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Changes in length and weight of milkfish fry preserved in formalin

Shigeru Kumagai and Nelson Castillo

In fisheries research, the length and weight of fish are very important. It is well known that the size of fish preserved in formalin does not show its live value (Hongskul, 1970). Smaller specimens, especially hatched larvae, shrink more than their adult forms. On the average, a 10% shrinkage in total length could be expected (Mito, 1960).

The purpose of this study is to determine the effect of formalin preservative on the length and weight of fry. If the change in length and weight of fry is significant, it would be necessary to determine the minimum preservation period prior to measurement.

Forty live fry ranging from 12.5 mm to 15.4 mm in total length and from 3.2 mg to 7.8 mg in body weight were preserved in 5% and 10% seawater-formalin solutions.

Figure 1 shows the relative changes in preanal length, the total length and the body weight of milkfish fry with time. The fry shrank immediately after they were preserved in formalin. Shrinkage was noticeable for the first week. From the second week onwards shrinkage was almost nil and negligible. The fry in freshwater-formalin solutions shrank less than those in seawater-formalin solutions, with the fry in the higher concentration (10%) being more affected. At the end of the experiment, the average shrinkage in total length were 2.14% and 3.21 for 5 percent and 10 percent freshwater-formalin solutions and, 5.07% and 5.14% for 5 percent and 10 percent seawater-formalin solutions, respectively. The percentages of shrinkage in preanal length were similar to those in total length.

The wet body weight of the fry, except those in 10 percent seawater-formalin solutions, increased at first; then it decreased towards the end of the third week to the fourth week. After three to four weeks of preservation, the values became constant. As shown in Table I, however, the percentage of shrinkage is not uniform in each of the series.

From the results obtained, it is recommended that milkfish fry be preserved in formalin solutions for one week prior to length measurement and at least for three weeks before determining body weight. Since there is a difference in the shrinkage of fry preserved in 5% freshwater-formalin solution and those in 5% seawater-formalin solution, only one kind of preservative —

diluent solution must be used to preserve milkfish fry for the valid and accurate comparison of sizes.

Table 1. Mean size of fry (in percent) after 81 days of preservation.

| | | Seawater 5% | Formalin 10% | Freshwater 5% | Formalin 10% |
|-----------------------|-----|----------------|-----------------|------------------|-----------------|
| Mean | PAL | 94.089 | 94.192 | 98.090 | 96.848 |
| | TL | 94.867 | 94.926 | 97.860 | 96.793 |
| | BW | 65.360 | 60.898 | 85.504 | 76.828 |
| Standard Deviation | PAL | 0.7670 | 1.3938 | 0.3674 | 0.8483 |
| | TL | 0.9985 | 1.2414 | 0.5396 | 0.8585 |
| | BW | 9.1895 | 12.5731 | 10.6348 | 11.2815 |

PAL, Preanal Length; TL, Total Length; BW, Body Weight

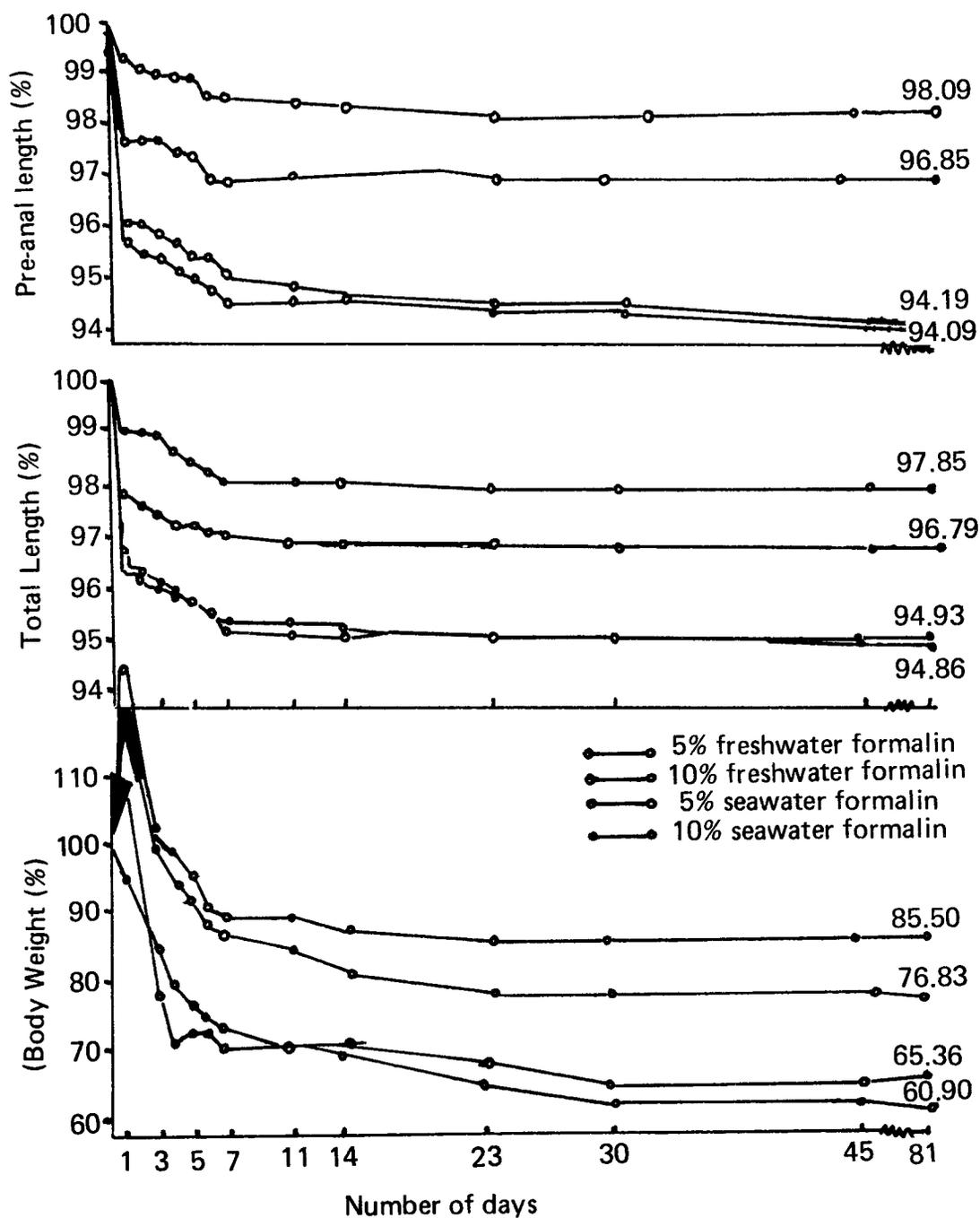


Fig. 1. Relative changes in the pre-anal length, the total length, and the wet body weight of milkfish postlarvae with time in different formalin solutions.

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