

Invertebrate Fauna Associated with Floating *Sargassum horneri* (Fucales: Sargassaceae) in the East China Sea

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(Received 2 July 2012; Accepted 16 May 2013)

The invertebrate fauna associated with floating *Sargassum horneri* (Turner) C. Agardh, 1820 in the East China Sea was investigated in terms of ecology and biogeography. Floating algal rafts consisting of only *S. horneri* were collected at 16 stations in the East China Sea during a cruise of research vessel (R/V) *Tansei-Maru* in February, 2011. A total of 53 rafts were obtained for faunal investigations at 14 of the 16 stations. In addition to fish eggs, 10 invertebrate taxa were found on the floating algae. Of the collected phytal animals, harpacticoid copepods were most abundant in terms of number (80%), followed by cirripedes (15%), amphipods (4%), and others (1%). The faunal diversity on the algae was correlated to the algal weight. The faunal diversity differed significantly between stations and was highest in the northernmost part of the East China Sea. Density and abundance of animals were highest in areas close to the Kuroshio Current. Considering the direction of flow of the Kuroshio Current and the density of cirripedes immigrating from the surrounding water onto the floating algae, most of the floating *S. horneri* possibly originated in the southern part of the East China Sea. On the other hand, the *Sargassum* rafts collected in the northernmost part of the East China Sea could have originated from the coast of eastern China. Most of the animals found on the floating *Sargassum* were pelagic taxa that complete their life cycles on the rafts *in situ*. Typical coastal animals, including gammaridean and caprellidean amphipods, tanaidaceans, nematodes, gastropods, polychaetes, halacarid mites, bryozoans, and hydrozoans, were also obtained from the floating *Sargassum*, but only occasionally and their densities were quite low. These facts suggest that dispersal events among benthic habitats via *Sargassum* rafts are relatively rare.

Key Words: floating algae, rafting, *Sargassum horneri*, phytal animals, invertebrate fauna, East China Sea.

Introduction

Recently, many studies have focused on faunal associations with floating algae from the points of community ecology and biogeography (e.g., Wichmann *et al.* 2012). In particular, extensive ecological studies of faunal communities on floating algae have been carried out in the North Atlantic Ocean (Ingólfsson 1995, 1998, 2000; Vandendriessche *et al.* 2006a, b; Clarkin *et al.* 2012), the South Pacific (Kingsford and Choat 1985; Wichmann *et al.* 2012), and in the Northeast Pacific (Hobday 2000a). Several studies have noted significant relationships between the size or weight of the floating algae and the faunal richness, faunal abundance, and density of animals in algal patches, which sometimes vary seasonally and/or geographically (Fine 1970; Stoner and Greening 1984; Ingólfsson 1998; Khalaman and Berger 2006; Vandendriessche *et al.* 2006a, 2007). Furthermore,

several studies have discussed the origin of the fauna on the floating algae, *i.e.*, whether such animals primarily inhabited the algae before they were dislodged from the shore or secondarily invaded from ambient pelagic waters while the algae were floating at the sea surface (Kingsford and Choat 1985; Ingólfsson and Ólafsson 1997; Ingólfsson 2000; Vandendriessche *et al.* 2006b). Biological dispersal of marine organisms on floating algae is also interesting in the context of biogeography. Several studies have emphasized the possibility of long-distance dispersal of particular seashore fauna across the ocean via algal rafts (Yeatman 1962; Locke and Corey 1989; Helmuth *et al.* 1994; Ingólfsson 1995; Hobday 2000a, b; Ólafsson *et al.* 2001; Thiel and Haye, 2006; Nikula *et al.* 2010; Fraser *et al.* 2011; Wichmann *et al.* 2012).

In the adjacent waters of Japan, ecological studies of communities of floating algae have been carried out from a phycological point of view (Segawa *et al.* 1959a–c, 1960a, b, 1961, 1963; Yoshida 1963, 2004; Ohno 1984; Hirata *et al.*