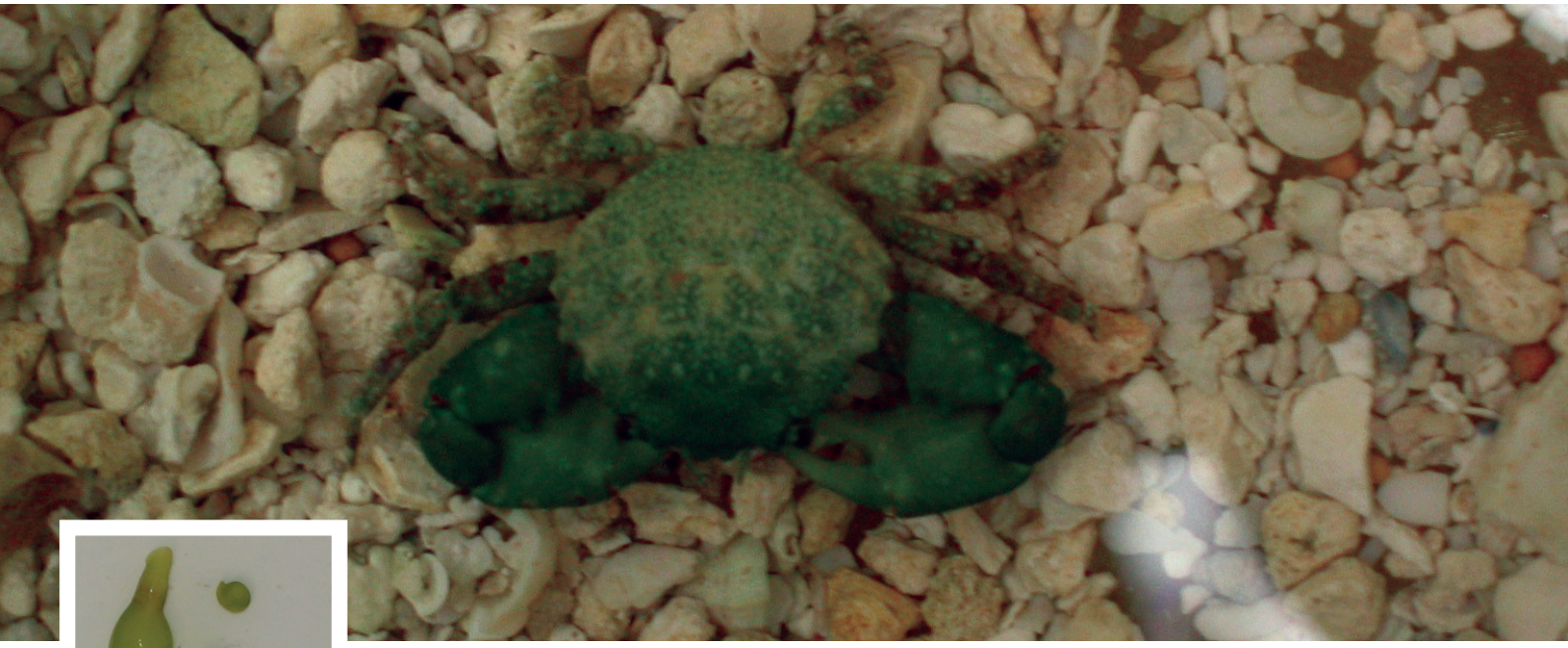
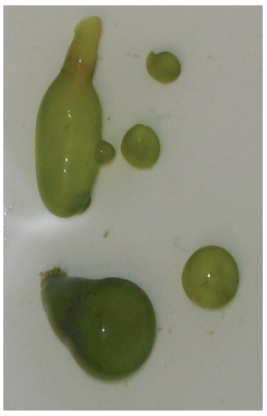
Emerald crabs keep bubble algae under control





Reef tanks, public aquariums and aquaculture facilities are commonly invaded by pest organisms, such as the glass-anemone (*Aiptasia pallida)*, the fireworm (*Hermodice carunculata)* and the bubble algae (*Valonia* spp. and *Ventricaria_ventricosa*). In an effort to minimize or eliminate the impacts and spread of pest organisms in reef tanks and public aquariums, a wide range of control techniques have been established including: (1) physical removal; (2) chemical treatments and (3) bio-control.

Ornamental crabs of the genus *Mithraculus* (Decapoda: Brachyura: Majidae) are utilized in reef aquaria to control nuisance algae, particularly bubble algae (*Valonia* spp. and *Ventricaria ventricosa*). Bubble algae are greenish, grapelike clusters of small (usually less than 1 cm in diameter), single-cell, fluid-filled spheres. Often living on the surfaces of sponges, soft corals, coral rock and other algae, these green algae cover hard substrates and corals, blocking light to zooxanthellae and may cause coral bleaching and death.

Emerald crab *Mithraculus sculptus* have modified, spooned-shaped chelae to feed on both fleshy and filamentous algae. However, they are able to consume a wide variety of animal feeds such as frozen and formulated food. Actually, in aquaria, their bubble algal consumption reduces significantly when pellets are also supplied, but it did not reduce when offered mysids. So, in case of infestation with bubble alga, using mysids as aquaria food may render *M. sculptus* as efficient bubble alga bio-controllers; the use of pellets is not advised.

M. sculptus of both sexes might be considered equally efficient has controllers. Since larger crabs can consume greater quantities of bubble algae and are able to exploit a wider size range of bubble algae, they may be considered more efficient bio-controllers. While less efficient, smaller crabs may be effective in controlling algae in areas difficult to access, such as crevices.

Emerald crabs actively feed on bubble alga *Ventricaria ventricosa*; they grab bubble alga with the chelae, burst it, and then proceed to eat the cell membrane. As the crab tears the algal cell apart, the cell liquid that contains juvenile cytoplasmatic spheres is released into the water, which might contribute to algal dispersal and consequently algal infestation. However, by taking into account that: (1) bubble algae juveniles may be removed and eliminated by tank filtration, (2) fish are fed few times a day while crabs are continuous foragers and (3) the greatest amount of food is consumed by fish while still in the water column (in this way inaccessible to crabs), we suggest the bio-control efficiency of *M. sculptus* could be improved by increasing density of crabs, along with not providing food in excess and using an effective filtration (mechanic filtration, skimmers and U. V. sterilizer to trap bubble algal juvenile cytoplasmatic spheres).

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