



## Contribution to the knowledge of cotylean flatworms (Turbellaria, Polycladida) from Iranian coasts: Introducing a new species, with remarks on new records

ABDOLVAHAB MAGHSOUDLOU<sup>1,3</sup> & HASSAN RAHIMIAN<sup>2</sup>

<sup>1</sup>Department of Marine Living Resources, Iranian National Institute for Oceanography and Atmospheric Science (INIOAS), Tehran, Iran

<sup>2</sup>School of Biology and Center of Excellence in Phylogeny of Living Organisms, College of Science, University of Tehran, Tehran, Iran

<sup>3</sup>Corresponding author. E-mail: [wahabbio@gmail.com](mailto:wahabbio@gmail.com)

### Abstract

Very little information is available regarding marine free-living flatworms not only from Iran, but throughout the countries surrounding the Persian Gulf and the Gulf of Oman. The present study first introduces a new euryleptid species, and then reports four pseudocerotid polyclads which inhabit Iranian shallow rocky shores of the Persian Gulf and the Gulf of Oman. *Maritigrella makranica* sp. nov. is characterized dorsally by a medial cream or white reticulated appearance containing pale orange spots in a honeycomb pattern, a distinct orange submarginal band around the entire body margin and between the marginal tentacles, black spots scattered around mid-dorsal surface, becoming more sparse on raised median region and towards body margin, surrounded by a dark-grey halo around the body midline and orange-black halo towards margin. Three of the four pseudocerotids species belonging to the genera *Pseudobiceros* Faubel, 1984; *Pseudoceros* Lang, 1884; and *Thysanozoon* Grube, 1840, are new records for the studied areas, while the other has been reported in the Persian Gulf previously. Comments on Iranian species are provided and associations of flatworms with ascidians and sponges were observed.

**Key words:** Platyhelminthes, Pseudocerotidae, Euryleptidae, *Maritigrella makranica* sp. nov., Persian Gulf, Gulf of Oman

### Introduction

Most polyclad flatworms live in coastal marine environments (Newman & Cannon 2003); nevertheless, some species have been collected from the mesopelagic (Faubel 1984b; Quiroga *et al.* 2008) and bathypelagic zones (Quiroga *et al.* 2006). These flatworms feed on ascidians (Newman *et al.* 2000), crustaceans (Lee *et al.* 2006; Prudhoe 1968), gorgonians and hard corals (Bock 1926; Newman & Cannon 2003; Nosratpour 2008; Rawlinson *et al.* 2011). Some species (i.e. Acotylea) have even been found in symbiotic association with mollusks (Faubel *et al.* 2007; Pearse & Wharton 1938; Wheeler 1894) and Echinodermata (Doignon *et al.* 2003).

Lang (1884) divided the order Polycladida into two suborders: Acotylea and Cotylea, based on the absence or presence of a sucker. Faubel (1983; 1984a), in his classification based on anatomical characters of the reproductive structures, placed 28 families within Acotylea and 15 families within Cotylea. In total, over 1,000 species of polyclads have been described (Rawlinson 2008), of which about 400 species are cotyleans (Rawlinson & Litvaitis 2008).

Among cotyleans, the family Pseudocerotidae includes some of the most diverse and brightly colored marine flatworms (Newman and Cannon 1994). In comparison with the pseudocerotids, Euryleptidae are relatively rare throughout the Indo-Pacific (Newman and Cannon, 1994). A major distinction between Pseudocerotidae and Euryleptidae is the presence of a tubular rather than a ruffled pharynx in euryleptids. Within the two aforementioned families, generic discrimination is based on the anatomical characters of the reproductive system, the digestive system, and external characters (e.g. dorsal papillae, tentacles and tentacular eyes). Due to the homogeneity of the male reproductive system, species identification within pseudocerotid and euryleptid genera is often based on the color patterns (Hyman 1955; Litvaitis & Newman 2001; Newman & Cannon 1994; Prudhoe 1985). However, some believe that color patterns are highly homoplasious (Rawlinson & Litvaitis 2008), a subject

distribution of this species on the southern coasts of Iran (the Persian Gulf and Gulf of Oman), for some reasons, is limited to the eastern side of Qeshm Island (Persian Gulf, Fig. 1, stations 31 and 33). In terms of the SACFOR abundance scale for animals greater than 15 cm (Connor *et al.* 1997), this species was distributed frequently on the aforementioned Island.

Khalili *et al.* (2009) found their specimens associated with orange sponge (*Cliona vastifica*); we collected our specimens under rocks and in tidal pools, mostly covered with red algae (*Solieria*) and the sponge, *Gelliodes carnosus* (Fig. 10D).

## Discussion

Marine polyclads are virtually ignored in most studies of macrobenthos, probably because of difficulties in sampling (i.e. cryptic mimicry and negative photoactive behavior), handling, fixation and identification of this group. Those difficulties along with many incomplete (*e.g.* without color documentation) or inadequate descriptions (*e.g.* based on immature specimens) as well as lack of deposited type specimens have made the polyclads a taxonomically difficult group around the world (Newman & Schupp 2002; Rawlinson 2008). Consequently, our knowledge of the polyclads of the Western Indo-Pacific is very poor, and is restricted to a few reports from the Red Sea (Newman and Cannon (2005). Unlike the Western Indo-Pacific, some of the highest diversities of polyclads (more than 600 species) have been recorded in the Eastern Indo-Pacific region, due to focused, long-term efforts (Bolaños *et al.* 2007).

While Khalili *et al.* (2009) had previously reported the occurrence of *Tytthosoceros lizardensis* and *Thysanozoon* sp. from Qeshm Island (Persian Gulf) the present study is the first comprehensive taxonomic study of marine polyclads along the Iranian coasts of the Persian Gulf and Gulf of Oman. Part of the results obtained during the study is presented here, and the rest will be presented in forthcoming communications. Among the species presented here, one (*Thysanozoon brocchii*) is cosmopolitan, *Pseudobiceros uniarborensis* is distributed in the Indian and Pacific Oceans, and one (*Tytthosoceros lizardensis*) is distributed in Eastern and Western Indo-Pacific. Apart from *T. lizardensis*, other cotylean species were associated with ascidians, which has been reported previously in pseudocerotid and euryleptid flatworms (Bahia *et al.* 2012; Bolaños *et al.* 2007; Marcus & Marcus 1951; Newman *et al.* 2000; Newman & Schupp 2002).

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