



Styela clava

Leathery Sea Squirt, Club sea squirt, Club tunicate, Asian tunicate, Rough sea squirt

Threat scores

1. Ecological impact
 - Negatively modifies native habitat; fouling; economic losses to aquaculture. Competes for food and resources with native and aquaculture species.
 - Known to consume planktonic larvae of other organisms and reducing their rates of settlement. In this way it can become a major problem for shellfish aquaculture, and it can also be a nuisance fouler of boat hulls and fishing gear.
 - In Japan, *Styela clava* has been blamed for an asthmatic condition in oyster shuckers, apparently caused by hammering open *Styela*-fouled oysters in poorly-ventilated work areas.
 - No recorded predators on *Styela clava*.
2. Invasive potential
 - A fouling organism requiring assisted transport to expand alien range.
3. Geographic extent
 - Locally pervasive
4. Management difficulty
 - Many management options listed for control, but are costly and time consuming.



Geography and Habitat

1. Origin: Asia from the Sea of Okhotsk, southern Siberia, Japan and Korea along the China coast to Shanghai.
2. 1st collected in California in Newport Bay 1932, then Elkhorn Slough in 1935
3. “*Styela clava* appears to have been introduced to Europe [1953], eastern North America [1970] and Australia [1972] in hull fouling, since its 1-2 day planktonic larval phase is too short for long distance transport in currents or ballast tanks” (Molnar 2008).
4. Marine, estuaries/bays, fouling communities, intertidal zones, aquaculture
5. “Common on rocks, floats and pilings in protected waters, and on oyster and mussel shells, and is occasionally found on seaweeds. It mainly occurs in the low intertidal to shallow subtidal zones, rarely to 25 m depth” (Molnar 2008).

Invasion Pathways

1. Natural Spread
 - Known
 - Larvae spend only 1-2 days in plankton - sufficient time for localized spread to nearby bays.
2. Ballast Water and Sediments
 - Accidental possible
 - Short distance transport in ballast water - larvae only spend 1-2 days in plankton
3. Hull/Surface Fouling
 - Accidental known
 - Cause- hull fouling
 - Attached to hulls of transcontinental ships

4. Aquaculture and Mariculture Activities

- Accidental known
- Cause- aquaculture
- Accidental introductions when transported with fish or shellfish

Non native locations

1. 40- Gulf of Maine/Bay of Fundy
2. 41- Virginian
3. 56- Puget Trough/Georgia Basin
4. 57- OR, WA, Vancouver Coast and Shelf
5. 58- Northern California
6. 59- Southern California Bight

Sources

1. Molnar, Jennifer, et al. 2008. "Assessing the global threat of invasive species to marine biodiversity." *Frontiers in Ecology and the Environment*. 6 (9), pp. 485-492.
1. <http://conserveonline.org/workspaces/global.invasive.assessment>
2. <http://doris.ffesm.fr/gestionenligne/photos/styela-clava-6.jpg>