Gracilaria salicornia

(C. Agardh) Dawson 1954

***Gracilaria salicornia* is one of the most successful invasive algae on reef flats. It appears competitively linked with the native *G. coronipfolia* and *G. parvispora*, but its mat form allows for a robust growth rate, and it is hardier than the natives.**

Division	Rhodophyta
Class	Rhodophyceae
Order	Gracilariales
Family	Gracilariaceae
Genus	*Gracilaria*

Identifying Features

DESCRIPTION

Thalli consist of solid, brittle, cylindrical to compressed branches, 2 - 5 mm in diameter. Axes 3 - 18 cm long and 1.5 mm broad, with branches usually irregularly arranged. Both axes and branches are regularly or irregularly constricted or continuous, with both conditions occuring on the same plant or neighboring plants. Plants often prostrate and overlapping, with lateral branches running along substrate, spreading in mats to 30 cm or broader, with rocks and pebbles between branches, or erect with an inconspicuous discoid holdfast and ocassional secondary attachments.

Gracilaria spp. are extremely variable in Hawaiian waters. Although normally cylindrical, the branches are frequently found flattened, and sometimes plants are compressed throughout.

COLOR

The plant is often yellow in sunny areas to greenish brown in shaded. One plant can have a full range of color, from yellow nearest the surface where it gets most light to greenish brown near the holdfast, where it is most shaded.

Habitat

Gracilaria salicornia is found in tidepools and on reef flats, intertidal to subtidal 4 meters deep, attached to limestone and basalt substrates. Intertidal plants often without constrictions, subtidal with constrictions.

Structural

Cortex 1-2 layered, cells 4-6 by 10-12 µm, basal hair cells common; medullary cells relatively small (to other *Gracilaria* sp.) Tertrasporangia scattered over surface, 16-20 by 40-45 µm. Spermatangia in pits. Cystocarps globose, constricted at base, 1.4 - 1.8 mm diameter, with few to many tubular nutritive cells; pericarp cells in relatively straight anticlinal rows of oval to rounded cells.

Distribution

HAWAI'I

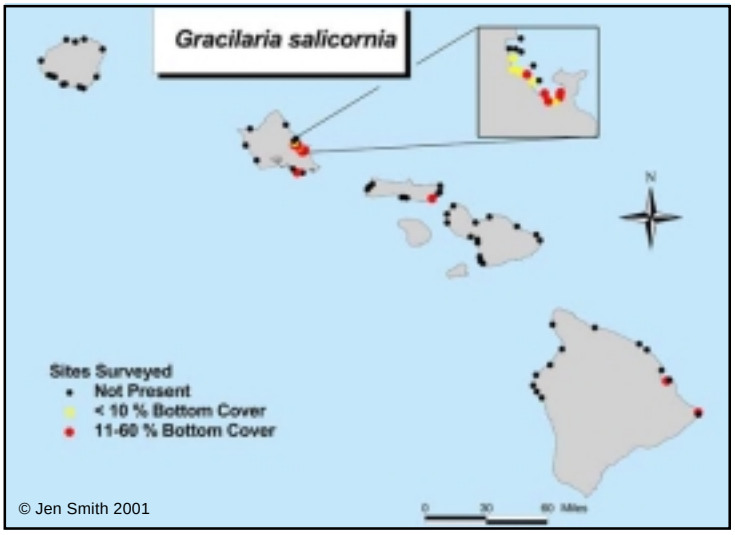
O'ahu, Hawai'i Island.

WORLDWIDE

Wide spread throughout the warm Indian and Pacific Oceans.

MECHANISM OF INTRODUCTION

First found in 1971 in Hilo Bay, Hawai'i. Introduced to Kane'ohe Bay and Waikiki in the 1970's.



Ecology/Impact

Gracilaria salicornia is very successful in calm, protected waters. It has spread over 5 kilometers from its point of introduction on Oah'u since it was introduced in 1978. This alien algae is usually sterile in Hawaiian waters, but has been found to propagate sexually as well as asexually. Its widespead dispersal is accomplished primarily through fragmentation. Molecular fingerprinting shows a high degree of genetic similarity within a community, supporting the idea that dispersal occurs by cloning through the fragmentation process.

This species is thought to compete with the native reef algae such as *G. coronopifolia,* for substrate on the reef flat. Compared to other *Gracilaria* species, *G. salicornia* appears more flexible to light adjustments and seems to have a higher growth rate. High abundance appears to be associated with moderate water motion. This species successfully competes with other macroalgae by forming large, intricate mats that cover the substate and inhibit settlement of other algae.

When other more desirable cultured *Gracilaria* species or the wild *G. coronopifolia* are not available for consumption, *G. salicornia* is used as a substitute. Its "crunchiness" is gaining favor, and this species has been sold under the name "robusta" on O'ahu.

References

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WEB LINKS

Marine Invasives of Hawai'i. http://www.botany.hawaii.edu/Invasive/default.htm

Ecological Success of Alien/Invasive Algae in Hawai'i. http://www.botany.hawaii.edu/GradStud/smith/websites/ALIEN-HOME.htm