First report of tubular corallites on *Stylophora* caused by a symbiotic copepod crustacean

Fig. 1 a *Stylophora pistillata* colony heavily infected by symbiotic copepods inducing tubular-shaped modification of corallites (arrowed), Saudi Arabian part of the Red Sea. b Close-up of a modified corallite. c SEM of tubular corallite without septa and columella. d SEM of longitudinal section of the modified corallite. e SEM of a *Spaniomolgus* sp., endosymbiont of *S. pistillata*, female, ventrolateral view

Among the more than 340 species of symbiotic copepods associated with numerous scleractinian species, four have been reported from galls or cysts in three species of corals (Dojiri 1988; Kim and Yamashiro 2007). The relationship between these copepods and their scleractinian hosts remains poorly studied. Here, we provide the first report of a tubular corallite shape caused by copepods.

The copepods were found to create short tubular outgrowths (2 mm diameter) on *Stylophora pistillata* branches in the Saudi Arabian Red Sea, off Thuwal (22°03'48.5"N, 38°45'51.2"E) on April 29, 2013 (Fig. 1a). Each outgrowth is a modified thick-walled corallite with a terminal opening and a polyp inside (Fig. 1b, c). The inner chamber of the modified corallite has longitudinal folds atypical for *Stylophora* as well as a reduced columella (Fig. 1c, d). Outgrowths found on *S. pistillata* in the Red Sea differ from those previously reported (Dojiri 1988; Kim and Yamashiro 2007) due to the presence of a terminal opening framed by well-developed tentacles of the polyp (Fig. 1b).

Single female individuals of the crustacean copepod, representing a new species of the genus *Spaniomolgus* Humes and Stock 1972 (Poecilostomatoida: Rhynchomolgidae), were found within the gastric cavity of the affected polyps (Fig. 1e). The genus *Spaniomolgus* was previously known only from Madagascar. Nonscleractinian invertebrates are particularly understudied in the Red Sea, and further work is needed to fully characterize their diversity and function in this region.

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References

Dojiri M (1988) *Isomolgus desmotes*, new genus, new species (Lichomolgidae), a gallicolous poecilostome copepod from the scleractinian coral *Seriatopora hystrix* Dana in Indonesia, with a review of gall-inhabiting crustaceans of anthozoans. J Crustacean Biol 8:99–109

Humes AG, Stock JH (1972) Preliminary notes on a revision of the Lichomolgidae, cyclopoid copepods mainly associated with marine invertebrates. Beaufortia 2:121–133

Kim IH, Yamashiro H (2007) Two species of poecilostomatoid copepods inhabiting galls on scleractinian corals in Okinawa, Japan. J Crustacean Biol 27:319–326

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