



Complete larval development of the Brachyuran crab (*Epixanthus Frontalis* H. Milne Edwards, 1834) (Crustacea, Decapoda, Eriphioidea, Oziidae) under laboratory conditions

ALI M. AL-AIDAROOS¹, AHMED E. AL-HAJ & A.A.J. KUMAR

Department of Marine Biology, Faculty of Marine Sciences, King Abdulaziz University, P.O. Box 80207, Jeddah 21589, Saudi Arabia.

¹Corresponding author. E-mail: aaidaroos@kau.edu.sa

Abstract

The complete larval development of the oziid crab *Epixanthus frontalis* (H. Milne Edwards, 1834) hatched from ovigerous specimens collected from Saso Island, southern Red Sea, was obtained under laboratory conditions. Four zoeae, one additional zoea and a megalopa were obtained and these are described and illustrated in detail for the first time. Larvae of this species can be differentiated from those of other oziid species based on a combination of characters such as the number of aesthetascs and setae of the antennule, and the coxal and basial setal numbers and patterns of the maxilla and maxillule.

Key words: Eriphioidea, Oziidae, larval development, *Epixanthus frontalis*, megalopa, zoea, Red Sea

Introduction

Epixanthus frontalis (H. Milne Edwards, 1834), belongs to the Oziidae Dana, 1851, of the superfamily Eriphioidea MacLeay, 1838. Five world-wide species have been described for this genus (Ng *et al.* 2008; De Grave *et al.* 2009). This species is distributed from the east coast of Africa to Japan and inhabits spaces under rocks and rubble of intertidal zones (Sakai 1976). *Epixanthus frontalis* and *E. corrosus* A. Milne-Edwards, 1873, have been recorded from the Red Sea (Serène 1984). Two oblique ridges are present on the branchial region of the carapace of *E. frontalis* and these are absent in *E. corrosus* (Sakai 1976).

Little is known on the taxonomy of the brachyuran larvae of the western Indian Ocean and available descriptions are inadequate and incomplete, having little implication for comparative studies (Clark & Paula 2003). There are reports on the larval development of only a few species of Oziidae: from pre-zoeal to megalopal stages of *Ozius truncatus* H. Milne Edwards, 1834, from Pukerau Bay, New Zealand (Wear 1968); the complete development of *O. rugulosus* Stimpson, 1858, from the west coast of India (Kakati & Nayak 1977); and the complete development of *Baptozius vinosus* H. Milne Edwards, 1834 from Okinawa, Japan (Saba *et al.* 1978b); and the complete development of *O. verreauxii* Saussure, 1853, from Costa Rica (Dittel & Epifanio, 1984) (the larval stages are not described). The zoea I stage of *Lydia annulipes* H. Milne Edwards, 1834, was described by Clark & Paula (2003).

Of the five species of *Epixanthus* Heller, 1861, only the zoea I of *E. frontalis* and all the larval stages of *E. dentatus* White, 1848, have thus far been described (Saba *et al.* 1978a; Clark & Paula 2003). The complete larval development of *E. frontalis* is herein described for the first time.

Material and methods

Ovigerous females of *E. frontalis* (CL. 1.4 cm, yellowish green in colour) were collected from Saso Island (16°51'33.98"N; 41°35'0.93.3E"), southern Red Sea, Saudi Arabia on 17.03.2013. The crab was reared in an Espec walk-in type environment chamber at 28°C under 12h dark and light photoperiod. Around 450 larvae hatched on

References

- Clark, P.F. & Paula, J. (2003) Descriptions of ten xanthoidean (Crustacea: Decapoda: Brachyura) first stage zoeas from Inhaca Island, Mozambique. *The Raffles Bulletin of Zoology*, 51 (2), 323–378.
- Clark, P.F., Calazans, D.K. & Pohle, G.W. (1998) Accuracy and standardization of brachyuran larval descriptions. *Invertebrate Reproduction and Development*, 33, 127–144.
<http://dx.doi.org/10.1080/07924259.1998.9652627>
- De Grave, S., Pentcheff, N.D., Ah Yong, S.T., Chan, T-Y, Crandall, K.A., Dworschak, P.C., Felder, D.L., Feldmann, R.M., Fransen, C.H.J., Goulding, L.Y.D., Lemaitre, R., Low, M.E.Y., Martin, J.W., Ng, P.K.L., Schweitzer, C.E., Tan, S.H., Tshudy, D. & Wetzer, R. (2009) A classification of living and fossil genera of Decapod Crustaceans. *Raffles Bulletin of Zoology*, 21, 1–109.
- Ditel, A. & Epifanio, C.E. (1984) Desarrollo larval de *Ozius verreauxi* (Saussure) Brachyura: Xanthidae en el laboratorio [Larval development of *Ozius verreauxii* (Saussure) (Brachyura: Xanthidae) in the laboratory]. *Revista de Biología Tropical*, 32 (1), 171–172. (In Spanish)
- Fransozo, A., Mantelatto, F.L.M. & Negreiros-Fransozo, M.L. (1990) Larval development of *Hexapanopeus paulensis* Rathbun, 1930 (Crustacea, Brachyura, Xanthidae) under laboratory conditions. *Revista Brasileira de Zoologia*, 7 (1–2), 31–45.
<http://dx.doi.org/10.1590/s0101-81751990000200002>
- Gardner, C. & Northam, M. (1997) Use of prophylactic treatments for larval rearing of giant crabs *Pseudocarcinus gigas* (Lamarck). *Aquaculture*, 158, 203–214.
[http://dx.doi.org/10.1016/s0044-8486\(97\)00182-8](http://dx.doi.org/10.1016/s0044-8486(97)00182-8)
- Gardner, C. and Quintana, R. (1998) Larval development of the Australian giant crab *Pseudocarcinus gigas* (Lamarck, 1818) (Decapoda: Oziidae) reared in the laboratory. *Journal of Plankton Research*, 20 (6), 1169–1188.
<http://dx.doi.org/10.1093/plankt/20.6.1169>
- Kakati, V.S. & Nayak, V.N. (1977) Larval development of the xanthid crab, *Ozius rugulosus* Stimpson (Decapoda, Brachyura) under laboratory conditions. *Indian Journal of Marine Sciences*, 6, 26–30.
- Ko, H.S. (2006) Complete larval development of *Novactaea pulchella* (Crustacea: Decapoda: Xanthidae). *Integrative Biosciences*, 10, 7–14.
<http://dx.doi.org/10.1080/17386357.2006.9647278>
- Martin, J.W. (1984) Notes and bibliography on the larvae of xanthid crabs, with a key to the known xanthids zoeas of the western Atlantic and Gulf of Mexico. *Bulletin of Marine Sciences*, 34 (2), 220–239.
- Ng, P.K.L., Guinot, D. & Davie, P.J.F. (2008) Systema Brachyurorum: Part I. An annotated checklist of extant brachyuran crabs of the world. *Raffles Bulletin of Zoology*, Supplement 17, 1–286.
- Rice, A. L. (1980) Crab zoeal morphology and its bearing on the classification of the Brachyura. *Transactions of the Zoological Society of London*, 35, 271–424.
<http://dx.doi.org/10.1111/j.1096-3642.1980.tb00060.x>
- Saba, M., Takeda, M. & Nakasone, Y. (1978a) Larval development of *Epixanthus dentatus* (White) (Brachyura, Xanthidae). *Bulletin of the National Science Museum, Series (Zoology)*, 43, 151–161.
- Saba, M., Takeda, M. & Nakasone, Y. (1978b) Larval development of *Baptozius vinosus* (H. Milne Edwards). *Proceedings of the Japanese Society of Systematic Zoology*, 14, 25–38.
- Sakai, T. (1976) *Crabs of Japan and the Adjacent Seas*. Tokyo: Kodansha, pp. 773.
- Scotto, L.E. (1979) Larval development of the Cuban stone crab, *Menippe nodifrons* (Brachyura, Xanthidae), under laboratory conditions with notes on the status of the family Menippidae. *Fishery Bulletin*, 77 (2), 359–386.
- Serène, R. (1984) Crustacés Décapodes Brachyours de l'Océan Indien occidental et de la Mer Rouge, Xanthoidea: Xanthidae et Trapeziidae. Avec un addendum par Crosnier (A): Carpiliidae et Menippidae, Faune Tropicale, no. XXIV, 1–349, pls. 1–8.
- Spivak, E.D. & Cuesta, V.N. (2009) The effect of salinity on larval development of *Uca tangeiri* (Eydoux, 1835) (Brachyura: Ocypodidae) and new findings of the zoeal morphology. *Scientia Marina*, 73 (2), 297–305.
<http://dx.doi.org/10.3989/scimar.2009.73n2297>
- Wear, R.G. (1968) Life?history studies on New Zealand Brachyura, *New Zealand Journal of Marine and Freshwater Research*, 2 (2), 293–332.
<http://dx.doi.org/10.1080/00288330.1968.9515267>