

NON-INDIGENOUS AQUATIC SPECIES OF CONCERN FOR ALASKA

Fact Sheet 17

Brown Alga

Phaeophyta (Microspongium globosum)

BIOLOGY & PHYSIOLOGY

Physical Description: Brown algae, including approximately 1,500 species, are the largest and most complex of all algae. All are multicellular and most are marine. They owe their characteristic brown or olive color to accessory pigments (fucoxanthin) in the chloroplasts. Chloroplasts are plant organelles that are responsible for photosynthesis.

Microspongium globosum (Brown Alga) is spherical in shape and is about 1/25 inch in diameter. It consists of branched upright filaments and hairs arising from a base of procumbent filaments. In general, very little information is available on the Brown Alga's biological and ecological characteristics.

Nutrition Requirements: Brown algae acquire nutrients from photosynthesis and by absorbing dissolved nutrients from the surrounding water.

Reproduction: Brown Alga reproduces entirely asexually by means of spores deriving from multi-cell sporangia (organ containing or producing spores) with each cell containing a single spore.

Lifecycle Stages: The lifecycle of brown algae typically involves an "alternation of generations" between diploid (a cell containing two sets of chromosomes, one set inherited from each parent) and haploid (a cell with one set of chromosomes) cells.

Habitat: Brown algae are especially common along temperate coasts and in colder water of the Northern Hemisphere. They inhabit the intertidal and subtidal zones of coastal waters. In general, brown algae are not free-floating organisms; they are more typically attached to rock, coral, or other firm surfaces. It has been shown that Brown Alga can typically grow at temperatures of 39-41°F in coastal Finland. It is widely reported that Brown Alga grows on *Fucus* species.

DISPERSAL POTENTIAL

Historical and Current Introduction/Spread: Brown Alga was first recorded in Alaska in 1998 where it is currently established. Brown Alga has been observed to grow on the cryptogenic (unknown origins) brown alga *Delamarea attenuata*, attached to oyster floats at Tatitlek, Alaska. The Brown Alga is known previously from the North Atlantic and Japan, but is has not been found in the waters of British Columbia and Washington. The current distribution of Brown Alga includes the North East Atlantic, North East Pacific, and the North West Pacific.

Dispersal Methods: Brown Alga can typically reproduce and disperse from fragmentation of plant parts that then can be carried by ocean currents or humans. Short distance dispersal can occur by the gametes (sperm and eggs) being carried on ocean currents. The Brown Alga may have been introduced to Prince William Sound, Alaska and dispersed by the oyster industry or by ballast water. It has been suggested that certain *Fucus* species may have been introduced to new habitats via ballast water. Since Brown Alga (*Microspongium*) typically attaches itself to *Fucus*, then it is possible that Brown Alga may also be introduced via ballast water.

IMPACTS AND CONTROL

General Impacts: Algal invasions can be of great concern because introduced species can have serious ecological consequences by competing with native macroalgae. Introduced species can eventually lead to changes in community structure and food webs. As fouling organisms, brown algae can have ecological consequences when introduced to new habitats.

Management Information: Invasions by algal species have received attention only recently. Identifying the type and ecology of an invasive algal species can be very difficult but essential to understanding how to reduce or eradicate the invasive. Currently, molecular techniques that use DNA markers are being used to help identify and trace the origin of invasive species. There are no known eradication techniques currently being used for Brown Alga.