



## Parental care in freshwater crabs *Maydelliathelphusa masoniana* and *Himalayapotamon emphysetum* inhabiting streams of Jammu region, J&K, India.

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### ABSTRACT

Parental care is a most important strategy in freshwater crabs so as to ensure the survival of the offspring. In the present studies parental care in the freshwater crabs *Maydelliathelphusa masoniana* and *Himalayapotamon emphysetum* has been recorded. Females of species *M. masoniana* were caught in the Gho-manhasan while *H. emphysetum* at Jajjar stream, having eggs underneath their abdomen. They were kept in the laboratory and hatching time of eggs recorded to be 36 and 44 days in *M. masoniana* and *H. emphysetum* respectively in the laboratory. The females of both the species retained the crablets underneath their abdomen for 12 days, after which crablets left the mother. In *M. masoniana*, the number of crablets recorded were 108 as compared to 88 in case of *H. emphysetum*. Mean size of crablets in both the cases was found to be  $3.2 \pm 0.10$  mm. Parental care was observed to be confined to females only as males did not play any role for the protection of brood.

**KEYWORDS :** Parental care, brood, crablets.

### Introduction:

Parental care is a common reproductive strategy which may be shown by one partner (uniparental) or by both the sexes<sup>[1]</sup>. In decapod crustaceans, however, parental care is usually confined to females that carry the eggs in the brood compartment till larvae or crablets are released into surrounding<sup>[2], [3]</sup>. Parental care includes preparation of nests and burrows, production of heavily yoked eggs, care of the eggs, provisioning of the young ones and care of the offspring after they reach nutritional independence<sup>[4]</sup>. In freshwater conditions there are strong selective pressures toward reduction in egg number and which thereby necessitate increased brood care until the eggs hatch out into crablets, resulting in a marked reduction in dispersal and gene flow, leading to the high degree of endemism and speciation seen in these crustaceans [5]. Much of the studies are confine to marine crabs regarding parental care, however very sparse of data is available regarding freshwater crabs. In freshwater crabs, 15 species have been reported to bear crablets attached to the female abdomen [6]. Presently two species of crabs viz., *Maydelliathelphusa masoniana* and *Himalayapotamon emphysetum* have been observed where the female counterpart carries eggs which hatch into crablets. Crablets are provided protection and are held within the brood of mother till they attain considerable size after which they are released, this observation is therefore, a clear indication of prevalence of parental care in these decapods crustaceans.

### Material and method

Freshwater crabs *Maydelliathelphusa masoniana* and *Himalayapotamon emphysetum* were collected from Gho-manhasan and Jajjar stream respectively by using cast net, drag net as well as by hands and brought to the laboratory. In laboratory females having eggs underneath their abdomen were segregated from other crabs so as to avoid cannibalism. Water was changed four times a day. Carapace as well as abdominal width of both the species were recorded by using vernier calliper scale (0.05mm).

### Results and discussion

In the present studies the females had a carapace width of 4.4 cm (*M. masoniana*) and 3.6 cm (*H. emphysetum*) with eggs attached to their abdomen (Fig. 1). The incubation period is reported to be at least 36 days and 44 days in *M. masoniana* and *H. emphysetum* respectively in the laboratory. As we did not observe the egg laying process, therefore, cannot accurately report the full period of eggs incubation by females. Since from their appearance and developmental status, eggs appear to be freshly released, therefore the embryo period can be slightly extended. Further the direct development is characteristics of both the species under investigation as the embryonic and larval periods are completed within the egg that hatched into miniature crablets rather than larvae. In freshwater crabs no larval stage is present instead larval stage is passed within the eggs<sup>[7]</sup>. In both the species of crabs, females protect the brood by using larger chela which was comparatively highly developed in case of *M. masoniana* while smaller chela in both species helps in feeding purpose<sup>[8]</sup>. The crablets were semi transparent in colour with their mean size  $3.2 \pm 0.10$  mm that remained adhered to the female's abdomen for 12 days (Fig. 2-3). During this period, these crablets occasionally leave the female's abdomen for several minutes. After 12 days, all the crablets left the female's abdomen and move over the cephalothorax of mother or nearby her (Fig.4-5), however, in the first three days of release the young crablets often return to the mother for shelter. It has also been recorded that the juvenile of crab *Sylviocarcinus pictus* return to female abdomen during first two weeks of release thereby supporting present observation<sup>[9]</sup>.

The crablets of *Sylviocarcinus pictus* hatched out from eggs had the same morphology and similar size, and remained in contact with male's abdomen for 12 days which, however, recorded to be 17 days.<sup>[9]</sup> The variation in duration may be attributed to fact that crabs in both the cases belong to different species as well as geographical area where they face different type of climatic condition. Further it has been observed that females of *M. masoniana* while bearing eggs or crablets lives in deep burrows, protect the eggs by using larger chela while *H. emphysetum* remain hidden underneath large stones.

Preparation of a special nest for defending as well as to feed its young ones has also been reported in in crab *Metopaulias depressus* by [3, 10]. This observation however, could never be authenticated in the species under investigation.

Parental care in freshwater crabs has advantage over marine crabs by enhancing the survival and fitness of their offspring [11]. However, due to their low dispersal and high degree of endemism, these crabs suffer loss of population and subject to a greater risk of extinction than the indirectly developing taxa (i.e., having larval stage) under conditions of rapid habitat destruction, environmental pollution and global warming [9].

**Conclusion**

The present study records extended parental care in the crab *M. masoniana* and *H. emphysetum*, contributing to our existing knowledge regarding the breeding behaviour of freshwater crabs. Present studies regarding the parental care behaviour in local freshwater crab species is definitely of great significance in understanding the concept of minimising the energy diversion towards eggs production because the no. of eggs produced in the species like *M. masoniana* and *H. emphysetum* where parental care is there, no. of eggs laid per brood is significantly less as compared to their marine counterparts. Energy thus saved, is optimally utilized for protecting the eggs/crablets and thereby enhancing the survival of species which otherwise are always facing the threat of being eaten by predation or getting washed by water current.

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**Fig. 1. *M. masoniana* carrying eggs**



**Fig. 2. *H. emphysetum* holding crablets.**



**Fig. 3 *M. masoniana* carrying crablets**



**Fig. 4 Crablets moving cephalothorax of mother.**



**Fig. 5. Crablets moving independent to mother.**

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