

Notice on plankton seminar

#07012

9:30-11:30, 9 July (Mon.), 2007 at Room #W-103

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Leah R. F., C. T. Shaw and W. T. Peterson (2006)

Larval development of *Euphausia pacifica* in the laboratory: variability in developmental pathways

*Mar. Ecol. Prog. Ser.*, **316**: 127-137

*Euphausia pacifica*の幼生発達：発達経路の多様性

*Euphausia pacifica* is abundant throughout much of the North Pacific, ranging from Mexico northward in the California Current, westward around to the Sea of Japan and southward to the East China Sea. Regional differences can exist among this species population. The development of *E. pacifica* includes; 2 naupliar stages, a metanauplius stage, 3 calyptopis stages and 6 to 7 furcilia stages. Variability in developmental pathways of the furcilia stages has been reported previously. However, it is impossible to tell whether the variability in developmental pathway through the late furcilia stages (FIII to FVII) had one or multiple instars within the same stage or skipped a stage. To document variability in the developmental patterns of late furcilia stages, we observed their development in the laboratory. Such the data can be used to estimate in situ growth, productivity and mortality rates, of field populations. In this study we monitored the development of *E. pacifica* from egg-hatching to the juvenile stage using specimens collected from the Oregon upwelling region. We report on the developmental stage, stage duration and individual variability in development pathways for the larvae reared in the laboratory.

We collected adult *Euphausia pacifica* at a station (44°40'N, 124°40'W; 300m depth) with bongo nets (60cm diameter, 202  $\mu$ m-mesh) off Newport, Oregon, in July 2001. The euphausiids were transferred to the laboratory, where females spawned eggs at 10.5°C (field temperature). After hatching of the eggs, we selected 4 cohorts of nauplii (a cohort represents a batch of eggs spawned from a single female) for experiments. Larvae were staged under a dissecting microscope using the morphological descriptions of Boden (1950). The larvae were maintained separately (1 individual per jar) from the third furcilia to the juvenile stage to observe the developmental pathways. The developmental pathways of individuals was determined based on cast molts.

All 4 cohorts followed a similar pattern of development. Individual cohorts developed at nearly the same rate until the first furcilia stage (F1), after which 2 cohorts (cohort 1 and 4) began to develop significantly faster than the others (cohort 2 and 3). Median time from egg-hatching to the juvenile stage ranged from 51.9 to 60.6d. Stage duration increased with increasing development stage up to FIII, and then declined. Especially, the first calyptopis stage (C1) and F III lasted longer than any other stages. Individual development from FIII to juvenile varied widely both within and among cohorts. We observed 4 main developmental pathways. Over one half of the euphausiids skipped 1 development stage between FIII and juvenile (58%), and none skipped multiple stages. There was no tendency for individuals from the same cohort to follow the same developmental pathway. This variability in development may be even higher in the field and could impact mortality calculations and cohort analysis from field samples.

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次回(7月23日)は松本さんと佐藤君にお願いしています。