

ON THE *LIAGORE ERYTHEMATICA* GUINOT, 1971 (BRACHYURA: XANTHIDAE) - A NEW RECORD OF CRAB FROM THE ARABIAN SEA

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ABSTRACT

Liagore erythemata Guinot, 1971, a xanthid crab, is reported for the first time from offshore waters of Pakistan (Northern Arabian Sea). It was caught by a shrimp trawler operating a depth of 76 m off Ormara, Balochistan. This species was previously known from Bay of Bengal, Andaman Sea and Persian Gulf but not known from Arabian Sea. The specimen was photographed and safely released at the site of collection.

Key-words: *Liagore erythemata* Guinot 1971, *L. rubromaculata*, Arabian Sea, Pakistan coast, Xanthidae

INTRODUCTION

Crabs of family Xanthidae from Pakistan were studied by Ahmed *et al.* (1972), Alcock (1898), Alcock and Anderson (1894), Ghani and Tirmizi (1992), Hashmi (1963, 1964), Henderson (1893), Karim (1973), Kazmi and Moazzam (2012), Kazmi *et al.* (2022), Khan (1977), Mendoza *et al.* (2012), Tirmizi and Ghani (1988, 1992, 1996) and Tirmizi and Kazmi (1983). So far 29 species belonging to this family are known from coastal and offshore waters of Pakistan (Kazmi *et al.*, 2022). During a recent commercial trawl operation of a depth of 76 m off Ormara along the coast of Pakistan, a live and colourful specimen of crab *Liagore erythemata* was collected. Present paper reports this species for the first time from the Arabian Sea.

MATERIAL AND METHODS

The specimen was trawled from offshore waters of Ormara, Balochistan (25°3'18.39N; 64°18'39.55 E) (Fig.1) using high opening bottom trawl net that has a cod end of mesh size 25 mm. Samples was photographed and since it was alive, therefore, safely released in the sea.



Fig. 1. Pakistan coast showing collection site of *Liagore erythemata*..

RESULTS AND DISCUSSION

This xanthid crab was found to be *Liagore erythemata* which is not previously reported from the Pakistan coast or from the Arabian Sea. It was identified by its distinct colouration and shape of carapace.

Taxonomic Enumeration

Genus *Liagore* De Haan, 1833
Liagore erythematica Guinot, 1971
 (Fig. 2 and 3)

Guinot (1971) described *Liagore erythematica* on the basis of a single dried specimen collected by S. S. 'Lady Fraser' at Sandheads, Kolkata, Bay of Bengal and was recorded as *Liagore rubromaculata* by Kemp (1923). It was distinguishable from *L. rubromaculata* mainly in the anterolateral margin having lobes (versus completely smooth and unarmed) and distinct coloration. This species is now reported from Bay of Bengal, Andaman Sea, Thailand, Malaysia and Persian Gulf (Naderloo, 2017; Roy 2017; Roy and Nandi, 2008). A specimen of this species was collected from offshore waters of Balochistan on 23 April, 2022 which is first report of this species from coast of Pakistan (Arabian Sea).



Fig. 2. *Liagore erythematica* Guinot, 1971; (a) dorsal view; (b) ventral view.

Diagnosis

Carapace: Egg-shaped and smooth. Regions of carapace not demarcated except cardiac region which is laterally delimited, smooth, very finely punctate, and convex from front to back (Fig. 2a). Relatively long antero-lateral border, provided with four denticles, the first two weak, the two hind legs more marked. Postero-lateral edges short, straight and convergent. Forehead bilobed, with the latero-external angles pointed.

Chelipeds: smooth, with elongated hand and fingers; long, pointed fingers armed with strong but blunt teeth (Fig. 3). The outer distal angle of the carpus of the cheliped has a distinct tooth projecting outwards (Ng and Chen, 2004).

Ambulatory legs: long, slender and unarmed.

Abdomen (male): sixth segment of the abdomen is relatively narrow and rectangular (Fig. 2b).

Colour: Red spots spread on carapace standing out against a light background, arranged on the carapace and legs; present on the gastric region, of an odd spot anterior and two pairs of posterior spots. Half of the 1st to 3rd abdominal segments also red colour.



Fig. 3. *Liagore erythematica* Guinot, 1971 frontal view showing chelipeds.

Remarks:

Liagore erythematica resembles its congener *L. rubromaculata* mainly in coloration. Both species have red spots standing out against a light background and distributed over the carapace and the legs. However, in *L. rubromaculata* the antero-lateral edge is entire and rounded whereas it is wavy and marked with four denticles in *L. erythematica*. In addition, the claws and ambulatory legs are more slender in *L. erythematica*. The spots of the central region of the dorsal face of the shell in *L. rubromaculata* have a spot odd on the gastric region, placed laterally below, two spots, then a large spot on cardiac odd. Whereas in *L. erythematica*, the odd gastric patch is flanked posterior first of two pairs of gastric spots then, lower down, of a heart spot odd.

Geographical Distribution:

This species is known from Northern Indian Ocean including Persian Gulf and Bay of Bengal. Type locality is Between Sri Lanka and Kolkata (20° 51'N, 87° 58'E), Bay of Bengal (Guinot, 1971, Roy, 2010). It was reported from India (Trivedi, *et al.*, 2018) including from Tamil Nadu (Sethuramalingam and Khan 1991; Selvakumar and Khan 1993; Jeyabaskaran *et al.* 2000; Roy and Nandi 2007a; Krishnamoorthy 2009; Kathirvel and Gokul 2010; Lakshmi Pillai *et al.*, 2013); Andhra Pradesh (Roy and Nandi 2007b); Orissa (Roy and Rath 2017) and West Bengal (Chopra, 1935; Kemp 1923; Deb 1995, 1999). Chopra (1935), Kemp (1923) reported it as *L. rubromaculata*. It was also reported from Andaman Sea and Thailand (Ng and Chen, 2004).

It was reported from Iran (Persian Gulf) by Naderloo (2017) and Naderloo and Sari (2007), from Khuzestan Province (Persian Gulf) by Ebadi, *et al.* (2017) and from Gulf of Oman (Deylami, *et al.*, 2012). It was also reported from Iran by Stephensen (1945) as *L. rubromaculatus*. It was also reported from Dubai (UAE) by Titgen (1982).

Its congeners *L. rubromaculata* (De Haan, 1835) is reported from the western Pacific including Japan (Miyake, 1983; Sakai, 1939, 1965, 1976), Taiwan (Lin, 1949), China (Dai and Yang, 1991; Guinot, 1971; Parisi, 1916; Shen, 1940), Hong Kong (Alcock, 1898; Gordon, 1931), Vietnam (Guinot, 1971), Philippines (Serène and Vadon, 1981) and Australia (Campbell and Stephenson, 1970; Rathbun, 1923).

Liagore pulchella, the third known species of the genus, is described from Vanuatu (Ng and Naruse, 2007). This species is easily recognizable from the two congeners by the complete absence of red spots on the dorsal surfaces of the carapace and the pereopods.

According to Naderloo (2017), this species is found subtidally between a depths of 28–33 m in muddy substrate. During the present study, however, specimen of *Liagore erythematica* was collected from a depth of 76 m where bottom was muddy in nature.

CONCLUSION

Liagore erythematica is an addition to the brachyuran fauna of Pakistan and among the few species known to occur subtidal areas in the offshore waters of Pakistan. Its egg shaped carapace and striking colour pattern make it distinguishable from other members of family Xanthidae.

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REFERENCE

- Ahmed, M. F., S. M. Syed, S. I. Karim, M. S. Niazi, T. Jawaid and M. Masihuzzaman (1972). Arthropoda (Marine Fauna Supplement). *Records of Zoological Survey of Pakistan*, 4: 1-68.
- Alcock, A. (1898) Materials for a carcinological fauna of India. No. 3. The Brachyura Cyclometopa. Part I. The family Xanthidae. *Journal of the Asiatic Society of Bengal*, 67: 67–233.
- Alcock, A. and A.R.S. Anderson (1894) No. 17. List of the Shore and Shallow-water Brachyura collected during the season 1893–1894. In: Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander C. F. Oldham, R.N., commanding. Series II, *Journal of the Asiatic Society of Bengal*, 63: 197–209.
- Campbell, B. M. and W. Stephenson (1970). The sublittoral Brachyura (Crustacea: Decapoda) of Moreton Bay. *Memoirs of the Queensland Museum*, 15: 235-302.
- Chopra, B. N. (1935). Further notes on Crustacea Decapoda in the Indian Muséum. VIII. On the decapod Crustacea collected by the Bengal Pilot Service of the mouth of the River Hooghly. Brachygnatha (Oryrhyncha and Brachyrhyncha). *Records of Indian Museum* 37: 463-514.
- Dai, A. and S. Yang (1991). *Crabs of the China Seas*. China Ocean Press, Beijing

- Deb, M. (1995) Crustacea: Brachyura. In: *Fauna of Chilka Lake*. Wetland Ecosystem Series. Vol. 1. Zoological Survey of India, Kolkata, (Director ZSI, Kolkata ed.). Pp. 345–366.
- Deb, M. (1999) Crustacea: Decapoda: Crabs. In: *Fauna of West Bengal. State Fauna Series*. Vol. 10. Part 3. Zoological Survey of India, Kolkata, (Director ZSI, Kolkata ed.). Pp. 345–403.
- Deylami, E. E., A. Savari, T. Valinassab and N. Sakhaei (2012). Study on catch composition of sub tidal true crabs on the Gulf of Oman, by focusing on commercial species. *Journal of Marine Biology, Islamic Azad University*, 3:1-13.
- Ebadi, Z., B. Doustshenas, N. Sakhaei and K. Ghanemi (2017). Study of distribution and morphology of Leucosiidae and Xanthidae crabs in the subtidal waters of the Khuzestan Province (Persian Gulf). *Journal of Oceanography*, 8: 19-28.
- Ghani, N. And N. M. Tirmizi (1992). Occurrence of four Xanthid (Brachyura) crabs in Karachi waters (northern Arabian Sea). *Pakistan Journal of Marine Sciences*, 1: 37-47.
- Gordon, I. (1931). Brachyura from the coasts of China. *Journal of Linnean Society (Zoology)*, 37: 525-558.
- Guinot, D. (1971). Sur l'existence d'une deuxième espèce de Liagore de Haan, *Liagore erythematica* sp. nov. (Crustacea Decapoda Brachyura). *Bulletin du Muséum National d'Histoire Naturelle, Paris*, Series 2. 42: 1091-1098.
- Haan, W. De, (1833). Crustacea. In: *Fauna Japonica, sive Descriptio animalium, quae in itinere par Japoniam, jussu et auspiciis superiorum, qui summuin in India Batava imperium tenent, suscepto, annis 1823-1830 collegit, notis, observationibus e dumbrationibus illustravit. Lugduni Batavorum, fasc. 1-243*.
- Hashmi, S. S. (1963). Carcinological fauna of Karachi, *Agriculture Pakistan*, 14: 237-243.
- Hashmi, S.S. (1964). Some additions to the check list of crabs of Karachi notes on habit and habitat of *Podophthalmus vigil* (Fabricius) and *Macrophthalmus* sp. *Agriculture Pakistan*, 15: 451-454.
- Henderson, J. R. (1893) A contribution to Indian carcinology. *Transactions of the Linnean Society of London, Series 2, Zoology* 5: 325–458.
- Jeyabaskaran, R., A. S. Khan and V. Ramaiyan (2000) *Biodiversity project on Gulf of Mannar biosphere reserve. Parangipettai, India*. Centre of Advanced Study in Marine Biology, Annamalai University, Chidambaram, India.
- Karim, S. I. (1973). An addition to the crab fauna of Pakistan. *Records of Zoological Survey of Pakistan*, 5: 33-39.
- Kazmi, Q. B. and M. Moazzam (2012). Four new records of brachyurans from Pakistan. *Pakistan Journal of Zoology*, 44:1499-1505.
- Kazmi, Q. B., R. Naushaba, M. Moazzam and M. A. Kazmi (2022). *Pakistani Marine Faunal Biodiversity Inventory and Taxonomic Resources*. Special Publication Zoological Society of Pakistan (In press).
- Khan, M. A. (1977). Xanthidae (Crustacea, Decapoda, Brachyura) from Karachi coast. *Biologia*, 23: 179-187.
- Kemp, S. W. (1923). Notes on Crustacea Decapoda in the Indian Muséum. XVI. On two interesting crabs from the mouth of the River Hughli. *Records of Indian Museum*, 25: 405-409.
- Kathirvel, M. and A. Gokul (2010). Checklist of brachyuran crabs from the Gulf of Mannar marine biosphere reserve. *Technical Bulletin. The Fisheries Technocrats Forum, Chennai*, 4; 1–45.
- Krishnamoorthy, P. (2009) Brachyuran crabs from the collections of Marine Biological Centre. *Records of Zoological Survey of India, Occasional Paper* 304: 1–46.
- Lakshmi Pillai, S., J. K. Kizhakudanand and P. Thirumilu (2013) Potential ornamental marine brachyuran crabs available off Chennai. *Fishing CHIMES*, 33: 70–73.
- Lin, C. C. (1949). A catalogue of Brachyurous Crustacea of Taiwan. *Quarterly Journal of the Taiwan Museum*, 2: 10-33.
- Miyake, S. (1983). *Japanese Crustacean Decapods and Stomatopods in color. Vol. II. Brachyura (Crabs)*. Hoikusha, Osaka.
- Mendoza, J.C., Q. B. Kazmi and M. Moazzam (2012). First report of two rare xanthid crabs (Crustacea: Decapoda: Brachyura: Xanthidae) from Pakistan. *Marine Biodiversity Records Marine Biological Association of the United Kingdom* 5: e51; 201.
- Naderloo, R., (2017). *Atlas of Crabs of the Persian Gulf*. Springer, Cham, Switzerland.
- Naderloo, R., and A. Sari (2007) Subtidal crabs of the Iranian coast of the Persian Gulf: new collections and biogeographic considerations. *Aquatic Ecosystem Health Management*, 10: 341–349.
- Ng, P. K. L. and H.-I. Chen (2004). On a new genus and new species of xanthid crab (Crustacea, Decapoda, Brachyura, Xanthinae) from the South China Sea, with notes on the genus *Liagore* De Haan, *Journal of Natural History*, 38: 2345-2360.
- Ng, P. K. L., D. Guinot and P. J. F. Davie (2008) Systema Brachyurorum, part I. An annotated checklist of extant brachyuran crabs of the world. *Raffles Bulletin of Zoology Supplement*, 17:1–286.

- Ng, P. K. L. and P. J. F. Davie. (2002). A checklist of the brachyuran crabs of Phuket and Western Thailand. *Phuket Marine Biological Center Special Publication*, 23: 369–384.
- Ng, P. K. L. and T. Naruse (2007). *Liagore pulchella*, a new species of xanthid crab (Crustacea: Decapoda: Brachyura) from Vanuatu. *Zootaxa*, 1665: 53-60.
- Parisi, B. (1916). I Decapodi Giapponesi del Museo di Milano. IV. Cyclometopa. *Atti Societas Italiano Sciences naturelle*, 55: 153-190.
- Rathbun, M. J. (1923). Report on the Crabs obtained by the F.I.S. *Endeavour* on the coasts of Queensland, New South Wales, Victoria, South Australia, and Tasmania. 3. Biological Results of the Fishing Experiments carried on by the F. I. S. Endeavour 1909-14. *Australian Department of Trade and Customs, Fisheries, Sydney*, 5: 95-156.
- Roy, M. K. D. (2010). Diversity and distribution of Crustacea fauna in wetlands of West Bengal. *Journal of Environment and Sociobiology*, 7: 147-187.
- Roy, M. K. D. (2017). Diversity and distribution of marine crabs of east coast of India. *Journal of Environment and Sociobiology*, 14: 201-240.
- Roy, M. K. D. and N. C. Nandi (2007a) Brachyuran diversity in coastal ecosystems of Tamil Nadu. *Journal of Environment and Sociobiology*, 4: 169–192.
- Roy, M. K. D. and N. C. Nandi (2007b). Brachyuran bioresources of coastal Andhra Pradesh. In: *National symposium on Conservation and Validation of Marine Biodiversity*. Zoological Survey of India, Kolkata (Director ZSI, Kolkata ed.). Pp. 53– 66.
- Roy, M. K. D. and N. C. Nandi (2008). Checklist and distribution of brachyuran crabs of West Bengal, India. *Journal of Environment and Sociobiology*, 5: 191-214.
- Roy, M. K. D. and S. Rath. (2017). an inventory of crustacean fauna from Odisha coast, India. *Journal of Environment and Sociobiology*, 14: 49-112,
- Sakai, T. (1939). *Studies on the crabs of Japan. IV. Brachygnatha, Brachyrhyncha*. Yokendo Co., Tokyo.
- Sakai, T. (1965). *The Crabs of Sagami Bay, collected by His Majesty the Emperor of Japan*. Maruzen Co., Tokyo.
- Sakai, T. (1976). *Crabs of Japan and the Adjacent Seas*. 3 volumes Kodansha Ltd, Tokyo.
- Serène, R. and C. Vadon (1981). Crustacés Décapodes: Brachyours. Liste préliminaire, description de formes nouvelles et remarques taxonomiques. In: Résultats des Campagnes MUSORSTOM, 1. Philippines (18-28 mars 1976), vol. 1, no. 5. *Mémoires ORSTOM*, 91: 117-140.
- Selvakumar, S. and Khan, A.S. (1993) Grapsid and Xanthid crabs of Parangipettai coast. *Records of Zoological Survey of India*, 93 (3–4), 329–354.
- Sethuramalingam, S. and Khan, A.S. (1991) *Brachyuran crabs of Parangipettai Coast*. Centre of Advance Study in Marine Biology, Annamalai University, Tamil Nadu, 93 pp.
- Shen, C. J. (1940). On the collection of Crabs of South China. *Bulletin of the Fan Memorial Institute of Biology (Zool.)*, Peiping 10: 69-104.
- Stephensen, K. (1945). The Brachyura of the Iranian Gulf. With an appendix: The Male pleopoda of the Brachyura. In: *Danish scientific Investigations in Iran*, Copenhagen, E. Munksgaard 4: 57-237.
- Titgen, R. H. (1982). *The systematics and ecology of the decapods of Dubai, and their zoogeographic relationships to the Arabian Gulf and the Western Indian Ocean*. D Phil thesis, Texas A&M University (quoted in Naderloo, 2007).
- Tirmizi, N. M. and N. Ghani (1988). Occurrence of two interesting brachyrhynchan crabs in Karachi waters. In: *Proceedings of the International Conference on Marine Sciences of the Arabian Sea* (M. –F. Thompson and N. M. Tirmizi Eds.). American Institute of Biological Science, Washington, DC, USA. Pp. 137-142.
- Tirmizi, N.M. and N. Ghani (1992). A new distributional record of *Zozymodes cavipes* (Dana, 1852) (Crustacea: Decapoda) from the coastal waters of Pakistan. *Pakistan Journal of Marine Sciences*, 1: 135-138.
- Tirmizi, N.M. and N. Ghani (1996). *Marine Fauna of Pakistan: 5. (Crustacea: Brachyura, Brachyrhyncha Part 1. (Xanthidae, Goneplacidae, Pinnotheridae, Ocypodidae, Grapsidae)*. Centre for Excellence in Marine Biology, University of Karachi, Karachi.
- Tirmizi, N. M. And Q. B. Kazmi (1983). Carcinological studies in Pakistan, with remarks on species to the Red Sea and the Mediterranean. In: *Marine Sciences in the Red Sea*. *Bulletin of Institute of Oceanography and Fisheries*, 9: 347–380.
- Trivedi, J. N., D. J. Trivedi, K. D. Vachhrajani and P. K. L. Ng (2018). An annotated checklist of the marine brachyuran crabs (Crustacea: Decapoda: Brachyura) of India. *Zootaxa*, 4502: 1-83.

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