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|  | Marine Algae and Ulva Lactua: What it is and how it grows.  The pacific coast waters are rich in nutrients. They support a rich assemblage of marine algae, including the world�s most elaborate submarine forests of kelp. The seaweeds, or algae, are considered relatively primitive plants by botanists because they lack the elaborate conductive tissues and nutrient gathering roots of the vascular plants that dominate terrestrial environments. However, because seaweeds are bathed by nutrient-bearing water, they can survive perfectly will without these specializations, and many grow to very large sizes. Seaweeds require light and a solid attachment site to prosper. They are attached to the substrate by a mass of root-like, anchoring devices called a holdfast. Because the entire plant is capable of absorbing the nutrient fertilizers from the water, true roots are not necessary, and the holdfast tissue has no special absorptive ability. They rely on the tough elasticity of the holdfast to pull themselves up toward surface light for photosynthesis. In a typical algae, stem-like structures called stipes grow from the holdfast. The stipes in turn support flat blades. In some seaweeds there are no recognizable stipes, and the size of the stipes blades vary considerably from one algal species to another. The size of the holdfast is directly related to the size of the plant and the particular environment in which it grows. Algae growing in the exposed rocky intertidal zone need much larger holdfasts than those growing in a protected, quiet water environment. The reproduction of marine algae is without seeds, but instead by way of microscopic gametes. Some of these have actively swimming reproductive bodies, may be so abundant they give a distinct green color to the water. Algae also supply food, oxygen, shelter and hiding places to intertidal animals (Niesen).  Ecological factors are of primary importance in determining the distribution of marine algae on the Monterey Peninsula. First, there must be an adequate substratum for the permanent attachment of algae. Sandy beaches with continually shifting sands, as Carmel Beach, rarely have permanently attached algae. On the other hand, the rough surface of rocks and cliffs, as at Moss Beach, affords so favorable a surface for the attachment of algae that all rocky surfaces are densely clothed with algae.  The green algae, Ulva lactua, are predominant in waters with a mix of fresh water and salt water. Ulva lactua or more commonly known as sea lettuce are the least diverse algae and tend to be found in fairly shallow, inshore environments. Ulva is restricted narrowly to coastal regions and do not occur below a depth of about 10 meters. The plants are usually thin, transparent sheets, bright green in color, and often rather crinkly. They are two cell-layers thick, a point that has to be established by microscopic examination of thin slices. Ulva can be very abundant an ecosystem and very short lived (Russo). For example, it sometimes covers nearly every hard substrate visible, and a week or so later is almost entirely gone. In many harbors and tide pools, sea lettuce, is decidedly the dominant alga. On areas exposed to considerable sunlight and extreme nutrients, it grows so luxuriantly that there is little room for anything else. It can grow in great profusion throughout the intertidal zone, often growing on other algae as well as the rocky substrate. These algae are extremely variable, and their habitat of growth is affected by water temperature and other environmental circumstances such as pollution.  [Intro #1](http://docs.google.com/intro.html)  [Intro #2](http://docs.google.com/intro2.html)  [Intro #4](http://docs.google.com/intro4.html) |

*This Web Site is Best viewed with 256 or more colors.*

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