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Proteolytic degradation of multiple vitellogenin and derived yolk proteins during final oocyte maturation in Japanese anchovy, *Engraulis japonicus*

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Japanese anchovy (*Engraulis japonica*) is a very important marine species for commercial fisheries in addition to marine ecosystem. They are multiple spawning type species having oval-shaped pelagic eggs. However, little has been known about physiological and biochemical features on the process of their egg production. The aim of this study is to clarify morphological and biochemical changes of oocytes during final oocyte maturation (FOM), especially focused on proteolytic degradation of vitellogenin (Vg)-derived yolk proteins (YPs). The oocytes/eggs were collected from 1 pm to 10 pm coincide with the times of FOM and spawning in captive condition. Morphological observations showed that FOM was completed within 8 hours, and the processes were classified into five stages, including post-vitellogenic oocyte stage (St-I) to ovulated egg stage (St-V). Wet mass of oocytes increased from 69 μg (St-I) to 244 μg (St-V) due to high increases of water contents suggesting drastic hydration occurred during the FOM. Three types of Vgs were identified in the liver of Japanese anchovy, including Ja-VgAa, -VgAb and -VgC, and quantitative analysis of Ja-Vgs mRNA expression levels indicated that VgAa and VgAb were probably majors having important roles on yolk accumulation. The analyses of gel chromatography coupled with SDS-PAGE demonstrated proteolytic degradations of major YPs during the latter half of FOM. On the other hand, free amino acid (FAA) contents increased approximately 11 folds high during FOM. These results suggest that FAAs yielded from the proteolysis of YPs generate buoyancy of eggs involved with drastic hydration.

Biography

Dipak Pandey has completed his Master's degree in Chemistry Education from Tribhuvan University, Nepal and Master's degree in Agriculture with major 'Bio-resource production sciences' specialized in Fisheries Research under supervision of Professor Takahiro Matsubara from Ehime University, Japan. Currently, he is pursuing his Doctoral degree at United Graduate School of Agricultural Sciences (UGAS), Ehime University, Japan.

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