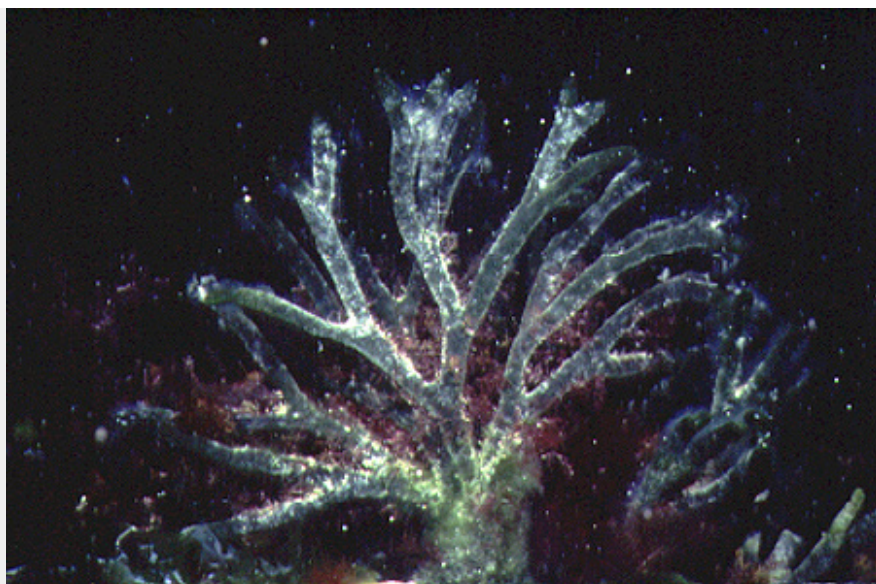


Dead man's fingers

Codium fragile ssp tomentosoides

(Sur.) Hariot subsp. (Van Goor) Silva

Division: Chlorophycota
Class: Chlorophyceae
Order: Bryopsidales
Family: Codiaceae



Copyright: Karen Gowlett-Holmes, CSIRO Marine Research

Description

Codium fragile ssp. tomentosoides is a large, dark green macroalga with one to several, thick upright branches arising from broad, spongy, basal disc attached to the substrata. The dichotomous branches are usually 3-10mm in diameter and 15-20cm high but have been recorded reaching 1m in length. The branches are generally hairy (tomentose) just below the tips. The utricles at the tips of the branches are irregularly cylindrical with a constriction (waist) in the middle portion. Fronds are generally annual and dieback in winter and arise from the perennial basal portion in spring.

Reproduction & Growth

C. fragile ssp. tomentosoides is capable of sexual and asexual reproduction. Sexual reproduction in the introduced form is parthenogenetic with the alga releasing motile female gametes "swarmers" that can germinate in the water column without fertilisation. *C. fragile* is considered to be dioecious (separate male and female plants), although numerous reports of monoecious (both sexes present on one plant) thalli do exist. Reproductive structures occur throughout the year but are more common in spring-summer. Asexual reproduction by thalli fragmentation occurs particularly in colder months.

Habitat

The alga has wide environmental tolerances including temperature and salinity regimes and is found in estuarine to full marine waters. It is found in a wide variety of areas, from very protected through to intermediately wave exposed in both intertidal and subtidal habitats. It grows profusely on any hard substrate including rocky reef, boulders, cobbles, shellfish, wharf pylons and marine farming equipment.

Feeding Primary Producer

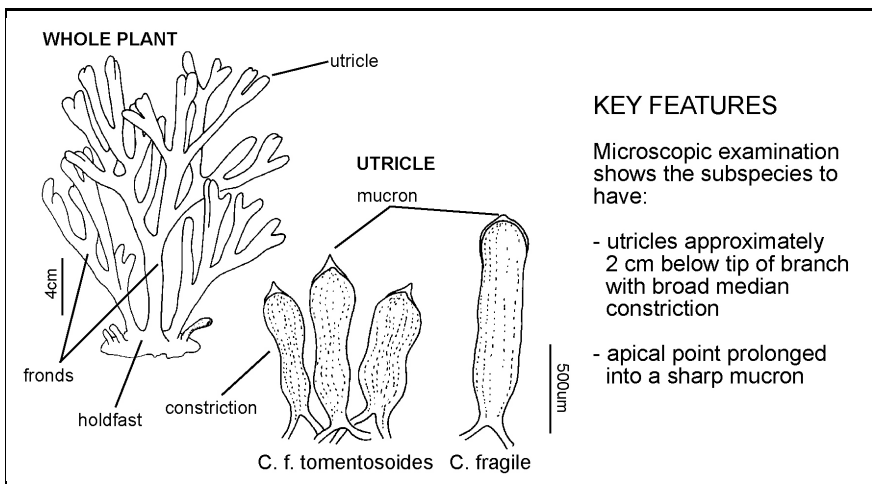
C. fragile ssp. tomentosoides produces its own food through photosynthesis.

Predators

C. fragile ssp. tomentosoides is consumed by generalist grazers such as snails, sea slugs, chitons, sea urchins and isopods in both its native and introduced ranges.

Impacts

C. fragile ssp. tomentosoides is regarded as a pest because of its invasive capabilities and its reported impacts on shellfish farms in the northwest Atlantic. It is recorded as preventing the re-establishment of native algal species in New Zealand but can not competitively exclude them. In Australia it is reported to settle on native algae and shellfish and to foul commercial fishing nets. In some areas large wracks of the algae accumulate and rot on beaches after storms.



Copyright: Diagram from Droomgoole, 1975

KEY FEATURES

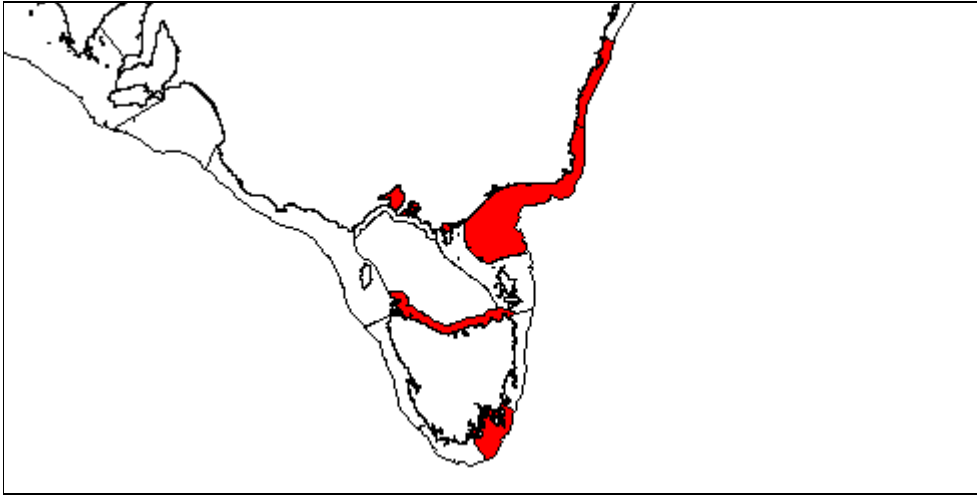
Microscopic examination shows the subspecies to have:

- utricles approximately 2 cm below tip of branch with broad median constriction
- apical point prolonged into a sharp mucron

Similar species

- Codium fragile ssp. tasmanicum* (J. Agardh) Silva in Silva & Womersley, 1956
- Codium fragile ssp. novae-zelandiae* (J. Agardh) Silva in Silva & Womersley, 1956
- Codium galeatum* J. Agardh, 1887
- Codium duthieae* Silva in Silva & Womersley, 1956
- Codium harveyi* Silva in Silva & Womersley, 1956
- Codium muelleri* Kuetzing, 1856
- Codium australicum* Silva in Silva & Womersley, 1956
- Codium spinescens* Silva & Womersley, 1956

Australian IMCRA BioRegion Infection Status



Control Options

For control information see the web site: <http://crimp.marine.csiro.au/nimpis>

Likely Vectors - Class/Vector

Fisheries

Fisheries: accidental with delibera

Natural Dispersal

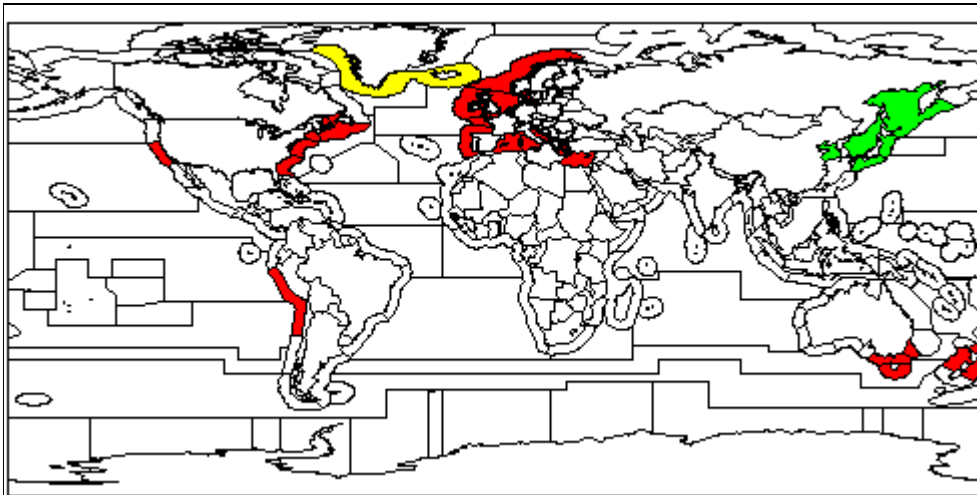
Natural Dispersal

Shipping

Ships: accidental with ballast wat

Ships: accidental as attached or fr

Worldwide BioRegion Infection Status



Key References

- Campbell, S. J. (1999). Occurrence of *Codium fragile* ssp. *tomentosoides* (Chlorophyta, Bryopsidales) in marine embayments of southeastern Australia. *Journal of Phycology* 35(5):938-940.
- Carlton, J.T. and Scanlon, J. A. (1985). Progression and dispersal of an introduced alga: *Codium fragile* ssp. *tomentosoides* (Chlorophyta) on the Atlantic Coast of North America. *Botanica Marina* 28:155-165.
- Dromgoole, F. I. (1975). Occurrence of *Codium fragile* subspecies *tomentosoides* in New Zealand waters. *New Zealand Journal of Marine and Freshwater Research* 9:257-264.
- Eno, C.N., Clark, R.A., Sanderson, W.G., (1997). Non-native marine species in British waters: a review and directory. Joint Nature Conservation Committee (JNCC), Peterborough .
- Ramus, J. (1972). Differentiation of the green alga *Codium fragile*. *American Journal of Botany* 59(5):478-482.
- Silva, P.C. (1955). The dichotomous species of *Codium* in Britain. *Journal of the Marine Biological Association of the United Kingdom* 34:565-577.
- Silva, P.C., Womersley, H.B.S. (1956). The genus *Codium* (Chlorophyta) in Southern Australia. *Australian Journal of Botany* 4:261-289.
- Trowbridge, C. D. (1996). Introduced versus native subspecies of *Codium fragile* : How distinctive is the invasive subspecies *tomentosoides*. *Marine Biology* 126:193-204.
- Trowbridge, C. D. (1999). An assessment of the potential spread and options for control of the introduced green macroalga *Codium fragile* ssp. *tomentosoides* on Australian shores. CSIRO CRIMP Technical Report, CSIRO Marine Research, Hobart .
- Trowbridge, C. D. (1998). Ecology of the green macroalga *Codium fragile* (Suringar) Hariot 1889: invasive and non-invasive subspecies. *Oceanography and Marine Biology: an Annual Review* 36:1-64.

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