Morphological differentiation of cryptic lineages within the invasive genus Asparagopsis (Bonnemaisoniales, Rhodophyta)

Zanolla M.

Carmona R.

De La Rosa J.

Salvador N.

Sherwood A.R.

Andreakis N.

Altamirano M.

Rapid identification of introduced seaweeds is crucial to support management and conservation decisions, especially when multiple cryptic lineages of high-profile invasive taxa occur sympatrically. The red seaweed genus Asparagopsis (Bonnemaisoniales, Rhodophyta) comprises two recognised morpho-species characterised by heteromorphic life cycles and presumably morphologically identical 'Falkenbergia' tetrasporophyte stages: A. armata and A. taxiformis. Populations of the former were easily identified by the presence of distinctive harpoon-like braches on the gametophyte thalli. Four morphologically cryptic yet genetically distinct mitochondrial lineages of invasive nature were recognised within A. taxiformis. We reported a morphological delineation of tetrasporophytes and gametophytes of Asparagopsis, including cryptic lineages collected from the Mediterranean Sea and the Hawaiian Islands, where multiple Asparagopsis lineages were present. Vegetative anatomical characters of the tetrasporophytes were useful in differentiating A. armata from those of A. taxiformis as well as among tetrasporophyte isolates belonging to the four A. taxiformis lineages. In addition, these characters distinguished lineage 2 native range specimens (Hawaii) from the invasive specimens (Mediterranean Sea), which suggested high levels of morphological plasticity in the invasive taxon. We propose that the taxonomic status of the lineages within A. taxiformis needs to be revised.

Falkenbergia

Identification

Management

Morphology

Reproductive

Taxonomy

Vegetative