

***Albinaria cretensis* group: definition of the species and subspecies,
with the description of new taxa
(Gastropoda, Pulmonata, Clausiliidae)**

Hartmut NORDSIECK

Rathenaustraße 8, D-65326 Aarbergen-Rückershausen, Germany; hnords@t-online.de

The valid species taxa of the *Albinaria cretensis* group sensu Nordsieck (1977) are defined, and their types, as far as available, are figured. Distributional data of the taxa and arguments for the proposed classification are given. The following taxa are described as new: *Albinaria eburnea inflaticollis* subsp. nov., *A. e. samariae* subsp. nov., *A. troglodytes niproensis* subsp. nov., *A. virginea gavdopoulensis* subsp. nov., *A. v. gavdosensis* subsp. nov., and *A. v. litoralis* subsp. nov.

Key words: Gastropoda, Pulmonata, Clausiliidae, *Albinaria*, taxonomy, new taxa, Greece, Crete.

INTRODUCTION

The *cretensis* group of the genus *Albinaria* Vest, 1867 (Nordsieck, 1977: 299) is the most 'difficult' of its species groups, because the species taxa involved are morphologically very similar, partly occurring sympatrically without transitions and partly connected by transitional forms (Nordsieck, 1999: 11-12). Precondition for a revision of the whole group or for an investigation of certain taxa is a basic knowledge of the respective taxa, i. e. the possibility to identify and to name the taxa under discussion correctly. Therefore, the aim of this paper is to define the valid taxa by their distinctive characters and to figure their types if available. The given distributional data of the taxa shall be a further support for their determination.

MATERIAL AND METHODS

The material on which the given information is based comprises about 900 samples, which were collected in the last decades, and about 300 samples from old collections, including type or original material of nearly all taxa concerned. It is in the collections of the following institutions (with abbreviations used): British Museum (Natural History), London [BM(NH)], Haus der Natur, Cismar (HNC), Nationaal Natuurhistorisch Museum, Leiden (NNM), Naturhistorisches Museum, Wien (NMW), Senckenberg-Museum, Frankfurt am Main (SMF), Természettudományi Múzeum Állattára, Budapest (TMB), and the private collections of W. Fauer (FAU, now Zoologisches Institut und Museum der Universität Hamburg), J. Hemmen (HEM) and of the author (N, now Staatliches Museum für Naturkunde, Stuttgart).

Most samples of the material were determined and only more carefully examined, if problematic. The type material, the material of the new taxa and that of sympatric occurrences was examined using the methods which are described in Nordsieck, 1998 (: 123).

HISTORY

Boettger (1878) included eight Cretan species in his *byzantina* group: *Clausilia byzanti-*

na Charpentier, 1852; *C. pura* O. Boettger, 1878; *C. deglupta* O. Boettger, 1878; *C. strigata* L. Pfeiffer, 1850; *C. virginea* L. Pfeiffer, 1846; *C. cretensis* Rossmässler, 1836; *C. troglodytes* A. Schmidt, 1868, and *C. strictecostata* O. Boettger, 1878. Possibly, *C. strigata* was wrongly determined by Boettger (Nordsieck, 1996: 94), but the name which this species bears since 1878 should continue to be used until the case is decided by tracing the type material. *C. troglodytes* which is also not verified by original material may be determined correctly by Boettger, because the diagnosis of A. Schmidt (1868: 90-91) fits this species exactly. *C. strictecostata*, which later on was confounded with other species by Boettger (1889) and following authors (A. J. Wagner, 1924b; Loosjes, 1955; Nordsieck, 1999), could be clearly identified by its figure (Boettger, 1878: pl. 145 fig. 6). It should be pointed out that several localities of the samples collected by Blanc which Boettger had at his disposal may be wrong, e. g. those of *C. byzantina* in and near Rethimno and those of *C. troglodytes* near Chania, because these species do not occur there.

Boettger (1883a) described further species of the *cretensis* group from material collected by Spratt (*C. subvirginea* O. Boettger, 1883; *C. sublamellosa* O. Boettger, 1883) and identified species which had been described by L. Pfeiffer as belonging to this group (*C. glabella* L. Pfeiffer, 1864 = *C. pura* + *C. deglupta*; *C. tenuicostata* L. Pfeiffer, 1864, to which *C. strictecostata* was affiliated; *C. eburnea* L. Pfeiffer, 1854).

Boettger (1883b) described a further species of the group from material collected by Maltzan (*C. grabusana* O. Boettger, 1883) and ranked *C. tenuicostata* var. *heteroptyx* Boettger, 1883, as a separate species. Maltzan (1887) described a new variety of *C. cretensis* which Boettger had overlooked (*C. c.* var. *sphakiota* Maltzan, 1887).

Boettger (1889) gave detailed information on the distribution of the species recognized by him, based on material collected by Oertzen and Maltzan. However, part of this information is incorrect because of unclear localities and wrong determinations. Westerlund (1892) described some, but not all, varieties of the species from the material of Maltzan which had been named by Boettger on the labels.

Finally, the system of Boettger was as follows:

- C. byzantina* (with vars. *solidula* L. Pfeiffer, 1856, *adpersa* O. Boettger, 1878);
- C. glabella* (with vars. *pura*, *deglupta*, *semialba* O. Boettger, 1878, *spratti* O. Boettger, 1883);
- C. eburnea*;
- C. strigata* (with vars. *orientalis* O. Boettger, 1883, *acuticosta* Westerlund, 1892, *centralis* Westerlund, 1892);
- C. grabusana* (with var. *humillima* O. Boettger, 1883);
- C. virginea* (with var. *leucoderma* Westerlund, 1892);
- C. subvirginea* (with var. *farcimen* Westerlund, 1884);
- C. cretensis* (with var. *sphakiota* Maltzan, 1887);
- C. troglodytes* (with vars. *vexans* O. Boettger, 1883, *interpres* Westerlund, 1892);
- C. sublamellosa* (with var. *obliterata* O. Boettger, 1883);
- C. heteroptyx*;
- C. tenuicostata* (with vars. *strictecostata*, *omalica* Westerlund, 1892, *mitis* Westerlund, 1892).

A. J. Wagner (1924a) described several subspecies from material of Sturany and Dörfler (of which, however, none was really new) and classified (1924b) the species of the *cretensis* group with two species groups, the group of *A. byzanthina* (sic!) and that of *A. cretensis*. *C. sublamellosa* was classified (1924c) with *Delima* (*Priodelima*) A. J. Wagner, 1924, because its penial coecum was missing. Evidently, Wagner's system compared to that of Boettger was no progress.

Loosjes (1955) determined species of the *cretensis* group from material of Wettstein and Rechner, following the system of Boettger (except *C. sublamellosa* which he classified like A. J. Wagner). Also in this paper some wrong distributional data are given, because of wrong localities or wrong determinations.

Nordsieck (1977) defined the *cretensis* group (p. 298) and proposed a revision of Boettger's system, based mainly on material of Fauver. Most of Boettger's species (*C. byzantina*, *C. strigata*, *C. grabusana*, *C. virginea*, *C. subvirginea*, *C. cretensis*, *C. troglodytes*, *C. tenuicostata*) were provisionally united in the species *A. cretensis*, while *A. sublamellosa* (with *C. heteroptyx*) and *A. eburnea* (with *C. glabella*) were recognized as separate species. *A. cretensis* was regarded as a complex of developing species which partly occur sympatrically without transitions and partly are connected by transitional forms.

Nordsieck (1999), after an investigation of further material, especially from Hemmen and Lindner, subdivided the *A. cretensis* complex (p. 11-13) into five species, *A. cretensis*, *A. troglodytes*, *A. tenuicostata*, *A. virginea*, and *A. sphakiota*. For this subdivision morphological differences and distributional relations (sympatric or parapatric occurrences without transitions) were decisive. To these species, sixteen taxa were affiliated as subspecies, based on morphological similarity and the presence of transition zones.

Welter-Schultes (2000) refused to accept this classification and defended the former classification (Nordsieck, 1977) against the new one (Nordsieck, 1999). His objections to the latter (p. 45-46) which are formulated in three theses (I-III) are partly inadequate (I, because the new classification was provisional and not the result of a revision) and partly wrong (II, because the named taxa of former authors are sufficiently diagnosed; III, because the species are defined not only by distributional relations, but also morphologically). He tried to define the species of the *cretensis* group (p. 45, 48, 56) and to demonstrate their variability by figures (figs 33-34, 35, 53).

Gittenberger et al. (2001) made probable by allozyme and DNA analyses that two forms of the *A. cretensis* complex occurring sympatrically in the Imbros and Aradena gorges (*A. sphakiota* and *A. troglodytes* sensu Nordsieck, 1999) are really separate species. Problems with the taxa names which in this paper are obvious show that definitions with correct denomination of the taxa of the *cretensis* group are urgently needed.

RESULTS

The main result which is based on a material much more extensive than that of the provisional subdivision (Nordsieck, 1999) is that this subdivision except of some minor changes is confirmed. These changes are the following:

1. *A. cretensis* and *A. byzantina* are considered separate species, because they differ morphologically more than the subspecies of the other species (see Definitions) and are not connected by transitional forms which could occur on the Akrotiri peninsula.

2. *A. virginea strictecostata* sensu Nordsieck, 1999, comprises two forms which are externally similar but are classified with different species. In the true *C. strictecostata* there is a tendency to develop an anterior lower palatal plica (basalis), as in subspecies of *A. troglodytes*; it is therefore classified with that species. This relationship is confirmed by the genetical investigations of Gittenberger et al. (2001). The other form ranked with *A. v. strictecostata* sensu Nordsieck has no tendency to develop a basalis and is connected by transitions with *A. v. virginea* and *A. v. strigata*. It remains therefore as a subspecies of *A. virginea* and is newly described as *A. v. litoralis* subsp. nov.

3. *A. tenuicostata grabusana* is no longer considered a subspecies next to *A. t. tenuicostata*, because the differences formerly stated could not be confirmed by the investigation of the larger material which was available for this work.

DEFINITION AND DISTRIBUTION OF THE TAXA

The following characters are important for the definitions of all taxa: 1, sculpture; 2, shape of body whorl (keels); 3, development of inferior lamella; 4, tendency to develop an anterior lower palatal plica (= basalis). The following characters are only important for some taxa, because in most taxa they are constantly (normally) developed: 5, development of parallel lamella; 6, development of subcolumellar lamella; 7, position of lunellar.

The characters are developed as follows (character states used in the definitions in brackets).

1. The sculpture of riblets on the teleoconch differs in prominence and spacing; in several taxa it is obsolete on the lower whorls, except for the final part of the body whorl, the cervix, which in all species is ribbed [prominently / weakly ribbed, smooth (ribs obsolete)].

2. In addition to the main keel = basal keel of the body whorl a differently prominent second keel = dorsal keel is present or missing [dorsal keel prominent / weak / missing].

3. The inferior lamella ascends more or less steeply on the columella [inferior lamella more straightly / more s-like ascending] and protrudes more or less into the lumen of the body whorl [inferior lamella high / moderately high / low].

4. The lunella is simple or more or less spur-like broadened below, i. e. a rudiment of the basalis is present [lunella without / with basalis rudiment].

For the characters 5-7 the normal development is not given in the definition.

5. The parallel lamella by the side of the spiral lamella is in most taxa indistinct or missing, but in some taxa more distinct [parallel lamella distinct].

6. The subcolumellar lamella is not easily visible in an oblique view into the aperture, but in some taxa visible far inwards [subcolumellar lamella well visible].

7. In most taxa the lunellar is situated dorsolaterally, but in some taxa it is laterally to ventrolaterally [lunellar deep-seated] or dorsally [lunellar advanced]. In correlation with this character the clausilium plate is in most taxa partly or fully visible in an oblique view in the aperture, but less so in taxa with deep-seated lunellar [clausilium plate less visible] and better in taxa with advanced lunellar [clausilium plate better visible]. As an exception *A. sphakiota* has a deep-seated lunellar but an easily visible clausilium plate because of the spirally ascending columella.

The *cretensis* group is defined by the absence of the palatal plicae (except the rudimentary basalis which is present in some taxa of the group). The other *Albinaria* taxa of western Crete belong to the *candida* group (Nordsieck, 1977: 299-300). In order to facilitate the determination of the taxa under discussion those of the *candida* group are shortly defined, and their distribution is given.

Albinaria candida (L. Pfeiffer, 1850)

Recognizable by the high inferior lamella and the well-developed basalis, while the anterior upper palatal plica is short or reduced.

Northwestern Crete in the coastal region near Chania between Platanias and Souda including Agii Theodori island and on the Akrotiri peninsula and Drapano peninsula.

Albinaria amalthea (Westerlund, 1878)

Recognizable by the well-developed basalis and the mostly well-developed anterior upper palatal plica; the inferior lamella is lower than in *A. candida*.

Northwestern Crete south of the coastal region near Chania between Manoliopoulo

and Malaxa, south to Meskla and Therisso.

Both species live sympatrically with species of the *cretensis* group in several localities.

Albinaria xanthostoma (O. Boettger, 1883)

Characterized by the low inferior lamella, the emerging subcolumellar lamella and the more or less distinct basalis. The anterior upper palatal plica is missing.

Northwestern Crete on the Rodopou peninsula.

Notes . – A form transitional to *A. tenuicostata* is found on the Rodopou peninsula at Cape Spada. As far as known, *A. xanthostoma* does not occur sympatrically with species of the *cretensis* group. *Albinaria loosjesi* Nordsieck, 1977, from the Agria Gramvoussa island which was described as a subspecies of *A. xanthostoma* differs from this species mainly by the non-emerging subcolumellar lamella and the occasional presence of the anterior upper palatal plica. It may be a species on its own.

The following definitions of the species and subspecies of the *cretensis* group, as far as widespread taxa are concerned, refer to the form which occupies the main part of the range. If extreme or transitional forms are considered the definitions become so vague that determination is rendered much more difficult.

The ranges of widespread taxa are given as regions roughly delimited by imaginary boundary-lines marked by a series of certain localities.

Albinaria byzantina (Charpentier, 1852) (fig. 1)

Lower whorls ribbed to smooth (ribs obsolete); dorsal keel weak or missing; parallel lamella more or less distinct; inferior lamella more straightly ascending, moderately high or low; lunella without basalis rudiment.

Northwestern Crete north of a line (from west to east) Platania - Kirtomados - Mournies - Malaxa - Kalami, southwestern part of Akrotiri peninsula, easternmost part of Drapano peninsula.

Synonyms: *Clausilia solidula* L. Pfeiffer, 1856; *C. byzantina* var. *adpersa* O. Boettger, 1878; *C. b.* var. *adpersa* f. *convexior* O. Boettger, 1878.

Note. – *Clausilia b.* var. *adpersa* (with f. *convexior*) (types SMF 66467, 66469) is a form of *A. byzantina* which has a bluish white shell with weak sculpture on the lower whorls, but prominent cervical sculpture. It is thus similar to *A. e. glabella*. The given locality (surroundings of Rethimno) is probably wrong; its actual range is unknown.

Albinaria cretensis (Rossmässler, 1836) (fig. 2)

Lower whorls smooth (ribs obsolete); dorsal keel missing; inferior lamella more s-like ascending, moderately high or low; lunella without basalis rudiment.

Northwestern Crete: northeastern part of Akrotiri peninsula.

Synonym: *A. cretensis microtypica* A. J. Wagner, 1924.

Albinaria troglodytes (A. Schmidt, 1868)

Albinaria t. troglodytes (fig. 3). – Lower whorls ribbed to smooth (ribs obsolete); dorsal keel prominent to weak; inferior lamella more s-like ascending, more or less high; lunella with a more or less distinct basalis rudiment.

Northwestern Crete north of a line (from west to east) Kalami - Stilos - Fres -

Alikambos - Georgioupolis.

Albinaria t. niproensis subsp. nov. (fig. 4). – Like *A. t. troglodytes*, but dorsal keel more prominent and basalis rudiment more distinctly developed.

Southwestern Crete from Chora Sfakion and Askifou in the west to Rodakino and Assi Gonia in the east, except the coastal region.

Albinaria t. strictecostata (O. Boettger, 1878) (fig. 5). – Lower whorls more or less prominently ribbed; dorsal keel more or less prominent; inferior lamella more s-like ascending, moderately high or high; lunella partly with basalis rudiment.

Southwestern Crete: coastal region from Aradena in the west to Chora Sfakion in the east.

Note: *C. strictecostata* was founded on specimens from the collection of Fitz-Gerald. Because original specimens are not traceable, a neotype (SMF 66538a, fig. 5) is designated. It was collected by Spratt who may also have collected the Fitz-Gerald material. The designation of a neotype is necessary because *A. t. strictecostata* must be delimited against *A. v. litoralis* subsp. nov. with which it has been confounded by several authors (O. Boettger, 1889; Loosjes, 1955; Nordsieck, 1999).

Albinaria t. subvirginea (O. Boettger, 1883) (fig. 6). – Lower whorls more or less weakly ribbed; dorsal keel mostly weak; inferior lamella more s-like ascending, more or less high; lunella without basalis rudiment.

Southwestern Crete: coastal region from Chora Sfakion in the west to Rodakino in the east.

Synonym: *C. subvirginea* var. *farcimen* Westerlund, 1884.

Note: *C. s.* var. *farcimen* (original specimens SMF 66486) is a form transitional to *A. t. niproensis* subsp. nov..

Albinaria t. vexans (O. Boettger, 1883) (fig. 7). – Lower whorls weakly ribbed to smooth (ribs obsolete); dorsal keel mostly weak; inferior lamella more or less receding, more s-like ascending, more or less high; lunellar in part more deep-seated, clausilium plate correspondingly less visible; lunella with a more or less distinct basalis rudiment.

Southwestern Crete: coastal region from Cape Kalotrividis in the west to Aradena in the east, lower Samaria gorge.

Synonym: *C. troglodytes* var. *interpretes* Westerlund 1892.

Note: The typical form of the subspecies (type SMF 66493) from Agia Roumeli has a lunellar in normal (dorsolateral) position; in *C. t.* var. *interpretes* (original specimens SMF 66496) from Anopoli it is more deep-seated (lateral).

Albinaria tenuicostata (L. Pfeiffer, 1864)

Albinaria t. tenuicostata (figs 8-9). – Lower whorls ribbed to smooth (ribs obsolete); dorsal keel mostly weak; inferior lamella more s-like ascending, moderately high or low; lunella without basalis rudiment; clausilium plate mostly better visible.

Western Crete from a line (from north to south) Topolia - Sirikari - Plokamiana - Kondokinigi - Paleochora in the west to a line (from north to south) Nea Roumata - Agia Irini - Koustogerako - Sougia in the east, Korikos peninsula. Forms transitional to *A. v. strigata* in the regions of Kondokinigi, Kandanos, Strovles and Kastelli.

Synonyms: *Clausilia grabusana* O. Boettger, 1883; *C. g.* var. *humillima* O. Boettger, 1883; *C. tenuicostata* var. *mitis* Westerlund, 1892.

Notes: The type series of *C. tenuicostata* [BM(NH) 1954.3.8.15-19] consists of five specimens, as far as can be concluded from the morphological differences, from three different localities. The lectotype designated by Welter-Schultes (1998: 47) (fig. 8) does not fit the measurements given by Pfeiffer but probably comes from the same locality as the specimen better corresponding to these measurements.

Clausilia grabusana (with var. *humillima*) (types SMF 66523, 66527) from the Korikos peninsula is a weakly sculptured form of *A. tenuicostata*, with weak dorsal keel and a cervical sculpture less coarse than in the typical form.

Albinaria t. omalica (Westerlund, 1892) (fig. 10). – Like *A. t. tenuicostata*, but prominently ribbed.

Southwestern Crete: Omalos region.

A further yet undescribed subspecies of *A. tenuicostata* which occurs in the region of Cape Tripiti differs from the nominate subspecies by the receding inferior lamella and the deep-seated lunellar. The available material is yet too scarce for description.

Albinaria virginea (L. Pfeiffer, 1846)

Albinaria v. virginea (fig. 11). – Lower whorls more or less smooth (ribs obsolete); dorsal keel more or less prominent; inferior lamella more s-like ascending, high or moderately high; lunella without basalis rudiment. Shell uniformly white.

Southwestern Crete from Sellia and Agios Ioannis in the west to Ardaktos and Spili in the east, except the coastal region, summits of Kedros and Siderotas mountains.

Synonyms: *C. virginea* var. *leucoderma* Westerlund, 1892; *A. virginea vianensis* A. J. Wagner, 1924.

Albinaria v. strigata (L. Pfeiffer, 1850, sensu O. Boettger, 1878) (figs 12-13). – Lower whorls ribbed to smooth (ribs obsolete); dorsal keel prominent to weak; inferior lamella and lunella like *A. v. virginea*. The shell has a tendency to be spotted.

Western Crete, western part of the range from a line (from north to south) Kastelli - Polirinia - Kambos - Papadiana - Spaniakos to Nerokouros, Meskla and Omalos in the east, eastern part of the range from a line (from west to east) Askifou - Argiroupoli - Agios Vassilios - Lambini - Kissos - Orne - Agios Ioannis - Fourfouras - Arkadi - Agios Mamas - Perama to the coast. Forms transitional to *A. t. troglodytes* southwest of Rethimno (regions of Kournas, Argiroupoli, Atsipopoulo-Gonia).

Synonyms: *Clausilia strigata* var. *orientalis* O. Boettger, 1883 [non L. Pfeiffer, 1842]; *C. s. var. acuticosta* Westerlund, 1892; *C. s. var. centralis* Westerlund, 1892.

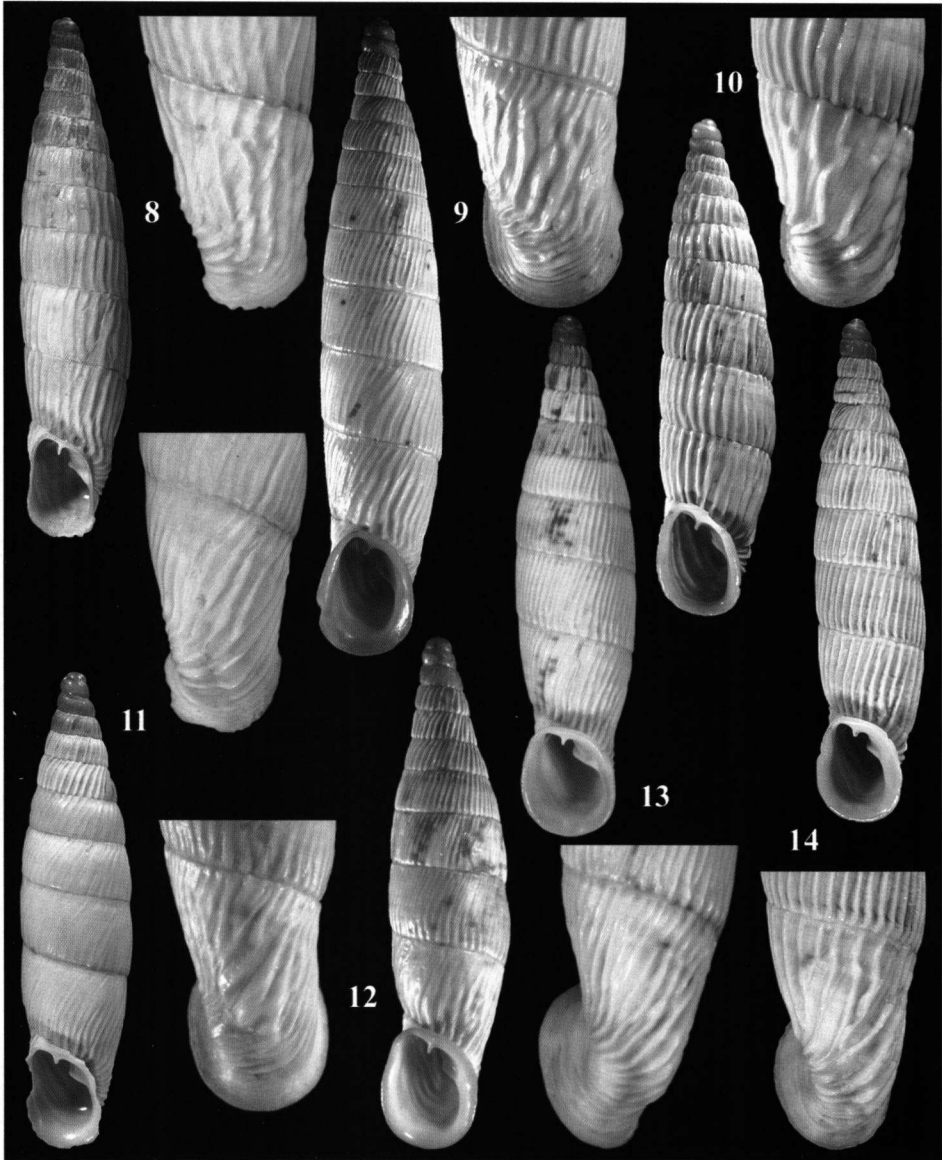
Note: *C. s. var. acuticosta* and *C. s. var. centralis* (original specimens SMF 66414 and 66430, respectively) are forms of *A. v. strigata* which were collected at the northwestern slope of Ida mountain. The former has ribbed lower whorls and is thus transitional to *A. v. litoralis* subsp. nov..

Albinaria v. litoralis subsp. nov. (fig. 14). – Lower whorls more or less prominently ribbed; dorsal keel more or less prominent; inferior lamella and lunella as in *A. v. virginea*. Shell mostly uniformly white.

Western Crete: coastal region, in the west to a line (from north to south) Nohia - Kastelli - Platanos - Plokamiana - Koundoura - Anidri, in the east to a line (from west to east) Rodakino - Sellia - Frati - Akoumia - Melambes - Rizikas.



Figs 1-7. *Albinaria* spec., Crete, 1, *A. byzantina*, Parreyss, coll. Rossmässler (original specimen, SMF 66435a); H 21.3 mm. 2, *A. cretensis*, coll. Rossmässler (holotype, SMF 4475); H 19.7 mm. 3, *A. troglodytes troglodytes*, Gortin, leg. Blanc, coll. Boettger (SMF 66491a); H 20.9 mm. 4, *A. t. niproensis* subspec. nov., Imbros 3 km towards Chora Sfakion, 14.VIII.1974, leg. Fauer, coll. Nordsieck (holotype, SMF 323347); H 19.3 mm. 5, *A. t. strictecostata*, Sphakia, leg. Spratt, coll. Boettger (neotype, SMF 66538a); H 16.65 mm. 6, *A. t. subvirginea*, leg. Spratt, coll. Boettger (lectotype, SMF 66484); H 13.6 mm. 7, *A. t. vexans*, [Aghia] Roumili, leg. Spratt, coll. Boettger (lectotype, SMF 66493); H 18.4 mm. Photographs by E. Neubert.



Figs 8-14. *Albinaria* spec., Crete, 8. *A. tenuicostata tenuicostata* Selino, leg. Spratt [lectotype, BM(NH) 1954.3.8.15]; H 17.3 mm. 9. *A. t. tenuicostata* (L. Pfeiffer, 1864), Crete, Cape Grabusa, leg. Maltzan, coll. Boettger (lectotype of *C. grabusana* O. Boettger, 1883, SMF 66523); H 21.25 mm. 10. *A. t. omalica* Omalo (4000 ft.), leg. Maltzan, coll. Boettger (original specimen, SMF 66554a); H 16.55 mm. 11. *A. virginea virginea* [lectotype, BM(NH) 197623a]; H 15.9 mm. 12. *A. v. strigata* (L. Pfeiffer, 1850, sensu O. Boettger, 1878), Ampelousa, leg. Blanc, coll. Boettger (SMF 66400a); H 17.15 mm. 13. *A. v. strigata*, 2 km S of Rethimno, IV.1974, leg. Brandt (SMF 317167a); H 17.4 mm. 14. *A. v. litoralis* subspec. nov., Lefkogia (1 km from cross-roads towards Moni Preveli), 19.VII.1986, leg. Sin, coll. Nordsieck (holotype, SMF 325524); H 16.8 mm.

Photographs by E. Neubert.

Albinaria v. rodakinensis Wiese, 1991 (fig. 15). – Like *A. v. litoralis* subsp. nov., but lower whorls more coarsely ribbed, also protoconch ribbed; clausilium plate better visible than in *A. v. litoralis*.

Southwestern Crete: only known from the type locality near Rodakino.

Albinaria v. gavidosensis subsp. nov. (fig. 16). – Like *A. v. litoralis* subsp. nov., but lower whorls weakly ribbed to smooth (ribs obsolete); inferior lamella mostly moderately high; clausilium plate mostly better visible than in *A. v. litoralis*.

Southwestern Crete: Gavidos island.

Albinaria v. gavidopoulensis subsp. nov. (fig. 17). – Like *A. v. gavidosensis* subsp. nov., but lower whorls densely ribbed.

Southwestern Crete: Gavidopoula island.

Albinaria sphakiota (Maltzan, 1887) (fig. 18)

Lower whorls smooth (ribs obsolete); dorsal keel weak; columella spirally ascending, inferior lamella very low; lunellar deep-seated, but clausilium plate well-visible; lunella without basalis rudiment.

Southwestern Crete: Aradena, Imbros and Asfendos gorges.

Synonym: *A. cretensis porphyrostoma* A. J. Wagner, 1924.

Albinaria eburnea (L. Pfeiffer, 1854)

Albinaria e. glabella (L. Pfeiffer, 1864) (fig. 19). – Lower whorls smooth (ribs obsolete); dorsal keel weak or missing; parallel lamella in part distinct; inferior lamella more straightly or more s-like ascending, moderately high or low; lunella without basalis rudiment.

Western Crete: Lefka mountain from Lakki and Kambi in the north to Omalos in the south.

Synonyms: *C. pura* O. Boettger, 1878; *C. deglupta* O. Boettger, 1878; *C. d. var. semialba* O. Boettger, 1878; *C. glabella var. spratti* O. Boettger, 1883 [non L. Pfeiffer, 1846].

Note: *Albinaria e. glabella* includes two forms which differ mainly by the development of the parallel lamella. *C. glabella* [type series BM(NH) 1954.3.8.3-5] from White Mountains (5000 ft.), *C. pura* and *C. deglupta* (with var. *semialba*, type SMF 66573), both without locality, have a more or less distinct parallel lamella, *C. g. var. spratti* (type SMF 66575), again without locality, lacks the parallel lamella. In the examined material, only the form from Kambi has a parallel lamella, while in the form from the region from Lakki to Omalos the parallel lamella is missing. The typical form of *A. e. glabella* agrees largely with *A. byzantina*, the western form is more similar to *A. tenuicostata*. Obviously, both forms should be separated, but the material of the typical form is yet too scarce for such a decision.

Albinaria e. samariae subsp. nov. (fig. 20). – Like *A. e. glabella*, but also ribs of upper whorls obsolete; spiral lamella distant from superior lamella; clausilium plate better visible.

Southwestern Crete: Lefka mountain (upper Samaria gorge).

Albinaria e. eburnea (fig. 21). – Like *A. e. glabella*, but also ribs of upper whorls and cervix obsolete; inferior lamella higher.

Southwestern Crete: Lefka mountain (exact locality unknown).

Albinaria e. inflaticollis subsp. nov. (fig. 22). – Lower whorls smooth (ribs obsolete); dorsal keel missing, instead cervix rounded; inferior lamella more s-like ascending, moderately high or low; lunella without basalis rudiment.

Southwestern Crete: Askifou region.

Albinaria sublamellosa (O. Boettger, 1883)

Albinaria s. sublamellosa (fig. 23). – Lower whorls prominently ribbed; dorsal keel prominent; inferior lamella more s-like ascending, high; subcolumellar lamella well visible; lunellar advanced; lunella with a more or less distinct basalis rudiment.

Southwestern Crete: coastal region from Aradena in the west to Chora Sfakion in the east.

Albinaria s. obliterated (O. Boettger, 1883) (fig. 24). – Like *A. s. sublamellosa*, but lower whorls more densely ribbed; dorsal keel less prominent or missing; lunellar not advanced.

Southwestern Crete: coastal region near Agia Roumeli, Samaria gorge.

Albinaria s. heteroptyx (O. Boettger, 1883) (figs 25-26). – Like *A. s. sublamellosa*, but white surface layer more pronounced; lower whorls more densely ribbed; subcolumellar lamella less visible; lunellar not advanced.

Southwestern Crete: coastal region near Agia Roumeli.

Note: *Clausilia heteroptyx* (type SMF 66521; fig. 25) has a clausiliar like *A. s. obliterated* but differs by a more pronounced white surface layer and a more dense ribbing. Thus, it is intermediate between *A. s. obliterated* and a subspecies from the coastal region near Agia Roumeli (fig. 26) which is transitional between *A. sublamellosa* and *A. v. litoralis* subsp. nov.. Therefore, it is suitable to use the name *A. s. heteroptyx* for this subspecies.

Albinaria s. schultesi Wiese, 1988 (fig. 27). – Like *A. s. sublamellosa*, but lower whorls more prominently ribbed (percostate); dorsal keel missing; subcolumellar lamella less visible; lunellar not advanced, clausilium plate less visible.

Southwestern Crete: only known from the type locality west of Agia Roumeli.

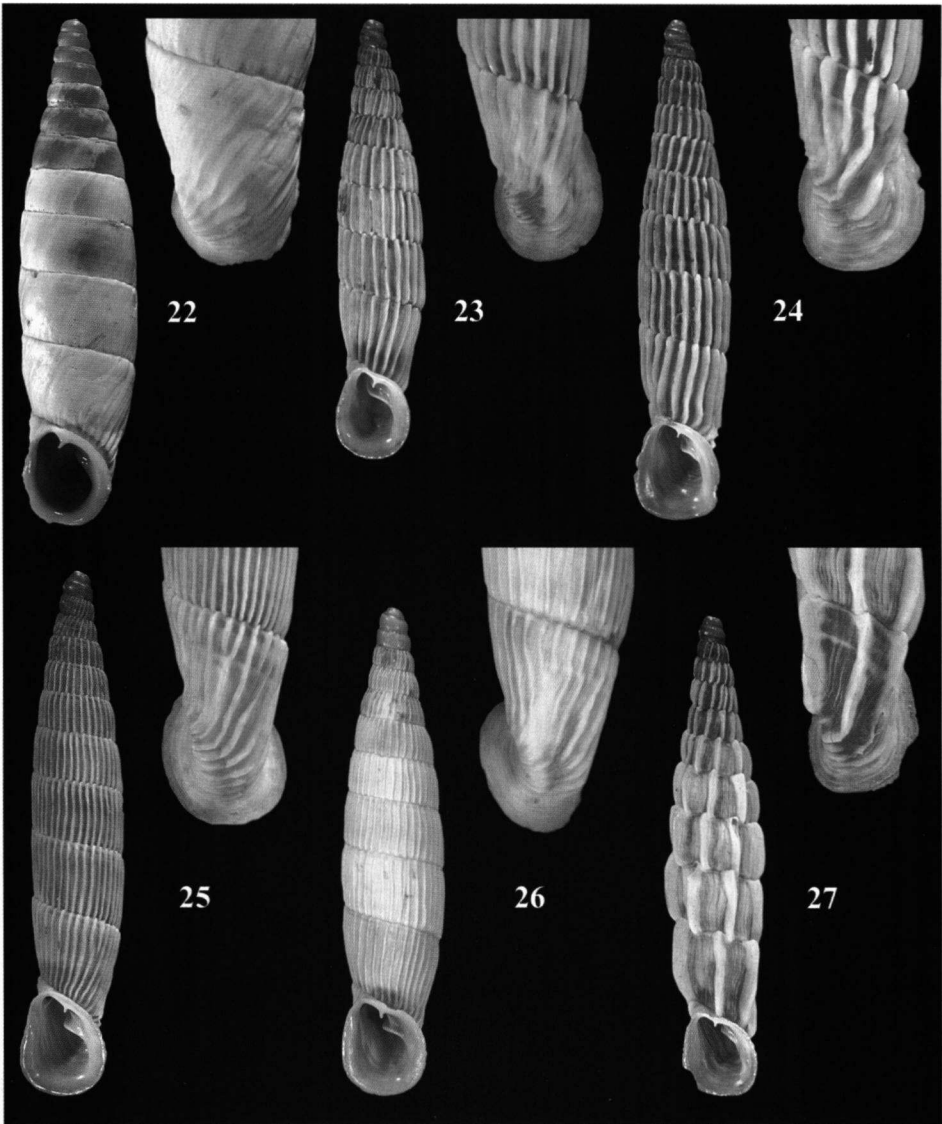
ARGUMENTS FOR THE PROPOSED SUBDIVISION OF THE *CRETENSIS* GROUP
INTO SPECIES

Distributional relations of the taxa are of special importance for the subdivision of the *cretensis* group into species, because the respective taxa are morphologically very similar. The sympatry of *A. troglodytes* and *A. sphakiota* in some gorges of Sfakia (cf. Gittenberger et al., 2001: 73), that of *A. tenuicostata* and *A. virginea* in Falassarna, and that of *A. troglodytes* and *A. sublamellosa* in the coastal region of Sfakia are known since a long time and have been ascertained by several collectors. Further sympatries were discovered by me in the course of the investigation of the *cretensis* group in the last decade. The cases of sympatry mentioned in the following may be syntopic occurrences or allotopic ones in close neighbourhood, in any case without or nearly without transitions. Both occurrences make species rank of the respective taxa probable.

On the other hand, there are populations which are transitional between taxa assumed to have specific rank. Populations which are transitional between *A. v. strigata* and *A. t. troglodytes* have been found in the region west of Rethimno. In the surroundings



Figs 15-21. *Albinaria* spec., Crete, 15, *A. v. rodakinensis*, 1 km W of Koraka beach near Rodakino, 10.X.1990, leg. Hemmen (holotype, HNC 27511); H 12.45 mm. 16, *A. v. gavidosensis* subsp. nov., Gavdos island (northern part), III.1992, leg. Welter-Schultes (holotype, HNC 61063); H 16.2 mm. 17, *A. v. gavidopoulensis* subsp. nov., Gavdopoula island (southern part), III.1992, leg. Welter-Schultes (holotype, HNC 61064); H 16.9 mm. 18, *A. sphakiota*, Nipro gorge, leg. Maltzan, coll. Boettger (lectotype, SMF 66513a); H 19.65 mm. 19, *A. eburnea glabella*, White Mountains (5000 ft.), leg. Spratt [lectotype, BM(NH) 1954.3.8.3]; H 20.05 mm. 20, *A. e. samariae* subsp. nov., Samaria gorge above Samaria village, 21.V.1975, leg. Roll, coll. Nordsieck (holotype, SMF 326031); H 21.6 mm. 21, *A. e. eburnea*, White Mountains (6000 ft.), leg. Spratt [lectotype, BM(NH) 197610a]; H 17.5 mm. Photographs by E. Neubert.



Figs 22-27. *Albinaria* spec., Crete, 22, *A. e. inflaticollis* subsp. nov., Alikambos, 8 km towards Askifou, 14.VIII.1974, leg. Fauer, coll. Nordsieck (holotype, SMF 323348); H 16.9 mm. 23, *A. sublamellosa sublamellosa*, Anapolis (1500-2000 ft.), leg. Maltzan, coll. Boettger (SMF 66501a); H 14.7 mm. 24, *A. s. obliterated*, Aghia Roumili, leg. Maltzan, coll. Boettger (holotype, SMF 66503); H 16.65 mm. 25, *A. s. heteroptyx*, Aghia Roumili, leg. Spratt, coll. Boettger (holotype, SMF 66521); H 17.5 mm. 26, *A. s. heteroptyx*, entrance of Samaria gorge (E-side), 23.X.1990, leg. Hemmen, coll. Nordsieck (N 10275a); H 16.3 mm. 27, *A. s. schultesi*, between Agia Roumeli and Tripiti, 16.I.1987, leg. Schultes, coll. Wiese (holotype, SMF 307180); H 16.0 mm. Photographs by E. Neubert.

of Rethimno and in the Askifou region a spotless form of *A. v. strigata* (fig. 13) occurs which is strikingly similar to *A. t. troglodytes*. In westernmost Crete there are populations which are morphologically intermediate between *A. t. tenuicostata* and *A. v. strigata*. Near Agia Roumeli a subspecies of *A. sublamellosa* which is transitional between this species and *A. v. litoralis* subsp. nov. (*A. s. heteroptyx*) has been found. These transitional forms which may have originated by hybridization are the most crucial points of the proposed classification. Nevertheless, I prefer to keep separate the named species, in order to avoid 'megasppecies' which would obscure the relationships of the subspecies belonging to and thus not reflect the actual diversity (cf. Nordsieck, 1999:2).

A. byzantina can hardly be confounded with other species, because it is recognizable by the conspicuous parallel lamella and the more steeply ascending inferior lamella. It occurs sympatrically with *A. t. troglodytes* near Kalami in Aptera (TMB) and Stilos (HNC). On the Drapano peninsula (Drapanos, Kokkinochori, TMB, Likotinaria, NNM) an isolated form of the species lives sympatrically with *A. t. troglodytes*.

A. cretensis lacks the dorsal keel and the basalis rudiment. It differs mainly from the similar *A. sphakiota* by the normal development of columella and inferior lamella.

A. troglodytes is characterized by the high inferior lamella and the tendencies to develop a dorsal keel and a basalis. *A. t. niproensis* subsp. nov. is similar to *A. t. troglodytes*. In the west, it is replaced by *A. t. strictecostata* which has also shown to be genetically close to *A. t. niproensis* subsp. nov. (Gittenberger et al., 2001). *A. t. subvirginea* is connected with the latter by transitional populations east of Chora Sfakion (from Kapsodassos to Rodakino). *A. t. vexans* is similar to *A. t. subvirginea*, but also to *A. t. troglodytes*. Therefore, all these taxa are regarded as subspecies of *A. troglodytes*.

A. t. troglodytes occurs sympatrically with *A. byzantina* (see above). *A. t. niproensis* subsp. nov. and *A. t. strictecostata* live sympatrically with *A. sphakiota* in the gorges of Sfakia (Imbros gorge, N, HEM, NNM, TMB, Aradena gorge, NNM, TMB). *A. t. niproensis* subsp. nov. occurs sympatrically with *A. e. inflaticollis* subsp. nov. in the Askifou region (TMB). All *troglodytes* subspecies of the western coastal Sfakia live sympatrically with *A. sublamellosa* (N, FAU, HEM, NNM, TMB).

A. tenuicostata is recognizable by the low inferior lamella and the clearly visible clausilium plate. *A. t. omalica* is a ribbed form of *A. tenuicostata*.

In the northern coastal region of its range *A. t. tenuicostata* lives sympatrically with *A. v. litoralis* subsp. nov. near Falassarna (N, HEM, NNM, TMB), Kaliviani (HEM, NNM) and Limani (HEM), in the southern coastal region near Anidri (HEM, HNC). Inland it occurs sympatrically with *A. v. strigata* south of Topolia (HEM, TMB), between Sassalos and Malatiros (HEM), near Kakopetros (TMB), Strovles (TMB) and Spaniakos (HEM). *A. t. omalica* occurs sympatrically with *A. e. glabella* resp. *A. e. samariae* in the Omalos region (TMB).

A. virginea has no special diagnostic characters, i. e. all characters are normally developed. *A. v. strigata*, *A. v. litoralis* subsp. nov. and *A. v. virginea* are connected by several transitional populations in the southeast of the range (e. g. near Agios Vassilios, Lambini-Mixorrouma, Assomatos, Akoumia and Melambes), the two former taxa also in the northwest (near Kastelli and Platanos). Therefore, they are regarded as subspecies of one species. *A. v. rodakinensis* is similar to *A. v. litoralis* subsp. nov. from Rodakino nearby, but is the only taxon of the *cretensis* group with a ribbed protoconch (Wiese, 1991). The island forms from Gavdos (*A. v. gavdosensis* subsp. nov.) and Gavdopoula (*A. v. gavdopoulensis* subsp. nov.), which were classified with *A. cretensis tenuicostata* by Welter-Schultes (1998: 46-48), are most similar to *A. v. litoralis* subsp. nov., especially what concerns the development of the dorsal keel, and are therefore classified as subspecies of *A. virginea*.

A. v. strigata and *A. v. litoralis* subsp. nov. occur sympatrically with *A. tenuicostata* in

several localities of its range (see above). *A. v. strigata* lives sympatrically with *A. e. glabella* near Omalos (TMB) and with *A. e. inflaticollis* subsp. nov. in the Askifou region (FAU, TMB).

A. sphakiota is easily recognized by the spirally ascending columella with the low inferior lamella and the deep-seated lunellar. It lives sympatrically with *A. troglodytes* in the gorges of Sfakia (see above), in the Aradena gorge also with *A. sublamellosa* (NNM).

The forms of *A. eburnea* have only the well-developed white surface layer and the weak sculpture in common. Because the typical form of *A. e. glabella* agrees largely with *A. byzantina* and *A. e. inflaticollis* is similar to *A. v. strigata* occurring nearby, it is the question if *A. eburnea* is a monophyletic unit. On the other hand, *A. e. samariae* subsp. nov. and *A. e. eburnea* are so similar to the neighbouring (western) form of *A. e. glabella* that their close relationship is not doubted.

A. e. samariae subsp. nov. occurs sympatrically with *A. s. obliterated* in the Samaria gorge (N, HEM, TMB). *A. e. glabella* and *A. e. samariae* subsp. nov. live sympatrically with *A. t. omalica* in the Omalos region, *A. e. inflaticollis* subsp. nov. with *A. v. strigata* and *A. t. niproensis* subsp. nov. in the Askifou region (see above).

A. sublamellosa is characterized by the high inferior lamella and the tendency to develop a basalis; all its subspecies have a strong sculpture. *A. s. sublamellosa*, *A. s. obliterated* and *A. s. schultesi* are so similar that their conspecificity is not doubted. *A. s. heteroptyx* is transitional between *A. sublamellosa* and *A. v. litoralis* subsp. nov.. All subspecies occur sympatrically with *A. troglodytes*, *A. s. sublamellosa* also with *A. sphakiota* and *A. s. obliterated* with *A. e. samariae* subsp. nov. (see above).

DESCRIPTIONS OF NEW TAXA

Abbreviations used: H, shell height; H_A , height of the aperture; R, number of ribs on the penultimate whorl; R_2 , number of ribs per 2 mm on the penultimate whorl; W, shell width; W_A , width of the aperture.

Albinaria troglodytes niproensis subsp. nov. (fig. 4)

Material. – Holotype (SMF 323347): Greece, Crete, Imbros, 3 km towards Chora Sfakion, UTM KV 4102, 14.VIII.1974, leg. Fauer, ex coll. Nordsieck; paratypes (N 7243/14, FAU): same data. Additional material (excluded as paratypes): Imbros 4 km towards Chora Sfakion (N 7771); Imbros, 5 km towards Chora Sfakion (N 7244); Imbros, 4 km to the south (N 9651); Imbros (gorge) (N 9650); Chora Sfakion, 2.3 km towards Imbros (N 8981); Chora Sfakion 3.1 km towards Imbros (N 8982); 3.3 km from cross-roads towards Asfendos (N 10520); Asfendos (N 10272); Rodakino (gorge) (N 7241).

Diagnosis. – Like *A. t. troglodytes*, but dorsal keel more prominent and basalis rudiment more distinctly developed.

Description (of type series). – Shell white, with scattered dark spots, occasionally with dark stripes on the upper whorls, protoconch yellowish to dark brown; teleoconch whorls more or less regularly coarsely ribbed, on the upper whorls more distantly, ribbing on the cervix prominent and more distantly spaced, rather undulate; body whorl more or less compressed, dorsal keel equally prominent or more prominent than basal keel, more or less divergent posteriorly; aperture oval or rhombic-oval, detached and more or less far protruding, orange brown inside, lip reflected, lighter in colour; superior lamella and spiral lamella overlapping, rarely superior lamella only reaching or not reaching spiral lamella, parallel lamella more or less conspicuous anteriorly; inferior lamella s-like

ascending, high, more or less distinctly thickened in front, ending near the columellar edge; subcolumellar lamella not visible in front view, rarely hardly visible; lunellar about dorsolateral in position, in part more dorsal; lunella with a more or less distinct basalis rudiment below (thickening of lunella to plica-like, mostly spur-like); clausilium plate not fully to fully visible in oblique view.

Measurements. – Holotype: H 19.3 mm, W 4.25 mm, W/H 0.220, H_A 4.16 mm, W_A 3.26 mm; whorls 11½; R 57, R₂ 11. Paratypes (28): H 17.6-22.0 mm, mean 19.4 mm; W 3.5-4.4 mm, mean 3.9 mm; whorls 10¾-12½; R 41-67, mean 51.5; R₂ 8-12¾, mean 10.4.

Etymology. – Named after the Imbros or Nipro gorge where the subspecies has first been found.

Notes. – The populations of this subspecies vary in shell shape, prominence and density of ribbing, cervix shape and prominence of dorsal keel, and position of lunellar and the correlated visibleness of the clausilium plate. Some forms have been figured by Welter-Schultes (2000: figs. 34 N-Q, localities O and P on the map exchanged!).

A. t. niproensis subsp. nov. was determined by Gittenberger et al. (2001: figs. 6-7) as *A. cretensis* cf. *vexans*, the related *A. t. strictecostata* as *A. c. tenuicostata*.

Albinaria virginea litoralis subsp. nov. (fig. 14)

Material. – Holotype (SMF 325524): Greece, Crete, Lefkogia near Sellia (1 km from crossroads towards Moni Preveli), UTM KU 6896, 19.VII.1986, leg. Sin, ex coll. Nordsieck; paratypes (N 9755/11, TMB): same data. Additional material (excluded as paratypes): Moni Preveli (N 7163); Plakias (Kakomouri) (N 9752); Ano Rodakino (N 10269); Melambes (N 7767); Agia Galini (harbour) (N 7773); 2 km W Koundoura (N 10499); Elafonissi (N 10502); Moni Chrissoskalitissa (N 7147); Platanos, 3 km towards Vrisses (N 7228); Falassarna (N 7145, 8968).

Diagnosis. – Lower whorls more or less prominently ribbed; dorsal keel more or less prominent; inferior lamella and lunella as in *A. v. virginea*. Shell mostly uniformly white.

Description (of type series). – Shell white, with scattered dark spots, protoconch yellowish to brownish; teleoconch more or less regularly coarsely ribbed, riblet sculpture between the ribs indistinct, ribbing on the cervix more prominent and irregular, more or less undulate; dorsal keel mostly more prominent than basal keel, in part equally prominent; aperture oval to rhombic-oval, detached and more or less far protruding, yellowish brown inside, lip more or less broadly reflected, lighter in colour; superior lamella mostly reaching spiral lamella, in part not reaching, rarely overlapping; inferior lamella s-like ascending, moderately high or high, anteriorly ending near to the columellar edge; subcolumellar lamella not visible in front view, occasionally also not in oblique view; lunellar dorsolateral in position, in part more dorsal; lunella in part indistinct, occasionally thickened below; clausilium plate not fully visible in oblique view, occasionally fully visible.

Measurements. – Holotype: H 16.8 mm, W 3.6 mm, W/H 0.214, H_A 3.52 mm, W_A 2.82 mm; whorls 11; R 36, R₂ 7¾. Paratypes (26): H 14.0-18.15 mm, mean 16.2 mm; W 3.2-3.9 mm, mean 3.6 mm; whorls 10-12¼; R 31-47, mean 40.2; R₂ 7-11¼, mean 9.0.

Etymology. – Named for its occurrence in coastal regions (Lat. *litoralis* = coastal).

Notes. – The populations of this subspecies vary in intensity of the white surface layer and spotting, prominence and density of ribbing, distinctness of riblet sculpture between the ribs, prominence of dorsal keel, and position of lunellar and the correlated visibleness of clausilium plate. Some forms have been figured by Welter-Schultes (2000: figs 33A, C, 34U).

Albinaria virginea gavidosensis subsp. nov. (fig. 16)

Material. – Holotype (HNC 61063): Greece, Crete, Gavdos island (northern part), UTM KU 3360, III.1992, leg. Welter-Schultes; paratypes (HNC 43448/15, SMF 326032/4): same data. Additional material (excluded as paratypes): Gavdos island (southern part) (HNC 43452); Gavdos island (NMW 80675, N 6758).

Diagnosis. – Like *A. v. litoralis* subsp. nov., but lower whorls weakly ribbed to smooth (ribs obsolete); inferior lamella mostly moderately high; clausilium plate mostly better visible than in *A. v. litoralis*.

Description (of type series). – Shell white, with scattered dark spots, especially on the upper whorls, protoconch whitish to yellowish brown; upper whorls of teleoconch ribbed, lower whorls more weakly ribbed or (mostly) smooth (ribs obsolete, but at the lower suture still well-developed), ribbing on the cervix prominent and more or less undulate; dorsal keel more prominent than basal keel, occasionally equally prominent; aperture oval to rhombic-oval, detached and more or less far protruding, yellowish brown inside, lip reflected, lighter in colour; superior lamella not reaching or reaching spiral lamella, in part overlapping, parallel lamella occasionally conspicuous; inferior lamella s-like ascending, moderately high, in part high or low, more or less clearly with thickening in front; subcolumellar lamella not visible in front view; lunellar about dorsolateral in position, in part more dorsal; lunella differently distinct; clausilium plate mostly fully visible in oblique view, occasionally less visible.

Measurements. – Holotype: H 16.2 mm, W 3.7 mm, W/H 0.228, H_A 3.33 mm, W_A 2.66 mm; whorls 11¼; R 40. Paratypes (19): H 14.3-17.35 mm, mean 16.4 mm; W 3.4-3.9 mm, mean 3.7 mm; whorls 10¾-12¼; R (in smooth specimens measured at the lower suture) 26-42 (-51), mean 33.05.

Etymology. – Named after Gavdos island.

Note. – Welter-Schultes (2000: 129-138, figs 95-100) gave a comprehensive survey on the variability of the subspecies (i.e. shell size and shape, number of whorls, rib density) in correlation with surface and vegetation of the island.

Albinaria virginea gavidopoulensis subsp. nov. (fig. 17)

Material. – Holotype (HNC 61064): Greece, Crete, Gavidopoula island (southern part), UTM KU 2768, III.1992, leg. Welter-Schultes; paratypes (HNC 43422/12, SMF 326061/1): same data. Additional material (excluded as paratypes): Gavidopoula island (northwestern part) (HNC 43417, SMF 326062); Gavidopoula island (eastern part) (HNC 43424).

Diagnosis. – Like *A. v. gavidosensis* subsp. nov., but lower whorls densely ribbed.

Description (of type series). – Shell white, occasionally with dark spots, protoconch whitish to dark brown; teleoconch regularly ribbed, lower whorls more or less clearly more densely, ribbing on the cervix prominent and more widely spaced, more or less undulate; dorsal keel mostly weakly developed, occasionally more prominent than basal keel; aperture oval to rhombic-oval, detached and more or less far protruding, yellowish brown inside, lip reflected, lighter in colour; superior lamella not reaching or reaching spiral lamella, rarely overlapping, parallel lamella occasionally conspicuous; inferior lamella s-like ascending, mostly moderately high, occasionally high, more or less clearly with thickening in front; subcolumellar lamella not visible in front view; lunellar about dorso-lateral in position; lunella differently distinct; clausilium plate not fully visible in oblique view, rarely fully visible.

Measurements. – Holotype: H 16.9 mm, W 3.85 mm, W/H 0.228, H_A 3.65 mm, W_A 2.88 mm; whorls 11¼; R 65, R₂ 13. Paratypes (12): H 15.1-19.4 mm, mean 17.1 mm; W 3.5-4.0 mm, mean 3.8 mm; whorls 9½-11¼; R 53-80, mean 68.8, R₂ 9½-16½, mean 14.0.

Etymology. – Named after Gavdopoula island.

Notes. – *A. v. gavdopoulensis* subsp. nov. includes two forms which are surprisingly different. The form from the northwestern part of Gavdopoula differs from the typical form of the remaining parts of the island by the following characters: ribbing on the lower whorls weak; dorsal keel prominent; superior lamella not reaching spiral lamella; inferior lamella high; lunellar advanced, clausilium plate fully visible in oblique view. This form may be restricted to the steep coastal cliffs in this part of the island (Welter-Schultes, written communication).

The specimen of *A. v. gavdopoulensis* subsp. nov. which has been figured by Welter-Schultes (2000: fig. 33j) belongs to the typical form.

Albinaria eburnea samariae subsp. nov. (fig. 20)

Material. – Holotype (SMF 326031): Greece, Crete, Samaria gorge above Samaria village, UTM GE 6610, 21.V.1975, leg. Roll, ex coll. Nordsieck; paratypes (N 7153/11): same data; (TMB): Samaria gorge, between 2-3 km from upper end, 17.VII.1986, leg. Sin; (TMB): Samaria gorge, upper part, (probably) 17.VII.1986, leg. Sin. Additional material (excluded as paratypes): Xiloskalo (1100-1250m) (N 7152); „Xyloskala“ (SMF 66569); Samaria gorge, first 2 km from upper end (TMB); Samaria gorge below Samaria village (N 7155).

Diagnosis. – Like *A. e. glabella*, but also ribs of upper whorls obsolete; spiral lamella distant from superior lamella; clausilium plate better visible.

Description (of type series). – Shell white to bluish-white, with scattered dark spots, rarely with dark stripes on the upper whorls, corroded parts violet-brown, protoconch yellowish to dark brown; upper whorls of teleoconch weakly ribbed or smooth (ribs obsolete), lower whorls smooth, cervix with few prominent and undulate ribs, ribbing already developed on the lower part of body whorl; basal keel more or less prominent, dorsal keel weakly developed, equally prominent as basal keel to indistinct, rarely more prominent; aperture oval, rhombic-oval or roundish, detached and more or less far protruding, yellowish brown inside, lip somewhat reflected; superior lamella not reaching spiral lamella (ending rather far from spiral lamella), parallel lamella indistinct or missing, rarely conspicuous; inferior lamella steeply or more s-like ascending, moderately high to low, rarely high; subcolumellar lamella not visible in front view, rarely hardly visible; lunellar about dorsolateral in position, in part more dorsal; lunella distinct to weak, occasionally fragmented; clausilium plate fully visible in oblique view, rarely less visible, distally pointed and bent outwards, nearly always leaving gaps, especially at the columellar side.

Measurements. – Holotype: H 21.6 mm, W 4.1 mm, W/H 0.190, H_A 4.03 mm, W_A 3.33 mm; whorls 12¼. Paratypes (N, 8): H 17.6-23.2 mm, mean 20.4 mm, W 3.7-4.5 mm, mean 4.2 mm; (TMB, 6): H 21.7-23.7 mm, mean 22.95 mm, W 4.3-4.8 mm, mean 4.5 mm; (TMB, 15): H 18.2-25.3 mm, mean 21.8 mm, W 3.8-5.0 mm, mean 4.4 mm; whorls 10½-13.

Etymology. – Named after the Samaria gorge.

Notes. – This subspecies has already been recognized by Loosjes (1955: 858-859), but not named.

The northern boundary of the range of *A. e. samariae* subsp. nov. is marked by Xiloskalo, because 1 km north of this locality *A. e. glabella* has been found (TMB).

Albinaria eburnea inflaticollis subsp. nov. (fig. 22)

Material. – Holotype (SMF 323348): Greece, Crete, Alikambos, 8 km towards Askifou, UTM KV 4409, 14.VIII.1974, leg. Fauer, ex coll. Nordsieck; paratypes (N 7252/8, FAU): same data; (N 10270/11): Vrisses, 12.3 km towards Askifou, 21.X.1990, leg. Hemmen. Additional material (excluded as paratypes): 2 km south of Askifou (TMB); 1.1 km from crossroads towards Asfendos (TMB); 1.2 km from cross-roads towards Asfendos (N 10519).

Diagnosis. – Lower whorls smooth (ribs obsolete); dorsal keel missing, instead cervix rounded; inferior lamella more s-like ascending, moderately high or low; lunella without basalis rudiment.

Description (of type series). – Shell white, with scattered dark spots, in part with regularly spaced dark stripes on the upper whorls, protoconch yellowish to violet brown; upper whorls of teleoconch faintly or more distinctly ribbed, lower whorls smooth (ribs obsolete), lower part of penultimate and body whorl ribbed, occasionally ribs on body whorl less obsolete, ribbing on the cervix prominent, in part undulate; basal keel more or less distinct, instead of dorsal keel neck somewhat inflated, thus rounded; aperture more or less oval, detached and more or less far protruding, orange brown inside, lip reflected, lighter in colour; superior lamella mostly not reaching or reaching spiral lamella, occasionally overlapping; inferior lamella s-like ascending, moderately high or low, rarely high, with more or less distinct thickening in front, ending near columellar edge; subcolumellar lamella not visible in front view, rarely hardly visible; lunellar dorsolateral in position, in part more lateral or more dorsal; lunella distinct to reduced; clausilium plate only partly visible in oblique view, occasionally less or fully visible.

Measurements. – Holotype: H 16.9 mm, W 4.0 mm, W/H 0.237, H_A 3.26 mm, W_A 2.91 mm; whorls 11½. Paratypes (N 7252, FAU: 27): H 14.95–20.65 mm, mean 17.8 mm, W 3.6–4.3 mm, mean 3.9 mm; (N 10270, 11): H 14.9–19.1 mm, mean 17.0 mm, W 3.5–4.2 mm, mean 3.85 mm; whorls 10–13.

Etymology. – Named for its inflated cervix (Lat. *inflatus*, -a, -um = inflated, *collis* = cervix).

Notes. – The populations of this subspecies vary in presence/absence of stripes on the upper whorls, degree of ribbing on the upper whorls, and position of lunellar and the correlated visibleness of clausilium. A form of this subspecies has been figured by Welter-Schultes (2000: fig. 35B). The other specimen figured by Welter-Schultes (2000: fig. 35A) to represent *A. eburnea* belongs to the spotless form of *A. v. strigata* occurring in the same region.

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