



Curtin University Standard Operating Procedure

IDENTIFICATION TECHNIQUES OF FISH IN RESEARCH PROJECTS

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Aims / Objectives: To provide guidelines on the recommended techniques used to identify individual fish during research projects at the Curtin Aquatic Research Laboratories (CARL).

Definitions:

Microchipping or Passive Integrated Transponder (PIT) tags: Microchips or PITs are small, approximately the size of a grain of rice, and are injected using a needle into the peritoneal cavity or into the shoulder muscle. This microchip is then scanned, giving a number on the readout which can then be used to individually identify fish.

Spaghetti Tags/ T-Bar Tags: these tags are a loop of vinyl tubing that attaches to the fish. Either information is painted on the tubing or tag, such as a number, or different colour tubes/tags are used.

Dart Tags: these tags are slightly larger than the T-bar tags, and used for slightly larger species of fish.

Visible Implant Elastomer (VIE): is a medical-grade, two-part silicone based material that is mixed immediately before use and then injected as a liquid that cures into a pliable, biocompatible solid. The tags are implanted beneath transparent or translucent tissue and remain externally visible.

VIE is available in six fluorescent and four non-fluorescent colours. The fluorescent colours are highly visible under ambient light and provide the option of greatly enhanced tag detection when fluoresced with the VI Light.



Procedures:

The factors which must be considered when considering tagging are

- The species of fish
- The size of the fish
- The length of time they require to be tagged for
- Project budget
- The information required to be collected

There are a multitude of tagging techniques available for fish research, but at CARL, these are the ones used:

1. Using individual markings and recording them- for many species, they can be differentiated with their individual markings and colours and this is most commonly used. For example, Koi are easily distinguished from each other. Photography is often used to assist with the recording.
2. Spaghetti Tags/ T-Bar Tags. These are used to either identify individuals with a number or sometimes used to differentiate sex or treatment groups with different colours. They can be attached in a number of ways, for example, injected into the fish and attached using a special locking device, or threaded through the body of the fish with a hollow needle. They stay on well, but have to be individually attached. They are inserted using an applicator gun, into the skin between scales (sometimes scales will need to be removed). See the link in the references for an instructional video.
3. Dart Tags. These are injected into the fish and used on larger-bodied species. Smaller dart tags are used in finfish species such as tuna or carp, especially in those likely to undergo fast growth rates. Medium dart tags are to be used for finfish from 35-55cm in size, and the large dart tags are used from about 60cm upwards.

The fish need to be under control to insert these safely, and it is recommended to be done under general anaesthetic. They are applied using a hand held needle and injected between high in the shoulder muscle and locked between the pterygiophores (bones which support the dorsal fin). The scales in the area are removed first, and then the needle is inserted into a depth just beyond the fin spine at a 45 degree angle with the barb orientated toward the fish. The needle should then be rotated to lock the barb between the fin spines and the needle can be withdrawn. Diagrams and illustrations can be found in Barker et al, 2015. Fish should be allowed to recover in an aerated tub prior to release.



4. Microchipping. The fish require sedation or anaesthesia and is quite costly to the researcher. It is more commonly used for brood stock, but a very useful tool to track particular fish, and attach important ongoing information to that fish.
5. Visible Implant Elastomer uses a bio-compatible, two-part, elastomer material. After mixing, the elastomer is a liquid that is injected into tissue with a hypodermic syringe; most species of fish, and many other animals, have suitable areas of transparent or translucent tissue. Within hours or days this material cures into a pliable solid. The elastomer holds the pigment in a well-defined mark, without damaging surrounding tissue. By the use of different marking sites, and perhaps two or more marks on each individual, development of numerous group or individual codes is possible. Some of the colored pigments used are fluorescent, and use of appropriate lighting can significantly enhance detection of tags.

Researchers and Staff must be fully trained if they are to carry out the above tagging techniques, and keep up to date with any changes to technique required.

References

Arizona Game and Fish Department Website <http://www.azgfd.gov/>

Barker, D., Allan, G.L., Rowland, S.J., Kennedy, J.D. and Pickles, J.M. (2015): A Guide to Acceptable Procedures and Practices for Aquaculture and Fisheries Research (4th Edition). Primary Industries (Fisheries) Animal Care and Ethics Committee, NSW Government.

Demonstration of T Bar Tagging:

http://www.youtube.com/watch?v=EVhpPSJgSYQ&feature=player_embedded

Northwest Marine Technology Inc (2008). Visible Implant Elastomer Tag Project Manual: Guidelines on Planning and Conducting Projects using VIE and Associated Equipment.