

Mariculture — Cultivating the crops of the sea

Following their successful development of techniques for the commercial cultivation of Irish Moss, a seaweed of importance to the Maritimes' economy, scientists from NRC's Atlantic Regional Laboratory have turned to other algae found in the Atlantic region. These investigations might one day provide new food crops from the sea.

Along with fishing, a traditional occupation of Maritimers has long been the harvesting and processing of the marine alga Irish Moss, a sea crop which brings in several million dollars to the local economy each year. This marine plant is the source of carrageenan, a polysaccharide gelling agent used in the processing of foods such as ice cream, desserts, beer and soups, as well as in the manufacture of cosmetics, paint and drugs. Until recently, Irish Moss harvested in the Atlantic region provided about 80 per cent of the carrageenan produced in the Western world. Today, a variety of seaweeds having different types of carra-

geenans are obtained from all over the world.

When the Atlantic Regional Laboratory (ARL) of NRC was established in Halifax in 1952, very little scientific information was available on marine algae. Dr. Fred Simpson, the present Director of ARL, makes the point rather strikingly: "when we started investigating seaweeds, more than two decades ago, our knowledge of their taxonomy, genetics, biochemistry and chemistry was at a level comparable to what man knew of terrestrial plants 200 years ago!

"Interest in marine algae stems as much from plain scientific curiosity as from a desire to exploit their unusual natural products," continues Dr. Simpson. "These plants have evolved in an environment vastly different from terrestrial or fresh water plants and not only contain unique biological compounds but have quite different life cycles, growth processes and reproductive mechanisms. For example, many grow best at low temperatures, reflecting biochemical adaptations that

have developed over the millions of years since their common ancestry with land plants. These and other unusual modifications make these plants extremely interesting to the researcher."

The Atlantic Regional Laboratory has established a multidisciplinary group of biologists, biochemists and chemists to study marine plants and utilize the knowledge gained in aiding the economy of the Atlantic region. The group is providing a central focus in the Maritimes for such studies and is heavily engaged in cooperative work with scientists in universities in the Atlantic region, and with other government agencies and industry. This year, in cooperation with students at Acadia University and the Department of Manpower and Immigration, a major study of the fauna and flora of tidal basins in the Bay of Fundy has been launched.

One of the principal success stories in marine algae research concerns the work on the Atlantic region's most economically important algal species, Irish Moss (*Chondrus crispus*).

Bruce Kane, PIB/DIP



Irish Moss cultured in the Sandy Cove growth tanks (left) differs in appearance from the wild plant found on the rocks of the seashore (right). Cultured plants are much darker in color because of the use of fertilizers, and assume a spherical shape, very likely due to continuous tumbling in the moving waters of the tank. Placed in unfertilized seawater, these cultured plants will bleach to a yellow color, much like that of the wild plant; this bleaching process, in which the level of carrageenan (a commercially valuable extract) increases, has been named the Neish effect after the late Dr. A. C. Neish, a former director of the Atlantic Regional Laboratory.

La mousse irlandaise cultivée dans les réservoirs de Sandy Cove (à gauche) diffère en apparence de la plante sauvage trouvée sur les rochers en bord de mer (à droite). Les plantes cultivées sont beaucoup plus foncées, vu l'utilisation des engrais, et prennent une forme sphérique, probablement en raison de l'agitation continue de l'eau des réservoirs. Si ces plantes sont placées dans de l'eau de mer exempte d'engrais, elles pâlisent pour prendre une couleur jaune proche de celle de la plante à l'état sauvage; ce processus, au cours duquel le niveau de carraghénane (un extrait intéressant sur le plan commercial) augmente, a été nommé l'«effet Neish», en mémoire du regretté Dr A. C. Neish, ancien directeur du Laboratoire régional de l'Atlantique.