

N. Iguchi and T. Ikeda (2004).

Vertical distribution, population structure and life history of *Thysanoessa longipes* (Crustacea: Euphausiacea) around Yamato Rise, central Japan Sea  
日本海、大和堆における*Thysanoessa longipes*の鉛直分布、個体群構造そして生活史  
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The euphausiid, *Thysanoessa longipes* Brandt, is distributed widely in the northern North Pacific. Within the northern North Pacific and its marginal seas, including the Bering, Okhotsk and Japan Seas. In the Japan Sea, *T. longipes* is one of the most dominant zooplankton species, especially in the northern and central areas. However, despite its potential importance, the ecological role of *T. longipes* in the Japan Sea has long been hampered by their net avoidance behavior and rough winter seas, especially in offshore areas. Also, information about growth is limited to the populations from other areas, the northern North Pacific, the Okhotsk Sea and off British Columbia, Canada. These previous data were obtained during short periods in the year and lack information on diel vertical migration, which is essential to detail the life history pattern of this species in the Japan Sea. Accordingly, we investigated vertical distribution patterns of *T. longipes* individuals in the northern, central and southern Japan Sea. We also studied their growth and spawning around the Yamato Rise, central Japan and those results are compared with the same species in other regions.

We used various nets, e.g. NORPAC (45cm, 335 $\mu$ m), bongo (70cm, 500 $\mu$ m), fish-larva (130cm, 500 $\mu$ m), MTD horizontal closing nets (56cm, 335 $\mu$ m) and MOCNESS (1m<sup>2</sup>, 335 $\mu$ m). All samples were preserved immediately in 10% buffered formalin. The specimens were separated into eggs, larvae (calyptopis - and furcilia), juveniles, males, females and females with spermatophores based on morphological characters. Body length (BL, from the posterior margin of the eye notch to the terminal end of the sixth abdominal segment) was measured under a dissecting microscope, and total length (TL, from the tip of the rostrum to the distal end of the telson excluding spines) was also examined for some specimens simultaneously to establish the allometric relationship.

*Thysanoessa longipes* was present throughout a broad bathymetric layer extending down as deep as 1000m. There was a tendency for larger specimens to live at deeper levels than smaller specimens. Since females attain a larger BL than males, females were more abundant than males in the deeper layer, whereas juveniles were consistently abundant in the shallower layers. The peak of abundance of the total population occurred at depths of 30-300m at night, and 150-500m during the day, and the distance of the diel vertical migrations of the total population was estimated to be between 100 and 150m. Over all developmental stages of *T. longipes*, the size ranges recorded were 2.8-3.3mm for furcilia larvae, 3.5-12.6mm for juveniles, 7.8-17.4 mm for males, 8.9-22.5mm for females and 15.9-22.1mm for females with spermatophores. Population structure analysis revealed the occurrence of three cohort aged 0+, 1+, 2+ years, with females attaining a larger body size than males. Growth as determined by body length was found to fit well to the von Bertalanffy growth equation. The estimated life span for males and females is 3 years, and females reach maturity in 2 years. Based on the occurrence of calyptopis larvae, spawning of *T. longipes* was estimated to occur over only a limited period of the year between April and May.

Laboratory experiments on egg spawning and observations of the larval development of *T. longipes* are needed to aid our understanding of the early life history of *T. longipes* in the future. Kim Hey Seon