

GROWTH AND SURVIVAL OF BARNACLES IN THE PRESENCE OF ASCIDIANS AS POTENTIAL COMPETITORS: GROWTH BANDS ANALYSIS

Marina Nikolaeva^{1*}, Alexandra Yakovis¹, Natalia Shunatova¹, Anna Artemieva¹, Eugeny Yakovis¹.

¹Invertebrate Zoology Department, St.-Petersburg State University, Universitetskaya nab. 7/9, 199034, St.-Petersburg, Russia

Competition between keystone species is one of the principal causes of successions in terrestrial and marine communities. In the White Sea shallow subtidal, barnacles *Balanus crenatus* Brugiere and solitary ascidians *Styela* spp., *Bolthenia echinata* (L.) and *Molgula* spp. often form clusters on bivalve shell debris partially buried into muddy sediment. These habitat islands are reported as pattern-generators for the surrounding assemblage. Preliminary observations suggested that individual clusters develop according to a certain temporal pattern, gradually changing from barnacle to ascidian dominance. The consistency found in size structures of ascidians and barnacles (live and dead analysed separately) may be attributed to the interplay of intraspecific competition in barnacles and interspecific one between barnacles and ascidians. We studied how the presence of large ascidians and neighbouring barnacles affects recent barnacle growth and survival, as traced from growth increments and dead:live ratios. In July 2004 and 2005, SCUBA divers collected 50 clusters containing 1933 barnacles at 2 sites near Solovetskiy Island (Onega Bay, White Sea). Barnacle age was determined by examining growth bands on the outer shell surface; growth increments were measured. Growth increments formed during the last three years decreased as age, conspecific neighbours' biomass, and ascidian biomass increased (all effects significant at $p < 0.05$, repeated measures GLM). The strength (but not the direction) of the effects was site- and year-specific. Dead:live ratio in barnacles was significantly higher for the age classes 1+ and 4+...9+ in the clusters where ascidians dominated or the barnacle biomass was less than 1 g/cm² (Fisher's exact test). We conclude that ascidians may affect patch dynamics by altering barnacle growth and survival, though the interspecific effect is weaker than intraspecific one.