Regular paper

Canthigaster caeruleolineata, a new species of toby (Teleostei: Tetraodontidae) from La Réunion, southwestern Indian Ocean

by

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Abstract. – The Blue-lined toby *Canthigaster caeruleolineata* n. sp. is described from the southeast coast of La Réunion, southwestern Indian Ocean, based on a single specimen that may have originated from a deep reef habitat. The species is distinguished within the genus by the few short, oblique blue streaks on the dorsal half of the body, and is characterised as follows: dorsal-fin rays 8; anal-fin rays ca. 7; pectoral-fin rays 15; caudal-fin rays (i) 10 (1); vertebrae 9 + 7 = 16 [damaged]; dorsal-fin origin anterior to anal-fin origin; dorsal half of body greyish brown with relatively few short, oblique blue streaks which are also present in the region between the occiput and the dorsal-fin base, lower part of caudal peduncle with yellow spots; eye yellow; dorsal and anal fins yellow; pectoral fins translucent; caudal fin yellowish grey, with 7 irregular, vertical, wavy blue lines. A molecular analysis revealed that the new species is closely related to *C. aziz* from deep reefs of the Red Sea.

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Résumé. – *Canthigaster caeruleolineata*, une nouvelle espèce de canthigaster (Teleostei: Tetraodontidae) de La Réunion, sud-ouest Océan Indien.

Le canthigaster à raies bleues, *Canthigaster caeruleolineata* n. sp., est décrit sur la base d'un seul spécimen, provenant de la côte sud-est de La Réunion, qui pourrait provenir d'un habitat récifal profond. L'espèce se distingue au sein du genre par les quelques stries bleues courtes et obliques sur la moitié dorsale du corps ; elle est caractérisée comme suit : rayons de la nageoire dorsale 8 ; rayons de la nageoire anale env. 7; rayons de la nageoire pectorale 15 ; rayons de la nageoire caudale (i) 10 (1) ; vertèbres 9 + 7 = 16 (endommagées); origine de la nageoire dorsale antérieure à l'origine de la nageoire anale; moitié dorsale du corps brun grisâtre avec relativement peu de stries bleues courtes et obliques qui sont également présentes dans la région entre l'occiput et la base de la nageoire dorsale, partie inférieure du pédoncule caudal avec des taches jaunes ; yeux jaunes; nageoires dorsale et anale jaunes ; nageoires pectorales translucides ; nageoire caudale gris jaunâtre, avec 7 lignes bleues irrégulières, verticales et ondulées. Une analyse moléculaire a révélé que la nouvelle espèce est étroitement liée à *C. aziz*, une espèce vivant dans les récifs profonds de la mer Rouge.

INTRODUCTION

The pufferfish family Tetraodontidae contains 193 valid species in 28 genera (Fricke *et al*., 2021a, b). The family is widely distributed in tropical and temperate marine areas of the Indo-Pacific and Atlantic Oceans, as well as in brackish and freshwater habitats (Nelson, 2006). From La Réunion, southwestern Indian Ocean, 21 species in 5 genera of Tetraodontidae have been reported (Fricke *et al*., 2009), including 10 species of the genus *Canthigaster* Swainson, 1839.

The genus *Canthigaster* was originally described by Swainson (1839: 194; type species *Tetrodon rostratus* Bloch, 1786, by subsequent designation of Bleeker, 1865: 12), and is popularly known as tobies or sharpnose puffers. The genus includes a worldwide total of 38 species, with 31 species in the Indo-Pacific and 7 species in the Atlantic, respectively (Fricke *et al*., 2021a). The Indo-West Pacific species were revised by Allen and Randall (1977), who distinguished 22 valid species. Subsequently, the following Indo-West Pacific species were described: *Canthigaster leoparda* Lubbock & Allen, 1979 from the eastern Indian Ocean and western Pacific, *Canthigaster flavoreticulata* Matsuura, 1986 from Tonga, *Canthigaster cyanetron* Randall & Cea-Egaña, 1989 from Easter Island, *Canthigaster punctata* Matsuura, 1992 from the Mascarene Ridge, *Canthigaster cyanospilota* Randall, Williams & Rocha, 2008 from the Gulf of Aqaba,

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Red Sea, *Canthigaster criobe* Williams, Delrieu-Trottin & Planes, 2012 from Gambier Archipelago, South Pacific; *Canthigaster aziz* Matsuura, Bogorodsky, Mal & Alpermann, 2020 from the Red Sea (Matsuura *et al.*, 2020: 83). In addition, *Canthigaster axiologus* Whitley, 1931 was resurrected out of the synonymy with *Canthigaster coronata* (Vaillant & Sauvage, 1875) by Randall *et al.* (2008: 6); *Canthigaster papua* (Bleeker, 1848) was reinstated from synonymy with *Canthigaster solandri* (Richardson, 1845) by Randall (1995: 405); *Canthigaster petersii* (Bianconi, 1854) was resurrected from synonymy with *C. solandri* by Allen and Erdmann (2012: 1095). This results in a total of 32 valid species currently known from the Indo-Pacific.

Ten species of *Canthigaster* were recorded from La Réunion (Fricke *et al.*, 2009): *Canthigaster amboinensis* (Bleeker, 1864), *C. bennetti* (Bleeker, 1854), *C. cyanospilota*, *C. inframacula* Allen & Randall, 1977, *C. janthinoptera* (Bleeker, 1855), *C. natalensis* (Günther, 1870), *C. rivulata* (Temminck & Schlegel, 1850), *C. smithae* Allen & Randall, 1977, *C. solandri*, *C. valentini* (Bleeker, 1853). During the Réunion Southeast Coast Mapping Programme, a specimen of an undescribed species of *Canthigaster* was obtained. This species is described herein, using both morphological and molecular data, and compared with other species of the genus.

MATERIALS AND METHODS

The holotype of the new species is deposited in the fish collection of the Staatliches Museum für Naturkunde in Stuttgart, Germany (SMNS). Collecting stations on the southeast coast of La Réunion are shown in figure 1.

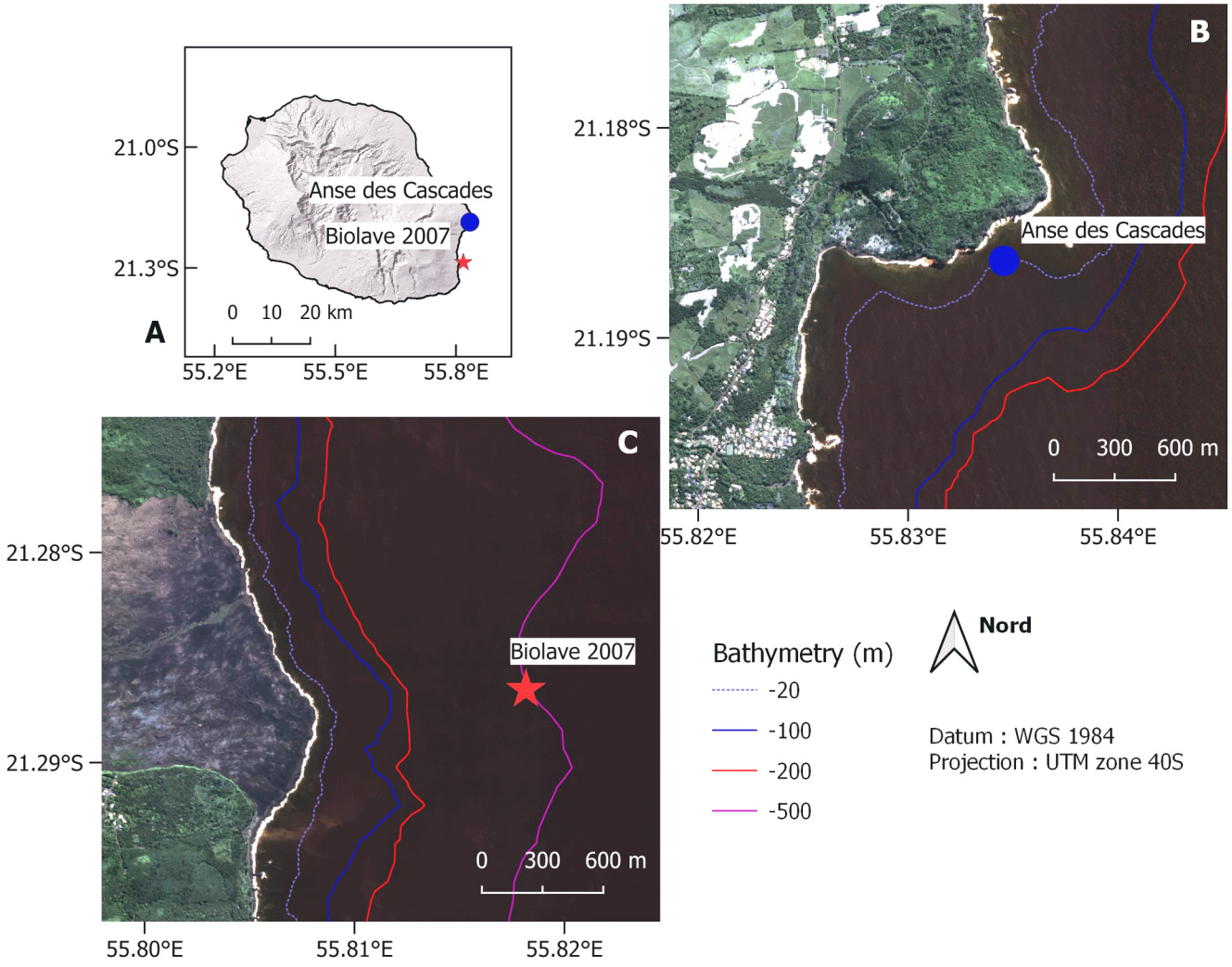

Figure 1. – Stations in La Réunion where *Canthigaster caeruleolineata* new species was collected. Overview of the island (**A**); Holotype locality at Anse des Cascades (**B**); Locality of the additional specimen during the Biolave 2007 Cruise (**C**). Bathymetry is indicated in the maps.

Counts and measurements follow Hubbs and Lagler (1947), descriptive methods follow Matsuura *et al*. (2020) except for the caudal fin ray formula that follows Fricke (1983); the classification follows Fricke *et al*. (2021b), family authorship follows Laan *et al*. (2014), references are cited according to Fricke (2021). The standard length is abbreviated as SL, the head length as HL.

To conduct our genetic analysis, whole genomic DNA from the new species of *Canthigaster* was extracted from fin clips preserved in 96% EtOH. DNA extraction was performed using Biobasic DNA extraction kit (Bio Basic Inc., Canada). A fragment of the mitochondrial gene coding for cytochrome C oxidase subunit 1 (COI) was amplified with the primers designed by Ward *et al*. (2005). PCR amplifications and sequencing were performed following Williams *et al*. (2012) protocol. A 655 base-pair fragment of the COI region was sequenced and deposited in BOLD (Accession number CANRU001-21; http://www.boldsystems.org/index.php/Public_RecordView?processid=CANRU001-21 and GenBank (Accession number: BankIt2494585, gnl|uoguelph|CANRU001-21.COI-5P, MZ921421) for comparative purposes. Matsuura *et al*. (2020) recently published the most comprehensive COI analysis of *Canthigaster*; we have thus downloaded from BOLD (Barcode Of Life Data system, www.boldsystems.org) sequences corresponding to their dataset (see their Table 1) covering all different species available so far, that is 28. We accessed sequence data with R (R Core Team, 2021) using the R package bold. We followed their re-identifications. It is worth noting that RESIC486-11 BOLD number reported in Matsuura *et al*. (2020) for *C. janthinoptera* correspond to the Rhodopsin sequence for this specimen, we thus used RESIC487-11 (COI). We used a representative of the Tetraodontinae Bonaparte 1831 as the outgroup.

A maximum-likelihood analysis was performed using the online version of IQ-TREE (Minh *et al*., 2013; Nguyen *et al*., 2015) available at http://iqtree.cibiv.univie.ac.at (Trifinopoulos *et al*., 2016). The best model of evolution was retrieved with ModelFinder (Kalyaanamoorthy *et al*., 2017) implemented in IQ-TREE using the Bayesian Information Criterion (BIC) prior to the construction of the ML tree. To assess branch support, the IQ-TREE analysis included the ultrafast bootstrap approximation (UFboot) with 1000 replicates (Minh *et al*., 2013) and the SH-like approximate likelihood ratio test (SH-aLRT) also with 1,000 bootstrap replicates (Guindon *et al*., 2010).

Comparative material (Indo-Pacific species of *Canthigaster*). *Canthigaster amboinensis*: SMNS 3347 (1), Quelimane, Mozambique; SMNS 16843 (1), SMNS 16896 (1), Mauritius; SMNS 17884 (1), Oahu, Hawaiian Islands; SMNS 20671 (1), SMNS 21045 (1), La Réunion; SMNS 23610 (1), Lifou, Loyalty Islands; SMNS 27140 (1), La Réunion. *Canthigaster bennetti*: SMNS 9157 (1), Java, Indonesia; SMNS 15864 (3), Sulawesi Utara, Indonesia; SMNS 16865 (2), SMNS 16955 (1), Mauritius; SMNS 16982 (1), SMNS 21003 (1), La Réunion; SMNS 17213 (1), Rodrigues; SMNS 18652 (2), Lombok, Nusa Tenggara Barat, Indonesia; SMNS 22892 (1), Île des Pins, New Caledonia; SMNS 23543 (1), Province Sud, Grande Terre, New Caledonia; SMNS 22923 (1), SMNS 23711 (10), SMNS 23786 (17), Lifou, Loyalty Islands. *Canthigaster callisterna* (Ogilby 1889): AMS I.1485 (1 syntype), AMS I.1965 (1 syntype), Lord Howe Island. *Canthigaster cyanospilota*: HUJ 9393 (1 paratype), Eilat, Israel Gulf of Aqaba, Red Sea. *Canthigaster janthinoptera*: SMNS 17200 (1), Rodrigues; SMNS 20913 (1), SMNS 20972 (1), SMNS 21060 (1), La Réunion; SMNS 23910 (1), Lifou, Loyalty Islands. *Canthigaster leoparda*: BMNH 1979.1.9.41 (holotype), Philippines. *Canthigaster margaritata* (Rüppell 1829): SMNS 3689 (4), Al-Qusayr, Egypt, Red Sea; SMNS 13627 (1), Eilat, Israel, Gulf of Aqaba, Red Sea; SMNS 13659 (2), Tawila Island, Egypt, Red Sea; SMNS 22527 (1), Egypt, Gulf of Aqaba, Red Sea. *Canthigaster natalensis*: SMNS 16953 (1), Mauritius; SMNS 17024 (1), La Réunion. *Canthigaster papua*: SMNS 1471 (3), Indonesia; SMNS 4022 (1), Apia, Upolu, Western Samoa; SMNS 10896 (7), Ambon, Maluku, Indonesia; SMNS 24016 (1), Île des Pins, New Caledonia. *Canthigaster petersii*: SMNS 8882 (1), Mombasa, Kenya. *Canthigaster rivulata*: SMNS 12595 (1), Mie Prefecture, Japan; SMNS 25462 (1), Banc Lansdowne, New Caledonia. *Canthigaster pygmaea* Allen & Randall 1977: HUJ 4756 (3 paratypes), Eilat, Israel, Gulf of Aqaba, Red Sea. *Canthigaster smithae*: BPBM 18009 (holotype), Mauritius. *Canthigaster solandri*: SMNS 8880 (2), SMNS 9005 (2), Davao, Mindanao, Philippines; SMNS 17718 (1), SMNS 17725 (1), Rarotonga, Cook Islands; SMNS 17800 (3), Aitutaki, Cook Islands; SMNS 18140 (1), Viti Levu, Fiji; SMNS 19885 (1), Maré, Loyalty Islands; SMNS 22631 (1), SMNS 23524 (1), Province Sud, Grande Terre, New Caledonia; SMNS 22851 (1), Île des Pins, New Caledonia. *Canthigaster tyleri*: BPBM 18014 (holotype), Mauritius. *Canthigaster valentini*: SMNS 5943 (1), One Tree Island, Queensland, Australia; SMNS 9133 (1), Mombasa, Kenya; SMNS 15952 (1), Sulawesi Utara, Indonesia; SMNS 16836 (1), Mauritius; SMNS 16973 (2), SMNS 20912 (1), SMNS 20973 (1), SMNS 21132 (1), La Réunion; SMNS 17167 (1), Rodrigues; SMNS 22886 (1), Île des Pins, New Caledonia; SMNS 23026 (1), SMNS 23525 (1), SMNS 23958 (2), SMNS 23985 (1), SMNS 25399 (1), SMNS 26460 (1), Province Sud, Grande Terre, New Caledonia; SMNS 24015 (2), Île des Pins, New Caledonia; SMNS 24801 (1), Penghu Islands, Taiwan.

RESULTS

Canthigaster caeruleolineata new species

Blue-lined toby

(Figs 2-4; Tab. I)

Material

Holotype: SMNS 27147, 86 mm SL, southwestern Indian Ocean, La Réunion, Anse des Cascades, 21°11'10.68"S 55°50'4.45"E, found dead in boulder habitat with little coral coverage at 17 m depth (probably originating from adjacent deep reef habitat in more than 100 m depth), Geoffrey Bertrand, 1 Apr. 2021.

Diagnosis

Dorsal-fin rays 8; anal-fin rays ca. 7 (may have been damaged); pectoral-fin rays 15; caudal-fin rays (i) 10 (1); dorsal-fin origin anterior to anal-fin origin; dorsal half of body greyish brown with relatively few short, oblique blue streaks which are also present in the region between the occiput and the dorsal-fin base, lower part of caudal peduncle with yellow spots; eye yellow; dorsal and anal fins yellow; pectoral fins translucent; caudal fin yellowish grey, with 7 irregular, vertical, wavy blue lines.

Description

Counts and measurements listed in table I are part of this description.

Characters provided in Diagnosis not repeated here. Body moderately deep and compressed; head length 2.4 in SL; snout moderately long and conical, its length 4.1 in SL; dorsal profile of snout straight; dorsal profile of nape slightly concave; ventral profile of head almost straight; eye diameter 3.3 in HL; interorbital region flat, fleshy interorbital width 2.8 in HL, bony interorbital width 3.0 in HL; postorbital length 6.0 in HL; gill opening small, located at level below ventral margin of eye, its length 9.0 in HL; caudal peduncle slightly tapering posteriorly, its depth 2.6 in HL, caudal peduncle length 2.4 in HL. Predorsal length 1.2 in SL, anal-fin origin behind dorsal-fin origin, preanal-fin length ca. 1.1 in SL. Dorsal and anal fins slightly rounded; longest dorsal-fin ray 2.6 in HL; longest anal-fin ray 3.0 in HL; pectoral fins broad and short, longest pectoral-fin ray 2.6 in HL; caudal fin truncate, its length 4.1 in SL; length of dorsal-fin base 6.0 in HL; length of anal-fin base 9.0 in HL. Tiny spinules scattered on head and body before dorsal and anal fins (Fig. 3); a raised skin fold on back extending from above pectoral-fin base to dorsal-fin origin; a tiny nasal organ on each side

Table I. – Morphometric measurements of *Canthigaster caruleolineata* n. sp. (SMNS 27147, holotype) from La Réunion.

Morphometric character	mm	% of SL
Total length	108	
Standard length (SL)	86	100.0
Head length (HL)	36	41.9
Eye diameter	11	12.8
Snout length	21	24.4
Gill opening length	4	4.7
Fleshy interorbital width	13	15.1
Bony interorbital width	12	14.0
Postorbital length	6	7.0
Pectoral-fin length	14	16.3
Prepectoral length	39	45.3
Pectoral-fin base length	10	11.6
Predorsal length	74	86.0
Dorsal-fin base length	6	7.0
Longest dorsal-fin ray length	14	16.3
Preanal length	ca.78	ca. 90.7
Anal-fin base length	4	4.7
Longest anal-fin ray length	12	14.0
Caudal-peduncle length	15	17.4
Caudal-peduncle depth	14	16.3
Caudal-fin length	21	24.4

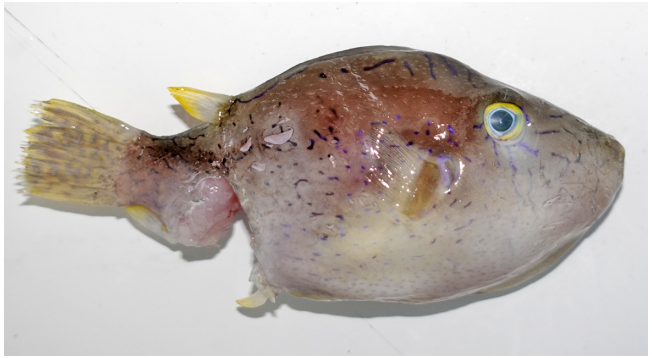

Figure 2. – *Canthigaster caeruleolineata* new species, SMNS 27147, holotype 86 mm SL, southwestern Indian Ocean, La Réunion, Anse des Cascades, 21°11'10.68"S 55°50'4.45"E. Photograph by Julien Wickel. Colour pattern immediately after collection.

Figure 3. – *Canthigaster caeruleolineata* new species, SMNS 27147, holotype 86 mm SL, southwestern Indian Ocean, La Réunion, Anse des Cascades, 21°11'10.68"S 55°50'4.45"E. Photograph by Julien Wickel. Colour pattern after one month of preservation; left side of body.

Figure 4. – *Canthigaster caeruleolineata* new species, SMNS 27147, holotype 86 mm SL, southwestern Indian Ocean, La Réunion, Anse des Cascades, 21°11'10.68"S 55°50'4.45"E. Photograph by Julien Wickel. Colour pattern after one month of preservation; detail of head showing dermal denticle pattern.

Figure 5. – *Canthigaster caeruleolineata* new species, southwestern Indian Ocean, La Réunion, 11.5 km south of Anse des Cascades, ca. 27°17'19"S, 55°49'09"E. Photograph by Aquarium de La Réunion, 2007. Fresh colouration. Specimen not preserved.

of snout, surrounded with elevated rim. Upper jaw with 12 pointed bony plates, lower jaw with 19 such plates. Vertebrae 9 + 7 = 16 [damaged].

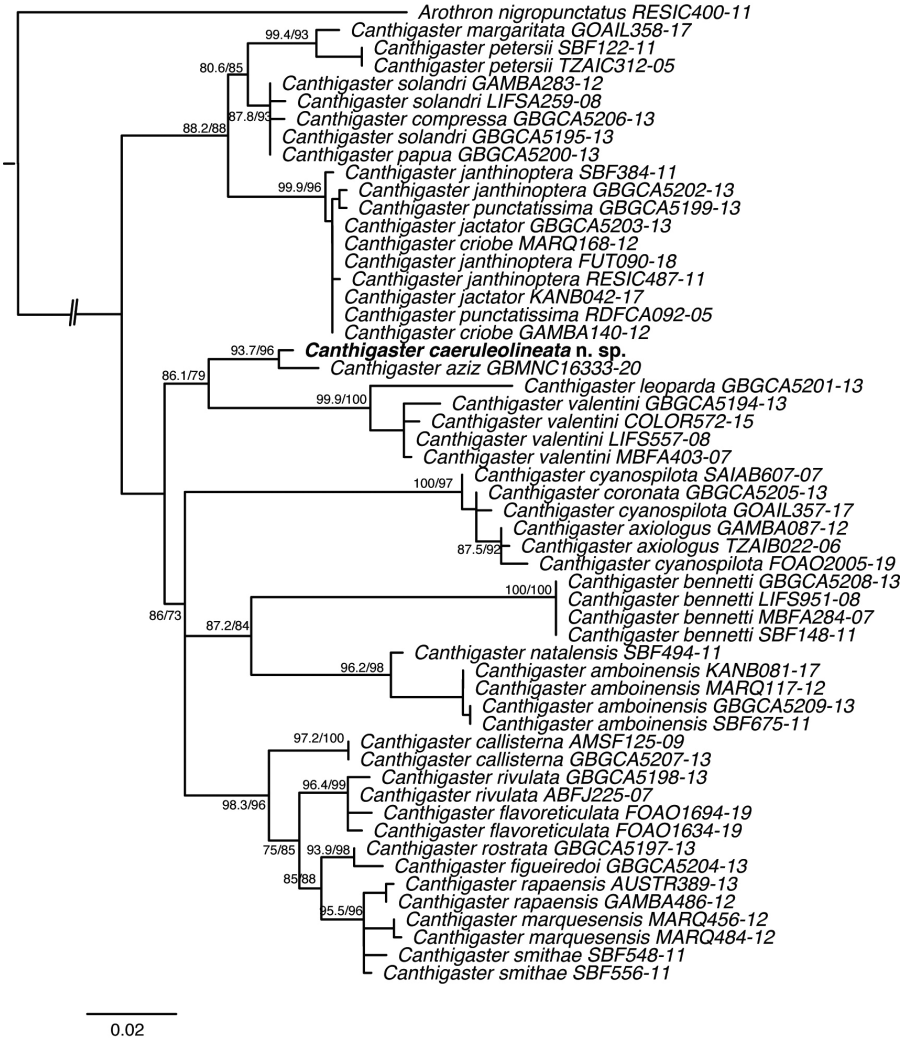

Figure 6. – Maximum-likelihood tree for the genus *Canthigaster*. Numbers on nodes denote ultrafast bootstrap approximation (UFboot) values with 1000 replicates and the SH-like approximate likelihood ratio test (SH-aLRT) also with 1000 bootstrap replicates. UFboot and SH-aLRT displayed only for nodes with values below 90.

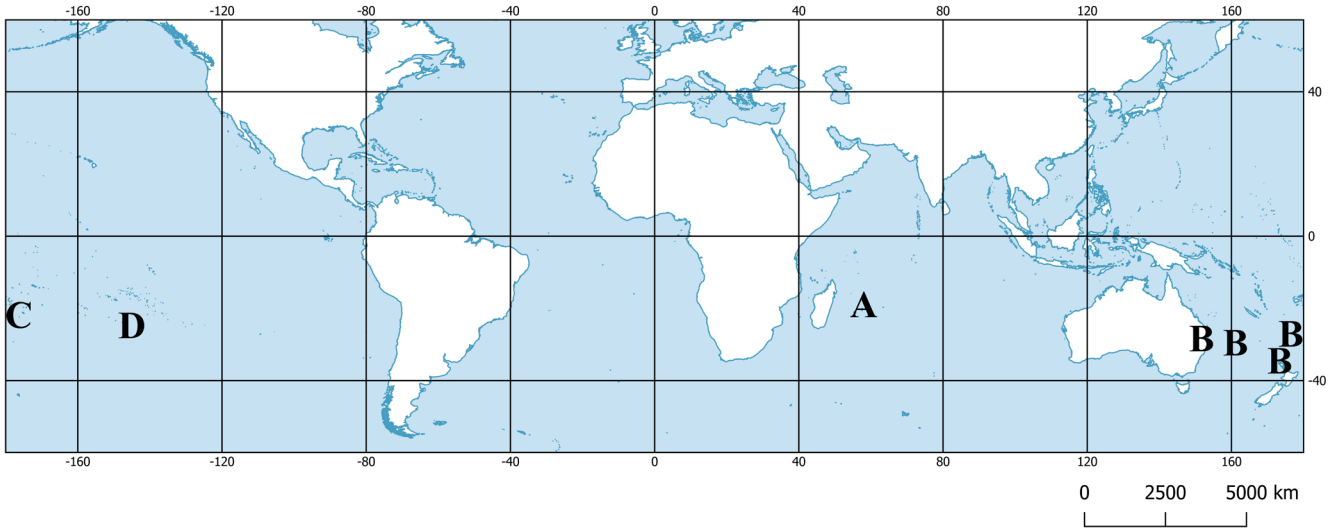

Figure 7. – Geographical distribution of species of *Canthigaster* with short blue lines. **A**: *Canthigaster caeruleolineata* n. sp.; **B**: *C. callisterna*; **C**: *C. flavoreticulata*; **D**: *C. rapaensis*.

Colour of preserved holotype (Figs 3-5). Dorsal half of body greyish brown with short, oblique blue streaks, lower part of caudal peduncle with yellow spots; eye yellow; dorsal and anal fins yellow; pectoral fins translucent; caudal fin yellowish grey, with 7 irregular, vertical, wavy lines consisting of irregular blue spots.

Molecular analysis

Molecular data examined here include all the hypothesized (based on colour and morphological characters) closest relatives of *Canthigaster caeruleolineata*. The topology of our maximum-likelihood tree is similar to that of Matsuura *et al*. (2020) based on COI. Our mtDNA analysis showed a well- supported genetic divergence between *C. caeruleolineata* and its congeners (Fig. 5). Our molecular analysis revealed that *C. caeruleolineata* is closely related to *C. aziz*, a species found so far only in deep reefs of the Red Sea with a type specimen collected at 315 m depth.

Etymology

Caeruleus (Latin) means light blue; *lineatus* (Latin) means lined. The name means blue-lined; it is an adjective, with the ending *caeruleolineata* when in the feminine genus *Canthigaster*. It refers to the numerous short, blue lines on the head and the body of this species.

Distribution

Canthigaster caeruleolineata n. sp. is known only from the type locality; it was collected near Anse des Cascades on the southeast coast of La Réunion (Fig. 7). The species is expected to be distributed in deep reefs.

Comparison

Canthigaster caeruleolineata n. sp. is distinguished from other species in the genus by its characteristic colouration with the dorsal half of body greyish brown with relatively few short, oblique blue streaks which are also present in the region between the occiput and the dorsal-fin base, lower part of caudal peduncle with yellow spots; the dorsal and anal fins yellow; the caudal fin yellowish grey, with 7 irregular, vertical, wavy blue lines. *Canthigaster caeruleolineata* n. sp. differs from all other species of *Canthigaster* except *C. aziz* and *C. margaritata* from the Red Sea by the combination of lower fin-ray counts, 8 rays in the dorsal and anal fins and 15 rays in the pectoral fins. The molecular analysis confirmed the meristic results, showing that C. caeruleolineata n. sp. and *C. aziz* were closely related. From *C. aziz*, the new species is distinguished by the caudal-fin colouration with 7 irregular, vertical, wavy lines consisting of irregular blue spots (versus pale, without lines in *C. aziz*), the dorsal-fin origin anterior to anal-fin origin (versus opposite of anal-fin origin in *C. aziz*), and the body with relatively few short, oblique blue streaks which are also present in the region between the occiput and the dorsal-fin base (versus pale brown without streaks in *C. aziz*). In terms of colouration, *C. caeruleolineata* n. sp. is most similar to *Canthigaster rapaensis* Allen & Randall 1977 from the South Pacific, but differs from that species by its 8 dorsal-fin rays (versus 9 dorsal-fin rays in *C. rapaensis*), 15 pectoral-fin rays (versus 16-17), the absence of 3 parallel light blue streaks on the ventral part of the snout (versus present), the region between the occiput and the dorsal-fin base with short blue streaks (versus monochromatic dark brown), and the caudal peduncle with irregular short blue streaks (versus regular, round blue spots).

Figure 8. – Boulder habitat at Anse des Cascades, La Réunion, where the holotype of *Canthigaster caeruleolineata* n. sp. was collected. Photograph: Julien Wickel.

The Red Sea and Gulf of Aden species *C. margaritata* shares with the new species 8 dorsal-fin rays, and the caudal fin with many blue spots. The new species is distinguished from *C. margaritata* in having the body with few wavy short lines (versus body with many blue spots and short lines in *C. margaritata*), no black blotch below dorsal-fin base (versus a black blotch present below dorsal-fin base), caudal peduncle with irregular, short blue lines (versus longitudinal rows of spots on caudal peduncle less than 10), and dorsal, anal and caudal fins yellow (versus bluish white).

DISCUSSION

The new species from La Réunion described herein well agrees with the generic characters of the genus *Canthigaster* as defined by Allen and Randall (1977), except its 7 anal-fin rays (8 to 11 rays according to Allen and Randall). However, as the injury of the fish is near the anal fin, it may be possible that the specimen has lost an anal-fin ray, so this information needs to be treated with caution.

Taxonomists faced historical problems in distinguishing the species of *Canthigaster* due to a relative uniformity of morphological characters between species, and incomplete separation of lineages, that is a high degree of genetic uniformity for several species complex retrieved using molecular data (Randall *et al.*, 2008; Williams *et al.*, 2012; Matsuura *et al.*, 2020). The colour pattern is thus usually the primary character used to distinguish the known species of *Canthigaster* (Randall *et al.*, 2008). Species of *Canthigaster* with short blue lines are restricted to the Southern Hemisphere, mostly to the southwestern and southern-central Pacific (Fig. 7); *Canthigaster caeruleolineata* n. sp. is the only species in the group that is known from the Indian Ocean. Other species include *C. callisterna* from New South Wales (Australia), Lord Howe Island, Elizabeth and Middleton Reefs, Kermadec Islands and northeastern New Zealand; *C. flavoreticulata* from the Tonga Ridge; and *C. rapaensis* from Rapa Iti, French Polynesia. All these species may be morphologically distinguished. Meristics are however for once helpful in distinguishing this new *Canthigaster* species, sharing only with *C. aziz* lower fin-ray counts for the dorsal (8), anal (8) and pectoral fins (15). Finally, molecular data showed a well-supported genetic divergence between *C. caeruleolineata* and all its sequenced congeners.

The unique holotype of this new species was found in the special boulder habitat of the Anse des Cascades. The boulders had little coral cover (*Porites* spp. and *Goniopora* spp.) (Fig. 8). However, the specimen was already dead, with a fresh, severe injury, still bleeding, at 17 m depth. The injury was apparently due to a fish bite. The specimen may have been originating from an adjacent deep-reef habitat, as the slope at Anse des Cascades is very steep, and deep-water habitats of more than 100 m depth are very close to the shore. So far it was impossible to locate other specimens, which makes it likely that the species lives cryptically in the adjacent deep reef habitat.

Another specimen of the new species was found during the BIOLAVE2007 Expedition, 11.5 km south of the Anse de la Cascade, ca. 21°17’19’’S 55°49’09’’E (Fig. 6). It was floating on the surface after an apparent underwater explosion during a volcanic eruption on the slope of the Piton de La Fournaise in April 2007 (location see Fig. 1). Unfortunately, the specimen was not preserved. Other species collected at the same event apparently originated from depths of 200-300 m. Finally, our molecular analysis showed that *C. caeruleolineata* n. sp. was closely related to a deep-reef species (*C. aziz*); providing additional evidence that *C. caeruleolineata* n. sp. is probably a deep-water species.

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