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Squat lobsters (Decapoda: Chirostyloidea and Galatheoidea) from Saya de Malha Bank, SW Indian Ocean, with the descriptions of three new species

Enrique MACPHERSON[1,*] & Annie MACHORDOM[2]

[1]Centre d'Estudis Avançats de Blanes (CEAB-CSIC), C. acc. Cala Sant Francesc 14, 17300 Blanes, Girona, Spain.
[2]Museo Nacional de Ciencias Naturales (MNCN-CSIC), José Gutiérrez Abascal, 2, 28006 Madrid, Spain.

[*]Corresponding author: macpherson@ceab.csic.es
[2]Email: annie@mncn.csic.es

Abstract. Specimens of galatheoid and chirostyloid squat lobsters were collected during a scientific cruise to the Saya de Malha Bank in the southwestern Indian Ocean. Nineteen species were identified, including three new species belonging to the genera *Coralliogalathea* Baba & Javed, 1974, *Galathea* Fabricius, 1793 and *Trapezionida* Macpherson & Baba, 2022. The present paper provides systematic accounts of the three new species, along with new locality records of other species. Molecular data are provided to support the identification and differentiation of each new species.

Keywords. Indian Ocean, integrative taxonomy, molecular data, new species, new occurrences.

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Introduction

The fauna of squat lobsters (Decapoda, Galatheoidea and Chirostyloidea) in the SW Indian Ocean has been studied intensively in recent decades, especially in the waters of Mozambique (Macpherson *et al.* 2017, 2023; Rodríguez-Flores *et al.* 2022), Madagascar and adjacent islands (Baba 1990; Baba *et al.* 2024), as well as off the coast of South Africa (Botha *et al.* 2025). These studies have allowed us to know both its biodiversity and different aspects of its phylogeny and biogeography (Cabezas *et al.* 2011, 2012; Macpherson & Baba 2011; Puillandre *et al.* 2011; Schnabel *et al.* 2011). Despite this sampling effort, some areas remain very little studied, with the Saya de Malha Bank, being one of the least sampled areas (Obura *et al.* 2012), although a few earlier records exist (see Borradaile 1910; Rathbun 1911; Burukovsky 1993; Spiridonov & Türkay 2001).

This bank is situated in the Mascarene plateau, in the east of Madagascar, covering an area of about 40 000 km^2, with depths between 15 and 200 m depth and surrounded by abyssal zones (Ramah *et al.*

2021). Several expeditions carried out at the end of the last century provide some lists of invertebrates (e.g., Vortsepneva 2008), and more recently expeditions using ROV-image analyses include data on the occurrence of corals, sponges and other invertebrates (Ramah *et al.* 2021; Bhagooli *et al.* 2024). Unfortunately, only a few species of squat lobsters were collected during a Soviet expedition in 1989 (RV *Vitiaz*), e.g., *Galacantha bellis* Henderson, 1885, *G. trachynotus* Anderson, 1896, and *Paramunida mozambica* Cabezas *et al.*, 2010 (Macpherson *et al.* 2017).

In November 2022, an expedition (SAYA) by the Muséum national d'Histoire naturelle, Paris (MNHN) collected more than 80 samples between 19 and 1141 m deep, including numerous crustacean decapods (e.g., Chen & Chan 2023; Galil 2025) among which a small collection of squat lobsters of the families Chirostylidae Ortmann, 1892, Galatheidae Samouelle, 1819, Munididae Ahyong, Baba, Macpherson & Poore, 2010, and Munidopsidae Ortmann, 1898. Morphological and molecular analyses of these squat lobster specimens indicate the presence of three undescribed species belonging to the genera *Coralliogalathea* Baba & Javed, 1974, *Galathea* Fabricius, 1793 and *Trapezionida* Macpherson & Baba, 2022. Therefore, these three new species are described and illustrated here as new to science, along with new records for previously known species.

Material and methods

Sampling and identification

The material examined is located in the Muséum national d'Histoire naturelle, Paris (MNHN). The holotypes of the new species are property of United Nation Development Programme – Mauritius and Seychelles Joint Management Area (UNDP–JMA) and under custody of MNHN. The terminology and measurements follow Baba *et al.* (2011) and Macpherson & Robainas-Barcia (2015). Specimen size is indicated by the postorbital carapace length (CL), measured along the midline from the base of the rostrum to the posterior margin of the carapace. In galatheid species, the length of the rostrum is measured from the tip to between the lateral basal incisions, the breadth is between left and right lateral basal incisions. In munidids, the length of the rostrum is measured from the tip to between the orbit. Measurements of appendages were taken in dorsal (pereopod 1), lateral (pereopods 2–4) and ventral (antennule and antenna) midlines. Abbreviations used are: F = female; G1–G2 = gonopods 1–2; M = male; Mxp3 = maxilliped 3; ovig. = ovigerous; P1–4 = pereopods 1–4. The types of setae partially followed Watling (1989), e.g., simple, plumose (with setules). We only describe those setae from the carapace, pleon and P1–4 (see also Macpherson *et al.* 2025).

Molecular data

The DNA extraction, amplification of the cytochrome c oxidase subunit (*COI*) and subsequent sequencing were done following the workflow optimized in previous studies on squat lobsters' systematics (e.g., Rodríguez-Flores *et al.* 2018; Machordom *et al.* 2022). DNA was extracted with the DNeasy Blood and Tissue kit (Qiagen), following the manufacturer's protocol after an overnight digestion. For PCR amplification, we used the primers LCO1490 5′-GGTCAACAAATCATAAAGATATTGG-3′, HCO2198 5′-TAAACTTCAGGGTGACCAAAAAATCA-3′ and LCOI-V1 5′-TTTTTGGTGCTTGA GCNGGNATAGT-3′ (Folmer *et al.* 1994; Zuccon *et al.* 2012) for the partial amplification of the mitochondrial *COI*. Thermal conditions followed Machordom *et al.* (2022), with an annealing temperature ranging from 42°C to 45°C. Genetic distances for comparisons were estimated using uncorrected 'p' divergences in PAUP* ver. 4.0 (build 169) (Swofford 2004). Taxonomic information and GenBank accession numbers are provided in the descriptions of the new species of *Coralliogalathea* and *Trapezionida*. The sequences of the new species are compared with those of other closely related species sequenced in Rodríguez-Flores *et al.* (2018, 2024) for species of *Coralliogalathea*, and Machordom *et al.* (2022) for species of *Trapezionida*. No sequences were obtained for the new species of *Galathea*.

Results

Species collected during the SAYA expedition

The squat lobsters were found in 28 stations at depth ranging from 19 m to 1441 m (Corbari *et al*. 2025). We document the presence of 16 galatheoid species on Saya de Malha Bank, covering three families (Galatheidae, Munididae and Munidopsidae) and three chirostyloid species (family Chirostylidae) of the genus *Uroptychus* Henderson, 1888. The morphological and molecular analyses revealed that these were identified to one species of the genus *Allogalathea* Baba, 1969, one new species of the genus *Coralliogalathea* Baba & Javed, 1974, five species of the genus *Galathea* Fabricius, 1793 (one new), one species of the genus *Phylladiorhynchus* Baba, 1969, one species of the genus *Paramunida* Baba, 1988, two species of the genus *Trapezionida* Macpherson & Baba, 2022 (one new), three species of the genus *Galacantha* A. Milne-Edwards, 1880, two species of the genus *Munidopsis* Whiteaves, 1874, and three species of *Uroptychus* Henderson, 1888. Unidentified megalopa of one species of *Bathymunida* Balss, 1914 were also collected. The systematic account for each species is given below. The species and specimens collected in the cruise are the following.

Phylum Arthropoda von Siebold, 1848
Subphylum Crustacea Brünnich, 1772
Class Malacostraca Latreille, 1802
Order Decapoda Latreille, 1802
Infraorder Anomura MacLeay, 1838
Superfamily Chirostyloidea Ortmann, 1892
Family Chirostylidae Ortmann, 1892
Genus *Uroptychus* Henderson, 1888

Uroptychus hippothoe Baba, Corbari & Macpherson, 2024

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ov. ♀ (3.0 mm); SAYA stn DW5424; 11°28′ S, 62°01′ E; 150–171 m depth; 12 Nov. 2022; MNHN-IU-2021-5793.

Distribution

Only known from the Mozambique Channel, at 450 m. The Saya de Malha specimen is the second occurrence of the species, at depths of 150–171 m.

Uroptychus nigricapillis Alcock, 1901

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 3 ♂♂ (5.1–8.1 mm); SAYA stn CP5412; 09°45′ S, 60°48′ E; 1396–1441 m depth; 7 Nov. 2022; MNHN-IU-2021-5776, MNHN-IU-2021-5777.

Distribution

Widely distributed in the Indian Ocean, from Madagascar to South Arabian coast, Maldives, and Andaman Sea, and western Pacific, from Japan to New Zealand (see Baba *et al.* 2024), between 396 and 1395 m. The present material was collected slightly deeper than previous records, at 1396–1441 m.

Uroptychus validus Baba, Corbari & Macpherson, 2024

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♀ (11.0 mm); SAYA stn CP5442; 09°45′ S, 60°48′ E; 1396–1441 m depth; 17 Nov. 2022; MNHN-IU-2022-295.

Distribution

Previously known from Mayotte and Madagascar, at depths of 302–660 m. The occurrence in the Saya de Malha Bank was deeper than previous records, at 1396–1441 m.

Superfamily Galatheoidea Samouelle, 1819
Family Galatheidae Samouelle, 1819
Genus *Allogalathea* Baba, 1969

Allogalathea inermis Cabezas, Macpherson & Machordom, 2011

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ov. ♀ (4.5 mm); SAYA stn YR09; 09°55.3′ S , 60°54′ E: 19 m depth; 8 Nov. 2022; MNHN-IU-2022-330 • 1 ♂ (2.0 mm), 1 ov. ♀ (4.2 mm); SAYA stn YR15; 10°22.7′ S; 62°07.7′ E; 24 m depth; 10 Nov. 2022; MNHN-IU-2021-5794 • 1 juv. (1.5 mm); SAYA stn YR17; 10°12.1′ S, 62°09.1′ E; 27 m depth; 11 Nov. 2022; MNHN-IU-2021-5795.

Distribution

Previously known from Mozambique, Japan, Thailand, Indonesia (Gorong Island), Vanuatu, New Caledonia and Chesterfield Islands, between 44 and 120 m deep. Usually living on crinoids. The present material was collected in Saya de Malha Bank, at depths of 19–27 m.

Genus *Coralliogalathea* Baba & Javed, 1974

Coralliogalathea alba sp. nov.

This study, see below.

Genus *Galathea* Fabricius, 1793

Galathea boucheti Macpherson & Robainas-Barcia, 2015

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♂ (2.2 mm); SAYA stn YR05; 10°37.2′ S, 60°10.3′ E; 39 m depth; 6 Nov. 2022; MNHN-IU-2021-5792 • 1 ov. ♀ (2.6 mm); SAYA stn YR31; 16°36.1′ S, 59°30.4′ E; 30 m depth; 21 Nov. 2022; MNHN-IU-2021-5812.

Distribution

Red Sea, Madagascar, South China Sea (Macclesfield Bank), Vanuatu, on rocky and coral areas, at 2–77 m. Saya de Malha Bank at 30–39 m.

Galathea genkai Miyake & Baba, 1964

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♀ (1.8 mm); SAYA stn YR19; 10°44′ S, 62°00.4′ E; 30 m depth; 11 Nov. 2022; MNHN-IU-2021-5779.

Distribution

Known from Japan, Taiwan, South China Sea, Sibuyan Sea, Western Australia, Red Sea, Madagascar, at 10–87 m. The specimen from Saya de Malha Bank was collected at 30 m.

Galathea lopisma Macpherson, Rodríguez-Flores & Machordom, 2023

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ov. ♀ (3.4 mm); SAYA stn DW5424; 11°28′ S, 62°01′ E; 150–171 m depth; 12 Nov. 2022; MNHN-IU-2021-9160.

Distribution

Previously only known by the holotype collected in the Glorieuses Islands, Mozambique Channel, at 219–224 m. This second occcurrence in Saya de Malha Bank was found at depths of 150–171 m.

Galathea sayaensis sp. nov.

This study, see below.

Galathea tanegashimae Baba, 1969

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 4 ♂♂ (1.4–2.0 mm), 1 juv. (1.5 mm); SAYA stn YR05; 10°37.2′ S, 60°10.3′ E; 39 m depth; 6 Nov. 2022; MNHN-IU-2021-5789 • 1 ♂ (2.0 mm); SAYA stn YR07; 09°55.5′ S, 60°54.2′ E; 25 m depth; 7 Nov. 2022; MNHN-IU-2022-843 • 1 ♂ (3.6 mm); SAYA stn YR17; 10°12.1′ S, 62°09.1′ E; 27 m depth; 11 Nov. 2022; MNHN-IU-2022-821 • 3 ♂♂ (2.6–3.0 mm), 3 ♀♀ (1.2–1.6 mm); SAYA stn YR21; 10°44′ S, 62°00.8′ E; 47 m depth; 11 Nov. 2022; MNHN-IU-2021-5787 to MNHN-IU-2021-5791.

Distribution

Widely distributed in the Indian and West Pacific oceans, from Seychelles Islands, Mayotte Island, Scattered Islands, Mozambique, Madagascar, Maldives Islands, Japan, Taiwan, Philippines, South China Sea, Vanuatu, Papua New Guinea, Queensland and New Caledonia, at depths of 0–153 m. The material from Saya de Malha Bank was collected at depths of 25–47 m.

Genus *Phylladiorhynchus* Baba, 1969

Phylladiorhynchus janiqueae Rodríguez-Flores, Macpherson & Machordom, 2021

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♂ (1.2 mm); SAYA stn YS04; 11°08.2′ S, 60°26.8′ E; 37 m depth; 6 Nov. 2022; MNHN-IU-2022-774.

Distribution

South West Indian Ocean, Madagascar, La Réunion Island and Walter Shoals, Saya de Malha Bank, at depths of 18–120 m.

Family Munididae Ahyong, Baba, Macpherson & Poore, 2010
Genus *Trapezionida* Macpherson & Baba, 2022

Trapezionida foresti (Macpherson & de Saint Laurent, 2002)

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♂ (3.0 mm), 1 ♀ (2.1 mm); SAYA stn YS20; 11°54′ S, 62°00.4′ E; 47 m depth; 13 Nov. 2022; MNHN-IU-2021-5782, MNHN-IU-2021-5783 • 1 ov. ♀ (3.2 mm); SAYA stn YR22; 11°54′ S, 62°00.4′ E; 47 m depth; 13 Nov. 2022; MNHN-IU-2022-754.

Distribution

La Réunion Island at 58–70 m deep, Mozambique Channel at 35–150 m deep. The present material was collected at a depth of 47 m.

Trapezionida pluto sp. nov.

This study, see below,

Genus *Paramunida* Baba, 1988

Paramunida mozambica Cabezas, Macpherson & Machordom, 2010

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 22 ♂♂ (9.4–14.7 mm), 20 ov. ♀♀ (11.5–13.6 mm), 7 ♀♀ (3.6–4.8 mm); SAYA stn CP5436; 11°50′ S, 60°56′ E; 300–312 m depth; 6 Nov. 2022; MNHN-IU-2021-5773, MNHN-IU-2021-9157, MNHN-IU-2022-294.

Distribution

Mozambique, at depths of 200–505 m. Saya de Malha Bank between 300 and 312 m deep.

Family Munidopsidae Ortmann, 1898
Genus *Galacantha* A. Milne-Edwards, 1888

Galacantha bellis Henderson, 1885

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♂ (8.0 mm), 2 ov. ♀♀ (14.5–15.2 mm); SAYA stn CP5412; 09°45′ S, 60°48′ E; 1396–1441 m depth; 7 Nov. 2022; MNHN-IU-2021-5780, MNHN-IU-2021-5781.

Distribution

Indian Ocean, from East African coast to India, Sri Lanka, Laccadive Sea, and Makassar Strait (Indonesia); Pacific Ocean from Japan, Philippines, Solomon Islands, Papua-New Guinea, New Caledonia, to off Juan Fernandez, Chile, between 840 and 3800 m. Saya de Malha Bank at depths of 1396–1441 m.

Galacantha rostrata A. Milne-Edwards, 1880

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 2 ♀♀ (8.0–9.8 mm); SAYA stn CP5412; 09°45′ S, 60°48′ E; 1396–1441 m depth; 7 Nov. 2022; MNHN-IU-2021-5774, MNHN-IU-2021-5775.

Distribution

Widely distributed at numerous localities of the western and eastern Atlantic, Indian Ocean, and western and eastern Pacific, from low to high latitudes between 1600 and 3294 m deep. The present material was collected at 1396–1441 m deep.

Galacantha valdiviae Balss, 1913

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♂ (11.5 mm); SAYA stn CP5412; 09°45′ S, 60°48′ E; 1396–1441 m depth; 7 Nov. 2022; MNHN-IU-2022-209.

Distribution

Indian Ocean, along East African coast, Indonesia, western Pacific from South China Sea and Japan to Queensland and Solomon Islands, between 277 and 1644 m deep (Baba *et al.* 2009). The present material was collected at depths of 1396–1441 m.

Genus *Munidopsis* Whiteaves, 1874

Munidopsis kensleyi Ahyong & Poore, 2004

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♂ (11.6 mm); SAYA stn CP5412; 09°45′ S, 60°48′ E; 1396–1441 m depth; 7 Nov. 2022; MNHN- IU-2021-5784.

Distribution

Previously known from South Africa, Taiwan and southwestern Pacific, from southeastern Australia to Solomon Islands, and Wallis and Futuna, between 296 and 1313 m deep. The present material was collected at depths of 1396–1441 m.

Munidopsis sinclairi McArdle, 1901

Material examined

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ov. ♀ (9.0 mm); SAYA stn CP5412; 09°45′ S, 60°48′ E; 1396–1441 m depth; 7 Nov. 2022; MNHN-IU-2021-5785.

Distribution

Known from the Indian Ocean, from Madagascar to Sri Lanka and Indonesia, and the western Pacific, from Taiwan and Philippines to New Caledonia and Vanuatu, between 400 and 2217 m deep (e.g., Macpherson *et al.* 2023, and references cited therein). The specimen of the Saya de Malha Bank was collected at depths of 1396–1441 m.

Description of the new species

Superfamily Galatheoidea Samouelle, 1819
Family Galatheidae Samouelle, 1819
Genus *Coralliogalathea* Baba & Javed, 1974

Coralliogalathea alba sp. nov.
urn:lsid:zoobank.org:act:DAFE58EC-40BA-41C5-B705-6DF4FD859843
Figs 1, 2A, 5A

Coralliogalathea joae Rodríguez-Flores *et al.* 2018: 998 (in part, only Madagascar specimens).

Etymology

From the Latin '*albus*', 'white', in reference to the colour pattern of the species.

Material examined

Holotype

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • ♂ (1.7 mm); SAYA stn YS12; 10°37.2′ S, 62°02.8′ E; 27 m depth; 9 Nov. 2022; MNHN-IU-2021-5806.

Paratypes

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 5 ♂♂ (1.5–2.3 mm), 7 ov. ♀♀ (1.6–2.2 mm), 2 ♀♀ (1.4–1.7 mm); SAYA stn YS12; 10°37.2′ S, 62°02.8′ E; 27 m; 9 Nov. 2022; MNHN-IU-2022-796 • 2 ov. ♀♀ (2.3–2.6 mm); SAYA stn YS14; 10°12.1′ S, 62°09.1′ E; 24 m depth; 10 Nov. 2022; MNHN-IU-2022-206, MNHN-IU-2022-834.

Non-type material

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 3 ♂♂ (1.2–1.7 mm), 1 ov. ♀ (1.7 mm), 3 ♀♀ (1.2–1.4 mm); SAYA stn YR05; 10°37.2′ S, 60°10.3′ E; 39 m depth; 6 Nov. 2022; MNHN-IU-2021-5811, MNHN-IU-2022-753 • 2 ♂♂ (1.4–1.6 mm); SAYA stn YS01; 09°55.5′ S, 60°54.2′ E; 25 m depth; 7 Nov. 2022; MNHN-IU-2022-766 • 1 ♂ (1.6 mm); SAYA stn YR16; 10°12.1′ S, 62°09.1′ E; 24 m depth; 10 Nov. 2022; MNHN-IU-2021-5808 • 1 ov. ♀ (2.2 mm); SAYA stn YB03; 10°12.1′ S, 62°09.1′ E; 27 m depth; 11 Nov. 2022; MNHN-IU-2022-812 • 4 ♀♀ (1.3–1.7 mm); SAYA stn YR26; 16°23.1′ S, 59°38.5′ E; 16 m depth; 19 Nov. 2022; MNHN-IU-2021-5809 • 1 ♂ (1.3 mm); SAYA stn YR28; 16°50′ S, 59°31.3′ E; 17 m depth; 20 Nov. 2022; MNHN-IU-2021-5820 • 1 ov. ♀ (2.8 mm); SAYA stn YR31; 16°36.1′ S, 59°30.4′ E; 30 m depth; 21 Nov. 2022; MNHN-IU-2021-5810.

Description

Carapace. 0.8 times as broad as long; cervical groove shallowly distinct; ridges each with dense short plumose setae and a few long thick and plumose setae; one medially interrupted epigastric ridge; anterior gastric area slightly convex; two protogastric ridges, anterior ridge medially and laterally interrupted, posterior ridge short, arcuate, prominent, with thick plumose setae; one mesogastric ridge, usually medially interrupted, not extending to anteriormost marginal branchial spines; one uninterrupted metagastric ridge not extending to anterior branchial ridges. Anterior branchial region with several short ridges. Mid-transverse ridge uninterrupted, followed by four uninterrupted transverse ridges (including posterior ridge). Lateral margins slightly convex medially, with six spines: one anterolateral spine and five spines on branchial margin; first spine anterolateral, well developed, anterior to level of orbit, located near outer orbital spine; two spines on anterior branchial margin, and three spines on posterior branchial margin. Strong outer orbital spine. Rostrum spatulate, horizontal, 1.2–1.3 times as long as wide, length 0.6 and breadth 0.4 that of carapace; dorsal surface nearly horizontal or slightly concave in lateral view;

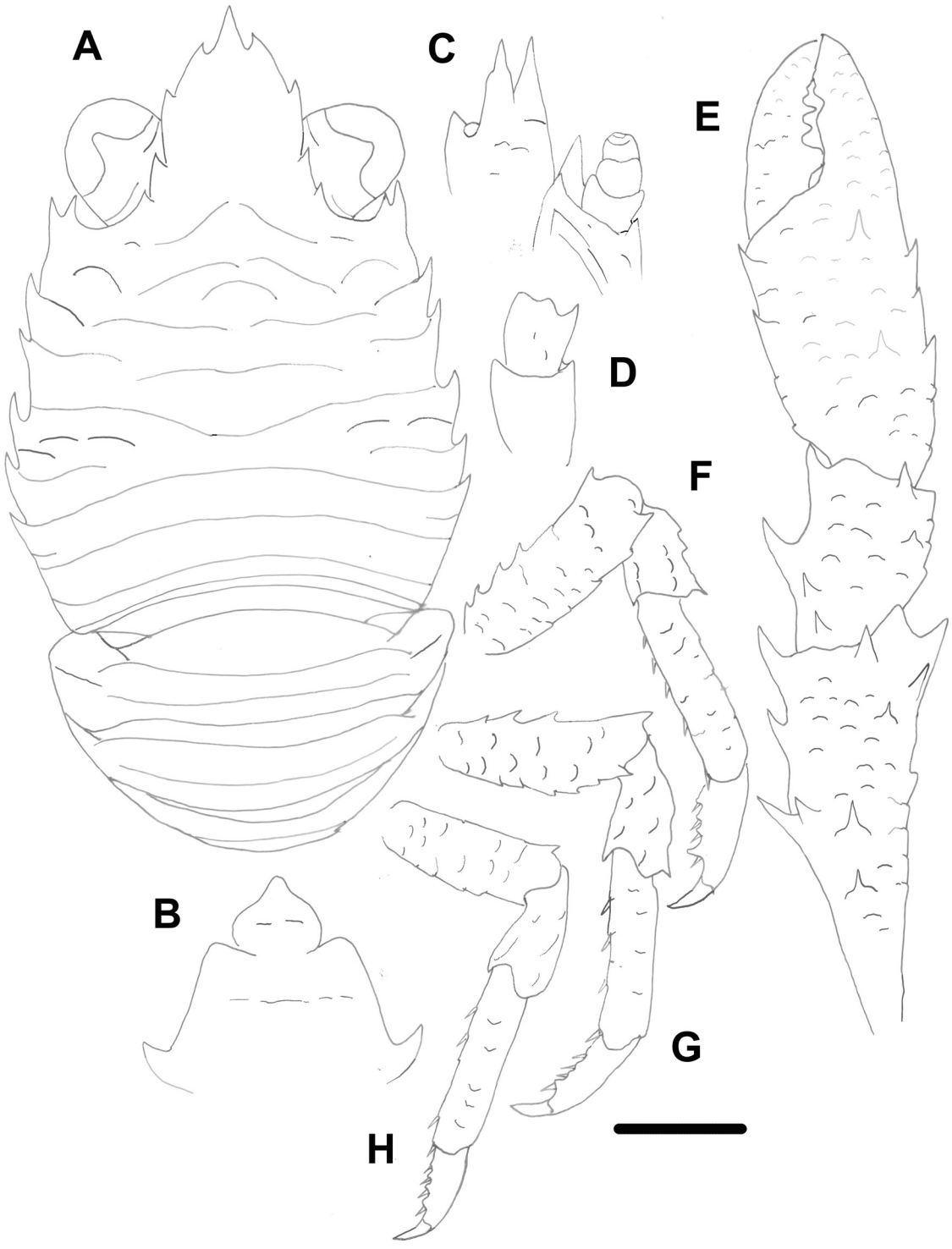

Fig. 1. *Coralliogalathea alba* sp. nov., holotype, ♂, 1.7 mm (MNHN-IU-2021-5806), Saya de Malha. **A**. Carapace and abdomen, dorsal view. **B**. Sternal plastron, anterior sternites. **C**. Left cephalic region, showing antennular and antennal peduncles, ventral view. **D**. Right Mxp3, showing ischium and merus, lateral view. **E**. Right P1, dorsal view. **F**. Right P2, lateral view. **G**. Right P3, lateral view. **H**. Right P4, lateral view. Scale bar: A, E–H = 0.6 mm; B–D = 0.4 mm.

lateral margin with four incised sharp teeth, basal pair of spines smaller than others; margin between distal two spines, and antepenultimate and penultimate spines slightly convex.

Pterygostomian flap. One distinct spine on upper margin near linea anomurica, with sparse short setae; anterior margin acute.

Thoracic sternum. Nearly as long as broad; lateral extremities gently divergent posteriorly. Sternite 3 broadly triangular, 1.3–1.4 times as long as wide.

Pleon. Tergites 2–4 each with uninterrupted transverse stria behind anterior ridge; tergites 5 and 6 smooth, posteromedian margin of tergite 6 straight. Ridges each with dense short simple setae.

Eyes. Ocular peduncles as long as broad, maximal corneal diameter 0.6 of rostrum width.

Antennule. Article 1 with two well-developed and subequal distodorsal and distolateral spines, distodorsal slightly longer; distomesial spine small.

Antenna. Article 1 with strong distomesial spine reaching end of peduncle.

Mxp3. Ischium with minute spine on flexor distal margin; crista dentata with 9 or 10 denticles. Merus as long as ischium; flexor margin with one broad blunt spine; extensor margin with one distal spine. Carpus unarmed.

P1. Each article with both numerous plumose and simple setae. In males 2.5–2.8 and in females 1.6–1.8 times carapace length. Merus 0.8–1.1 length of carapace, 1.5–2.1 times as long as carpus, with some strong dorsal and dorsomesial spines and a few ventromesial spines. Carpus 0.8–1.0 length of palm, 1.3–1.7 times as long as broad; dorsal surface with some small spines; mesial row with two or three strong spines. Palm 1.3–1.5 times as long as broad, with a few spines along lateral, dorsal and mesial margins. Fingers unarmed except for opposed margins, 0.8–1.0 times as long as palm.

P2–4. Moderately short, each article with numerous plumose and simple setae. P2 1.7 times carapace length. Meri successively shorter posteriorly (P3 merus 0.9 length of P2 merus, P4 merus 0.8 length of P3 merus); P2 merus 0.6 carapace length, 2.8 times as long as broad, 1.2 times length of P2 propodus; P3 merus 3.0 times as long as broad, 1.2 times length of P3 propodus; P4 merus 2.6 times as long as broad, 1.4 length of P4 propodus. Extensor margins of meri with row of 4 to 6 proximally diminishing spines on P2–3, 0–1 spine on P4; flexor margins distally ending in small spine followed proximally by several eminences; lateral surface unarmed, with scatered scale-like ridges. Carpi with distal spine on extensor margin, unarmed on P4. P2–4 propodi 3.0–3.8 times as long as broad; extensor margin unarmed; flexor margin with 4–6 slender movable spines. P2–4 dactyli distally ending in well-curved strong spine, length 0.7–0.9 that of propodi; flexor margin with 4 proximally diminishing teeth.

Colour. Base colour of carapace, pleon and P1–4 white. P1–4 with some black transverse stripes.

Genetic data

COI (MNHN-IU-2021-5820, GenBank Acc. PV749085).

Remarks

The new species resembles *Coralliogalathea joae* from western and eastern Australia, and Papua New Guinea and Vanuatu (Rodríguez-Flores *et al.* 2018), and *C. viridis* from Guam (Rodríguez-Flores *et al.* 2024) in having four teeth on the lateral margin of the rostrum, instead of three, as seen in the rest of the species in the genus. These three species can be easily distinguished by the following differences:

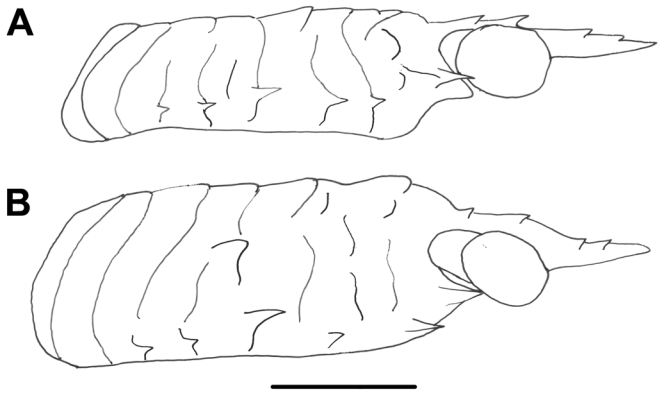

Fig. 2. Carapace, lateral view. **A**. *Coralliogalathea alba* sp. nov., holotype, ♂, 1.7 mm (MNHN-IU-2021-5806). **B**. *C. joae* Rodríguez-Flores *et al.*, 2018, ov. ♀, 1.9 mm (MNHN-IU-2019-1561). Scale bar: 1 mm.

- The rostrum is as long as wide or longer than wide in *C. joae* and *C. viridis*, whereas it is clearly wider than long in the new species.
- The mid-transverse ridge is medially interrupted in *C. viridis* whereas it is medially uninterrupted in *C. joae* and the new species.
- The anterior gastric area is nearly horizontal in lateral view in the new species (Fig. 2A), whereas it is clearly convex in lateral view in *C. joae* (Fig. 2B). The colour patterns differ in the three species: *C. alba* sp. nov., base colour of carapace and pleon white, without black spots; P1–4 whitish, with some black transverse stripes. *Coralliogalathea viridis*, base colour of carapace, pleon and pereopods light green or white, with two symmetrical black round spots behind cervical groove (Rodríguez-Flores *et al.* 2024). *Coralliogalathea joae*, base colour of carapace and pleon brownish with darker brown markings, usually with median large white spot on anterior gastric area; P1–4 whitish to brownish with some black transverse stripes (Rodríguez-Flores *et al.* 2018).
- The genetic divergences for the *COI* gene between *C. alba* sp. nov. and *C. joae* and *C. viridis* are: 9.4% for *C. joae* and 20.5% for *C. viridis*. See the sequences of *C. joae* and *C. viridis* in Rodríguez-Flores *et al.* (2018, 2024).

Distribution

Saya de Malha Bank, at depths of 17–39 m.

Genus *Galathea* Fabricius, 1793

Galathea sayaensis sp. nov.
urn:lsid:zoobank.org:act:A7D03ED9-1A2E-4708-B688-4EE59FAD87E3
Fig. 3

Etymology

The species is named after the type locality (Saya de Malha Bank).

Material examined

Holotype

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • ♀ (2.4 mm); SAYA stn CP5419; 10°16′ S, 61°47.4′ E; 80 m depth; 10 Nov. 2022; MNHN-IU-2021-5797.

Description

Carapace. Slightly longer than broad; anterior and posterior cervical grooves distinct; dorsal surface with scale-like and interrupted ridges in all regions; mid-transverse ridge interrupted medially and laterally, preceded by posterior cervical groove; transverse groove anterior to row of cardiac spines; ridges not densely setose, with short plumose setae and with some long and thick plumose setae on protogastric and cardiac ridges. Epigastric region with 8 small spines; two submedian protogastric spines, two parahepatic spines, one lateral mesogastric and two median metagastric spines on each side; one anterior branchial spine, one postcervical spine on each side of mid-transverse ridge, one or three branchial dorsal spines on each side near branchial margin; seven small median cardiac spines. Lateral margins slightly convex, with seven spines: 2 spines in front of and 5 strong spines behind anterior cervical groove; first anterolateral, well developed, distinctly posterior to level of lateral limit of orbit; second small, situated at midlength between anterolateral spine and anterior cervical groove, accompanying another spine ventral to between first and second; 2 spines on anterior branchial region, and 3 spines on posterior branchial margin. Outer orbital angle rounded; infra-orbital margin with one spine. Rostrum 1.9 times as long as broad, length and breadth 0.6 and 0.4 that of carapace, respectively; distance between distalmost lateral incisions 0.4 that between proximalmost lateral incisions; dorsal surface nearly horizontal in lateral view, with minute setiferous ridges; lateral margin with four sharp teeth and a minute distal tooth.

Pterygostomian flap. Rugose with sparse setae, anteriorly rounded; some granules on upper margin near linea anomurica.

Thoracic sternum. 1.2 times as long as wide. Sternite 3 with median shallow notch on anterior margin. Sternite 4 nearly as wide as following sternites, with anterior margin slightly wider than sternite 3; surface with some short striae. Sternites 4–6 wih a few striae. Sternite 3 2.1 times as wide as long; sternite 4 nearly 2.1 times as wide as long, and 3.2 times as wide as sternite 3.

Pleon. Tergites 2–4 each with 2 or 3 transverse ridges and, with some additional scales, anterior ridge more distinctly elevated than posterior ridges; tergite of somite 5 with medially interrupted ridge; somite 6 with two scale-like ridges, posteromedian margin straight.

Eye. Ocular peduncles 1.8 times as long as wide, maximum corneal diameter 0.8 rostrum width.

Antennule. Article 1 with 3 distal spines, including 2 well-developed spines laterally, distodorsal spine larger than others, distomesial spine small but distinct; 2 small spines on lateral margin. Ultimate article with a few short setae not in tuft on distodorsal margin.

Antenna. Article 1 with distomesial spine reaching distal margin of article 2. Article 2 with subequal small distomesial and distolateral spines, not reaching midlength of article 3. Articles 3 and 4 unarmed.

Mxp3. Ischium with one spine on extensor and flexor distal margins; crista dentata with 15–17 denticles. Merus subequal in length to ischium, with 4 spines on flexor margin, proximal 2 spines larger than remaining spines; extensor margin with small distal spine. Carpus with 3 acute prominences along extensor margin.

P1. 4.5 times carapace length, with scattered long setae and some short setae on spines and scales. Merus 1.7 times carapace length, twice as long as carpus, with rows of mesial, dorsal and lateral spines; distal spines strong, distomesial spine barely reaching proximal fourth of carpus. Carpus 0.8 palm length, 3.6 times as long as broad, with rows of spines along mesial and dorsal surfaces. Palm 4.3 times as long as broad, with rows of mesial, dorsal and lateral spines. Fingers 0.8 lengtht of palm, unarmed except opposed margins. Epipods present.

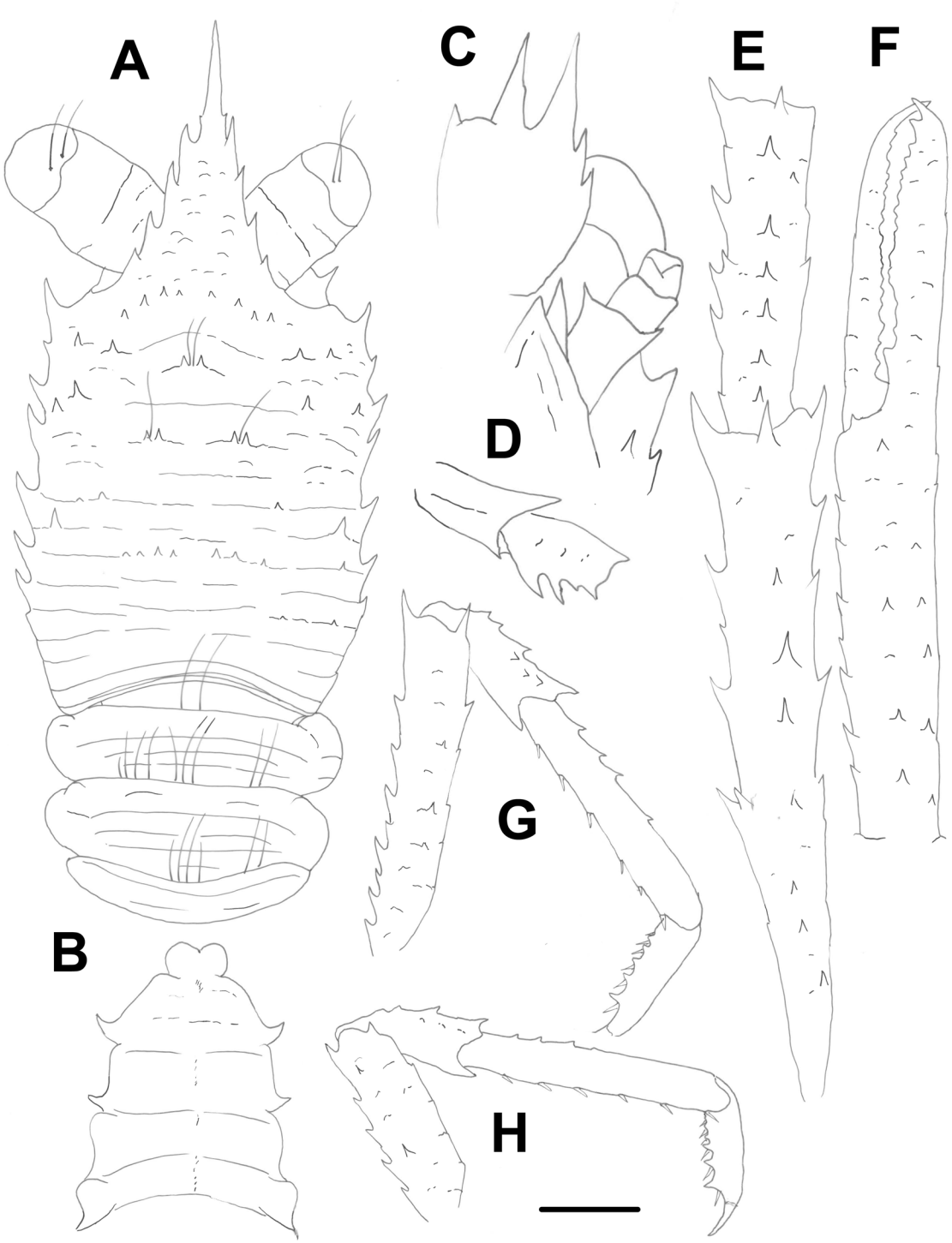

Fig. 3. *Galathea sayaensis* sp. nov., holotype, ♀, 2.4 mm (MNHN-IU-2021-5797), Saya de Malha. **A**. Carapace and abdomen, dorsal view. **B**. Sternal plastron. **C**. Left cephalic region, showing antennular and antennal peduncles, ventral view. **D**. Right Mxp3, showing ischium and merus, lateral view. **E**. Right P1, merus and carpus, dorsal view. **F**. Right P1, palm and fingers, dorsal view. **G**. Right P2, lateral view. **H**. Right P4, lateral view. Scale bar: A–B, E–H = 0.6 mm; C–D = 0.3 mm.

P2 and 4 (P3 lost). Slender, somewhat compressed laterally, sparsely setose with some simple setae and some scattered thick long plumose setae on all articles. Meri shorter posteriorly (P4 merus 0.6 length of P2 merus), equally broad; P2 merus 0.9 carapace length, 5.3 times as long as broad, 1.3 times as long as P2 propodus; P4 merus 3.0 times as long as broad, 0.8 length of P4 propodus. Extensor margins of meri with row of 9 proximally diminishing spines on P2 and 5 spines on P4; lateral surface with 2 or 3 small spines; lateroflexor margins each ending in strong terminal spine proximally followed by smaller spines; mesioflexor margin with 4 spines on P2 and unarmed on P4. Carpi each with 3 or 4 spines on extensor margin on P2 and P4; lateral surface with row of small spines or acute granules paralleling extensor row; distoflexor margins each with small distal spine. Propodi 5.5–6.0 times as long as broad; extensor margin with three or four spines on proximal half; flexor margin with five or six movable spines. Dactyli subequal in length, 0.6 length of propodi, each ending in curved, strong, sharp spine; flexor margin with six proximally diminishing teeth, terminal tooth prominent. Epipods absent.

Setae. Three types of setae were observed on carapace, pleon, and pereopods, (1) moderately short plumose setae, with minute setules along both sides of proximal half of each shaft, not dense, located on ridges of carapace and pleon, and scales of P1–4; (2) long thick plumose setae, with setules along one side of each shaft, distally forming a tuft, sparsely located on carapace, around protogastric and cardiac spines, pleon, and P1–4; (3) long thick simple setae, sparsely located on carapace, pleon and pereopods.

Remarks

The new species belongs to the group of species having the carapace with median protogastric and cardiac spines, and the antennular article 1 with a very small distomesial spine. This group contains five species: *G. bicornis* Macpherson *et al.*, 2025, from New Caledonia, *G. echinata* Macpherson, 2012, from New Caledonia, *G. robusta* Baba, 1990, from Madagascar and La Réunion, *G. sentosa* Macpherson & Robainas-Barcia, 2015, from Wallis and Futuna, and the new species. However, only two species have spines on the metagastric región: *G. robusta* and the new species. Both species can be distinguished by the following characters:

– The metagastric region of the carapace is armed with two median spines in *G. robusta*, whereas it has four spines in the new species. Furthermore, the branchial region has one–three dorsolateral spines in *G. sayaensis* sp. nov., whereas these spines are absent in *G. robusta*.
– The corneae are narrower in *G. robusta* than in the new species.
– The thoracic sternite 3 is clearly wider than long in the new species, whereas it is slightly longer than wide in *G. robusta*.

Distribution

Saya de Malha Bank, at a depth of 80 m.

Family Munididae Ahyong, Baba, Macpherson & Poore, 2010
Genus *Trapezionida* Macpherson & Baba, 2022

Trapezionida pluto sp. nov.
urn:lsid:zoobank.org:act:1CE1FD11-24F2-43B8-83A9-1D85C8C41916
Figs 4, 5B

Etymology

The name refers to one of the Children of the Oceans of the Greek mythology (Pluto). The name is a noun in apposition.

Material examined

Holotype

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • ov. ♀ (5.1 mm); SAYA stn DW5407; 11°00′ S, 60°19′ E; 193–198 m depth; 6 Nov. 2022; MNHN-IU-2021-5805.

Paratypes

SOUTHWESTERN INDIAN OCEAN – **Saya de Malha Bank** • 1 ♀ (4.4 mm); same data as for holotype; MNHN-IU-2022-331 • 1 ov. ♀ (4.0 mm); SAYA stn DW5423; 11°27′ S, 62°01′ E; 198–210 m depth; 12 Nov. 2022; MNHN-IU-2022-852 • 1 ♂ (4.6 mm); SAYA stn DW5424; 11°28′ S, 62°01′ E; 150–171 m depth; 12 Nov. 2022; MNHN-IU-2021-5756.

Description

Carapace. Slightly longer than broad. Ridges with dense short plumose setae and scattered thick long iridescent setae. Gastric region with 2 epigastric spines behind rostrum and 4 or 5 spines at each side, longest spines behind supraocular spines. One well-developed parahepatic spine on each side. Cervical groove distinct, with 2 branchial dorsal spines and one postcervical spine on each side. Frontal margins slightly oblique. Lateral margins subparallel and convergent posteriorly. First lateral spine at anterolateral angle, well developed, not reaching level of sinus between rostrum and supraocular spines, one small and one well developed spine between anterolateral spine and anterior branch of cervical groove. Branchial margin with 2 spines, first strongest, followed by 4 smaller spines. Rostrum spiniform, about 0.6 length of remaining carapace, slightly upwards directed, dorsally not carinated. Supraocular spines short, not reaching midlength of rostrum and clearly not reaching end of corneae, subparalell.

Pterygostomian flap. Unarmed, anteriorly ending in blunt tip.

Thoracic sternum. As long as wide. Surface of thoracic sternites 4–6 smooth, only a few short scales on sternite 4. Sternite 3 four times as wide as long. Sternite 4 anterior margin transverse, nearly contiguous to sternite 3; three times as wide as long, and 2.2 times as wide as sternite 3. Numerous small granules on lateral sides of sternites 6 and 7.

Pleon. Tergite 2 with only one pair of lateral spines on each side of anterior margin (holotype and one paratype), and with 1–3 additional minute median spines (on two paratypes); tergites 2–3 each with one uninterrupted transverse ridge behind anterior ridge, several small scales between both ridges; tergites 4–5 each with several scales; posteromedian margin of somite 6 straight.

Eyes. Ocular peduncles broader than long; corneae dilated, maximum corneal diameter 0.4 distance between bases of anterolateral spines.

Antennule. Article 1 (distal spines excluded) 0.3 carapace length, 2.0 times as long as wide (excluding spines), barely overreaching end of cornea, with two subequal or slightly different-sized distal spines with lateral longer; 2 spines on lateral margin, proximal one short, located at midlength of segment, distal spine much longer.

Antenna. Article 1 with strong distomesial spine reaching end of article 2. Article 2 with distomesial and distolateral subequal spines, reaching or exceeding end of article 3, mesial margin with small spine. Articles 3 and 4 unarmed.

Mxp3. Ischium with well-developed spine on flexor distal margin. Merus 0.8 ischium length; flexor margin with two subequal strong spines; extensor margin with small distal spine.

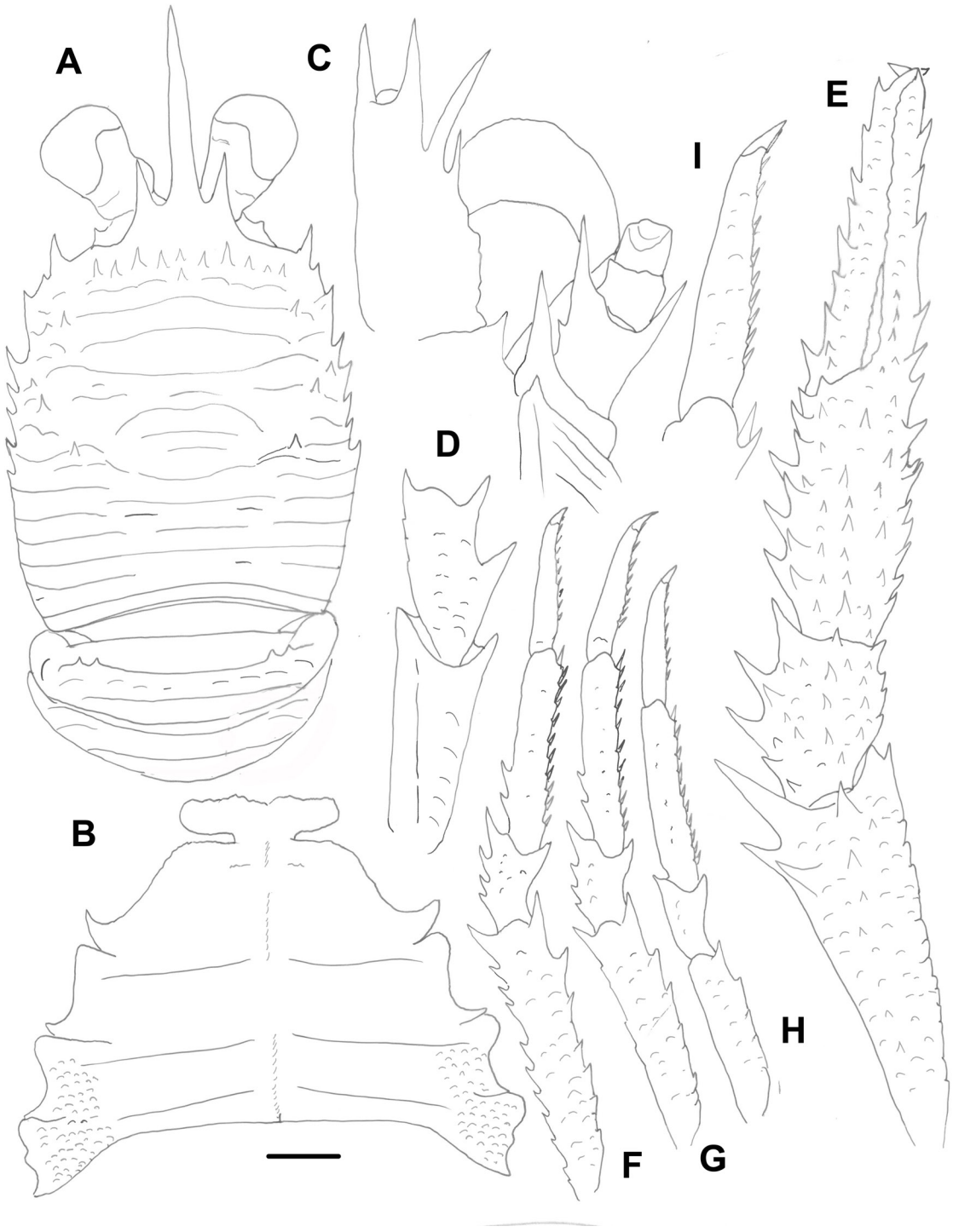

Fig. 4. *Trapezionida pluto* sp. nov., holotype, ov. ♀, 5.1 mm (MNHN-IU-2021-5805), Saya de Malha. **A**. Carapace and abdomen, dorsal view. **B**. Sternal plastron. **C**. Left cephalic region, showing antennular and antennal peduncles, ventral view. **D**. Right Mxp3, showing ischium and merus, lateral view. **E**. Right P1, dorsal view. **F**. Right P2, lateral view. **G**. Right P3, lateral view. **H**. Right P4, lateral view. **I**. Dactylus of right P2, lateral view. Scale bar: A, E–H = 1.0 mm; B–D = 0.5 mm.

P1. 3.0 (females)–3.5 (male) times carapace length, with scattered long simple iridescent setae and numerous short plumose setae on spines and scales. Merus as long as or slightly longer than carapace length, 2.1–2.5 times as long as carpus, with rows of dorsal and mesial spines; distomesial spine strongest, barely reaching proximal third of carpus. Carpus 0.7–0.9 palm length, 1.4–1.8 times as long as broad, with rows of spines along mesial, lateral and dorsal surfaces, mesial spines stronger. Palm twice as long as broad, with 3 or 4 rows of dorsal spines; one row of spines along both mesial and lateral margins. Finger 1.4–1.5 times palm length; fixed finger with a row of small spines on lateral margin, dactylus with a row of mesial spines, proximalmost spine strongest.

P2–4. Moderately slender, with scattered long simple iridescent setae and numerous short plumose setae along extensor margins of all articles. P2 twice carapace length. Meri shorter posteriorly (P3 merus 0.8 length of P2 merus, P4 merus 0.7 length of P3 merus); P2 merus 0.8 carapace length, five times as long as broad, 1.4–1.6 times as long as P2 propodus; P3 merus 4.5 times as long as broad, 1.3 times as long as P3 propodus; P4 merus 3.5 times as long as broad, 1.1 times as long as P4 propodus. Extensor margins of meri with row of 8–12 proximally diminishing spines on P2–3, 0–3 small spines on P4; flexor margins with 3–5 spines followed proximally by several eminences on P2–4; lateral surfaces unarmed, with sparsely scaly ridges. Carpi with 4 extensor spines on P2–3, only disto-extensor spine on P4; lateral surface with several granules sub-paralleling extensor margin; flexor margin with distal spine. Propodi 4.6–5.0 times as long as broad; extensor margin with two proximal spines on P2–3, unarmed on P4; flexor margin with 9–11 slender movable spines, one fixed well-developed distal spine. Dactyli slender, length 0.7–0.8 that of propodi; flexor margin with 7–9 movable spinules along entire border, and ultimate spinule at base of unguis; P2 dactylus 5.5 times as long as wide.

Fig. 5. Colours in life, dorsal view. **A**. *Coralliogalathea alba* sp. nov., paratype, ov. ♀, 2.6 mm (MNHN-IU-2022-206), Saya de Malha. **B**. *Trapezionida pluto* sp. nov., paratype, ♀, 4.4 mm (MNHN-IU-2022-331), Saya de Malha.

Colour. Base colour of carapace and pleon light orange, darker in gastric area and base of rostrum; tip of rostrum whitish; brownish eyes. P1–4 light orange to whitish; P1 with several transverse orange bands; P2–4 with transverse light orange bands on meri, carpi and propodi, dactyli whitish.

Genetic data

COI (MNHN-IU-2022-852, GenBank Acc. PV749084; MNHN-IU-2021-5756, GenBank Acc. PV749083).

Remarks

Trapezionida pluto sp. nov. belongs to the group of species having five branchial spines on the carapace, lateral spines on the second pleomere, granules on sternites 6 and 7, and dorsal spines on the carapace other than epigastric spines. Additionally, the Mxp3 has a small distal spine on the extensor margin, and P2–4 dactyli have movable spines along the entire length of flexor margin. The new species resembles *T. limula* (Macpherson & Baba, 1993) from the SW Indian Ocean (Madagascar, MNHN-IU-2014-13483, GenBank Acc. PV749086) and *T. taenia* (Macpherson, 1994) from New Caledonia. However, the new species can be distinguished from these species by the following characters:

- The thoracic sternum of the new species and *T. taenia* has numerous granules on the sternites 6 and 7, whereas the granules are only on the sternite 7 in *T. limula*. Furthermore, the sternum has more scale-like ridges in *T. limula* and *T. taenia* than in the new species.
- The pleonal tergites 2 and 3 each have only one uninterrupted transverse ridge behind the anterior transverse ridge in the new species, whereas these sternites possess three or four transverse ridges in *T. limula* and *T. taenia.*
- The distomesial spine of the antennular peduncle article 1 is distinctly longer than the distolateral spine in *T. limula* and *T. taenia*, whereas these spines are subequal in the new species.
- The distomesial spine of the antennal peduncle article 2 reaches or exceeds the end of article 3 in the new species, whereas it overreaches the distal end of the antennal peduncle in *T. limula* and *T. taenia*.
- The P1 has clearly more spines in the new species than in *T. taenia*.
- The new species is genetically very different from the other two species, a *COI* divergence of 9.3% from *T. limula* and > 15% from *T. taenia*. See Machordom *et al.* (2022) for the sequences of *T. taenia*.

Distribution

Saya de Malha Bank, at depths of 150–210 m.

Discussion

The number of squat lobster species found in the Saya de Malha Bank (19) is much lower than that found in adjacent areas (e.g., Madagascar, Mayotte, Mozambique, with over 100 species) (Macpherson *et al.* 2017, 2023; Botha *et al*. 2025), which is probably due to a small number of samples collected across limited depth ranges. Most of the species captured during the sampling missions are also found in other locations in the Western Indian Ocean and more widely. For example, among shallow-water species, some have a wide distribution, ranging from the Western Indian Ocean to the Western Pacific (*Allogalathea inermis*, *Galathea boucheti*, *G. genkai*, and *G. tanegashimae*). A similar pattern is observed in deep-water species, which are widely distributed in the Indian and Pacific oceans (*Galacantha bellis*, *G. rostrata*, *G. valdiviae*, *Munidopsis kensleyi*, *M. sinclairi*, and *Uroptychus nigricapillis*). Species with a restricted distribution are few, including the present new species, *Galathea lopisma*, *Phylladiorhynchus janiqueae*, *Trapezionida foresti*, *Uroptychus hippothoe*, and *U. validus* (Baba *et al.* 2008, 2024; Macpherson *et al.* 2023).

Other species of crustacean decapods obtained from Saya de Malha are also found in African waters, including *Solenocera mascarensis* Burukovsky, 1993, *Charybdis crosnieri* Spiridonov & Türkay, 2001, and *Monodaeus tuberculidens* (Rathbun, 1911). These results suggest that the Saya de Malha Bank appears well connected with adjacent areas. This fauna is, in general, clearly differentiated from those of the Southeastern Atlantic and Western Pacific areas (e.g., Schnabel *et al.* 2011; Obura *et al.* 2012; Macpherson *et al.* 2017). Most species are primarily distributed along the coast of eastern Africa, Madagascar and the oceanic islands. However, some of the decapod species found in the Saya de Malha Bank, such as *Nephropsis malhaensis* Borradaile, 1910 and *Stenopus sayaensis* Chen & Chan, 2023, have not been recorded in other areas of the Western Indian Ocean, suggesting the potential existence of endemisms. In any case, the low number of species found, both in decapods and in other groups (Bergstad *et al.* 2021) underscores the need for a more intensive sampling in the Saya de Malha Bank to more reliably describe the biodiversity of this interesting bank.

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