violet tunicate
*Botrylloides violaceus*

Synonyms: *Botrylloides aurantius, Botrylloides aurantium, Botrylloides carnosum*,

Other common names: chain tunicate, lined colonial tunicate, orange sheath tunicate, ascidian

Family: Styelidae

AphiaID. 148715

**Description (Curran & Chan, 2013)**

*B. violaceus* is a marine colonial tunicate with rapid growth and mat-forming capabilities that colonizes and dominates artificial and natural hard substrata. They form flat sheets and occasionally lobate structures. A colony consists of a number of teardrop-shaped zooids, connected by a common tunic, that are arranged in elongated clusters. Zooids have 10-11 rows of stigmata and 9-12 stomach folds. Each zooid is a single color, and all the zooids within a colony are the same color, usually orange, yellow, red, purple or tan, and occasionally brown or lavender. The matrix is usually clear, though in some older colonies it can be the same color as the zooids. Blood vessels can be seen extending through the matrix with pigmented blobs at their terminus.

**Ecological impact**

*Impact on community composition, structure, and interactions:* *B. violaceus* colonies can displace other fouling organisms through competition for resources, which can result the marked decrease in select species, or biodiversity as a whole (Myers 1990, Osman & Whitlatch, 1995; Bullard et al. 2004; Dijkstra and Harris 2009).

*Impact on ecosystem processes:* Reduced biodiversity and limited species access to resources can limit ecosystem productivity and lessen ecosystem resilience to disturbance.

*Economic Impact:* *D. vexillum* poses a nuisance to aquaculture activities and is expected to have substantial impacts on the shipping and fisheries industry (Gittenberger, 2009; Carman et al., 2010; Bullard et al. 2015)

**Biology and invasive potential**

*Reproductive potential:* Like all colonial ascidians, *B. violaceus* reproduces sexually and asexually. Larvae are lecithotrophic and spend less than 24 hours in the water column before settling and developing into adult colonies (Brown et al., 2009).

*Potential for long-distance dispersal:* Transoceanic transport of *B. violaceus* is unlikely because the planktonic stage is short.

*Potential to be spread by human activity:* Transport occurs as biofouling on vessel hulls and infrastructure, shipping of live seafood, or in ballast and bilge water (Dijkstra et al., 2008; Lambert, 2007; Ruiz et al., 2000)

*Habitat requirements:* *B. violaceus* can tolerate a wide range of temperature, salinity, and nutrient
conditions (Carman et al., 2007; Dijkstra et al., 2008). They can survive in temperatures ranging from -1 to 27°C and salinities of 15 to 34. Grows on hard substrata and occurs in the intertidal to 50 m and can persist out of water during tidal cycles (CABI, 2021).

Congeneric biota: At the time of writing, Botrylloides is a parent to over 68 species.

Legal Listings
- Has not been declared invasive
- Listed invasive in Alaska
- Listed invasive by other states
- Federal invasive species
- Listed invasive in Canada or other countries

Distribution and abundance
B. violaceus is native to the northwest Pacific from northern Japan and China, extending to southern Korea. It has since spread to the eastern Pacific (Lambert & Sanamyvan 2001; Bock et al., 2011), parts of the northern Atlantic (Stachowics et al., 2002), Mediterranean and Black Sea (Zanilolo et al., 1998). It is a common fouling organism throughout much of its range.

Management
Eradication of invasive tunicates becomes difficult after significant geographic dispersal. However, local control methods have been applied using X-ray radiation (Rinkevich & Weissman, 1990), chemical methods such as application of organotics (Cima et al., 1995), and use of anti-fouling agents to prevent settlement (Terlizzi et al., 1997). However, anti-fouling methods have been cautioned against as they may exacerbate spread by facilitating colony fragmentation (Coutts and Sinner, 2004). The uncertainty of removal methods and ease of transport indicates that the current best method of reducing the impacts of B. violaceus is to establish effective education and monitoring programs to promote early detection and rapid response.

References


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