Biology of *Salpa thompsoni*: editorial comment on the highlight article by Lüsckow et al. (2020)

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While the importance of pelagic tunicates has long been recognized (e.g., Alldredge and Madin 1982), most of the research on marine zooplankton has focused on crustacean forms, particularly copepods (Fig. 1). This discrepancy can be explained by the colossal abundance of copepods, but it is also surely driven by the challenges posed by studying more fragile organisms. However, information on the biology and ecology of pelagic tunicates, and salps in particular, is crucial, especially in the light of the alarming ongoing shift from krill to salps in the Southern Ocean (Atkinson et al. 2004). In this system, *Salpa thompsoni* is the most abundant pelagic tunicate and, because of its high ingestion rates and fast sinking fecal pellets, *S. thompsoni* has the potential to drive biogeochemical cycling in the Southern Ocean (Perissinotto and Pakhomov 1998; Manno et al. 2015). Despite its importance, this species has not been studied in great detail (Fig. 1), and its biology remains poorly understood.

In this context, the study by Lüsckow et al. (2020) is particularly timely as it provides novel insights into the growth and development rates, and on the diel vertical migration behavior of *S. thompsoni*. By tracking several water parcels, each containing one cohort of *S. thompsoni*, for a few days, the authors characterized the demography of this species through a series of in situ observations and ex situ on-board experiments. This approach enabled Lüsckow et al. (2020) to estimate that 6–10-mm blastozoids grow at 8.8–11.7% day⁻¹ at 10 °C, with good agreement between cohort-based field estimates and ex situ growth chamber measurements. Furthermore, the authors determined that transition times between development stages are of 3.8 ± 1.5 days, which

allows newly released aggregate chains to complete a cycle to functional male blastozoids within 23 days. The authors also identified through integrative Bongo tows that *S. thompsoni* exhibits daytime-dependent vertical abundance patterns, and that these diel migration patterns are size specific, with medium-sized blastozoids and large oozoids contributing most to the elevated abundances in the upper 200 m at night. This study provides new and important information on the biology of *S. thompsoni*, which will prove particularly

Fig. 1 Number of studies published in ISI journals on marine copepods, pelagic tunicates, and *Salpa thompsoni*. Information was obtained by searching the ISI Web of Science database for studies from 1970 to 2020 using the following search terms: (1) marine copepod, (2) salp or doliolid or appendicularian and plankton, and (3) *Salpa thompsoni*

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useful to understand the increasingly structuring role of this species in a gradually warming Southern Ocean.

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