コレゴヌス・ムクスンの飢餓時におけるL-ヒスチジンとアンセリンの消長

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Short Paper

Changes of Free L-Histidine and Anserine Levels in the Muscle of Starved Whitefish *Coregonus muksun*

Hideomi Amano,*1 Toshihiko Fujiyoshi,*2 and Hiroyuki Noda*1

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We have reported that the muscle of whitefish *Coregonus muksun* (Family Coregonidae) transplanted to a reservoir showed a large decrease in free L-histidine and a small increase in anserine levels with a decrease in body weight.[1] In starving rainbow trout[2] a marked decrease in free L-histidine and a relatively smaller in-increase in anserine levels were pointed out. The present study was conducted to see whether these changes of histidine and anserine levels in transplanted whitefish reappear in artificially starved fish.

Ninety whitefish weighing about 540 g each were transferred from the Inland Fisheries Branch, Fisheries Research Institute of Mie into a net cage (3 m in length ×3 m in width ×8 m in depth) placed in an Isaka reservoir where whitefish were previously transplanted experimentally, and kept for 180 days without feeding. For sampling, three fish were caught every 30 days. Ten grams of white muscle was collected from the dorsal part of each fish, minced, and mixed with the fleshes from 3 fishes.[1] The contents of L-histidine and anserine in trichloroacetic acid extracts of the muscle were measured in the same manner as described previously.[1]

The results obtained are shown in Fig. 1. The condition factor was given as an indication of starvation. At the end of the experimental period, the body weight and condition factor of starved fish decreased to 78.8 and 76.3% respectively of the initial value. Corresponding figures for transplanted fish[1] were 82.2 and 76.5% after body weight and condition factor started to decrease upon reaching peak value. Absence of stomach contents were observed throughout the experimental period. With the decrease in body weight and condition factor, free histidine levels of starved fish decreased from 8.6 to 0.9 μmol/g of wet muscle tissue, a loss of 89.5% of initial level. For transplanted fish a comparable loss of 87.9% was observed, calculated from the period of decreasing histidine level. In contrast, anserine level increased steadily in both groups during the experimental period. More pronounced increase in anseine was observed in starved fish after 90 days. This trend in anserine level is similar in transplanted fish following decrease in condition factor. The levels in starved fish increased from 8.1 to 11.1 μmol/g muscle tissue during this period, a 37.0% increase, comparable to that of transplanted fish during the period of decreasing condition factor (39.3%). Therefore, we conclude that the changes of histidine and anserine levels in transplanted whitefish as re-reported previously[1] are the results of starvation.

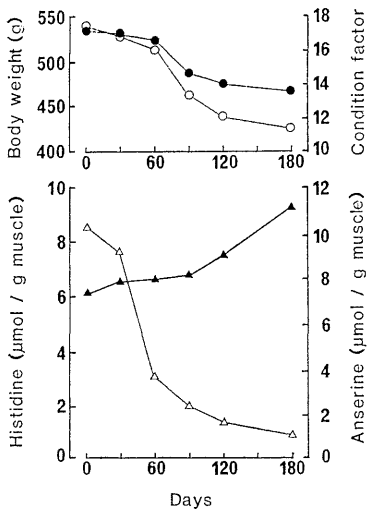

Fig. 1. Comparison of body weight, condition factor, and the levels of free L-histidine and anserine in the muscle of starved whitefish. ○, Body weight; ●, Condition factor; △, Histidine; ▲, Anserine.

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*1 Laboratory of Marine Biochemistry, Faculty of Bioresources, Mie University, Tsu, Mie 514, Japan (天野秀臣，野田宏行：三重大学生物資源学部).
*2 Fisheries Promotion Division, Mie Prefectural Office, Tsu, Mie 514, Japan (藤吉利彦：三重県水産振興課).