

MINISTERIE VAN ONDERWIJS, KUNSTEN EN WETENSCHAPPEN

ZOOLOGISCHE MEDEDELINGEN

UITGEGEVEN DOOR HET

RIJKSMUSEUM VAN NATUURLIJKE HISTORIE TE LEIDEN

DEEL XXXVIII, No. 15

18 sept. 1963

CLAUSILIIDAE (GASTROPODA, PULMONATA) COLLECTED BY THE NETHERLANDS BIOLOGICAL EXPEDITION TO TURKEY IN 1959

by

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The route of the Netherlands Biological Expedition to Turkey in 1959 is published elsewhere (Hennipman a.o., 1961; Anonymus, 1963). As is mentioned there also, the zoological material collected is preserved in the Rijksmuseum van Natuurlijke Historie at Leiden. I am greatly indebted to Dr. C. O. van Regteren Altena, curator of that Museum, for placing the Clausiliidae collected by the expedition at my disposal. Moreover my thanks are due to Mrs. W. S. S. van der Feen-van Benthem Jutting, Amsterdam, and Dr. A. Zilch, Frankfurt am Main, for specimens lent for the purpose of comparison.

The Clausiliidae were all collected by Mr. W. J. M. Vader, one of the members of the expedition. Only one sample is from Greece (Porto Lagos), the others are from Istanbul, near the Bosphorus, and from Asiatic Turkey. All the samples are preserved dry, the soft parts having hardened in the top whorls of the shells by loss of moisture.

In the systematic account the arrangement given in the „Handbuch der Paläozoologie“ vol. 6 by Wenz-Zilch (1959/60) is followed.

Some of the specimens are in the author's collection and in the collection of Mr. W. J. M. Vader.

PHAEDUSINAE

Tribus Serrulineae

Serrulina Mousson, 1873

Serrulina (Serrulina) serrulata (L. Pfeiffer, 1847)

Material examined. — Turkey, Vilayet of Trabzon, 3 km S. of Hamsiköy (pl. XX), about 45 km SSW. of the city of Trabson, altitude ca. 1900 m,

in a wet forest with firs and beech trees; a small number of specimens was found on the trunks of living beech trees, the majority, however, were living in a decaying beech trunk, lying on a small mountain pasture, 5-VI-1959 (29 specimens). Length of shells 12.2-15.5 mm, diameter 2.8-3.4 mm; whorls: 10-12.

The columellar side of the peristome is folded as usual in the species, but in most specimens the outer peristome is not or only faintly folded. The set thus shows features tending towards the var. *semiserrata* Lindholm (1913) that was described from Wasrya (Gouvernement of Batum).

Distribution. — Type locality "Tauria". The species is known from the coastal areas of the Black Sea, on the east side (O. Boettger, 1879, 1880, 1883, 1889; Von Martens, 1874; Mousson, 1863; Retowski, 1889; Rosen, 1907), on the south side (Götting, 1961; Retowski, 1889) and on the west side (Hesse, 1913; Jaeckel, 1957; Urbanski, 1960a). Washed ashore on the Crimea peninsula (Retowski, 1883, 1887). The locality given is thus within the known area of distribution.

Biotope. — Shady forests. O. Boettger (1880) recorded (according to Leder) that the species lives: "in alten, faulenden, durch und durch nassen und auch bei der grössten Trockenheit doch stets reichlich Wasser haltenden Stämmen einer grossblättrigen Acer Art, deren Holz man Stück für Stück zerfasern muss". Retowski (1889): "in einem faulenden Baumstamme". Urbanski (1960a): "unter der Rinde alter, faulender Stubben und Baumstämme, falls diese nicht ganz trocken sind". Götting (1961) mentioned: "an und unter Bäumen". These data are in accordance with the habitat mentioned by Vader.

***Serrulina (Pravispira) semilamellata* (Mousson, 1863)**

Material examined. — Turkey, Vilayet of Trabzon, 3 km S. of Hamsiköy (pl. XX), about 45 km SSW. of the city of Trabzon, alt. ca. 1900 m, in a wet forest with firs and beech trees; collected together with *S. serrulata* Pfeiffer, thus on trunks of living beech trees or in a decaying beech trunk, lying on a small mountain pasture. It is likely that the present two specimens lived in the decaying trunk and not on the living trees as most of the *Serrulina* material came from the trunk and as the species is especially known from such a biotope. 5-VI-1959 (2 specimens). Length of shells 12.4 and 13.4 mm, diameter 2.9 and 3.1 mm; whorls: 9 and 9.

The specimens have no third (middle) plica palatalis and the upper (principalis) and lower plicae are less strong than in typical specimens. Retowski (1889) described this condition for his variety *serrulosa* from Sephanos near Trebisond (= Trabzon). The small folds along the right

side of the peristome, however, are as in typical *S. semilamellata* and not as numerous as was described for var. *serrulosa* Retowski. The specimens are large as compared with the original set from Réduktaleh (length 10 mm, diam. 2.4 mm, Mousson, 1863) and with var. *serrulosa* Retowski (length 9 mm, diam. 2 mm). Specimens from other localities, however, may have larger dimensions (among others Swanetien: length 11¼-14 mm, diam. 2¼-3 mm; O. Boettger, 1883). According to O. Boettger (1880) shape, dimensions and sculpture of the species are very variable.

Distribution. — *S. semilamellata* is only known from the coast of the Black Sea (O. Boettger, 1879, 1880, 1883, 1889; Clessin, 1881; Von Martens, 1876; Mousson, 1863; Retowski, 1883, 1889), from the SE coast (Retowski, 1889) and washed ashore on the Crimea peninsula (Retowski, 1887). The locality Hamsiköy is within the known area of distribution.

Biotope. — The biotope is the same as that of *S. serrulata*. According to O. Boettger (1880) both species were found together in old, wet, decaying tree trunks. Retowski (1889) collected the species in completely decayed wood. Rosen (1907) recorded: "sie lebt sehr vereinzelt und nie in Colonien wie andere Arten, an Bergabhängen im Walde unter faulenden Baumstämmen. Unter einen dicken Baumstumpf fand ich eine Colonie von *Clausilia serrulata* Midd. in 80 Exemplaren und darunter bloss zwei Exemplare *semilamellata*. Sie führt wahrscheinlich ein Einsiedlerleben, denn ich konnte nie mehr wie ein oder höchstens zwei Exemplare an einem Ort finden". This is in accordance with the situation at Hamsiköy where 2 specimens of *S. semilamellata* were collected among more than 20 *S. serrulata*.

CLAUSILIINAE

Laciniaria Hartmann, 1844

Laciniaria (Denticularia) thessalonica thasia (O. Boettger, 1907 ex recte Urbanski, 1960)

Material examined. — Greece, Macedonia, road from Komotini to Porto Lagos, under stones in poor grassland, 28-VI-1959 (10 specimens). Length of shells 11.2-12.6 mm, diameter 2.9-3.1 mm; whorls: 11-12.

The specimens are short and rather ventricose with somewhat concave lateral outlines, the striae are occasionally whitish only on the upper parts of a whorl. Most of the specimens (7) have only small folds on the peristome, one is also provided with some interlamellar plicae. Plica principalis and lower palatal plica long, visible in the aperture; the middle palatal plica is short in all except two specimens, where it is clearly visible in the aperture.

Distribution. — The polytypic species is known from Central Greece (Euboea), Thessalia, Macedonia and SE. Bulgaria, from the coasts of the Sea of Marmara and from W. Turkey (O. Boettger, 1885; Fuchs & Käufel, 1936; Urbanski, 1960b). *L. thessalonica thasia* is known from the island of Thasos (O. Boettger, 1907; Urbanski, 1960b), from the island of Thasopoula (Urbanski, 1960b) and according to Urbanski (1960b) presumably also from eastern Macedonia. Our locality is in accordance with Urbanski's expectations.

Biotope. — Under decaying wood (O. Boettger, 1885; Götting, 1961) under shrubs (Hesse, 1914; Urbanski, 1960b). Vader found the specimens under stones.

Euxina O. Boettger, 1877

Euxina (*Euxina*) *circumdata* (L. Pfeiffer, 1848) (pl. XVIII figs. 16, 17)

Material examined. — Turkey, Istanbul, in a small park near the Aya Sophia, clinging to the bark of the only tree present (it was a very small park indeed!), 21-III-1959 (3 specimens). Length of shells 12.2, 12.7 and 13.4 mm, diameter 3.1, 3.1 and 3.2 mm; whorls: 11.

Turkey, Rumeli Hisar, along the Bosphorus, along the road under stones, 1-IV-1959 (4 specimens and 3 juv.). Length of shells 12.2-13.2 mm, diameter 2.9-3.1 mm; whorls: 11-11½.

Turkey, Rumeli Hisar, along the Bosphorus, on a stony grass-slope, under a stone, 25-III-1959 (1 specimen). Length of shell 11.7 mm, diameter 2.9 mm; whorls: 11.

The specimens are typical. The var. *byzantina* Nägele (1910) from the same district is insufficiently characterized.

Distribution. — The typical set was collected near Brussa in Natolia; the species occurs in NW. Asia Minor, E. Thracia and Bulgaria (A. J. Wagner, 1920; Urbanski, 1960a; Likharev, 1962), and was found washed ashore on the coast of the Crimea peninsula (Retowski, 1887). The three localities mentioned above are all west of the Bosphorus. The species is already known from this area: Constantinople, on walls of the Serail (Mousson, 1863), Bujukdere (Retowski, 1889), Constantinople, garden of the Jezuits (Nägele, 1910).

Biotope. — On walls (Mousson, 1863), common in shady woods, under fallen leaves, dead wood, more rarely under stones; sometimes in light oak woods and even in *Paliurus* shrubs (Urbanski, 1960a). The habitats where Vader collected his specimens were indeed hardly wooded at all.

Euxina (Multiplicaria) duboisi (Charpentier, 1852)

Material examined. — Turkey, Trabzon, on old city walls in dry places, under ferns, etc., 2-VI-1959 (39 specimens). Length of shells 10.9-13.7 mm, diameter 2.6-3.0 mm; whorls: $10\frac{1}{2}$ - $12\frac{1}{2}$.

The specimens are typical, among 39 shells most have smooth peristomes, only a few have the peristome faintly folded; both forms occur together in the same locality as was already recorded by Retowski (1889).

Distribution. — The species was described from "Tauria" (Charpentier, 1852). According to O. Boettger (1879) the species is: "im ganzen Gebiet des Kaukasus verbreitet und entschieden eine der häufigeren dortigen Clausilienformen". Further the species is known from the Armenian coastal region (Mousson, 1863; Von Martens, 1874; O. Boettger, 1877). The presence on the Crimea peninsula mentioned by Kessler is doubted by O. Boettger (Retowski, 1883). The occurrence in Trabzon is mentioned already by Mousson (1863), Von Martens (1874) and Retowski (1889).

Biotope. — O. Boettger (1883) reported the occurrence in woods, Likharev (1962) mentioned the species from woods and even from savannas, mostly on branches and in crevices of bark, less often in crevices of damp rocks or under stones and in litter. The occurrence in dry places under ferns on an old wall where Vader collected the species is rather unexpected.

Euxina (Strumosa) subulata (L. Pfeiffer, 1848)

Material examined. — Turkey, Ulu Dağ, 18 km SE. of Bursa, forest with fir trees, alt. 800-1200 m, along the forest road; as far as Vader remembers, under a stone, 20-VI-1959 (1 specimen). Length of shell > 11.0 mm, diameter 2.9 mm; whorls: > 9 . The top whorls are damaged.

The specimen is provided with 3 short palatal plicae below the plica principalis, which itself is also rather short (only $\frac{1}{4}$ whorl long). The plica basalis is not longer than the other two plicae (conf. A. Schmidt, 1868).

Distribution. — The species was described from the neighbourhood of Brussa, Natolia (Pfeiffer, 1848) and up to now not recorded from elsewhere.

Biotope. — Under stones, especially under *Abies* trees (Götting, 1961). This agrees with Vader's data.

Euxinastra hamata (O. Boettger, 1888) (pl. XVIII figs. 3, 4)

Material examined. — Turkey, Vilayet of Trabzon, 3 km S. of Hamsiköy (pl. XX), about 45 km SSW. of the city of Trabzon, altitude about 1900 m, in a wet forest with firs and beech trees, on trunks of beech trees, 5-VI-1959 (2 specimens and a top). Length of shells 17.8 and 17.9 mm, diameter 4.8 and 4.8 mm; whorls: $12\frac{1}{2}$ and $12\frac{1}{2}$.

The specimens are identical with a paratype (S.M.F., 133606/1) kindly placed at my disposal by Dr. A. Zilch from the Senckenberg Museum.

Distribution. — The type locality is Batum (O. Boettger, 1888); the species is also recorded from the bank of the Tschorok River, about 2 miles W. of Batum (Retowski, 1889) and from Mount Salolet in the Province of Batum near Arwin in a beech forest under a fallen beech tree, together with *Euxina lindholmi* (Lindholm) and *Mentissoidea litotes* (A. Schmidt), (Lindholm, 1912). The new locality extends the known area of distribution considerably to the SW.

Biotope. — The species seems to live especially in beech forests. Likharev (1962) mentioned moist, subtropical forests; under stones or bushes and on tree trunks.

***Euxinastra fertilis* spec. nov.** (text-fig. 1, pl. XVIII figs. 1, 2)

Diagnosis. — A very ventricose *Euxinastra* with a blunt, thick apex and a rather low lamella inferior.

Description. — Shell of medium height, ventricose, clavate, with a blunt thick apex, not very solid, yellowish horn-coloured, slightly translucent. Spire short, with concave lateral outlines. Whorls about $11\frac{1}{2}$, moderately convex, sculptured with spaced straight transverse ribs (about 4 per millimeter on the whorl above the aperture), these ribs are hardly coarser on the neck. There is no thread along the suture. The nuclear whorls are smooth. The neck has one distinct, ribbed basal crest.

Aperture quadrangular with rounded angles, yellowish within; the sinulus is broad and rather high, the upper peristomal margin has a distinct angle where the superior lamella ends. The base of the peristome is receding. The peristome is continuous, whitish, a little reflexed, the upper margin is clear of the preceding whorl. The lateral margins are almost parallel, the base of the peristome is semicircular but slightly angular in the centre.

Lamella superior rather low, reaches the margin, clear of the well developed lamella spiralis, that begins laterally at the left side of the end of the lamella superior, is separated from it at the side by a wide gap, and ends inwards rather abruptly at the right side of the shell, just beyond the end of the lamella inferior. The lamella inferior is rather low; in a front view of the aperture, it is just visible at the left side of the columella, it ascends inwards and ends at the right side of the shell, slightly beyond the inner end of the subcolumellar lamella. Looking into the aperture from below, it is not possible to see the inner side of the base of the lamella inferior. The lamella subcolumellaris is only just visible in the aperture if one looks

from the extreme left side, it ends on the columella at the right side of the shell.

The closing apparatus lies at the dorsal side. The principal plica runs from the left side, behind the outer margin of the peristome to just beyond the dorsal side, so it is about $\frac{1}{4}$ whorl long. Below the principal plica only

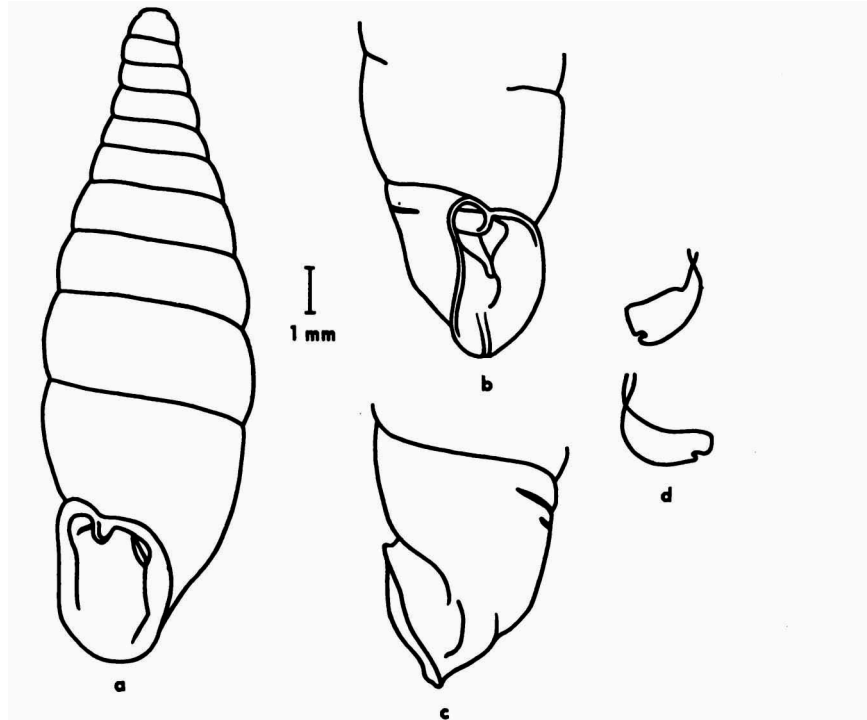


Fig. 1. *Euxinastra fortilis* spec. nov. a-c, holotype; d, paratype. a, ventral view of the shell; b, ventro-lateral left side of the last whorl; c, right side of the last whorl; d, two views of the clausilium.

the upper palatal plica is present, there is no lunella. The plate of the clausilium is only moderately curved and has almost parallel sides, at the outer side near the round top is small but distinct notch; the outer side of the plate gradually merges into the pedicle, whereas the columellar side shows a distinct angle there. Length of the plate 2.5 mm, width 1.2 mm.

The holotype and the only known paratype are in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden; the dimensions are (in mm):

	shell		aperture		number of whorls
	length	diam.	height	width	
holotype	15.7	4.9	4.0	2.7	11½
paratype	ca. 16.4	4.9	—	—	ca. 11

The ventrosity l/d is 3.2 and ca. 3.3 respectively.

The topmost whorls and the peristome of the paratype are damaged.

A third but juvenile specimen consisting of 10 whorls is present.

Type locality. — Turkey, Vilayet of Trabzon, 3 km S. of Hamsiköy (pl. XX), about 45 km SSW. of the city of Trabzon, at an altitude of about 1900 m, in a wet forest with firs and beech trees, 5-VI-1959. The specimens were, as far as Mr. Vader remembers clinging to beech tree trunks, together with *Eu. hamata*.

This new species is considerably more ventricose than *Eu. hamata* which is more fusiform and of which the ventrosity (l/d of the specimens mentioned before) is about 3.7 and (of the type specimens) about 3.7 to 3.9. Moreover *Eu. hamata* from Hamsiköy has more and fainter ribs (5 per mm on the whorl above the aperture). Also the lamella inferior, which is much higher in *Eu. hamata*, its margin almost reaching below the superior lamella, is a character separating the two species.

Eu. dilatata Westerlund (1901) from Samsun, according to the author's description, differs from the new species as follows: *Eu. dilatata* is less ventricose ($l/d = ca. 4$), it is densely striated on the lower whorls, it has a high lamella inferior of which the margin runs under the superior lamella, the lamella subcolumellaris is well visible in the aperture.

Because of the incised clausilium and the absence of palatal plicae below the superior one, the new species belongs to the genus *Euxinastra*.

ALOPHIINAE

Albinaria Vest, 1867

Albinaria (*Bigibbosa*) *bigibbosa* (Charpentier, 1847) (pl. XIX figs. 3, 4)

Material examined. — Turkey, Antalya, on a small brick wall near the harbour, 6-IV-1959 (18 specimens and 3 tops). Length of shells 14.2-18.6 mm, diameter 3.2-3.9 mm; whorls: 10-11.

Turkey, Antalya, in front of the Archeological Institute in Bahçeli Evler, on a dry spot (red soil) near the Mediterranean, under a stone, altitude 20 m, 5-IV-1959 (1 top).

The shells are typical, the supplements to the original description given by A. Schmidt (1868) agree also very well. According to Charpentier (1852) the species is very variable.

Distribution. — *A. bigibbosa* was described from Karaman in Pamphylia on the south coast of Asia Minor. Furthermore the species is recorded from Rhodos (Charpentier, 1852), Adalia in Pamphylia, Natolia (O. Boettger,

1878), Arsa Valley near Xanthus in Lycia (O. Boettger, 1883), rock-graves near Makri in Lycia (Wagner, 1924). The locality Rhodos is not maintained in later accounts and is probably erroneous. The species was already known from Antalya (= Adalia).

Biotope. — The animals live on rocks and walls and occur also under stones.

Albinaria (Bigibbosa) alajana (O. Boettger, 1896) (pl. XIX fig. 5)

Material examined. — Turkey, Side, Roman ruins near the village of Selimiye, near the sea shore about 6 km SW. of Manavgat and about 62 km E. of Antalya, among the rubbish of the ruins, 23-IV-1959 (26 specimens). Length of shells 10.4-14.7 mm, diameter 2.8-3.6 mm; whorls: $8\frac{1}{2}$ -10.

I compared the shells with the holotype (S.M.F., 66714/1), kindly lent me by Dr. A. Zilch from the Senckenberg Museum, Frankfurt. The largest specimens agree in all respects with it. O. Boettger (1896) recorded: length 15-18 mm, diam. $3\frac{1}{2}$ - $3\frac{3}{4}$ mm, so our specimens are rather smaller than the original series.

Distribution. — The type locality is Alaja, SE. of Adalia, Cilicia; other localities have not been recorded. Our locality, near Manavgat, is in the same district.

Biotope. — No previous records of the biotope are known to me.

Albinaria (Albinaria) maculata (Rossmässler, 1836)

Material examined. — Turkey, Istanbul, on the Byzantic city-walls near Yedikule, 22-III-1959 (11 specimens). Length of shells 16.3-18.1 mm, diameter 3.8-4.3 mm; whorls: $10\frac{1}{2}$ -12.

On account of the obsolete costulation of the median whorls of the bluish-white coloured shells, the specimens belong to the variety *calcareo* O. Boettger (1878), which lives together with the typical form near Ephesus and which according to K. L. Pfeiffer (1955) can hardly be maintained.

Distribution. — *A. maculata* is known from Smyrna (= Izmir) and Ephesus in Lydia, W. Asia Minor (O. Boettger, 1878; A. Wagner, 1924; Forcart, 1961); it was probably imported into the island of Kos with building materials from the mainland (K. L. Pfeiffer, 1955); var. *calcareo* was only recorded from Ephesus (O. Boettger, 1878).

The record from Istanbul extends the known range of the species to the north.

Biotope. — In cracks in walls (Götting, 1961). Vader found the specimens recorded here also on walls, together with *Papillifera bidens* (L.).

Papillifera Hartmann, 1842**Papillifera bidens** (Linnaeus, 1758)

Material examined. — Turkey, Istanbul, on the Byzantic city-walls near Yedikule, 22-III-1959 (15 specimens and 2 tops). Length of shells 12.3-14.0 mm, diameter 3.2-3.5 mm; whorls: 10-10½.

Istanbul, Bab-i-Humayun, on wall, principally in cracks, 21-III-1959 (27 specimens). Length of shells 11.8-14.5 mm, diameter 2.9-3.5 mm; whorls: 10-11.

The Turkish specimens agree with those from the coasts of the western Mediterranean as was stated already by Mousson (1863).

Distribution. — The species lives along the coasts of the Mediterranean and is only lacking in the extreme eastern part (Wagner, 1919). Mousson (1863) recorded the occurrence in Istanbul, in the garden of the serail, and Sturany (1905) stated that Penther found the species near Haidar-Pascha near Skutari, east of the Bosphorus. The localities where Vader found his specimens are thus within the known area of distribution.

Biotope. — On rocks and walls, in crevices and cracks.

FUSULINAE

Acrotoma O. Boettger, 1881**Acrotoma (Acrotoma) concavelamellata** spec. nov. (text-fig. 2, pl. XVIII figs. 8-11)

Diagnosis. — The decollated shell is provided with distinct striae that stand wider apart on the upper whorls, only on the last one or two whorls they are fainter and more crowded; the last whorl has no crest behind and parallel to the outer peristomal margin. Lamella inferior is visible in front view as a low concave lamella.

Description. — Shell decollated, of medium height, rather broad, fusiform, rather solid, reddish-brown, slightly translucent. Topwhorls not known. The decollated shell consists of 7 rather flat whorls, sculptured with slightly wavy ribs, which are wider apart on the upper whorls (4 per mm on the second one above the aperture) and more close together on the last whorl (6 per mm on the whorl above the aperture). The ribs are not coarser on the neck. Especially on the upper whorls many ribs are whitish, often only on the upper half. The suture has no thread but may be somewhat crenulated. The neck has one distinct, ribbed basal crest.

Aperture more or less oval, yellowish horn-coloured within; the sinulus is broad and high, the upper peristomal margin forms almost a right angle where the superior lamella ends. The peristome is continuous, whitish and a

little reflexed, the upper margin is clear of the preceding whorl, the lateral margins are more or less parallel. The base is semicircular except for a slight angle near the centre.

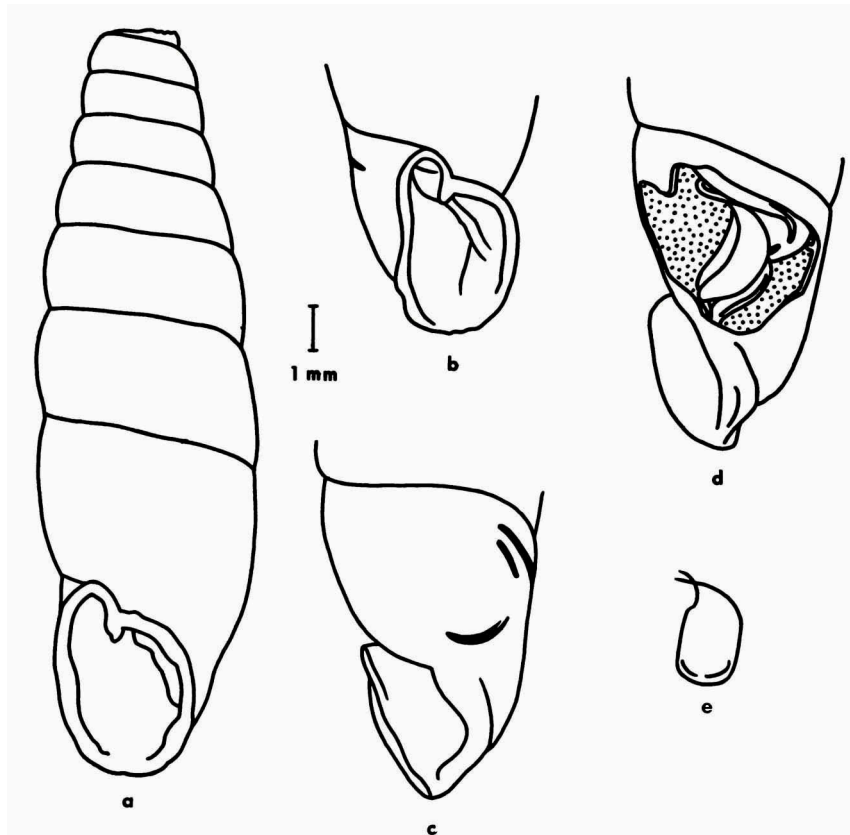


Fig. 2. *Acrotoma (Acrotoma) concavelamellata* spec. nov. a-c, holotype; d, e, paratype. a, ventral view of the shell; b, ventro-lateral left side of the last whorl; c, right side of the last whorl; d, dorso-lateral right side of the last whorl, opened to show the inner structure of the shell; e, clausilium.

Lamella superior is rather long but low and reaches the margin. It is clear of the rather low lamella spiralis, that begins shortly behind and at the left side of the produced part of the lamella superior and ends inwards, slowly decreasing in height, at the right side of the shell, together with the inner end of the lamella inferior. In a front view of the aperture the lamella inferior is visible as a low concave fold, running upward and inward while increasing in height, its outer end shows a small fold more or less completely grown together with it, it ends inwards at the right side of the shell. Looking into the aperture from below, it is just possible to see the inner side of the

base of the lamella inferior. The lamella subcolumellaris is just visible as a rather straight fold if one looks from the left side into the aperture, it ends inwards on the columella at the right side of the shell.

The closing apparatus lies at the dorsolateral-right side of the shell. The principal plica runs from the left side, rather far beyond the outer margin of the peristome to the dorsolateral-right side, it is $\frac{1}{4}$ whorl long. Below the principal plica is a short upper palatal plica and eventually (in the holotype) one more very small plica; below that is a lunella, consisting only of a very faint callosity in its upper part but becoming very distinct in its lower portions.

The plate of the clausilium is regularly curved, it is rather broad and has a blunt apex.

At $\frac{2}{3}$ of its length from the top the columellar side of the plate bends rather sharply and then merges into the pedicle. Length of the plate 3.0 mm, width 1.8 mm.

The holotype and two paratypes are in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden, the third paratype is in the author's collection. The dimensions of the decollated shells are (in mm):

	shell		aperture		number of
	length	diam.	height	width	whorls
holotype	18.0	5.2	4.8	3.0	7
paratypes	17.1	5.0	4.6	3.0	7
	17.7	5.0	4.4	3.1	7
	17.9	5.3	4.7	3.1	7

Type locality. — Turkey, Vilayet of Trabzon, 3 km S. of Hamsiköy (pl. XX), about 45 km SSW. of the city of Trabzon, at an altitude of about 1900 m, in a wet forest with firs and beech trees, 5-VI-1959.

Habitat. The specimens were, as far as Mr. Vader remembers, clinging to beech trunks.

The new species is related, but not very closely, to *A. laccata* (O. Boettger). I compared my material with the holotype of the latter species (S.M.F., 144040/1), from which it differs in many respects. *A. laccata* is not ribbed but almost smooth, there is a white callosity behind and parallel to the outer peristomal margin, the lamella superior and spiralis overlap distinctly, the lamella inferior is less concave, finally the dimensions (in mm) are as follows:

length	shell		aperture		number of
	diam.	height	width	whorls	
19.6	5.1	6.1	4.4	6	

A. semicincta (O. Boettger) is provided with a crest parallel to the outer peristomal margin (paratypes S.M.F., 144042/4) and has among other differences a convex lamella inferior, the yellowish shell is only faintly ribbed. The other species of the genus are still more different.

Armenica O. Boettger, 1877

Armenica laevicollis (Charpentier, 1852) (pl. XIX figs. 1, 2)

Material examined. — Turkey, Boğazkale, on limestone rocks of a loose limestone formation on a grassy hill (pl. XIX fig. 6), 13-VI-1959 (30 specimens). Length of shells 16.4-20.1 mm, diameter 3.6-4.4 mm; whorls: 11½-13.

The specimens are typical.

Distribution. — The type locality is "Asia minor". O. Boettger (1879) recorded the species from Astrabad in Persia (SE. of the Caspian Sea); other localities are: Tokat (Nägele, 1894), Amasia and Vil. Siwas (O. Boettger, 1899), Mersiwan (Hesse, 1910) all from northern Asiatic Turkey, E. of Ankara. I have found no information about the biotope, but Nägele (1897) recorded that specimens brought home to Germany and put in his garden there, crept about on the wall of his house up to a height of about 1 m, where they stayed. This agrees with Vader's statement that he found the animals on rocks.

Armenica bicarinata (Rossmässler, 1839) (pl. XVIII figs. 12, 13)

Material examined. — Turkey, mountains at the N. end of the "Cilician Gate", slope W. of the road from Ankara to Adana, altitude 1100-1900 m, found after rain in crevices of the rock, 10-V-1959 (14 specimens). Length of shells 18.6-23.4 mm, diameter 4.1-4.6 mm; whorls: 13½-15.

The shells are typical and the supplementary description by A. Schmidt (1868) is applicable as well. In my opinion my material does not agree with the descriptions of the varieties *dichroa* O. Boettger and *tesselata* Nägele, although the latter were collected in the same district.

Distribution. — The type locality is "Syria"; the species is also known from Numran (O. Boettger, 1899), forests of the Lebanon in Syria (Germain, 1921), Giosna near Merossina (O. Boettger, 1899), Gulek and Findikpunar Ciliciae (Nägele, 1901, 1903). Our locality thus lies in the known area of distribution in the Taurus mountains.

Biotope. — Mr. Vader collected the animals on rocks in cracks and crevices together with *Armenica brunnea* (Rossmässler).

Armenica brunnea (Rossmässler, 1839) (pl. XVIII figs. 14, 15)

Material examined. — Turkey, mountains at the N. end of the "Cilician Gate", slope W. of the road from Ankara to Adana, altitude 1100-1900 m, found after rain in crevices of the rock, 19-V-1959 (30 specimens). Length of the shells 14.7-17.9 mm, diameter 3.3-3.9 mm; whorls: 10½-12½.

The specimens were compared with the lectotype (S.M.F., 144120/1), with which they were found to be identical. Likharev (1962) recorded synonymy with *A. unicristata* O. Boettger and with *Inobseratella lantzi* Lindholm.

Distribution. — The type locality is "in montibus Tauri". Charpentier (1852) mentioned only Asia Minor. A. Schmidt (1868) stated that Ziegler's original label reads "Mons Taurus Syriae". Nägele (1901) reported the species from Gulek. This latter locality is very near the place where Vader collected the present specimens. *Armenica unicristata* O. Boettger is recorded from Schuscha, Asdshekend, Kodshaly and Axtala (O. Boettger, 1899) and Idzjewan (Likharev, 1962) in Russian Armenia.

Biotope. — Mr. Vader collected the animals on rocks in cracks and crevices together with *Armenica bicarinata* (Rossmässler).

Armenica hueti (Mortillet, 1854) (pl. XVIII figs. 5-7)

Material examined. — Turkey, Dükkân, about 38 km SSW. of Trabzon, altitude ca 1600 m, on a steep, almost dry rockface of schist, in crevices and under overhanging surfaces, 6-VI-1959 (41 specimens). Length of shells 19.2-22.4 mm, diameter 4.0-4.8 mm; whorls: 13-14½.

Turkey, Vilayet of Trabzon, 3 km S. of Hamsiköy (pl. XX), about 45 km SSW. of the city of Trabzon, altitude ca 1900 m, in a wet forest with firs and beech trees, specimens found especially on moss-grown rocks but also on trunks of beech trees, 5-VI-1959 (74 specimens). Length of shells 15.3-19.8 mm, diameter 3.8-4.5 mm; whorls: 11-13.

The specimens of both localities were compared with two syntypes (S.M.F., 144181/2). Those from Dükkân are identical, those from Hamsiköy are a little smaller than the syntypes, otherwise they are alike.

Moreover it turned out, that neither the syntypes nor the specimens recorded here, have a clausilium with a notch near the top as was described by Küster (in Martini & Chemnitz, 1847-1862, p. 159). On the strength of Küster's statement Lindholm (1924) established the subgenus *Creniclavus*. Thiele (1931) and Zilch (1959/60) followed him, but Likharev (1962, p. 151) published a drawing of an entire clausilium and brought *A. hueti* (Mortillet) without further comments to *Armenica* s.s.

Comparing *A. hueti* (Mortillet) with a paratype of *A. euprepes* Biggs I

found that the two species are synonymous. The differences given by Biggs (1936) occur as individual variations within the series recorded here.

Distribution. — The type locality is "Ispir Armeniae" on the ruins of the castle. Other localities are: Province of Trebizond (= Trabzon); above Maçka, alt. ca 370 m (Biggs, 1936). These localities are in the vicinity of those where Vader collected the present material. Vader's specimens, however, were found at higher altitudes; that perhaps is the reason why they are smaller, especially those from Hamsiköy, the highest locality known for the species. Likharev (1962) mentioned the species from the Zakatalski reserve in the southern Caucasus.

Biotope. — The animals live on rocks and walls and on the trunks of beech trees.

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EXPLANATION OF THE PLATES

Plate XVIII

Figs. 1, 2. *Euxinastra fertilis* spec. nov., from three km south of Hamsiköy. 1, holotype, ventral view; 2, paratype, dorsal view.

Fig. 3, 4. *Euxinastra hamata* Boettger, from three km south of Hamsiköy. 3, ventral view; 4, dorsal view.

Figs. 5-7. *Armenica hueti* (Mortillet). 5, 6, from three km south of Hamsiköy; 7, from Dökkân. 5, 7, ventral view; 6, dorsal view.

Figs. 8-11. *Acrotoma (Acrotoma) concavelamellata* spec. nov., from three km south of Hamsiköy. 8, holotype, ventral view; 9, paratype, dorsal view; 10, paratype, right side of shell; 11, paratype right side of shell, opened to show clausilium.

Figs. 12, 13. *Armenica bicarinata* (Rossmässler), from "Cilician Gate". 12, ventral view; 13, dorsal view.

Figs. 14, 15. *Armenica brunnea* (Rossmässler), from "Cilician Gate". 14, ventral view; 15, dorsal view.

Figs. 16, 17. *Euxina (Euxina) circumdata* (Pfeiffer), from Rumeli Hisar. 16, ventral view; 17, dorsal view.

Plate XIX

Figs. 1, 2. *Armenica laevicollis* (Charpentier), from Boğazkale. 1, ventral view; 2, dorsal view.

Figs. 3, 4. *Albinaria (Bigibbosa) bigibbosa* (Charpentier), from Antalya. 3, ventral view; 4, dorsal view.

Fig. 5. *Albinaria (Bigibbosa) alajana* (Boettger), from Side; ventral view.

Fig. 6. Boğazkale, ruins of an old Hittitic city; the rocks of loose limestone formation in the background are the habitat of *Armenica laevicollis* (Charpentier).

Plate XX

Fig. 1. Pontus mountain range near Hamsiköy, habitat of *Serrulina serrulata* (Pfeiffer), *Serrulina semilamellata* (Mousson), *Euxinastra hamata* Boettger, *Euxinastra fertilis* spec. nov., *Acrotoma concavelamellata* spec. nov., and of *Armenica hueti* (Mortillet).

