

Seaweed For Human Consumption reading passage

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A. Seaweeds are algae that live in the sea or in brackish water. Scientists often call them 'benthic marine algae', which just means 'attached algae that live in the sea'. Seaweeds come in three basic colors: red, green, and brown: dulse is the red seaweed; sea lettuce is amongst the green algae, and the brown is a wrack. Red and brown algae are almost exclusively marine, whilst green algae are also common in freshwater and in terrestrial situations. Many of these algae are very ancient organisms, and although lumped together as 'algae' are not actually closely related, having representatives in four of the five kingdoms of organisms. There are about 10,500 species of seaweeds, of which 6,500 are red algae (Rhodophyta).

B. The trend today is to refer to marine algae used as food as 'sea-vegetables'. The main species used in Ireland at present are dulse, carrageen moss, and various kelps and wracks. Dulse – also known as dillisk in a number of areas – is a red alga that is eaten on both sides of the North Atlantic. Generally only eaten in Ireland after it has been dried, it is frequently sold in small packets, most commonly in the west and north. About 16 tonnes are used in Ireland at present; the species is also eaten in Canada, Iceland, Norway, France, and Scotland. About 53 tonnes of carrageen moss were gathered in Ireland in 1994.

C. Whilst dulse and carrageen moss are worthy sea-vegetables with a history of utilization and a small but proven market, other species also show considerable promise. Our kelp resources are considered underutilised. All of the kelp species are edible but *Laminaria saccharina* is probably the most palatable as it has a somewhat sweet taste, probably due to its high levels of mannitol, and it also looks better.

D. Two other brown algae with potential as food are currently under investigation by us: *Himanthalia elongata*, known in some places as thongweed, and *Alaria esculenta*, also known as dabberlocks or murlins. *Himanthalia* is eaten in France after drying or pickling ('Spaghettis demer'), and plants are sold in Ireland dried. After soaking in water it makes a surprisingly fine accompaniment to a mixed salad; it does not have the strong seaweedy taste that some dislike. With the aid of a basic research grant from Forbairt, the Irish research, and development body, we are examining the growth and life cycle of populations of this species on the west coast. Plants are easy to collect but must be dried quickly and packaged well to preserve their excellent taste and mouthfeel.

E. *Alaria* is a large, kelp-like brown alga that grows on exposed shores; In Ireland, plants grow to considerable sizes, being found up to 6m in length in some areas, but these are dwarfed by some Pacific species that may grow to 18m in length and to 2m in width. With Marine Research Measure funding, a study of the possibility of developing fast-growing hybrids of this species by crossing species from the Atlantic and Pacific is being carried out. We have grown in culture isolates of *A. esculenta* from Ireland, Scotland, France, Norway, and Atlantic Canada and other

species from British Columbia and Japan. Species of this genus are ideal for cross-breeding studies as the males and females are tiny filamentous plants that are relatively easy to grow and propagate in culture under the red light which stimulates reproduction in our growth rooms. Male and female reproductive structures occur on different plants so that we can put plants from one country in with those from another to see if they are sexually compatible.

F. To date, we have obtained interesting results with *A. praelonga*, a large species from Japan that co-operates sexually with *A. esculenta* from the Aran Islands and other Irish sites. The resulting Irish/Japanese progeny are grown initially in sample bottles agitated on a small shaker and their growth rates compared with plants that have resulted from self-crosses. Preliminary results are very encouraging, with hybrid plants showing relatively high growth rates. We hope by this method to obtain sterile hybrids that will not reproduce in the wild so that we can introduce foreign genetic material without the fear that some sort of a triffid will be introduced that will take over the west coast of Ireland.

G. While studies of these two food species are very promising, we must bear in mind that the market -for such sea-vegetables is very small and needs development and investment. Nutritionally, sea-vegetables are as good as any land-vegetable and are superior in their vitamin, trace element, and even protein content. The increase in catholic food tastes in Europe should see greater utilisation of sea-vegetables in the next 20 years.

Seaweed For Human Consumption - Reading Questions

Questions 1-5

Classify the following features as characterizing

- A.** brown algae
- B.** green algae
- C.** red algae
- D.** Brown and red algae

Write the correct letter **A, B, C or D** in boxes 1-5 on your answer sheet.

- 1. are being investigated as possible food sources.
- 2. are now called sea-vegetables.
- 3. make up more than half of all seaweed species.
- 4. are found on land and in freshwater.
- 5. are nearly all marine.

Question 6 – 9

Complete the table below.

Choose **NO MORE THAN THREE WORDS** from the reading passage for each answer. Write your answers in boxes 6 – 9 on your answer sheet.

Types of brown algae	Himanthalia elongate	Alaria esculenta
Potential	food	Food
Common name	thongweed	Dabberlocks or 6. _____
Research funded	With a 7 _____ from forbairt	By marine research measure
Purpose	To examine growth and lifecycle populations	Creation of fast growing 8. _____
Advantage	Easy to collect	Just right for 9. _____

Question 10 – 13

Answer the questions below. Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 10-13 on your answer sheet.

10. What does the red light in the growth rooms do?
11. What are initial growth rates shown to be?
12. What does the sea-vegetable market need?
13. What increasingly should lead to greater consumption of sea-vegetables?