

Enteromorpha flexuosa

(Wulfen) J. Agardh 1883

Enteromorpha flexuosa is a native green alga that exhibits invasive characteristics in areas of fresh water intrusion and high nutrient input.

Division Chlorophyta
 Class Chlorophyceae
 Order Ulvales
 Family Ulvaceae
 Genus *Enteromorpha*



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IDENTIFYING FEATURES

DESCRIPTION

Long, filamentous green alga up to 15 cm tall, mostly tubular, hollow, with tube walls 1 cell thick, axes 1-7 mm wide. Branches cylindrical throughout or with the terminal portion expanded and bladelike, or centrally compressed with only the margins hollow. Larger tubular portions may or may not branch; if branched, with narrow filamentous branchlets. Attached to rocky substrate by rhizoids that grow from basal cells of the tube.

It often grows in tufts of 6 cm long, but in areas of high nutrients and fresh water, can form long, hairlike strands up to 20 cm long.

COLOR

Grass green.

HABITAT

Forms clusters or tufts attached to rocks in sandy areas, high intertidal to mid-intertidal. Will often be exposed at low tide, and often found near freshwater intrusion. Epiphytic in ponds.



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STRUCTURAL

Thallus hollow tube, walls 1 cell thick. Cells in surface view arranged in short longitudinal rows. Cells rounded rectangular, 10-28 μm wide, 8-30 μm long, in somewhat longitudinal and often transverse rows; basal cells up to 50 μm long.

DISTRIBUTION

HAWAI'I

Kaua'i, O'ahu, Maui, and Hawai'i Island.

WORLDWIDE

Worldwide distribution in both temperate and tropical waters of the Pacific and Atlantic Ocean, Indonesia, Philippines, southern Japan, Viet Nam, and Thailand.

MECHANISM OF INTRODUCTION

Indigenous to Hawai'i.

ECOLOGY/IMPACT

Enteromorpha flexuosa is a very common high intertidal green alga found wherever there is freshwater intrusion, such as freshwater stream or underwater spring input to the ocean. It is often associated with coastal areas of high nutrients, including areas with residential and industrial development.

E. flexuosa is considered an invasive and fouling species in much of the world. This is an opportunistic species that has a very successful reproductive stage. Under the right conditions it will release propagules daily. The motile reproductive cells actually have the ability to photosynthesis, thus increasing their potential viability and dispersion.

Because of this high reproductive ability, *E. flexuosa* is markedly fecund, and, therefore, an excellent pioneer species, settling available substrates quickly. But it does not compete well with other successional species. In studies of disturbance and settlement, *E. flexuosa* was found to maintain a low percent cover in undisturbed areas but, following a disturbance, density increased dramatically.

E. flexuosa is often found in communities with or near *Ulva fasciata*, another pioneer green alga species. Both are fouling organisms associated with industrial pollution. Anti-fouling studies investigating control and/or eradication of fouling species identify these two species as serious pests in shipping and industrial areas.

REFERENCES

- Abbott, I.A., 1996. Limu: An ethnobotanical study of some Hawaiian seaweeds. National Tropical Botanical Garden, Lawai, Kaua'i, Hawai'i. 4th edition.
- Beach, K.S., C.M. Smith, T. Michael, and H.W. Shin, 1995. Photosynthesis in reproductive unicells of *Ulva fasciata* and *Enteromorpha flexuosa*: implications for ecological success. Mar. Ecol. Prog. Series, 125: 229-237.
- Littler, D.S. and Mark M., 2000. Caribbean Reef Plants. OffShore Graphics, Washington, D.C.
- Magruder, W.H., and J.W. Hunt, 1979. Seaweeds of Hawai'i. Oriental Publ. Co., Honolulu, Hawai'i.

WEB LINKS

- Hawaiian Reef Algae. <http://www.botany.hawaii.edu/reefalgae/>
- The Indian River Lagoon Species Inventory; <http://www.serc.si.edu/sms/IRLSpec/index.htm>
- Virtual Herbarium. <http://www.botany.hawaii.edu/reefalgae/greenskey.htm>