (probably close to village of Ždrelo); Velika Tisnica river gorge (near town of Žagubica); village of Vratna, Vratna limestone gates and river gorge; Vučje (?); Mt. Vidlič near city of Pirot; Vujinovača near city of Valjevo; Velika Klisura (?); Monastery Gornjak near town of Žagubica; Grza river gorge; village of Gornje Košlje; Gradac (Studenica); Golubac fortress near town of Golubac; river Dubočica near town of Raška; Mt. Tara (canyon of river Derventa, Krstača hill, village of Perućac); village of Donja Bela Reka near city of Bor; Zečki Vrh peak, Mt. Čemernica; village of Zlot; Jasenovac near town of Krepoljin; Jelašnica gorge near city of Niš; Mt. Javor; village of Jelovac near town of Despotovac; Mt. Kosmaj; town of Krupanj; Mt. Kablar; Kadijina Stena near Mt. Javor; Koprivštički Krst near city of Pirot; Stara Planina Mts., village of Kalna; village of Kopajkošara near town of Svrljig; Krivi Vir; village of Krepoljin near town of Žagubica; village of Lisa near town of Ivanjica; Luka (?); village of Lunjevica near town of Gornji Milanovac; village of Ljuberađa; town of Majdanpek; Svrljiške planine (Mts., Milenkova Stena, village of Periš, Sirinjava Duvka, Ulanac); Mt. Mučanj; Mt. Kopaonik (Metođe, Radmanov kamen); Monastery Manasija near town of Despotovac; Mt. Povlen, Mali Povlen; Mt. Medvednik; village of Negbina near town of Kokin Brod; village of Niška Banja near city of Niš; Mt. Ovčar; Proslop (?); Mt. Povlen; village of Prekonoga near town of Svrljig; Svrljiške planine Mts., Pleš; Rgtoski Kamen near city of Bor; Mt. Rtanj; Ripaljka waterfall near town of Sokobanja; village of Rti near town of Lučani; Monastery Ravanica near town of Ćuprija; Monastery Suvodol near village of Minićevo; Stenka peak, near town of Paraćin; Mt. Suva planina; Sićevo gorge near city of Niš; Monastery St. Stevan near town of Aleksinac; Mt. Stol near city of Bor; Mt. Starica near town of Majdanpek; Sv. Azosim near town of Golubac; Monastery Tumane near town of Golubac; Turija near town of Kučevo; Mt. Tupižnica; Stara planina Mts., village of Temska; Mt. Talambas; Mt. Bobija, Tornička Bobija peak; Crkva Lozica near Krivi Vir; Crnica gorge near town of Paraćin; village of Ceremošnja near town of Kučevo, Ceremošnja cave; village of Poćuta near city of Valjevo, Monastery Pustinja; Mt. Čemernica; Stara Planina Mts., Široke Luke. **After Pfeiffer (1856)**: Mt. Avala near city of Belgrade. **After Maassen (1988)**: Monastery Manasija near Despotovac; Grza near Paraćin. **After Jovanović (1997b)**: Mt. Tara. **After Đuknić *et al.* (2010)**: Vrelska padina and Ivanštica rivers, eastern Serbia.

Differential diagnosis. *Sphyradium doliolum* has more elevated periostracal riblets and a more ovoid shell, which has clearly wider apical whorls than *O. wagneri*.

Distribution and habitats in Serbia. A very common species in Serbia, *S. doliolum* is found in limestone-rich areas. It usually occurs in moister, but not saturated habitats, such as in leaf litter, in forest ravines, on soil around the base of rocks, and in moist alluvial *Alnus* forests in gorges.

Remarks. Đuknić *et al.* (2010) reported "*Orcula dolium*" from eastern Serbia. Since the in Serbia *O. dolium* is known only from fossil records (Mitrović 2007; Páll-Gergely *et al.* 2013), this most probably refers to *S. doliolum* which was for a while known under a synonym "*Orcula doliolum*". Thus, Đuknić *et al.* (2010) most probably misspelt the name, and it does not refer to *O. dolium*.

Family Pagodulinidae Pilsbry, 1924

Genus *Pagodulina* Clessin, 1876

Type species. *Pupa pagodula* Des Moulins, 1830, by monotypy.

Pagodulina pagodula (Des Moulins, 1830)

Figures 41–43

Pupa pagodula Des Moulins 1830: 161.
Pagodina pagodula—Pavlović 1912: 65–66; Tomić 1959: 32.

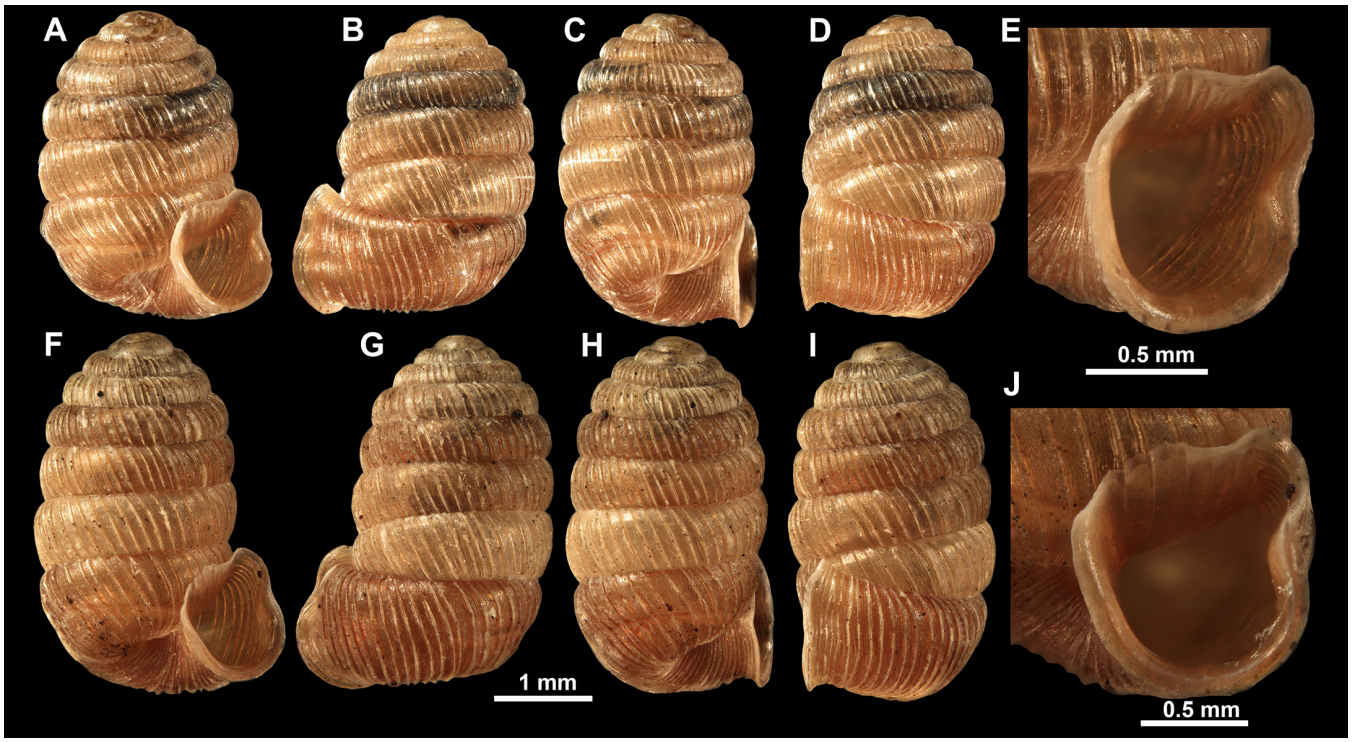

Figure 41. *Pagodulina pagodula* from Uvac region, Seništa - Klak. **A**–**E**, specimen 1. **F**–**J**, specimen 2.

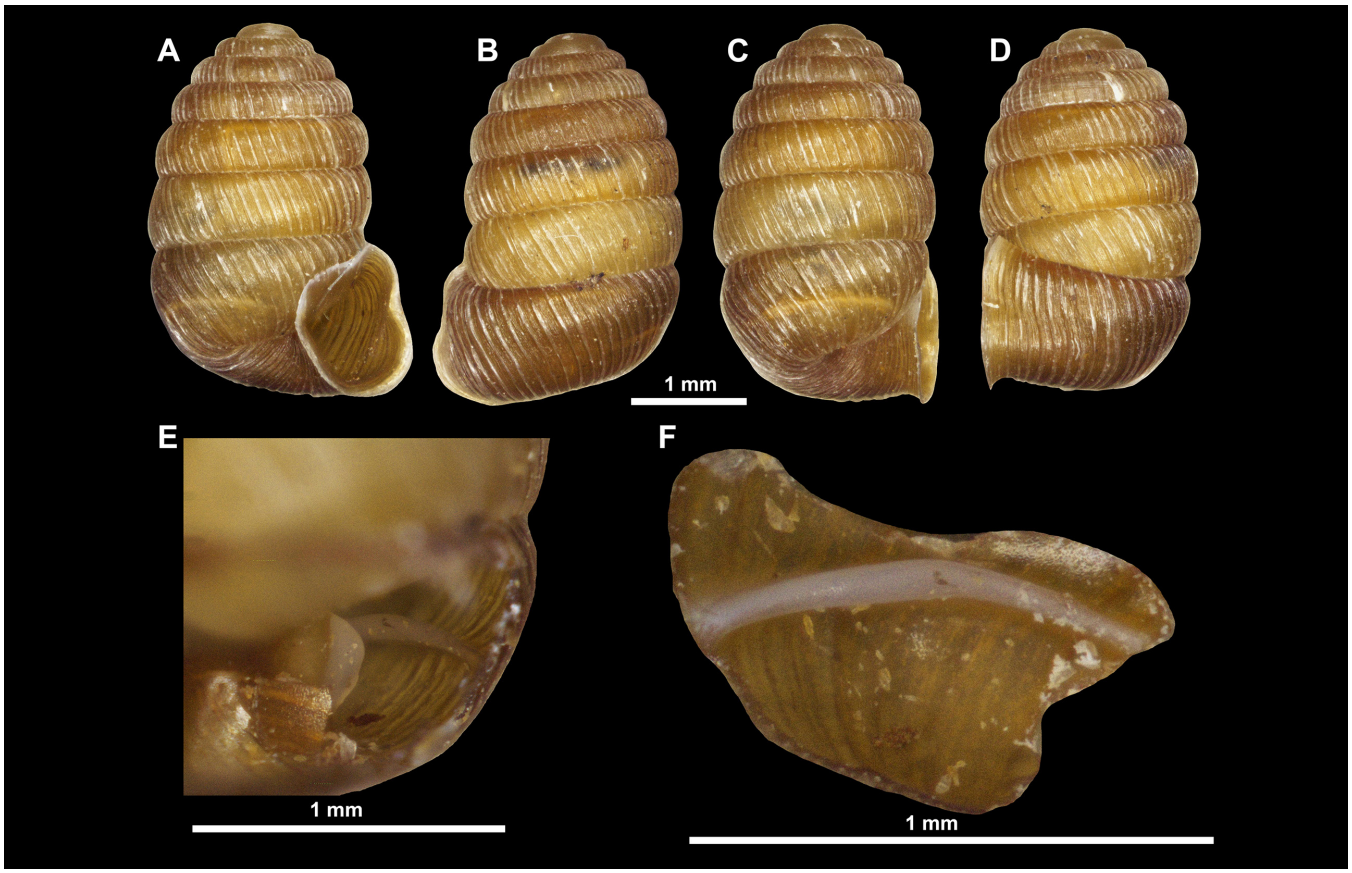

Figure 42. *Pagodulina pagodula* from Mt. Golija, village of Devići. **A**–**D**, shell. **E**, **F**, last whorl broken to show internal barriers.

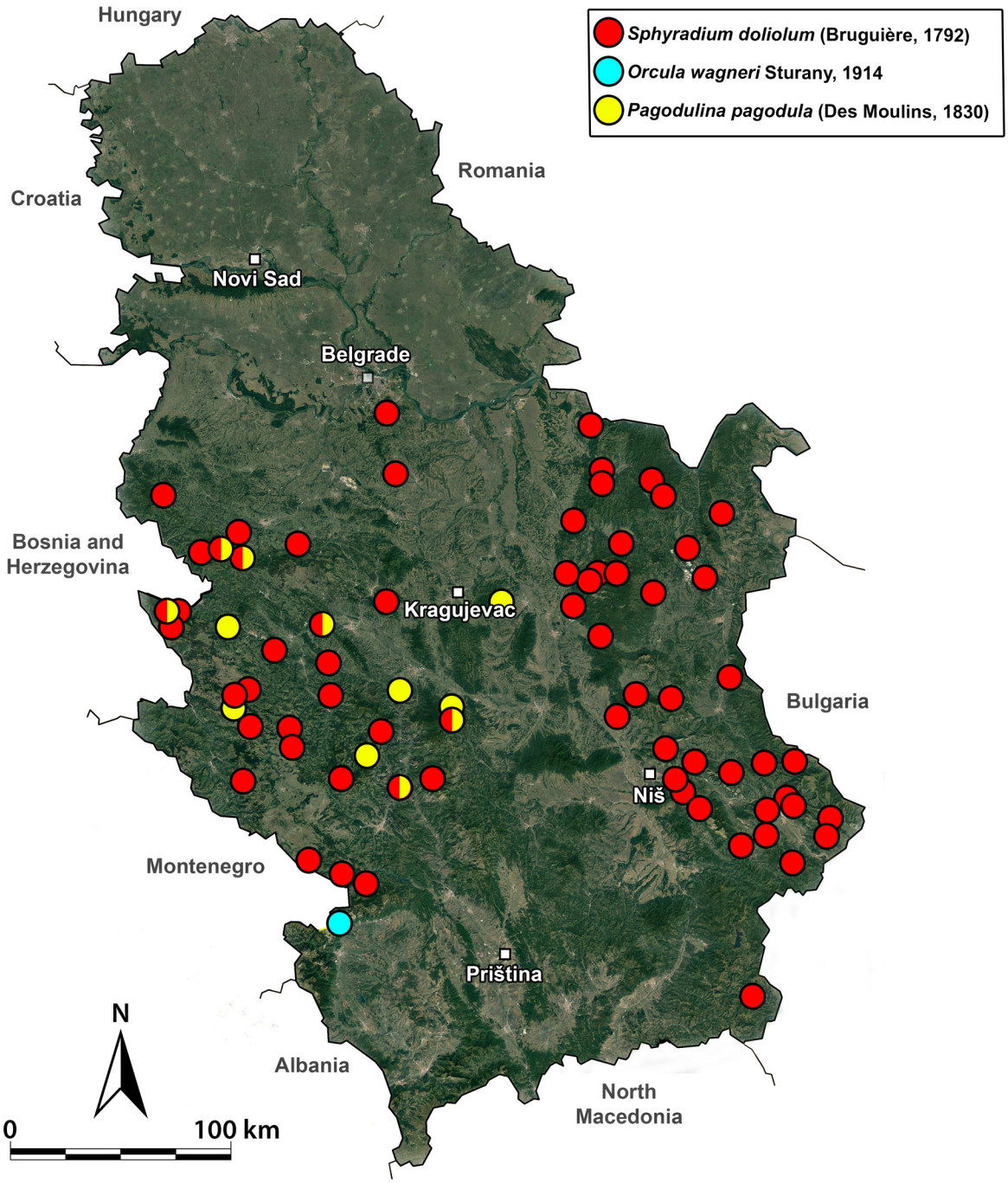

Figure 43. Distribution map of *Orcula*, *Sphyradium*, and *Pagodulina* in Serbia.

Pagodulina pagodula—Jovanović 1997b: 231; Karaman 2007: 146.

Material examined. Mt. Goč, Gočko oko lake, near playground, *leg.* V. Gojšina, 26 Mar. 2023, 1 specimen (43°31′55″N, 020°53′52″E); town of Vrnjačka Banja, soil next to a small creek, *leg.* V. Gojšina, 24 Mar. 2023, 1 specimen (43°35′19″N, 020°54′25″E); Uvac region, Seništa klak, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 25 Apr. 2024, 15 specimens (43°33′03.91″N, 019°42′09.80″E); Mt. Golija, village of Bogutovac, near Lopatnica river, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 08 Jul. 2024, 2 specimens (43°39′15.67″N, 020°32′40.85″E); Mt. Golija, village of Devići, waterfall on river Izubra, *leg.* D. Stojanović, 1 specimen (43°25′21″N, 020°25′03″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Beli Izvor and Monastery Jošanica

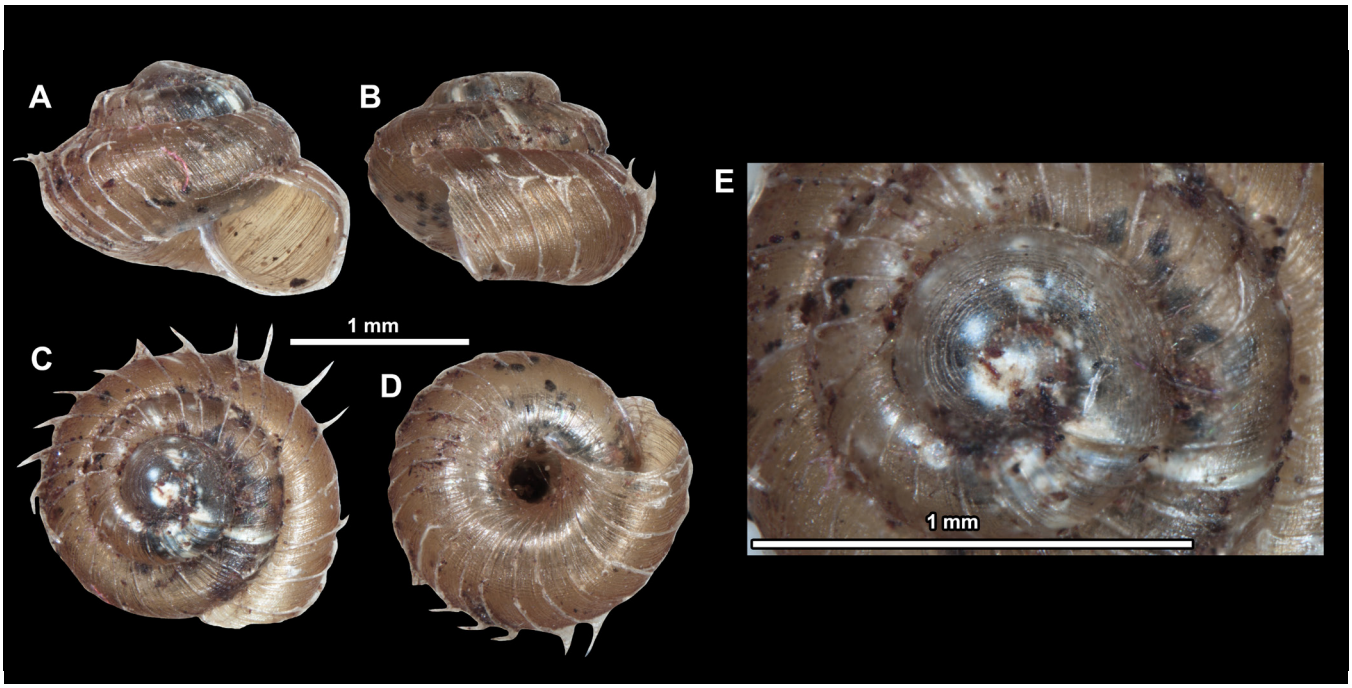

Figure 44. *Acanthinula aculeata* from Mt. Tara, Lukino selo. **A**–**D**, shell. **E**, enlarged view of protoconch.

in village of Kalenovac near city of Jagodina; Mt. Povlen; Mt. Medvednik; Mt. Tara (Perućac, Drundebo); village of Stapari near city of Užice; Mt. Kablar; Mt. Ovčar; Volujačka Karaula in Uvac region (Zlatibor district); Dubočica near town of Raška. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species can be distinguished from *P. subdola* by the absence of 2–3 palatal folds deep inside the aperture (only one in *P. pagodula*) and the absence of suturalis (Welter-Schultes 2012).

Distribution and habitats in Serbia. This species occurs only in western Serbia. We have found this species next to a small brook on Mt. Goč (town of Vrnjačka Banja) and on rocks next to the Uvac River, near the town of Nova Varoš.

Remarks. There has been some ambiguity about the identification of *Pagodulina* species in Serbia. Pavlović (1912) mentioned only *P. pagodula*, while Welter-Schultes (2012) indicated that these records refer to *P. subdola*. Based on our collected material, we are able to conclude the following: our specimens showed only a single, palatal plica deep inside the aperture. No folds below or above this plica are present. The density of the radial ribbing of the shell is more reminiscent of the one shown for *P. pagodula* by Welter-Schultes (2012); that is, it is not as dense as in *P. subdola*. Therefore, we identify all our samples as *P. pagodula*, while the presence of *P. subdola* in Serbia must still be investigated.

Family Valloniidae E. S. Morse, 1864

Genus *Acanthinula* H. Beck, 1847

Type species. *Helix aculeata* O.F. Müller, 1774, by subsequent designation by Martens in Albers (1860).

***Acanthinula aculeata* (O.F. Müller, 1774)**

Figures 44, 45

Helix aculeata O.F. Müller 1774: 81.

Acanthinula aculeata—Pavlović 1912: 62; Jaeckel *et al.* 1958: 147; Tomić 1959: 30–31; Maassen 1988: 37; Jovanović 1997b: 231; Sólymos *et al.* 2004: 152; Karaman 2007: 147; Karaman 2012: 19.

Material examined. Town of Majdanpek, Paskova cave, *leg.* V. Gojšina, 23 Mar. 2022, 1 specimen (44°26′30.57″N, 021°57′06.54″E); village of Plavna, river Zamna, Rajska prerast limestone gate, *leg.* V. Gojšina, 25 Feb. 2022, 5 specimens (44°18′04.27″N, 022°16′44.51″E); Vrčin settlement, near small spring under rotten tree bark, *leg.* M. Vujić, 25 Apr. 2023, 1 specimen; village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 1 specimen (42°59′25.32″N, 020°07′49.94″E); Jelašnica Gorge near city of Niš, on limestone rocks, *leg.* V. Gojšina, 04 Jun. 2019, 3 specimens (43°16′45.82″N, 022°03′49.59″ E); Dobri Do village near Pirot town, Popoviči Vir, *leg.* V. Gojšina, M. Vujić, N. Vesović, 29 Apr. 2023, 1 specimen (43°12′33.41″N, 022°38′14.60″E); village of Resnik near town of Sokobanja,

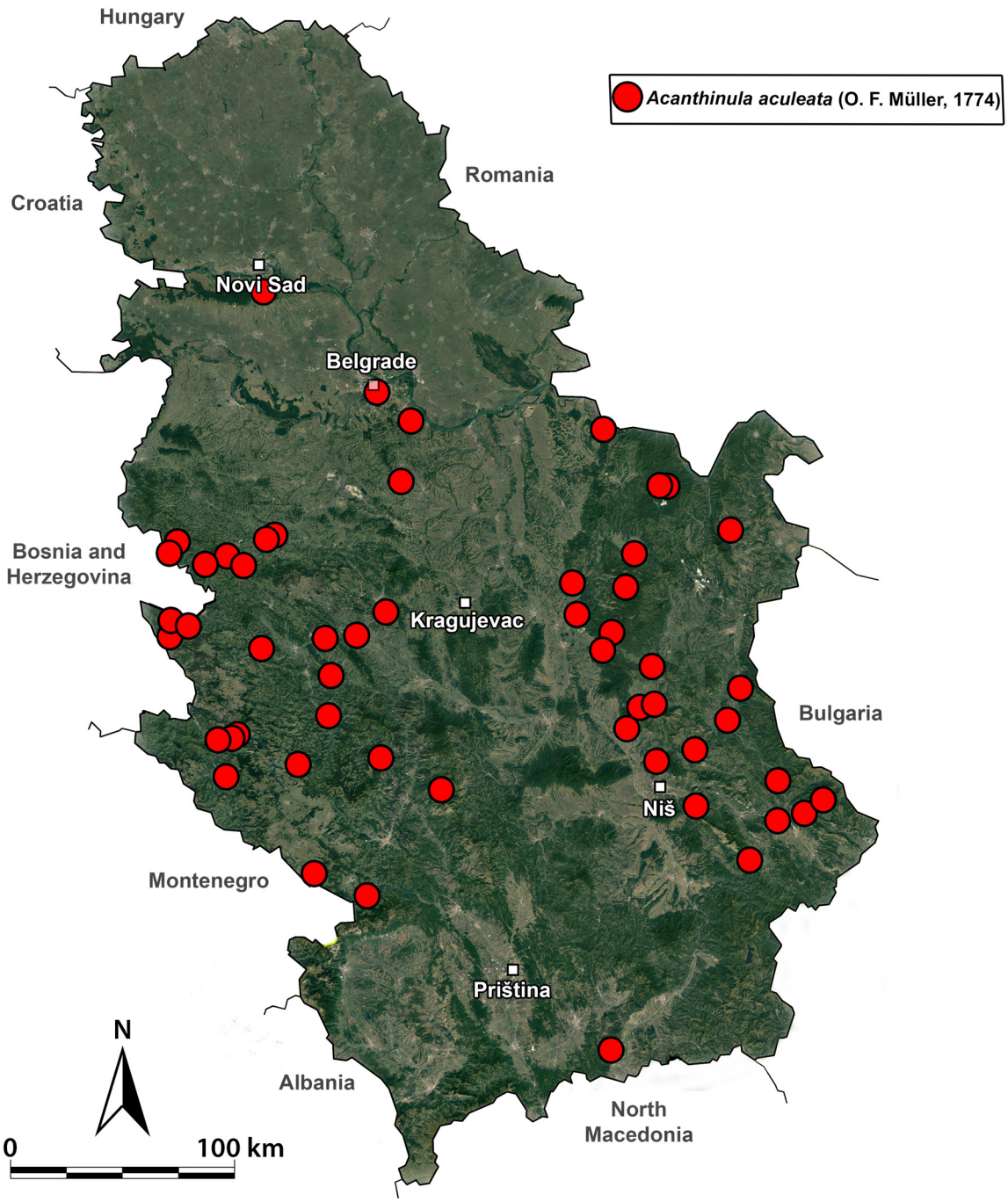

Figure 45. Distribution map of *Acanthinula aculeata* in Serbia.

spring Vrelo, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 1 specimen (43°37′57.49″N, 021°48′55.48″E); Mt. Beljanica, ancient beech forest "Vinatovača", *leg.* V. Gojšina, M. Vujić, N. Vesović, 02 May 2023, 1 specimen (44°04′24.58″N, 021°45′31.70″E); Mt. Tara, village of Lukino selo, *leg.* D. Antić, M. Šević, D. Pavićević, I. Karaman, 06 Oct. 2023, 1 specimen (43°50′51.42″N, 019°23′48.62″E); canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 4 specimens (42°56′03.06″N, 020°24′02.95″E); limestone cliffs near Monastery of St. Joakim and Ana, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 25 Apr. 2024, 1 specimen (43°31′45.41″N, 019°43′26.19″E); limestone cliff next to Kosaćanka river close to Monastery Mileševa, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 8

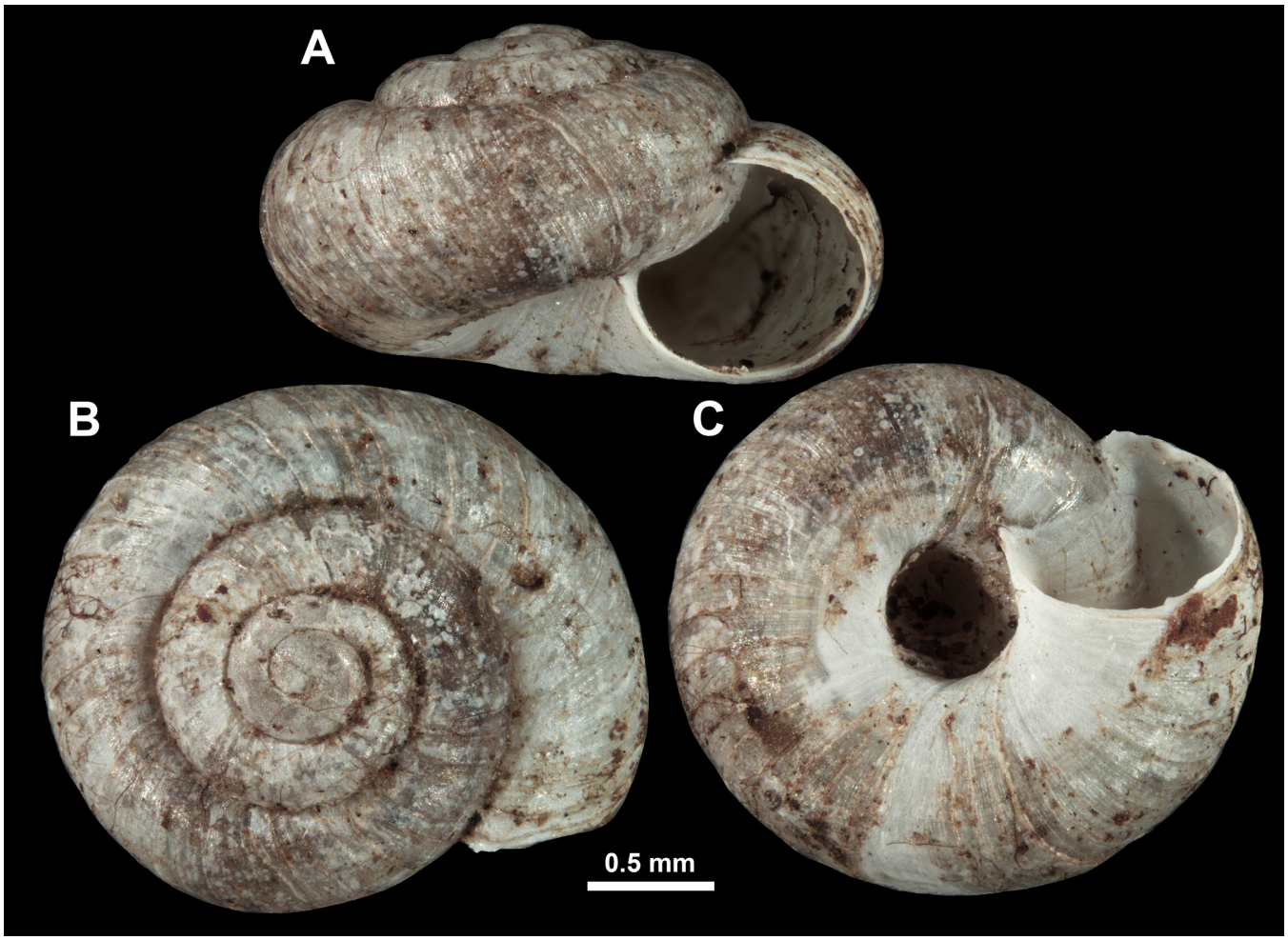

Figure 46. *Gittenbergia sororcula* from the surroundings of Bjeluša (HNHM 101614).

specimens (43°22′23.39″N, 019°42′36.80″E); village of Čelice near town of Nova Varoš, hill, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43°29′57.95″N, 019°38′39.34″E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43°31′25.18″N, 019°39′39.54″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 83 specimens (43°28′20.53″N, 022°05′46.77″E); town of Preševo, Ilinska cave, *leg.* V. Gojšina, M. Vujić, 09 Oct. 2024, 21 specimens (42°20′51.44″N, 021°35′55.62″E); village of Ljuberađa, Ljuberaško vrelo, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43°01′48.90″N, 022°23′17.31″E); village of Ljuberađa, limestone cliff, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43°01′02.33″N, 022°21′59.74″E); village of Cerje near ciy of Niš, Cerjanska cave, rocks above, *leg.* V. Gojšina, 18 May 2024, 1 specimen (43°25′47.93″N, 021°56′20.95″E); limestone rocks around spring of river Grza, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2024, 1 specimen (43°53′56.92″N, 021°39′06.75″E); Mačva district, behind Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 9 specimens (44°16′05.50″N, 019°25′48.44″E); Mačva district, rocks around Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 2 specimens (44°16′13.33″N, 019°25′38.93″E); Popovo vrelo near Monastery Ćelije, *leg.* V. Gojšina, M. Vujić, 05 May 2025, 1 specimen (44°14′03.62″N, 019°51′46.93″E); Uvac region, near Potpećko lake, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 28 May 2025, 1 specimen (43°29′22.92″N, 019°36′40.35″E); canyon of river Trešnjica, *leg.* V. Gojšina, M. Vujić, 22 Aug. 2025, 4 specimens (44°08′25.57″N, 019°32′27.24″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Belava near city of Pirot; city of Čačak, settlement of Beljina; Mt. Tara (Vrujce spring; Drundebo; canyon of river Derventa; Krstača hill near Rača

monastery; village of Perućac); Vujinovača near city of Valjevo; Velika Tisnica river gorge near town of Žagubica; Gradac river gorge near city of Valjevo; village of Gornje Košlje near town of Ljubovija; next to Dubočica river, near town of Raška; Mt. Javor; Jelašnica gorge near city of Niš; Stara planina Mts., village of Kalna; Kadijina Stena near Mt. Javor; Mt. Kablar; Krupac (?); Mt. Kosmaj; village of Lunjevica near town of Gornji Milanovac; village of Lisa near town of Ivanjica; village of Lepena, near town of Knjaževac; Mt. Medvednik; Monastery Manasija near town of Despotovac; Pogana Peć near town of Žagubica; Pešter (?); Mt. Povlen; Monastery Ravanica near town of Ćuprija; village of Rti near town of Lučani; Mt. Rtanj; Ripaljka waterfall near town of Sokobanja; Mt. Kopaonik, Radmanov Kamen; Mt. Starica near town of Majdanpek; Sv. Azosim near town of Golubac; Sarlak (?); Monastery Suvodol near village of Minićevo; Monastery St. Stevan near town of Aleksinac; Monastery Studenica; city of Belgrade, Topčider; city of Užice; Crnica river gorge near city of Paraćin; village of Poćuta near city of Valjevo (Monastery Pustinja); Stara planina Mts., Široke Luke. **After Maassen (1988)**: along river near Ovčar Banja; Grza near Paraćin; Sokobanja near Aleksinac. **After Jovanović (1997b)**: Mt. Tara. **After Sólymos *et al.* (2004) and Karaman (2012)**: Mt. Fruška Gora, Dobri potok stream.

Differential diagnosis. This species is easily recognized by the presence of periostracal "fringes" on the shell.

Distribution and habitats in Serbia. A common species occurring across Serbia. Frequently found on the karstified limestone but clearly not limited to these types of habitats. In the settlement of Vrčin (city of Belgrade), it has been found under a rotten tree log (*Carpinus betulus*) next to a small brook.

Genus *Gittenbergia* F. Giusti, Castagnolo & Manganelli, 1985

Type species. *Helix sororcula* Benoit, 1859, by monotypy.

Gittenbergia sororcula (Benoit, 1859)

Figures 46, 50

Helix sororcula Benoit 1859: 148.
Gittenbergia sororcula—Karaman 2007: 147.

Material examined. Bjeluša gorge along road to Čakor Pass, 1250 m a.s.l., *leg.* T. Deli, Z.P. Erőss, Z. Fehér, D. Murányi, 05 Oct. 2005, 1 specimen (42° 41′ 06″ N, 020° 03′ 15″ E) (HNHM 101614).

Differential diagnosis. See *P. pygmaeum* and *P. servilis*.

Distribution and habitats in Serbia. This species is known only from Bjeluša on Kosovo and Metohija where it is found among rocks.

Remarks. Karaman's (2007) checklist included *G. sororcula* in the fauna of Serbia; but without a reference or locality data. Welter-Schultes (2012) presented a map that shows the this species' distribution comes in contact with Serbia, and Bank & Neubert (2020) also considered this species to be present in the country. Therefore, even thought we cannot find precise locality data for these earlier reports, we do not consider our records as first from the country, but rather they confirm of the presence of this species.

Genus *Vallonia* Risso, 1826

Type species. *Vallonia rosalia* Risso, 1826, by monotypy.

Vallonia costata (O.F. Müller, 1774)

Figures 47, 49, 50

Helix costata O.F. Müller 1774: 31.
Vallonia costata—Pavlović 1912: 32–33; Hesse 1929: 233; Jaeckel *et al.* 1958: 147; Tomić 1959: 18; Jovanović 1985: 42; Maassen 1988: 37; Jovanović 1990: 24; Jovanović 1993: 239; Jovanović 1997a: 355; Jovanović 1996: 218; Karaman 2007: 147; Karaman 2012: 20.
Vallonia costata helvetica—Hesse 1929: 233.
Vallonia costellata—Hesse 1929: 233.
allonia costata [*sic*]—Jovanović 1997b: 231.

Material examined. Settlement of Opovo, near Tamiš River, *leg.* V. Gojšina, 21 Apr. 2019, 3 specimens (45° 03′ 14.69″ N, 020° 25′ 00.03″ E); town of Kovin, Kovinski Dunavac locality, *leg.* V. Gojšina, 04 Oct. 2020, 13 specimens (44° 43′ 37.42″ N, 020° 58′ 40.94″ E); village of Deliblato, Obzovik locality, *leg.* V. Gojšina, 09 May 2020, 2 specimens (44° 51′ 06.69″ N, 021° 00′ 36.16″ E); Mt. Zlatibor, town of Čajetina, village of Gostilje, Gostilje waterfalls, *leg.* V. Gojšina, 07 Aug. 2020, 2 specimens (43° 39′ 24.83″ N, 019° 50′ 18.54″ E); village of Ovčar Banja, surroundings of Ovčar-Kablar gorge, *leg.* V. Gojšina, 10 Aug. 2020, 2 specimens (43° 53′ 56.70″ N, 020° 11′ 17.33″ E); village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 09 May 2020, 5 specimens (44° 50′ 31.32″ N, 021° 01′ 50.49″ E); near river Nera, *leg.* V. Gojšina, 4 specimens (44° 52′ 22.74″ N, 021° 25′ 33.44″ E); city of Belgrade, Kalemegdan fortress, *leg.* V. Gojšina, 21 Apr. 2021, 1 specimen (44° 49′ 17.74″ N, 020° 27′ 12.33″ E); Mt. Tara, Račanska Šljivovica, *leg.* V. Gojšina, 31 May 2021, 3 specimens (43° 53′ 55.55″ N, 019° 30′ 53.48″ E); village of Vratna near city of Negotin, Vratna limestone gates on canyon of Vratna river, *leg.* V. Gojšina, 24 Mar. 2022, 6 specimens (44° 22′ 59.97″ N, 022° 20′ 12.63″ E); town of Bosilegrad, Milevska planina mountain, *leg.* V. Gojšina, 06 Jun. 2022, 1 specimen (42° 31′ 03.66″ N, 022° 28′ 26.94″ E); spring of river Vapa, Pešter plateau, *leg.* V. Gojšina, 26 Jul. 2022, 10 specimens (43° 14′ 12.56″ N, 020° 06′ 00.23″ E);

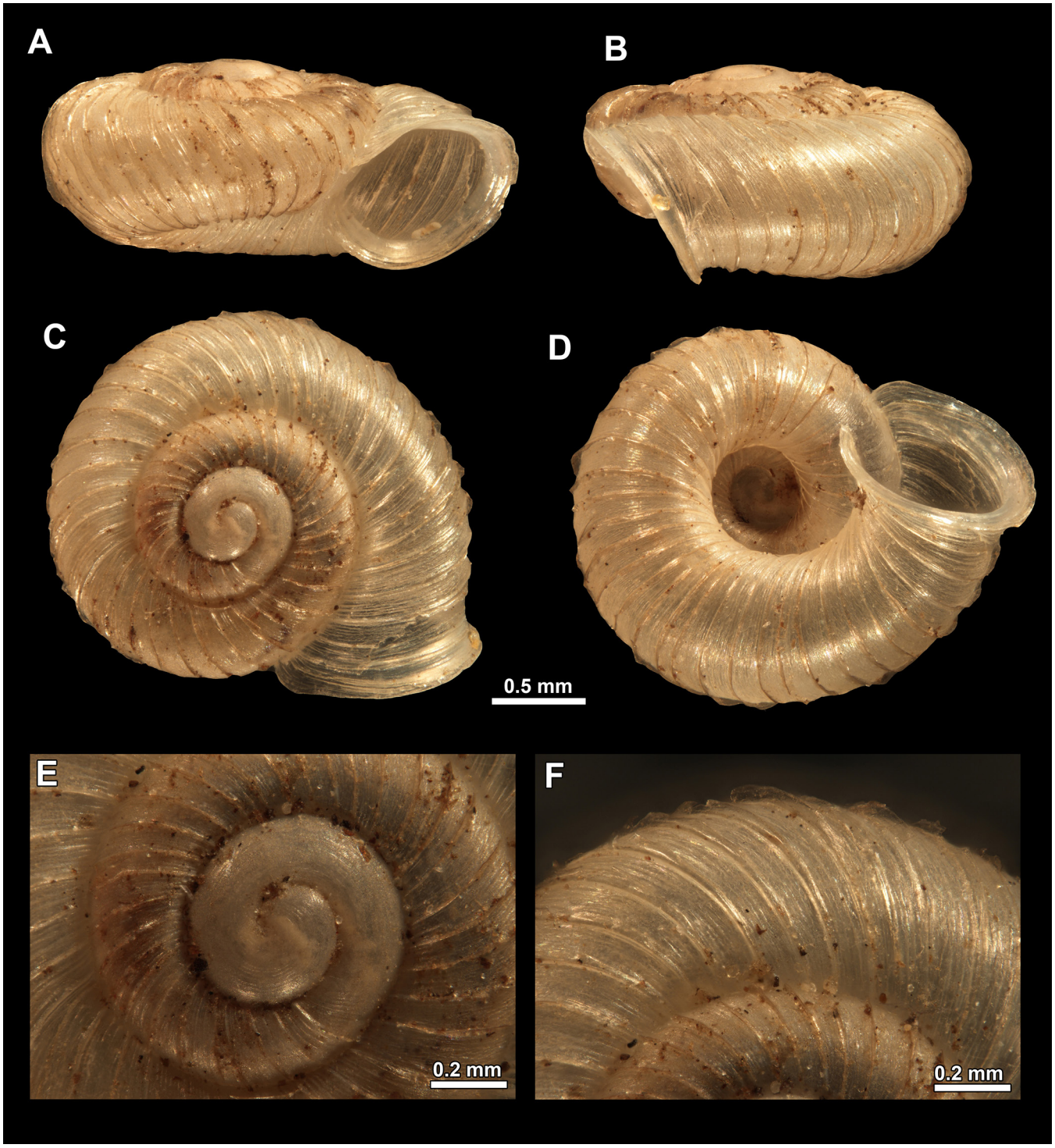

Figure 47. *Vallonia costata* from the village of Temska. **A**–**D**, shell. **E**, enlarged view of protoconch. **F**, enlarged view of the last whorl.

village of Đerekare, *leg.* V. Gojšina, 25 Oct. 2022, 3 specimens (42° 59′25.32″N, 020° 07′49.94″E); village of Temska, limestone rocks next to road, *leg.* V. Gojšina, 30 May 2022, 25 specimens (43° 15′43.33″N, 022° 32′56.45″E); Jelašnica Gorge near city of Niš, on limestone rocks, *leg.* V. Gojšina, 04 Jun. 2019, 2 specimens (43° 16′45.82″N, 022° 03′49.59″ E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 4 specimens (43° 11′19.65″N, 022° 38′47.14″ E); Landscape of Outstanding Features "Dolina Pčinje", surround-

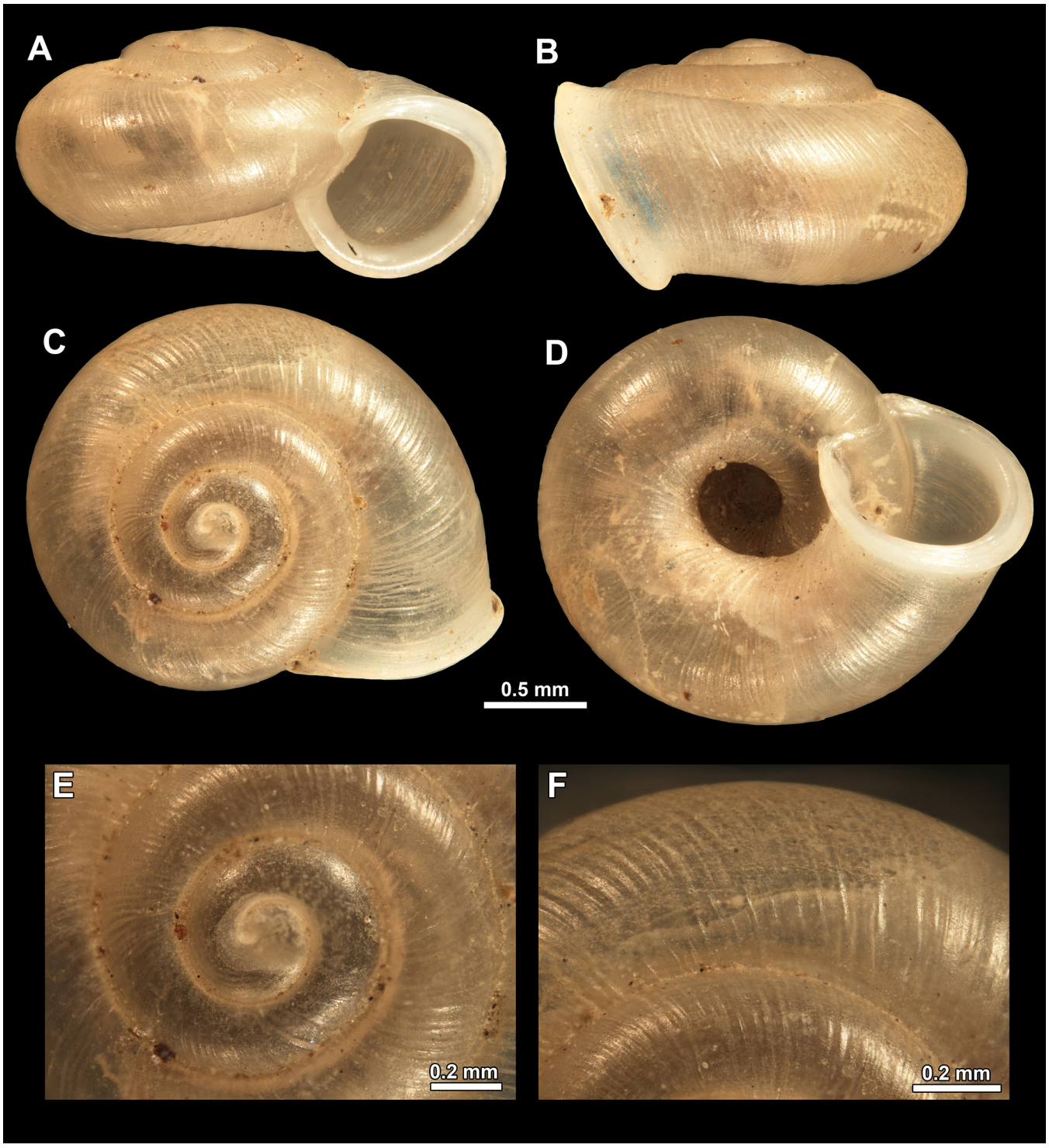

Figure 48. *Vallonia pulchella* from the settlement of Vrčin. **A**–**D**, shell. **E**, enlarged view of protoconch. **F**, enlarged view of last whorl.

ings of Prohor Pčinjski monastery, *leg.* V. Gojšina, M. Vujić, N. Vesović, 16 May 2023, 1 specimen (42°19′48.32″N, 021°53′37.59″E); village of Resnik near town of Sokobanja, spring Vrelo, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 7 specimens (43°37′57.49″N, 021°48′55.48″E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 3 specimens (43°38′08.33″N, 021°53′18.25″E); city of Pirot, Pirot castle (Momčilov grad), *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 May 2023, 5 specimens (43°09′33.60″N, 022°34′52.40″E); village of Zlot, Vernjikica

cave, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 5 specimens (44° 01′ 34.44″N, 021° 56′ 56.29″E); Mt. Povlen, Pašna ravan, *leg.* V. Gojšina, 03 Jun. 2021, 5 specimens (44° 08′ 32.94″N, 019° 40′ 06.14″E); city of Belgrade, Grocka municipality, settlement of Vrčin, *leg.* M. Vujić, 11 Apr. 2021, 2 specimens (44° 40′ 19.75″N, 020° 37′ 16.24″E); city of Novi Sad, Petrovaradin fortress, *leg.* V. Gojšina, 2023, 4 specimens (45° 15′ 08.69″N, 019° *51′ 41.10″E)*; village of Ram, Ram sandland, *leg.* M. Vujić, 14 Jul. 2023, 1 specimen (44° 48′ 59.62″N, 021° 20′ 38.13″E); town of Preševo, Ilinska cave, *leg.* V. Gojšina, M. Vujić, 09 Oct. 2024, 10 specimens (42° 20′ 51.44″N, 021° 35′ 55.62″E); Stara planina Mts., village of Temska, *leg.* V. Gojšina, M. Vujić, 23 Mar. 2024, 37 specimens (43° 15′ 43.24″N, 022° 32′ 56.67″E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 21 specimens (43° 38′ 02″N, 022° 09′ 55″E); village of Vladimirovac, *leg.* V. Gojšina, 18 May 2022, 3 specimens (45° 01′ 14.75″N, 020° 52′ 09.7″E); spring of river Raška, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jun. 2025, 5 specimens (43° 06′ 55.70″N, 020° 22′ 12.69″E); village of Velepolje, Banja Topilo, 08 Aug. 2024, *leg.* V. Gojšina, M. Vujić, 3 specimens (43° 26′ 52.74″N, 021° 52′ 40.79″E); Mačva district, behind Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 4 specimens (44° 16′ 05.50″N, 019° 25′ 48.44″E); surroundings of village of Miljkovac, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 2 specimens (43° 26′ 00.61″N, 021° 52′ 11.24″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; city of Belgrade; Bistra (?); Vratna limestone gates and river gorge; Visoka Klisura (?); Voden (?); gorge of river Gradašnica near town of Sokobanja; Golubac fortress near town of Golubac; village of Donja Bela Reka near city of Bor; Jelašnica gorge near city of Niš; Jevik hill near city of Knjaževac; Stara planina Mts., village of Kalna; Mt. Tara (Krstača hill); village of Ljuberađa near town of Babušnica; Mt. Miroč, Mali Štrbac; village of Negbina near town of Kokin Brod, Glavičica; village of Prekonoga near town of Svrljig; Svrljiške planine Mts., village of Periš; city of Pirot, Đelteš; Petnička cave near city of Valjevo; village of Rsovci near city of Pirot; Rgotski Kamen near city of Bor; Monastery St. Stevan near city of Aleksinac; Monastery of St. Marko Koriški near city of Prizren; Sićevo gorge near city of Niš; next to Trgoviški Timok river. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1985)**: Mt. Avala near city of Belgrade. **After Maassen (1988)**: Pirot, surroundings of Pirot castle. **After Jovanović (1990)**: Deliblato sandland (Banatski Karlovac; Devojački bunar; Dubovac; Kajtasovo; Korn; Mala Tilva; Putnokovo; Flamunda; Čardak). **After Jovanović (1993)**: city of Bor, village of Zlot, Lazarev canyon. **After Jovanović (1996)**: Mt. Stol near city of Bor. **After Jovanović (1997a)**: Mts. Mali Krš and Vizak. **After Jovanović (1997b)**: Mt. Tara. **After Karaman (2012)**: Petrovaradinska Tvrđava-fortress, near abandoned railway tunnel.

Differential diagnosis. See *V. pulchella*.

Distribution and habitats in Serbia. This species is widespread in Serbia. It obviously prefers calcareous substrate, but it is not exclusively found there. *Vallonia costata* usually is found in open, dry habitats such as grasslands.

Remarks. *Vallonia costata* occurs in drier habitats than *V. pulchella*, but these two species may co-occur.

Vallonia pulchella (O.F. Müller, 1774)

Figures 48–50

Helix pulchella O.F. Müller 1774: 30.
Helix pulchella—Möllendorff 1873: 131.
Vallonia pulchella—Pavlović 1912: 32; Hesse 1929: 233; Jaeckel *et al.* 1958: 147; Tomić 1959: 17–18; Jovanović 1985: 41; Jovanović 1990: 24; Jovanović 1993: 239; Jovanović 1996: 218; Karaman 2007: 147; Karaman 2012: 20; Stojnić *et al.* 2019: 163–171, figs 3, 4; Gojšina *et al.* 2024a: 193.
Vallonia cf. *pulchella*—Maassen 1988: 37.
Vallonia excentrica—Hesse 1929: 233; Jaeckel *et al.* 1958: 147; Karaman 2007: 147; Stojnić *et al.* 2019: 163–171, figs 1, 2.

Type material examined. 4 paratypes of *V. excentrica* (SMF 3744)

Additional material examined. Town of Kovin, Kovinski Dunavac locality, *leg.* V. Gojšina, 04 Oct. 2020, 15 specimens (44° 43′ 37.42″N, 020° 58′ 40.94″E); village of Deliblato, Obzovik locality, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44° 51′ 06.69″N, 021° 00′ 36.16″E); Belgrade, Jevremovac Botanical Garden, *leg.* V. Gojšina, 14 Jan. 2022, 2 specimens (44° 48′ 54.69″N, 020° 28′ 23.59″E); town of Majdanpek, surroundings of Rajkova cave, Radenkova bina locality, *leg.* V. Gojšina, 23 Feb. 2022, 7 specimens (44° 26′ 32.86″N, 021° 57′ 17.97″E); village of Vratna near city of Negotin, Vratna limestone gates on canyon of Vratna river, *leg.* V. Gojšina, 24 Mar. 2022, 1 specimen (44° 22′ 59.97″N, 022° 20′ 12.63″E); village of Plavna, canyon of Zamna river, Rajska prerast limestone gate, *leg.* V. Gojšina, 25 Mar. 2022, 1 specimen (44° 18′ 04.51″N, 022° 16′ 44.58″E); village of Rudna Glava, Valja prerast (Šuplja stena) limestone gate, *leg.* V. Gojšina, 26 Mar. 2022, 18 specimens (44° 21′ 42.79″N, 021° 59′ 32.13″E); village of Mokranje, Mokranjske stene locality, *leg.* V. Gojšina, 25 Mar.

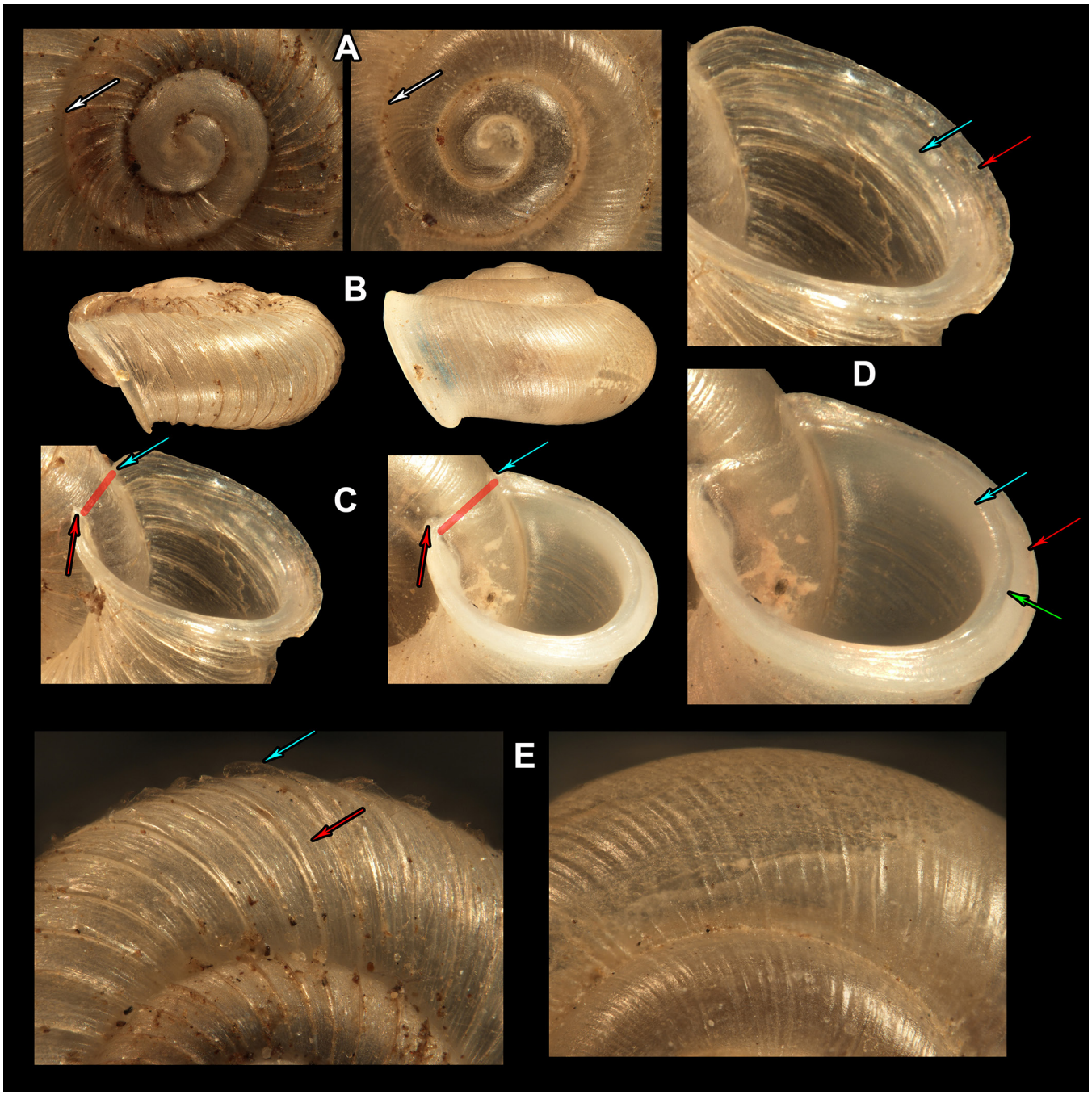

Figure 49. Visualization of the differential characters between *V. costata* and *V. pulchella* as suggested by Nekola *et al.* (2025b). **A**, suture impression in *V. costata* (left) and *V. pulchella* (right) (white arrows point to the sutures). **B**, level of last whorl descending near aperture in *V. costata* (left) and *V. pulchella* (right). **C**, point of upper and lower margin insertion and their distance in *V. costata* (left) and *V. pulchella* (right) (blue arrow points to upper margin insertion; red arrow points to lower margin insertion; tranlucent red line indicates distance between upper and lower insertion point). **D**, callus and peristome-edge position in *V. costata* (top) and *V. pulchella* (bottom) (blue arrow points to callus; red arrow points to peristome edge; green arrow points to narrow furrow between callus and peristome edge in *V. pulchella*. **E**, differences in microsculpture between *V. costata* (left) and *V. pulchella* (right) (blue arrow points to the periostracal rib of *V. costata*; red arrow points to microscopic ribs between larger ones in *V. costata*).

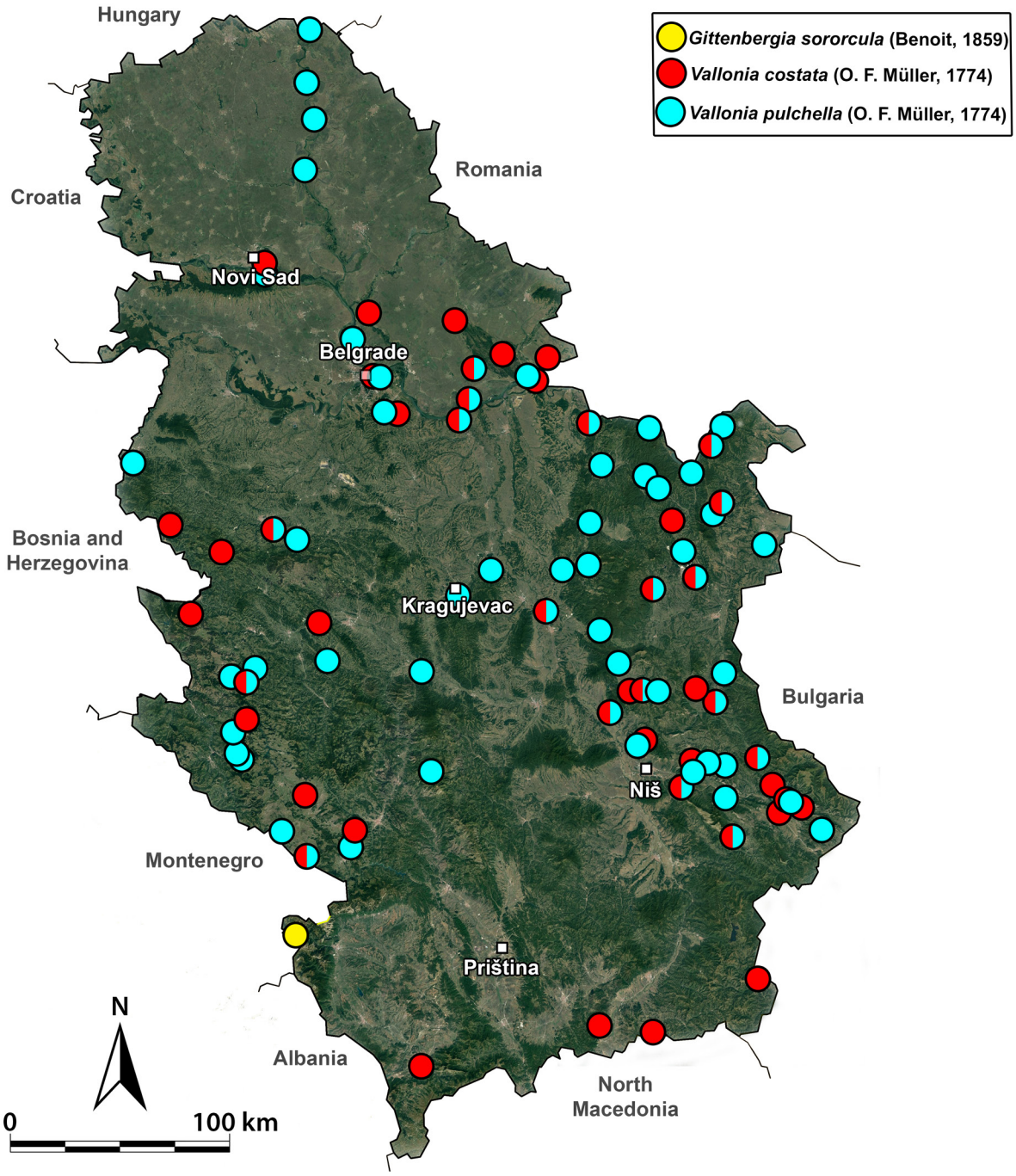

Figure 50. Distribution map of *Gittenbergia sororcula* and *Vallonia* spp. in Serbia.

2022, 2 specimens (44°09′40.24″N, 022°32′11.50″E); village of Krivelj, road towards Mts. Veliki Krš and Stol, *leg.* V. Gojšina, 19 Jun. 2022, 1 specimen (44°10′11.46″N, 022°06′22.42″E); Stara planina Mts., village of Temska, *leg.* M. Šćiban, 04 May 2012, 1 specimen; village of Srbobran, *leg.* M. Šćiban, Nov. 2012, 1 specimen; Stara planina mts., towards village of Oreovica, *leg.* M. Šćiban 30 Apr. 2012; Pešter plateau, village of Dolićе, Hotel Pešter, among rocks, *leg.* V. Gojšina, 26 Jul. 2022, 1 specimen (43°06′01.83″N, 020°00′17.06″E); village of Banatska Palanka, Labudovo okno, *leg.* V. Gojšina, N. Vesović, M. Vujić, 10 Dec. 2022, 1 specimen (44°50′03.84″N, 021°18′39.82″E); village of Bečej, near Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 7 specimens (45°36′41″N, 020°04′10″E);

town of Senta, close to Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 1 specimen (45° 56′ 3.31″ N, 020° 05′ 23.16″ E); village of Ada, next to Tisza river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 25 Dec. 2022, 1 specimen (45° 47′ 04″ N, 020° 09′ 01″ E); village of Dobri Do near city of Pirot, *leg.* V. Gojšina, M. Vujić, N. Vesović, 29 Apr 2023, 1 specimen (43° 12′ 33.38″ N, 022° 38′ 14.60″ E); Petnica village, Petnica research station, *leg.* M. Vujić, 29 May 2023, 2 specimens (44° 14′ 49.61″ N, 019° 55′ 44.78″ E); Devica mountain, *leg.* V. Gojšina, 25 Jun. 2022, one specimen; town of Mionica, village of Paštrić, deciduous forest, Hajdučka Česma well, *leg.* V. Gojšina, M. Vujić, D. Stojanović, M. Šević, 20 Jul. 2023, 1 specimen (approximate coordinates 44° 12′ 14.89″ N, 020° 05′ 37.95″ E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 1 specimen (43° 38′ 08.33″ N, 021° 53′ 18.25″ E); Đerdap National Park, near village of Dobra, *leg.* V. Gojšina, M. Vujić, N. Vesović, 04 May 2023, 2 specimens (44° 38′ 07.33″ N, 021° 56′ 18.23″ E); town of Tutin, Smolućka cave, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2023, 1 specimen (43° 02′ 43.84″ N, 020° 21′ 40.00″ E); Mt. Jadovnik, village of Kaćevo, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 26 Apr. 2024, 2 specimens (43° 19′ 57.51″ N, 019° 45′ 47.69″ E); limestone cliff next to Kosaćanka river near Monastery Mileševa, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 1 specimen (43° 22′ 23.39″ N, 019° 42′ 36.80″ E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 2 specimens (43° 31′ 25.18″ N, 019° 39′ 39.54″ E); Đerdap gorge, village of Tekija, limestone rocks next to road, *leg.* V. Gojšina, M. Vujić, 13 Oct. 2024, 25 specimens (44° 39′ 53.61″ N, 022° 20′ 20.90″ E); village of Ljuberađa, Ljuberaško vrelo, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43° 01′ 48.90″ N, 022° 23′ 17.31″ E); village of Periš, Periško vrelo, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 2 specimens (43° 22′ 07.34″ N, 022° 18′ 57.74″ E); village of Ljuberađa, limestone cliff, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43° 01′ 02.33″ N, 022° 21′ 59.74″ E); city of Belgrade, settlement of Vrčin, house yard, *leg.* M. Vujić, 06 Avg. 2023, 8 specimens (44° 40′ 35.81″ N, 020° 36′ 29.10″ E); surroundings of village of Miljkovac, *leg.* V. Gojšina, N. Vesović, S. Ćurčić, 19 May 2024, 1 specimen (43° 26′ 00.61″ N, 021° 52′ 11.24″ E); city of Belgrade, settlement of Padinska Skela, Zatonja pond, *leg.* V. Gojšina, M. Vujić, 10 Jul. 2023, 1 specimen (44° 57′ 1.8″ N, 020° 20′ 4.2″ E); village of Strmosten near town of Despotovac, next to a restaurant close to road, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2024, 3 specimens (44° 05′ 39″ N, 021° 38′ 00″ E); village of Đala near town of Novi Kneževac, *leg.* V. Gojšina, M. Vujić, 25 Sept. 2024, 1 specimen (46° 10′ 05.98″ N, 020° 05′ 16.80″ E); Mačva district, rocks around Monastery of St. Nikolaj Žički, *leg.* V. Gojšina, M. Vujić, 23 Apr. 2025, 11 specimens (44° 16′ 13.33″ N, 019° 25′ 38.93″ E); Mt. Zlatibor, Crni Rzav, *leg.* V. Gojšina, M. Vujić, 21 Oct. 2025, 5 specimens (43° 40′ 00″ N, 019° 42′ 20″ E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 2 specimens (43° 04′ 29″ N, 022° 47′ 46″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; city of Belgrade; town of Bela Palanka; village of Basara near city of Pirot; Mt. Miroč, Brzec; Vratna limestone gates and river gorge; city of Kraljevo, Vrba; town of Žagubica, Gornjak Monastery; Mt. Gučevo; Gradac near town of Raška; gorge of river Gradašnica near town of Sokobanja; Golubac fortress near town of Golubac; town of Donji Milanovac; village of Donja Bela Reka near city of Bor; village of Jelašnica near city of Niš; Jevik hill near city of Knjaževac; Stara Planina Mts., village of Kalna; city of Kragujevac, Metino brdo; Mt. Kopaonik (Radmanov Kamen); village of Ljuberađa near town of Babušnica; Monastery Manasija near town of Despotovac; village of Negbina near town of Kokin Brod, Đensko brdo; river Prištavica near Mt. Zlatibor; city of Pirot (Đelteš, Zmijavica); Svrljiške planine Mts., village of Periš; Potajnica (?); Rgotski Kamen near city of Bor; Ripaljka waterfall near town of Sokobanja; village of Rti near town of Lučani; Rogot near town of Batočina; Sićevo gorge near city of Niš; Svrljig gorge; Monastery St. Stevan near city of Aleksinac; village of Minićevo, Monastery Suvodol; Mt. Stol near city of Bor; Mt. Starica near town of Majdanpek; town of Kučevo, Turija; near Trgoviški Timok river; Stara planina Mts., village of Temska; city of Užice; Crni Vrh, Jošanica; Crni Vrh, Kalenovačka reka river; Crnica gorge near city of Paraćin; village of Crnoljevica. **After Hesse (1929)**: river Danube, near city of Smederevo; Velika Morava river, near town of Ćuprija; river Ravanica, tributary of Velika Morava river. **After Jovanović (1985)**: Mt. Avala near city of Belgrade. **After Maassen (1988)**: Monastery Manasija near Despotovac; Sokobanja near Aleksinac; Pirot, surroundings of Pirot castle. **After Jovanović (1990)**: Deliblato sandland (Devojački bunar; Dubovac; Korn; Mala Tilva; Flamunda; Čardak). **After Jovanović (1993)**: city of Bor, village of Zlot, Velja Mikulj; Dubašnica. **After Jovanović (1996)**: Mt. Stol near city of Bor. **After Gojšina *et al.* (2024a)**: Vojvodina province, village of Ada (45° 47′ 04.0″ N, 020° 09′ 01.0″ E); Vojvodina province, town of Senta (45° 56′ 11.5″ N, 020° 05′ 26.4″ E). **After Karaman (2012)**: Sremska Kamenica.

Differential diagnosis. According to the latest revision of the *Vallonia* by Nekola *et al.* (2025b), the characters which

separate *V. pulchella* from *V. costata* are the following: i) suture shallower in *V. pulchella*, ii) last whorl descending near the aperture in *V. costata* and not so in *V. pulchella*, iii) upper and lower insertions of the apertural margin closer to each other in *V. costata* than in *V. pulchella*, iv) a ring-like callus in the aperture of *V. costata* is beyond the edge of the thin peristome and separated from it by a wide and shallow furrow, while in *V. pulchella*, the callus protrudes in front of the peristome edge and is separated from it by a narrow, deeper furrow, v) ribs on the shell topped with periostracal fringes in *V. costata*, while ribs are absent in *V. pulchella* or if present, not topped by periostracal fringes; vi) microscopic periostracal ridges present in *V. costata* and absent in *V. pulchella*.

Distribution and habitats in Serbia. Habitats of *V. pulchella* are similar to those of *V. costata*, but wetter habitats are preferred. It can occur on dry ruderal land, in gardens and parks, and in small, green patches in almost every anthropogenic environment. It is also common in pots, both indoors and outdoors, and probably can be translocated with potting soil. It even occurs in the tropical dome of the greenhouse of Jevremovac Botanical Garden.

Remarks. The differences between the two *Vallonia* species, as explained by Nekola *et al.* (2025b), are visualised in Figure 49.

Family Pyramidulidae Kennard & B.B. Woodward, 1914

Genus *Pyramidula* Fitzinger, 1833

Type species. *Helix rupestris* Fitzinger, 1833, by monotypy.

Remarks. *Pyramidula* is a taxonomically very challenging genus, with a number of authors attempting to resolve the relations between its species (Gittenberger & Bank 1996; Martínez-Orti *et al.* 2007; Kirchner *et al.* 2016; Razkin *et al.* 2017; Miller *et al.* 2021; Horsáková *et al.* 2022; Horsák *et al.* 2026). We have followed the descriptions by Gittenberger & Bank (1996), as well as differential diagnoses by Horsáková *et al.* (2022) and Horsák *et al.* (2026), and identified all our samples as *P. pusilla*. However, we assume that more than one species could be present in Serbia. Further research is needed to confirm whether *P. hierosolymitana* (Bourguignat, 1852) and *P. cephalonica* (Westerlund, 1898) occur in Serbia.

Pyramidula pusilla (Vallot, 1801)

Figures 51, 53

Helix pusilla Vallot 1801: 5.

Pyramidula rupestris—Pavlović 1912: 31 ; Jaeckel *et al.* 1958: 147; Tomić 1959: 16; Maassen 1988: 37; Jovanović 1997b: 231; Karaman 2007: 147.

Material examined. Town of Majdanpek, Paskova cave, *leg.* V. Gojšina, 23 Mar. 2022, 1 specimen (44°26′30.57″N, 021°57′06.54″E); town of Majdanpek, surroundings of Rajkova cave, Radenkova bina locality, *leg.* V. Gojšina, 23 Feb. 2022, 49 specimens (44°26′32.86″N, 021°57′17.97″E); village of Vratna near city of Negotin, Vratna limestone gates on canyon of Vratna river, *leg.* V. Gojšina, 24 Mar. 2022, 1 specimen (44°22′59.97″N, 022°20′12.63″E); village of Plavna, river Zamna, Rajska prerast limestone gate, *leg.* V. Gojšina, 25 Feb. 2022, 18 specimens (44°18′04.27″N, 022°16′44.51″E); village of Rudna Glava, Valja prerast (Šuplja stena) limestone gate, *leg.* V. Gojšina, 26 Mar. 2022, 1 specimen (44°21′42.79″N, 021°59′32.13″E); village of Mokranje, Mokranjske stene locality, *leg.* V. Gojšina, 25 Mar. 2022, 3 specimens (44°09′40.24″N, 022°32′11.50″E); city of Bor, Mt. Stol, *leg.* V. Gojšina, 18 Jun. 2022, 1 specimen (44°10′17.00″N, 022°07′40.53″E); spring of river Vapa, Pešter plateau, *leg.* V. Gojšina, 26 Jul.2022, 6 specimens (43°14′12.56″N, 020°06′00.23″E); village of Temska, limestone rocks next to road, *leg.* V. Gojšina, 30 May 2022, 11 specimens (43°15′43.33″N, 022°32′56.45″E); city of Pirot, Pirot castle (Momčilov grad), *leg.* V. Gojšina, M. Vujić, N. Vesović, 06 May 2023, 6 specimens (43°09′33.60″N, 022°34′52.40″E); village of Resnik near town of Sokobanja, spring Vrelo, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 2 specimens (43°37′57.49″N, 021°48′55.48″E); town of Tutin, Smolućka cave, *leg.* V. Gojšina, M. Vujić, 19 Jul. 2023, 2 specimens (43°02′43.84″N, 020°21′40.00″E); Uvac region, rocks above monastery of Sv. Joakim and Ana, *leg.* V. Gojšina, M. Vujić, D. Stojanović, 25 Apr. 2024, 13 specimens (43°31′45.58″N, 019°43′26.12″E); Mt. Kopaonik, Srebrnac, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jul. 2024, 26 specimens (43°18′36.27″N, 020°50′17.09″E); Mt. Kopaonik, Metođe, limestone rocks next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 8 specimens (43°18′02.81″N, 020°51′05.34″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 12 specimens (43°28′20.53″N, 022°05′46.77″E); Stara planina Mts., village of Temska, *leg.* V. Gojšina, M. Vujić, 23 Mar. 2024, 84 specimens (43°15′43.24″N, 022°32′56.67″E); village of Stogazovac near city of Knjaževac, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 70 specimens (43°38′02″N, 022°09′55″E); village of Prekonoga near town of Svrljig, Prekonoška cave, *leg.* V. Gojšina, M. Vujić, 04 Aug. 2024, 1 specimen (43°22′46.95″N, 022°06′08.02″E); village of Periš, Periško vrelo, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 51 specimens (43°22′07.34″N, 022°18′57.74″E); village of Ljuberađa, limestone cliff, *leg.* V. Gojšina, M. Vujić, 05 Aug. 2024, 1 specimen (43°01′

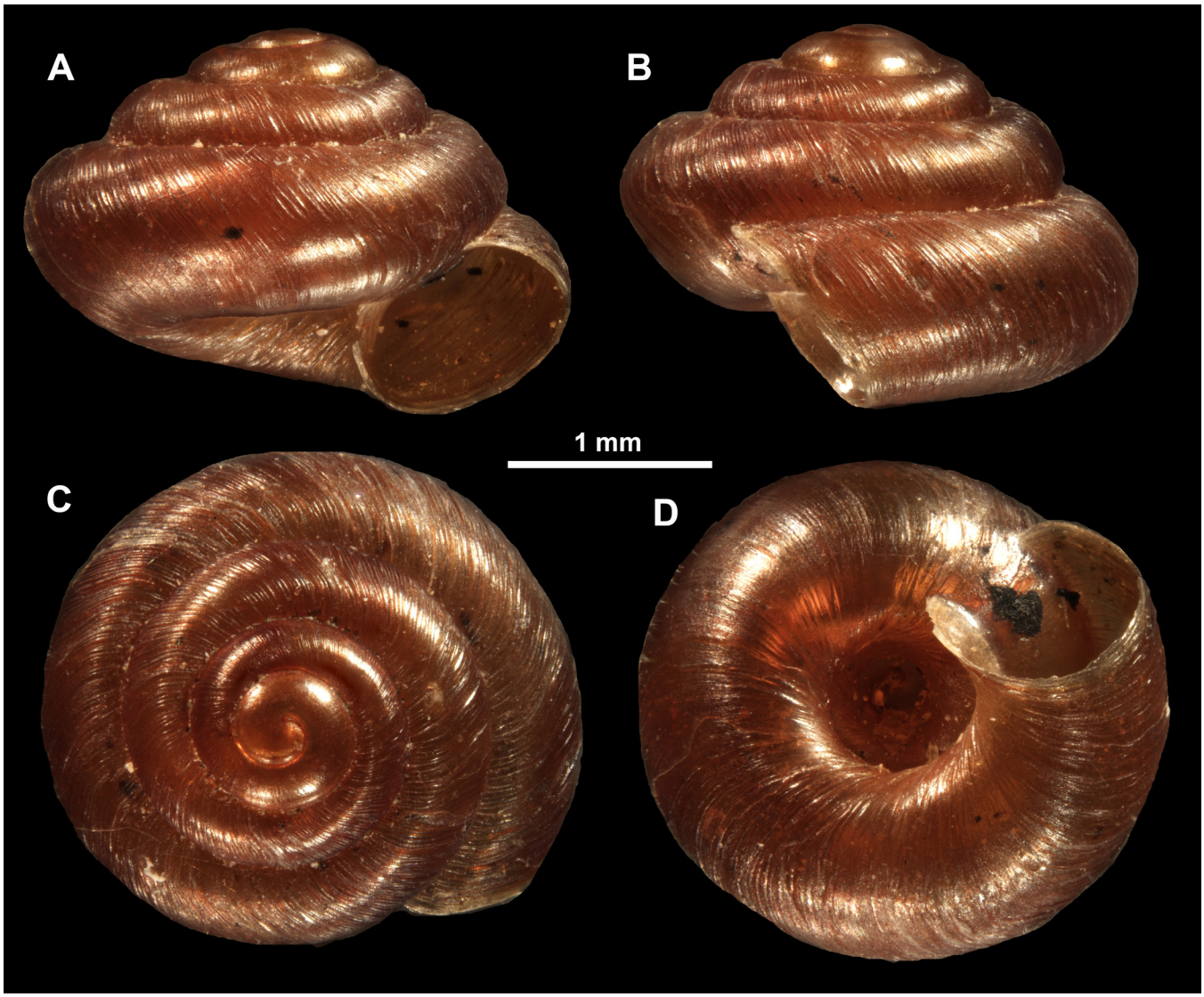

Figure 51. *Pyramidula pusilla* from the Niševac gorge.

02.33″N, 022°21′59.74″E); Mt. Jadovnik, near Katunić peak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 27 Jun. 2025, 1 specimen (43°16′01.52″N, 019°48′46.04″E); Petrlaška cave near city of Pirot, *leg.* V. Gojšina, M. Vujić, 14 Apr. 2026, 8 specimens (43°4′29″N, 022°47′46″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Avala near city of Belgrade; Mt. Belava mear city of Pirot; village of Basara near city of Pirot; Mt. Beljanica; Vratna limestone gates and river gorge; Mt. Vidlič near city of Pirot; Vujinovača near city of Valjevo; Golubac fortress near town of Golubac; Mt. Tara (canyon of river Derventa, Krstača hill); village of Donja Bela Reka near city of Bor; Jelašnica gorge near city of Niš; village of Jovanja near city of Valjevo; Mt. Kopaonik (Majića Krš, Radmanov kamen); Koprivštički Krst near city of Pirot; Jevik hill near city of Knjaževac; Mt. Kablar; village of Ljuberađa near town of Babušnica; Mt. Mučanj; Mt. Povlen, Mali Povlen; Panica near town of Ivanjica; village of Periš, Svrljiške planine Mts.; village of Rti, near town of Lučani; Ripaljka waterfall near town of Sokobanja; Rgotski kamen locality near city of Bor; Mt. Starica near town of Majdanpek; Mt. Stol near city of Bor; Monastery St. Stevan near town of Aleksinac; Svrljig gorge near village of Niševac; Svrljiške planine Mts., Milenkova Stena; Sićevo gorge near city of Niš; Sarlak (?); Taor, near city of Valjevo; Mt. Bobija near town of Ljubovija, Tornička Bobija peak; near Trgoviški Timok river. **After Maassen (1988)**: Grza near Paraćin; Pirot, surroundings of Pirot castle; Sokobanja near Aleksinac. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. This species has a more depressed shell and a wider umbilicus than *P. rupestris*. For detailed differential diagnosis, see Horsák *et al.* (2026).

Distribution and habitats in Serbia. This species occurs on karstified limestone in both eastern and western Serbia. It is usually quite abundant where present. It can frequently be found climbing rocks during the wet days, and during dry periods, it is usually found clinging to rocks, often hidden within hollows and crevices.

Remarks. More than one species may be present. We identified all populations in Serbia to *P. pusilla* due to the significant morphological resemblance and the fact that our forms agree with the descriptions of this species by Gittenberger & Bank (1996), Horsáková *et al.* (2022), and Horsák *et al.* (2026).

Family Spelaeodiscidae Steenberg, 1925

Genus *Aspasita* Westerlund, 1889

Type species. *Helix triaria* Rossmässler, 1839, by subsequent designation by Pilsbry (1926).

Aspasita triaria (Rossmässler, 1839)

Figures 52–54

Helix triaria Rossmässler 1839: 13, fig. 611.
Helicodonta triaria—Pavlović 1912: 34; Tomić 1959: 18.
Spelaeodiscus triaria—Bole 1965: 349.
Spelaeodiscus (*Aspasita*) *triaria triaria*—Gittenberger 1969: 290.
Spelaeodiscus triarius—Maassen 1988: 37.
Spelaeodiscus triaria triaria—Karaman 2007: 147.

Type material examined. Lectotype (SMF 5065).

Additional material examined. National park Kučaj-Beljanica, *leg.* V. Gojšina, M. Vujić, N. Vesović, 02 May 2023, 33 specimens (44° 04′ 43.09″N, 021° 40′ 44.68″E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Monastery Manasija near town of Despotovac; between villages of Stenjevac and Strmosten near town of Despotovac; village of Jelovac near town of Despotovac; Grza river gorge near town of Despotovac; Mt. Beljanica; Velika Tisnica river gorge (near town of Žagubica); near village of Krepoljin (Jasenovac, Gradac). **After Maassen (1988)**: Grza near Paraćin.

Differential diagnosis. This species is the most similar to *A. bulgarica* Subai & Dedov, 2008, from which it differs by the presence of a single palatal fold; there are no palatal folds in *A. bulgarica* (Subai & Dedov 2008).

Distribution and habitats in Serbia. *Aspasita triaria* is confined to karstified limestone. Occurs only in eastern Serbia with most findings around the town of Despotovac. At Kučaj-Beljanica, this species is quite abundant in the karst gorge, where it lives in limestone rock scree mixed with leaf litter and soil. The specimens were found exlusively in moist microhabitats, under rocks and in litter.

Superfamily Punctoidea E. S. Morse, 1864

Remarks. The superfamily Punctoidea *sensu* Salvador *et al.* (2020) comprises five families, two of which, Helicodiscidae and Punctidae, are distributed in Europe. These authors have also shown that the Discidae, previously considered to belong to the Punctoidea (Bouchet *et al.* 2017), should be included in a separate superfamily, Discoidea, together with the North American Oreohelicidae. Punctidae are tiny terrestrial snails that are distributed almost worldwide, apart from Central and South America (Salvador *et al.* 2020). In Serbia, the Punctidae are represented by the widespread *Punctum pygmaeum* (Draparnaud, 1801), but also by the allochthonous species *Paralaoma servilis* (Shuttleworth, 1852), which is reported herein for the first time from Serbia. The family Helicodiscidae, with a single species, *Lucilla singleyana* (Pilsbry, 1889), is also reported for the first time from Serbia.

Family Punctidae E.S. Morse, 1864

Subfamily Punctinae E.S. Morse, 1864

Genus *Punctum* E.S. Morse, 1864

Type species. *Helix minutissima* I. Lea, 1841, by monotypy.

Punctum pygmaeum (Draparnaud, 1801)

Figures 55, 58

Helix pygmaeum Draparnaud 1801: 93.
Punctum pygmaeum—Pavlović 1912: 29–30; Hesse 1929: 236; Tomić 1959: 14–15; Jovanović 1985: 42; Maassen 1988: 37; Jovanović 1997b: 232; Sólymos *et al.* 2004: 152.; Karaman 2007: 146.
Punctum (*Punctum*) *pygmaeum*—Karaman 2012: 27.

Material examined. Town of Kovin, Kovinski Dunavac locality, *leg.* V. Gojšina, 04 Oct. 2020, 10 specimens (44° 43′ 37.42″N, 020° 58′ 40.94″E); village of Deliblato, Kraljevac lake, *leg.* V. Gojšina, 30 Jan. 2021, 3 specimens (44° 50′ 31.32″N, 021° 01′ 50.49″E); village of Babe near village of Ralja on Mt. Kosmaj, *leg.* V. Gojšina, M. Vujić, N. Vesović, 16 Apr. 2022, 1 specimen (44° 32′ 16.37″N, 020° 30′ 53.13″E); Mt. Kosmaj, village of Guberevac, near forest, *leg.* V. Gojšina, M. Vujić, N. Vesović, 16 Apr. 2022, 2 specimens (44° 32′ 40.04″N, 020° 29′ 27.40″E); Jelašnica Gorge near city of Niš, *leg.* V. Gojšina, 28 May 2022, 9 specimens (43° 6′ 45.82″N, 022° 03′ 49.59″ E); village of Šljivovik, towards Šljivovički Vis locality, *leg.* V. Gojšina, 29 May

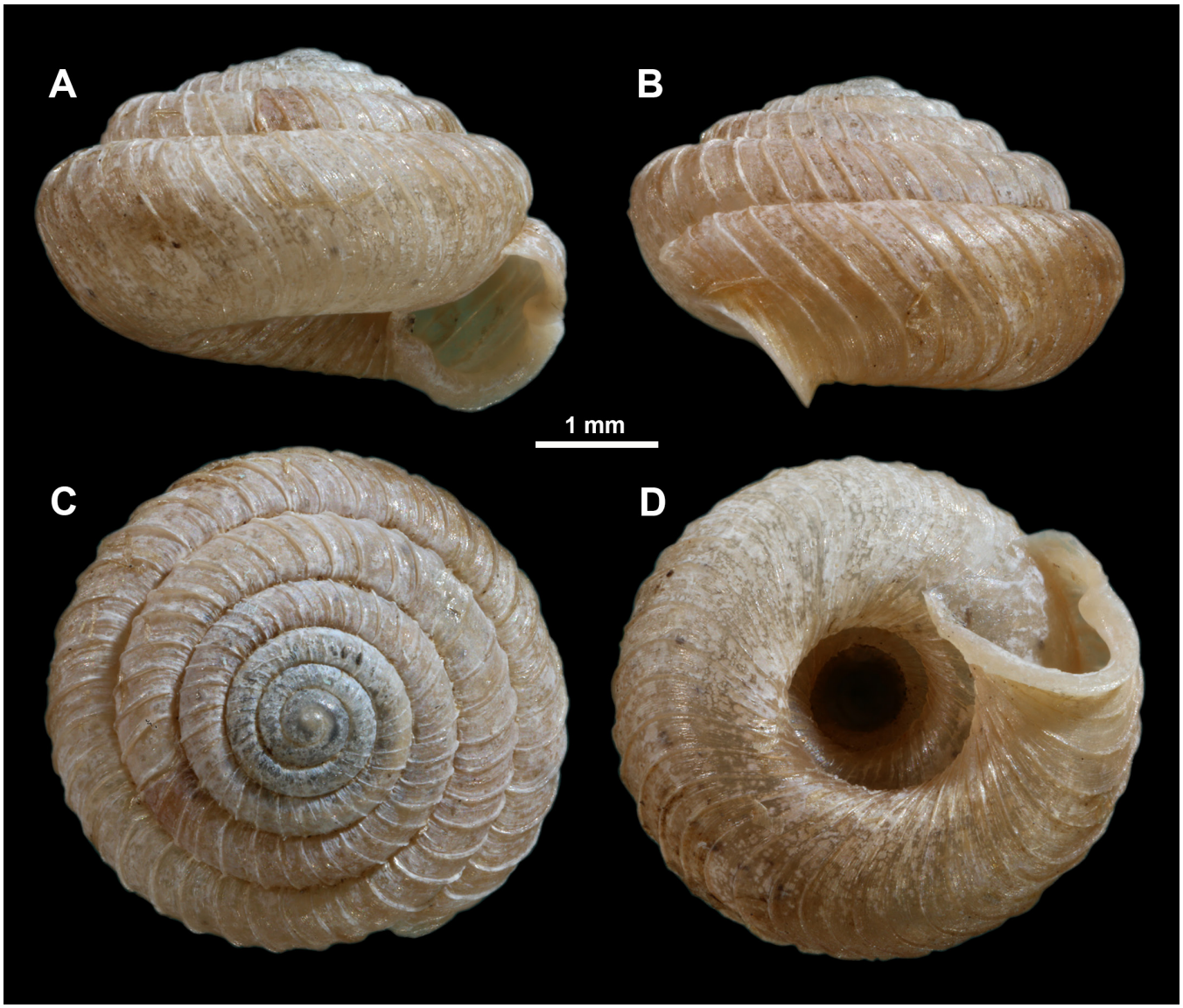

Figure 52. Lectotype of *Aspasita triaria* (SMF 5065).

2022, 5 specimens (43° 08′ 32.47″N, 022° 21′ 21.01″E); Dobri Do village near Pirot town, Popoviči Vir, *leg.* V. Gojšina, M. Vujić, N. Vesović, 29 Apr. 2023, 25 specimens (43° 12′ 33.41″N, 022° 38′ 14.60″E); city of Pirot, hill above Kitka rock quarry, *leg.* V. Gojšina, M. Vujić, N. Vesović, 28 Apr 2023, 4 specimens (43° 11′ 19.65″N, 022° 38′ 47.14″ E); Landscape of Outstanding Features "Dolina Pčinje", village of Donja Trnica, Vražji Kamen, *leg.* V. Gojšina, M. Vujić, N. Vesović, 17 May 2023, 1 specimen (42° 22′ 59.25″N, 022° 03′ 05.57″E); Mt. Kozjak above Prohor Pčinjski monastery, *leg.* V. Gojšina, M. Vujić, N. Vesović, 18 May 2023, 2 specimens (42° 19′ 28.95″N, 021° 54′ 45.30″E); village of Resnik near town of Sokobanja, next to a spring, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 4 specimens (43° 37′ 57.69″N, 021° 48′ 55.78″E); canyon of river Ibar, *leg.* V. Gojšina, M. Vujić, 18 Jul. 2023, 1 specimen (42° 56′ 03.06″N, 020° 24′ 02.95″E); Mt. Kopaonik, Jankove bare peat bog, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 3 specimens (43° 19′ 15.67″N, 020° 46′ 23.88″E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 45 specimens (43° 28′ 20.53″N, 022° 05′ 46.77″E); town of Preševo, Ilinska cave, *leg.* V. Gojšina, M. Vujić, 09 Oct. 2024, 7 specimens (42° 20′ 51.44″N, 021° 35′ 55.62″E); Uvac region, below Monastery of Sv. Joakim and Ana, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 27 May 2025, 1 specimen (43° 33′ 47.2″N, 019° 42′ 19.3″E).

Sites in Serbia from the literature. After Pavlović (1912)

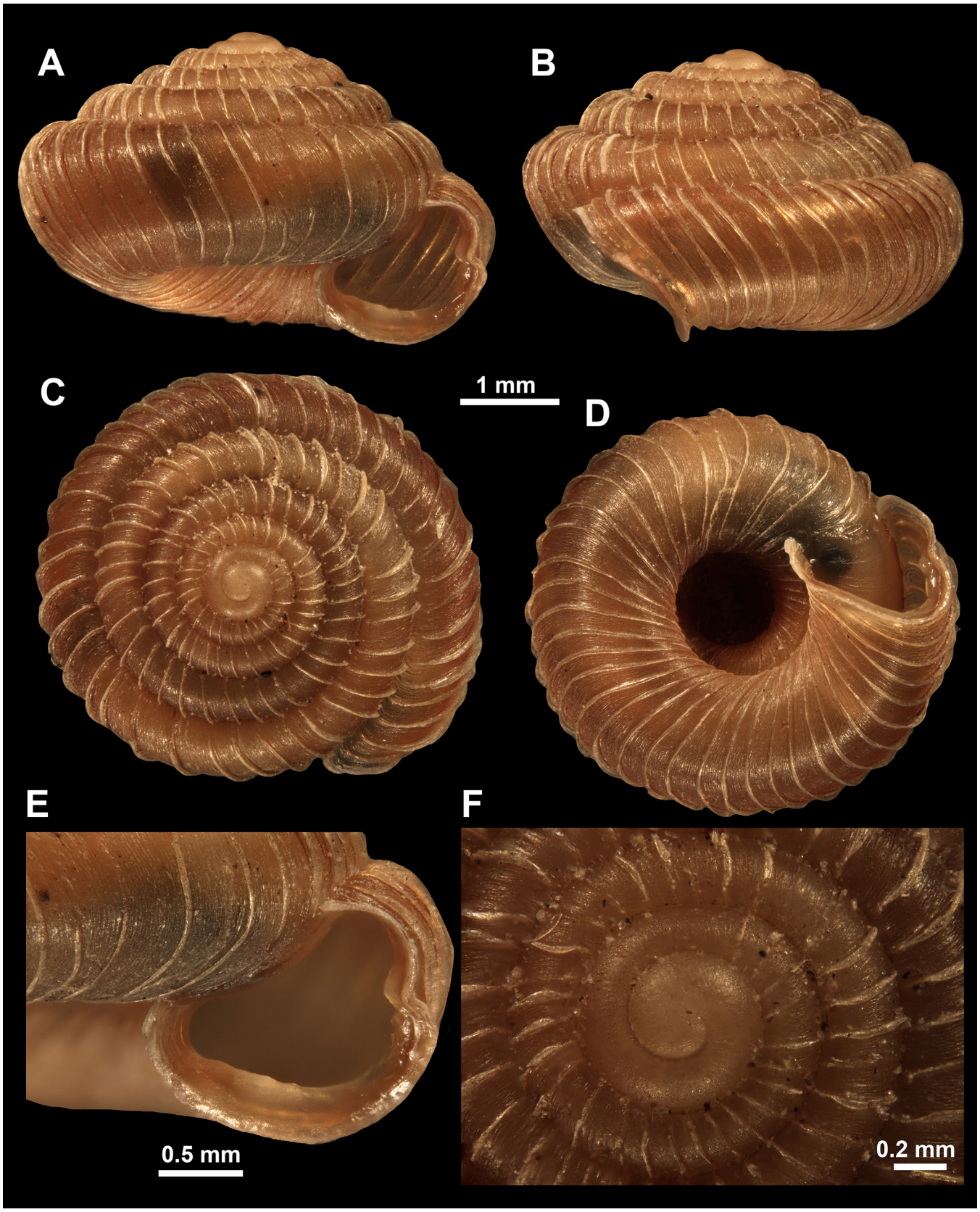

Figure 53. *Aspasita triaria* from the National Park "Kučaj-Beljanica". **A**–**D**, shell. **E**, enlarged view of aperture. **F**, enlarged view of protoconch.

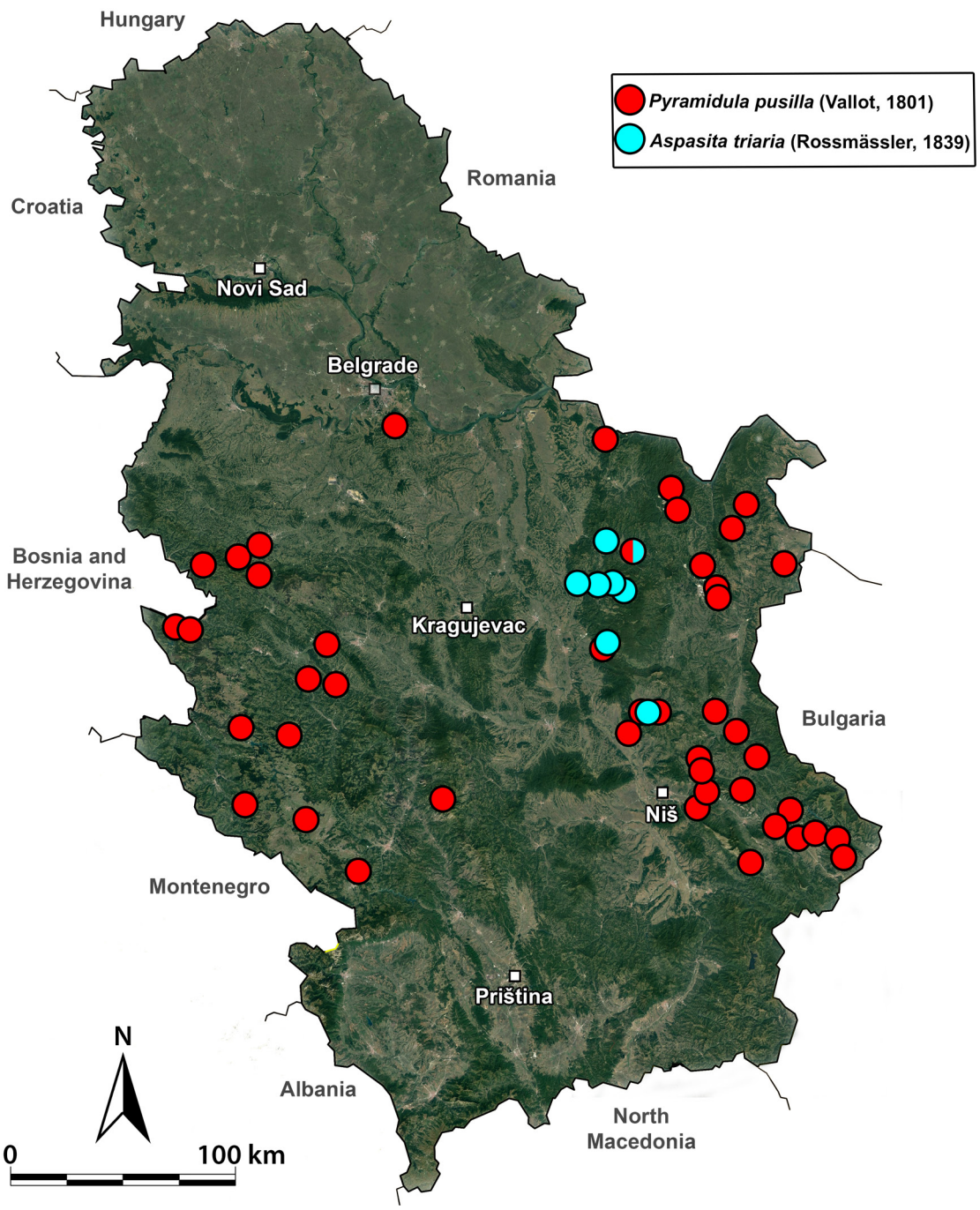

Figure 54. Distribution map of *Pyramidula* and *Aspasita* in Serbia.

and Tomić (1959): Mt. Avala near city of Belgrade; village of Bučje near city of Knjaževac; Mt. Beljanica; Mt. Belava; Gradac near city of Valjevo; Vujinovača near city of Valjevo; Velika Tisnica river gorge (near town of Žagubica); Mt. Golija; village of Gornje Košlje; Grza river gorge; Mt. Tara (Drundebo, canyon of river Derventa, Krstača hill, village of Perućac); next to Dubočica river, near town of Raška; town of Žagubica; Žlijebac (?); Zečki Vrh peak, Mt. Čemernica; city of Ivanjica; Mt. Javor; Mt. Kosmaj, Tresija; town of Krupanj, Marića stena; Mt. Kablar; Kadijina Stena, near Mt. Javor; Mt. Kopaonik (Srebrnac, Metođe, Majića Krš); Koprivštički Krst near city of Pirot; Jevik near city of Knjaževac; Pogana Peć near village of Krepoljin; village of Lepena, near town of Knjaževac; village of Lunjevica near

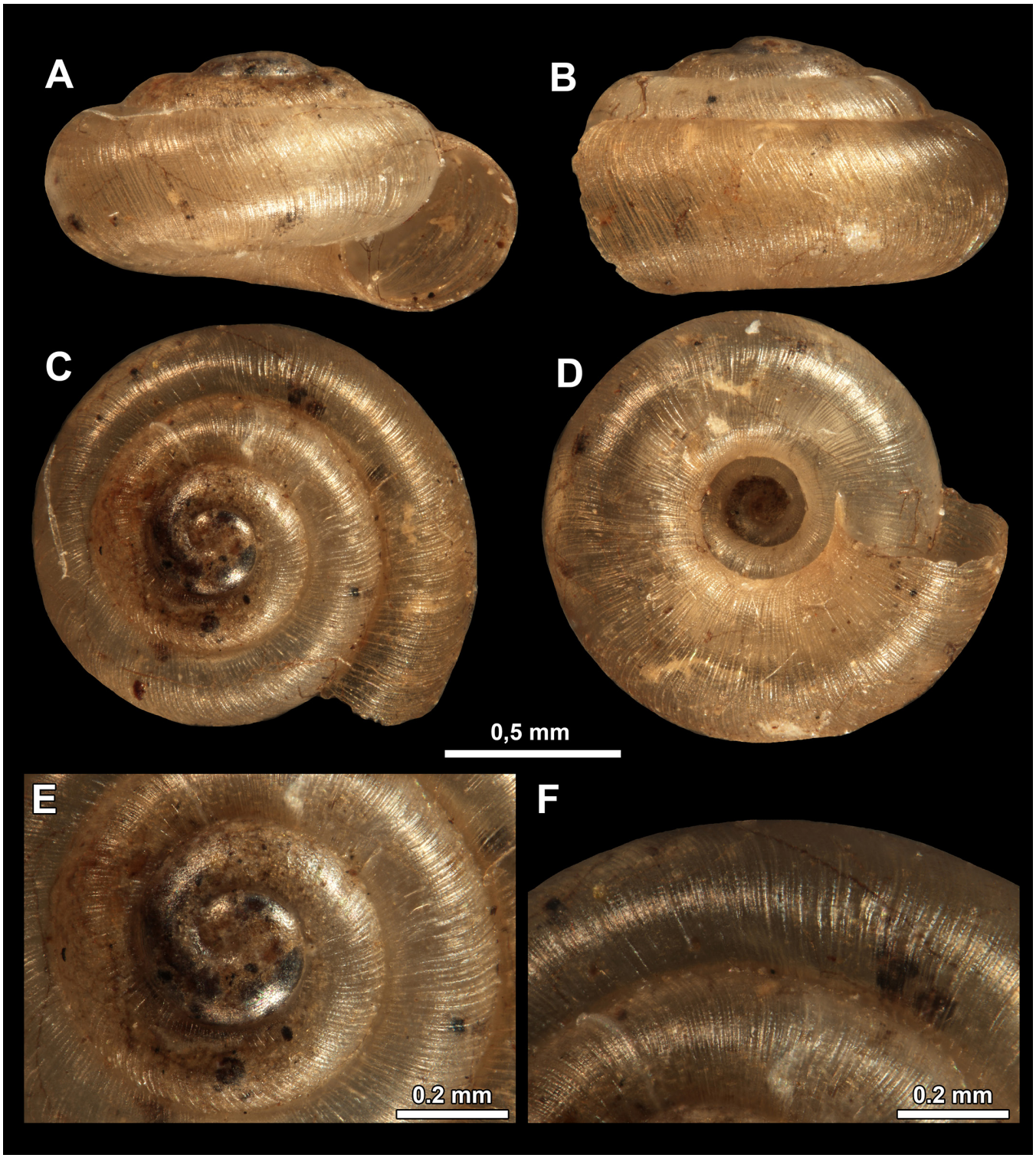

Figure 55. *Punctum pygmaeum* from the Jelašnica gorge. **A**–**D**, shell. **E**, enlarged view of protoconch. **F**, enlarged view of last whorl.

town of Gornji Milanovac; Mt. Miroč, Mali Štrbac; Mt. Mučanj; Monastery Manasija near town of Despotovac; Mt. Medvednik, Malo Platno; Murtenica mountain massif, Mt. Zlatibor; village of Negbina near town of Kokin Brod; Mt. Ovčar; village of Prekonoga near town of Svrljig; village of Periš, Svrljiške planine Mts.; Mt. Povlen; village of Poćuta near city of Valjevo; Petnička cave near city of Valjevo; Monastery Ravanica near town of Ćuprija; village of Rti, near

town of Lučani; Mt. Rtanj; Monastery Suvodol near village of Minićevo; Sićevo gorge near city of Niš; Svrljiške planine Mts., Ulanac; Svrljiške planine Mts., Pleš; Stara planina Mts., Široke Luke; Mt. Suva planina; Monastery Studenica; Sv. Ilija (?); Mt. Tumba near town of Svrljig; Mt. Tupižnica, Glogovački vrh peak; Monastery Tumane (St. Azosim) near town of Golubac; Mt. Bobija near town of Ljubovija, Tornička Bobija peak; Treska (?); Taor near city of Valjevo; Crnica river gorge near city of Paraćin; Crni Vrh, Jošanička reka river; Crni Vrh near city of Užice; city of Užice. **After Hesse (1929)**: river Danube, near city of Smederevo. **After Jovanović (1985)**: Mt. Avala near city of Belgrade. **After Maassen (1988)**: Grza near Paraćin; Sokobanja near Aleksinac. **After Jovanović (1997b)**: Mt. Tara. **After Sólymos *et al.* (2004) and Karaman (2012)**: Mt. Fruška Gora, Dobri stream; Crveni Čot peak.

Differential diagnosis. The shell of *G. sororcula* is larger than *P. pygmaeum* and is a more globular, with a less expanded umbilicus, and with strong but widely spaced radial ribs. See also *P. servilis*.

Distribution and habitats in Serbia. This species is found in leaf litter in deciduous forests throughout Serbia. It is not restricted to limestone.

Subfamily Laominae Suter, 1913

Genus *Paralaoma* Iredale, 1913

Type species. *Paralaoma raoulensis* Iredale, 1913, by subsequent designation (Zilch 1959).

Paralaoma servilis (Shuttleworth, 1852)

Figures 56, 58

Helix servilis Shuttleworth 1852: 140.

Material examined. City of Belgrade, settlement of Vrčin, house yard, *leg.* M. Vujić, 06 Avg. 2023, 19 specimens (44° 40′ 35.81″ N, 020° 36′ 29.10″ E) and 28 Oct. 2024, 5 specimens (44° 40′ 37.54″ N, 020° 36′ 26.72″ E).

Previous records from Serbia. This species has not been previously recorded from Serbia.

Differential diagnosis. Among Serbian land snails, *P. servilis* can be only confused with *Punctum pygmaeum*. However, *P. servilis* clearly differs from *P. pygmaeum* by its larger shell with more prominent surface sculpture of coarse radial riblets crossed by much finer, denser spiral striae. *Gittenbergia sororcula* is more globular and larger, with less pronounced spiral sculpture but stronger, more elevated radial ribs.

Distribution and habitats in Serbia. *Paralaoma servilis* has been found only in a single house yard in the city of Belgrade, but it was very abundant. During dry periods is found in soil crevices, leaf litter, and moss, while in wet periods, it usually climbs low-growing plants and concrete curbs heavily overgrown by algae, lichens, and lithophytic mosses.

Remarks. This is an allochthonous species in Serbia, clearly imported by soil brought with plants.

Family Helicodiscidae Pilsbry, 1927

Genus *Lucilla* R. T. Lowe, 1852

Type species. *Helix scintilla* R. T. Lowe, 1852, by monotypy.

Lucilla singleyana (Pilsbry, 1889)

Figures 57, 58

Zonites singleyanus Pilsbry 1889: 84.

Material examined. Village of Deliblato, Obzovik locality, *leg.* V. Gojšina, 09 May 2020, 1 specimen (44° 51′ 06.69″ N, 021° 00′ 36.16″ E); town of Bela Crkva, near river Nera, *leg.* V. Gojšina, 28 Jan 2021, 1 specimen (44° 52′ 22.74″ N, 021° 25′ 33.44″ E); town of Mionica, village of Paštrić, deciduous forest, Hajdučka Česma well, *leg.* V. Gojšina, M. Vujić, D. Stojanović, M. Šević, 20 Jul. 2023, 1 specimen (approximate coordinates 44° 12′ 14.89″ N, 020° 05′ 37.95″ E); town of Sokobanja, Lepterija, *leg.* V. Gojšina, M. Vujić, 07 Nov. 2023, 1 specimen (43° 38′ 08.33″ N, 021° 53′ 18.25″ E); village of Niševac near city of Niš, Niševac gorge, *leg.* V. Gojšina, M. Vujić, 06 Aug. 2024, 11 specimens (43° 28′ 20.53″ N, 022° 05′ 46.77″ E); city of Belgrade, settlement of Vrčin, Grocka municipality, house yard, *leg.* M. Vujić, 12 Oct. 2025, 1 specimen (44° 40′ 37.55″ N, 020° 36′ 27.19″ E).

Previous records from Serbia. This species has not been previously recorded from Serbia.

Differential diagnosis. Horsák *et al.* (2009) mentioned several important and reliable differences between *L. scintilla*, which is still not known from Serbia, and *L. singleyana.* These are colour of the periostracum (yellowish in *L. scintilla* but colourless in *L. singleyana*), shell shape (much flatter in *L. singleyana*), size (*L. singleyana* is larger and can grow up to 3 mm in diameter, while *L. scintilla* barely exceedes 2 mm), and appearance of the umbilicus (wider and shallower in *L. singleyana*).

Distribution and habitats in Serbia. Records of *Lucilla singleyana* are patchy, scattered across Serbia. This species obviously lives in deep soil. Many specimens were obtained from alluvium deposits of the Svrljiški Timok in the Niševac gorge, and at Vrčin, the single shell was washed from crevices of retaining wall in a private yard.

Remarks. This is an allochthonous species in Serbia.

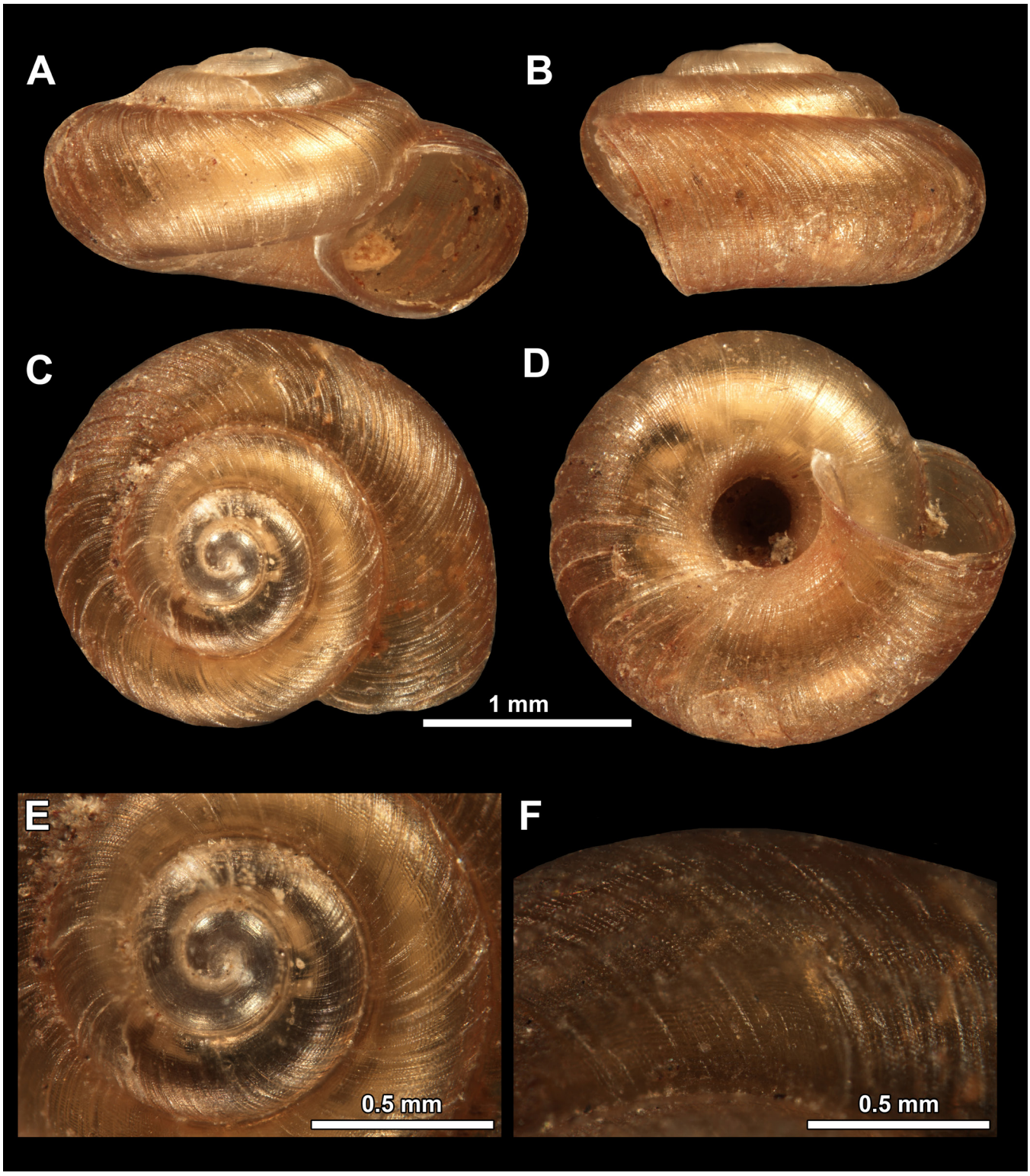

Figure 56. *Paralaoma servilis* from the settlement of Vrčin. **A**–**D**, shell. **E**, enlarged view of protoconch. **F**, enlarged view of last whorl.

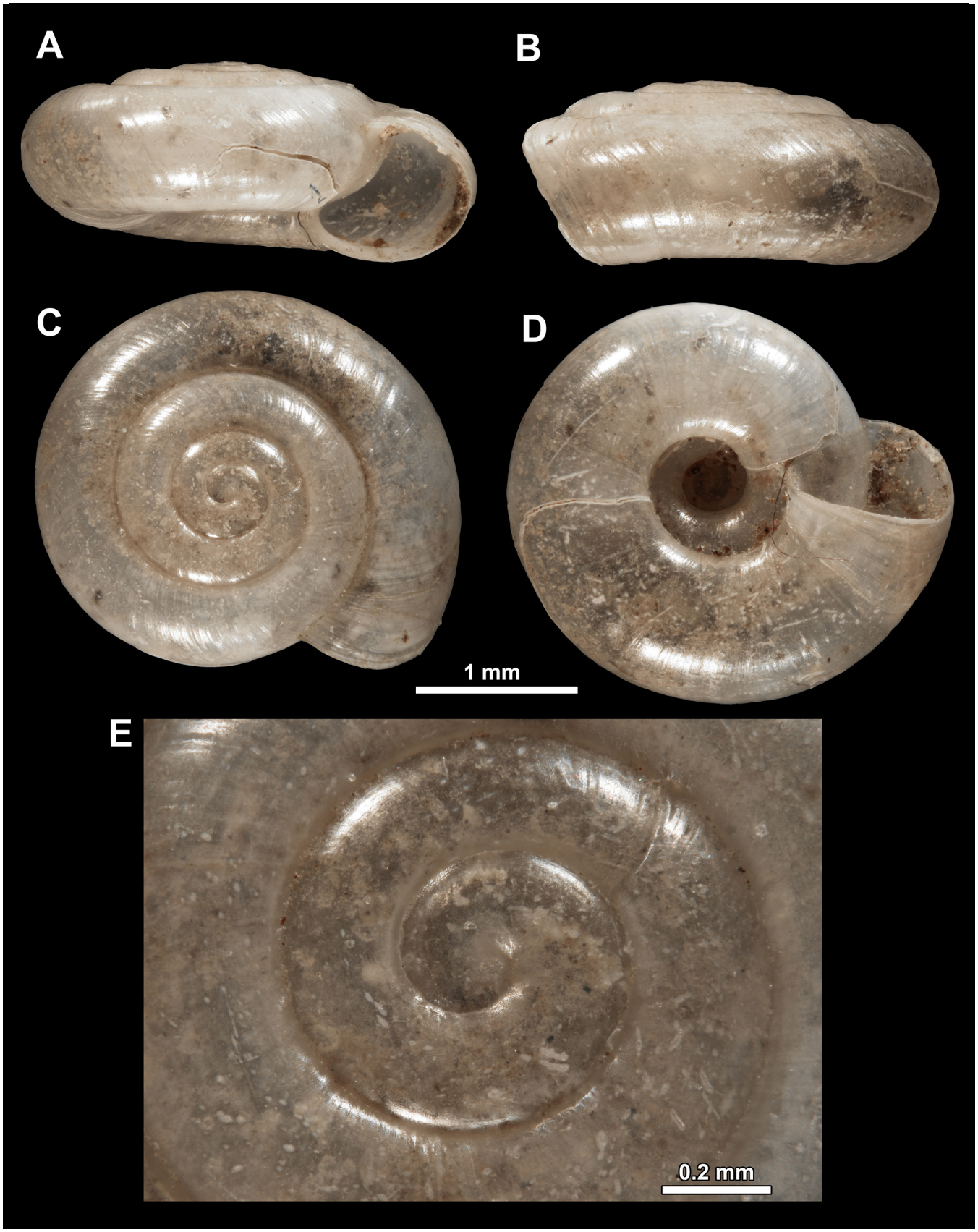

Figure 57. *Lucilla singleyana* from the Niševac gorge. **A**–**D**, shell. **E**, enlarged view of protoconch.

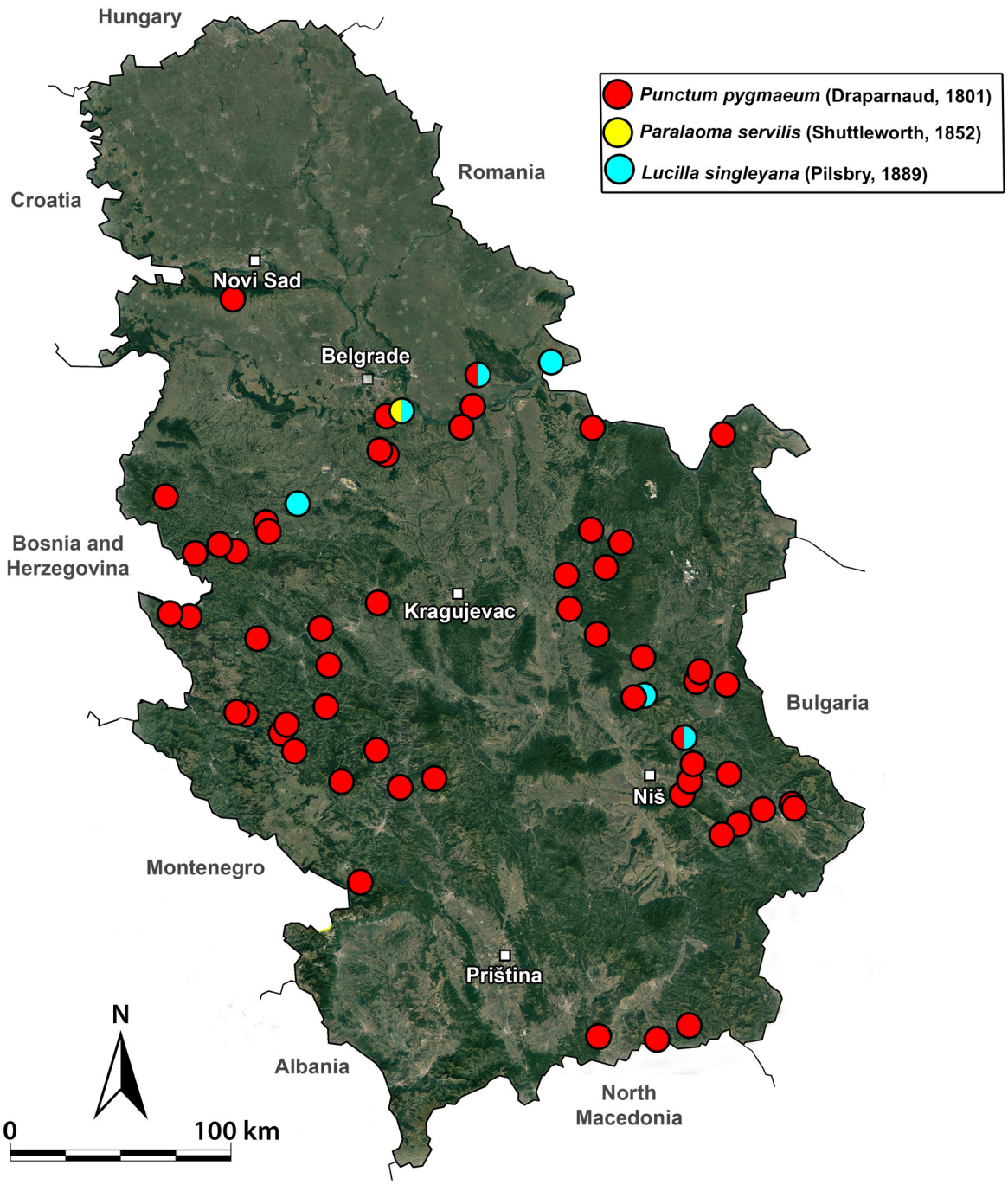

Figure 58. Distribution map of *Punctum*, *Paralaoma*, and *Lucilla* in Serbia.

Superfamily Discoidea Thiele, 1931 (1866)

Family Discidae Thiele, 1931 (1866)

Genus *Gonyodiscus* Fitzinger, 1833

Type species. *Helix perspectiva* Megerle von Mühlfeld, 1816, by monotypy.

***Gonyodiscus perspectivus* (Megerle von Mühlfeld, 1816)**

Figures 59, 61

Helix perspectiva Megerle von Mühlfeld 1816 : 11.
Helix solaria—Möllendorff 1873: 131.
Patula solaria—Pavlović 1912: 30–31.
Goniodiscus perspectivus—Hesse 1929: 236.
Patula solaria—Tomić 1959: 15–16.

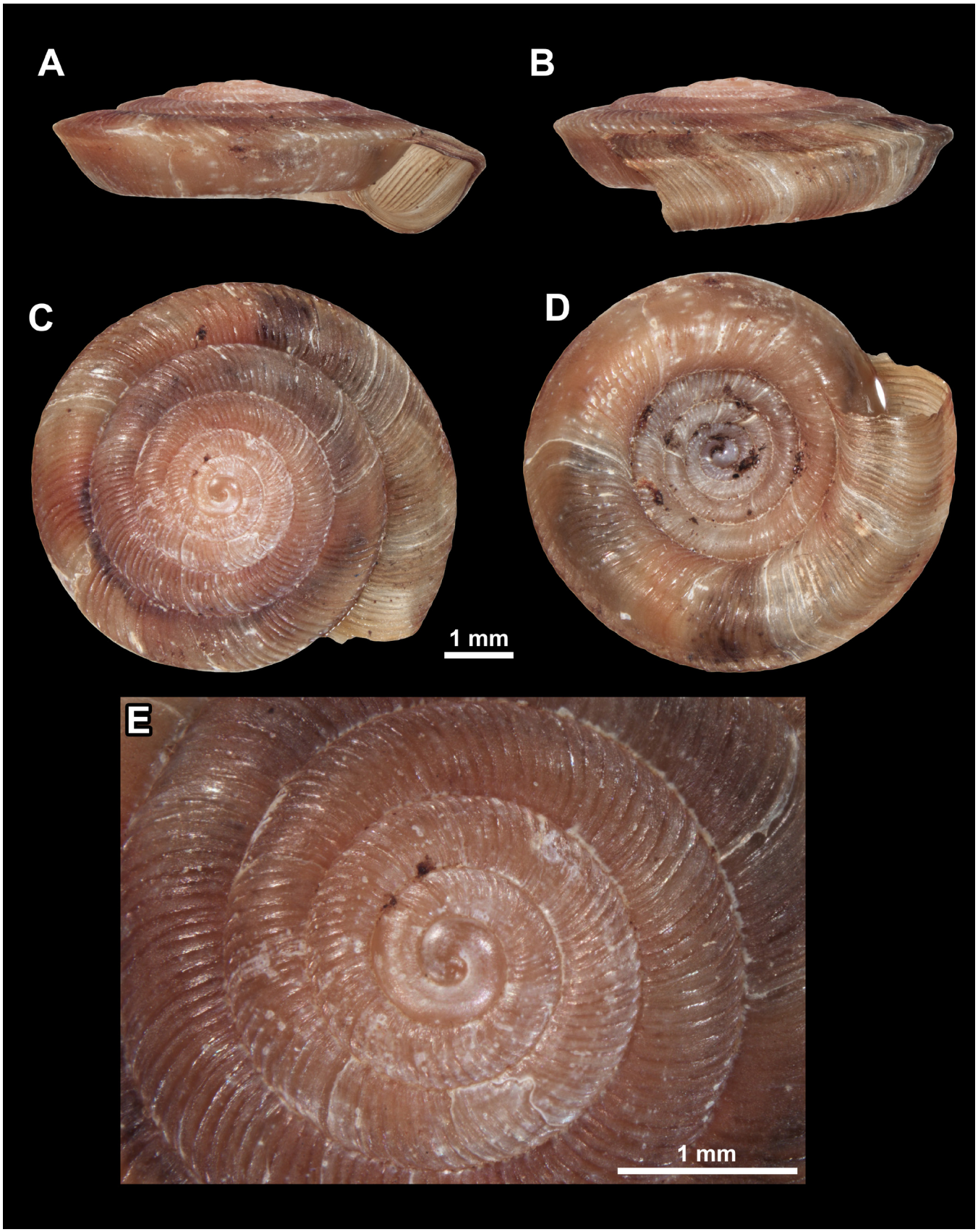

Figure 59. *Gonyodiscus perspectivus* from Mt. Tara, Lukino selo. **A**–**D**, shell. **E**, enlarged view of protoconch.

Discus perspectivus—Jovanović 1997b: 232; Karaman 2007: 145.

Material examined. Mt. Zlatibor, town of Čajetina, village of Gostilje, Gostilje waterfalls, *leg.* V. Gojšina, 07 Aug. 2020, 5 specimens (approx. 43° 39′ 24.83″ N, 019° 50′ 18.54″ E); Mt. Jadovnik, stream near mountain lodge, *leg.* M. Vujić, 17 Jul. 2021, 1 specimen; Mt. Tara, village of Perućac, near spring of river Vrelo, *leg.* V. Gojšina, 26 Oct. 2022, 3 specimens (43° 57′ 16″ N, 019° 25′ 33″ E); Mt. Suva Planina, village of Gornja Studena, Bojanine vode locality, *leg.* V. Gojšina, 31 May 2022, 2 specimens (43° 13′ 13.06″ N, 022° 06′ 52.36″ E); town of Masurica, Masurička reka river, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Jun. 2022, 2 specimens (42° 39′ 39.10″ N, 022° 10′ 03.60″ E); Mt. Tara, *leg.* M. Vujić, 02 Jun. 2023, 3 specimens (43° 55′ 05.87″ N, 019° 25′ 19.76″ E); town of Mionica, village of Paštrić, deciduous forest, Hajdučka Česma well, *leg.* V. Gojšina, M. Vujić, D. Stojanović, M. Šević, 20 Jul. 2023, 19 specimens (approximate coordinates 44° 12′ 14.89″ N, 020° 05′ 37.95″ E); Mt. Tara, village of Lukino selo, *leg.* D. Antić, M. Šević, D. Pavićević, I. Karaman, 06 Oct. 2023, 3 specimens (43° 50′ 51.44″ N, 019° 23′ 48.62″ E); village of Ušće, Monastery Studenica, *leg.* V. Gojšina, M. Vujić, 17 Jul. 2023, 17 specimens (43° 29′ 16.33″ N, 020° 31′ 47.81″ E); village of Seništa near town of Nova Varoš, Seništa klak, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 25 Apr. 2024, 6 specimens (43° 33′ 04.01″ N, 019° 42′ 09.82″ E); below Monastery of St. Joakim and Ana, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 02 Jun. 2024, 8 specimens (43° 32′ 38.33″ N, 019° 43′ 11.64″ E); same locality data as previous, *leg.* K. Stojanović, D. Stojanović, M. Božanić, 11 May 2024, 3 specimens; limestone cliff next to Kosaćanka river close to Monastery Mileševa, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 8 specimens (43° 22′ 23.39″ N, 019° 42′ 36.80″ E); Rutoška riverbank, between villages of Kratovo and Rutoši, near town of Nova Varoš, *leg.* V. Gojšina, D. Stojanović, M. Vujić, 26 Apr. 2024, 4 specimens (43° 31′ 25.25″ N, 019° 39′ 39.60″ E); village of Rutoši near tow of Nova Varoš, black alder forest, *leg.* V. Gojšina, D. Stojanović, M. Šćiban, 03 Jun. 2024, 1 specimen (43° 30′ 57.42″ N, 019° 42′ 27.74″ E); next to river Uvac, Grad hill, *leg.* D. Stojanović, D. Antić, M. Šević, 23 May 2024, 10 specimens (43° 32′ 37.97″ N, 019° 43′ 13.43″ E); Mt. Kopaonik, Jelak, *leg.* V. Gojšina, M. Vujić, N. Vesović, 01 Aug. 2024, 8 specimens (43° 18′ 17″ N, 020° 51′ 36″ E); Mt. Kopaonik, Metođe, limestone rocks next to St. Metodije Olimpski church, *leg.* V. Gojšina, M. Vujić, 31 Jul. 2024, 12 specimens (43° 18′ 02.81″ N, 020° 51′ 05.34″ E); Uvac region, below Monastery of Sv. Joakim and Ana, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 27 May 2025, 1 specimen (43° 33′ 47.2″ N, 019° 42′ 19.3″ E); Uvac region, near Potpećko lake, *leg.* V. Gojšina, M. Vujić, K. Stojanović, D. Stojanović, 28 May 2025, 11 specimens (43° 29′ 22.92″ N, 019° 36′ 40.35″ E); Pešter plateau, village of Ugao, SNR Gutavica, coniferous forest, *leg.* V. Gojšina, M. Vujić, N. Vesović, 30 Jun. 2025, 2 specimens (43° 02′ 38.7″ N, 020° 03′ 58.0″ E); Mt. Fruška Gora, near Monastery Rakovac, *leg.* V. Gojšina, M. Vujić, 06 Jan. 2025, 3 specimens (45° 10′ 57″ N, 019° 46′ 58″ E).

Sites in Serbia from the literature. After Pavlović (1912) and Tomić (1959): Mt. Boranja near town of Krupanj; Mt. Tara (Vrujce, canyon of river Derventa, Kamenova Kosa); village of Gornje Košlje; Mt. Golija; rive Dubočica near town of Raška; Mt. Čemernica, Zečki Vrh peak; Mt. Javor; Mt. Kablar; Mt. Kopaonik (Metođe, Majića Krš); Mt. Medvednik, Malo Platno; Murtenica mountain massif, Mt. Zlatibor; Mt. Ovčar; Rogot near town of Batočina; Mt. Suva planina; Crni Vrh near city of Užice. **After Hesse (1929)**: Velika Morava river, near town of Ćuprija. **After Jovanović (1997b)**: Mt. Tara.

Differential diagnosis. See *G. rotundatus*.

Distribution and habitats in Serbia. *Gonyodiscus perspectivus* is a calciphile but not strictly bound to limestone areas. This species clearly prefers damp habitats, and is usually found in forest litter, among rocks in rock crevices covered with soil and debris, even present in swampy areas in alder/beach forests. It occurs in both western and eastern part of Serbia but is clearly more frequent and abundant in the west. The northernmost known Serbian locality is on Mt. Fruška Gora.

Gonyodiscus rotundatus (O.F. Müller, 1774)

Figures 60, 61

Helix rotundata O.F. Müller 1774: 29.

Material examined. City of Belgrade, near Omladinski stadion, next to a tennis court, *leg.* V. Gojšina, M. Vujić, 04 Apr. 2025, 44 specimens (44° 48′ 52.78″ N, 020° 29′ 42.81″ E).

Previous records from Serbia. This species has not been previously recorded from Serbia.

Differential diagnosis. In contrast to *G. perspectivus*, this species has less flat shell, narrower umbilicus and it lacks the sharp keel on the last whorl.

Distribution and habitats in Serbia. *Gonyodiscus rotundatus* is only known from a single locality in the city of Belgrade where it lives among wood and rock rubble.

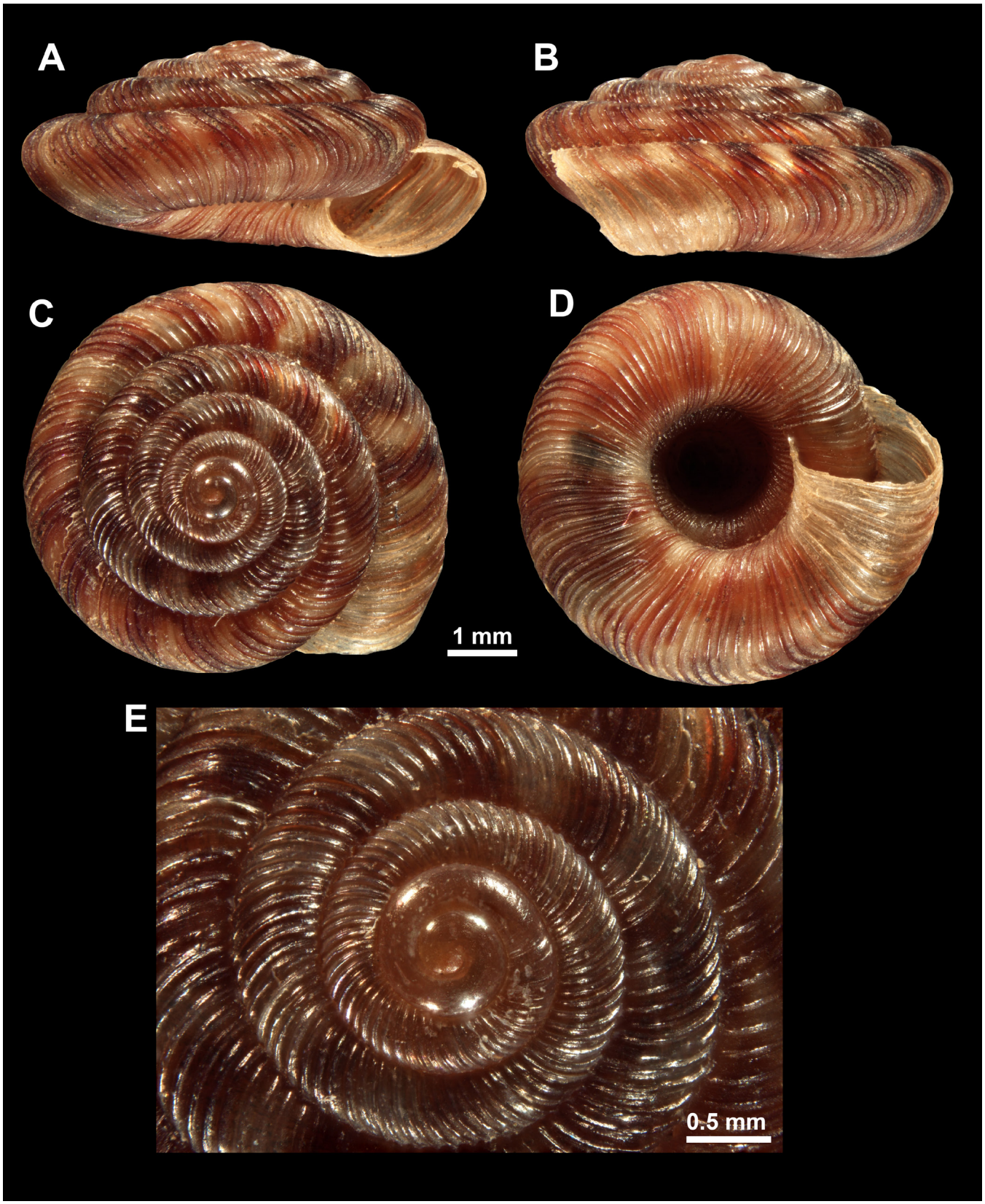

Figure 60. *Gonyodiscus rotundatus* from the city of Belgrade. **A**–**D**, shell. **E**, enlarged view of protoconch.

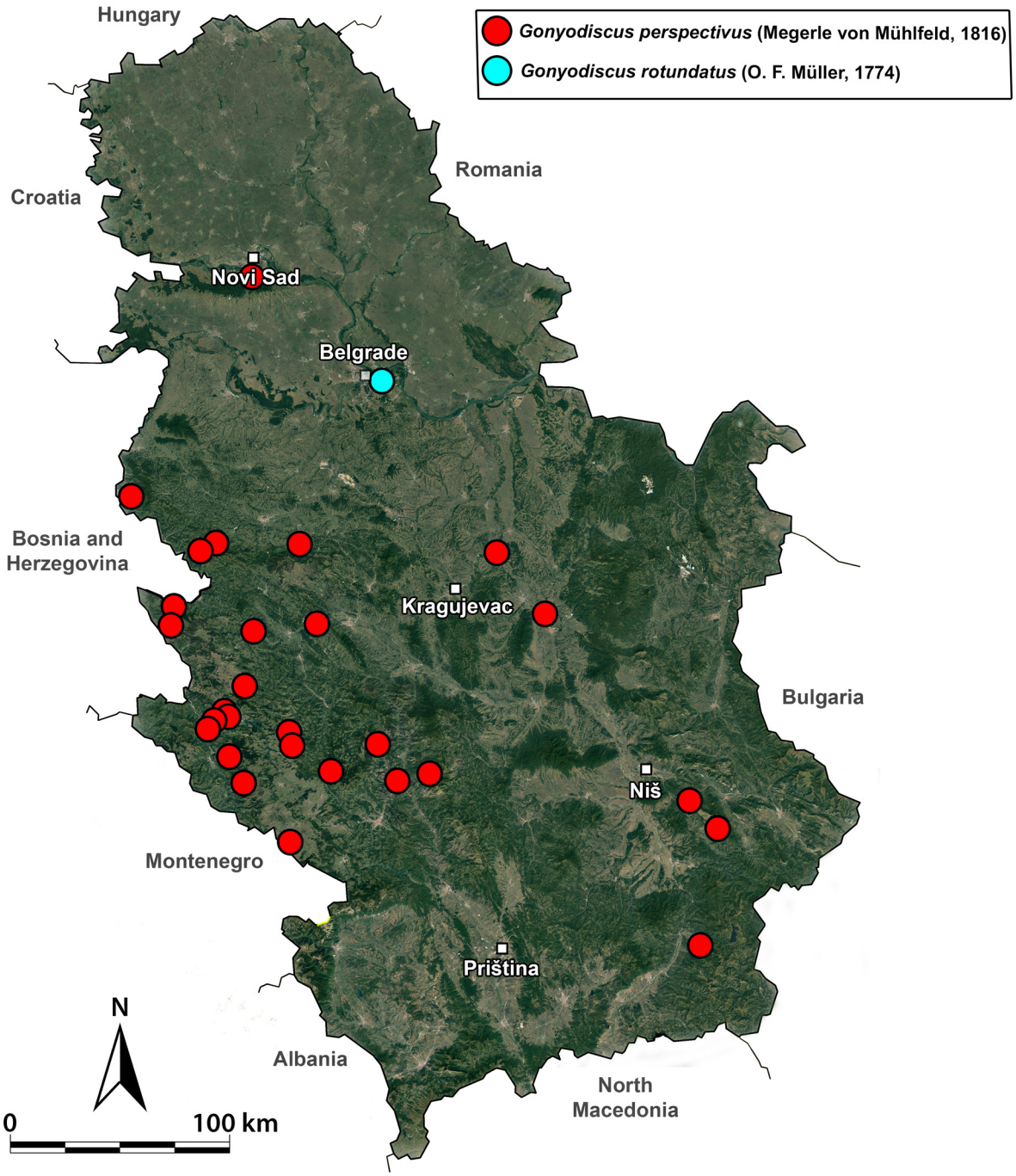

Figure 61. Distribution map of *Gonyodiscus* in Serbia.

Remarks. This is an allochthonous species in Serbia, native to Western Europe, Italy, and Scandinavia (Welter-Schultes 2012). *Gonyodiscus rotundatus* has probably introduced to Serbia with ornamental plants, soil, or even tennis court clay, giving into account that specimens were recorded near a sports centre and tennis courts.

Discussion

This study includes eight land-snail superfamilies in Serbia: Ellobioidea, Achatinoidea, Oleacinoidea, Succineoidea, Chondrinoidea, Pupilloidea, Punctoidea, and Discoidea. Of these superfamilies, Pupilloidea with 33 species is the most species-rich, followed by Chondrinoidea (6 species),

Table 2. List of species mentioned in two previous checklists (Pavlović 1912; Karaman 2007) and list of species reported in this study. Species are sorted alphabetically.

Species	Pavlović 1912	Karaman 2007	This study
Abida secale (Draparnaud, 1801)	–	+	–
Acanthinula aculeata (O.F. Müller, 1774)	+	+	+
Agardhiella armata (Clessin, 1887)	–	–	+
Agardhiella incerta Grossu, 1986	–	–	+
Agardhiella lamellata (Clessin, 1887)	–	+	–
Agardhiella macrodonta (P. Hesse, 1916)	–	+	+
Agardhiella parreyssii (L. Pfeiffer, 1848)	+	+	–
Agardhiella pirotana Subai, 2011	–	–	+
Agardhiella serbica Subai, 2011	–	–	+
Agardhiella truncatella (L. Pfeiffer, 1841)	+	+	+
Aspasita triaria (Rossmässler, 1839)	+	+	+
Carychium minimum O.F. Müller, 1774	+	+	+
Carychium tridentatum (Risso, 1826)	–	–	+
Cecilioides acicula (O.F. Müller, 1774	+	+	+
Chondrina arcadica (Reinhardt, 1881)	+	+	+
Chondrina avenacea (Bruguière, 1792)	+	+	–
Chondrina spelta (H. Beck, 1837)	–	+	+
Chondrula microtragus (Rossmässler, 1839)	–	–	+
Chondrula tridens (O.F. Müller, 1774	+	+	+
Cochlicopa lubrica (O.F. Müller, 1774	+	+	+
Cochlicopa lubricella (Porro, 1838)	+	–	+
Columella edentula (Draparnaud, 1805)	+	+	+
Discus ruderatus (W. Hartmann, 1821)	–	+	–
Ena concolor (Westerlund, 1887)	–	+	–
Ena montana (Draparnaud, 1801)	+	+	+
Ena subtilis (Rossmässler, 1837)	–	–	+
Gittenbergia sororcula (Benoit, 1859)	–	+	+
Gonyodiscus perspectivus (Megerle von Mühlfeld, 1816)	+	+	+
Gonyodiscus rotundatus (O.F. Müller, 1774)	–	–	+
Granaria frumentum (Draparnaud, 1801)	+	+	+
Lucilla singleyana (Pilsbry, 1889)	–	–	+
Mastus venerabilis (L. Pfeiffer, 1853)	+	+	+
Merdigera obscura (O.F. Müller, 1774)	+	+	+
Napaeopsis cefalonica (Mousson, 1859)	–	+	–
Orcula (*Illyriobanatica*) *wagneri* Sturany, 1914	–	–	+
Oxyloma dunkeri (L.Pfeiffer, 1865)	+	–	–
Oxyloma elegans (Risso, 1826)	+	+	+
Pagodulina pagodula (Des Moulins, 1830)	+	+	+
Paralaoma servilis (Shuttleworth, 1852)	–	–	+
Poiretia cornea (Brumati, 1838)	+	+	+
Pseudojaminia seductilis (Rossmässler, 1837)	+	+	+
Punctum pygmaeum (Draparnaud, 1801)	+	+	+
Pupilla muscorum (Linnaeus, 1758)	+	+	+
Pupilla sterrii (Voith, 1840)	–	+	+
Pupilla triplicata (S. Studer, 1820)	–	–	+
Pyramidula pusilla (Vallot, 1801)	–	–	+
Pyramidula rupestris (Draparnaud, 1801)	+	+	–

Table 2. Continued

Species	Pavlović 1912	Karaman 2007	This study
Rumina decollata (Linnaeus, 1758)	–	–	+
Sphyradium doliolum (Bruguière, 1792)	+	+	+
Succinea putris (Linnaeus, 1758)	–	–	+
Succinella oblonga (Draparnaud, 1801)	+	+	+
Truncatellina claustralis (Gredler, 1856)	+	+	+
Truncatellina cylindrica (J.B. Férussac, 1807)	+	+	+
Truncatellina laeviuscula (Küster, 1850)	–	+	–
Vallonia costata (O.F. Müller, 1774)	+	+	+
Vallonia pulchella (O.F. Müller, 1774)	+	+	+
Vertigo alpestris Alder, 1838	–	+	–
Vertigo angustior Jeffreys, 1830	–	+	+
Vertigo antivertigo (Draparnaud, 1801)	+	+	+
Vertigo pusilla O.F.Müller, 1774	+	+	+
Vertigo pygmaea (Draparnaud, 1801)	+	+	+
Vertigo substriata (Jeffreys, 1833)	–	–	+
Zebrina detrita (O.F. Müller, 1774)	+	+	+

Succineoidea (3 species), Punctoidea (3 species), Ellobioidea, Achatinoidea, and Discoidea (each with 2 species), and Oleacinoidea (1 species). The total number of species included herein is 52. Altogether, 50 species and subspecies from these groups were included in the latest checklist by Karaman (2007).

However, Karaman's checklist did not reflect the true diversity, as some species were inadvertently omitted or added, and for others the taxonomic status has changed. *Cochlicopa lubricella* and *Carychium tridentatum* were previously reported from Serbia but inadvertently omitted by Karaman (2007). *Abida secale*, *Chondrina avenacea*, *Napaeopsis cefalonica*, and *Discus ruderatus* were included by Karaman (2007), but we could not find any reliable literature data for them. We exclude *Agardhiella lamellata* and *A. parreyssi* from the fauna of Serbia, as they were demonstrably misidentified and Serbian records belong to other taxa (Subai 2011). Hesse (1929) mentioned *Vertigo alpestris* Alder, 1838 from near the city of Smederevo, but this occurrence was doubted by Jaeckel *et al.* (1958). Since there were no records of this species from Serbia for nearly 100 years, we exclude it from the fauna. Jaeckel *et al.* (1958) mentioned *Chondrus zebrula tantalus* (L. Pfeiffer, 1868), which does not live in Serbia. Considering the ambiguous trustworthiness of some of Jaeckel *et al.*'s (1958) records, we doubt the reliability of the record of *Ena concolor* (Westerlund, 1887) and exclude this species from the Serbian fauna. However, this species may be present on the territory of Kosovo and Metohija province. Finally, the taxonomic status of several species has changed, namely *Granaria illyrica* (now as a subspecies of *G. frumentum*), *Mastus reversalis* (with reference to *M. venerabilis*), and *Truncatellina laeviuscula* (uncertain).

We report five species for the first time from Serbia: *Chondrula microtragus*, *Ena subtilis*, *Gonyodiscus rotundatus*, *Paralaoma servilis*, and *Lucilla singleyana*.

Paralaoma servilis is an introduced punctid species thought to have originated from Australia (Nekola *et al.* 2025a). The first records from the Balkans were from Greece (Falkner 1974) and Croatia (Maassen 1984). In this century, this species has been reported from six additional Balkan countries—Albania (Reischütz *et al.* 2011), North Macedonia (De Mattia 2017), Slovenia, Bosnia and Herzegovina, Montenegro (Reischütz *et al.* 2019), and Bulgaria (Georgiev & Dedov 2022)—as well as Czechia (Říhová *et al.* 2026). We report *P. servilis* for the first time from Serbia. Our record comes from a garden of a house in Vrčin municipality, part of the city of Belgrade. Altogether 24 specimens were collected on two occasions. Since there are many cultivated plants in the yard, it is most likely that snails had been transported with plants or soil purchased from plant nurseries.

The succineid fauna in Serbia is still considered poorly known. Pavlović (1912) mentioned two species of *Oxyloma*, namely *O. elegans* (as *S. elegans*) and *O. dunkeri* (as *S. hungarica*), but he did not indicate how he distinguished between them. We suppose that the distinction was based on shell characters since there is no ethanol-preserved specimens among material from Petar Pavlović in NHMBEO.

Given the current confusion in the genus *Oxyloma*, especially between *O. elegans* and *O. dunkeri*, the distribution of this genus in Serbia is not well known. Sampling not been undertaken throughout Serbia. We believe that *O. dunkeri* may be confirmed from Serbia in the future, (if the appropriate taxonomic revision is made), and even *O. sarsii* might be found. Although *S. putris* is a relatively common succineid in Serbia, we could not find any previously published data on this species prior to Gojšina *et al.* (2024a), who only mentioned it as a part of the accompanying fauna. We find it unlikely that this common species has not been found in Serbia before, but it was not mentioned by Karaman (2007) in the latest checklist.

Orcula dolium is known only by fossil records in Serbia (Mitrović 2007; Páll-Gergely *et al.* 2013). Besides these fossil records, Hesse (1929) and Đuknić *et al.* (2010) had mentioned this species from Serbian fauna. Hesse (1929) did not specify whether his record from the Danube River near the city of Smederevo was based on recent or fossil specimens. According to the map provided by Páll-Gergely *et al.* (2013), there are confirmed fossil records of this species near Smederevo, which suggest that Hesse's (1929) record was not based on living specimens. Đuknić *et al.* (2010) reported "*Orcula dolium*" from Vrelska Padina and Ivanštica rivers in eastern Serbia, but it is very probable that this was in error for *Sphyradium doliolum* (see our earlier remarks), and we find the misidentification less likely.

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