

Two new *Albinaria* subspecies (Gastropoda Pulmonata: Clausiliidae) from the Ionian island of Kephallinia

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From the Ionian island of Kephallinia, *A. s. kolpomyrtensis* subsp. nov. and *A. jonica assicola* subsp. nov. are described. For *A. jonica* a neotype is designated.

Key words: Gastropoda, Pulmonata, Clausiliidae, *Albinaria*, taxonomy, Greece, Kephallinia.

INTRODUCTION

Within the framework of a multidisciplinary study on the systematics and the evolutionary history of the stylommatophoran genus *Albinaria* Vest, 1867, the forms represented on the neighbouring islands Kephallinia and Ithaka received special attention. In the present paper, two new subspecies are introduced, belonging to the wide-spread *Albinaria senilis* (Rossmässler, 1836) and the endemic Kephallinian *A. jonica* (Pfeiffer, 1866), respectively. Apart from morphological and biogeographical data, the results of allozyme analyses (see Kemperman & Degenaaers, in prep.) also indicate that these taxa deserve recognition. However, in the following descriptions, only conchological characters are mentioned. This is because there are hardly any published data on the structure of the genitalia, or on allozyme compositions, concerning the most closely related taxa. Thus comparisons would be impossible, unless data on a much larger group of (sub)species would be additionally provided. It is preferred here, to do so in a following, more extensive treatment of the entire *Albinaria* fauna of Kephallinia and Ithaka.

Collection numbers preceded by "A" refer to animals kept in 70% alcohol; the number of specimens is indicated after the slash. The other numbers apply to dry shells.

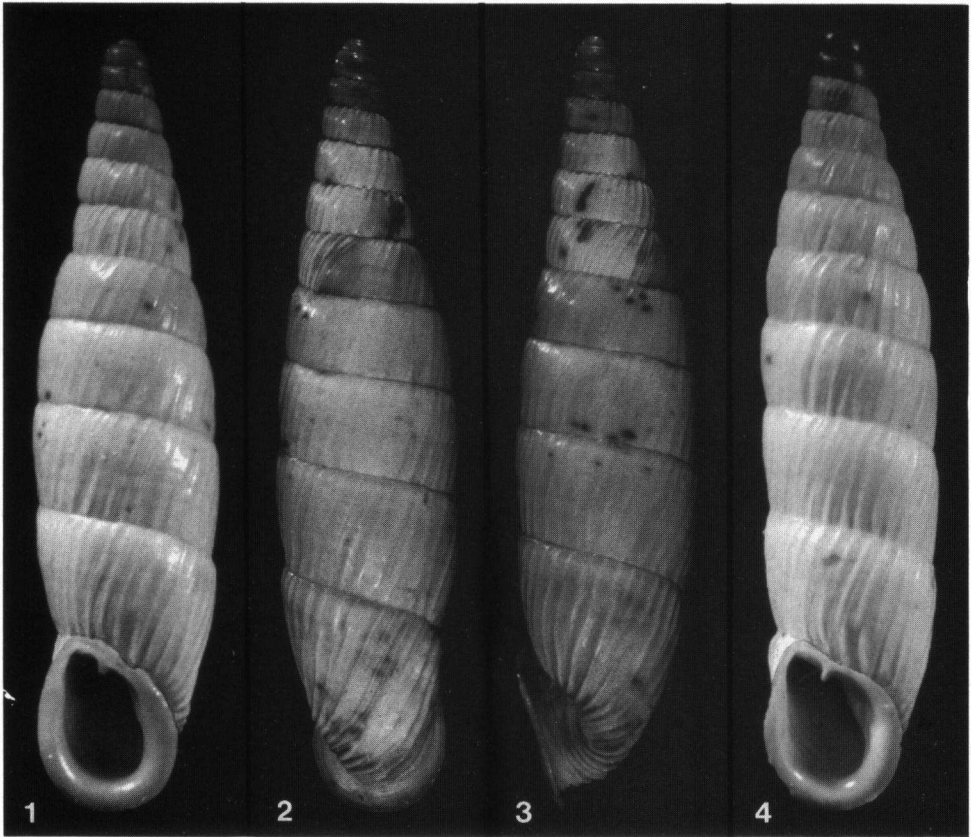
DESCRIPTIONS

Albinaria senilis (Rossmässler, 1836)

Albinaria senilis kolpomyrtensis subsp. nov. (figs. 1-4)

Diagnosis. — A relatively slender *A. senilis*, with flattened whorls, most of which provided with obsolete ribs.

Description. — Shell slender fusiform, with a height/width ratio of 4.1; upper part of the spire slightly concave in outline. There are 10-11 flattened whorls, with indented sutures; the body whorl measures almost 4/10 of the total shell height. Nuclear whorls



Figs. 1-4. *Albinaria senilis kolpomyrtensis* subsp. nov. 1-3, holotype (RMNH 56364), Kephallinia, 2 km NE. of Angon (= 15.4 km N. of Argostoli), 100 m S. of a bridge over a deep cleft, 260 m alt. (actual shell height 15.4 mm, width 3.6 mm); 4, paratype (RMNH 56365), type locality (actual shell height 15.4 mm, width 3.5 mm). Photographs 2, 3, A. 't Hooft (Lciden); 1, 4, E. Gittenberger.

smooth. The initial three teleoconch whorls with sharp, irregularly spaced ribs; on the adjoining teleoconch whorls the ribs are more or less obsolete. Penultimate whorl with $26 (\pm 4)$ [$n = 18$] slightly oblique ribs. Growth-lines very fine, running parallel to the ribs; no further microsculpture. A vague basal keel is indicated by a somewhat more prominent part of the cervical sculpture; a dorsal keel cannot be distinguished. The cervical ribs are somewhat more prominent and slightly more widely spaced than those on the penultimate whorl. Aperture roundish to oval and measuring c. $\frac{1}{4}$ of the shell height. Peristome always detached from the penultimate whorl; apertural lip somewhat reflected and not thickened. The shell is greyish cream, mostly with some sharply delimited dark grey speckles; the apex is brown. The aperture is dark yellowish brown inside; the apertural lip may be slightly lighter in colour.

Parietalis moderately high, extending less than $\frac{1}{4}$ whorl into the aperture; spiralis not in line with the parietalis, starting behind the parietalis. Columellaris very oblique and low; subcolumellaris only discernable in oblique view. Near the lunella, the spiralis runs as far as the principalis inside, or slightly deeper. Palatalis curved down in front; lunella obsolete. There is no callus between the palatalis and the lunella. Clausiliar style attached to the columella between $1\frac{1}{4}$ and $1\frac{3}{4}$ whorls higher than the apertural lip.

Shell height 11.9-14.1-16.1 mm; width 3.0-3.4-3.9 mm [n = 16].

Material (all samples from Kephallinia). — Holotype (RMNH 56364): 2 km NE. of Angon (= 15.4 km N. of Argostoli), 100 m S. of a bridge over a deep cleft, 260 m alt., on rocks along the road, UTM DH5642 (loc. 411); 29-iv-1987. Paratypes: locus typicus (RMNH 56365/29, A9266/5); 2 km NE. of Angon (= 15.4 km N. of Argostoli), S.-side of bridge over a deep cleft, 260 m alt., on rocks along the road, UTM DH5641 (loc. 241) (RMNH 56366/10 shells, A9276/5); 1.5 km NE. of Angon (= 14.5 km N. of Argostoli), on crumbling rock-face along the road, 255 m alt., UTM DH5641 (loc. 242) (RMNH 56367/15); 3 km N. of Angon (= 16.3 km N. of Argostoli), on high rock-faces along the road, 250 m alt., UTM DH5742 (loc. 412) (RMNH 56368/33, A9277/5); 5 km NE. of Angon (= 17.4 km NE. of Argostoli), on rocks along the road, 280 m alt., UTM DH5843 (loc. 413) (RMNH 56369/16, A9278/2).

Distribution. — *A. s. kolpomyrtensis* has been found along the west coast of northern Kephallinia, from 1.5 km NE. of Angon, northwards along the Kolpos Myrtou, to the coastal rocks 2 km NW. of Divarata, thus along a linear range of about 3 km. The cliffs dominating the entire coastal area might be inhabited by this subspecies, but because they are inaccessible, *A. s. kolpomyrtensis* can only be reported from rocks along the road. At the north, south and east, the range of *A. s. kolpomyrtensis* borders that of *A. c. contaminata* (Rossmässler, 1835).

Remarks. — Shells of *A. s. kolpomyrtensis* are more slender than those of both *A. s. senilis* and *A. s. flavescens* (Boettger, 1878) and are provided with more widely spaced, less prominent ribs. The shell surface resembles that of *A. s. flavescens*. The apertural lip is less broadly reflected than it is in *A. s. flavescens*. In *A. s. kolpomyrtensis* both the apertural lip and the aperture itself are brownish, whereas in *A. s. senilis* and *A. s. flavescens* a white apertural lip and a cream to brownish aperture are most common. *A. s. kolpomyrtensis* can be distinguished from *A. j. assicola* (see below) by the more flattened whorls with a more obsolete sculpture and a low, more oblique columellaris.

Nordsieck (1977) initially placed *A. jonica* in a "Gruppe der scopulosa". While reporting the rediscovery of *A. jonica* on Kephallinia, Nordsieck (1979: 66) mentioned material collected between Assos and Angon (see also Rähle, 1980). We seriously doubt whether *A. jonica* occurs south of the Cape of Asprokavos. *A. jonica* sensu Nordsieck (1979) and Rähle (1980) might be a mixture of *A. s. kolpomyrtensis* and *A. j. assicola*, which meet near the Cape of Asprokavos, where some introgression might occur, witnessed by specimens of *A. j. assicola* with a less prominent sculpture. This could explain why Nordsieck (1979) concluded that *A. jonica* should be transferred from the *scopulosa*-group to the *grissea*-group with, e.g., *A. senilis* and *A. contaminata*.

Derivatio nominis. — The epithet *kolpomyrtensis* is the Latin contraction of Kolpos Myrtou (Myrton Gulf).

Albinaria jonica (Pfeiffer, 1866)

Clausilia jonica Pfeiffer, 1866: 147; 1968: 432.

Clausilia (Albinaria) jonica; Rossmässler, 1896: 80, pl. 205 fig. 1280.

Clausilia ionica [sic]; Boettger, 1878: 124, pl. 148 fig. 7a-e.

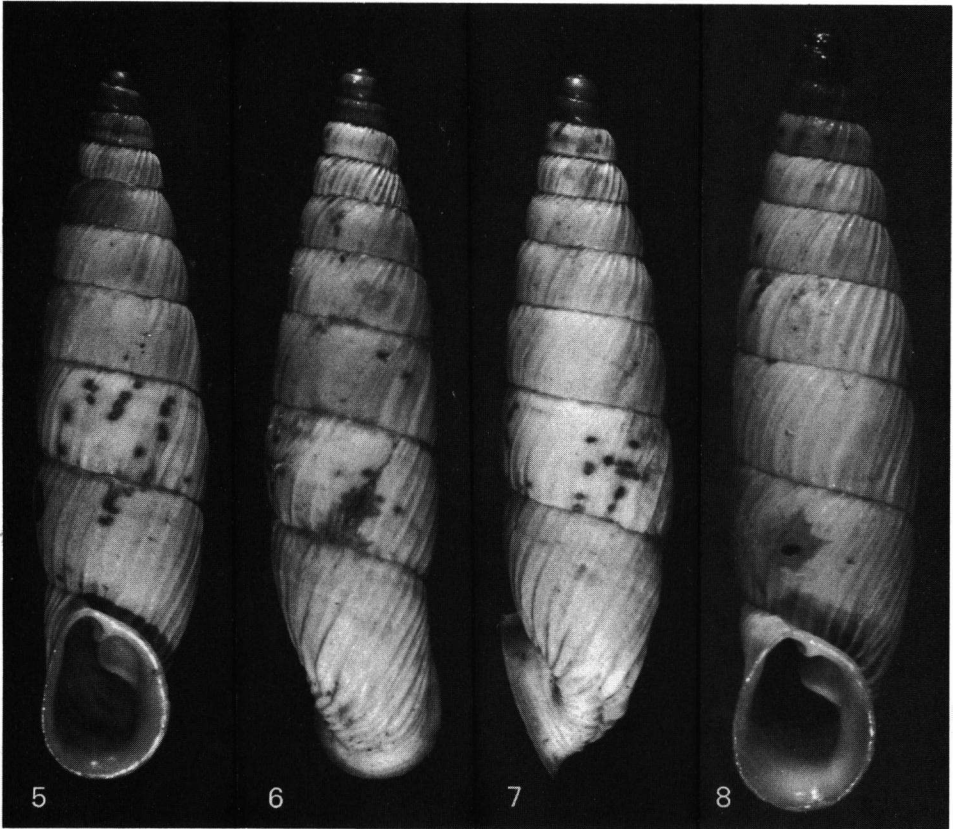
Pfeiffer (1866) described *A. jonica* after material provided by Parreyss, referring to only Kephallinia as type locality. Nordsieck (1979) reported the rediscovery of the species from the north-western coast of Kephallinia (see also Rähle, 1980). We found that *A. jonica* occurs in two widely disjunct subranges, near Assos and c. 4 km north (in a straight line) of Argostoli. On and near the Assos-peninsula *A. jonica* is the only *Albinaria* species, occurring abundantly, whereas 4 km north of Argostoli, the species is found in very low numbers, mixed with *A. s. senilis* on the same rocks. Shells of both areas differ in size and shape. The dimensions of the latter form coincide best with the measurements given by Pfeiffer (1866: 148), viz., $14 \times 3\frac{1}{2}$ mm for the shell and $3\frac{1}{2} \times 2\frac{1}{2}$ mm for the aperture. Boettger (1878: pl. 148 fig. 7a-e) figured a specimen of Mousson, which might originate from Parreyss (see also Nordsieck, 1977: fig. 1). These figures clearly resemble material from 4 km north of Argostoli. Hence we regard the southern subrange as *A. jonica* sensu Pfeiffer. Since syntypes of Pfeiffer are not in the collection of the British Museum (Natural History) (Dr. P. Mordan, personal communication, 1990), they were probably kept in the Stettin Museum (coll. Dohrn) (Dance, 1986: 210), which was totally destroyed during the Second World War. Therefore, the type material of *A. jonica* (Pfeiffer, 1866) is considered lost and conform art. 75 of the International Code of Zoological Nomenclature (1985), we have designated a neotype to stabilize the nomenclature of this polytypic species.

Albinaria jonica jonica (Pfeiffer, 1866) (figs. 5-8)

Diagnosis. — An *A. jonica* with slightly flattened whorls and more or less obsolete ribs; with only a vague basal furrow, not accompanied by a prominent keel. The spiralis starts behind the parietalis; columellaris high and not very oblique, reaching up to halfway the distance between the columella and the palatal wall.

Description. — Shell fusiform, with a height/width ratio of 4.0; upper part of the spire slightly concave to somewhat convex in outline. There are 9-10 slightly flattened whorls; the body-whorl measures c. 4/10 of the total shell height. Nuclear whorls without sculpture. Initial teleoconch whorls with sharp and more or less irregularly spaced ribs; on the adjoining whorls the ribs become very low to obsolete. Penultimate whorl with c. $33 (\pm 4)$ [$n = 15$] oblique ribs. Growth-lines running parallel to the ribs; no further microsculpture. Body-whorl rounded towards the shell base, which is provided with a vague basal furrow and an obsolete basal keel. Cervical ribs of the same size and as widely spaced as those on the teleoconch. The aperture is roundish to slightly oval, measuring $\frac{1}{4}$ of the total shell height. Peristome always detached from the penultimate whorl; apertural lip hardly reflected and not thickened. The more or less shiny shell is greyish cream, generally with some speckles and small blotches; the apex is somewhat darker to brown. The inside of the aperture and the apertural lip are yellowish cream.

Parietalis long, extending more than $\frac{1}{4}$ whorl into the aperture; spiralis not in line with the parietalis, usually starting behind the parietalis. Columellaris high, protruding into the aperture up to halfway the palatal wall; subcolumellaris only visible in oblique view. Near the lunula, the spiralis runs clearly beyond the principalis; the palatalis is narrow and somewhat curved down in front; the lunella is well developed, rather narrow, and sometimes interrupted. Clausiliar style attached to the columella c. $1\frac{1}{4}$ whorl higher than the apertural lip.



Figs. 5-8. *Albinaria jonica jonica* (Pfeiffer). 5-7, neotype (RMNH 56370), Kephallinia, Akr. Kokkinos Vrachos, 4 km N. of Argostoli, 75 m alt. (actual shell height 13.4 mm, width 3.4 mm); 8, type locality (actual shell height 12.8 mm, width 3.0 mm). Photographs A. 't Hooft (Leiden).

Shell height 12.5-13.5-15.5 mm; width 3.1-3.4-3.6 mm [n = 15].

Type material. — Neotype (RMNH 56370): Kephallinia, Akr. Kokkinos Vrachos, 4 km N. of Argostoli, 75 m alt., on W. exposed rocks along the road, UTM DH5430 (loc. 045); 06-viii-1982.

Distribution. — *Albinaria j. jonica* has only been collected on rock-faces along the high coastal road, from 50 m north of the most western point of Akros (Cape) Kokkinos Vrachos to ca. 500 m north of Akros Kokkinos Vrachos.

Remarks. — *A. j. jonica* can be distinguished from *A. senilis senilis* by its slightly smaller, more slender shell, with less distinct ribs. The columellaris of *A. j. jonica* is high and not very oblique, whereas that of *A. s. senilis* is low and less clearly protruding into the aperture. Compared with *A. j. assicola*, shells of the nominate subspecies are somewhat larger, less slender and provided with more widely spaced and more obsolete ribs.

A. j. jonica lives fully sympatrical with *A. s. senilis*, which means that individuals of both species share the same rocks and shelter places. Morphologically intermediate specimens between *A. j. jonica* and *A. s. senilis* have only been found in the northernmost 100 m of the range of *A. j. jonica*.

***Albinaria jonica assicola* subsp. nov. (figs. 9-12)**

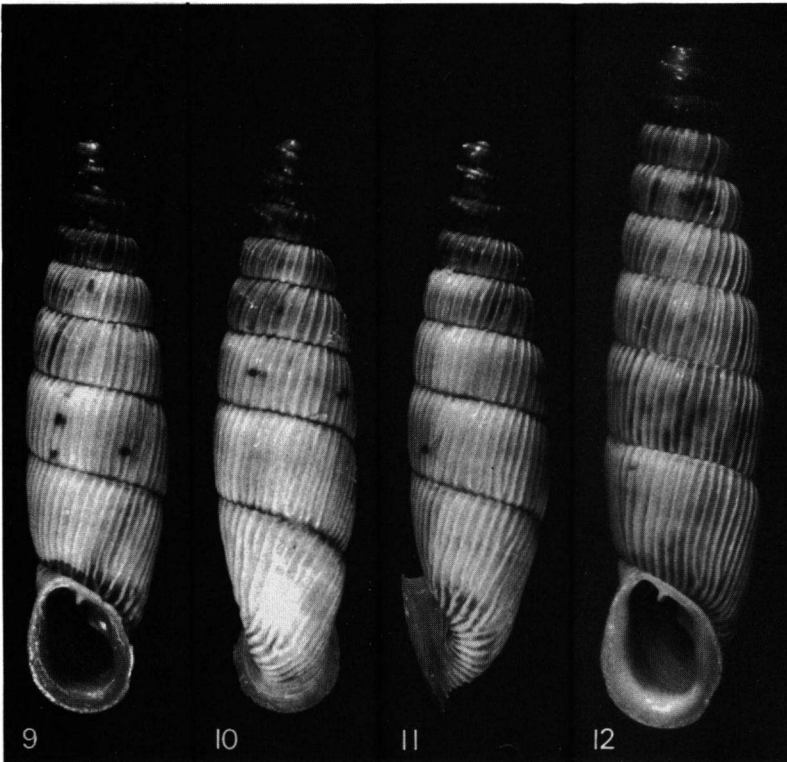
Diagnosis. — A small and slender *A. jonica* with somewhat globose whorls, covered with fine, distinct ribs; dorsal keel not discernable. The spiralis starts before the apical end of the parietalis; columellaris moderately high, reaching up to 1/3 the distance of the columella to the palatal wall.

Description. — Shell slender fusiform, with a height/width ratio of 4.3; upper part of the spire slightly concave to straight in outline. There are 8.5-10 somewhat inflated whorls; the body-whorl measures c. 4/10 of the total shell height. Nuclear whorls smooth. Ribs on the entire teleoconch fine and low but distinct; on the penultimate whorl there are c. 42 (\pm 4) [$n = 18$] oblique ribs. Very fine growth-lines run parallel with the ribs; no further microsculpture. Body-whorl somewhat flattened towards the shell base, without a basal furrow; basal keel obsolete. The cervical ribs are as prominent as those on the penultimate whorl; at the shell base, the ribs are slightly more prominent. Aperture relatively small, oval, measuring c. 1/5 of the shell height. Peristome always detached from the penultimate whorl, with a more or less broadly reflected lip. The generally dull shell is light to dark greyish brown, with some vague dark blotches or speckles; the apex is brown. The inside of the aperture is cream to yellowish brown; the apertural lip might be somewhat lighter.

Parietalis high and sharp, relatively long, extending more than 1/4 whorl inside the aperture. The spiralis is not in line with the parietalis and starts before the apical end of the parietalis. Columellaris high, protruding into the aperture up to a third of the distance between the columella and the palatal wall; subcolumellaris only visible in oblique view. Near the lunula, the spiralis runs only slightly further than the principalis. The palatalis is short and somewhat curved down in front; the lunella is relatively well developed but narrow and sometimes more or less clearly interrupted. Clausiliar style attached to the columella 1 1/4 whorl higher than apertural lip.

Shell height 10.1-11.9-14.6 mm; width 2.3-2.8-3.1 mm [$n = 50$].

Material (all samples from Kephallinia). — Holotype (RMNH 56371): Assos-peninsula (23 km NNE. of Argostoli), 100 m alt., UTM DH5948 (loc. 007); 4-v-1979. Paratypes: locus typicus (RMNH 56372/127, A9279/16; Assos peninsula (23 km NNE. of Argostoli), 75 m alt., UTM DH5948 (loc. 049) (RMNH 56374/136, A9280/14); 0.5 km N. of junction from main coastal road to Assos (= 12.5 km NNE. of Argostoli), 370 m alt., on rocks, UTM DH6147 (loc. 343) (RMNH 56375/9, A9281/5); Markantonata (deserted village, 30.8 km N. of Argostoli), 130 m alt., on walls of ruins, UTM DH6056 (loc. 352) (RMNH 56376/19, A9282/7); Steliata (deserted village, 30.4 km NNE. of Argostoli), 180 m alt., on/in shaded walls of ruins, UTM DH6056 (loc. 355) (RMNH 56377/57); Vasilikiades (= 26.3 km NNE. of Argostoli), 350 m alt., on house ruins, UTM DH6151 (loc. 360) (RMNH 56378/13); 1 km S. of Enosi near Vasilikiades (= 25.4 km NNE. of Argostoli), 340 m alt., on rocks along road, UTM DH5161 (loc. 369) (RMNH 56379/9, A9283/1); Drapanitika (= 25.3 km NNE. of Argostoli), 120 m alt., on rocks along road, UTM DH6150 (loc. 370) (RMNH 56380/5, A9284/1); Kokolata (= 23.8 km NNE. of Argostoli), 400 m alt., on yard-wall, UTM DH6149 (loc. 371) (RMNH 56381/11, A9285/4); 0.5 km S. of Kothreas (= 24.1 km NNE. of Argostoli), 400 m alt., on rocks along road, UTM DH6149 (loc. 372a) (RMNH 56382/2); Kothreas (= 24.6 km NE. of Argostoli), 370 m alt., on stones along road, UTM DH6150 (loc. 373)



Figs. 9-12. *Albinaria jonica assicola* subsp. nov. 9-11, holotype (RMNH 56371), Kephallinia, Assos-peninsula (23 km NNE. of Argostoli), 100 m alt. (actual shell height 10.3 mm, width 2.7 mm); 12, paratype (RMNH 56372), type locality (actual shell height 10.6 mm, width 2.5 mm). Photographs A. 't Hooft (Leiden).

(RMNH 56383/3, A9286/2); 0.5 km S. of junction from main coastal road to Drapanitika (= 24.2 km NNE. of Argostoli), 350 m alt., on rocks along road, UTM DH6149 (loc. 374) (RMNH 56384/6, A9293/1); half-way between junctions from main coastal road to Drapanitika and Depharinata (= 23.4 km NNE. of Argostoli), 350 m alt., on rocks along road, UTM DH6148 (loc. 375) (RMNH 56385/12, A9294/7); near junction from main coastal road to Depharinata (= 22.5 km NNE. of Argostoli), 300 m alt., on rocks along road, UTM DH6148 (loc. 376) (RMNH 56386/4, A9295/2); Depharinata (= 22.9 km NNE. of Argostoli), 405 m alt., on rocks and walls near church, UTM DH6248 (loc. 377a) (RMNH 56387/3, A9296/2); 1 km E. of Depharinata along road to Vary (= 23.1 km NNE. of Argostoli), 410 m alt., on rocks, UTM DH6247 (loc. 378) (RMNH 56388/2); Vary (= 24.0 km NNE. of Argostoli), 400 m alt., on house-wall; UTM DH6349 (loc. 379) (RMNH 56389/3, A9297/2); 2 km N. of junction for Assos along main coastal road (= 22.3 km NNE. of Argostoli); 310 m alt., UTM DH6147 (loc. 383) (RMNH 56390/7, A9298/3); opposite junction from main coastal road to Assos (= 21 km NNE. of Argostoli), 380 m alt., on rocks along road, UTM DH6146 (loc. 387) (RMNH 56391/11, A9298/3); c. 1.5 km S. of junction from main coastal road to Assos (= 20 km NNE. of Argostoli), 300 m alt., on rocks along road, UTM DH6145 (loc. 388) (RMNH 56392/24, A9299/7); Assos-peninsula (= 22.5 km NNE. of Argostoli), 5-75 m alt., rocks and stones along lower part of road to main entrance of fortress, UTM DH5948 (loc. 742) (RMNH 56393/7); Assos-peninsula, (= 22.5 km NNE. of Argostoli), 75-150 m alt., rocks along higher part of road to main entrance

of fortress, UTM DH5948 (loc. 743) (RMNH 56394/28); Assos-peninsula, (= 22.5 km NNE. of Argostoli), 100 m alt., fortress and southern rocks, UTM DH5948 (loc. 744) (RMNH 56395/6).

Populations somewhat resembling *A. s. kolpomyrtensis* in size and sculpture (not considered paratypes): at junction from main coastal road to Patrikata (= 22.4 km NNE. of Argostoli), 320 m alt., on stones of sheep-barn along N. side of road, UTM DH6147 (loc. 385a); 1.1 km N. of junction from main coastal road to Assos (= 21.8 km NNE. of Argostoli), 280 m alt., on rocks along road, UTM DH6147 (loc. 386a); Akros Asprokavos (= 19.2 km NNE. of Argostoli), 300 m alt., on rocks along road, UTM DH6045 (loc. 390); Akr. Asprokavos (= 19.3 km NE. of Argostoli), 300 m alt., on rocks along road, UTM DH6045 (loc. 477); Akr. Asprokavos (= 19.3 km NNE. of Argostoli), alt. 300 m, on rocks along road, UTM DH6045 (loc. 741); 100 m S. of Akr. Asprokavos (= 19.0 km NNE. of Argostoli), 300 m alt., on rocks along road, UTM DH6044 (loc. 745).

Distribution. — *A. jonica assicola* occurs from a few km west of Fiskardo in the north, along the west side of the island, to Akros (Cape) Asprokavos, 3 km south of Assos. The center of its distribution range is the Assos-peninsula and the adjacent area on the main island, where *A. jonica assicola* is the only *Albinaria*. More to the east and to the north, the range of *A. jonica assicola* overlaps with that of *A. contaminata contaminata*. Morphologically intermediate forms have been found in this area of overlap.

Derivatio nominis. — The epithet *assicola* is Latin for "inhabitant of Assos".

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