NOTE

Effect of magnetotherapy on the hatchability of eggs of fish, *Cyprinus carpio*

K. SIVAKUMARI AND R. MANAVALARAMANUJAM

Department of Zoology, Bharathiar University, Coimbatore — 641 046, India

ABSTRACT

Fertilised eggs of *Cyprinus carpio* were exposed to radiant magnetic energy. The hatching time of eggs decreased with a significant increase in the per cent hatchability in the experimental groups. The impact of north pole energy was profound than the south pole on the above parameters. The fry size and activity showed positive correlation with magnetotherapy. The results are discussed in relation to the reasons governing the facts.

Both qualitative and quantitative effects of magnetic field on tissue respiration are correlated with several biological factors including cellular metabolism (Ganapathy, 1990). Studies on animal and human subjects have indicated that magnetic fields may increase general activity levels. However, there is no such work on aquatic organisms especially on the hatchability of eggs of fishes.

Circular magnets (10 cm, diameter), each with a power of 4,000 Gauss were used in this study. Three plastic tubs with 5 litres of water constituted one experimental set of containers. One tub was placed over the north pole and another over the south pole so that magnetic energy got radiated to the water. The third tub served as control. Two replicates were maintained. The tubs were kept on wooden tables and left undisturbed for 24 hrs. Fresh, fertilised eggs of *Cyprinus carpio* transported from Tamil Nadu Government Fish Farm, Aliyar, Tamil Nadu, were counted (100 eggs/tub) and introduced in the control and experimental tubs. The tubs were kept under sunlight (water temperature of $25\degree \pm 1\degree$C).

The hatching of eggs started after 36, 31, and 29 hrs in the control, north pole and south pole tubes, respectively (Table 1). The hatching of eggs was maximum in north pole (85.67%) followed by south pole (77.33%) and control tubs (56.33%). Mortality of fry was also higher in the control. In the tubs exposed to north pole, the fry were slender and long while those exposed to south pole, were short and stout and were active than in the control.

Dat (1989) reported that cells and tissues having magnetic fields of their own resonate with appropriate
magnetic fields created externally which leads to transfer of energy from magnets to organisms. The ambient magnetic field alters the permeability of the cell membranes to the flow of ions such as calcium, potassium etc., thereby affecting the bioelectrical field in and around the cell (Sanker, 1989). This response is the key mechanism of self-regulation by the living cell to any change in its environment (homeostasis). Molecular layers composing biological membranes behave like superconducting junctions (Sanker, 1989). Magnetotherapy appears to have affected the bioelectrical field of eggs by altering the membrane permeability, leading to the transfer and deposition of energy inside the eggs, resulting in quicker developmental changes, thereby decreasing the hatching time and increasing the percentage of hatching.

References

