



**LIFE HISTORY STRATEGIES OF THREE
SPECIES OF *CYSTOPHORA* (PHAEOPHYTA,
FUCALES) FROM A SHALLOW SUBTIDAL
COMMUNITY IN SOUTH AUSTRALIA**

by

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Summary

A number of life-history traits were quantified for three species of *Cystophora* J. Agardh (Phaeophyta, Fucales) from a shallow, subtidal mixed fucoid community in South Australia. The three species studied were *C. expansa* (Areschoug) Womersley, *C. monilifera* J. Agardh and *C. subfarcinata* (Mertens) J. Agardh. The community was located in Backstairs Passage, South Australia, at an approximate depth of 4.5m (at low tide). The community was rich in algal species but the canopy was dominated by fucoids, in particular species of *Cystophora*.

The composition and dynamics of the community were monitored and related to temporal changes in the patterns of growth and reproduction of each species, and also to patterns of recruitment and early community development. These were determined using an artificial system of settlement plates.

The results showed that community structure was variable through time depending on the demographics of *Cystophora*, and in particular *C. expansa*, the community dominant. Although a number significant differences existed in the various life-history traits of each species, a general strategy for the success of *Cystophora* in the community can be proposed.

Cystophora was able to dominate the community through the maintenance of a closed canopy for most of the year and this was perpetuated through a "bank of sub-canopy juveniles" that was always present in the understory and acted as a buffer against the removal of adults. Patterns of growth and reproduction were both seasonal and clearly linked. Increased growth occurred as the reproductive structures were developing and maximal plant size was achieved as plants became reproductively mature.

After reproduction the spent receptacles were shed and growth became minimal or even negative in *C. expansa*. Adult plants became denuded and typically dense canopy was thinned for a short period of time. This was seen to facilitate recruitment in *Cystophora* as growth conditions in the sub-canopy environment were improved and the newly settled offspring were able to achieve rapid growth.

The overall strategy for success in *Cystophora* therefore relied on the timing of the various life-history processes to promote this mechanism and enable the “bank of sub-canopy juveniles” to thrive.