

## Fresh record of the moon crab *Matuta victor* (Fabricius, 1781) (Crustacea: Decapoda: Matutidae) from the Odisha coast after a century

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Received 29 December 2016; revised 20 April 2017

The recurrence of common moon crab *Matuta victor* (Fabricius, 1781) was recorded from near shore waters of Gopalpur port of the Ganjam district, Odisha after a century. Totally ten specimens were collected which comprised of 5 males and 5 females. *Matuta victor* was first reported in Chilika Lake during 1915.

[**Keywords:** Recurrence; Crab; *Matuta victor*; Odisha; Super cyclone]

### Introduction

Considering the ecological and the habitat point of view the crabs represents a most significant crustacean resource in offshore trawling<sup>1-2</sup>. The coastal and offshore water of Odisha forms a rich and diverse habitat for many pelagic and demersal fishery resources including crab. Brachyuran crabs are among the most species-rich animal groups as studied by different authors<sup>3-4</sup>. In India Venkataraman and Wafar<sup>5</sup> reported 705 brachyuran crab species comprising 28 families and 270 genera. Later Pillai and Thirumilu reported 991 species of brachyuran crabs<sup>6</sup>. Significant information is available on the brachyuran fauna of India and are well explain along the east<sup>7-11</sup> and the west coast<sup>12-17</sup> of India. In Indian water, Calapidae family was first studied by Dana (1852) comprehending 16 genera, among them seven were fossils and 33 species has been reported which are from Indo-west pacific region<sup>18</sup>. Alcock reported 13 species of ocypodids from Andaman and Nicobar Islands<sup>19</sup>. In Odisha, the first study on crab diversity was conducted by Zoological Survey of India in Chilika Lake during 1914-1924<sup>20</sup>. The review was undertaken during 1985-1987 and 28 species of crab were reported<sup>21</sup>. Mahapatra et al.<sup>22</sup> made an extensive survey and recorded 35 species representing 9 families comprising 8 species from Portunidae, 9 species (Grapsidae), 10 (Ocypodidae), 2 (Leucosiidae and Calappidae) and 1 species each from Majidae, Hymenosomatidae, Gecarcinidae, Xanthidae family from Chilika lagoon.

Regarding information on crab diversity along south Odisha, Rath and Devroy reported 22 species from 16 genera and 4 families in Banshadhara, Nagabali and Bahuda estuary<sup>23-24</sup>. The most attractive crabs in the tropical and subtropical area belong to family Calapidae and Mututidae which is popularly known as shame faces or moon crabs<sup>25</sup>.

On Odisha coast, the moon crab *Matuta victor* of Mututidae family was first recorded in Chilika lake during March 1914 at outer channel<sup>20</sup>. After that, no description or occurrence record exists in the literature regarding *Matuta victor* in the Odisha. Here we made a survey on the occurrence and distribution of this species, and reports the recurrence of *Matuta victor* after a century, along Gopalpur port coastal water, East coast of India after super cyclone Hudhud.

### Materials and Methods

During a regular survey made by fiber fishing boat on nearshore waters of Gopalpur port, Odisha (19° 16' 4" N and 84° 54' 3" E) on 4<sup>th</sup> November 2014, ten species of moon crab both male and female were collected using the fishing net (Fig. 1). Morphometric characters (Body weight, Length and Width of Carapace, Abdominal length and width, number of lateral spine and Cheleped (Length of Claw, Dactylus length, Merus length and carpus length) as well as walking leg characters were recorded for identification. Immediate preservation was made in 10% formalin and kept in Department of Marine science, Berhampur University.

The taxonomic key provided by Gali and Clark<sup>25</sup>, FAO identification guide by Carpenter and Niem<sup>26</sup> and Ng<sup>27</sup> were followed for identification and morphometric description.

**Results and Discussion**

The collected specimen from Gopalpur port were taxonomically identified as *Matuta victor* (Fabricius, 1781) which belongs to kingdom Animalia and is popularly known as surf crab or Moon crab (FAO).

*Taxonomic Hierarchy*

- Phylum Arthropoda
- Class: Crustacea
- Order: Decapoda
- Superfamily: Leucosioidea
- Family: Matutidae
- Genus: *Matuta*
- Species: *Matuta victor*

Line diagram along with a different view of crab is presented in figures 2 and 3. The carapace is sub-

circular bearing two long well developed lateral spine. Presence of 6 obtuse tubercles in the central part of carapace which acts as a stridulating organ. Anterolateral margin is acute and tuberculate whereas post lateral margin is convergent and craniated. The front is wider than orbit region and the orbit is trilobed where the median lobe projected interiorly and emarginated. Orbit is intact with antennular fossa and the sub-orbital margin intermittent by the curved inhalant canal. Chelepod is subequal, the pollex is slightly shorter than the dactylus. In the male the dactylus contains a clear milled ridge on outer surface having two spines whereas in female milled ridge are absent and the spines are 3 in number. It is having 4 pairs of walking legs the ambulatory legs are natatory and the 1<sup>st</sup>propodus bearing triangular tooth on inferior margin. Carpus is unicarinate and sternum is anteriorly in ‘fleur de lis’ form<sup>28</sup>. The detail morphometric character as well as the length and width of walking legs, are presented in Table 1 & 2.

In live condition, the male specimen appears yellowish in colour with numerous fine black spots on the carapace, whereas the female appearance is

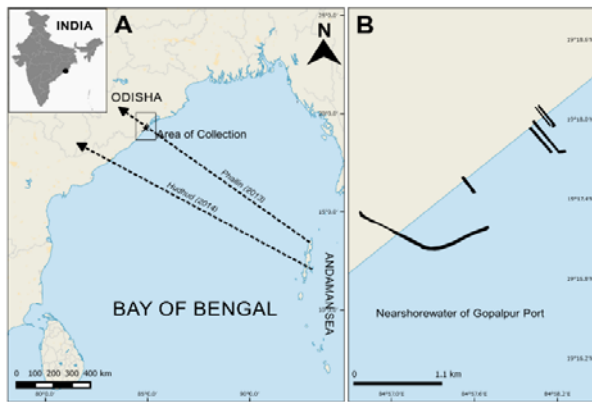


Fig. 1 — Map showing the study area, Gopalpur port, Odisha

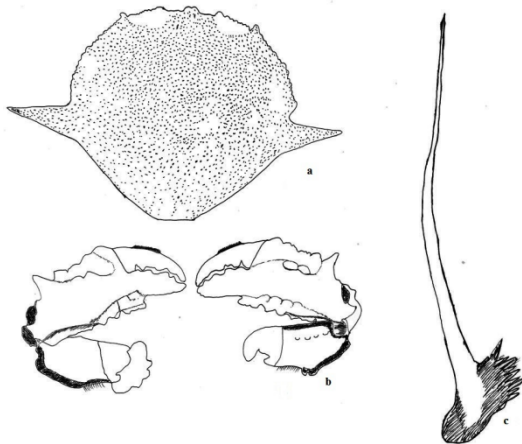


Fig. 2 — Line diagram on body parts of *Matuta victor* presenting (a) Carapace, (b) Chela, (c) Male gonopod.

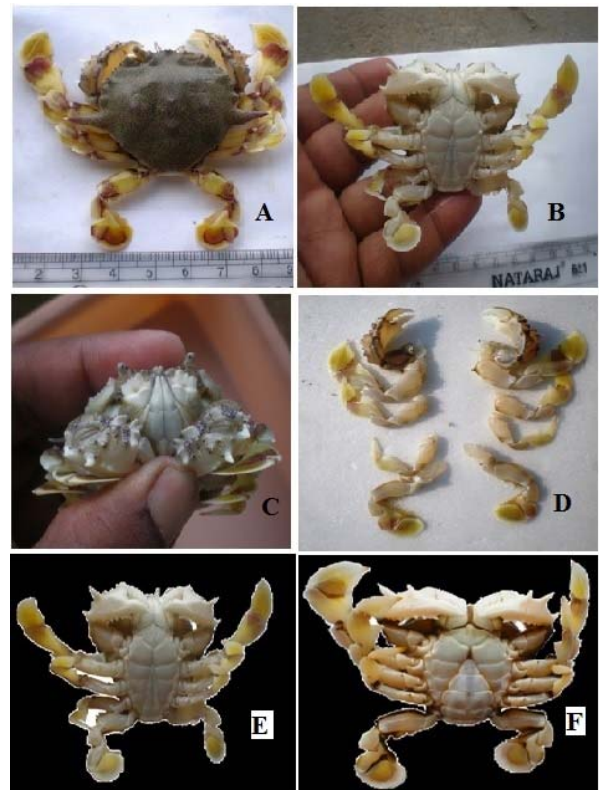


Fig. 3 — Dorsal, frontal and Ventral view of *Matuta victor* differentiating male and female crab. A. Dorsal part, B. Ventral Part, C Frontal part Cheliped, D. Cheliped with Walking leg, E. Male crab, F. Female crab

slightly greenish with ivory colour. The legs and chelae are bright ivory in colour containing purple dots. But, after preservation both the species changed to faint yellow in colour.

Based on the revision made by Galil and Clark<sup>25</sup> *Matuta victor* is separated on account of midpalmar ridge with respect to its similar species *Ashtoret lunaris* (Forsskal)<sup>29</sup> and *Mututa banksii* (Leach)<sup>30</sup>. In *Matuta victor* it is strongly milled dactylar ridge and uni-carinate carpus of fourth periopods whereas in *Ashtoret lunaris* the mid palmar ridge is parallel with lower margin; the dactylar ridge is finely milled bearing-carniate carpus. Moreover, the males are bigger in size than female. The length of cheleped character such as claw, dactylus, merus, and carpus are bigger as compared to female species.

The species is Indo-pacific in distribution from south-east Asia to Fiji and New Hebrides. Distinctly this species is distributed in Gulf of Suez, Gulf of Oman, East Africa, Madagascar, Comoro Island, Malaysia, Indonesia, South China Sea, Japan, New Caledonia, Australia Red Sea, Andaman Sea and the Mediterranean Sea. In Indian context, it has been reported from Sundarbans (West Bengal), Chennai coast, Gulf of Mannar (Tamil Nadu), Andaman and Nicobar from the east coast whereas in west it was reported from Coast of Karwar and Mumbai<sup>31</sup>. As far as Chilika lake is concerned this species was evidently carried into the lake during inflow of salt water and it is said to be visitor to the lake system but, not as permanent inhabitant as observed by Kemp in outer lake of Chilika<sup>20</sup>.

Table 1 — Measurement of *Matuta victor* with Morphometric Character

Character	Male	Female
Weight (g)	39 ± 16.0	26.6 ± 3.6
Carapace length (cm)	6.94 ± 0.8	6.56 ± 0.2
Posterior width of Carapace (cm)	4.84 ± 0.5	4.46 ± 0.2
Length of posterior-lateral Margin (cm)	3.74 ± 0.5	3.5 ± 0.1
Length of anterior-lateral margin (cm)	2.9 ± 0.2	2.9 ± 0.1
Length of lateral tooth or spine (cm)	1.3 ± 0.2	1.28 ± 0.2
Number of lateral spine (cm)	2.0 ± 0.0	2.0 ± 0.0
Orbital length (cm)	1.0 ± 0.1	0.96 ± 0.2
Frontal width or margin (cm)	1.08 ± 0.1	1.02 ± 0.1
Abdominal length (cm)	3.66 ± 0.4	3.26 ± 0.1
Abdominal width (cm)	2.46 ± 0.3	2.42 ± 0.2
Chelipeds	Male	Female
Length of Claw (cm)	2.78 ± 0.4	2.24 ± 0.22
Dactyl length (cm)	1.52 ± 0.3	1.4 ± 0.14
Pollex length (cm)	1.02 ± 1.02	0.94 ± 0.15
Merus length (cm)	1.28 ± 1.28	1.5 ± 0.12
Carpus length (cm)	1.22 ± 0.1	1.36 ± 0.05

The Bay of Bengal region of India is most vulnerable to the natural catastrophe which has faced 128 tropical cyclones from 1804 to 1999<sup>32</sup>. In recent past, there are frequent occurrences of the super cyclone in Gopalpur coastal waters naming Phailin on 12<sup>th</sup> October 2013 and Hudhud in October 2014<sup>33-34</sup>. These cyclones had some major impact on the distribution of organisms. The moon crab *Matuta victor* was first recorded during March 1914 at the outer channel in Chilika lake. Global studies related to cyclonic events influencing reef fish communities have produced contradictory results<sup>35</sup>. “Contradictory”, which is synonymous to “conflicting”, the word actually used by the author can be seen in examples like Adams and Ebersole<sup>36</sup> and Kaufman<sup>37</sup>. The former mentioned that post-cyclone habitat damage has no visible effects on the associated fish community, whereas the latter has referred to severe changes in fish assemblage due to cyclone induced habitat loss. Such differences in findings may be due to multiple factors among which the geographical location of the affected area, frequency

Table 2 — Length (L) and Breadth (B) of Walking leg of both Male and Female Crab *Matuta victor*

Leg	Male Walking Length in cm								Female Length Walking in cm							
	Dactylus		Propodus		Carpus		Merus		Dactylus		Propodus		Carpus		Merus	
	L	B	L	B	L	B	L	B	L	B	L	B	L	B	L	B
1	1.78± 0.13	1.18 ± 0.22	1.48± 0.16	1.3 ± 0.19	1.06± 0.24	0.8 ± 0.16	1.74± 0.22	1.16± 0.23	1.56± 0.11	0.96± 0.05	1.46± 0.09	1.16± 0.11	1.0 ± 0.16	0.56± 0.11	1.6 ± 0.12	0.86± 0.26
2	1.58± 0.20	0.9 ± 0.30	1.3 ± 0.08	0.88± 0.30	0.9 ± 0.27	0.56± 0.21	1.55± 0.24	0.7 ± 0.12	1.40± 0.20	0.74± 0.18	1.20± 0.21	0.8 ± 0.19	0.94± 0.23	0.48± 0.13	1.28± 0.28	0.46± 0.27
3	1.25± 0.48	0.38 ± 0.08	1.05± 0.44	0.44± 0.21	0.75± 0.51	0.3 ± 0.07	1.25± 0.06	0.34± 0.19	1.00± 0.10	0.36± 0.05	0.54± 0.09	0.32± 0.11	0.76± 0.15	0.32± 0.13	0.94± 0.09	0.66± 0.23
4	1.50± 0.07	0.82 ± 0.49	1.10± 0.27	0.94± 0.40	0.75± 0.38	0.52± 0.15	1.20± 0.29	0.38± 0.11	0.98± 0.13	0.52± 0.13	0.58± 0.19	0.42± 0.33	0.58± 0.04	0.35± 0.05	0.90± 0.12	0.54± 0.15

and speed of the cyclone can be well related to our observation<sup>38</sup>. In Indian waters, studies related to the occurrence of fishes after cyclone or post cyclonic effects on the fish communities are extremely limited among which an impressive work by Mukherjee *et al.*<sup>39</sup> sheds some light on the post cyclonic fish assemblages in the Matla river.

In the present study, we report the recurrence of *Matuta victor* species after a century which might be due to the effect of super cyclone Hudhud. Cyclonic storms have a major impact on biota and bring out significant changes in marine habitat. As a consequence, the destruction of original habitat is obvious that might have forced the marine organism to invade another habitat for food and shelter and may bechance the disappearance of native species, appearance alliance species or reappearance of native species which was previously disappeared. Previously from this region, Mohapatra *et al.*<sup>40</sup> reported Indo-Pacific porcupine puffer fish *Diodon holocanthus* after post super cyclone Phailin which hit the Gopalpur coast on 12 October 2013, and suspected that the loss of their original habitat due to super cyclone *Phailin* has forced the species to invade new territories. However, it is believed the degrading environment and human intervention (pre-cyclone) is responsible for the change in the assemblage. Harsh physical conditions created due to cyclonic events can also be a possibility as juveniles can drift long distances<sup>41</sup>. According to our observation, high waves and changes in current pattern forced this species to invade new areas. Second thing availability of abundant gastropods, bivalves in this area as reported earlier by Mohapatra *et al.*<sup>40</sup> in this area is conducive for *Matuta victor* to sustain their life smoothly. The feeding habits of moon crab is carnivorous and being a facultative scavenger, their diet is mainly composed of crustacean and mollusca with smaller individuals feeding on smaller soft-shelled species whereas larger individuals feeding on shelled sessile or slow moving species such as anomurans, bivalves, and gastropods<sup>42</sup>. As a predator of slow moving benthic invertebrates *Matuta victor* may influence the abundance and distribution of its prey also. However, its further impact on the ecology and behaviour in the new territory must be monitored regularly.

#### Acknowledgments

Authors thank the Head, Department of Marine Sciences, Berhampur University for the laboratory facilities provided and acknowledge the financial

support by RGNG U.G.C (Grant number: F.14-2(SC)/2009SA Nov 2010).

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