

SPURILLA DAKARIENSIS PRUVOT-FOL 1953 (MOLLUSCA: OPISTHOBRANCHIA: AEOLIDOIDEA), A VALID SPECIES OF BERGHIA TRINCHESE 1877 FROM SENEGAL, WEST AFRICA

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Abstract *Spurilla dakariensis* Pruvot-Fol 1953, a poorly known species from west Africa, is redescribed based on a specimen collected alive in Gorée Bay, Senegal, during the campaign Dakar'09. A neotype is designated and new data are provided on the colouration and the external and the internal anatomy. The characters observed suggest that *S. dakariensis* is indeed a valid species of the genus *Berghia* Trinchese 1877, thus, a new combination for this taxon is proposed: *Berghia dakariensis* new combination.

Key words Mollusca, *Berghia dakariensis*, new combination, redescription, Senegal

INTRODUCTION

One of the earliest monographic works on the sea slugs from the Atlantic coast of Africa was authored by Pruvot-Fol (1953), who studied 60 species, 55 of them illustrated in colour, based on the sketches given by Hélène Gantès. In this paper, a species of Aeolidioidea from Senegal collected in Dakar by M. Sourie is referred to with the ambiguous description "very big and beautiful" (Pruvot-Fol, 1953: 53–54, fig. XVII). This species was identified in the text as "*Baeolidia möbii* Bergh, 1888, syn. ? *Baeolidia quoyi* Pruvot-Fol, 1934 – Dakar 1949, R. Sourie leg (fig XVII)" (Pruvot-Fol, 1953: 53) but illustrated as "*Baeolidia moebii* Pruvot-Fol, 1934". Afterwards, in the same work, Pruvot-Fol (1953: 55–57, Fig. XVIII) described *Spurilla dakariensis* based on some specimens also collected in Dakar, but did not provide data on the colouration of the living specimens, or on the shape of the rhinophores. On the other hand, Pruvot-Fol pointed out the large size of this species and the typical shape of the jaw and radular teeth, which resemble more the teeth of a *Baeolidia* than those of *S. neapolitana*: "Cette dent rapelle plus celle que Bergh a figurée chez *Baeolidia* que celle de la *S. neapolitana*" (Pruvot-Fol, 1953).

During the campaign "MNHN-Dakar'09" organized by the Museum National d'Histoire

Naturelle, a large Aeolidioidea (35 mm long) was captured in Gorée Bay, Dakar, Senegal. Studies on its internal anatomy allowed us to identify it as *Spurilla dakariensis* Pruvot-Fol 1953, which is a valid member of the genus *Berghia* Trinchese 1877, according to the classification proposed by Miller (2001). In the present paper, *S. dakariensis* is redescribed, a neotype is designated and the species is relocated in the genus *Berghia*. Additionally, the taxonomical status of *Baeolidia möbii* – *B. moebii* is discussed.

MATERIAL AND METHODS

The specimen was obtained by scuba diving in the wreck "La Russe" (14°38.1'N 17°18.9'W), Gorée Bay, Dakar, Senegal, (September 6th 2009), at 17 m depth. The hull of the boat was brushed off. Then the samples were transported to the laboratory where they were carefully examined on plastic trays with fresh sea water.

A Nikon D70s camera was used to take photographs of the living specimen. These photographs were used to describe the colouration. Afterwards, the animal was preserved in 96% ethanol. To compare it with other Aeolidiidae, diagrams were made of the general internal anatomy, jaws and radula using an Olympus SZ16 stereomicroscope. The specimen is deposited in the Museum National d'Histoire Naturelle (MNHN), Paris.

SYSTEMATICS

Family Aeolidiidae Gray 1827

Genus *Berghia* Trinchese 1877Type species: *Berghia coerulescens* (Laurillard 1830) by monotypy*Berghia dakariensis* (Pruvot-Fol 1953), new combination*Synonymy* *Baeolidia benteva* Marcus 1958 syn. nov.*Neotype* 35 mm long alive (15 mm preserved), MNHN.*Type locality* Wreck "La Russe" (14°38.1'N 17°18.9'W), Gorée Bay, Dakar, Senegal, (September 6th, 2009), at 17 m deep.

Description Body (Fig. 1A) wide compared to other species of the genus. Body sides parallel from the anterior end to the region occupied by the last three groups of cerata, where they converge into a narrow tail that occupies a sixth of the length of the body. Pericardium wide, not raised in the living animal, situated between the fourth and the seventh groups of cerata. Oral tentacles thick, longer than the rhinophores (Fig. 1B). Rhinophores slightly pointed, curved backwards, with blunt apices and the posterior surface covered with close set tubercles. Foot sole wide except in the tail, with short pointed processes anteriorly (Fig. 2A). Cerata elongate and cylindrical, curved inwards when the animal moves, with the digestive gland inside forming a central axis (Fig. 2C). The largest cerata, located in the median-dorsal area, are as long as the tail. Cnidosac ovoid and elongated. Cerata arranged in 20 groups on each side of the body, each group with 5–30 cerata arranged in oblique arches arising from short stalks. Anus and nephropore (Fig. 2A) located behind the cardiac area, inside the seventh ceratal arch on the right side. Gonopore below the cerata under the right eye.

Body hyaline. Digestive gland visible through the dorsal body wall, whitish anteriorly, cream-coloured further back. Oesophagus on the right side of the heart, pale green. Rhinophores and oral tentacles hyaline at the base, white distally. Eyes small and black. Heart pale yellowish. Ototestis yellowish cream, composed of numerous acini



Figure 1 *Berghia dakariensis* (Pruvot-Fol 1953) n. comb.: **a** Dorsal view of the living animal; **b** Detail of the head.

filling all the visceral cavity behind the heart. Cerata translucent, with white pigment scattered all over the surface and concentrated on the apex. Digestive gland inside cerata reddish brown. Cnidosac pink with a dark red tip. Tail translucent, with a narrow central white line reaching the tip.

Buccal bulb large, with well developed musculature. Jaws (Fig. 2D) 2.25 mm long by 1.65 mm wide, translucent, curved, with an anterior bulge. Masticatory border and anterior end of jaw amber-coloured. Masticatory border smooth. Radular formula 22×0.1.0. Radula short, with the smallest teeth one third of the length of the largest ones. From the first to the sixth teeth the width increase is exponential, from the seventh to the last it is more gradual. Radular teeth composed of two arches joined together in the center. Each arch has numerous denticles, the longest of which are in the centre. On the ventral side there is an amber-coloured structure, also with the shape of a double arch, with a notch in the middle.

The smallest tooth is 197×108 μm, with 40 denticles, the next one is 366×188 μm, with 58

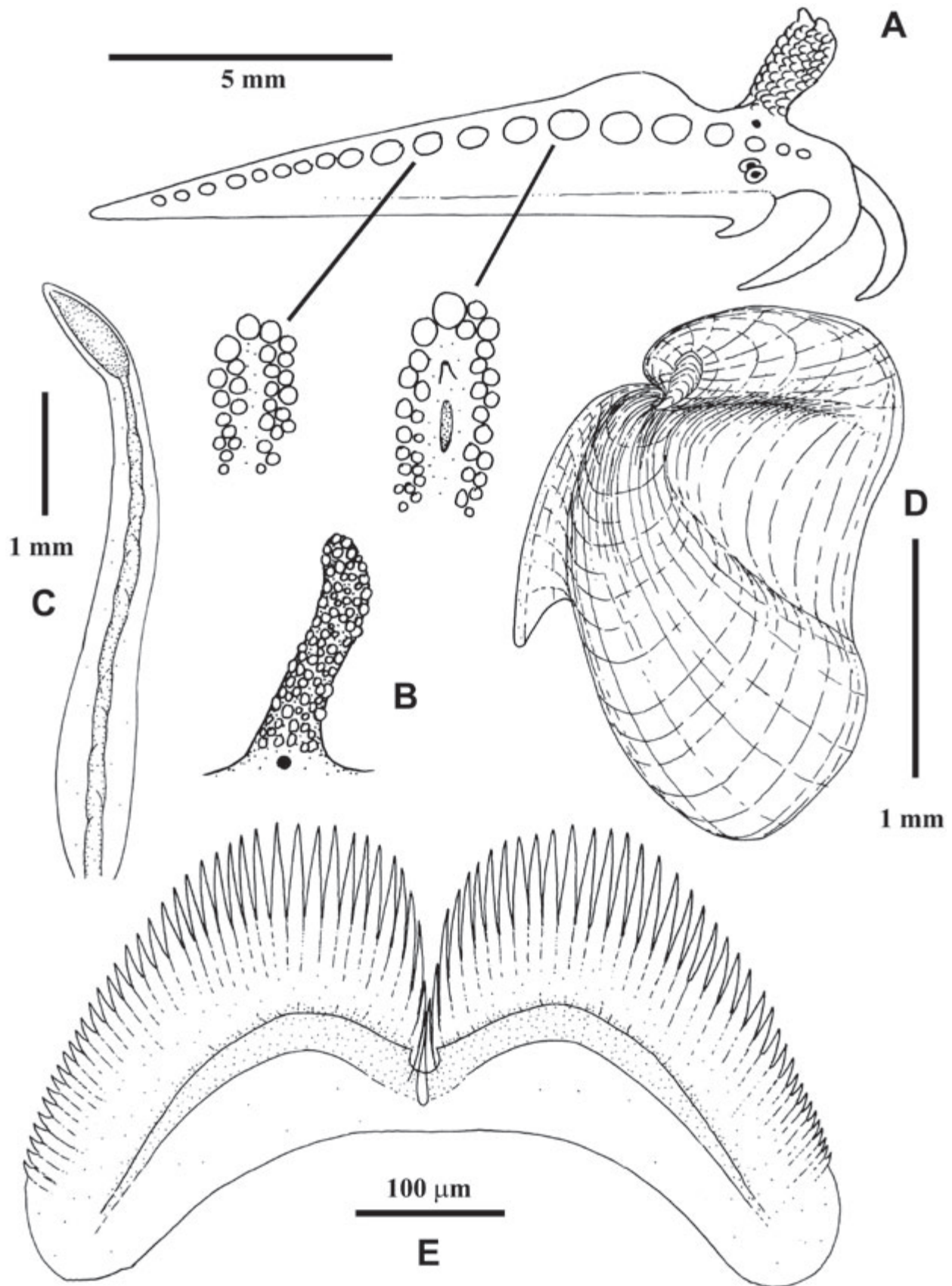


Figure 2 *Berghia dakariensis* (Pruvot-Fol 1953) n. comb.: **A** Lateral view of the fixed animal, with detail of the arrangements of two groups of cerata; **B** Rhinophore (fixed) in postero-lateral view; **C** Ceras; **D** Jaw; **E** Radula: 21st tooth.

denticles and the biggest tooth is $571 \times 227 \mu\text{m}$, with 82 denticles. In the largest teeth some denticles are bifid or may have up to four tips.

Geographic range Known for Dakar, Senegal, in eastern Atlantic, and Brazil (as *B. benteva*) in western Atlantic.

DISCUSSION

The original description of *Spurilla dakariensis* by Pruvot-Fol (1953) is incomplete and lacks important characters including colouration of the living animal, morphology of the rhinophores and arrangement of the cerata. On the other hand, it includes a precise description of the radula, which is very similar to that of our specimen from Gorée Bay: 20 teeth whose size is doubled from the first to the last one, with a dark brown band below the lateral denticles: “*Les dents, au nombre de vingt, s’élargissent du simple au doublé à peu près, de la première à la dernière,La bande très étroite qui porte les denticules est peu arquée et fortement colorée; de un brun presque noir*”. Pruvot-Fol (1953: fig. XVIII) illustrates the teeth of the radula, comparing the first and the nineteenth, and describes the jaws as large curved plates with a bulge on the apical end and a smooth cutting edge, identical to our specimen from Dakar.

Pruvot-Fol (1953: fig. XVII e–d) also illustrates other teeth similar to these of *S. dakariensis*, under the name *Baeolidia moebbi* Pruvot-Fol 1934, which is, in fact, a species that was never described; an erroneous combination of the names *Baeolidia moebii* Bergh 1888 (type locality: Mauritius) and *Baeolidia quoyi* Pruvot-Fol 1934 (type locality: unknown). The resemblance of the radula and jaws of *B. moebbi sensu* Pruvot-Fol (1953) and *S. dakariensis* is consistent with the hypothesis that they are the same species. Additionally, the illustrations of the cerata and the rhinophores bearing papillae under the name *Baeolidia moebbi* Pruvot-Fol 1934 are nearly identical to those of our specimen (Pruvot-Fol, 1953: fig. XVII a, c), thereby, confirming that this is indeed *S. dakariensis*.

Studies on the external and internal anatomy of *S. dakariensis*, allow us to identify it as a valid member of the genus *Berghia* Trinchese 1877, according to the classification proposed by Miller (2001), thus, we suggest the reclassification of the species as *Berghia dakariensis* new combination.

Berghia verrucicornis (A. Costa 1864) is another species of the genus *Berghia* that has been

recorded from the continental Atlantic coast of Africa (Edmunds, 1968), is common in the Canary Islands (Moro *et al.*, 2003; Ortea, Bacallado & Moro, 2012), and whose southernmost distribution limit is in Príncipe Island, (Muniain & Ortea, 1999). This species is easily distinguished from *Berghia dakariensis* by the bright orange colouration of *B. verrucicornis*. The records of this species from the Caribbean, in Florida (Marcus, 1972), Jamaica (Thompson, 1980), Costa Rica (Ortea & Espinosa, 2001) and Brazil (Rios, 1994), are in fact misidentifications of *Berghia rissodominguezi* Muniain & Ortea 1999. Thus, this species must be considered to occur exclusively in the Eastern Atlantic.

Baeolidia benteva Marcus 1958, (type locality: Ubatuba, Brazil) is a junior synonym of *Berghia dakariensis*. Marcus (1958) compared *B. benteva* with *Spurilla dakariensis* and pointed out that there were differences in the jaws and radula of both species, but afterwards he described the radula of *B. benteva* as bearing 19 teeth, the smallest of which is $130 \mu\text{m}$ and the biggest $510 \mu\text{m}$, four times bigger. Additionally, the illustration of the radula of *B. benteva* (Marcus, 1958: figs 108–110) shows a double arched structure with a notch in the middle of the ventral side of the teeth, a typical character of *B. dakariensis*. The specimens of *Berghia benteva* (Marcus 1958) from Buzios, Praia de Armação and Praia dos Ossos (Brazil) illustrated by García, Domínguez & Troncoso (2008: 189) and Domínguez, Troncoso & García (2008: fig. 1 B–D) are identical to our specimens from Senegal and confirm the synonymy of *B. benteva* with *B. dakariensis*, which is a new ampho-Atlantic opisthobranch.

The specimens from Temara, Morocco, illustrated by Pruvot-Fol (1953: pl. I, fig. 11 and pl. III, fig. 56) under the name *B. coerulea*, are more likely to belong to *Berghia columbina* García-Gómez & Thompson 1980 and to *B. verrucicornis* (respectively).

Muniain & Ortea (1999) have published a detailed discussion of the Atlantic species of *Berghia* and Domínguez *et al.* (2008) have provided a comparative table to distinguish them.

Berghia dakariensis (Pruvot-Fol 1953) new combination, is the sixth species described by Pruvot-Fol (1953) which have been recently reinstated or redescribed, with clarification of their taxonomic status. The other five are: *Aplysiopsis formosa*,

by Ortea, Bacallado & Pérez (1990); *Hypselodoris bilineata*, by Ortea, Valdés & García-Gómez (1996); *Chelidonura africana*, by Ortea, Moro & Espinosa (1997); *Placida dakariensis*, by Caballer, Ortea & Moro (2006) and *Berthella africana*, by Ortea, Moro & Caballer (2012).

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