OSMOTIC AND IONIC REGULATION OF THE HAWAIIAN ANCHOVY, *STOLEPHORUS PURPUREUS*

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extended time period due to the build-up of toxic metabolites (periods greater than approximately 8 hr.). The alternative is to reduce baitwell water concentration to approximately 50% S.W. whenever possible. At baiting sites, the wells should be filled with diluted sea water. As previously mentioned, a brackish water system can remain closed for 6 to 8 hr. without reaching dangerous pollution levels. In the evening, when the tuna vessels return to port, baitwells should again be diluted to 50% S.W. This would necessitate an adequate water supply to the docks, but the water pipe installation would prove a profitable investment for the skipjack tuna industry.

SUMMARY

(1) Some osmoregulatory processes of the Hawaiian anchovy (Stolephorus purpureus, Fowler) were examined under controlled laboratory conditions. Nehu were exposed to five sea water dilutions (0%, 20%, 30%, 40%, and 60% S.W.) and the variables; mortality, body water, and serum salts were then analyzed to provide indices of tolerance and regulatory ability.

(2) Nehu suffer a significant loss of body water as a result of injury incurred during capture and transport (Appendix I). Body dehydration continues for a few hours after introduction to laboratory holding tanks (100% S.W.), followed by a recovery. Re-establishment of osmotic balance usually requires six to ten days.

(3) Mortality data indicate that the anchovy is slightly euryhaline. Although intolerant and slightly tolerant of 0% and 20% S.W. respectively, nehu subjected to 30%, 40% and 60% S.W. exhibited survival

rates equal to or higher than the control fish (100% S.W.).

(4) The body water and serum salt data (chloride and osmotic pressure) revealed a positive correlation between nehu tolerance and osmoregulatory ability in the various sea water dilutions. The anchovy suffered a rapid and non-recovering increase of body water and loss of serum salts in freshwater. 20% and 30% S.W. also induced significant changes in body water and internal fluid concentration, with a partial recovery occurring in 20% S.W. and a nearly complete recovery in 30% S.W.

(5) The processes possibly responsible for the "osmotic imbalance" and "recovery" phases were discussed.

(6) Results from the present investigation indicate that nehu survival aboard tuna vessels could be increased with: (1) the development of bait handling techniques less injurious to the animal, and (2) the use of brackish water (50% S.W.) in the baitwells whenever possible.