

## An over clawed (with two enlarge Chela) male crab of *Uca urvillei* (Ocypodidae: Tubuca: Uca) along the coast of Karachi, Pakistan

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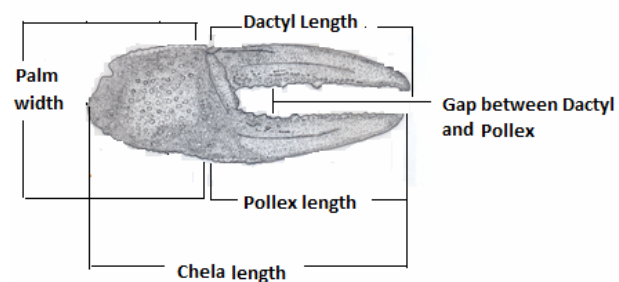
**Abstract.** The male of narrow front species *Uca urvillei* (Milne- Edwards, 1852) has been recorded as super male (with two large cheliped) first time from the natural habitat of Sandspit, Karachi, Pakistan. Specimen posses two enlarged chelipeds rather than only cheliped along with other small one. Before this no any such super male has been found so far in natural habitat.

**Key words:** Fiddler Crab, Ocypodidae, narrow front, *U. urvillei*, over-clawed male.

Fiddler crabs of genus *Uca* can prominently recognized for their exceptional sexual dimorphism, such as equal sized Chela of female and right or left handed enlarged cheliped of males. It plays a very important role for habitual in fighting and for courtship signalling (Crane 1975, Takeda & Murai 1973, Croll & McClintock 2002). It is commonly determined that male handedness shows the evenly distribution (1:1 ratio) among the right and left clawed individuals (Croll & McClintock 2002). Besides this normal handedness, some unusual forms have also been reported so far from populations of *Uca* due to their variations in normal secondary sexual characters (Morgan 1920, 1923, 1924, Vernberg & Costlow 1966, Ahmed 1976, Yamaguchi 1977, Ahmed & Khan 1978). Morgan (1923) first time recognized some unusual characters during his study on regeneration of selectively removed the claw of unknown *Uca* species reared by him, followed by Vernberg and Costlow (1966) and Yamaguchi (1977) reported similar unusual forms of male with enlarged Chela in *U. rapax* (Smith, 1870) and *U. lactea* (de Haan 1835) groups. All the males with two enlarged Chela were reported during experimentation in an artificial environment, no such species was found in a natural habitat except in *Uca pugnax* (Levinton 2004). Morgan (1920) referred such type of specimen as "Supermale or Over-Clawed Male".

*Uca urvillei* (H. Milne Edwards 1852) is one of the most abundant narrow front species in the Pakistan mangrove forest (Saher, 2008, Saher and Qureshi. 2014). This species is commonly known as blue fiddler crab (Litulo, 2005), mostly found within the canopy of mangrove forest, partly shaded muddy areas at low tide level and at a few places on open mud flats associated or adjacent to the mangrove forest. Saher (2008) provided a detailed information on the ecology and population biology of the *U. urvillei* with reference to habitat and biotopes properties. Saher and Qureshi (2014) studied the some aspect of food and feeding ecology of the four species of fiddler crab includes *U. urvillei*.

An Over clawed (two enlarged chelipeds) adult male of genus *Uca urvillei* (Milne-Edwards 1852) was collected during the monthly random collection in April, 2014 for ongoing study on the genetic diversity of crabs from the mangrove area of Pakistan. The study area predominantly covers with a single species (*Avicennia marina*) of mangrove.. The crab specimen was taken to lab alive for identification, initially the specimen was fixed in 10% formalin and then preserved in 70% alcohol. After taking some metric measurements (Fig. 1) the specimen submitted as a record in Marine Reference Collection



**Figure 1.** The diagrammatic representation of some morphometric variables of Chela.

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**Habitat.** This species, mainly associated with the canopy of mangrove areas within pneumatophores along with sympatric distribution of *Uca iranica* and *Uca annulipes*.

**Visual and morphological characters.** The colour of the carapace was dark bluish brown with yellowish green eye stalks (Fig. 1) in fresh specimen. The both enlarged Chela structures seemed to be dark orange in color with white bands on the pointed edge of dactyls and Pollex. The merus and manus of both cheliped showed completely orange in colour (Fig. 2). The different morphometric measurements of crab were also noted. The total length and the dactyl length of both Chela were equal (Table 1). The minor difference was noted in Chela width. Palm thickness and the gap between the pollex and dactyl (Table 1).

The over clawed adult male rarely found in natural habitats. It is the first time in Pakistan that such type of over-clawed male (with two equal sized large cheliped) has been found along the coast of Karachi. Morgan (1920, 1923, 1924) has described four different types of cheliped arrangement that juvenile fiddler crab posses that are (1) two small equal sized chelipeds (2) two large equal sized chelipeds (3) one enlarged Chela and one small Chela and (4) one cheliped lost. As described by Morgan (1920, 1923, 1924), previous field studies (Pynn 1998) and other experimental studies carried out by the various authors (Charniaux-Cotton 1962, King 1964, Vernberg & Costlow 1966, Adiyodi & Adiyodi 1970, Ahmed 1976, Yamaguchi 1977, Ahmed & Khan 1978)



Figure 2(a-d): a & c, Dorsal view of over clawed male of *U. urvillei*; b, ventral view of *U. urvillei*; d, frontal view of *U. urvillei*.

Table 1. Some metric measurements (in mm) of over clawed male of *Uca urvillei*.

S. no.	Morphological characters	Measurements in mm
1	Carapace length	14
2	Carapace width	10
3	Right Chela length	12
	Left Chela length	12
4	Right Chela width	7.5
	Left Chela width	8.0
5	Right Palm thickness	4.0
	Left palm thickness	4.5
6	Right Pollex width	6.5
	Left Pollex width	7.0
7	Right dactylus length	6.0
	Left dactylus length	6.0
8	Gap b/w pollex and dactyl	
	Right Chela	2.5
	Left Chela	3.0
9	Abdominal length	8.0
10	Abdominal width	5.0
11	Pleopod length	6.0

expressed that each cheliped has an equal potential to grow and differentiate into a giant cheliped during the early growth period and androgen gland is responsible for the secondary sexual development conditions in crustaceans (Charniaux-Cotton 1962, King 1964, Adiyodi & Adiyodi 1970, Yamaguchi 1977). It may be possible that androgen may also control the development of enlarged cheliped in genus *Uca*. Gouchardi & Govind (1989) and Pynn (1998) stated that the regenerated Chela in *Carcinus maenas* always show some variation in size and the gaps between the pollex and dactyl and seem different from the original one. This over clawed adult male fiddler crab possessed two large equal sized chelipeds and there was no difference found between each of these cheliped along with colour and

dentition as observed to be same but the right Chela was apparently weaker than the left Chela. The slight difference in Chela width, palm thickness and gaps indicated that the right Chela (was likely small) break off in very early stage of growth and the regenerated Chela developed as an enlarged one due to some growth or hormonal disorder.

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#### References

- Adiyodi, K.G., Adiyodi, R.G. (1970): Endocrine control of reproduction in decapods Crustacean Biology 45: 121-165.
- Ahmed, M. (1976): A study of the normal and aberrant sexual types of the Venezuelan fiddler crabs *Ucacumulanta* and *U. rapax*. Bulletin of Marine Science 26(4): 499-505.
- Ahmed, M., Khan, R.A. (1978): Development of Asymmetry in the claws of the fiddler crab *Uca lactea*. Pakistan Journal of Zoology 10(1): 49-54.
- Charniaux-Cotton, H. (1962): Androgenic glands of crustaceans. General and Comparative Endocrinology 1: 241-247.
- Crane, J. (1975): Fiddler crabs of the world. Princeton University Press, Princeton: Pp. 424.
- Croll, G.A., Mc Clintock, J.B. (2002): An analysis of cheliped asymmetry in three species of fiddler crabs. Gulf of Mexico Science 2: 106-109.
- Gouchardi, J.A., Govind, C.K. (1989): Vascular supply to bilaterally asymmetric chelae in crustacean. Canadian Journal of Zoology 68: 1062-1064.
- Khan, D.S. (1964): Fine structure of the androgenic gland of the crab *Pachygrapsus crassipes*. General and Comparative Endocrinology 4: 533-544.
- Khan, M.Z., Ghalib, S.A., Hussain, B. (2010): status and new nesting sites of sea turtles in Pakistan. Chelonian conservation and Biology 9(1): 119-123.
- Levinton, J. (2004): Mud fiddler crab, *Ucapugnax*. <<http://life.bio.sunysb.edu/marinebio/westmeadow/fiddler.html>>
- Litulo, C. (2005): Population structure and reproductive biology of the fiddler crab *Uca urvillei* (Brachyura: Ocypoidae) in Maputo Bay (southern Mozambique). Journal of Natural History, London 39(25): 2307-2318.
- Pynn, H.J. (1998): Chela dimorphism and handedness in the shore crab *Carcinus maenas*. Field Studies 9: 343-353.

- Saher N.U. (2008): Population dynamics and Biology of fiddler crab in the mangrove area of Karachi Coast. PhD Thesis, Department of Zoology, University of Karachi, Pakistan.
- Saher N.U., Qureshi N.A. (2010): Burrow morphology of three species of fiddler crab (*Uca*) along the coast of Pakistan. Belgium Journal of Zoology 142(2): 112-124.
- Saher N.U., Qureshi N.A. (2014): Food and feeding ecology of fiddler crabs Species found along the coast of Pakistan. Romanian Journal of Biology, Zoology 59(1): 35-46.
- Takeda, S., Murai, M. (1993): Asymmetry in male fiddler crabs is related to the basic pattern of claw-waving display. Reference Biological Bulletin 184: 203-208.
- Vernberg, F.J., Costlow Jr. J.D. (1966): Handedness in the fiddler crab (genus *Uca*). Crustaceana 11: 61-64.
- Yamaguchi, T. (1977): Studies on the handedness of the fiddler crab, *Uca lactea*. Reference Biological Bulletin 152: 424-436.
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