

GREEN SEAWEEDS

DOMAIN	Eucarya
KINGDOM	Plantae
DIVISION	Chlorophyta
CLASSES	4
SPECIES	1,200

GREEN ALGAE LARGE ENOUGH to be seen with the naked eye are known as green seaweeds. They are classified with the microscopic green algae, or microalgae (see p.250). True plants of the sea, they have pigments and other features in common with higher plants. They can be abundant in tropical lagoons, and proliferate seasonally on many temperate seashores. *Ulva* (sea lettuce) is grown for food.

HABITATS

Green seaweeds often attach to rocks on rocky coasts, particularly in temperate and cold waters, and are ephemeral colonizers in seasonally disturbed tidal and shallow subtidal habitats. *Ulva* species, such as sea lettuce, dominate in high-level rock pools, or where fresh water seeps over the shore, since they can withstand changes in salinity and temperature. The more delicate *Cladophora* and *Bryopsis* species live in rock pools or among red and brown seaweeds in the shallow subtidal zone. Green seaweeds also thrive in shallow, tropical lagoons, where species of *Caulerpa*, *Udotea*, and *Halimeda* are often abundant. *Caulerpa* species have runners (stolons), which creep through sand or cling to rock, while the bases of *Udotea* and *Halimeda* are a bulbous mass of fibers that anchor in sand. *Halimeda* (cactus seaweed) is heavily encrusted with calcium carbonate, which breaks up when the plant dies, contributing to the lagoon sand.

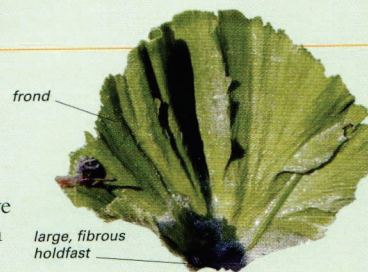


FLEXIBLE SEAWEED

Able to handle fluctuations in salinity and temperature, *Ulva* species thrive in this freshwater stream as it flows across the seashore.

ANATOMY

The body structure of green seaweeds lacks stems and roots. Green seaweed shapes range from threadlike (filamentous) to tubes, flat sheets, and more complex forms. Their bright green color is due to the fact that their chlorophyll is not masked by additional pigments, unlike red and brown seaweeds. Many of the features of green algae, including their types of chlorophyll, are shared by higher plants (mosses, liverworts, and vascular plants), so green seaweeds appear to be more closely related to higher plants than to red and brown seaweeds.

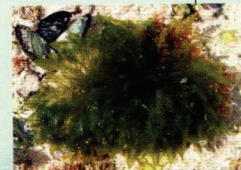


SEAWEED BODY PARTS

Green seaweeds have a simple structure, with an erect frond and a disk-shaped or fibrous holdfast. This tropical *Udotea* species has calcified fronds with many branched siphons.

FRAGILE FRONDS

This delicate *Bryopsis plumosa* has coenocytic fronds, meaning its fronds do not have the crosswalls common in other green seaweeds.



CODIUM FOREST

This mini-forest of *Codium fragile* is growing on shallow rocks in a sheltered bay in Scotland. The fronds are buoyant, holding the plants up to the light.

CLASS ULVOPHYCEAE

Flaccid Green Seaweed

Ulothrix flacca



SIZE Up to 4 in (10 cm)

HABITAT Intertidal on various shore types

HABITAT 32–68°F (0–20°C)

DISTRIBUTION Northern Atlantic, Mediterranean, waters off South Africa, Pacific

This seaweed is made up of many unbranched green filaments, which themselves consist of strings of cells. The filaments form soft, woolly masses or flat green layers that stick to intertidal rocks. Each filament is

attached to its rock by a single cell called a basal cell, which may be given additional anchorage by outgrowths called rhizoids. This seaweed reproduces by releasing up to a hundred gametes, each with two flagellae, from some of the cells. In another phase of its life cycle it is a single globular cell.



CLASS ULVOPHYCEAE

Sea Lettuce

Ulva lactuca



SIZE Up to 40 in (100 cm)

HABITAT Intertidal and shallow subtidal

WATER TEMPERATURE 32–86°F (0–30°C)

DISTRIBUTION Coastal waters worldwide

Sea lettuce is common worldwide on seashores and in shallow subtidal areas, growing in a wide range of conditions and habitats. Its frond is a bright green, flat sheet, which is often split or divided, and has a wavy edge. The plant is very variable in shape and size, ranging from short, tufted plants on exposed shores to



sheets over a yard long in sheltered, shallow bays, especially where extra nutrients are available in polluted harbors. Sea lettuce reproduces by releasing gametes from some cells, and it can also spread vegetatively by regeneration of small fragments. Large fronds lying on the seabed may be full of holes made by grazing animals. It is a popular food for humans in many parts of the world.