「コバルト」ニジマスの血漿浸透圧およびナトリウムと塩素濃度

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Short Paper

Osmotic Pressure, and Sodium and Chloride Concentrations in the Blood Plasma of "Cobalt" Variant of Rainbow Trout*1

After hypophysectomy, plasma osmotic pressure, and sodium and chloride concentrations decrease in various species of freshwater fishes.[1] Consequently, these fishes become difficult to survive for long time. Recently, YAMAZAKI[2] reported that the "cobalt" variant of rainbow trout, *Salmo gairdneri*, was devoid of the pituitary gland. Accordingly, it is conceivable that the "cobalt" might show significantly lower values in plasma osmolality and electrolyte levels than those in normal rainbow trout. To confirm this, the present study was designed.

We obtained each nine fishes of "cobalt" and normal rainbow trouts from Shiga Prefectural Samegai Trout Experimental Station, Maibara. Fish blood was drawn from Cuvierian duct. The blood plasma was immediately separated by centrifuge. Plasma osmolality was measured with Advanced Osmometer, and plasma sodium and chloride concentrations were determined with flame photometer (Evans, Model 100) and chloride meter (Evans, Model 920), respectively.

Table 1 shows the results in the present study. In group A the plasma osmolality of the "cobalt" is significantly higher than that of normal rainbow trout ($P<0.01$). But there are no significant differences in the plasma sodium and chloride concentrations between "cobalt" and normal rainbow trouts ($P>0.05$). In group B, there are also no significant differences in the plasma osmolality, and sodium and chloride concentrations between these two kinds of fishes ($P>0.05$). DONALDSON and MCBRIDE[3] reported that the hypophysectomized rainbow trouts could survive for about three months. But they did not mention about the changes in plasma osmolality and electrolyte levels. Recently, OGURI[4] reported that the "cobalt" possessed the detached pituitary remnant consisting mostly of prolactin-like cells. The present study revealed that the plasma sodium and chloride concentrations in the "cobalt" were not significantly different from those in normal rainbow trout. This indicates that at least enough prolactin to maintain normal plasma osmolality and electrolyte levels is secreted from the pituitary remnant of the "cobalt" rainbow trout.

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Table 1. Plasma osmolality, and sodium and chloride concentrations of "cobalt" rainbow trout

Name of group Date of collection	Kind and No. of fish	Body length*1	Osmolality (mOsm/kg)	Sodium (mEq/l)	Chloride (mEq/l)
Group A	"Cobalt", 6	19–23.5 cm	339.7±7.7*2	155.5±4.0	117.5±4.9
July 25, 1973	Normal, 6	21.5–23	302.8±10.3	151.0±3.9	114.2±3.6
Group B	"Cobalt", 3	12–15	336.1±1.7	166.0±2.5	124.8±2.5
Dec. 6, 1973	Normal, 3	13–14	335.7±3.0	173.7±1.5	124.2±4.2

*1 Standard length, *2 Mean ± standard error

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