

**Serrulininae in Greece, there may be more
(Gastropoda, Pulmonata, Clausiliidae)**

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Tsoukatosia liae gen. et spec. nov. is described from the Peloponnisos, Greece. This subterranean species belongs to the Serrulininae, a poorly known subfamily of the Clausiliidae, far more widespread in the Tertiary than in recent times. The Serrulininae are represented in Greece by four more species, all of which known from only a single locality, 300 and 425 km far away, in Ipiros and Makedhonia, respectively, and all but one after only one or a few empty shells. The emphasis is also on collecting these rare gastropod species.

Key words: Gastropoda, Pulmonata, Clausiliidae, Serrulininae, new genus, new species, Greece.

INTRODUCTION

The Serrulininae are considered a subfamily of the Clausiliidae, most closely related to the Phaesusinae (Nordsieck, 2000), or as Serrulinini, a tribus of the Phaesusinae (Németh & Szekeres, 1995). Both views are based on subjective character weighting. An extensive cladistic analysis has not been performed. Obviously, the group is in decline. Fossil species are known from Middle Eocene and younger deposits, from a wide range, extending from W. Europe to Caucasia. Nordsieck (2000) lists 39 pre-Pleistocene species. At present only sixteen extant species are known (Németh & Szekeres, 1995; Subai & Szekeres, 1999), from N. Iran, Caucasia, Turkey and Greece. There are no records of Recent representatives from central or western Europe. The westernmost Recent species are known from Greece. Four species have been described from that country, each of which from only a single locality. No more than one or a few specimens are known for three of these species, whereas many shells are known of the fourth one. A fifth species is described below on the basis of several specimens, but again from only a single locality. A compilation of the records of Greek species of Serrulininae (fig. 1) makes clear that there are large disjunctions in the range of the subfamily as we know it. All this suggests that our actual knowledge is still very incomplete. That is why the way in which the limited material has been collected is described and illustrated in more detail than usual in the literature.

So far not a single live snail belonging to this clausiliid subfamily has been reported from Greece. The locality data, summarized below, suggest that the animals live subterraneously in limestone areas, most probably not in large caves accessible to man but in muddy narrow crevices containing organic matter for food. Such places may be connected with caves or with fissures in limestone walls. If so, the empty shells can be collected in the mud produced by those crevices, which is a time-consuming activity. Large amounts of soil have to be sieved, by preference using running water to avoid damage caused by pieces of limestone, but this is often impossible in practice. Only by



Fig. 1. Records of Greek species of Serrulininae. Dots: *Sciocochlea* spec.; 1, *S. collasi* Sturany, 1904; 2, *S. nordsiecki* Subai, 1993; 3, *S. cryptica* Subai & Szekeres, 1999. Square: *Gracophaedusa sperlei* Rähle, 1982. Star: *Tsoukatosia liae* spec. nov.

systematically investigating particular microhabitats during malacological fieldwork in Greece, the number of species of Serrulininae can be increased substantially. The presence of zonitid shells in a muddy deposit in a limestone area, in particular of *Oxychilus*, and *Vitrea*- or *Lindbergia*-like species, may be indicative of the occurrence of shells of subterraneous gastropods in general. The new species described in this paper was discovered in a bottom sample primarily taken because such shells had been noticed.

NNM = National Museum of Natural History, Leiden.

THE GREEK SERRULININAE

Sciocochlea Sturany, 1904

Németh & Szekeres (1995) consider *Sciocochlea* C. Boettger, 1935, a subgenus of *Serrulina* Mousson, 1873. Here, the opinion of Subai (1993), Subai & Szekeres (1999), and Nordsieck (2000) is followed. The *Sciocochlea* species are known from Greece, Ipiros. See Subai & Szekeres (1999) for figures, an identification key, and descriptions of the three species that are known.

Sciocochlea collasi Sturany, 1904 (figs 2, 5).— Sturany (1904) described *S. collasi* from the island of Kerkyra (= Corfu), Greece, on the basis of four shells, without indicating exactly where the specimens were found. The type locality was said to be located in the Pantocrator mountain (“Mte San Salvatore”) and, according to Paganetti-Hummler (in Sturany, 1904: 105) who collected the material, a cave, accessible only with difficulty (“schwer zugänglich”). I rediscovered this species in 1977, in the cave Katsuri near Barbati (UTM DJ09) (Gittenberger, 1977), where dozens of more or less worn, whitish shells were found and few fresh ones, which are glassy transparent. The shells were found in soil samples without bat droppings, taken at relatively humid places in the dark interior of the cave. Despite three more visits in subsequent years, no living snails were observed. This cave could be the one referred to by Sturany, because it is not very easily accessible indeed (fig. 8).

Sciocochlea nordsiecki Subai, 1993 (figs 3, 6). — Subai discovered and described (Subai, 1993) this second *Sciocochlea* species from Greece, Ipiros. It was found at c. 150 m alt. in a narrow crevice below a chapel in the slope above the road to Mavroneri, 5 km from the main road Filiates-Igoumenitsa. At first only a single specimen was available. Guided by a detailed description of its provenance, I could collect an additional shell, which was selected as a paratype (fig. 3), and during another visit of the type locality (UTM DJ48), one year later, a damaged shell with two fragments. The shells were sieved from various crevices in the limestone rocks. Maybe there are caves in the area, but none could be located and entered. (The chapel might be constructed in front of a cave; this could not be checked, because it was closed during both visits.)

Sciocochlea cryptica Subai & Szekeres, 1999. — *S. cryptica* was described on the basis of only a single shell. I suppose to have visited the type locality in Ipiros, originally described as “carstic slope above the Preveza-Igoumenitsa highway near Karteri, 1 km NW of the Mazarakia junction, 80 m above sea level, UTM DJ46” (Subai & Szekeres, 1999: 9), which does not give the impression that there might be caves nearby. Additional material was not found.

Graecophaedusa Rähle, 1982

This monotypic genus was described with *Graecophaedusa sperlei* Rähle, 1982, on the basis of a single shell, collected from a deep crevice in the limestone rocks at 1900 m altitude on Mt. Pangeon, Makedhonia, UTM KF53 (Rähle, 1982). Together with D. Uit de Weerd I searched the rocky area where I supposed the type locality to be for several hours in June 1999, but in vain.



Figs 2-6. Serrulininae, shells (2-4) with details of the body whorl (5-7). 2, 5, *Sciocochlea collasi* Sturany, 1904 (NNM); 3, 6, *S. nordsiecki* Subai, 1993 (3, paratype, NNM 56815; 6, topotype, NNM); 4, 7, *Tsoukatosia liae* spec. nov. (4, holotype, NNM 75727; 7, paratype, NNM 75728). Shell height, for figs 2-4: 11.0 mm, 7.1 mm and 10.9 mm, respectively. Scale line, for figs 5-7, 1 mm.

Tsoukatosia gen. nov.

Type species. – *Tsoukatosia liae* spec. nov.

Diagnosis. – Shell dextral, with a broad apex; with vertical riblets, interrupted by a basal furrow. Spiralis and columellaris reaching equally far inside; upper palatal lamella and lunella situated laterally.

Etymology. – The name is after the Tsoukatos family, in recognition of their friendship and the many pleasant times I spend in their house at the seaside, from where the type locality of *T. liae* can be seen.

Notes. – It was quite a surprise that Mr. W.J.M. Maassen discovered two apices and a last whorl fragment of obviously an unknown representative of the Serrulininae in a small soil sample that I had collected at 300 km SW of the known range of *Sciocochlea* and 425 km SSW of the type locality of *Graecophaedusa sperlei*. The sample was taken because of the presence of many small *Lindbergia*-like shells that were noticed in the reddish mud. This reminded me of earlier incidental finds of uncommon species like *Spelaodiscus dejongi* Gittenberger, 1969, in Montenegro, *Virpazaria pageti* Gittenberger, 1969, in Hercegovina, and *Gyalina ermonae* Gittenberger, 1977, and *G. pageti* Gittenberger, 1988, in Greece. Shells of these species were also found in reddish mud from crevices in limestone walls, in the open air (Gittenberger, 1988). During a second visit at the site where the soil sample had been taken three weeks earlier (fig. 9), large amounts of soil were sieved for about five hours, using a combination of two sieves with mesh sizes of 1 and 8 mm, respectively, adapted to the size of the clausiliid shell to be found. This resulted in the material here described.

Tsoukatosia liae spec. nov. (figs 4, 7)

Material. – Greece, Peloponnisos, Arkadhia, 3.95 rkm along by-road (from Leonidhion-Plaka) to Tsitalia, in mud from crevices in N-exposed limestone rocks, 310 m alt., FG663.122 (NNM 75727/holotype, 75728/26paratypes [7 shells, 9 body whorls, 10 apical whorls]; Colln Subai/2 paratypes [body whorl and upper whorls]; Colln Nordsieck/2 paratypes [body whorl and upper whorls]).

Shell dextral, with a clearly curved columella and a relatively broad apex, not decollated. With 8-8½ whorls, separated by an incised suture; uppermost teleoconch whorls moderately convex, the following ones gradually more flattened. Protoconch glossy, without a sharp boundary followed by the teleoconch whorls, densely sculptured by vertical ribs, i.e. running parallel to the columella. The ribs are regularly spaced all over the teleoconch, but vary in prominence and relative width. Initially they are prominent and about as broad as the interstices, whereas on the middle whorls they become somewhat broader and obsolete, with relatively narrow interstices. The prominence of the ribs increases again on the lower whorls; on the last quarter of the body whorl they are highest and narrower than the interstices. There are some growthlines in between the ribs, clearly discernible only on the last whorl. The apertural lip is broadly reflected and strongly thickened additionally, forming a roundish rib which is about as broad as two normal ribs and their interstice of the body whorl. Encircling the basal part of the body whorl and visible still in frontal view, there is a conspicuous furrow, interrupting the radial ribs, which may form an angle there, or stop altogether below it. The furrow is confined to the shell sculpture, so it does not border a true keel in the shell wall.

Aperture U-shaped and conspicuously protruding, with an oblique parietal border with a marked, broadly rounded sinus. Parietalis connected with the spiralis. In frontal view, the columellaris is not visible as a lamella apart from its lowest part, which prominently encircles the columellar lip, about halfway the columellar border of the aperture; it runs about as far inside as the spiralis. The subcolumellaris is not interrupted and encircles the columellar lip as an equally conspicuous ridge. In between there are a third prominent ridge which is only partially visible in frontal view, and usually two prominent but shorter ridges, situated between the three longest ones. On the inside of the apertural lip, between the columellaris and the parietalis, there are up to four more or less obsolete short riblets. A lamella inserta is not present. Laterally in the body whorl, there is a single, short, oblique palatal lamella, connected to a moderately prominent lunella below and clearly separate from the principalis above, which reaches only slightly further inside the whorl. Principalis hardly or not discernible in frontal view. Clausilium with a slender plate which is regularly rounded at the end.

Shell height 10.5-11.5 mm.

Affinities. — The species of Serrulininae known from Greece, classified in the genera *Tsoukatosia*, *Sciocochlea* and *Graecophaedusa*, respectively, share the relatively broad apex, which is not conspicuously broad in for example the *Serrulina* species. As long as data on the anatomy are unknown, considerations about the phylogenetic relationships of these genera and the other taxa of the Serrulininae are premature.

Habitat. — The shells were found among reddish soil and limestone rocks produced by two narrow crevices situated close to each other (fig. 9).

Etymology. — The species is named after my sister-in-law Mrs. Lia Harkes, to keep a promise.

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Fig. 8. Entrance of the cave Katsuri in the steep slope of the Pantokrator near Barbati, Kerkyra island, Greece; UTM DJ09. Maybe the type locality of *Sciocochlea collasi* Sturany, 1904.

Fig. 9. Crevices in N-exposed limestone rocks along the road, at the type locality of *Tsoukatosia liae* spec. nov.; Greece, Peloponnisos, Arkadhia, 3.95 rkm along by-road (from Leonidhion-Plaka) to Tsitalia, 310 m ; UTM FG663.122.

