



Potential cryptic speciation in Mediterranean populations of *Ophioderma* (Echinodermata: Ophiuroidea)

SABINE STÖHR^{1,4}, EMILIE BOISSIN², & ANNE CHENUIL³

¹Swedish Museum of Natural History, Department of Invertebrate Zoology, Frescativ. 40, 10405 Stockholm, Sweden.

E-mail: sabine.stohr@nrm.se

²UMR 6540-DIMAR, Centre d'Océanologie de Marseille, Station Marine d'Endoume, Chemin de la Batterie des Lions, 13007 Marseille, France. E-mail: emilie.boissin@univmed.fr

³UMR 6540-DIMAR, Centre d'Océanologie de Marseille, Station Marine d'Endoume, Chemin de la Batterie des Lions, 13007 Marseille, France. E-mail: anne.chenuil-maurel@univmed.fr

⁴Corresponding author

Abstract

Ophioderma longicauda is a large brittlestar species, common in the Mediterranean Sea and spread across the subtropical-tropical eastern Atlantic Ocean. Recently, a morphologically similar brooding form of *O. longicauda* was discovered in the eastern Mediterranean Sea. The brooding period is restricted to late May and early June and the largest females brood over 1,000 juveniles, all of the same ontogenetic stage. Brooders differ from non-brooding *O. longicauda* in body colour (dominated by green instead of red), gonad colour (in alcohol white instead of olive- to reddish-brown) and size (up to 17 mm disk diameter instead of 30 mm). These characters overlap between both forms though. Molecular data (mt-COI sequences) lend weak support to the existence of two separate species, but suggest that if a split occurred it is recent and both forms interbreed. Alternatively, the eastern Mediterranean populations could represent a poecilogonous subgroup of *O. longicauda*.

Key words: brooding, taxonomy, phylogeny, morphology, mt-COI

Introduction

The ophiuroid genus *Ophioderma* is common in shallow, mostly tropical-subtropical waters. In daylight, the often colourful animals usually hide under rocks, coral rubble and similar objects (Hendler *et al.* 1995). Currently, 27 species are recognized in the genus *Ophioderma* according to the latest census of the Ophiuroidea (Stöhr & O'Hara 2007). The latest review of the genus was carried out by Ziesenhenne (1955), when 21 species were known. In the Atlantic Ocean, at least 11 species of *Ophioderma* occur (Hendler *et al.* 1995), all but the east Atlantic *O. longicauda* Bruzelius, 1805 and the South African *O. leonis* Döderlein, 1910 restricted to the western parts. The characters used to separate the species include the shape of disk granules and the extent to which the granules cover underlying plates, disk size, arm length, shape and degree of fragmentation of dorsal arm plates, arm spine number and shape, as well as colour (Hendler *et al.* 1995). However, these characters are often rather variable, which may cause some difficulties for identification.

Ophioderma longicauda is one of the largest brittle star species in the Mediterranean Sea, quite common and widely distributed (Tortonese 1983). It is so far the only species of the genus in the eastern North Atlantic, although a subspecies *O. longicauda guineense* Greeff, 1882 has been reported from the West African coast, but its distinguishing characters fall within the variations found in *O. longicauda* (Madsen 1970). The species reproduces through a pelagic vitellaria larva (Fenaux 1969), which is the predominant larval type in the genus (Hendler & Littman 1986). However, specimens of what at first appeared to be *O. longicauda*, recently