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A Comparison between Clove Oil and Rotenone for Collecting Subtropical Intertidal Fishes

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ABSTRACT

The efficacy of using an anaesthetic, clove oil, to collect subtropical intertidal fish assemblage was compared with an ichthyocide, rotenone. The effect of different water salinities and temperatures while using clove oil was also compared. The fish used in the latter experiment was the large-scale mullet (*Liza macrolepis*), which is abundant in intertidal zones of Taiwan. Results show that the effect of salinity on induction time of fish differs significantly from high salinities to low salinities. Significant linear relationship was found between water temperature and the induction time. The individual and fish species numbers collected using clove oil (36 species of 13 families) and rotenone (39 species of 17 families) is slightly different in northern Taiwan from January 2000 to October 2001. These findings suggest that clove oil is a chemical as efficient as rotenone and therefore can be used to replace the latter in collecting subtropical intertidal fishes.

Key words: *Anaesthetics, fish assemblage, intertidal fish, Liza macrolepis, Taiwan.*

INTRODUCTION

Fish sampling is a basic requirement for many ichthyological studies. To date, no single method which is efficient, economic and easily quantified has been carried out. In many semi-closed environments (e.g. intertidal zones, lakes, and estuaries) usage of ichthyocide, however, is still considered as the most efficacious and convenient way to collecting specimens compared with other netting techniques. Ichthyocides, such as NaCN (sodium cyanide) has been shown to be effective but toxic. Although under low concentrations and immediate aeration in fresh water some specimens can be revived for the live fish trade and for the seafood and aquarium markets (Hall and Bellwood, 1995). With demands for environmental and health protections, use of toxic chemical like cyanide has been strictly controlled in many countries, including Taiwan. Another ichthyocide, i.e. rotenone, has been used to replace cyanide; rotenone is known to be ineffective for collecting live specimens because the fish collected are dead mostly and not revivable.

The usage of anaesthetics provides an alternative for collecting fishes specimens. Applying anaesthetics in surveying intertidal fish assemblages is a beneficial method (Horn *et al*., 1999), particularly on rocky reefs where many fishes are either cryptic or agile to avoid visual surveys (Griffiths, 2000). It also avails the transportation of live specimens to the laboratory to carry out measurements and surgical procedures (Soto and Buthanuddin, 1995). Few have

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