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First record of Hermit crab *Clibanarius ransoni* Forest, 1953 (Crustacea: Anomura: Diogenidae) from India

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Abstract

Hermit crab species *Clibanarius ransoni* Forest, 1953 is recorded for the first time from India based on specimens collected from the rocky intertidal zone of Veraval and Sutrapada located in Gujarat state of India. The species was described from Tahiti in the South Pacific archipelago and later reported from Indonesia, Vietnam and Taiwan. The present record shows westward extension in the distribution range of the species.

Keywords: Anomurans, Range extension, Rocky shore, Gujarat

1 Introduction

The infraorder Anomura presents a highly diverse group of organisms among decapod crustaceans which includes organisms like mole crabs, king crabs, squat-lobsters, porcelain crabs and hermit crabs (Bracken-Grissom et al., 2013). Hermit crabs are unique anomurans which lack calcified abdomen, and hence some of them occupy gastropod shells to protect their soft abdomen (Bertness, 1981). Approximately 2002 species of hermit crabs are reported worldwide, which are distributed in tropical and subtropical regions (McLaughlin et al., 2010). In India, so far around 112 species of hermit crabs are reported (Trivedi and Vachhrajani, 2017). Hermit crab genus *Clibanarius* Dana, 1852 currently comprises 59 species (McLaughlin et al., 2010) worldwide out of which 17 species are reported from India (Trivedi and Vachhrajani, 2017).

In the present study, *Clibanarius ransoni* Forest, 1953 is recorded for the first time from India, which adds one more species in the diversity of hermit crab belonging to genus *Clibanarius* in Indian waters.

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2 Materials and Methods

The specimens examined during the present study were collected from the rocky intertidal area of Veraval (20° 54' 37" N, 70° 21' 04" E) and Sutrapada (20° 49' 53" N, 70° 29' 17" E) located on the Saurashtra coast of Gujarat state, India. Handpicking method was adopted for the collection of specimen during the low tide in the intertidal area. The hermit crabs were carefully removed from the gastropod shells and fresh photographs were captured. The sex of the animal was identified and shield length and width (SL, SW) were recorded using digital vernier callipers. The specimens were preserved in 70% alcohol and deposited in the Zoological Reference Collection (LFSc.ZRC), Department of Life Sciences, Hemchandracharya North Gujarat University, Patan, Gujarat, India.

3 Results and Remarks

Systematics
Order: Decapoda Latreille, 1802
Infraorder: Anomura MacLeay, 1838
Superfamily: Paguroidea Latreille, 1802
Family: Diogenidae Ortmann, 1892
Genus: *Clibanarius* Dana, 1852
Clibanarius ransoni Forest, 1953 (Fig, 1)
Clibanarius ransoni Forest, 1953: 446, figs. 2, 6; Fize and Serène, 1955: 150, fig. 23; Ball and Haig, 1972:99, Rahayu and Forest, 1993:774; Rahayu, 1996: 337; Rahayu and Komai, 2000: 28; Mclaughlin et al., 2007: 131, 132.

Material examined. 8 Males (SL: 4.05 mm- 6.98 mm, SW: 3.64 mm- 5.66 mm), 2 Female (SL: 3.90 mm- 4.18 mm, SW: 3.29 mm- 3.40 mm), LFSc.ZRC-146, Veraval (20° 54' 37" N, 70° 21' 04" E) and Sutrapada (20° 49° 53² N, 70° 29' 17" E), 14th June, 2018, Gujarat, India, rocky shore, collectors: Pooja Patel and Krupal Patel.

Diagnosis (modified from Mclaughlin et al., 2007). Shield nearly as long as broad (Figs. 1A, B). Ocular peduncles slender; ocular acicles with 3 to 4 spinules. Antennular peduncles extended beyond distal margins of cornea (Fig. 1B); antennal peduncles extended beyond proximal margin of cornea; antennal acicle overreaching distal margin of fourth peduncular segment. Cheliped subequal (Fig. 1A), covered with small spines or tubercles, mesial margin of palm, dactylus and fixed fingers with slightly prominent spines or tubercles (Fig. 1D), carpus dorsal margin with three spines. Ambulatory legs with dactylus shorter than propodus, dactylus ventral margin with 4 to 5 corneous spines (Fig. 1C). Telson (Fig. 1E) with slightly asymmetrical posterior lobes; terminal margins each with several small spines.

Coloration. Shield mottled light blue and orange. Ocular peduncles reddish-orange, each with a blue band at the base of cornea. Chelipeds bluish-black with lighter spines and tubercles. Ambulatory legs brownish black, each with light orange or tannish-orange stripe on lateral face extending from the base of claw to proximal margin of merus.

Habitat. Rocky intertidal shore.

Distribution. The species was described from specimens collected from Tahiti (Forest, 1953) which was later recorded from Vietnam (Fize and Serène, 1955), Indonesia (Rahayu and Forest, 1993), Singapore and French Polynesia (Rahayu, 1996), Thailand (Rahayu and Komai, 2000), Taiwan (Mclaughlin et al., 2007) and now from India.

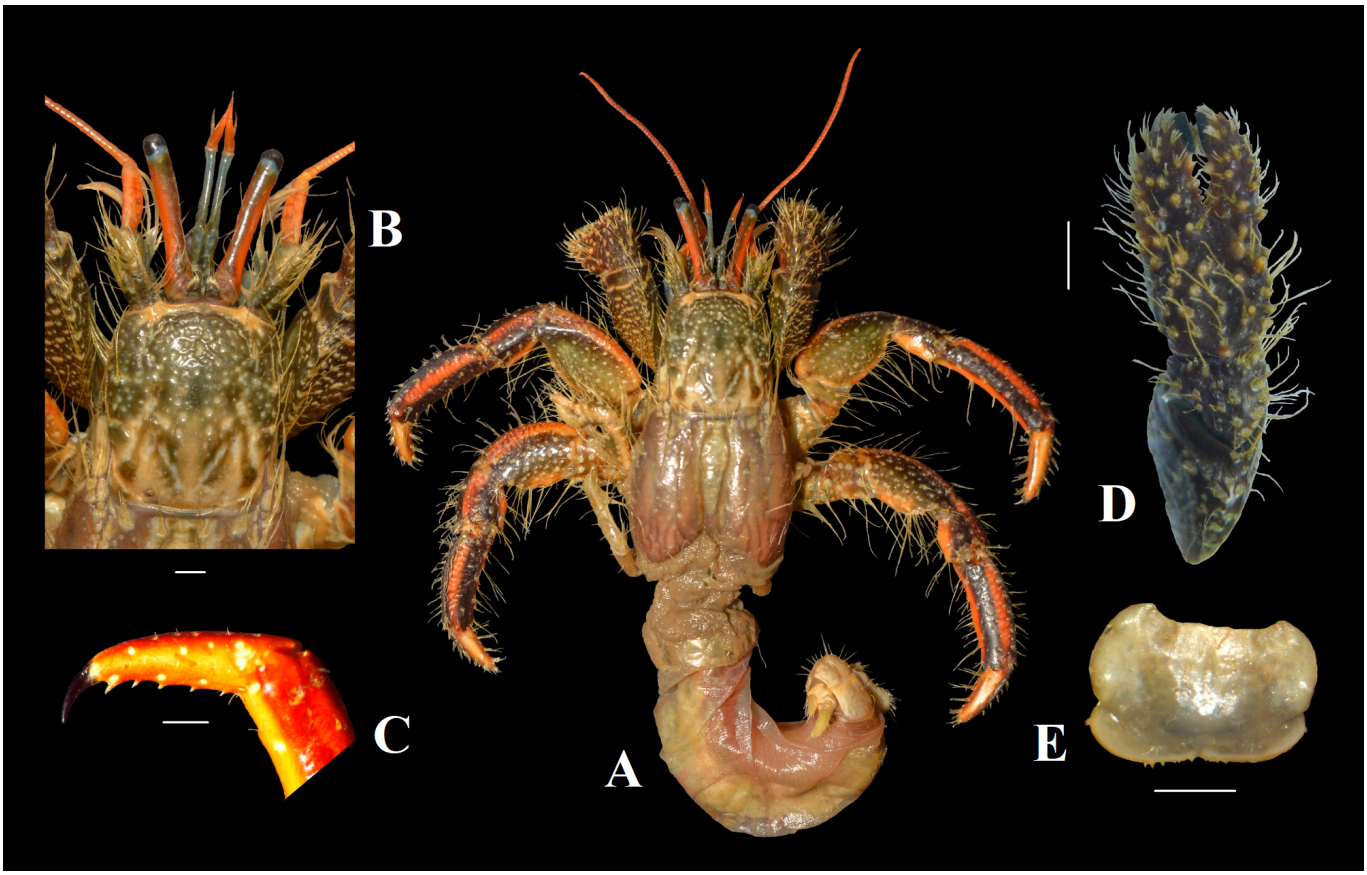

Figure 1. *Clibanarius ransoni* Forest, 1953, male (LFSC.ZRC-146), SL: 6.98 mm; SW: 5.66 mm: A. habitus, dorsal view; B. shield and cephalic appendages; C. dactylus, left second ambulatory leg, lateral view; D. left cheliped; e. telson, setae partially omitted.

Remarks. The specimens examined in the present study agree with the original description given by Forest (1953) and McLaughlin et al., (2007). *Clibanarius ransoni* closely resembles *C. merguiensis* De Man, 1888 but differs in the following characters: the ocular acicles are having 3 to 4 spinules (versus 5 to 6 spinules in *C. merguiensis*, cf. Mclaughlin et al., 2007); fewer spines on palm of cheliped (versus more spines in *C. merguiensis*, cf. Mclaughlin et al., 2007), the ambulatory legs dactyli with strong claw (versus less stronger in *C. merguiensis*, cf. Rahayu and Komai, 2000) and left second ambulatory leg propodus with less conspicuous dorsolateral ridge (versus prominent ridge in *C. merguiensis*, cf. Rahayu and Komai, 2000).

Clibanarius ransoni also resembles *C. englaucus* Ball & Haig, 1972 but varies in the following characters: the ocular peduncles are stouter (versus less stout in *C. englaucus*, cf. Rahayu and Komai, 2000); the antennular peduncles do not reach the distal margin of the corneas (versus reaching or slightly overreaching in *C. englaucus*, cf. Rahayu and Komai, 2000).

Conflict of interests

The authors declare that they have no conflicts of interest.

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References

Ball, E.E. & Haig, J. (1972). Hermit crabs from eastern New Guinea. Pacific Science, 26, 87–107.

Bertness, M.D. (1981). Predation, physical stress, and the organization of a tropical rocky intertidal hermit crab community. Ecology, 62, 411–425.

Bracken-Grissom, H.D., Cannon, M.E., Cabezas, P., Feldmann, R.M., Schweitzer, C.E., Ahyong, S.T., Felder, D.L., Lemaitre, R. & Crandall, K.A. (2013). A comprehensive and integrative reconstruction of evolutionary history for Anomura (Crustacea: Decapoda). BMC Evolutionary Biology, 13, 1–128.

Dana, J.D. (1852). Conspectus crustaceorum, etc., Conspectus of the Crustacea of the Exploring Expedition under Capt. Wilkes, U.S.N., including the Paguridea, continued, the Megalopidea, and the Macroura. Paguridea, continued, and subtribe Megalopidea. Proceedings of the Academy of Natural Sciences, 6, 6–28.

Fize, A. & Serène, R. J. (1955). Les Pagures du Vietnam. Institut Océanographique Nhatrang, Note, 45: ix, 1–228.

Forest, J. (1953). Crustacés Décapodes Marcheurs des îles de Tahiti et des Tuamotu.- I. Paguridea. Bulletin du Muséum national d'Histoire naturelle, Paris, 25, 441–450.

Latreille, P.A. (1802). Histoire naturelle, générale et particulière des Crustacés et des insectes, 3, 1–467.

MacLeay, W.S. (1838). On the Brachyurous Decapod Crustacea. Brought from the Cape by Dr. Smith, in Illustrations of the Annulosa of South Africa; being a portion of the objects of natural history chiefly collected during an expedition into the interior of South Africa, under the direction of Dr. Andrew Smith, in the years 1834, 1835, and 1836; fitted out by "The Cape of Good Hope Association for Exploring Central Africa." Invertebratae chapter in Illustrations of the Zoology of South Africa; consisting chiefly of figures and descriptions of the objects of natural history collected during an expedition into the interior of South Africa, in the years 1834, 1835, and 1836; fitted out by "The Cape of Good Hope Association for Exploring Central Africa" by Andrew Smith, M.D., Deputy Inspector General of Army Hospitals; Director of the Expedition. Published under the Authority of the Lords Commissioners of Her Majesty's Treasury. Smith, Elder and Co. 65, Cornhill, London, 1849, 53–71.

McLaughlin, P.A., Rahayu, D.L., Komai, T. & Chan T. Y. (2007). A Catalogue of the Hermit Crabs (Paguroidea) of Taiwan. Keelung: National Taiwan Ocean University, 365 pp .

McLaughlin, P.A., Komai, T., Lemaitre, R.& Rahayu, D.L. (2010). Annotated checklist of Anomuran decapod crustaceans of the world (exclusive of the Kiwaoidea and families Chirostylidae and Galatheidae of the Galatheoidea) Part 1 – Lithodoidea, Lomisoidea and Paguroidea. The Raffles Bulletin of Zoology, Supplement 23, 5–107.

Ortmann, A. (1892). Die Decapoden-Krebse des Strassburger Museum, mit besonderer Berücksichtigung der von Herrn Dr. Doederlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen. IV. Die Abtheilungen Galatheidea und Paguridea. Zoologishen Jahrbüchern. Abtheilung für Systematik, Geographie und Biologie der Thiere, 6, 241–326.

Rahayu, D.L. & Komai, T. (2000). Shallow-water hermit crabs (Crustacea: Decapoda: Anomura: Diogenidae and Paguridae) of Phuket, Thailand. Phuket. Marine Biological Centre Research Bulletin, 63, 21–44.

Rahayu, D.L. (1996). Notes on littoral hermit crabs (excluding Coenobitidae) (Crustacea: Decapoda: Anomura) mainly from Singapore and peninsular Malaysia. The Raffles Bulletin of Zoology, 44, 335–355.

Rahayu, D.L. & Forest, J. (1993). Le genre *Clibanarius* (Crustacea, Decapoda, Diogenidae) en Indonésie, avec la description de six espèces nouvelles. Bulletin du Muséum national d'Histoire naturelle, Paris, 14(A), 745–779.

Trivedi, J.N. & Vachhrajani, K.D. (2017). An annotated checklist of hermit crabs (Crustacea, Decapoda, Anomura) of Indian waters with three new records. Journal of Asia-Pacific Biodiversity, 10, 175–182.