



HAL
open science

First record of *Epigrapsus politus* Heller, 1862 from Réunion Island (Decapoda, Brachyura, Gecarcinidae)

Nicolas Huet, Joseph Poupin

► To cite this version:

Nicolas Huet, Joseph Poupin. First record of *Epigrapsus politus* Heller, 1862 from Réunion Island (Decapoda, Brachyura, Gecarcinidae). *Crustaceana*, 2020, 93 (6), pp.661-670. 10.1163/15685403-bja10034 . hal-04006753

HAL Id: hal-04006753

<https://hal.science/hal-04006753>

Submitted on 27 Feb 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL
open science

First record of *Epigrapsus politus* Heller, 1862 from Réunion Island (Decapoda, Brachyura, Gecarcinidae)

Nicolas Huet, Joseph Poupin

► To cite this version:

Nicolas Huet, Joseph Poupin. First record of *Epigrapsus politus* Heller, 1862 from Réunion Island (Decapoda, Brachyura, Gecarcinidae). *Crustaceana*, 2020, 93 (6), pp.661-670. 10.1163/15685403-bja10034 . hal-04006753

HAL Id: hal-04006753

<https://hal.science/hal-04006753>

Submitted on 27 Feb 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Author Query Form

Journal code: CRUS

Transmittal No.: CRUS4004

Dear Author,

During the preparation of your manuscript for typesetting, some questions have arisen. They are listed below. Please check your proof carefully and mark all corrections at the appropriate place in the proof (e.g., by using on-screen annotation in the PDF file) or compile them in a separate list. Note: if you opt to annotate the file with software other than Adobe Reader then please also highlight the appropriate place in the PDF file.

Any queries or remarks that have arisen during the processing of your manuscript are listed below and highlighted by flags in the proof.

Location in article	Query / Remark: Click on the Q link to find the query's location in text Please insert your reply or correction at the corresponding line in the proof
	No queries

FIRST RECORD OF *EPIGRAPSUS POLITUS* HELLER, 1862 FROM
RÉUNION ISLAND (DECAPODA, BRACHYURA, GECARCINIDAE)

BY

NICOLAS HUET¹⁾ and JOSEPH POUPIN^{2,3)}

¹⁾ 11 rue Saladin, F-97480 Saint-Joseph, La Réunion, France

²⁾ École Navale, BCRM de Brest, CC 600, Lanvéoc, F-29240 Brest, France

The gecarcinids of the genus *Epigrapsus* are terrestrial crabs of the tropical Indo-West Pacific, with only two species currently accepted (Ng et al., 2008; Naruse et al., 2018; Sasaki, 2019): *Epigrapsus politus* Heller, 1862, type locality Tahiti, and *Epigrapsus notatus* (Heller, 1865), type locality Nicobar Islands. These crabs are the smallest gecarcinids, carapace width (CW) being usually no more than 2-3 cm. They occupy a narrow coastal band, a few metres above the supratidal level. Although being probably common in the Indo-West Pacific, they are rarely reported because of a lack of interest in these crabs as human food, and their discreet way of life, remaining hidden under stones or vegetation during daytime. Here, we report for the first time the presence of *E. politus* on Réunion Island, a significant geographic range extension of this species in the Western Indian Ocean (WIO).

Epigrapsus crabs have been searched in Réunion Island during two dedicated land investigations at the stations mapped on fig. 1. A first investigation was made by the second author (JP) in March-April 2008 on the southwestern coast, between Saint Gilles-Les-Bains and Saint Joseph (fig. 1, circles; details of stations in Poupin, 2009: 116, Annexe 1, stations 1, 2, 6, 7, 10, 14, 16). A second investigation was made in November 2019 on the same coast by the first author (NH) between Saint-Leu and Saint-Philippe (fig. 1, squares) with 8 stations visited (from north to south): (1) Pointe au Sel, (2) Terre Sainte, (3) Grand Bois, (4) Grande Anse, (5) Manapany-Les-Bains, (6) Pointe Cayenne to (7) Piton Babet, and (8) Pointe Marine Vincenzo. *Epigrapsus* crabs were found only during the second investigation and only at Manapany-Les-Bains (fig. 1, black square, 5). A dozen crabs were seen in that place during three successive visits. Two

³⁾ Corresponding author; e-mail: joseph.poupin@ecole-navale.fr



Fig. 1. Places prospected for *Epigrapsus* crabs around La Réunion in 2008 (white circles, unnumbered) and 2019 (squares, 1 to 8). *Epigrapsus politus* Heller, 1862 was found only at Manapany-Les-Bains (black square, 5).

specimens were collected for morphological observations: 1 male 13.7×16.2 mm (carapace length \times CW) (fig. 2), and 1 female 15.3×18.7 mm. After observations and macro photographs, they have been deposited and registered in the collection of the Muséum national d'Histoire naturelle, Paris (MNHN-IU-2013-7280).

The crabs were identified as *E. politus*, based on morphological characters presented in Ng et al. (1988, table 1) and in the key to Japanese Gecarcinidae in Ng et al. (2000), including: (a) carapace poorly convex with posterolateral margins converging towards posterior carapace (fig. 2a, b); (b) single low epibranchial notch (fig. 3b); (c) ambulatory legs stout without setae on meri, carpi, propodi (fig. 2a); (d) small size, larger specimen being 15.3×18.7 mm while the largest *E. notatus* can reach 29.6×36.4 mm (Ng et al., 1988). The specimens examined also match well with high definition macro photographs examined for several specimens of *E. politus* collected by JP at Moorea, French Polynesia (10/x/2008) and deposited in the Florida Museum of Natural History, Gainesville, FL (FLMNH, UF15715-718).

Epigrapsus politus resembles, and has been sometimes confused with, *Cyclograpsus integer* H. Milne Edwards, 1837, also collected at Manapany-Les-Bains by the first author (NH). The latter is distinguished by: (a) a smaller size (CW

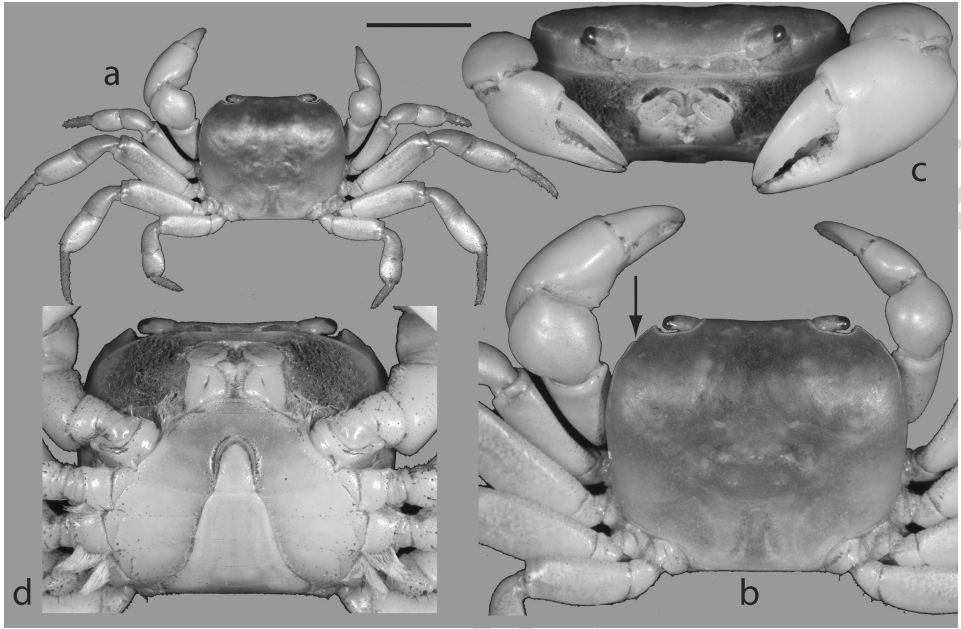


Fig. 2. Habitus of *Epigrapsus politus* Heller, 1862, male 13.7×16.2 mm (MNHN-IU-2013-7280): a, whole animal, dorsal view; b, carapace dorsal view with indication of low epibranchial notch (arrow); c, cephalothorax, frontal view; d, ventral view with aspect of male abdomen. Scale bar: a, 10 mm; b, c, d, 5 mm.



Fig. 3. *Epigrapsus politus* Heller, 1862 biotope at Réunion Is. (Manapany-Les-Bains). The crab was observed exclusively inside the dotted oval line, about 5 m away from the highest sea level, in a place with pebbles covered with creeping vine Convolvulaceae, *Ipomoea pes-caprae* (L.) R. Br., 1818, and grass.

about 1 cm versus about 2 cm for *E. politus*); (b) an oblique setose ridge on the meri and ischia of the third maxillipeds; (c) no teeth on the anterolateral margin of the carapace; (d) red eyes (but this character is sometimes also observed in *E. politus*); and (e) posterior margins of carapace subparallel to slightly diverging backward. It also lives closer to the sea in the intertidal zone and it moves much faster than *E. politus*, being more difficult to catch in the field (JP personal field notes in French Polynesia).

At Manapany-Les-Bains, specimens of *Epigrapsus politus* were seen about 5 m far from the higher sea level on a very limited place, staying on a wet earthy ground under pebbles that were covered with creeping vine, Convolvulaceae (*Ipomoea pes-caprae* (L.) R. Br., 1818) and grass (fig. 3). The associated fauna includes unidentified insects (crickets and ants) and a gastropod of the family Ellobiidae (*Melampus* sp.), rarely found in Réunion and perhaps part of the crab's diet? Terrestrial decapods commonly associated to the same biotope in Réunion (Poupin, 2009) are *Coenobita rugosus* H. Milne Edwards, 1837, *Geograpsus crinipes* (Dana, 1851) and *G. grayi* (H. Milne Edwards, 1853). The crabs were seen only during daytime (around 5 p.m.) by fine weather and calm sea, and not during other visits made at night or with bad weather with rough sea and big swell. They are probably not recent settlers in Réunion, because already observed in 2016 at the same station but not identified at that time (NH, field notes). *Epigrapsus politus* seems, however, uncommon on the island and was not retrieved in any others places prospected in 2019, despite careful attention paid to its preferred biotope.

The taxonomic history and previous geographic records of *Epigrapsus* species are recapitulated herein, limited to contributions where specimens were examined and/or with photographs. A few unpublished records are also included for the first time for *E. politus* from G. Paulay and students' collections in the western and central Pacific (FLMNH, 2020). All these places of observations are mapped on fig. 4.

***Epigrapsus politus* Heller, 1862**

Epigrapsus politus Heller, 1862: 522, French Polynesia (Tahiti).

Nectograpsus politus Heller, 1865: 57, pl. 5 fig. 3, French Polynesia (Tahiti).

Epigrapsus politus — Miers, 1886: 266, Vanuatu (Api =? Epi Is.). — Ortmann, 1894: 703, Fiji, Papua New Guinea (Kaiser WilhelmsLand). — De Man, 1895: 79, Indonesia (Atjeh = Aceh, Sumatra), Micronesia (Ponape = Pohnpei). — Alcock, 1900: 444, Andaman and Nicobar. — Rathbun, 1902: 126, Maldives (Fadiffolu Atoll). — Tesch, 1918: 133, Indonesia, Flores Sea (Tanah-Djampeah = Pulau Tanahjampea Is.). — Sandler, 1923: 26, fig. 1, Papua New Guinea (Bertrand Island = Tarawai Is.). — Ward, 1942: 51, 108, Chagos archipelago (Salomon Atoll). — Holthuis, 1953: 34, Marshall Islands (Arno Atoll), Society Islands, Tahiti (Taravao). — Forest & Guinot, 1961: 162, fig. 176, Indonesia (Atjeh), Tuamotu (Hikueru). — Türkay, 1974: 248, figs. 7, 18, Sumatra (Atjeh), Papua New Guinea (Bertrand Is.), Micronesia (Ponape = Pohnpei), Society (Tahiti; types), Tuamotu (Hikueru). — Tavares, 1989: 36, Tahiti (types). — Poupin,

NOTES AND NEWS

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

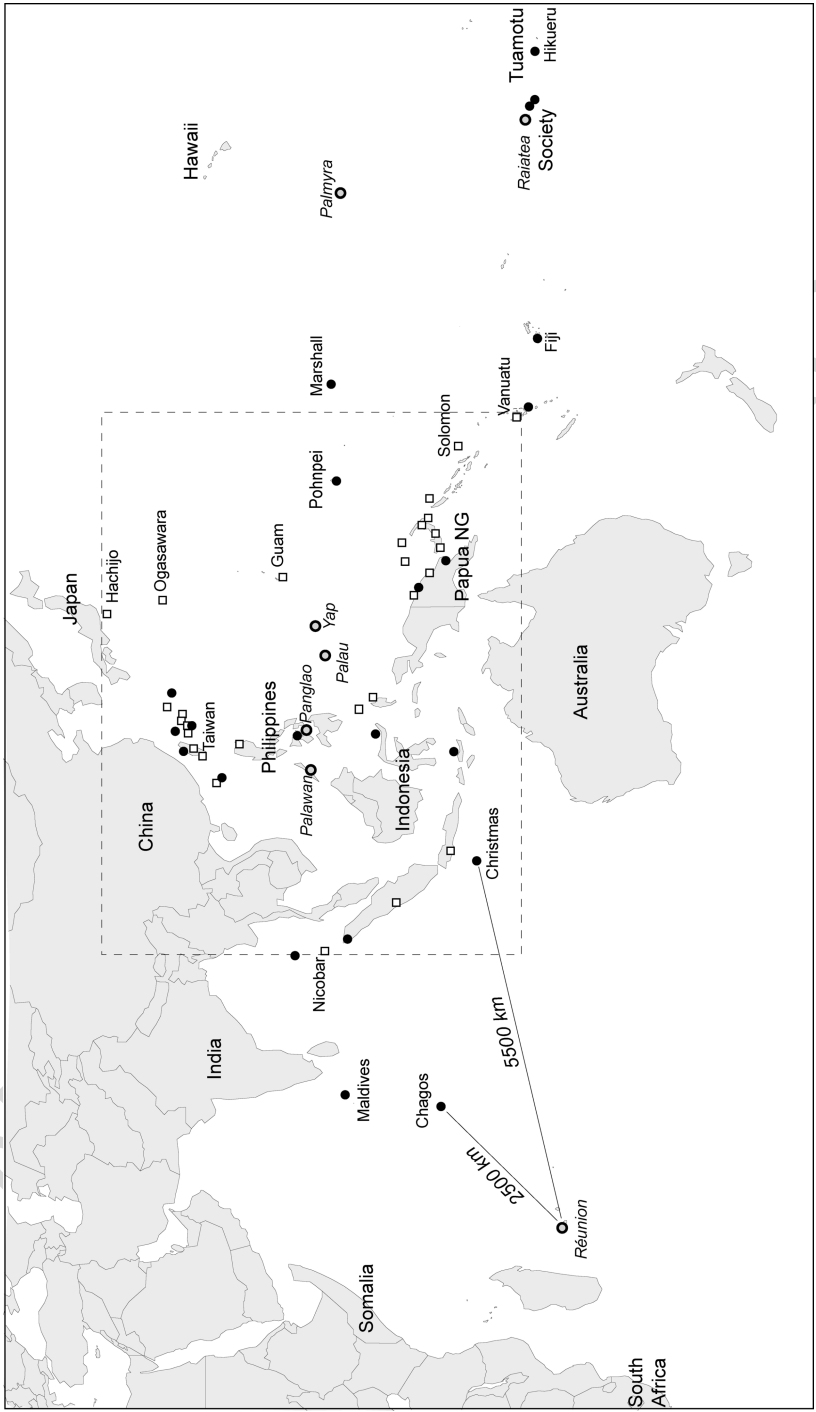


Fig. 4. Geographic distributions of *Epigrapsus politus* Heller, 1862 (circles) and *E. notattus* (Heller, 1865) (squares). New recorded places for *E. politus* are in italics, with grey spots, from west to east: Réunion, Palawan, Panglao, Palau, Yap, Palmyra, and Raiatea. Black lines indicate distances (in km) between Réunion and previous records in the central (Chagos Is.) and eastern (Christmas Is.) Indian Ocean. The dashed rectangle indicates the known geographic range of *E. notattus*.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

1994: 55, fig. 51, pl. 6d, Tuamotu (Hikueru), Indonesia (Atjeh). — Ng et al., 1998: 82, Tahiti (types), Papua New Guinea (Bertrand Is. = Tarawai Is.). — Ng et al., 2000: 380, Christmas Is., Japan (Ryukyus), Papua New Guinea (Bertrand Is.), Tahiti (types). — Cuesta et al., 2002: 1672, Indonesia (Sulawesi), Taiwan (Pingtung, Hsiang-Chiao-Wan). — Osawa & Fujita, 2005: 59, Japan (Okinawa). — Orchard, 2012: 152, Christmas Is. (colour photos). — Guinot et al., 2013: 284, Indonesia (Atjeh). — Shih, 2013: 110, Dongsha Island (colour photos). — Hartnoll et al., 2017: 933, fig. 5, Society (Moorea), Micronesia (Ponape = Pohnpei), Indonesia (Sumatra). — Ng et al., 2017: 97, fig. 10e-f (comprehensive references for Taiwan; colour photos). — Guinot et al., 2018: 551, Indonesia (Atjeh). — Naruse et al., 2018: 210, tab. 1, Philippines (Cebu, Kawasan), Taiwan. — Sasaki, 2019: 12684 (taxonomy and comprehensive references). — Toyota et al., 2019: 192-193, Ryukyus (Okinawa Is.; colour figs.). — FLMNH, 2020, additional museum collections in: Philippines (Panglao, UF8899, Palawan, UF8844), Palau (Ngarchelong, UF4995), Micronesia (Yap, UF2355), Line Islands (Palmyra Atoll, UF10591, 10875), Society Island (Raiatea, UF2221; Moorea, UF1434, 1521, 15715-718, 10086, 34900; Tahiti, UF1406, 2215).

***Epigrapsus notatus* (Heller, 1865)**

Grapsodes notatus Heller, 1865: 58, pl. 5 fig. 2, Nicobar. — Miers, 1877: 136, Papua New Guinea (Duke of York Is.). — De Man, 1887: 160, Indonesia, Moluccas (Morotai Is.). — Alcock, 1900: 442, Nicobar.

Mystacocarcinus crenidens Hilgendorf, 1888: 29, Bismarck Archipelago (New Ireland, Carteret 'Harbour' =? Carteret Is.)

Epigrapsus (Grapsodes) notatus — Sendler, 1923: 27, fig. 2, pl. 5(20) photos 3, Papua New Guinea (Bertrand Is. = Tarawai Is.).

Epigrapsus (Grapsodes) notatus punctatus Sendler, 1923: 28, Papua New Guinea (Bertrand Is. = Tarawai Is.; Liebliche Is. = Arawa Is.).

Epigrapsus (Grapsodes) wolfi Sendler, 1923: 28, fig. 3, pl. 6(21) photos 4, Papua New Guinea (Lamassa).

Epigrapsus villosus Ng, 2002: 1220, figs. 1-3, Guam. — Ng et al., 2008, 215, fig. 160, Vanuatu.

Epigrapsus sp. 1 (n. sp., Ng) — Paulay et al., 2003: 494, Guam (type of *E. villosus*).

Epigrapsus notatus — Tesch, 1918: 134, Indonesia, 'Talaud' = Talaud Is. (Lirung). — Sakai, 1955: 200, Japan (Hachijo Is.). — Türkay, 1973a: 105, figs. 1, 3, Nicobar (type of *E. notatus*), figs. 2, 4, 5-6, Papua New Guinea (type of *E. wolfi*). — Türkay, 1974: 251, figs. 6, 9, 19, Nicobar, Indonesia (Talaud Is.), Papua New Guinea (Bertrand Is. = Tarawai Is., type of *E. punctatus*; Lamassa, New Ireland; St. Matthias = Mussau Is.; Liebliche Is. = Arawa Is.; Admiralty Is. = Manus Is.), Salomon (Steward Is.); Japan (Bonin Is. = Ogasawara Is.). — Sakai, 1976: 678, fig. 373, Japan (Hachijo Is.). — Türkay, 1977: 157, Carteret 'Harbour' =? Carteret Is., type of *Mystacocarcinus crenidens*. — Tavares, 1989: 36, Indonesia (western Sumatra), Papua New Guinea (Bismarck Archipelago). — Takeda, 1994: 218, colour photo 5, Ryukyus (Ishigaki Is.). — Ng et al., 1998: 72, figs. 1-5, Taiwan (fig. 3, colour photo). — Ng et al., 2000: 379, Ryukyus (Ishigaki Is.), 380, Papua New Guinea (Nagada). — Lee, 2001: 141, Taiwan (colour photo). — Cuesta et al., 2002: 1672, Taiwan (Hengchun, Hualien). — Ng, 2002: 1224, Guam. — Paulay et al., 2003: 494, Guam. — Liu & Jeng, 2005: 135, Taiwan (Hengchun). — De Grave et al., 2009: 109, fig. 7G, Taiwan (colour photo). — Shih, 2013: 108, Dongsha Is. (colour photos). — Hartnoll et al., 2017: 933, Taiwan (Kenting). — Ng et al., 2017: 97 (comprehensive references for Taiwan). — Guinot et al., 2018: 551, Taiwan (Hsiang-Chiao-Wan). — Naruse et al., 2018: 210-212, tab. 1, Indonesia (west Java), Philippines (Cagayan, Palau Is.), Taiwan, Japan (Ryukyus), Guam (including type of *E. villosus*), Vanuatu. — Sasaki, 2019: 12683 (taxonomy and comprehensive references). — Toyota et al., 2019: 190-191, Ryukyus (Ishigaki Is.; colour figs.).

The new record of *Epigrapsus politus* in Réunion significantly extends its geographic range in the WIO, 2500 km away from Chagos Is. and 5500 km far

1 from Christmas Is (fig. 4). For the time being this is the only WIO place where 1
2 the crab has been found. No other record has been retrieved despite a thorough 2
3 search in previously published contributions (mentioning Gecarcinidae) for the 3
4 following places: central and western India (Trivedi et al., 2018; without Andaman 4
5 & Nicobar); Seychelles (Haig, 1984); Red Sea (Holthuis, 1977); Somalia (Vannini 5
6 & Valmori, 1981); Mozambique and South Africa (Türkay, 1973b; Emmerson, 6
7 2016); Comoros (Fourmanoir, 1954), Mayotte (Bouchard et al., 2013), Scattered 7
8 Is. (Poupin et al., 2013a-b; Poupin, 2016; Poupin et al., 2018), and Madagascar 8
9 (Türkay, 1974). 9

10 The discreet way of life of *Epigrapsus politus* suggests, however, that it has 10
11 been potentially overlooked in other WIO places. It could probably be discovered 11
12 in the future in neighbouring islands such as Mauritius, Rodrigues, Madagascar, 12
13 Scattered Is., Mayotte, and Comoros, when its preferred biotope is more carefully 13
14 investigated. In Mayotte, for example, Bouchard et al. (2013) have reported the 14
15 sesarmid crab *Metasesarma obesum* (Dana, 1851), another discreet species that 15
16 has been shown to co-occur with *E. politus* in Okinawa (Osawa & Fujita, 2005). 16
17 This suggests that *E. politus* is perhaps also present in Mayotte. 17

18 ACKNOWLEDGEMENTS 18

19 G. Paulay, University of Florida, and his students, J. Starmer, C. McKeon 19
20 and H.-C. Liu, are thanked for giving permission to use of their unpublished 20
21 observations of *Epigrapsus politus* in several places of the western and central 21
22 Pacific (Philippines, Palau, Micronesia, Line Islands, and Society Islands). 22
23 23
24 24
25 25
26 26

27 REFERENCES 27

- 28 ALCOCK, A., 1900. Material for a carcinological fauna of India, 6. The Brachyura Catometopa or 28
29 Grapsidae. Journal Asiatic Society of Bengal, Calcutta, **69**(2): 279-456. 29
30 BOUCHARD, J.-M., J. POUPIN, R. CLEVA, J. DUMAS & V. DINHUT, 2013. Land, mangrove and 30
31 freshwater decapod crustaceans of Mayotte region (Crustacea, Decapoda). Atoll Research 31
32 Bulletin, **592**: 1-69. 32
33 CUESTA, J. A., H. C. LIU & C. D. SCHUBART, 2002. First zoeal stages of *Epigrapsus politus* 33
34 Heller and *Gecarcoidea lalandii* H. Milne-Edwards, with remarks on zoeal morphology of 34
35 the Gecarcinidae MacLeay (Crustacea: Brachyura). Journal of Natural History, **36**: 1671-1685. 35
36 DANA, J. D., 1851. Grapsoidea. Conspectus Crustaceorum quae in Orbis Terrarum circumnaviga- 36
37 tione, Carolo Wilkes e Classe Reipublicae Foederatae Duce, lexit et descripsit J. D. Dana. 37
38 Proceedings of the Academy of Natural Sciences, Philadelphia, **5**: 247-254. 38
39 DE GRAVE, S., N. D. PENTCHEFF, S. T. AHYONG, T. Y. CHAN, K. A. CRANDALL, P. C. 39
40 DWORSCHAK, D. L. FELDER, R. M. FELDMANN, C. H. J. M. FRANSEN, L. Y. D. GOULDING, 40
41 R. LEMAITRE, M. E. Y. LOW, J. W. MARTIN, P. K. L. NG, C. E. SCHWEITZER, S. H. TAN, 41
42 D. TSHUDY & R. WETZER, 2009. A classification of living and fossil genera of decapod 42
43 crustaceans. The Raffles Bulletin of Zoology, (Suppl.) **21**: 1-109. 43
44 44

- 1 DE MAN, J. G., 1887. Carcinological studies in the Leyden Museum. No 3. Notes from the Leyden 1
2 Museum, **5**: 150-169. 2
- 3 DE MAN, J. G., 1895. Bericht über die von Herrn Schiffscapitän Storm zu Atjeh, an den westlichen 3
4 Küsten von Malakka, Borneo und Celebes sowie in der Java-See gesammelten Decapoden und 4
5 Stomatopoden. Zweiter Theil. Zoologische Jahrbücher, (Abtheilung für Systematik, Geogra- 5
6 phie und Biologie der Thiere) **9**(1): 75-218. 6
- 7 EMMERSON, W. D., 2016. A guide to, and checklist for, the Decapoda of Namibia, South Africa and 7
8 Mozambique, **1**: 1-590; **2**: 1-650; **3**: 1-720. (Cambridge Scholars Publishing, Newcastle upon 8
9 Tyne). 9
- 10 FLMNH, 2020. Florida Museum of Natural History, invertebrate zoology collection. Available 10
11 online at <http://specifyportal.flmnh.ufl.edu/iz/> [Consulted 2020.] 11
- 12 FOREST, J. & D. GUINOT, 1961. Crustacés Décapodes Brachyours de Tahiti et des Tuamotu. In: 12
13 Expédition française sur les récifs coralliens de la Nouvelle Calédonie. Volume préliminaire, 13
14 **9-11**: 1-195, pls. 1-18. (Editions de la Fondation Singer Polignac, Paris). 14
- 15 FOURMANOIR, P., 1954. Crabes de la côte ouest de Madagascar. Le Naturaliste Malgache, **6**(1/2): 15
16 1-16. 16
- 17 GUINOT, D., N. K. NG & P. A. RODRÍGUEZ MORENO, 2018. Review of grapsoid families 17
18 for the establishment of a new family for *Leptograpsodes* Montgomery, 1931, and a new 18
19 genus of Gecarcinidae H. Milne Edwards, 1837 (Crustacea, Decapoda, Brachyura, Grapsoidea 19
20 MacLeay, 1838). *Zoosystema*, **40**(26): 547-604. 20
- 21 GUINOT, D., M. TAVARES & P. CASTRO, 2013. Significance of the sexual openings and supplement- 21
22 ary structures on the phylogeny of brachyuran crabs (Crustacea, Decapoda, Brachyura), with 22
23 new nomina for higher-ranked podotreme taxa. *Zootaxa*, **3665**(1): 1-414. 23
- 24 HAIG, J., 1984. 7. Land and freshwater crabs of the Seychelles and neighbouring islands. In: D. R. 24
25 STODDART (ed.), Biogeography and ecology of the Seychelles Islands: 123-139. (Dr. W. Junk 25
26 Publishers, The Hague, Boston, Lancaster). 26
- 27 HARTNOLL, R. G., H. WEBER, S. B. WEBER & H.-C. LIU, 2017. Polymorphism in the chelae 27
28 of mature males of the land crabs *Johngarthia lagostoma* and *Epigrapsus* spp. *Crustaceana*, 28
29 **90**(7-10): 931-951. 29
- 30 HELLER, C., 1862. Neue Crustaceen, gesammelt während der Weltumseglung der k.k. Fregatte 30
31 *Novara*. Zweiter vorläufiger Bericht. Verhandlungen der Kaiserlich-Königlichen, Zoologisch- 31
32 Botanischen Gesellschaft in Wien, **12**: 519-528. 32
- 33 HELLER, C., 1865. Die Crustaceen. Reise der österreichischen Fregatte *Novara* um die Erde 33
34 in den Jahren 1857-1859 unter den Befehlen des Commodore B. von Wüllerstorff-Urbair. 34
35 Zoologischer Theil. Zweiter Band. III. Abteilung: 1-280, pls. 1-25. (Kaiserliche Akademie der 35
36 Wissenschaften, Vienna). 36
- 37 HILGENDORF, F., 1888. Bemerkungen über die Morphologie der Augenhöhle von *Gecarcinus* 37
38 und über eine neue verwandte Gattung *Mystacocarcinus*. Sitzungsberichte der Gesellschaft 38
39 Naturforschender Freunde zu Berlin, **1888**: 26-29. 39
- 40 HOLTHUIS, L. B., 1953. Enumeration of the decapod and stomatopod Crustacea from Pacific coral 40
41 islands. *Atoll Research Bulletin*, **24**: 1-66. 41
- 42 HOLTHUIS, L. B., 1977. The Grapsidae, Gecarcinidae and Palicidae (Crustacea: Decapoda: 42
43 Brachyura) of the Red Sea. *Israel Journal of Zoology*, **26**: 141-192. 43
- 44 LEE, J.-H., 2001. A field guide to crabs in Taiwan: 1-174. (Bigtrees Co., Taipei). [In Chinese.] 44
- 45 LIU, H.-C. & M.-S. JENG, 2005. Reproduction of *Epigrapsus notatus* (Brachyura: Gecarcinidae) in 45
46 Taiwan. *Journal of Crustacean Biology*, **25**(1): 135-140. 46
- 47 MIERS, E. J., 1877. On a collection of Crustacea made by rev. G. Brown, C.M.Z.S. on Duke of York 47
48 Island. *Proceedings of the Zoological Society of London*, **1877**: 133-138. 48
- 49 MIERS, E. J., Report on the Brachyura collected by H.M.S. Challenger during the years 1873-1876. 49
50 Report on the Scientific Results of the Voyage of H.M.S. Challenger, *Zoology*, part 49, **17**(2): 50
51 1-362, pls. 1-29. 51

- 1 MILNE EDWARDS, H., 1837. Histoire naturelle des Crustacés, comprenant l'anatomie, la physiologie 1
2 et la classification de ces animaux, 2: 1-532. Atlas: 1-32, pls. 1-42. (Librairie de Roret, Paris). 2
- 3 MILNE EDWARDS, H., 1853. Mémoire sur la famille des Ocypodiens. Annales des Sciences 3
4 Naturelles, Paris, (Zoologie) (3) 20: 163-228, pls. 6-11. 4
- 5 NARUSE, T., H.-T. SHIH, Y. FUJITA, J. C. E. MENDOZA & P. K. L. NG, 2018. Size-associated 5
6 morphological changes in *Epigrapsus notatus* (Heller, 1865) and the taxonomic status of *E.* 5
7 *villosus* Ng, 2003 (Crustacea: Decapoda: Brachyura: Gecarcinidae). The Raffles Bulletin of 6
8 Zoology, 66: 208-216. 7
- 9 NG, P. K. L., 2002. On a new species of *Epigrapsus* (Decapoda, Brachyura, Gecarcinidae) from a 8
10 cave in Guam. Crustaceana, 75(10): 1219-1227. 9
- 11 NG, P. K. L., D. GUINOT & P. J. F. DAVIE, 2008. Systema Brachyurorum: part 1. An annotated 9
12 checklist of extant brachyuran crabs of the world. The Raffles Bulletin of Zoology, (Suppl.) 17: 10
13 1-286. 11
- 14 NG, P. K. L., H.-C. LIU & C.-H. WANG, 1998. A newly recorded land crab, *Epigrapsus notatus* 11
15 (Heller, 1865) (Crustacea: Decapoda: Brachyura: Gecarcinidae) from Taiwan. Journal of 12
16 Taiwan Museum, 51(2): 71-82. 13
- 17 NG, P. K. L., Y. NAKASONE & T. KOSUGE, 2000. Presence of the land crab, *Epigrapsus politus* 14
18 Heller (Decapoda, Brachyura, Gecarcinidae) in Japan and Christmas Island, with a key to the 15
19 Japanese Gecarcinidae. Crustaceana, 73(3): 379-381. 16
- 20 NG, P. K. L., H.-T. SHIH, P.-H. HO & C.-H. WANG, 2017. An updated annotated checklist 16
21 of brachyuran crabs from Taiwan (Crustacea: Decapoda). Journal of the National Taiwan 17
22 Museum, 70(3-4): 1-185. 18
- 23 ORCHARD, M., 2012. Crabs of Christmas Island: 1-287. (Christmas Island Natural History Associ- 18
24 ation). 19
- 25 ORTMANN, A., 1894. Die Decapoden-Krebse des Strassburger Museums. VIII Theil. Abtheilung: 20
26 Brachyura (Brachyura genuina Boas), III. Unterabtheilung: Cancroidea, 2. Section: Can- 21
27 crinea, 2. Gruppe: Catametopa. Zoologische Jahrbücher, Jena, (Abtheilung für Systematik) 8: 22
28 683-772, pl. 23. 23
- 29 OSAWA, M. & Y. FUJITA, 2005. *Epigrapsus politus* Heller, 1862 (Crustacea: Decapoda: Brachyura: 23
30 Gecarcinidae) from Okinawa Island, the Ryukyu Islands, with note on its habitat. The 24
31 Biological Magazine, Okinawa, 43: 59-63. 25
- 32 PAULAY, G., R. KROPP, P. K. L. NG & L. G. ELDREDGE, 2003. The crustaceans and pycnogonids 25
33 of the Mariana Islands. Micronesica, 35-36: 456-513. 26
- 34 POUPIN, J., 1994. Quelques crustacés décapodes communs de Polynésie française. Rapport Scien- 27
35 tifique du Service Mixte de Surveillance Radiologique et Biologique: 1-86, pls. 1-8. 28
- 36 POUPIN, J., 2009. Crustacés de la Réunion, Décapodes et Stomatopodes: 1-140. (IRD Editions, 29
37 Marseille). 30
- 38 POUPIN, J., 2016. First inventory of the Crustacea (Decapoda, Stomatopoda) of Juan de Nova Island 30
39 with ecological observations and comparison with nearby islands in the Mozambique Channel 31
40 (Europa, Glorieuses, Mayotte). Acta Oecologica, 72: 41-52. 32
- 33 POUPIN, J., R. CLEVA, J.-M. BOUCHARD, V. DINHUT & J. DUMAS, 2018. The crabs from Mayotte 33
34 Island (Crustacea, Decapoda, Brachyura). Atoll Research Bulletin, 617: 1-109. 34
- 35 POUPIN, J., M. ZUBIA, N. GRAVIER-BONNET, P. CHABANET & A. DUHEC, 2013b. Crustacea 34
36 Decapoda of Glorieuses Islands, with notes on the distribution of the coconut crab (*Birgus* 35
37 *latro*) in the western Indian Ocean. Marine Biodiversity Records: 1-12. 36
- 38 POUPIN, J., M. ZUBIA, N. GRAVIER-BONNET, P. CHABANET & M. MALAY, 2013a. Illustrated 37
39 checklist of the Decapoda at Europa Island. Western Indian Ocean Journal of Marine Science, 38
40 11(1): 1-25. 38
- 41 RATHBUN, M. J., 1902. Crabs from the Maldive Islands. Bulletin of the Museum of Comparative 39
42 Zoology at Harvard College, 39(5): 123-138, pl. 1. 40

- 1 SAKAI, T., 1955. Further notes on the brachyuran Crustacea of the Hachijo Island. Records of 1
2 Oceanographic Works in Japan, (n. ser.) **1**(2): 73-77. [Dated 1954.] 2
- 3 SAKAI, T., 1976. Crabs of Japan and the adjacent seas. English volume: 1-773; Japanese volume: 3
4 1-461; plates volume: pls. 1-251. (Kodansha, Ltd., Tokyo). 4
- 5 SASAKI, J., 2019. The species list of Decapoda, Euphausiacea, and Stomatopoda, all of the world, 5
6 version 03-3.1. (Local Independent Administrative Agency Hokkaido Research Organization, 6
7 Resources Management and Enhancement Division, Abashiri Fisheries Research Institute, 7
8 Fisheries Research Department, Hokkaido, Japan): 14644 pp. At: <https://doi.org/10.13140/RG.2.2.22353.89446>. 8
- 9 SENDLER, A., 1923. Die Decapoden und Stomatopoden der hanseatischen Südsee-Expedition. 9
10 Abhandlungen Herausgegeben von der Senckenbergischen Naturforschenden Gesellschaft, **38**: 10
11 21-47, pls. 5-6 (20-21). 11
- 12 SHIH, H.-T., 2013. Warrior, the seashore crabs of Dongsha Islands: 1-163. (Marine National Park, 12
13 Taiwan). [In Chinese.] 13
- 14 TAKEDA, M., 1994. Crustaceans. In: T. OKUTANI (ed.), Animal life on coral reefs: 191-232. (Field 14
15 Books n°9, Yama-Kei, Tokyo). [In Japanese.] 15
- 16 TAVARES, M. D. S., 1989. Sistemática filogenética dos Gecarcinidae H. Milne Edwards (Crustacea, 16
17 Brachyura): 1-163. (M.Sc.Thesis, Universidade Federal do Rio de Janeiro, Brazil). 17
- 18 TESCH, J. J., 1918. The Decapoda Brachyura of the Siboga expedition. I. Hymenosomidae, Retro- 18
19 plumidae, Ocypodidae, Grapsidae, and Gecarcinidae. Siboga-Expeditie Mon., **39c**: 1-148, 19
20 pls. 1-6. 20
- 21 TOYOTA, K., S. SEKI & T. KOMAI, 2019. Fresh and brackish water shrimps and crabs of Japan: 21
22 1-339. (Midorishobo, Tokyo). [In Japanese.] 22
- 23 TRIVEDI, J. N., D. J. TRIVEDI, K. D. VACHHRAJANI & P. K. L. NG, 2018. An annotated checklist 23
24 of the marine brachyuran crabs (Crustacea: Decapoda: Brachyura) of India. Zootaxa, **4502**(1): 24
25 1-83. 25
- 26 TÜRKAY, M., 1973a. Zur Synonymie von *Epigrapsus notatus* und *Cardisoma carnifex* (Crustacea: 26
27 Decapoda). Senckenbergiana Biologica, **54**(1-3): 105-110. 27
- 28 TÜRKAY, M., 1973b. Die Gecarcinidae Afrikas (Crustacea: Decapoda). Senckenbergiana Biologica, 28
29 **54**(1/3): 81-103. 29
- 30 TÜRKAY, M., 1974. Die Gecarcinidae Asiens und Ozeaniens (Crustacea: Decapoda). Senckenber- 30
31 giana Biologica, **55**(4-6): 223-259. 31
- 32 TÜRKAY, M., 1977. Die Identität von *Mystacocarcinus crenidens* und *Perigrapsus excelsus* (Crus- 32
33 tacea, Decapoda, Gecarcinidae). Mitteilungen aus dem Zoologischen Museum in Berlin, **53**(1): 33
34 157-159. 34
- 35 VANNINI, M. & P. VALMORI, 1981. Researches on the coast of Somalia. The shore and the dune 35
36 of Sar Uanle. 31. Ocypodidae and Gecarcinidae (Decapoda, Brachyura). Monitore Zoologico 36
37 Italiano, **14**(14): 199-226. 37
- 38 WARD, M., 1942. Notes on the Crustacea of the Desjardins Museum, Mauritius Institute, with 38
39 descriptions of new genera and species. The Mauritius Institute Bulletin, **2**(2): 49-113, pls. 5-6. 39
40