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A new species of *Bistolida* (Gastropoda: Cypraeidae).

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Abstract: *Bistolida nanostraca* n. sp. from the Cargados Carajos Shoal, Northern Mauritius differs from *B. piae* LORENZ & CHIAPPONI 2005 in that it is a smaller, and less callused shell, with a less flattened dorsal profile, reduced transverse banding, and less developed teeth. The animals differ in coloration. Radula differences are slight. The Cypraeid fauna of the atoll is discussed.

Keywords: *Cypraeidae, Bistolida nanostraca, Bistolida piae,* Mauritius.

Zusammenfassung: *Bistolida nanostraca* n. sp. von Cargados Carajos, Nord-Mauritius unterscheidet sich von *B. piae* LORENZ & CHIAPPONI 2005 durch ein kleineres, weniger kallöses Gehäuse mit weniger abgeflachtem Dorsalprofil, reduzierten transversalen Bändern und weniger ausgeprägten Zähnen. Die Tierkörper unterscheiden sich in der Färbung, Unterschiede in der Radula sind recht gering. Die Fauna der Cypraeidae auf dem Cargados Carajos-Atoll wird diskutiert.

Introduction: Recently, we had the rare opportunity to visit the Cargados Carajos Shoal, which is 400 km north of Mauritius. We observed the elusive and insufficiently characterized *Bistolida piae* LORENZ & CHIAPPONI, 2005 in its habitat. We noticed a diversity in shape, size, and coloration that is unique among the Cypraeidae and suggested that the species radiated to form two distinct, and partly sympatric populations. On reviewing the type material of *B. piae*, we noticed that four of the paratypes belong to the new species described in the following report.

Abbreviations:
CLSF: CHIAPPONI-LORENZ Seashell Foundation, Lecco, Italy
HNC: Haus der Natur - Cismar, Germany
MAM: Collection Dr. Michael A. Mont, Owings Mills, Maryland, USA
MNHN: Museum National d'Histoire Naturelle, Paris, France
SMF: Senckenberg Naturkundemuseum, Frankfurt/M., Germany

Material and methods: For the statistical comparison, we were able to measure 35 live-taken or fresh-dead specimens of *B. piae* and 40 live-taken or fresh-dead, as well as 200 beached *B. nanostraca* n. sp.

Measurements are listed as length x width x height in millimeters, with the labral and columellar teeth counted. The shell formula was derived from the measurements as described by LORENZ (2002). The percent relative mass (mR) of a shell is the relationship between the measured weight (mD) of a shell (in grams) and the hypothetical weight of a solid block of aragonite (ρ = 0,00293 g/mm^3) of the shell's dimensions (length, width and height). Radulae were extracted from three individuals of each species. The animals had been dried after being kept in 60% ethanol for 24 hours. For extraction of the soft parts, the specimens were softened in water overnight. The radulae were cleaned by washing them in a 50% solution of DAN Klorix™ (bleach) for 5 minutes and then photographed. Drawings depicting the respective radula teeth at the same angle were made from these photographs.

Bistolida nanostraca n. sp.

Bistolida owenii owenii, LORENZ & HUBERT 1993: pl. 380 fig. 19, 22, 25, 28
Bistolida owenii piae, Paratypes 3, 5, 7, 8. LORENZ & CHIAPPONI 2005: Visaya Vol. 1 No. 5 p. 22, pl. 7 fig. 29, 31, 32

Holotype	12,6 x 7,5 x 5,6 (15 : 13) coll. MNHN24515
Paratype 1	13,8 x 7,7 x 5,8 (16 : 14) coll. CLSF
Paratype 2	13,5 x 7,4 x 5,6 (15 : 11)
Paratype 3	11,8 x 6,1 x 4,6 (13 : 10)
Paratype 4	14,0 x 7,8 x 5,8 (16 : 11)
Paratype 5	12,3 x 6,6 x 5,1 (14 : 11)

Paratype 6 13,9 x 7,6 x 5,8 (15 : 11) coll. CLSF
Paratype 7 13,6 x 7,4 x 5,7 (14 : 12) coll. MAM3050
Paratype 8 14,9 x 8,2 x 6,2 (16 : 11)
Paratype 9 11,8 x 6,7 x 5,2 (13 : 11) coll. CLSF
Paratype 10 15,4 x 8,4 x 6,4 (15 : 12)
Paratype 11 16,9 x 9,7 x 7,2 (16 : 12)
Paratype 12 15,4 x 8,3 x 6,3 (15 : 12)
Paratype 13 13,4 x 7,0 x 5,3 (15 : 12)
Paratype 14 14,8 x 8,0 x 6,0 (14 : 11)
Paratype 15 12,8 x 7,1 x 5,3 (14 : 11)
Paratype 16 16,2 x 8,7 x 6,7 (15 : 12) coll. MAM3049
Paratype 17 15,5 x 9,2 x 6,7 (15 : 11) coll. MAM3051
Paratype 18 16,2 x 9,5 x 7,1 (14 : 11) coll. MAM3048
Paratype 19 15,8 x 8,5 x 6,3 (17 : 13) coll. MAM3053
Paratype 20 12,5 x 6,9 x 5,1 (13 : 11)
Paratype 21 17,3 x 9,7 x 7,6 (16 : 13)
Paratype 22 18,0 x 10,2 x 7,6 (15 : 15) coll. CLSF
Paratype 23 12,6 x 7,4 x 5,4 (15 : 11) coll. CLSF
Paratype 24 14,3 x 8,1 x 6,1 (14 : 11)
Paratype 25 12,2 x 7,1 x 5,4 (14 : 10)
Paratype 26 13,0 x 7,4 x 5,6 (13 : 11) coll. MAM3052
Paratype 27 16,8 x 9,2 x 7,0 (15 : 13) coll. SMF
Paratype 28 13,4 x 7,4 x 5,8 (15 : 11) coll. HNC
Paratype 29 14,6 x 8,5 x 6,4 (13 : 10)
Five further paratypes in the MNHN24516

All from Cargados Carajos Shoal, north of Mauritius
The paratypes are deposited in the author's collections unless otherwise stated. Five specimens of *B. piae* are deposited in the MNHN IM-2012-5 and the HNC respectively.
Further paratype specimens will be distributed among institutions and collectors in due course.

Description: The shell is small (10 to 17 mm), elongate to cylindrical in shape (the 12,6 mm holotype is slightly elongated oval), with an equally wide, straight aperture. The shell's general appearance is semi-transparent dorsally. The spire is umbilicate, and partly exposed. The protoconch consists of only two whorls. It is brown, with a fine, cancellate sculpture below a thin layer of enamel, and it measures 1,0 mm in diameter. The sides of the shell are rounded, without callus, but merely forming narrow flanges bordering the slightly rostrate extremities. The dorsal profile, when viewed from the side, is nearly rounded, with a somewhat flattened area in the midsection. The teeth are moderately strong, with wide interstices. They extend onto the flattened base midways on the columellar side and become shorter towards the extremities. In the first quarter of the anterior columellar side, the teeth are notably thinner when compared to those in the midsection of the base. The columellar teeth are restricted to the edge of the aperture and do not extend into the shell. The fossula region is flat and smooth. The shell formula derived from measuring 50 shells is: [14(56–42)17:13] rM= 18,9.

The dorsal ground color is plain white in the holotype. There are hues of pink, blue, or brown in some of the the paratypes. There may be pink to pale, greyish-blue zones concealing the paler ground color, of which only two, white, transverse, wavy bands remain visible. The terminal blotches are distinct and dark in the holotype, but in the paratypes, they vary from discrete reddish-brown to being absent. The dorsal spotting is fine, conspicuous, and sparse in the holotype, but there are albinistic specimens without any darker spotting. Brown blotches originating from darker, interrupted embryonal banding are usually absent, with remnants of them found in some paratypes, including some of those that are unspotted and nearly all-white otherwise (e.g. Paratype 9). Sparse, dark-brown, small, and distinct spots cover the margins and the outer half of the base in most shells. Some specimens are completely white, without any darker pigmentation. Others merely show vague, greyish-to-brown clouds dorsally, but lack any spotting or banding. The shape varies slightly from elongate oval to cylindrical. The degree of callosity does not vary much, shells with prominent marginal callus have not been found. The length of the teeth varies slightly, in some shells the columellar teeth only extend slightly towards the base. The dorsum shows a pale, yellow fluorescence when viewed under ultraviolet light.

The animal has a transparent-white mantle with minute, crowded papillae. Tentacles, proboscis, and eyestalks are yellow-to-orange. The foot is greyish-white and semi-transparent. A darker, grey stripe at the posterior end of the foot is barely discernible or absent. The siphon is transparent white, with numerous hairlike processes around its outer edge.

The animal is able to autotomize a small portion of its foot. There is a dense array of glands in the anterior part of the foot. These can secrete large amounts of transparent mucus. The stomach contents of three specimens examined consisted of spicules of different types, suggesting that the species feeds on a variety of sponges. The radula is large, measuring 4,5 mm in length in a shell of 13 mm length (Fig. 1, 2)

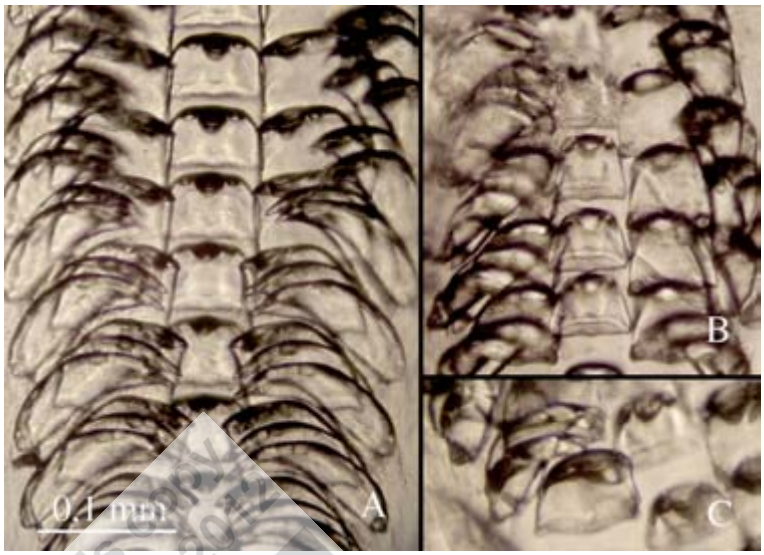

Fig. 1: Light microscopic photo of radulae.
Left: *B. piae*.
Right: *B. nanostraca* n. sp.

Fig. 2: Sketches of the radular teeth. From left to right: Outer and inner lateral, marginal and rhachidian. Top: *B. piae*, bottom: *B. nanostraca* n. sp.

The spawn consists of 15 to 40 spherical transparent egg capsules of 3,1 to 3,5 mm diameter, each of which contain 50 to 70 larvae. The capsules are not placed in a compact assembly, but are spread over an area of 2 to 3 cm. The female does not cover the spawn with its foot, but remains close by, often accompained by one or two males (Fig. 6A).

Habitat and distribution: *Bistolida nanostraca* n. sp. are found in holes and ledges of shallow reefs, usually well hidden among debris. They are found throughout the Cargados Carajos Shoal (Type locality: unnamed intertidal reef flat off South Island).

Etymology: The name *nanostraca* (gr. *nanos* = dwarf and *ostracum* = shell) refers to the dwarfed appearance of the species in comparison with its sister *B. piae*.

Discussion: Until recently, the name *menkeana* DESHAYES, 1863 was used for *Bistolida piae* (e.g. by RAYBAUDI 1992, 1997), going back to an article by CATE (1967), who apparently never saw the holotype of *menkeana* in the MNHN. That shell is a small (10 mm), badly eroded specimen, possibly coming from a population of *B. owenii* (SOWERBY I, 1837), which are commonly cast ashore in the south of Mauritius. The name is now in use for that variation. In 2005, we published a review of *Bistolida owenii* and its related taxa in Visaya Vol.1 No. 5 p. 22 ff, where we also described *Bistolida piae* (as a subspecies of *owenii*) to introduce a valid name for the population formerly mistaken for *menkeana*. Subsequent analysis of the mtDNA of *Bistolida owenii*, *B. vasta* SCHILDER & SCHILDER, 1938, and *B. piae* conducted by Dr. CHRISTOPHER MEYER (personal communication) revealed considerable differences between those three taxa that we interpret as supportive of their distinction on the level of a species.

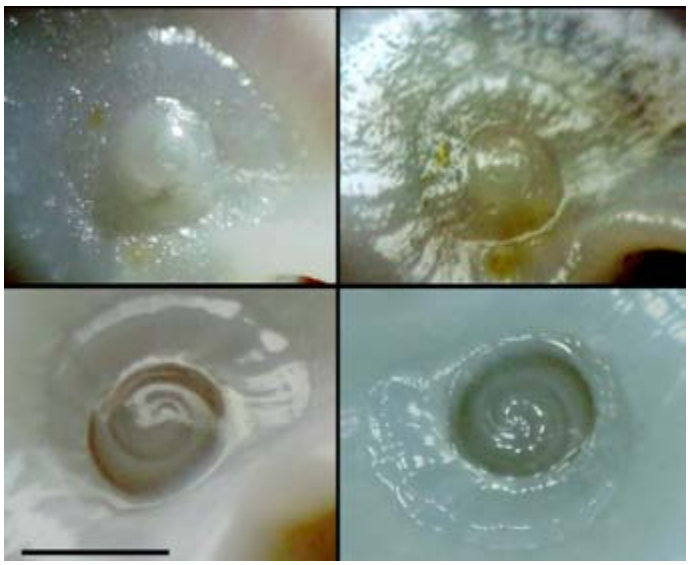

Fig. 3: Protoconchs in subadult shells.
Top: *B. piae*. Bottom *B. nanostrac*.
Scale: 1 mm

As four of nine specimens of the original type material (paratypes 3, 5, 7, 8) of *B. piae* belong to the new species, the concept of the true *B. piae* will be described in the following, based on the study of additional material that was not available at the time of the initial description.

B. piae ranges from 15 to 24 mm [19(61–43)16:13] rM=24,2. It is characterized by an oval to pyriform, very depressed, heavily callused shell with angular, bent-up margins surrounding the dorsum. The posterior extremity is rather blunt. The dorsal outline, when viewed from the side, forms a flat plateau with abrupt slopes on either side (see Plate 3, especially the third row on the right). The spire is mostly flat and covered with callus in adult shells (Fig. 4: top). The protoconch measures 1 mm in diameter and has approximately 2 whorls (The images of a protoconch in Fig. 3A were taken from a dead, slightly eroded shell. So far, we have not been able to study a live-taken juvenile *B. piae*). The teeth are thick and extend far across the convex base and the labrum. The aperture is narrow and straight. The fossula area may show 2 to 3 weak denticles.

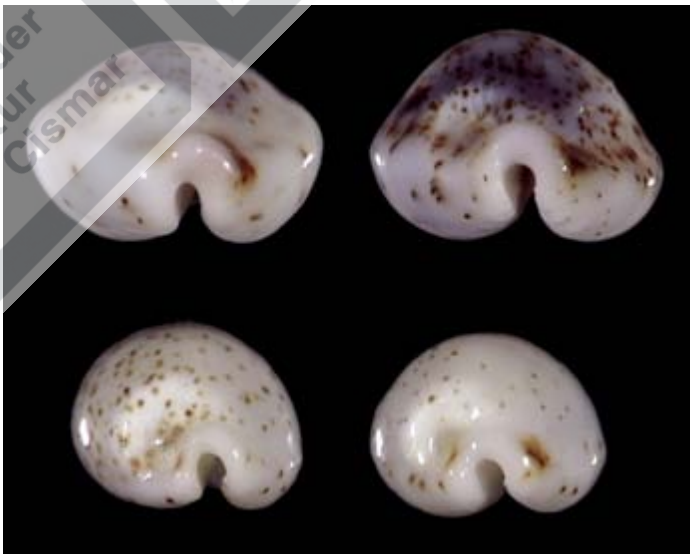

Fig. 4: Marginal callosities
(shells not to scale).
Top: *B. piae*. Bottom *B. nanostraca*

The dorsal ground color is pale-pink, with three broad, blue zones. There are one or two square brown patches on the right side of the dorsum, above the spire. These are part of a brown, interrupted embryonal band. The entire dorsum is densely covered with fine brown spots and sometimes one or two compact, brown blotches. The terminals show discrete red-brown blotches on either side of the dorsum. Above the angular callus ridge there is dense, mottled brown marginal spotting. Below this, towards the base, the spotting is slightly less dense.

The animal has a thin, semi-transparent, yellow mantle with crowded, minute, branching papillae giving it a "blurry" surface. The tentacles and the proboscis are bright orange, and the eyestalks are brown. The foot is white, with a black longitudinal stripe between its tip and the posterior part of the shell (Fig. 5).

Fig. 5: *Bistolida piae*, living animals. Top row: Specimens in the habitat, photos JANA KRATZSCH. Bottom left: Specimen showing the orange proboscis. Bottom right: Crawling specimen showing the dark stripe on the posterior part of the foot. Photo by THIERRY DANDRIMONT.

The radula is illustrated in Fig 1, 2. The spawn is unknown. The species is a spongivore as the stomach contents of the specimens studied contained different types of poriferan spicules.

B. nanostraca n. sp. is mostly smaller than *B. piae*, ranging from 9 to 17 mm [14(56–42)17:13] rM= 18,9. Compared to *B. piae*, *B. nanostraca* is lighter, more elongate, oval rather than pyriform, often cylindrical, hardly callused, and with a more rounded dorsal profile. The posterior extremity is more delicate and rostrate than that of *B. piae*. The spire is slightly umbilicate, and not covered with callus, whereas in *B. piae*, it is usually flat and always covered with callus. The sides are rounded, not callused, and not forming angular margins as in *B. piae* (Fig. 4). The teeth are less thick and extend less onto the flattened base and the margins. The dorsal ground color is paler and the transverse banding that is always seen in *B. piae* is usually reduced in *B. nanostraca*, which instead has a pellucid, semi-transparent appearance. The terminal blotches are distinct and dark, and are usually more conspicuous than those of *B. piae*. The dorsal spotting, when present, is finer and more sparse than in *B. piae*. Brown blotches originating from the embryonal banding, as typically seen in *B. piae*, are often absent in *B. nanostraca*.

The animal of *B. nanostraca* has a transparent instead of a yellow-orange mantle as in *B. piae*. The black stripe at the posterior end of the foot typically found in *B. piae* is barely discernible or absent in *B. nanostraca* (Fig. 6).

Unspotted, nearly all-white shells (Paratypes 21-27), range from 11 to 18 mm. They are similar to the typical variation in lacking strong callosities, but the teeth are usually shorter. The ground color is pellucid white and there may be three pale-tan zones, but there are no darker spots or blotches either dorsally or along the margins. Even though the shell appears to be an albino, the animal has bright yellow-orange tentacles. Approximately 10% of the specimens found in the south of the Atoll are of this variation. Comparable off-color shells have not been found among *B. piae* or any other relative in the genus.

Fig. 6: *Bistolida nanostraca*, living animals.
A: Specimens with spawn (paratypes 3 to 5). B: Pale and dark pigmented forms from the same area.
C: The dark stripe at the posterior of the foot is barely discernible. D: Unspotted "albinistic" specimen with yellow-orange tentacles. E: The holotype *in situ*.

The ground color of *Bistolida stolida clavicola* LORENZ, 1998 and *B. diauges* (MELVILL, 1888) may switch from the typical saturated green or blue to paler reddish-brown or lemon-yellow. However, also in off-color shells, there are always darker spots and blotches. The frequent occurrence of an albinistic phenotype within the same habitat is otherwise only known from a few species of Cypraeidae: *Cribrarula melwardi* (IREDALE, 1930), *Notocypraea comptonii* (GRAY, 1847), and species of the genus *Zoila*. With the exception of the first one, all of these species are intracapsular developers.

The radulae of *B. piae* and *B. nanostraca* show a number of slight differences: the rhachidian tooth in *B. piae* has straight sides and in *B. nanostraca* it is distinctly wider at its base, which is not indented above its middle part as in *B. piae*. The marginal teeth are shorter in *B. nanostraca*, and their median denticle is somewhat longer than in *B. piae* (Figs. 1, 2). In relation to the variability of radulae observed within other species of the family, the differences between the two species discussed here are noteworthy, but too slight to contribute as a diagnostic feature. Both species seem to feed on the same types of encrusting sponges.

The lack of a prominent, denticulate fossula safely separates shells of *B. piae* and *B. nanostraca* from their closest relatives, *B. owenii* (Mauritius and La Reunion) and *B. vasta* (East Africa and Madagascar). The animal of *B. owenii* has a grey-brown mantle with small, branched, white papillae and a grey siphon with coarser papillae along its edge and darker grey blotches on either side (Fig. 7).

Fig 7: *Bistolida owenii*, Tamarin Bay, Southwest Mauritius (11 mm)

The Cargados Carajos Shoal, also known as St. Brandon, is a 50 km long chain of small, sandy islands and a compact fringing reef to the east, located 400 km north of Mauritius Island. It is exposed to heavy storms and cyclones. Its shallow islands are remnants of a volcanic crater, but now largely consist of dead coral, shell rubble, and sand, with little vegetation. During the year, floods move large amounts of sand in the lagoon, passes break through the dunes of the islands, reefs get covered in sand and rubble, and the direction of prevailing currents constantly changes. Coral growth is limited to solid, robust species. The coral bolders in the shallows usually have living polyps and specimens of *Tridacna* on both sides, indicating that everything gets rolled around on a regular basis by extreme currents.

The fauna is famous for a number of molluscs that are not typically found elsewhere: *Lambis violacea* SWAINSON, 1821, *Lyria anna* LESSON, 1835, and *Conus* (*Textilia*) *timorensis* HWASS, 1792, but none of these is endemic to Cargados Carajos. Recently, *Morum* (*Oniscida*) *lorenzi* MONSECOUR, 2012, and *Conus* (*Rolaniconus*) *lecourtorum* LORENZ, 2012 were discovered and these are endemic, as are *Ficus dandrimonti* n. sp. and *Conus* (*Cylindrus*) *textile vaulberti* n. ssp., which are described in this issue, and a number of undescribed species that are currently under study. Our rough estimate is that less than 5% of the molluscan fauna is really endemic to the atoll. Many species of gastropods that one would expect to find in this part of the Indian Ocean are rare or absent, indicating a high degree of isolation. The local Cypraeid fauna has some species that are typical for the Seychelles and Madagascar, but are not found in Mauritius (e.g. *Cribrarula abaliena* LORENZ, 1989). Interestingly, none of the species considered endemic to Mauritius and La Reunion are found in Cargados Carajos.

Certain Cypraeidae that are common in Mauritius or the Seychelles are absent in Cargados Carajos: *Erronea caurica elongata* (PERRY, 1811), *Melicerona listeri* (GRAY, 1824), *Palmadusta asellus* (LINNAEUS, 1758), *P. clandestina passerina* (PEASE, 1865), and *Purpuradusta microdon chrysalis* (KIENER, 1843).

Three cowry-species that have been found at Cargados Carajos are not found in Mauritius or La Reunion: *Bistolida piae* LORENZ & CHIAPPONI, 2005, *Cribrarula abaliena* LORENZ, 1989, and *Erronea adusta* (LAMARCK, 1810).

The following cowries are found in Mauritius and the Seychelles: *Bistolida diauges* (MELVILL, 1888), *Cypraea tigris* (LINNAEUS, 1758), *E. helvola argella* (MELVILL, 1888), *Lyncina carneola* (LINNAEUS, 1758), *L. leviathan titan* SCHILDER & SCHILDER, 1962, *L. vitellus* (LINNAEUS, 1758), *L. lynx* (LINNAEUS, 1758), *Mauritia arabica immanis* SCHILDER & SCHILDER, 1939, *M. histrio* (GMELIN, 1791), *Nucleolaria nucleus* (LINNAEUS, 1758), *Ovatipsa chinensis violacea* (Rous, 1905), *Pustularia cicercula* (LINNAEUS, 1758), *P. globulus brevirostris* SCHILDER & SCHILDER, 1938, *Staphylaea limacina interstincta* (WOOD

1828), *S. staphylaea laevigata* (DAUTZENBERG, 1932), and *Talostolida pellucens* (MELVILL, 1888) are moderately regular finds on the beaches.

Monetaria annulus (LINNAEUS, 1758), *M. caputserpentis* (LINNAEUS, 1758), and *M. moneta* (LINNAEUS, 1758) are fairly abundant along the shores in shallow water. Inside the lagoon, *Bistolida kieneri* (HIDALGO, 1906), *Erosaria erosa* (LINNAEUS, 1758), *Palmadusta diluculum* (REEVE, 1845), and *Purpuradusta fimbriata durbanensis* (SCHILDER & SCHILDER, 1938) are locally common.

Some species that are living in the turbid, inaccessible waters of lagoon edges, or the sublitoral zone below (*Arestorides argus contracasta* Lorenz, 2012, *Leporicypraea mappa rosea* (GRAY, 1924), *Mauritia depressa dispersa* SCHILDER & SCHILDER, 1939, *M. mauritiana* (LINNAEUS, 1758), *M. scurra scurra* (GMELIN, 1791), and *Talparia talpa* (LINNAEUS, 1758), seem to successfully maintain indigenous populations as their empty shells wash up frequently along beaches that are exposed to the outer reef.

B. piae is rather widespread along the Mascarene ridge, from Rodrigues Island northwards to Cargados Carajos and the Seychelles, where it lives only at greater depths (JARRETT, 2000). It is not found on La Reunion and the island of Mauritius.

On the contrary, *B. nanostraca* is definitely endemic to Cargados Carajos Shoal. It is by far the most abundant species in the lagoon, judging from the amount of eroded shells on the beaches. However, finding a fresh dead or a living animal is difficult and a matter of good luck, as there seems to be no particular habitat for larger numbers of them. Living *B. nanostraca* were mainly found in deep crevices among rubble and sand, and *B. piae* only in areas exposed to strong current and wave action. Both can be found less than ten meters apart from each other. At Cargados Carajos, it seems that *B. piae* and *B. nanostraca* adapted to several ecological niches that are occupied by other species of cowries elsewhere.

Explanations of Plate 1:

Bistolida nanostraca
1st row: Holotype (16 mm)
2nd row: Paratype 6 (14 mm)
3rd row left: Paratype 28 (13 mm). Right: Paratype 3 (12 mm)
4th row: Paratype 14 (15 mm)

LORENZ, F. & CHIAPPONI, M.: A new species of *Bistolida* (Gastropoda: Cypraeidae).

Explanations of Plate 2:

Bistolida nanostraca
1st row left: Paratype 7 (14 mm). Right: Paratype 19 (16 mm)
2nd row left: Paratype 2 (14 mm). Right: Paratype 9 (12 mm)
3rd row left: Paratype 25, (12 mm). Right: Paratype 23 (13 mm)
4th row left: Paratype 21 (17 mm). Right: Paratype 22 (18 mm)

LORENZ, F. & CHIAPPONI, M.: A new species of *Bistolida* (Gastropoda: Cypraeidae).

Explanations of Plate 3:

Bistolida piae
1st row: 19,7 mm
2nd row: 19,7 mm
3rd row: 22,2 mm
4th row left: 18,7 mm. Right: 17,1 mm

LORENZ, F. & CHIAPPONI, M.: A new species of *Bistolida* (Gastropoda: Cypraeidae).

The differences between the two concern all of the features that are understood as being most subject to natural selection pressures: shape, thickness, and size, as well as the coloration of the shell, which is constant in *B. piae*, but varies considerably in *B. nanostraca*. The number of teeth and the structure of the radula show less obvious differences. We suspect that the thick, callused shell of *B. piae* is a defense against fish attacks. Many specimens show traces of healed fish-bites. The smaller and narrower *B. nanostraca* appears better adapted to hiding deeper in the narrow crevices of a coral conglomerate.

The species of *Bistolida* have a planktotrophic development, and their spawns are similar to those of most cowries in consisting of one hundred or more egg capsules, each containing several hundred larvae. The spawn of *B. nanostraca* consists of remarkably few egg capsules with exceptionally large and few larvae. Nurse eggs, characteristic of intracapsular larval development in other genera (*Cypraeovula*, *Notocypraea*, *Zoila*), were not observed. The size and small amount of whorls of the protoconchs of *B. nanostraca* and *B. piae* suggest that their free-swimming veliger phase is either short or absent (See also RANSON, 1967, LILTVED, 1989, FOIN, 1981, 1982, and MEYER, 2003). This mechanism may aid in maintaining populations in an isolated atoll that is hit heavily by cyclones and under the permanent influence of strong currents.

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A new species of *Ficus* (Gastropoda: Ficidae).

By FELIX LORENZ, Buseck-Beuern

Abstract: *Ficus dandrimonti* n. sp. from Cargados Carajos, N. Mauritius differs from *Ficus ficus* LINNAEUS, 1758, by a more coarse, cancellate sculpture and much paler overall color.

Keywords: New species, *Ficus dandrimonti*, Mauritius.

Zusammenfassung: *Ficus dandrimonti* n. sp. von Cargados Carajos, N. Mauritius, unterscheidet sich von *Ficus ficus* LINNAEUS, 1758, durch eine gröbere, gegitterte Skulptur und eine viel blassere Färbung.

Introduction: Recent explorations to study the molluscan diversity of Mauritius and its offshore atolls in the Southwest Indian Ocean has led to the discovery of several new species. These include *Rolaniconus lecourtorum* LORENZ, 2012 (Conidae) and *Morum* (*Oniscida*) *lorenzi* MONSECOUR, 2012 (Harpidae) as remarkable examples, as well as several new species of the families Turbinidae, Cypraeidae, Fasciolariidae, Muricidae, Conidae and Tridacnidae that are yet to be named. In the following, a new species of Ficidae is described.

Ficus dandrimonti n. sp.

Holotype: 35,4 mm x 18,7 mm. Museum National d'Histoire Naturelle, Paris, France MNHN25145
Paratype 1: 40,2 mm x 24,6 mm. FELIX LORENZ, Buseck, Germany
Paratype 2: 37,6 mm x 22,8 mm. MICHAEL A. MONT, Owings Mills, Maryland, USA
Paratype 3: 47,6 mm x 25,7 mm. PETE STIMPSON, Loudon, Tennessee, USA
Paratype 4: 33,7 mm x 19,5 mm. FELIX LORENZ, Buseck, Germany
Paratype 5: 42,3 mm x 26,2 mm. Haus der Natur - Cismar, Germany
Paratype 6: 42,4 mm x 24,9 mm. SENCKENBERG Naturkundemuseum, Frankfurt, Germany
Plus 23 additional paratypes, which will be distributed among institutions and malacologists.

Description: The shell is rather small for the genus, and is quite solid, with a pear-shaped body, a slightly projecting spire, and a rather short, evenly tapered anterior canal. The protoconch is smooth, consisting of only one whorl, and measuring 1,6 mm in diameter. The entire shell has strong transverse ribs, usually with just a single weaker intermitted riblet. The transversely oriented ribs are crossed by longitudinal ones of variable, but comparable thickness. This gives the shell a rough and regular, cancellate sculpture. On the anterior half of the shell, the transverse ribs are stronger and more distinct than mid-dorsally.

The ground color is plain white. There are two broad, interrupted pinkish zones, one on the mid-portion of the shell, and the other towards the anterior canal. The ribs are white and may show distant, pale brown dots. Many specimens are plain white with no discernible color pattern.

The living animal is transparent white, with numerous irregular opalescent white spots on the proboscis, the mantle, and the foot. The mantle shows numerous discrete black spots in addition to the white spots. The crawling surface of the foot is saturated red with white dashes.

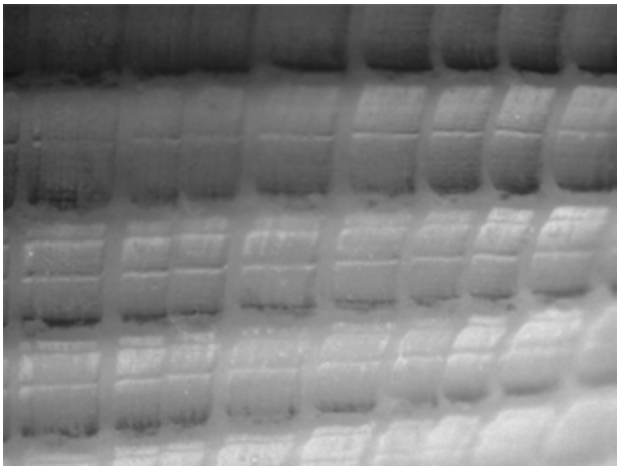

Fig. 1:
Close-up of the dorsal sculpture of
Ficus dandrimonti n. sp.

Explanations of Plate 4:

Ficus dandrimonti n. sp.
1st row: holotype, with detail of protoconch
2nd row: left: paratype 1, right: paratype 2
3rd row: left: paratype 3, right: paratype 4
bottom right: holotype with animal, shortly after removal from fish gut.

LORENZ, F.: A new species of *Ficus* (Gastropoda: Ficidae).

Habitat and distribution: *Ficus dandrimonti* n. sp. is endemic to Cargados Carajos in the north of Mauritius. The holotype was recovered from the stomach of an indeterminate fish caught at approximately 10 meters by local fishermen in the close vicinity of South Island. The animal was still alive when the fish was landed and cleaned. The stomach contents of fish caught in the same place consisted of fragments of the bivalve *Fragum hemicardium* LINNAEUS, 1758, indicating a sandy, moderately shallow-water habitat. Occasional fresh dead shells and numerous fragments of *Ficus dandrimonti* n. sp. are washed ashore throughout the atoll, especially on beaches facing sandy areas of the lagoon. The species has not been found on the Mauritian mainland or elsewhere.

Etymology: Named in honour of THIERRY DANDRIMONT of Paris, France, a passionate photographer of living gastropods and an expert in the molluscan fauna of Mauritius.

Discussion: The geographically isolated *Ficus dandrimonti* n. sp. somewhat resembles the highly variable *Ficus ficus* LINNAEUS, 1758, which is widespread thoughout the Indo-Pacific. The new species differs by its smaller size and much coarser, cancellate sculpture (Fig. 1). In *Ficus ficus*, the transverse ribbing is usually dominant, whereas, in *Ficus dandrimonti* n. sp. this is less obvious. Only *Ficus eospila* (PÉRON & LESUEUR, 1807) from Australia has a similar sculpture, but that species differs by its remarkable spotted color pattern. The most obvious difference from all species in the genus is the pale pink to white color of *Ficus dandrimonti* n. sp., which lacks darker elements such as conspicuous blotches or the brown ground color of its relatives. VERHAEGE & POPPE (2000) assumed that *Ficus ficus* constitutes a complex of species, which became obvious to me on comparing series of shells from various localities. However, no population of *Ficus ficus* studied contained shells matching the new species in color and sculpture.

Acknowledgements: Many thanks to ERIC & MARYSE LE COURT DE BILLOT, Dr. MARCO CHIAPPONI, Dr. MICHAEL A. MONT, Dr. VOLLRATH WIESE, and JANA KRATZSCH.

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A new subspecies of Conidae from Mauritius (Gastropoda).

By FELIX LORENZ, Buseck-Beuern

Abstract: *Conus (Cylinder) textile vaulberti* n. ssp. from Cargados Carajos, N. Mauritius differs from the other subspecies and their numerous variations in that it is a more lightweight shell, with a more cylindrical shape, and is absent of any blue, red or yellow pigment. The usage of the name *Conus scriptus* SOWERBY II 1858 non DESHAYES 1823, 1831, is discussed in this context.

Keywords: *Conidae, Cylinder textile vaulberti,* Mauritius.

Zusammenfassung: *Conus (Cylinder) textile vaulberti* n. ssp. von Cargados Carajos, N. Mauritius unterscheidet sich von anderen Unterarten und deren zahlreichen Variationen durch ein leichteres, schmal-zylindrisches Gehäuse und dem Fehlen jeglicher blauen, roten oder gelben Farbelemente. Der Gebrauch von *Conus scriptus* SOWERBY II 1858 non DESHAYES 1823, 1831, wird in diesem Zusammenhang diskutiert.

Introduction: During recent trips to Mauritius and St. Brandon, a surprising number of new species and subspecies have been discovered (see also the description of *Ficus dandrimonti* n. sp. in this issue). In the following, two subspecies of Conidae from that area are described.

Conus (Cylinder) textile vaulberti n. ssp.

Holotype: 46,3 mm x 20,5 mm. Museum National d'Histoire Naturelle, Paris, France, MNHN25146
Paratype 1: 44,4 mm x 19,7 mm. Haus der Natur, Cismar, Germany
Paratype 2: 42,6 mm x 20,7 mm. Felix Lorenz, Buseck, Germany
Paratype 3: 36,0 mm x 16,5 mm. Senckenberg Naturkundemuseum, Frankfurt, Germany
Paratype 4: 39,6 mm x 18,3 mm. Michael A. Mont, Owings Mills, Maryland, USA
Paratype 5: 44,1 mm x 20,6 mm. Jean Pierre Vaulbert de Chantilly, Mauritius
Paratype 6: 41,6 mm x 18,5 mm. Felix Lorenz, Buseck, Germany
All collected by the author at South Island, Cargados Carajos, North of Mauritius

Description: The shell is rather small, almost cylindrical, and of light weight. The spire is of moderate height with a slightly concave outline. The protoconch is pointed and consists of three smooth whorls. The aperture is quite wide anteriorly and constricted posteriorly. The anal notch is deep and symmetrical. The ground colour is plain white, and the protoconch is also white. There are fine, dark brown, variably sized, angular tentmarks on the body whorl, which are arranged along two darker areas where they are smaller and condensed and along a paler middorsal section where they are larger, exposing much of the white ground colour. The spire shows fine lines which are prolongations of the tentmark pattern. The aperture and the interior are plain white. There are no blue, yellow, or red dashes.

The periostracum is thin and yellow.

Habitat and distribution: *Conus* (*Cylinder*) *textile vaulberti* n. ssp. is common throughout the Cargados Carajos Shoal, North of Mauritius. It lives in shallow, sheltered lagoon waters, under rocks, and half buried in fine clean sand. It is not found anywhere else.

Etymology: Named in honor of my friend JEAN PIERRE VAULBERT DE CHANTILLY of Mauritius, a keen student of the family Conidae.

Discussion: For decades, no specimens of *Conus* (*Cylinder*) *textile* from St. Brandon have been available and not much effort was made to review the taxonomy of the endemic *textile* from that place. The name *scriptus* SOWERBY II, 1858, had been proposed for specimens that appeared to be of this population, but the name is preoccupied by *scriptus* DESHAYES, introduced twice by this author (1823, 1831; see FILMER, 2001). Sowerby described *scriptus* only briefly, with no locality data and just a single aspect of a specimen that belongs to the *textile*-complex, but not necessarily to the taxon discussed herein (Fig. 1).

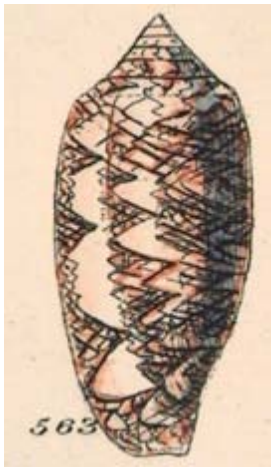

Fig. 1:
Figure of *Conus scriptus* SOWERBY II 1858 (non DESHAYES 1823, 1831), from SOWERBY 1858, pl. 23, fig. 563

There is no indication of the origin of the three specimens that are only suspected to be syntypes (in the British Museum of Natural History). RÖCKEL (1983) chose SOWERBY's *scriptus* as the name for the St. Brandon population, based on the similarity of that taxon's suspected syntypes, and yet the situation retained an aspect of uncertainty. As no locality data was given by SOWERBY, it seems necessary to describe the population on the basis of new type material of ascertained origin.

The name *loman* DAUTZENBERG, 1937 was originally introduced for a shell from Senegal, later corrected to "Mauritius and Cargados". There is no original figure and no data available that would allow an assignment of the name to the population described herein.

The population from Cargados Carajos differs consistently from other populations of *Conus* (*Cylinder*) *textile* by its narrow, nearly cylindrical shape, the lightweight shell, the wider aperture, and the plain white and dark brown ornamentation lacking any shades of blue, yellow, or red color components. Also, the protoconch is white instead of pale-pink to orange-red. *Conus* (*Cylinder*) *textile vaulberti* n. ssp. probably constitutes the least variable and most restricted endemic subspecies of the *textile*-complex.

In the community of shell collectors, the name *scriptus* is in common use for pale forms of *Conus* (*Cylinder*) *textile* with large, angular tentmarks. Such shells are common in the south of Madagascar and other places in the Indian Ocean. These shells differ from *Conus* (*Cylinder*) *textile vaulberti* n. ssp. as they are solid and heavy, with a more angular shoulder and being a ventricosely conical instead of cylindrical shell. Also in these shells the protoconch is typically orange to red and not white as in the subspecies described herein. The tentmarks of the St. Brandon population are more angular and thinner, and the markings on the spire are finer and not condensed to darker patches.

Explanations of Plate 5:

Conus (*Cylinder*) *textile vaulberti* n. ssp.
All from Cargados Carajos, N Mauritius

1st row left: holotype, right: paratype 1
2nd row left: paratype 6, right: paratype 3
3rd row left: detail of the protoconch, right: paratype 2

LORENZ, F.: A new subspecies of Conidae from Mauritius (Gastropoda)

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