



## Larval development in the lutjanid subfamily Lutjaninae (Pisces): the Indo-Pacific genus *Pinjalo*

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### Abstract

The larvae of the two species of *Pinjalo* are described for the first time based on seven specimens of *P. pinjalo* (4.3–7.5 mm) and 23 specimens of *P. lewisi* (5.6–15.0 mm) captured in plankton tows and midwater trawls in the eastern Indian and western Pacific Oceans. Identification was confirmed by fin meristics. These deep-bodied, compressed larvae share all the characteristics of lutjanid larvae, and have some of the most well-developed head spination and fin spines of any lutjanids. The robust spines of the dorsal, anal and pelvic fins bear strong serrations. The preopercular spines are particularly enlarged, some bear fine serrations, and the anterior end of the maxilla also has fine serrations: these fine serrations are rare in lutjanine lutjanids. The two species of *Pinjalo* can be distinguished by the meristics of dorsal and anal fins, the relative lengths of the first spine of the dorsal fin and the spine of the pelvic fin. The larvae have distinctive pigment on the dorsal fin, head and caudal peduncle. The body shape, pigment pattern, fin-spine morphology, and the fine serrations on the head spines of the two *Pinjalo* species are very similar to the larvae of *Lutjanus erythropterus* and *L. malabaricus*, and may indicate a close relationship among these four species.

**Key words:** Larva, Ontogeny, Lutjanidae

### Introduction

The approximately 125 species of tropical snappers of the perciform fish family Lutjanidae are medium to large fishes of great ecological and commercial importance, and are divided among five subfamilies (Johnson 1993; Nelson, 1994). The largest lutjanid subfamily, Lutjaninae, (sensu, Johnson 1980) with about 80 species, contains six genera: *Hoplopagrus* (east Pacific, monotypic), *Lutjanus* (worldwide, ca 70 species), *Macolor* (Indo-west-Pacific, two species), *Ocyurus* (western north Atlantic, monotypic), *Pinjalo* (Indo-west-Pacific, two species) and *Rhomboplites* (western north Atlantic, monotypic). Larvae of at least some species in most lutjanine genera have been described, including several *Lutjanus* species (see summaries in: Kojima 1988; Watson and Brogan 1996; Leis and Rennis 2004; Lindeman *et al.* 2005), both *Macolor* species (Leis 2007), and the monotypic genera *Hoplopagrus*, *Ocyurus* and *Rhomboplites* (summarized in Watson and Brogan 1996, and Lindeman *et al.* 2005), leaving *Pinjalo* as the only genus in the subfamily for which no larval stages have been described.

The two species of *Pinjalo* – *P. pinjalo* (Bleeker) and *P. lewisi* Randall, Allen and Anderson – are compressed, deep-bodied reddish species of moderate size (to 40 or 50 cm SL) that live in association with hard bottoms at moderate depths (15 to 150 m), and feed on both benthic and planktonic invertebrates (Anderson and Allen 2001). Little is known of the biology of *Pinjalo* species, and separate fishery statistics are generally not kept on them, but they are locally important in artesinal fisheries (Allen 1985). The two *Pinjalo* species have broad distributions in the tropical Indo-Pacific west of the Pacific Plate, from southern Japan to northern