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Trivedi JN

Marine Biodiversity and Ecology
Lab., Department of Zoology,
Faculty of Science,
The Maharaja Sayajirao
University of Baroda, Vadodara-
390002, Gujarat, India

Vachhrajani KD

Marine Biodiversity and Ecology
Lab., Department of Zoology,
Faculty of Science,
The Maharaja Sayajirao
University of Baroda, Vadodara-
390002, Gujarat, India

On identity of *Atergatis ocyroe* (Herbst, 1801) (Crustacea: Brachyura: Xanthidae) in Indian waters

Trivedi JN, Vachhrajani KD

Abstract

The present report records the occurrence of brachyuran crab *Atergatis ocyroe* (Herbst, 1801) which was identified wrongly as *A. floridus* (Linnaeus, 1767) in older studies carried out in Indian waters. The details of differences in morphological characters and distribution pattern of both species are given in the report.

Keywords: Xanthidae, Rocky shore, Brachyuran crab, Intertidal area, Gujarat

1. Introduction

Brachyuran crab species of family Xanthidae are common inhabitant of tropical rocky shore (Ng *et al.*, 2008). The family Xanthidae is amongst the most diverse families of brachyuran crabs found in Indian waters comprising 111 species belonging to 44 genera in which genus *Atergatis* is represented by 9 species^[1, 2, 3]. Ng & Davie^[4] revised the taxonomy of *Atergatis floridus* (Linnaeus, 1767) and recognized *A. ocyroe* (Herbst, 1901) as a valid species, which had been regarded as a junior synonym of the former species. In their paper, Ng & Davie^[4] examined a series of specimens collected from the Indian Ocean, Southeast Asia and western Pacific; and observed that *A. ocyroe* (Herbst, 1901) differed from *A. floridus* (Linnaeus, 1767) in terms of body coloration and morphological characters like shape of the branchial region of the carapace and proportions of the ischium of the third maxilliped. In the literature on Indian brachyuran crabs, the species is always identified as *Atergatis floridus* (Linnaeus, 1767)^[5, 6, 7] which is now doubtful because according to Ng & Davie^[4], the species occurring in northern and western Indian Ocean (Including Sri Lanka, India and Pakistan) should be *Atergatis ocyroe* (Herbst, 1901). The species occurring in West Pacific and Australia is *Atergatis floridus* (Linnaeus, 1767) s. str. In the light of above mentioned revision, the present study was carried out to check the identity of species occurring in the Indian waters.

2. Materials and Methods

The specimens were collected from the rocky shore of habitat of Okha (22° 28' 03" N, 69° 04' 12" E), Dwarka (22° 28' 03" N, 69° 04' 12" E), Veraval (20° 54' 37" N, 70° 21' 04" E), Sutrapada (20° 49' 53" N, 70° 29' 17" E), Dhamlej (20° 46' 29" N, 70° 36' 19" E) and Kodinar (20° 45' 29" N, 70° 39' 39" E) located on the Saurashtra coast of Gujarat state, Handpicking method was adopted for the collection of the specimens during low tide. The specimens were washed properly to remove the sediment and photographed (18-55 mm lens, Cannon 1000D) in the field to record the details of fresh coloration. The specimens were preserved in 70% alcohol and deposited in the Zoology Museum, Department of Zoology, Faculty of Science, The M. S. University of Baroda, Vadodara, Gujarat, India. The literature published on identification of *A. floridus* (Linnaeus, 1767) occurring in different coastal areas of India was reviewed, and specimens were examined for morphological characters described by Ng & Davie^[4]. All the measurements are recorded in mm. Abbreviations: CL carapace length, measured along the vertical median line of the carapace, mm; CW carapace width, measured at the widest point, mm.

3. Results and Discussion**3.1 Systematic**

Family Xanthidae MacLeay, 1838

Sub family Zosiminae Alcock, 1898

Correspondence:**Vachhrajani KD**

Marine Biodiversity and Ecology
Lab., Department of Zoology,
Faculty of Science,
The Maharaja Sayajirao
University of Baroda, Vadodara-
390002, Gujarat, India
Email: kauresh@gmail.com

Genus *Atergatis* De Haan, 1833
Atergatis ocyroe (Herbst, 1901)
 (Fig. 1, 2)

3.2 Synonyms

Cancer ocyroe Herbst, 1801: 20, Pl. 54 fig. 2.
Atergatis compressipes MacLeay, 1838: 59.
Atergatis floridus Sakai, 1999: 32, Pl. 17c. Chhapgar, 1957a: 426, Pl. 8. Jeyabaskaran *et al.*, 2000: 62, Pl. 52. Trivedi & Vachhrajani, 2012:11.
Atergatis ocyroe Ng & Davie (2007): 172, Fig. 2D-H, Fig. 3, Fig. 4B, 4D.

3.3 Material examined

1 male (CL: 21.1 mm, CW: 30.1 mm) (ZL-AR-CR- 24), Kodinar (20° 45' 29" N, 70° 39' 39" E), Saurashtra coast Gujarat, India, rocky shore, coll. Jignesh Trivedi and Ravi Vasava, 27 September, 2011; 1 male and 1 female (CL: 45.0 mm, CW: 56.1 mm; CL: 56.2 mm, CW: 69.0 mm) (ZL-AR-CR-24 (1, 2)) Sutrapada (20° 49' 53" N, 70° 29' 17" E), Saurashtra coast Gujarat, India, rocky shore, coll. Jignesh Trivedi and Ravi Vasava, 29 April, 2012; 1 male (CL: 49.1 mm, CW: 58.2 mm) (ZL-AR-CR- 24 (3)), Dhamlej (20° 46' 29" N, 70° 36' 19" E), Saurashtra coast Gujarat, India, rocky shore, coll. Jignesh Trivedi and Ravi Vasava, 15May, 2012; 1 male (CL: 35.4 mm, CW: 44.1 mm) (ZL-AR-CR- 24 (4)), Dwarka (22° 28' 03" N, 69° 04' 12" E), Saurashtra coast Gujarat, India, rocky shore, coll. Jignesh Trivedi and Ravi Vasava, 20March, 2013; 2 male and 2 female (CL: 40.2 mm, CW: 48.0 mm; CL: 30.1 mm, CW: 35.4 mm; CL: 34.0 mm, CW: 41.0 mm; CL: 38.3 mm, CW: 47.1 mm) (ZL-AR-CR- 24 (5,6,7,8)), Okha (22° 28' 03" N, 69° 04' 12" E), Saurashtra coast Gujarat, India, rocky shore, coll. Jignesh Trivedi and Gunjan Soni, 16November, 2014; 3 male (CL: 36.0 mm, CW: 43.5 mm; CL: 26.1 mm, CW: 31.8 mm; CL: 18.1 mm, CW: 21.5 mm) (ZL-AR-CR- 24 (9,10,11), Verval (20° 54' 37" N, 70° 21' 04" E), Saurashtra coast Gujarat, India, rocky shore, coll. Jignesh Trivedi and Gunjan Soni, 26 April, 2014.

3.4 Remarks

Ng and Ahyong^[8] observed that the specimens identified as *Atergatis floridus* (Linnaeus, 1767) collected from Indian Ocean, Southeast Asia and Pacific may belong to two species as there appeared to be two color forms. Later, Ng & Davie^[4] revised the taxonomy of *Atergatis floridus* (Linnaeus, 1767) in which they compared the specimens collected and photographed from Phuket and Sri Lanka with the specimens collected from Southeast Asia and Western Pacific and stated that the species occurring in Northern and Western Indian ocean differed in terms of body coloration and morphology of the carapace and third maxilliped with the species occurring in Southeast Asia and Western Pacific. Ng & Davie^[4] stated that the species occurring in the Northern and Western Indian Ocean should be identified as *A. ocyroe* (Herbst, 1801) instead of *A. floridus* (Linnaeus, 1767). *A. ocyroe* (Herbst, 1801) has long been regarded as a junior synonym of *A. floridus* (Linnaeus, 1767), with the latter species actually restricted to Southeast Asia and Western Pacific. Live specimens of *A. floridus* (Linnaeus, 1767) s. str. have a characteristic greenish coloration with flower-like yellowish to yellowish white markings on the carapace, the branchial region is more swollen and the ischium of the third maxilliped is relatively more quadrate; while in *A. ocyroe* (Herbst, 1801), the carapace is cream colored with reddish brown to dark brown colored

patches and blotches, the branchial region is relatively lower and the ischium of the third maxilliped is distinctly longitudinally rectangular^[4].

The specimens examined in the present study all agree in the body coloration and morphological characters described by Ng & Davie^[4] and Herbst^[9]. Herbst^[9] described *Cancer ocyroe* by stating the type locality "Das Vaterland ift Offindien". This locality is generally considered to be present on east coast of India but it may extend as far as the Indo-Malayan Archipelago (Ng & Davie^[4]). The figure and photographs given by Herbst^[9] and Ng & Davie^[4] respectively also matches with the specimens examined in the present study. The brown colored blotches and patches present on the carapace of specimens examined in the present study were surrounded by white line and the chelipeds, abdomen, maxillipeds and thoracic sternum were also covered with dark brown spots (Fig. 1, 2). A similar kind of color pattern was also recorded by Barnard^[10], who examined the specimen of *Atergatis compressipes* MacLeay, 1838 collected from South Africa which is now treated as synonym of *A. ocyroe* (Herbst, 1801) (see Ng & Ahyong^[8]). The specimen examined also agreed in body coloration with those examined by Tirmizi and Ghani^[11] from Pakistan. Jeyabaskaran *et al.*^[6] figured a specimen identified as *A. floridus* collected from the Gulf of Mannar on the southern coast of India. The figure of their specimen matches that of *A. ocyroe*. Chhapgar^[5] examined one male specimen (identified as *A. floridus*) collected from Mumbai; and his figure (and color pattern) closely resembles *A. ocyroe*. *Atergatis ocyroe* occurs in large numbers in the lower intertidal areas of the rocky shores of Gujarat state. The species is mostly found hiding in intertidal rock crevices and in areas dominated by zoanthid colonies (Trivedi & Vachhrajani^[7]). The present study confirms that the species occurring in the Indian waters is *A. ocyroe* (Herbst, 1801) and not *A. floridus* (Linnaeus, 1767).

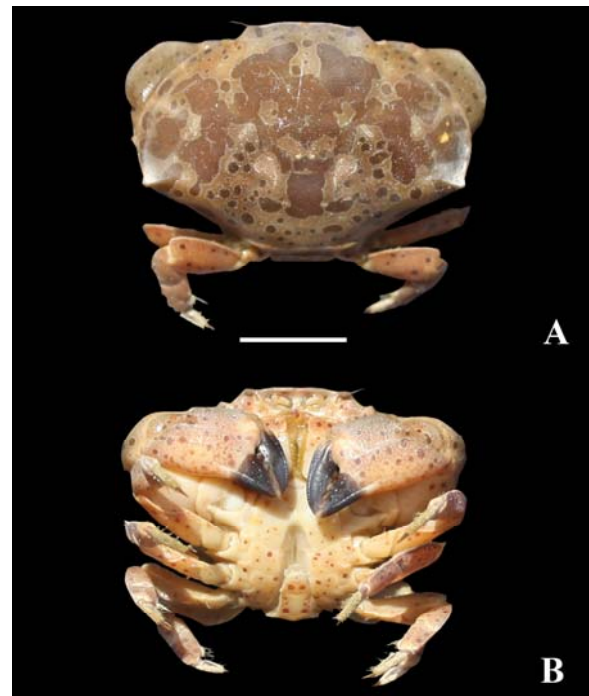


Fig 1: *Atergatis ocyroe* (Herbst, 1801), male (CL: 21.1 mm, CW: 30.1 mm) (ZL-AR-CR- 24), Gujarat, India. Overall habitus, color freshly after collection. (A) Dorsal view (B) Ventral view. (Scale = 10mm)



Fig 2: *Atergatis ocyroe* (Herbst, 1801) in life, Kodinar, Gujarat, India.

3.5 Distribution

The species is distributed in Northern and Western Indian Ocean including South Africa, Pakistan, India, Sri Lanka and western Thailand.

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