

Large-scale study on patchy distribution of salps and doliolids in North Pacific Ocean: Patterns, Drivers and Impacts.

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Zooplankton are central link in the marine pelagic food web. They bridge the gap between primary producers and higher order consumers. Their sensitivity to environmental variability enables them to indicate the ecological condition in the ecosystem. However, highly diverse groups of zooplankton in the pelagic environment respond differently to the environmental variables. We investigated a large-scale surface distribution, biomass and species composition of salps and doliolids during four consecutive summers (2016-2019) along several transects on 36°N and 46.38°N extended from 141.9°E to 164.9°W along North Pacific Current (NPC). NPC is a dynamic region that is formed by southern part of the North Pacific Subpolar Gyre and the northern part of the North Pacific Subtropical Gyre. Collections of ten groups of zooplankton were made at total of 267 stations and six environmental parameters were recorded (temperature, salinity, NO₃, PO₄, SiO₂ and Chlorophyll a). Spatial distribution patterns of gelatinous and non-gelatinous zooplankton were distinct and were closely associated with nutrients and hydrographic conditions. Salp, *Thalia democratica* showed a preference for lower temperatures (mean SST 11.1-13.4 °C) than *Salpa fusiformis* (mean SST 14.5°C) but with similar range of salinity (mean SSS 34.16-34.40 and 34.3 respectively). The doliolid *Dolioletta gegenbauri* preferred lower temperatures (mean SST 15.0-17.8°C) and lower salinity (mean SSS 32.76-32.99) than *Doliolum denticulatum* (mean SST 21.3 °C; mean SSS 33.67). Relationship between spatial distribution of salps and doliolids and environmental factors was assessed by the BIOENV analysis which highlighted the patchy distribution patterns in NPC were erratic in time or space due to the variability in environmental parameters.

Keywords: pelagic tunicate, salp, doliolid, North Pacific Ocean