PF-2

The Effective Location of Visible Implant Tags for Short-Term Marking in Nile Tilapia (*Oreochromis niloticus*: Cichlidae)

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Introduction

Identification of individual fish is essential for fisheries research on growth, migration, mortality, stock identification, and gear selectivity to trace the fate of a particular fish population (Konstantinov, 1978), although short-term retention may suffice for some experimental laboratory studies.

The visible implant (VI) tag designed to later identify individual specimens is an alphanumerically labeled strip of bio-compatible plastic (Haw et al., 1990). The purpose of this study is to assess efficacy for the site beneath branchiostegal ray inside operculum in Nile tilapia *Oreochromis niloticus* as a potential target of VI tagging.

Materials and Methods

Fish used in this experiment were healthy Nile tilapia with mean total length of 19.1±1.5 ㎝, ranging 17.2 ㎝ to 22.4 ㎝ and mean body weight of 95.7±22.6 g, ranging 62.9 g to 147.4 g. The application of VI tags to treatment fish and handling of control fish occurred on 23 January 1998. VI tags (2.5×1.0×0.1 ㎜, Northwest Marine Technology, Inc.) with an alphanumeric code on a black background were applied with a VI tag injector (Northwest Marine Technology, Inc.). VI tags were placed beneath branchiostegal rays inside left operculum. Control fish were handled the same as the treatment fish, except that no marks were applied. For 75 days after tagging, retention and readability of marks were determined at every 15 day intervals (a total of six times) and any mortalities were recorded in each

tank. All experiments were performed in duplicate.

Result and Conclusion

Although no mortalities occurred in control fish throughout the study period, survival of tagged fish decreased to 90% after 75 days. No tag loss occurred at the time of tagging, but tag retention rate decreased with time after tagging; cumulative tag retention after 15 days was 96%, 92% for 30 days, 90% for 45 days, 60% for 60 days and 10% for 75 days. All tags were readable through 30 days after they were implanted. However, the percentage of readable tags decreased to 91% after 45 days, 87% after 60 days and 20% after 75 days. This study demonstrated that during experimental period of the 45 days the site beneath the branchiostegal ray inside the operculum of Nile tilapia was suitable for VI tagging.

Previous attempts by Northwest Marine Technology to tag the Nile tilapia have been unsuccessful (NMT, 1998). This study showed Nile tilapia implanted with VI tags beneath branchiostege of the operculumn provide satisfactory short-term results. Application of the visible implant tags for short-term to Nile tilapia in suitable tissue of this study are advantagous of VI Alpha tags: high retention in suitable tissue/species, though with the necessity to sacrifice the fish tags detected visually and readable in live specimens and minimal impact on survival, and conquest the limitation of VI Alpha tags; unsuitable for very small fish and species with suitable tissue and tag visibility may become occluded by pigmentation (NMT, 1998). Considering the results of use in elastomer tags with generally retained at greater rates than 90% (Willis and Babcock, 1998), application of elastomer tags to the same site used in this study in Nile tilapia needs to explore.

References

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