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Report on a collection of South African chitons, including the description of a new Lepidozona species

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A small collection of chitons from South Africa was studied. Apart from new records of some rare species and bathymetrical range extensions for several of the more common species, the collection contained an undescribed *Lepidozona* species, *L. debruini* n. sp. The genus *Lepidozona* is most speciose in the northern Pacific. The present new species is the first recor for the coast of the African continent and the second *Lepidozona* species known exclusively from the Southern Hemisphere.

Key words: Polyplacophora, *Lepidozona*, taxonomy, distribution, South Africa.

INTRODUCTION

Recently Mr. B. de Bruin (Hout Bay, South Africa) sent me several very interesting samples of South African chitons, which he collected by SCUBA diving at depths of between 12 and 42 meters. Altogether, 174 specimens, representing 10 species, could be studied. Although several of these species are well known from the intertidal zone, the records presented in this paper provide new information on their bathymetrical range.

Remarkably, several other well known South African species, like *Chaetopleura papilio* (Reeve, 1847), *Chaetopleura pomarium* Barnard, 1963, *Ischnochiton bergoti* (Velain, 1977), and *Chiton nigrovirescens* Blainville, 1825, were absent in the material. The small and inconspicuous species of the genus *Leptochiton* were absent too, but these could have been easily overlooked.

Unless stated otherwise, all specimens are stored in the author's collection. The number of specimens in the samples is indicated between square brackets.

SYSTEMATICS

ISCHNOCHITONIDAE
CALLOCHITONINAE
Genus *Callochiton* Gray, 1847

Callochiton dentatus (Spengler, 1797)

Material. — False Bay, 1 km off Buffels Bay, 12-18 m, iii.1993 [1]; False Bay, 1-2 km off Buffels Bay, 15-25 m, x.1993 [2]; False Bay, ca. 18 m, i.1994 [4].

Remarks. — *C. dentatus* is better known as *C. castaneus* (Wood, 1815), but according to Kaas & Van Belle (1985: 15-17) *C. castaneus* is a junior synonym of *C. dentatus*.

Although *C. dentatus* is a relatively common species, not much is known about its habitat. Kilburn & Rippey (1982: 138) only report that it lives on the underside of rocks in low-tide pools.

CHAETOPLEURINAE

Genus *Chaetopleura* Shuttleworth, 1853

Chaetopleura pertusa (Reeve, 1847)

Material. — East London area, 4-7 km off Gonubie, 23-32 m, v.1993 [2]; False Bay, 12-15 m, ix.1993 [1]; False Bay, 1-2 km off Buffels Bay, 15-25 m [4]; False Bay, ca. 18 m, i.1994 [6].

Remarks. — According to Kilburn & Rippey (1982: 138) this is an uncommon species found in low-tide pools. It seems to be mainly a subtidal species.

ISCHNOCHITONINAE

Genus *Lepidozona* Pilsbry, 1892

Lepidozona debruini n. sp. (figs. 1-9)

Holotype. — East London area, 4-7 km off Gonubie, under rocks embedded in sand, 23-32 m, v.1993; length 27 mm, width 16.5 mm, preserved in alcohol, colln. Nationaal Natuurhistorisch Museum, Leiden, no. A 9386 (fig. 1).

Paratypes. — East London area, 4-7 km off Gonubie, 23-32 m, under rocks embedded in sand, v.1993 [9, 2 of which disarticulated], colln. H.L. Strack no. 2194; Glen Eden (North of East London), 28-35 m, under medium sized rocks, iii.1994 [2], colln. B. de Bruin; do. [2], colln. South African Museum (Cape Town) no. SAM A39245; do. [2], colln. Natal Museum (Pietermaritzburg) no. V516/T978; do. [2], colln. Museum National d'Histoire Naturelle (Paris); do., [2], colln. H.L. Strack no. 2195.

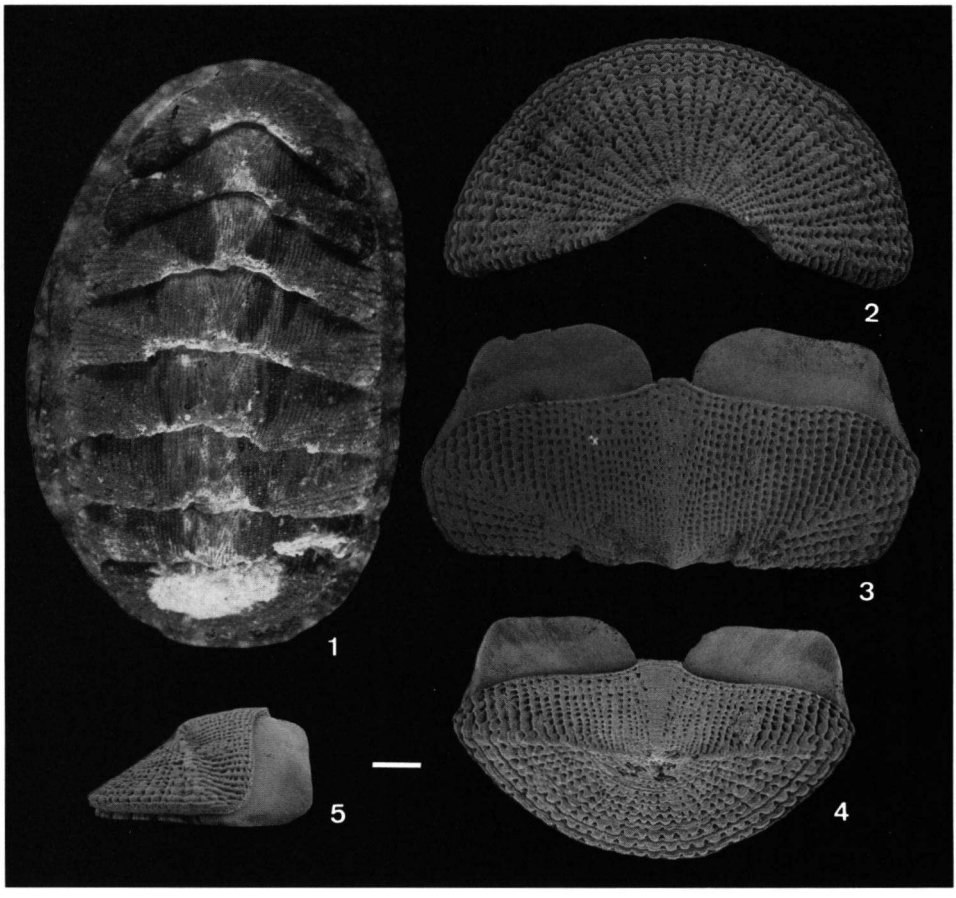
Diagnosis. — Animal of medium size, tegmentum sculptured with numerous radial riblets on end valves and lateral areas of intermediate valves, longitudinally on central areas, interspaces latticed. Intermediate valves and tail valve with very narrow sinus, tegmentum jugal area anteriorly protruding. Girdle dorsally covered with small, ribbed scales, interspersed with small bunches of spicules.

Description: Medium sized animal, largest specimen (partly rolled up and contracted) c. 35 x 22 mm (including girdle) when stretched. Back carinate, dorsal elevation quotient 0.38 in c. 26 mm long paratype, up to 0.44 in ca. 30 mm long paratype. Intermediate valves not beaked, lateral areas well differentiated, little to moderately raised. Colour of tegmentum white, grey or beige with reddish brown streaks and/or spots; some specimens are uniform light brown or dark brown.

Head valve (fig. 2) semicircular, anterior slope slightly concave in the smallest specimen to straight or little convex in larger specimens, tegmentum sculptured with 34-48 radial slightly nodulous ribs, interspace narrow, finely latticed, posterior margin serrated by tubercles.

Intermediate valves (fig. 3) rectangular, small apex present in smallest specimen, worn in larger specimens; tegmentum anterior margin jugal area markedly protruding, lateral areas with 5-8 radial ribs sculptured like head valve, ribs of small specimens ornamented with few, small cylindrical pustules which are worn in larger specimens, posterior margins serrated, central area with 23-33 narrow longitudinal ribs on each side, interspaces becoming narrower near jugum, latticed (fig. 6).

Tail valve (fig. 4) rather flat, less than semicircular, with convex front margin, narrower than head valve. Postmucronal area with 26-40 ribs sculptured like head



Figs. 1-5. *Lepidozona debruini* n. sp. 1, dorsal view complete specimen, holotype, colln. Nationaal Natuurhistorisch Museum, Leiden, no. A 9386, 27 x 16.5 mm; 2-5, disarticulated paratype, colln. H.L. Strack no. 2194; 2, valve I, dorsal view; 3, valve VII, dorsal view; 4, valve VIII, dorsal view; 5, valve VIII, lateral view. Scale bar (for figs. 2-5) 1 mm.

valve, antemucronal area sculptured like central areas of intermediate valves, mucro somewhat anterior, not prominent, postmucronal slope slightly concave in smallest specimens, straight in larger specimens (fig. 5).

Articulamentum white, apophyses wide, rectangular in valve VII becoming rounder towards valve II, connected by a short, very finely denticulate jugal plate, notched on outer sides, sinus remarkably narrow, slit formula of insertion plates 12/1/10-12, teeth of tail valve short and sharp in small specimens, those of head valve longer, blunt, somewhat rugose.

Girdle moderately wide, white or orange with dark red irregular bands. Dorsally covered with small, imbricating, curved scales, 70-120 µm wide, 100-160 µm long, ornamented with 11-18 vertical narrow riblets (fig. 7); scales interspersed with

Figs. 6-9. *Lepidozona debruini* n. sp., disarticulated paratype, colln. H.L. Strack no. 2194: 6, valve VII, detail of tegmentum, scale bar 100 µm; 7, dorsal girdle scales, scale bar 10 µm; 8, ventral girdle scales, scale bar 10 µm; 9, radula, central and lateral teeth, scale bar 100 µm.

numerous bunches of 2-4 stalked, straight or curved, smooth, 200-300 µm long, pointed spicules. Girdle ventrally paved with rows of elongate, irregular rectangular scales (fig. 8), measuring 60-90 x 15-25 µm. Marginal spicules small, 55-75 µm long, conical, pointed, strongly longitudinally ribbed.

Radulae (fig. 9) of ca. 26 and 30 mm long paratypes, 9.8 and 11.7 mm in length, respectively, with about 38 and 41 rows of mature teeth. Median tooth with broad blade, 180-230 µm wide. Cusp of major lateral tooth 270-290 µm wide, strongly curved, with a long, sharply pointed denticle and a second, much smaller denticle on the side.

Gills originating at posterior margin of valve II, extending to the anterior margin of valve VIII, numbering 22-26 on each side.

Remarks. — The genus *Lepidozona* has its greatest radiation in the northern Pacific Ocean (about 43 species). This is the first record of a *Lepidozona* species from the edge of the African continent. Except for a few records of *Lepidozona luzonica* (Sowerby, 1842) (Kaas & Van Belle, 1990: 51, map 15) and the New Zealand species *Lepidozona beui* O'Neill, 1987, no *Lepidozona* is known from the Southern Hemisphere. *L. debruini* has very little in common with *L. luzonica*. The latter species remains much smaller (up to 12 mm), has a weaker tegmental sculpture and has a totally different radula of which the major lateral tooth has a tricuspid head. *L. debruini* is somewhat more similar t *L. beui*, the only other species known exclusi vely from the Southern Hemisphere. According to the type material of *L. beui*, *L. debruini* differs from that species in (1) a more prominent, markedly latticed tegmental sculpture; (2) a strongly protruding anterior margin of the

jugal area in intermediate valves and tail valve; (3) a very narrow sinus; (4) smaller marginal spicules; (5) dorsal girdle scales interspersed with numerous small bunches of smooth spicules; (6) a radula with much wider central teeth.

Both species occur more or less at the same latitude (*L. debruini* at c. 33° and *L. beui* between 34° and 45°, but are separated by a gap of almost 15.000 km. Morphologically, both Southern Hemisphere species have no diagnostic characters in common (synapomorphic character states) discriminating them from the Northern Hemisphere species, and it is evident that they are not closely related.

The fact that this relatively large and common species remained unknown for such a long time, suggests that *L. debruini* has a local and strictly subtidal distribution.

Etymology. — *L. debruini* is named after Mr. B. de Bruin, a diver and shell collector from Hout Bay, South Africa, who discovered this remarkable new species.

Genus *Ischnochiton* Gray, 1847

Ischnochiton oniscus (Krauss, 1848)

Material. — Hout Bay area (near Cape Town), 35-42 m, ii.1993 [5]; False Bay, 1 km off Buffels Bay, 12-18 m, iii.1993 [6]; False Bay, 12-15 m, ix.1993, [11]; False Bay, 1-2 km off Buffels Bay, 15-25 m, x.1993 [12].

Remarks. — According to Kaas & Van Belle (1990: 122) this species only occurs intertidally. The present study proves that this species may be quite common at depths of between 12 and 42 meters.

Ischnochiton textilis (Gray, 1828)

Material. — False Bay, 1 km off Buffels Bay, 12-18 m, iii.1993 [6]; East London area, 4-7 km off Gonubie, 23-32 m [1]; False Bay, 12-15 m, ix.1993 [5]; False Bay, 1-2 km off Buffels Bay, 15-25 m, x.1993 [8].

Remarks. — This is an intertidal to shallow subtidal species (Kaas & Van Belle, 1990: 119).

CHITONIDAE
CHITONINAE
Genus *Chiton* Linnaeus, 1758
Subgenus *Rhyssoplax* Thiele, 1893

Chiton (Rhyssoplax) tulipa Quoy & Gaimard, 1835

Material. — False Bay, 1 km off Buffels Bay, 12-18 m, iii.1993 [12]; East London area, 4-7 km off Gonubie, 23-32 m, v.1993 [4]; False Bay, 12-15 m, ix.1993 [4]; False Bay, 1-2 km off Buffels Bay, 15-25 m, x.1993 [7].

Remarks. — A very common species on the underside of rocks in low-tide pools (Kilburn & Rippey, 1982: 139). Apparently it remains quite common at depths up to 30 meters.

Chiton (Rhyssoplax) crawfordi Sykes, 1898

Material. — False Bay, 1 km off Buffels Bay, 12-18 m, iii.1993 [4]; East London area,

4-7 km off Gonubie, 23-32 m, v.1993 [1]; False Bay, 12-15 m, ix.1993 [3]; False Bay, 1-2 km off Buffels Bay, 15-25 m, x.1993 [3]; False Bay, ca. 18 m, i.1994 [4].

Remarks. — Although specimens of this species have been found in the lower intertidal area, it seems to be predominantly a subtidal species.

ACANTHOCHITONIDAE

Genus *Craspedochiton* Shuttleworth, 1853

Craspedochiton productus (Carpenter, in Pilsbry, 1892)

Material. — South Africa, Hout Bay area (near Cape Town), 35-42 m, ii.1993 [2]; East London area, 4-7 km off Gonubie, 23-32 m, v.1993 [6]; Glen Eden (North of East London), 28-35 m, iii.1994 [27].

Remarks. — Kaas (1979: 872-873) originally placed this species [and *Craspedochiton isipingoensis* (Sykes, 1901)] in the genus *Craspedochiton*. Later on (Kaas, 1986, 1989), he classified it with the genus *Notoplax*, subgenus *Spongiochiton*. However *C. productus* is without doubt very closely related to *C. laqueatus* (Sowerby, 1842), the type species of the genus *Craspedochiton* Shuttleworth, 1853. The morphology of the true *Craspedochiton* species is related to their peculiar carnivorous habits. Small organisms are actively caught by trapping them underneath the girdle, which has a remarkable anterior expansion (Saito & Okutani, 1992). It also accounts for the reduced foot and the peculiar ventral girdle covering. Undoubtedly *Craspedochiton* must be regarded as a valid genus *Spongiochiton* Dall, 1882 is now considered a junior synonym.

Although *C. productus* is regarded as an uncommon species (Ashby, 1931: 10-12, pl. 1 figs. 9-12; Barnard, 1963: 329; not mentioned by Kilburn & Rippey, 1982), the present study shows that subtidally it may be locally common.

There are several at least closely related (if not conspecific) additional *Craspedochiton* species described from the Western Indian Ocean and southern Africa. These are: *C. isipingoensis* (Sykes, 1901), type locality Isipingo, South Africa; *C. moebiusi* Thiele, 1909, type locality Mauritius; *C. umgaziana* (Koch, 1951), type locality near Umgazana River, South Africa; *C. aberrans* (Ohdner, 1919), type locality Majunga, Madagascar; *C. carpenteri* (Pilsbry, 1893), type locality Port Elizabeth, South Africa; *C. involutus* (Carpenter in Pilsbry, 1893), type locality Zanzibar; *C. foresti* (Leloup, 1965), type locality Ile Principe, Gulf of Biafra; *C. laqueatus* (Sowerby, 1842), type locality Calapan, Mindoro, Philippines (but also recorded from the Red Sea). At present their taxonomic status remains unclear.

Genus *Acanthochitona* Gray, 1821

Acanthochitona garnoti (De Blainville, 1825)

Material. — East London area, 4-7 km off Gonubie, 23-32 m, v.1993 [1].

Remarks. — This is a common intertidal specie, living in the mid-tidal zone (Kilburn & Rippey, 1982: 137). Its occurrence in somewhat deeper water must probably be regarded as exceptional.

Acanthochitona turtoni Ashby, 1828

Material. — False Bay, 1 km off Buffels Bay, 12-18 m, iii.1993 [1]; False Bay, 1-2 km off Buffels Bay, 15-25 m, x.1993 [1].

Remarks. — *A. turtoni* is certainly not conspecific with *A. garnoti*, as suggested by Barnard (1963: 328). It is different in colour and tegmental sculpture. Furthermore, its tail valve is quite different in shape (Ashby, 1931: 9). It is apparently a rare, predominantly subtidal, species in South Africa; it is seldom reported and only very few specimens are present in collections.

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