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FRESH-WATER CRAB OF NORTHEAST INDIA, ITS IMPORTANCE AND CONSERVATION

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Abstract

Freshwater crabs have a great role in nutrient cycle in freshwater ecosystem, these species has a significant use as food in rural peoples. Recently these species are considered as bio-indicator in environmental monitoring. Some species of freshwater crabrecently found as carrier of paragonimiasis a serious disease caused by the Lung-fluke from Manipur and Arunachal Pradesh. Freshwater crab constitutes only a small fraction of the brachyuran fauna of our country. True freshwater crabs are those which spend their entire lives in freshwater without return to the sea for whatever reason. There are some crabs which occasionally wander or even live in freshwater habitats, especially those occurring near the sea, but they are always common in estuarine areas and their larval development occurs in the open sea. True freshwater crabs belong to two superfamilies *viz*. Potamoidea and gecarcinucoidea. All the members of the Potamoidea and Gecarcinucoidea spend their entire lives in freshwater or surrounding wetland area.The NortheastIndia are more considered as one of the global biodiversity hotspot of India,This area harbour a total 44 species of Freshwater crab, Among the total 96 species of Freshwater crab occurs in Indian Territory. A list of 44 species of crabs has been prepared with State-wise distribution in this region. Their economic use, Threats and conservation measures of these crabs are also discussed in full paper.

Keywords:
Freshwater Crab,
Northeast India,
Biodiversity, Conservation.

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1. Introduction

Freshwater crabs have a great role in nutrient cycle in freshwater ecosystem, these species has a significant use as food in rural peoples. Recently these species are considered as bio-indicator in environmental monitoring. Some species of freshwater crabrecently found as carrier of paragonimiasis a serious disease caused by the Lung-fluke from Manipur and Arunachal Pradesh. Freshwater crab constitutes only a small fraction of the brachyuran fauna of our country. True freshwater crabs are those which spend their entire lives in freshwater without return to the sea for whatever reason. There are some crabs which occasionally wander or even live in freshwater habitats, especially those occurring near the sea, but they are always common in estuarine areas and their larval development occurs in the open sea. True freshwater crabs belong to two superfamilies *viz*. Potamoidea and gecarcinucoidea. All the members of the Potamoidea and Gecarcinucoidea spend their entire lives in freshwater or surrounding wetland area.

In recent years there has been a drastic change in the taxonomy of freshwater crabs. For example, Alcock (1910) dealt all freshwater species under a single family Potamonidae. But presently these are treated under two families namely, Gecarcinucidae and Potamidae. Many of the genera dealt therin are either splitted or merged and several new genera have been erected (Ng *et al*, 2007).

The Himalyas are known to be a geologically young and dyanamic mountain range system supporting a highly diverse Fauna and Flora, many of which are endemic. The Indian Himalayas extends over 2500 Km from Jammu & Kashmir in the West to Arunachal Pradesh in the East, covering an area of about 5,33,600 sq.km. North-eastern region is constituted by seven north-eastern states and is popularly known as '**seven sisters.**' The North-eastern India along with Himalayan region is a unique transitional zone amongst the Indian, the Indo-Malayan and the Indo-Chinese biogeographical zones as well as being the meeting point of the Himalayan region with the Peninsular India.Geographically, Esatern Himalayas are characterized by high rainfall, heavy snowfall and conditions more akin to temperate regions. Both, the climate condition as well as geographical variations are play a great role in the distribution of Fauna and Flora in Northeast india.

In the present communication, a check-list of 44 species of crabs has been prepared providing recent generic and species names of the group as far as possible. State-wise distribution along the Northeast India, of these crabs has been presented. The traditional practices, threats and conservation measures of these crabs are also discussed in this communication.

2. Review of Literature

From the perusal of literature, it appears that the first freshwater crab reported from freshwater habitat of India collected by Daldorff was *Cancer senex* (= *Oziotelphusasenex* (Fabricius, 1798). Herbst (1799) and Nobili (1903) recorded the species *Potamonleschenaudii* (Edwards) = *Oziotelphusasenex* (Fabricius, 1798) from Pondichery. Lucas (1850) recorded *Thelphusaindica* from the Coromandel Coast. H. Milne Edwards (1853) reported three species from "Inde" (=India) namely, *Thelphusaindica, T. perlata and T leschenaultia*. In 1869, Hilgendorf also recorded the species *Thelphusa leschenaultia* (Milne Edwards) from Pondichery. In addition, he also reported *Telphusaguerini* which was probably collected from India. Heller (1862) described the crab *Thelphusawüllerstorfi* (= *Spiralothelphusawüllerstorfi*) based on collections from Madras, Nicobar, Sri Lanka and Tahiti. In1865, he described another species, *Thelphusacorrugata* on the basis of collections from Madras and Java. Both the species are now merged with the species, *Spiralothelphusawüllerstorfi*. The crab, *Thelphusaleschenaudii* was also recorded by him from Nicobars and Madras. Wood-Mason (1871a, b; 1875) and Bürger (1894)

Alcock (1909a, b) described several species from India. In 1910, he published catalogue of the Indian decapod crustacean which is still considered invaluable publication in the study of freshwater crab of the Indian subcontinent. Henderson (1893, 1912 and 1913), Rathbun (1904, 1905), Bouvier (1918), Roux (1931), Bott (1964, 1969, 1970), Pretzman (1963, 1966a, b) have also studied the freshwater crabs of India and reported several new species.Dutta (1983), Ghatak and Ghosh (2008), Ghosh and Ghatak (1999, 2000), Ghosh*et al*. (1999), have studied the freshwater crabs of Assam, Meghalaya, Manipur and Tripura. Yeo and Ng (2007) have made significant contributions on the taxonomy of freshwater crabs belongs to family Potamidae.

3. Result of Discussions

Among the total 96 species of Freshwater crab occurs in Indian territory there are only 11 species are recorded from Western Himalayas and 44 species are recorded from eastern Himalayas in Indian part. This available data suggests that the eastern Himalayas are much more diverse than western Himalayas, total 14 genera are recorded from Esatern Himalayas and 6 genera are reported from Western Himalayas. The following is the check-list of species with detailed synonymy which have been arranged as a table 1 and state wise distribution of each species are given here (Fig. 1). The check-list is prepared based on recent classification of Ng *et al*. (2008).

TABLE 1. State wise Distribution of All Freshwater crab species in the states of North east India

Sr. No. & Name of Species	Mizoram	Assam	Arunachal Pradesh	Manipur	Nagaland	Meghalaya	Sikkim	Tripura	WB: Darjeeling
Family: Gecarcinucidae									
1. *Barytelphusacunicularis*(Westwood, 1836) *	-	-	-	-	-	-	-	-	+
2. *Globitelphusabakeri*(Alcock, 1909)	-	+	-	-	-	-	-	-	-
3. *Globitelphusacylindra*(Alcock, 1909)	-	+	-	-	+	-	-	-	-
4. *Globitelphusapistorica*(Alcock, 1909)	-	+	-	-	-	-	-	-	-
5. *Liotelphusagagei*(Alcock, 1909)	-	-	–	–	–	–	+	-	+
6. *Liotelphusalaevis*(Wood-Mason, 1871)	+	+	-	-	+	+		-	+
6. *Liotelphusaquadrata*(Alcock, 1909)	-	+	-	-	+	+	-	-	-
7. *Phricotelphusaelegans*(De Man, 1898)	+	-	-	-	-	-	-	-	-
9. *Maydelliathelphusaedentula*(Alcock, 1909)	+	+	-	-	+	-	-	-	-
10. *Maydelliathelphusafalcidigitis*(Alcock, 1910)	+	+	-	-	+	+	-	-	-
11. *Maydelliathelphusaharpax*(Alcock, 1909)	+	+	-	-	+	+	-	-	-
12. *Maydelliathelphusalugubris*(Wood-Mason, 1871)	+	+	+	+	+	+	+	-	+
13. *Maydelliathelphusamasoniana*(Henderson, 1893) *	-	+	-	-	-	+	+	-	-
14. *Travancoriananapaea*(Alcock, 1909)	-	+	-	-	-	-	-		-
15. *Sartorianaspinigera*(Wood-Mason, 1871)	+	+	+	-	+	+	+	+	+
16. *Sartorianatrilobata*(Alcock, 1909)	-	+	-	-	-	-	-	-	-
17. *Sommanniathelphusa Sinensis* (H.M.Edwards, 1853)	-	+	-	-	-	-	-	-	-
Family: Potamidae									
18.	+	+	-	-	-	-	-	-	-

Acanthopotamonfungosum(Alcock, 1909)									
19. *Acanthopotamonmartensi* (Wood-Mason, 1875)	-	+	-	-	-	+	-	-	-
20.*Acanthopotamon horai*sp. nov.	+	-	-	-	-	-	-	-	-
21. *Alcomonlophocarpus*(Kemp, 1913)	-	-	+	-	-	-	-	-	-
22. *Alcomonsuperciliosum*(Kemp, 1913)	+	-	+	-	-	-	-	-	-
23. *Himalayapotamonatkinsonianum*(Wood-Mason, 1871)	-	-	-	-	-	-	+	-	+
24. *Himalayapotamonbifariu m*(Alcock, 1909)	-	-	-	-	-	-	+?	-	-
25. *Himalayapotamonkooloo ense*(Rathbun, 1904)	-	-	-	-	-	+	+	-	+
26. *Himalayapotamonmontic ola*(Alcock, 1910)	-	-	-	-	-	+	-	-	+
27.*Lobothelphusa woodmasoni*(Rathbun, 1905)	+	+	-	-	-	+	-	+	-
28. *Aspermonfeae*(de Man, 1898)	+	+	+	-	-	-	-	-	-
29. *Eosamontumidum*(Wood-Mason, 1871)	_	-	--	-	-	-	-	-	+
30. *Indochinamonasperatum*(Alcock, 1909)	_	+	_	_	_	_	_	_	_
31. *Indochinamonbeieri*(Pretz mann, 1966)	+	+	-	-	+	-	-	-	-
32. *Indochinamonedwardsi*(Wood-Mason, 1871)	_	+	_	_	+	+	_	_	_
33.*Indochinamonandersonianum*(Wood-Mason, 1871)	_	_	_	+	_	_	_	_	_
34. *Indochinamonmanipurense*(Alcock, 1909)	_	_	_	+	_	_	_	_	_
35. *Indochinamondampaense* sp. nov.	+	-	_	_	_	_	_	_	_
36. *Potamiscusannandali*(Alcock, 1909)	+	_	-	-	-	-	-	-	-
37. *Potamiscusdecourcyi*(Kemp, 1913)	+	-	+	-	-	+	-	-	-

38. *Potamiscuspealianus*(Wood-Mason, 1871)	+	+	-	-	-	-	-	-	-
39 *Potamiscustumidulus*(Alcock, 1909)	-	-	-	-	-	-	+	-	-
40. *Quadromonaborense*(Kemp, 1913)	-	-	+	-	-	-	-	-	-
41. *Teretamonadiatretum*(Alcock, 1909)	-	-	+	-	-	-	-	-	-
42. *Teretamonindicum* sp. nov.	+	-	-	-	-	-	-	-	-
43. *Tiwaripotamonaustenianum*(Wood Mason 1871)	-	-	-	-	-	+	-	-	-
44. *Trichopotamonsikkimense* (Rathbun, 1905)	-	-	+	-	-	-	+	-	+

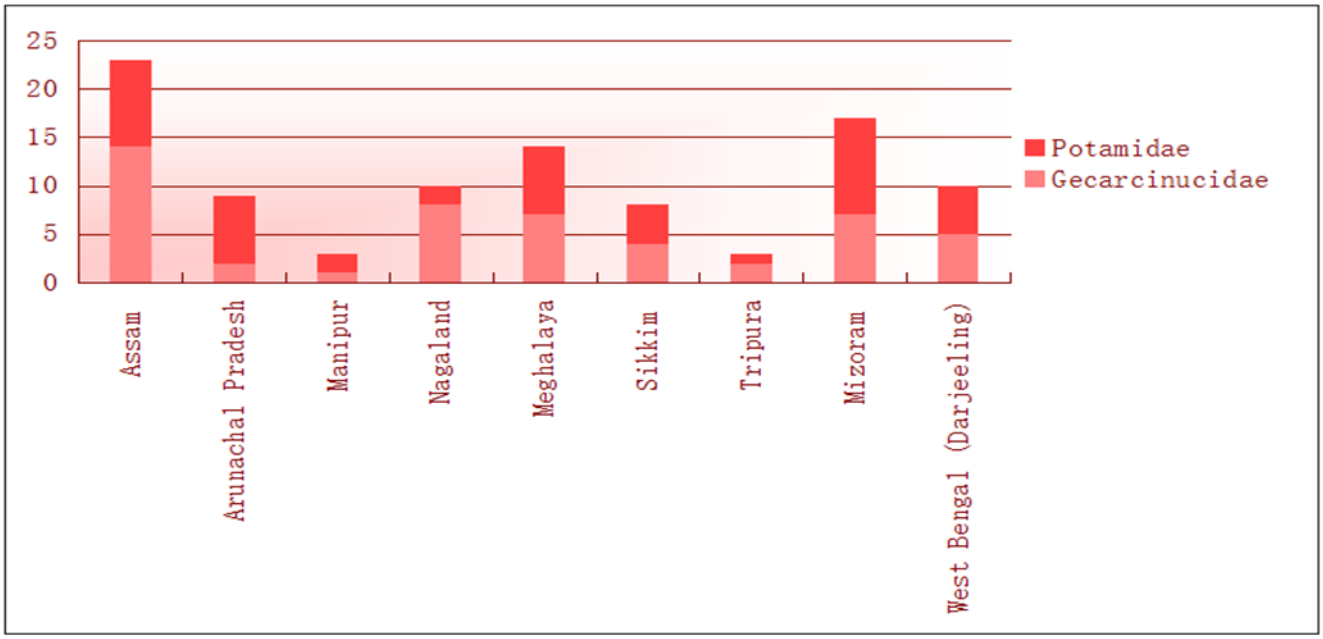

Fig. 1.Distribution of freshwater crabs in the state of eastern and Northeastern Himalaya of India.

4. Freshwater Crab as food and Ethno-Medicine in Northeast India

Freshwater crabs are found in all the types of freshwater ecosystem, but in Northeast india, 4 species of Hill stream crabs (***Maydelliathelphuslugubris***, ***Maydelliathelphusafalcidigitis***, ***Indochinamonbeieri***, ***Potamiscusdecourcyi***) are considered as most preferable and highly priced crab; ***Sarorinaspinigera***is

considers as relatively low coast food materials in pond, rivers and paddy fields in almost most of the states, also observed that mainly **seven** species i.e. ***Maydelliathelphuslugubris***, ***Maydelliathelphusharpax,Maydelliathelphusafalcidigitis***, ***Lobotelphusa wood-masoni***, ***Indochinamonbeieri***, ***Potamiscusdecourcy*** and ***Sarorinaspinigera***were considered as delicious as well as low coast nutritious source of protein for the local people. In Mizoram they are also considered important in the biological control of pest. Perhaps the most widely used of all the traditional pest management practices is the use of decomposing crabs in the control of rice bugs (as the filling of paddy grain starts, locally available crabs are smashed and put on pointed bamboo sticks in terraced paddy fields). This method is environmentally friendly, as some farmers replace the crab baits as soon they dry up. The crab bait traps can be used in connection with other traditional methods of managing the pest.

It is also observed the use of ***Maydelliathelphusalugubris*** as a medicine in cough and cold as well as in liver problems, the crabs are simple boiled and its flesh are eat immediately with some salt.

5. Threats to Freshwater Crab

Like other parts of the world, freshwater crabs are also subjected to tremendous pressure of threats. Major threats to freshwater crabs of Mizoram are due to habitat destruction. Loss of natural forests to land development and agriculture has impacted almost every habitat in which freshwater crabs live. Rapid urbanization, industrialization, poor sloping-land management and unwise land-use change in the high lands continues to be a serious problem resulting to habitat loss and wiping out the freshwater crabs. Only a handful of freshwater crab species have wide distribution and able to tolerate of land-use change.

6. Proposed Conservation Measures

Though there is almost 70 species of freshwater crab out of 90 species of true freshwater crab available in India were not common, till there is no any status report of the most of the freshwater crab, and this is why there is no any species of freshwater crab is included in any of the" schedule" in Indian Wildlife Protection Act, 1972. Though IUCN has recently included 1280 species of freshwater crabs of the World in the Red List of Threatened Species, of which, 227 has been considered as near threatened, vulnerable, endangered or critically endangered. Further, for another 628 species adequate data is not available to assess their status. According to the estimation of IUCN, nearly, two-thirds of freshwater crabs are going to be extinct, with one in every six species particularly vulnerable. So far, from Indian Part of Himalaya, all the 45 species has been enlisted in the IUCN Red data list. Among these, only 13 species enlisted as Least Concern. Where as a single species *Liotelphusaquadrata* (Alcock, 1909) are categorized as Vulnerable. Three species namely *Liotelphusagagei*(Alcock, 1909); *Liotelphusalaevis*(Wood-Mason, 1871) and *Maydelliathelphusaedentula*(Alcock, 1909) are considered as Near Threatened. Surprisingly 26 species are until enlisted as Data Deficient categories as there is no collection data or any further report of those species since a long period. However, most of the freshwater crabs need to be brought under Rapid Assessment Survey to ascertain their status in India.

Bio Culture of *Maydelliathelphusalugubris*may have to initiate to met the highly demand of this crab as a delicious food items among the local people.

As we observed that some rare crab are also came in market frequently with the common crab *Maydelliathelphusalugubris*and by this way the the existed population of the rare crabs are in declining rapidly.

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