

## The genus *Seila* in West Africa (Gastropoda, Cerithiopsidae)

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Species of the genus *Seila* from West Africa are studied, comparing their shell characters. The differences in the sculpture of the protoconch seem to be the most constant character. *Seila kuiperi* spec. nov. is described from Senegal.

Key words: Gastropoda, Cerithiopsidae, *Seila*, West Africa, taxonomy.

### INTRODUCTION

The genus *Seila* A. Adams, 1861 is widely distributed in circum (sub)tropical seas. In the Pacific, 5 species of *Seila* have been mentioned from Japan in Okutani (2000). One species is mentioned by Keen (1958) from the tropical West American coast. In central America, Abbott (1974) mentioned 3 species in the Atlantic Ocean and 3 in the Pacific Ocean.

Atlantic species are known from the Caribbean as well from the African coast. Rolán & Fernandes (1990) revised the already known taxa and described 5 new species from West Africa. Due to the fact that fullgrown shells were very similar in teleoconch sculpture with only small differences in size and colour, but also showed important intraspecific variation (see variations of *S. angolensis* in figs. 30-32), these descriptions were based mainly on differences in the protoconch.

Since then, more material has been studied and new photographs of the protoconchs have been made. Here we present this new information. An identification was not possible in many shells due to the lack of protoconch (sculpture).

Abbreviations: sp., specimen with soft parts; s, empty shell; f, fragment; j, juvenile.

For collections: MNCN, Museo Nacional de Ciencias Naturales, Madrid; MNHN, Muséum National d'Histoire Naturelle, Paris; AMNH, American Museum of Natural History, New York; ZMA, Zoölogisch Museum Amsterdam; ZSM, Zoologische Staatssammlung München; CER, collection Emilio Rolán; CAP, collection Anselmo Peñas; CFR, collection Federico Rubio; CFS, collection Frank Swinnen; CJP, collection Jacques Pelorce

## SYSTEMATIC PART

Family Cerithiopsidae H. & A. Adams, 1853

Genus *Seila* A. Adams, 1861

*Seila trilineata* (Philippi, 1836) (figs 1-3, 24-28, 35)

*Cerithium trilineatum* Philippi, 1836: 195 (Type locality: Pantelleria Island, near Sicilia, Mediterranean).

Type material.- Not examined.

Material examined.- Italy: Correnty Island, Sicily, 30 m (CFR/5 s); Siracusa (CAP/1 s).

Turkey: Bodrum, 4 m (CFS/1 s).

Mauritania: Tyro Mauritania-I Expedition 1988, sta. VII (ZMA/3 s, 13 j); Tyro Mauritania-I Expedition 1988, sta. B-6, 18-20 m (ZMA/12 s); Tyro Mauritania-I Expedition 1988, sta. V, (ZMA/6 s, 12 j); Tyro Mauritania-I Expedition 1988, sta. IX (ZMA/3 s).

Senegal: Dakar, Cap Vert (CJP/1 s); Cap Vert, Tiwa, 35 m (CJP/1 sp, 2 s); Les Madeleines, 10-20 m (CJP/3 s, 2 j); Vezo, 39 m (CJP/1 s); Petit Thiouriba, 30 m (CJP/2 s); W Gorée, 12 m (CJP/1 s); W Gorée, 20-40 m (CER/6 j); Banc du Seminole (CJP/2 sp); Gouye Teni M'Both, 27 m (CJP/1 s).

Description.- Drawings of the protoconch are in Rolán & Fernandes (1990) and a photo in Giannuzzi-Savelli *et al.* (1999). Protoconch (figs 1-3, 24-27) usually brown, sometimes lighter, a little bit more than two convex and smooth whorls; there is a trace of a small depressed cord in the suture (figs 1, 3), which sometimes are changed by a depression (figs 2, 24-27). Maximum diameter is between 350-390  $\mu$ m. At the beginning of the teleoconch three spiral cords appears almost simultaneously. The shell is uniformly brownish in colour.

Distribution.- From the Mediterranean and NW Africa down to Dakar, Senegal.

Remarks.- *Seila lirata* Sowerby, 1897 (fig. 4) from South Africa has a similar protoconch but is milk-white in colour, diameter about 470  $\mu$ m, and 2.75 whorls. *Seila adamsi* (H. C. Lea, 1845) from the Caribbean (see Rolán & Fernandes, 1990, fig. 12) has flatter whorls and a simple suture, without any cord or depression.

*Seila carinata* (E. A. Smith, 1871) (figs 5-7)

*Cerithium* (*Cerithiopsis*?) *carinatum* E.A. Smith, 1871: 736 (Type locality: Ouidah, Dahomey [now Benin], West Africa).

Type material.- Holotype in BMNH, height 5.8 mm. This shell has a partly broken protoconch, a drawing of it was shown in Rolán & Fernandes (1990, fig. 20).

Other material studied.- Mauritania: Tyro Mauritania-I Expedition 1988, Sta V, 18-20 m (ZMA/2 f); Tyro Mauritania-I Expedition 1988, Sta IX (ZMA/5 j); Tyro Mauritania-I Expedition 1988, Sta B-6, 18-20 m (ZMA/1 s).

Senegal: Dakar, Madeleines (CER/1 s); Petit Thiouriba, 30 m (CER/1 s); Epave Tiwa, 35 m (CJP/1 s).

Guinea Conakry: W Cap Verga N/O "André Nizery" sta. 595, 38 m, 10°12'N 14°56.5'W (MNHN/1 s).

Description.- See Rolán & Fernandes (1990). Shell uniformly dark brown. Protoconch (figs 5-7) of light brown colour, with a maximum diameter of about 290  $\mu$ m, and about 4 whorls, which are scarcely convex, the first one with numerous tubercles which decrease

apparently in the subsequent whorls; there is a row of axially elongate tubercles in a depression below the suture. Near the last whorl of the protoconch an angulation appears on the periphery and from there the spiral cords of the teleoconch are formed as was mentioned in Rolán & Fernandes (1990) for the holotype.

Distribution.— West Africa, from Mauritania to Benin.

Remarks.— The description of the protoconch in Rolán & Fernandes (1990) is incomplete since it was missing in the holotype.

*Seila angolensis* Rolán & Fernandes, 1990 (figs 8-11, 31-33)

*Seila angolensis* Rolán & Fernandes, 1990: 23, figs 3, 4, 11, 13, 14, 21. (Type locality: Corimba Bay, Luanda, Angola).

Type material.— See Rolán & Fernandes (1990). Holotype in MNCN, height 9.4 mm.

Other material studied.— See Rolán & Fernandes (1990). About 50 more specimens have been collected from Corimba, Farol das Lagostas, Praia Amelia and other places (CER). All Angola.

Description.— See Rolán & Fernandes (1990) for the shell. Protoconch (figs 8-11) with a little more than 3 whorls, whitish in colour, somewhat translucent, convex, with a maximum diameter between 330 and 370  $\mu\text{m}$ ; the first whorl is covered with rows of small tubercles; the other two are smooth, wider, and with very opisthocline growth lines; between these lies a deep suture, where a very small cord and a line of tubercles can be seen with high magnification. The teleoconch begins with only one spiral cord, which is later duplicated, the third cord appearing a little further in the suture.

Distribution.— North coast of Angola.

Remarks.— The protoconch of *S. angolensis* can be distinguished from that of *S. carinata* because it has only a little more than 3 whorls (against 4 in *S. carinata*), the second and third whorls of protoconch are wider and more convex, and the elongate tubercles in the suture are scarcely evident and placed in a depression. Furthermore, the shell of *S. carinata* is smaller and more uniform in colour. The spiral cords of the teleoconch are similar in size in *S. carinata*, while in *S. angolensis* the lower one is larger.

*Seila inchoata* Rolán & Fernandes, 1990 (figs 12-14)

*Seila inchoata* Rolán & Fernandes, 1990: 26, figs 8, 16. (Type locality: Boavista Island, Cape Verde Archipelago).

Type material.— See Rolán & Fernandes (1990). Holotype in MNCN, height 4.3 mm.

Other material studied.— Cape Verde Islands: Palmeira, Sal (CER/2 s); Sal Rei, Boavista (CER/2 s).

Description.— See Rolán & Fernandes (1990). Protoconch (figs 12-14): 2.25 whorls, cream in colour, convex, with a depression below the suture, which is occupied towards the end by a wider cord; the teleoconch begins with three spiral cords, the upper one thinner; maximum diameter about 400  $\mu\text{m}$ .

Distribution.— Cape Verde Islands.

Remarks.— The protoconch of *S. inchoata* is a similar size to that of *S. trilineata*, but the Cape Verdian species is lighter in colour and more pointed whereas the Mediterranean species is darker and more pupoid. Also, the sutural depression is wider at the end of the protoconch in *S. inchoata*.



*Seila parilis* Rolán & Fernandes, 1990 (figs 15-17)

*Seila parilis* Rolán & Fernandes, 1990: 25, figs 9-10, 18. (Type locality: Esprainha, São Tome Island).

Type material.— See Rolán & Fernandes (1990). Holotype: MNCN, height 7.0 mm.

Other material studied.— Equatorial Guinea: Annobón Island, San Antonio de Palé, 10-30 m (CER/4s, 6f, 5j).

Description.— See Rolán & Fernandes (1990). Protoconch (figs 15-17): between 1.75 and about 2 whorls, convex, the first covered with small tubercles and the second smooth; a deep suture, and a maximum diameter of about 350  $\mu$ m. The teleoconch begins with three spiral cords.

Distribution.— Known from São Tomé and Annobón Island.

Remarks.— The numerous tubercles on the protoconch differentiate this species from others with a paucispiral protoconch. The samples from Annobón Island are somewhat different as the tubercles of the protoconch are larger and less numerous. In spite of these differences we regard both as conspecific.

*Seila carquejai* Rolán & Fernandes, 1990 (figs 18-21)

*Seila carquejai* Rolán & Fernandes, 1990: 29, figs 7, 15. (Type locality: Baia das Pipas, South Angola).

Type material.— See Rolán & Fernandes (1990). Holotype in MNCN, height 4.2 mm.

Other material studied.— Angola: Baia das Pipas, (MNHN/10 s; CER/5 sp).

Description.— See Rolán & Fernandes (1990). Protoconch (figs 18-21) of 2.5 whorls, convex, brown in colour, a deep suture, with a depression below. Under high magnification, many spiral striae can be seen in this depression. Protoconch diameter is between 380 and 440  $\mu$ m. The teleoconch begins with three simultaneous attenuated spiral cords.

Distribution.— Only known from the south of Angola.

Remarks.— This species may be confused with *S. trilineata*, but the subsutural depression of that species is not so deep and has no striae; *S. inchoata* has a more narrow and pointed apex.

One shell from Praia das Conchas, Namibe, Angola (MNHN), has a protoconch with 2.75 whorls and the teleoconch starts with the two lower spiral whorls, the upper one appearing later. This variation may be an abnormality.

*Seila deaurata* Rolán & Fernandes, 1990 (figs 22-23)

*Seila deaurata* Rolán & Fernandes, 1990: 28, figs 5, 17 (Type locality: Luanda, Angola).

Type material.— See Rolán & Fernandes (1990). Holotype: MNCN, height 9.3 mm.

Other material studied.— Angola: Luanda, 40-60 m, (MNHN/1 s).

Description.— See Rolán & Fernandes (1990). Protoconch (figs 22-23) with 2 whorls, white in colour, convex and about 460  $\mu$ m of maximum diameter. The second whorl has a peripheral angulation and a depression below the suture. With magnification it can be

seen that this subsutural depression has axial striae. The teleoconch is badly defined at the beginning, with the peripheral angle of the last whorl descending and becoming bifurcated to form the lower two spiral cords, the upper one appearing further from the suture.

Distribution.— Only known from Angola.

Remarks.— The characters of the protoconch (the white colour, the wide second whorl and the peripheral angulation) distinguish this species from others in the genus.

*Seila kuiperi* spec. nov. (figs 29-30, 34)

Type material.— Holotype (fig. 30) in MNHN (collection Marche-Marchad). Paratypes: Tiwa, 35 m (MNCN 15.05/46642/2 s); Grand Thiouriba, 40 m (CJP/1 s); Dakar, Les Blockaus, 10-17 m (CJP/1 s); Epave Tiwa, 35 m (CER/1 s); Gorée, 20-25 m (CER/5 j); Faïlles, 23 m (CJP/2 sp); W Gorée, 12 m (AMNH/1 s); Cap Vert, 35 m (ZSM/1 s, 1 j); Les Madeleines, 20 m (ZMA/1 s). All from Dakar area.

Other material examined.— Mauritania: Port Etienne (CER/1 s).

Senegal: Cap Vert, along N'Gor, 20-25 m (CJP/1 j); Les Madeleines, 10-20 m (CJP/1 s) (lost); Les Madeleines, 6-14 m (CER/3 j); Dakar, 20 m (CER/2 j).

Guinea Conakry: W Cap Verga N/O "André Nizery" sta. 595, 38 m, 10°12'N 14°56.5'W (MNHN/1 s).

Type locality.— Dakar area, Senegal.

Derivatio nominis.— The species is named after Dr. J.G.J. (Hans) Kuiper on the occasion of his 90th birthday.

Description.— Shell (fig. 34) solid, elongate, with about 13 whorls. Protoconch (figs 29-30) wide, very convex, usually white-cream or yellowish when it is fresh, with 2 whorls and a maximum diameter of about 360 µm. An evident spiral cord on the suture. The teleoconch begins with two lower spiral whorls the upper one appearing from the suture. The three cords of the teleoconch are at similar distance in the first whorls, but later, the upper two are closer while the lower one is more separate and prominent. On the suture, we can see another small cord which is always smaller but more evident in the last whorls. The colour is yellowish with some lighter axial flammules. Some shells are darker.

Dimensions: The holotype is 7.2 mm in height.

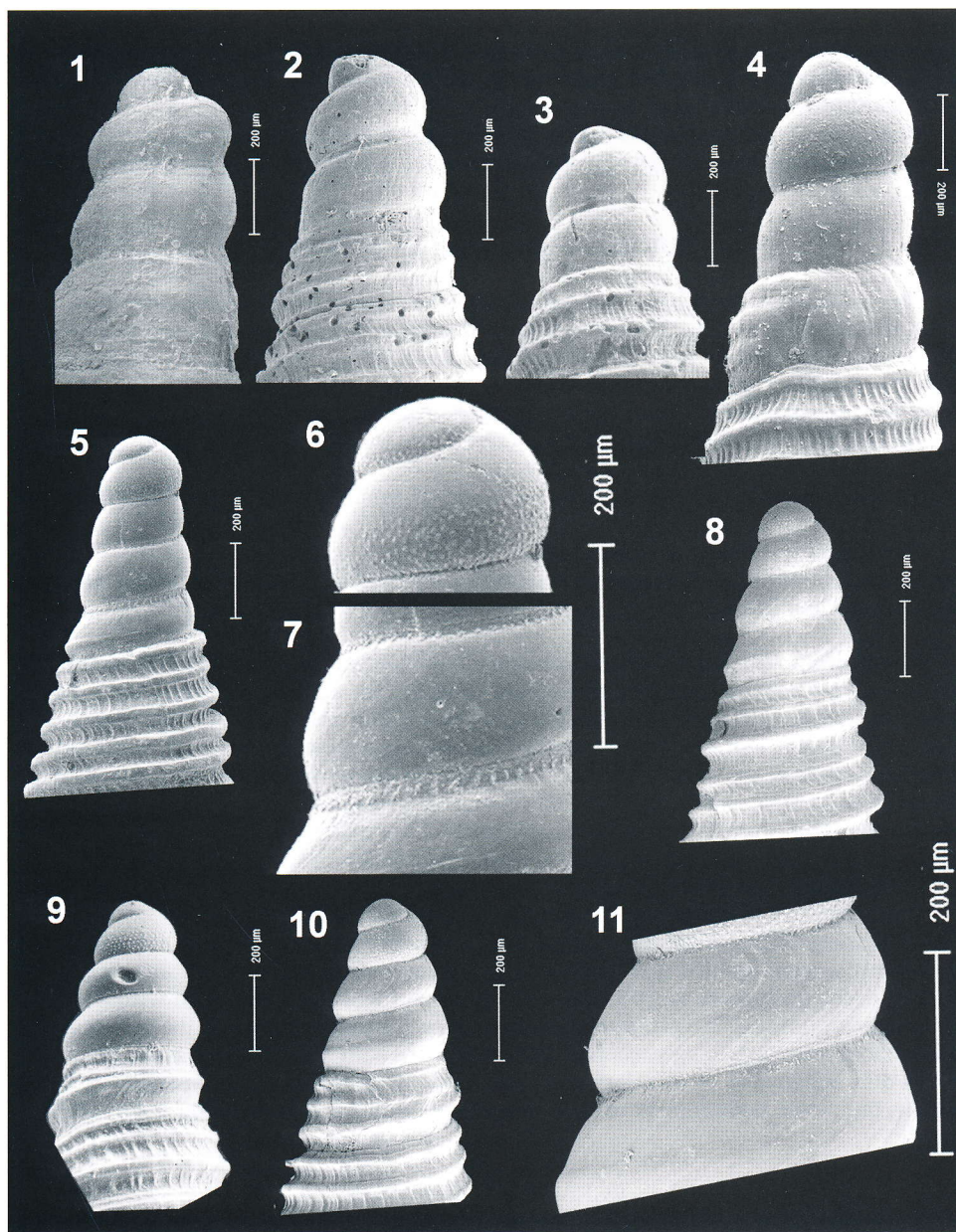
Distribution.— Known from Mauritania, Senegal and Guinea Conakry.

Remarks.— *Seila carinata* and *S. angolensis* have a protoconch with more whorls; that of *S. inchoata* is more pointed and narrow, with a deep depression in the suture; *S. deaurata* has the protoconch more sharp in the first whorl, and wider in the second with a peripheral angulation; *S. parilis* has numerous tubercles on the protoconch, and the suture is simple without any cord; *S. carquejai* has a simple suture with a slight depression; the protoconch of *S. trilineata* is usually darker, it has a depression or sometimes a small cord in the suture, but never as prominent as in *S. kuiperi* spec. nov. the whorls being not so convex.

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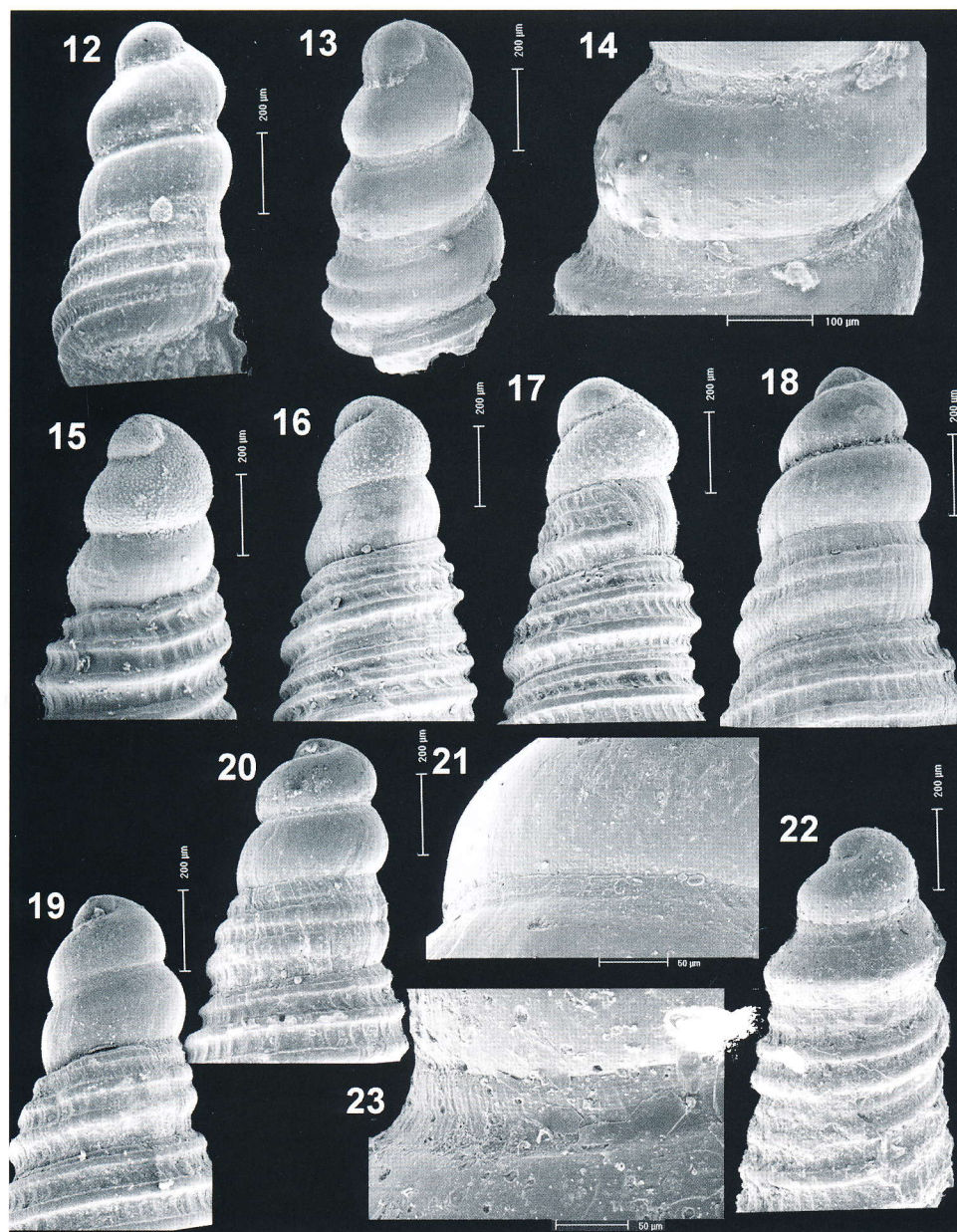
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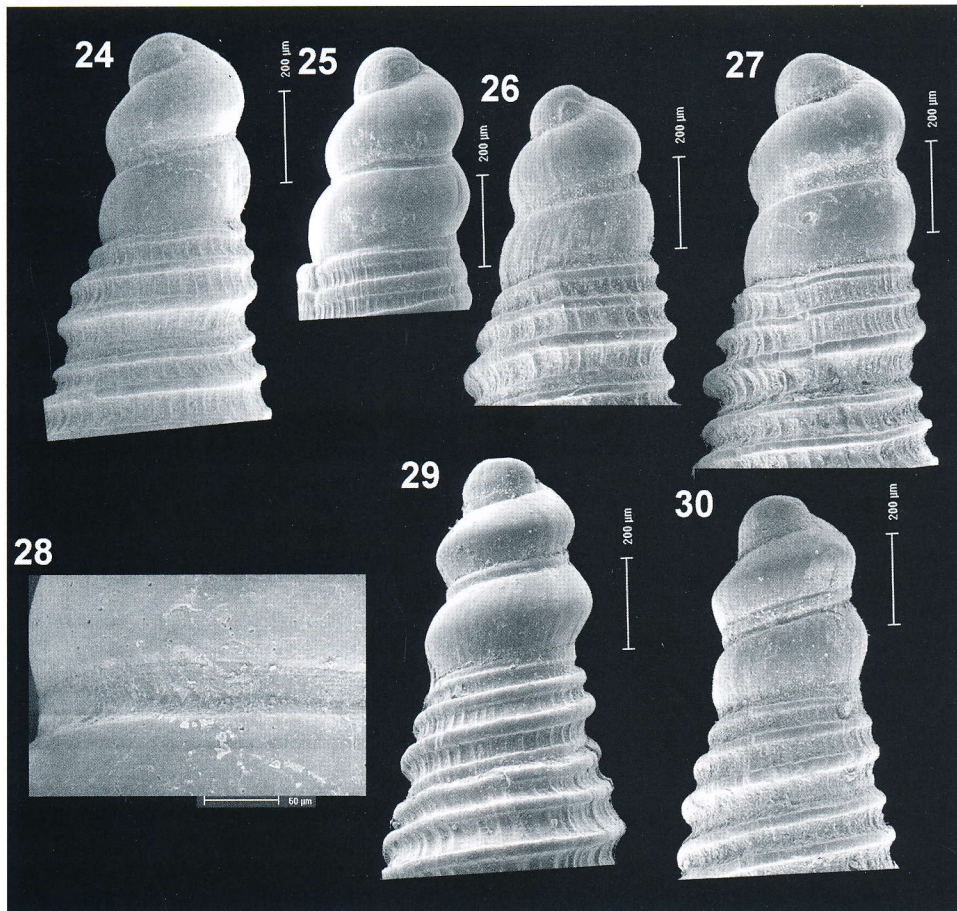


Figs 1-11. Protoconchs of *Seila*. 1-3, *Seila trilineata*; 1, Bodrum, Turkey (CFS); 2, Siracusa, Italy (CAP); 3, Pantelleria, Italy (CFR). 4, *Seila lirata*, South Africa (CER). 5-7, *Seila carinata*, Guinea Conakry (MNHN); 5, protoconch; 6, detail of the apex; 7, detail of the suture. 8-11, *Seila angolensis* (CER); 8, Baia das Pipas, Angola; 9-10, Corimba, Luanda; 11, detail of protoconch from figure 10.



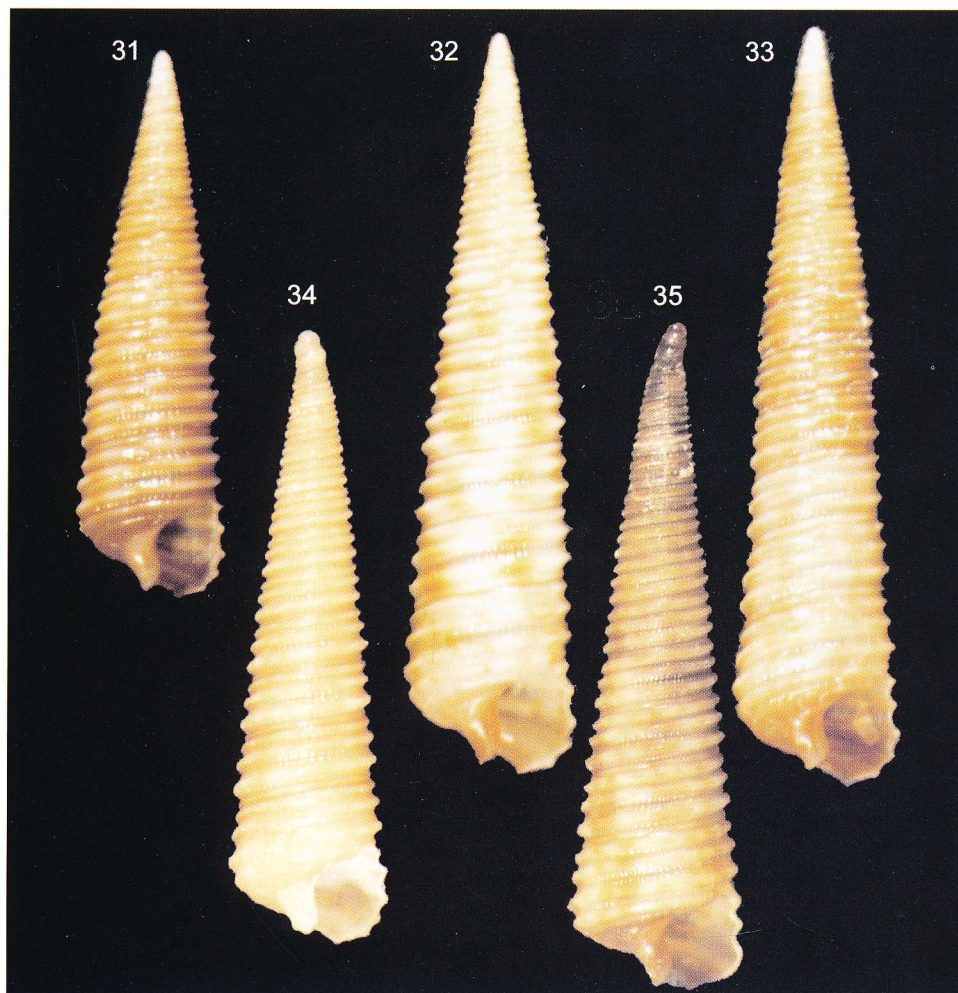


Figs 12-23. Protoconchs of *Seila*. 12-14, *Seila inchoata*, Sal Rei, Boavista, Cape Verde; 12-13, paratype (CER); 14, detail of suture. 15-17, *Seila parilis*. 15, holotype, Esprainha, São Tomé (MNCN); 16-17, San Antonio de Palé, Annobón Island (CER). 18-21, *Seila carquejai*, Baía das Pipas, Angola; 18, paratype (CER); 19-20, shells (CER); 21, detail of suture. 22-23, *Seila deaurata*, Luanda, Angola; 22, paratype (CER); 23, detail of suture.



Figs 24-30. Protoconchs of *Seila*. 24-27, *S. trilineata*, Dakar, Senegal; 28, detail of the suture; 29-30, *Seila kuiperi* spec. nov., Guinea Conakry and Dakar.





Figs 31-35. Shells of *Seila*. 31-33, *Seila angolensis*, height resp. 8.1, 11.2, and 11.7 mm from Angola; 34, *Seila kuiperi* spec. nov., holotype, height 7.2 mm, Dakar, Senegal (MNHN); 35, *Seila trilineata*, height 8.8 mm, Tacoma, Dakar, Senegal (MNHN).

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