Food habit of larval *Electrona antarctica* (Myctophidae) off Wilkes Land, East Antarctica

Satoshi Nirazuka[1, 2], Kohei Matsuno[2, 3], Ruth Eriksen[2], Ryosuke Makabe[4, 5], Kerrie Swadling[2, 6], So Kawaguchi[2, 3], Dirk Welsford[3], Masato Moteki[1,4]

[1]Tokyo University of Marine Science and Technology, [2]Antarctic Climate and Ecosystems Cooperative Research Centre, [3]Australian Antarctic Division, [4]National Institute of Polar Research, [5]Graduate University of Advanced Studies, [6]Institute for Marine and Antarctic Studies

Myctophid fishes are believed to play a key role in the Southern Ocean (SO) food web along with krill. Of the 35 species of myctophids in the SO, *Electrona antarctica* is the most abundant species. Early larval *E. antarctica* is believed to use an environment related sea ice as a nursery ground, which likely provide a preferable food environment. Larval stages of other myctophid species mainly feed on zooplankton such as copepod nauplii. This study aims to reveal the food habit of larval *E. antarctica*.

A multidisciplinary research cruise was conducted off Wilkes Land of the SO during January 2017 (austral summer). Larvae were sampled by a ring net (mouth diameter: 1.60 m, mesh size: 500 μm) and IONESS (Intelligent Operative Net with Environmental Sampling System; mouth area: 1.0 m^2, mesh size: 335 μm). Guts were extracted on a slide to analyse gut contents for 58 larvae (5.0-14.4 mm body length: BL). Gut contents were identified into 13 groups: *Pseudo-nitzschia* spp. / *Nitzschia* spp. complex, *Rhizosolenia* spp., setae of *Chaetoceros* spp. / *Thalassiothrix antarctica* / *Trichotoxon reinboldii* complex (setae of CTT), *Thalassiosira* spp., *Fragilariopsis* spp., *Chaetoceros* spp., zooplankton, zooplankton fragments, aggregates including zooplankton (zoo. aggregates), aggregates including setae of *Chaetoceros* spp. / *T. antarctica* / *T. reinboldii* complex, other aggregates, detritus fragments, phytoplankton fragments, membranous fragments, other fragments. Volume of each item was measured by polarized light microscopy. IRI [Index of Relative Importance, IRI = %F×(%N + %V)]. Percentages of volume and IRI were calculated for each size class (A: 5.0-6.9 mm, B: 7.0-8.9 mm, C: 9.0-11.9 mm and D: 12.0- 14.9 mm BL). Detritus and phytoplankton fragments were excluded from calculation of percentages of volume and IRI. Kruskal-Wallis test was used to compare the percentage value of a food item.

Some setae of CTT and zooplankton fragments were found in an aggregated form. Setae of CTT and zooplankton fragments were considered to be derived from aggregates, as zooplanktons in the guts of larvae were usually found in nearly complete form. Setae of CTT recorded the highest percentage of volume and IRI in the size classes A (58.4% of volume and 84.0% of IRI) and B (29.7% and 42.7%). The total volume percentage of setae of CTT, zooplankton fragments, zoo. aggregates and other aggregates decreased with growth (71.7%, 64.4%, 67.6% and 20.2% in classes from A to D, respectively), while total IRI percentage of these items exhibited no significant difference (Kruskal-Wallis test, $p = 0.11$) between all size classes (87.6%, 66.4%, 54.1% and 58.9%). Zooplankton in the class D recorded apparently high percentages in volume (11.9%, 15.0%, 18.2% and 72.8%) and IRI (0.51%, 0.59%, 2.1% and 23.3%) compared to other classes. However, IRI percentage of zooplankton was lower than that of setae of CTT (25.9%) and other aggregates (26.6%) in class D. These results imply that sinking detritus such as phytoplankton-aggregates and fecal pellet is the potentially important food item for larval *E. antarctica*, even though larger larvae most likely feed more zooplankton.