培養シオミズツボワムシのアイソザイムの電気泳動分析

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Short Paper

Electrophoretic Analysis of Isozymes from Cultured Rotifer *Brachionus plicatilis*

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Two variations among the rotifer *Brachionus plicatilis* are found in Japan, and are generally designated as S-type and L-type. The ecological differences clearly exist between the two types.[1-3] We cultured S-type rotifer as food organisms for larval ayu. It is said that this S-strain produces no resting eggs in mass culture with salt water. However, we have observed rotifers that probably hatched from resting eggs in a culture tank, and then confirmed the the production of resting eggs in a S-derived strain. The S-derived strain, designated G-type, is much larger in size than the S-type.

In these circumstances, it is considered that differences between S- and G-types are caused by not only environmental conditions but also genetic variations. Similar reasons are expected as to differences between S- and L-types. Therefore, we examined electrophoretic patterns of isozymes from the three types of rotifer.

S- and L-types of rotifer were supplied from Yakult Central Institute for Microbiological Research, and G-type rotifers were obtained by hatching resting eggs. The three types of rotifer were cultured under optimal condition from May to October, 1986. The samples were collected from the tanks on the logistic phase and were kept in a −20°C freezer until experiment.

Each sample was homogenized in an equal volume of distilled water under cooling. The homogenate was allowed to stand for several minutes to obtain a supernatant. The supernatant was subjected to starch gel electrophoresis. Electrophoresis and analysis were carried out according to Fujio[4] and Clayton and Tretiak.[5]

The five enzymes [lactate dehydrogenase(LDH, EC 1.1.1.27), malate dehydrogenase(MDH, EC 1.1.1.37), malic enzyme(ME, EC 1.1.1.40), 6-phosphogluconate dehydrogenase(6PGD, EC 1.1.1.44), and phosphoglucomutase(PGM, EC 2.7.5.1)] were detected by the method of Shaw and Prasad.[6]

The electrophoretic patterns of 6 PGD isozymes were classified into two groups; one was L-type and the other was S- and G-types (Fig. 1). L-type exhibited two bands, one migrating toward the anode and the other toward the cathode. S- and G-types exhibited a single band in the cathodic region. Between S-(or G-) and L-types, the electrophoretic mobility of cathodic band was the same. The pattern of L-type isozymes was designated as phenotype AB, and that of S- and G-types was as phenotype B. The different phenotypes were indicated by two alleles at *6 Pgd* locus. Two patterns were also found in MDH siozymes (Fig. 2). S- and G-types exhibited two bands, whereas L-type had three bands. The difference of banded pattern appeared in slow-moving bands. LDH and PGM isozymes appeared also as two patterns,

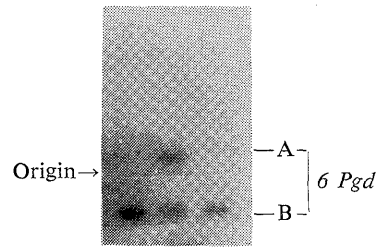

Fig. 1. Electrophoregram of 6 PGD isozymes from the three types of rotifer.

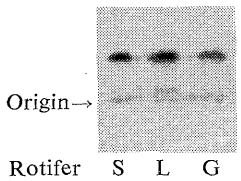

Fig. 2. Electrophoretic patterns of MDH isozymes from the three types of rotifer.

differing between S- or G-types, and L-type. In other species of Rotifera, *Asplanchna brightwelli*, *A. girodi*, and *B. calyciflorus*, genetic variations were confirmed by isozymic analysis of glucosephosphate isomerase and malic enzyme.[7] However, ME isozyme was found monomorphic in the present study for *B. plicatilis*. In previous studies[1,2,8] the possibility of genetic variation between S- and L-types was suggested from differences in optimal temperature for growth and reproductive isolation between the two types, but not evidenced.

It was proved that genetic variations exist between the S- (or G-) type and the L-type of rotifer by the present experiment. However, genetic variation between S- and G-types was not found.

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