Distributions of larval and juvenile/adult stages of the Antarctic myctophid fish, *Electrona antarctica*, off Wilkes Land in East Antarctica

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Mesopelagic fish represent a vast amount of biomass in the Southern Ocean ecosystem, and lanternfish (Myctophidae) are a dominant family of these fish. Of the 35 myctophid species recorded in the Southern Ocean, *Electrona antarctica* has the largest biomass and is broadly distributed in the Southern Ocean, across a wide range of latitudes from the Antarctic Polar Front (APF) to the high Antarctic zone This study investigated the larval and juvenile/adult spatial distributions of the Antarctic myctophid *E. antarctica*. Fish were sampled in January 2011 and January 2012 on a transect along 140°E and in January 2013 along 110°E using two different opening/closing net systems. In total, 1,075 *E. antarctica* were collected: 948 larvae, 121 juveniles/adults, and 6 in the transformation stage. Most larvae were collected at 5–200m depth, with diel vertical migration (DVM) not apparent. Larvae were mainly distributed in the Modified Circumpolar Deep Water (–1.5°C to 2.0°C). By contrast, an analysis of the echogram at 38 kHz and discrete depth samples implied that juveniles/adults undertook DVM except in the continental slope area (65.5°S). As the distribution of krill is limited to the cold water mass (<–1.5°C) along the continental slope, *E. antarctica* and krill populations are spatially separated off Wilkes Land during summer. According to the previously estimated larval period of 30–47 days, *E. antarctica* may spawn in late November to December in the marginal ice zone or near the sea ice edge. This study implies that the environment related to sea ice provides a nursery ground for early stage larvae of *E. antarctica*, suggesting that sea ice changes could impact on the population dynamics of adult fish, which is important prey for higher trophic animals in the Southern Ocean, through annual fluctuation of the early survival.

References

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Fig. Developmental sequences of larval and juvenile *Electrona antarctica*. A–C: larval stage, D: transformation stage, E and F: juvenile stage. Arrows *a* and *b* in panel D indicate melanophores on the body surface and newly appearing photophores, respectively. The numbers in each photograph indicate body length.