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Sphaeromatid isopod (Crustacea: Peracarida) assemblages in an algae-sponge association at North Stradbroke Island, southeastern Queensland

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ABSTRACT

The endofauna of the green algae Cladophoropsis vaucheriaeformis (Aresch.) Papenf. was examined. This algae is associated with sponge tissue and has a tough, spongyous thallus morphology. Twenty thalli were sampled in shallow waters of 1–9 m near Amity Point, North Stradbroke Island, Queensland, of which five samples were found to be inhabited by large numbers of sphaeromatid isopods belonging to the species Oxinasphaera lobivia, Bruce 1997. This is the first time assemblages of the isopod O. lobivia are reported in association with the algal-sponge association Cladophoropsis vaucheriaeformis. q symbiosis, algae, sponge, Crustacea, Peracarida, Isopoda, Queensland, Australia

The green algal genus Cladophoropsis is widely distributed in warm-temperate and tropical waters of the Atlantic, Indian and Pacific Oceans. The genus was created by Børgesen (1905) and a recent revision resulted in the recognition of 6 morpho-species, although recognising that generic relationships with other taxa in the Siphonocladales require further attention (Leliaert & Coppejans 2006). Cladophoropsis vaucheriaeformis (Aresch.) Papenf. is an unusual member of the genus because of its association with sponge tissue. This sponge association results in a tough, spongiosous thallus morphology and an atypical branching pattern. Cladophoropsis vaucheriaeformis generally grows epilithically, occasionally on calcified seaweeds in the mid-intertidal to shallow subtidal down to 1 m (Leliaert & Coppejans 2006). At Amity Point, North Stradbroke Island, Queensland, Cladophoropsis vaucheriaeformis is found on most stones in the sandy bay.

Isopods are well known as parasites of both fishes and crustaceans (e.g. see Rhode 2005), but other forms of opportunistic or obligate symbioses are relatively rare. Examples include the cirolanid Cartetolana integra (Miers, 1884) (Bruce 1986) which inhabits the anal cavity of tropical crinoids, Neocioiriana hermitensis (Boone, 1918), another cirolanid, lives in association with hermit crabs (Bruce 1994), and the corallanid Argathona rostrata Bruce, 1982, which inhabits sponges. Species of Sphaeromatidea are not frequently known as symbionts or associates of other biota. Within the family Sphaeromatidae the monotypic Xynosphaera Bruce, 1994, has morphological adaptations for a symbiotic association with alcyonaceans; X. colemani Bruce, 1994, burrows into the host although the exact trophic relationship is not known. Sphaeromatid association with sponges are more widely reported, notably the species Paracerceis sculpta (Holmes, 1904) (see Shuster 1992; Shuster & Sassaman 1997) while Cassidias sp. has been reported from gorgonian corals (Bruce 1999). In contrast to these sparse records of isopod-sponge
association, the Indo-West Pacific genus Oxinasphaera Bruce, 1997, is known to have numerous species associated with sponges or which have been directly collected from or in association with sponges, ‘sponges’ being the most commonly recorded habitat for species of the genus. In most cases the identity of the host sponges is not known, and therefore the level of host specificity or degree of host preference remains unknown.

MATERIAL AND METHODS

In February 2005, during the Moreton Bay Marine Biodiversity workshop, 20 thalli of Cladophoropsis vaucheriaeformis were sampled at Amity Point via snorkelling. The pieces were cut off at the base with a knife and each algal piece placed in a fine-mesh (0.30 mm) bag.

In the laboratory the volume of each sample was determined by water replacement in a measuring cylinder. The associated epifauna was collected and identified to OTU and to species where possible. The fauna found living within the anastamosing network of the Cladophoropsis thalli was revealed by carefully slicing the algae under a stereomicroscope; the isopods were directly removed, counted and identified.

RESULTS

Five of the twenty pieces of Cladophoropsis vaucheriaeformis contained sphaeromatid isopods, all belonging to the species Oxinasphaera lobivia. The volume of the Cladophoropsis ranged from 85–410 ml, the number of sphaeromatids, not directly related to the volume of the alga, ranged from 15–506 individuals. A total of 811 specimens of Oxinasphaera lobivia were found in the five algal pieces, see Table 1. Males, females and juveniles of Oxinasphaera lobivia were found within the tissue mass of Cladophoropsis. The average host volume per individual sphaeromatid varied from 0.8 ml to 13.3 ml, with an average of one sphaeromatid per 1.4 ml algae tissue.

The 15 pieces of Cladophoropsis vaucheriaeformis not containing sphaeromatids were not inhabited by any other macro-invertebrates. Occasional Tanaidacea and Amphipoda were found externally on the algae-sponge association, but not inside. The volume of the ‘empty’ Cladophoropsis samples varied from 10–350 ml. Overall the epifauna of the Cladophoropsis hosting sphaeromatids and those without inhabitants was very similar.

DISCUSSION

Oxinasphaera lobivia Bruce, 1997, is a known associate of sponges, although sponge identity has not been recorded (Bruce 1997). O. lobivia is here reported in association with the algal-sponge association of Cladophoropsis vaucheriaeformis for the first time. We believe O. lobivia is primarily using the algae-sponge association as a refugium, not as a direct food source. Even though we have not conducted stomach content analysis, the host tissue did not seem to be affected by its inhabitants. At least while slicing the algal pieces, no apparent difference in structure was obvious between Cladophoropsis hosting sphaeromatids and those without inhabitants.

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LITERATURE CITED


