ANESTHETISATION IN FISH—TILAPIA
AND MAJOR CARPS

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INTRODUCTION

ICHTHYO-ANESTHESIOLOGY has assumed considerable importance in the recent years, particularly in the field of transport of large size live fish, either for food or for artificial breeding, and of live baby fishes or “fish seed” for piscicultural practices. In the air-transport of aquarium fishes, which has assumed significant proportion as an air-cargo, anesthetics are being increasingly used. McFarland (1959, 1960) has notably contributed to the knowledge of ichthyo-anesthetics. Bell (1964) has reviewed the literature on comparative effectiveness of different anesthetics.

Application of anesthetics has, so far, been restricted to their introduction in water containing fish. But no work has been done on the administration of drugs directly into the fish-body, following the similar method adopted by anesthetists for inducing local anesthesia in human beings and domestic mammals. The present study was undertaken to examine the possibility of introducing such a method of anesthetisation in the transport of major carps, ‘Rohu’—Labeo rohita (Ham.), ‘Mrigal’—Cirrhina mrigala (Ham.) and ‘Catla’—Catla catla (Ham.), for artificial breeding.

Among the drugs used for inducing local anesthesia by injection method, barbiturates and novocaine are widely used. Novocaine is generally given for surgical operations and for relief of pain; it is characterised by rapid onset of action and absence of any local irritation. The barbiturates are generally used for alleviating mild discomforts, anxiety, sleeplessness and for inducing general anesthesia; these are classified clinically on the basis of periods of hypnosis induced. Phenobarbital and barbital sodium are the long acting drugs, whereas pentobarbital and thiomyyl represent derivatives of barbiturates that induce anesthesia for short or ultra-short durations. Amobarbital and other similar drugs are intermediate in action.
The drugs used in this investigation were novocaine, amobarbital sodium and barbital sodium, taking into consideration the periods, 2 to 40 hours, that are involved in transporting breeders of major carps.

**Material and Methods**

Pilot experiments on induction of anesthesia by injection method were conducted on *Tilapia mossambica*, as this fish was available in larger quantities. On the basis of results obtained, experiments were then conducted on the major carps.

The study necessitated procurement of live specimens of each species in healthy condition. Specimens of *Tilapia*, caught from freshwater tanks around Bombay, were brought to the Taraporevala Aquarium and stored there in tanks, each of the size of 10’ × 4’ × 4’, with freshwater circulation. Live specimens were then taken out as and when required for experimental studies. Experiments on major carps were conducted near a freshwater pond at Bombay, where these fishes were caught. This was done in consideration of the fact that these were large fishes and as such could not be kept in the aquarium, owing to lack of tank space. After capture, the major carps were stored and conditioned in enclosures (‘Hapa’) made out of knotless nylon nets each of the size of 4’ × 4’ × 4’. All the experiments were performed at water temperatures, ranging between 28° C. and 30° C.

*Administration of Anesthetic*

The three anesthetic drugs were dissolved in distilled water to prepare requisite concentrations and were injected intramascularly near the base of the dorsal fin. The injected area was then rubbed gently. The injected fish were then released for observation into a glass tank, measuring 36’ × 18’ × 18’ or a ‘hapa’ as the case may be.

*Anesthetic Stages*

McFarland (*op. cit.*) reported that reactions induced in fishes, by introducing different anesthetics in water in varying concentrations, follow a similar and specific course. He recognised four distinct stages of anesthesia, first two stages comprising sub-stages, technically called in medical