Green sea-fingers (tomentosoides), *Codium fragile subsp. fragile*

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Overview

Short description of *Codium fragile subsp. fragile*, Green sea-fingers (tomentosoides)

A spongy green seaweed with numerous Y-shaped, branching, cylindrical fronds; may reach 70 cm high but in Britain usually to 25 cm. The fronds have a felt-like texture and a disc-shaped holdfast formed from many fine filaments. Can be distinguished from native *Codium tomentosum* by microscopic examination.

Description of *Codium fragile subsp. fragile*, Green sea-fingers (tomentosoides) status in GB

Established around GB including the Scilly Isles, Channel Islands, South Wales, the south coast of England, the west coast of Scotland to Argyll.

Habitat summary: *Codium fragile subsp. fragile*, Green sea-fingers (tomentosoides)

Occurs on rock and coralline algae in pools and on open rock from the mid to lower shore, and in shallow subtidal waters. On sandy or muddy bottoms it attaches to bivalve shells, rocks or artificial structures. It mainly inhabits protected bays and estuaries but also occurs on semi-exposed shores.

Overview table

Environment:	Marine
Species status:	Non-Native
Native range:	Kazan-retto, Nansei-shoto, Ogasawara-shoto
Functional type:	Algae (macroalgae)
Status in England:	Non-Native
Status in Scotland:	Non-Native
Status in Wales:	Non-Native
Location of first record:	River Yealm, Devon.
Date of first record:	1939

Invasion history: *Codium fragile subsp. fragile*, Green sea-fingers (tomentosoides)

Origin

Native to the Pacific Ocean; Japan and Korea.

First Record

Green sea fingers first appeared on Dutch shores just before 1900 and subsequently spread rapidly through Europe. In Great Britain it was first recorded from the Yealm Estuary, Devon in 1939, growing on oyster shells.

Pathway and Method

It is unknown by which means green sea fingers arrived in Europe, but secondary dispersal has occurred through the movement of shellfish and associated equipment, fouling of ships' hulls and natural dispersal.

Species Status

Green sea fingers has spread from the Northwest Pacific to the Pacific and Atlantic coasts of North America, the Atlantic coast of Europe, the Mediterranean, Australia, New Zealand, South Africa and Chile. Rapid spread has been reported in some regions, up to 1200 km in 10 years. It is believed that man-made structures can act as corridors for dispersal into habitats where green sea fingers would otherwise not become established. Aquaculture sites, harbours and pontoons may all provide settlement sites.

Ecology & Habitat: *Codium fragile subsp. fragile*, Green sea-fingers (tomentosoides)

Dispersal Mechanisms

This alga produces a variety of propagules including vegetative buds, fragments of the thallus and entire dislodged thalli, all of which are dispersed by surface currents. Furthermore, it releases weakly swimming 'swarmer' cells toward the end of the growing season. These propagules exhibit varying retention rates in the water column, enabling both short and long distance dispersal. Human-mediated transport also occurs through fouling of ships' hulls, fishing nets and aquaculture products and equipment.

Reproduction

In GB, green sea fingers reproduces sexually but also exhibits parthenogenetic (an unfertilized cell develops into a new individual) and vegetative (a new plant grows from part of the parent plant) reproductive strategies. In the parthenogenetic method, weakly swimming, swarmer cells which settle and develop into an adult plant. Vegetative reproduction occurs by fragmentation (through wave action or grazing), producing segments which are dispersed and subsequently settle and reattach to the substrate. Mature plants also produce vegetative buds which detach from the parent plant and are also capable of reattachment and growth.

Known Predators/Herbivores

The sea slugs *Elysia viridis* and *Placida dendritica*, sea urchins and snails are known to feed upon green sea fingers.

Resistant Stages

None known.

Habitat Occupied in GB

Occurs on rock and coralline algae in pools and on open rock from the mid to lower shore, and subtidally to depths of fifteen metres. On sandy or muddy bottoms it attaches to bivalve shells, rocks or artificial structures. It mainly inhabits protected bays and estuaries but also occurs on semi-exposed shores.

Distribution: *Codium fragile subsp. fragile*, Green sea-fingers (tomentosoides)

Native range from around Japan in the Pacific Ocean. In GB it is found from the Scilly Isles, Channel Islands, South Wales, the south coast of England, the west coast of Scotland to Argyll.

Impacts: *Codium fragile subsp. fragile*, Green sea-fingers (tomentosoides)

Environmental Impact

In Canada green sea fingers has displaced native seaweed species and become the dominant canopy species in some areas, consequently altering community structure and composition, where conditions permit. Most significant impacts have occurred where algal diversity in the invaded area is low. In Great Britain algal diversity is high and green sea fingers has not yet occurred in nuisance densities.

Health and Social Impact

May cause a nuisance to humans when it accumulates and rots on beaches, producing a foul smell.

Economic Impact

Where it occurs in high densities, green sea fingers can be a fouling nuisance to shellfish beds, smothering mussels and scallops, clogging scallop dredges and interfering with harvesting. It also fouls boats, fishing nets, wharf pilings and jetties. Economic losses may be incurred through cleaning costs, loss of utility and reduced harvest.

References & Links: *Codium fragile subsp. fragile*,

Green sea-fingers (tomentosoides)

Identification

Brodie, J., Maggs, C.A. & John, D.M. (2007) *Green Seaweeds of Britain and Ireland*. British Phycological Society, Dunmurry

Biology, ecology, spread, vectors

Chapman, A.S. (1999) From introduced species to invader: what determines variation in the success of *Codium fragile* ssp. *tomentosoides* (Chlorophyta) in the North Atlantic Ocean? *Helgoland Marine Research*, **52**, 277-289.

Scheibling, R.E., Lyons, D.A. & Sumi, C.B.T. (2008) Grazing of the invasive alga *Codium fragile* ssp *tomentosoides* by the common periwinkle *Littorina littorea*: Effects of thallus size, age and condition. *Journal of Experimental Marine Biology and Ecology*, **355**, (2), 103-113.

Watanabe, S., Metaxas, A. & Scheibling, R.E. (2009) Dispersal potential of the invasive green alga *Codium fragile* ssp. *fragile*. *Journal of Experimental Marine Biology and Ecology*, **381**, 114-125.

Management and impact

Chavanich, S., Harris, L.G., Je, J-G, & Kang, R-S. (2006) Distribution pattern of the green alga *Codium fragile* (Suringar) Hariot, 1889 in its native range, Korea. *Aquatic Invasions*, **1**, (3), 99-108.

Neil, P.E., Alcalde, O., Faugeron, S., Navarrete, S.A. & Correa, J.A. (2006) Invasion of *Codium fragile* ssp. *tomentosoides* in northern Chile: A new threat for *Gracilaria* farming. *Aquaculture*, **259**, 202-210.

Trowbridge, C.D. (2002) Local elimination of *Codium fragile* ssp. *tomentosoides*: indirect evidence of sacoglossan herbivory? *Journal of the Marine Biological Association of the United Kingdom*, **82**, 1029-1030.

General

Silva, P.C. (1955) The dichotomous species of *Codium* in Britain. *Journal of the Marine Biological Association of the United Kingdom*, **34**, (3), 565-577.