



## Final-stage phyllosoma of *Palinustus* A. Milne-Edwards, 1880 (Crustacea: Decapoda: Achelata: Palinuridae)—The first complete description

FERRAN PALERO<sup>1</sup>, GUILLERMO GUERAO<sup>2</sup>, PAUL F. CLARK<sup>3</sup> & PERE ABELLÓ<sup>4</sup>

<sup>1</sup>*Evolutionary Genetics, Institute of Science and Technology Austria (ISTA), Am Campus 1, A – 3400 Klosterneuburg, Austria.  
E-mail: fpalero@ist.ac.at*

<sup>2</sup>*IRTA, Unitat de Cultius Experimentals, Sant Carles de la Ràpita, Tarragona, Catalonia, Spain. E-mail: guillermo.guerao@irta.cat*

<sup>3</sup>*Department of Zoology, Natural History Museum, Cromwell Road, London SW7 5BD, UK. E-mail: p.clark@nhm.ac.uk*

<sup>4</sup>*Institut de Ciències del Mar (CSIC), Passeig Marítim de la Barceloneta 37-49, 08003 Barcelona, Catalonia, Spain.  
E-mail: pabello@icm.csic.es*

### Abstract

Four rare palinurid phyllosoma larvae, one mid-stage and three final stage, were found among the unclassified collections in the Crustacea Section, Natural History Museum, London. Detailed morphological analysis of the larvae indicated that they belong to several *Palinustus* species given the presence of incipient blunt-horns, length of antennula, length ratio of segments of antennular peduncle, distribution of pereopod spines, and shape of uropods and telson. Moreover, the size of the final-stage larvae agrees with that expected given the size of the recently described puerulus stage of *Palinustus mossambicus*. This constitutes the first description of a complete phyllosoma assigned to *Palinustus* species. The phyllosoma described in the present study include the largest Palinuridae larva ever found.

**Key words:** *Palinura*, RRS *Discovery*, Scyllaridae, *Linuparus*, *Justitia*

### Introduction

Achelata lobsters, which include the Palinuridae Latreille, 1802 and Scyllaridae Latreille, 1825, are characterized by the lack of chelae on their first pair of pereopods and the presence in their development of a phyllosoma larval stage (Scholtz & Richter, 1995; Palero *et al.*, 2009a). Phyllosoma larvae are highly modified zoeae in which cephalon and thorax are extremely flattened and which possess a particularly small pleon in their early stages. It is these characteristics that make them specially adapted for dispersal (Rothlisberg *et al.*, 1994; Palero & Abelló, 2007). After spending several months drifting in oceanic currents to complete the larval development, final-stage phyllosoma larvae metamorphose into puerulus (palinurid) or nisto (scyllarid) stages, and settle on the sea bottom to a benthic existence (Herrnkind *et al.*, 1994; Lipcius & Eggleston, 2000). Despite the importance of larval survival to predict recruitment, little is known about the mechanisms by which phyllosoma larvae may disperse and then return to coastal waters. According to Booth & Phillips (1994) this is mainly due to difficulties with regard to identification of planktonic stages. Furthermore, the long duration and delicate nature of phyllosomae has made them difficult to rear in the laboratory, and for many species only first phyllosoma stages are known with certainty (Kittaka, 1997; Coutures & Booth, 2004).

Previous records of phyllosomae from the Indian Ocean are sparse, with knowledge being mainly limited to studies by Prasad *et al.* (1975). Other authors have provided descriptions of phyllosoma larvae found in the South China Sea (Johnson, 1971), South African waters (Berry, 1974) and Indo-Pacific waters (McWilliam *et al.*, 1995). The most general accounts of Indian Ocean phyllosoma larvae, such as those belonging to the DANA expedition (Prasad *et al.*, 1975) and from the International Indian Ocean Expedition (Tampi & George, 1975), were published about 35 years ago to include observations relating to the distribution of these larvae.