Reproductive Biomarkers of Fish Population as an Indicator of Water Pollution in Uppanar River in Cuddalore District, Tamilnadu

SUMMARY

Water Quality

In the present report water parameters of Uppanar River showed variations in different stations. The water parameters showed significant variation in summer than the other seasons. The analysed water parameters revealed that the station III showed significant variation than station I and II.

Gross examinations

In the current report, fin fishes and shell fishes had been collected from the Uppanar River and were identified. Among the various species of fishes, the fish *M. cephalus* populated more. Hence, we have chosen the fish *M. cephalus* as a biomarker species for the current study.

Biochemical Parameters

Serumbiochemical parameters such as glucose, cholesterol, protein, SGOT and SGPT of fish *M. cephalus* collected from Uppanar River found to be varied among the stations. Glucose, cholesterol and protein level showed a decreasing trend, maximum reduction was observed during summer than the other seasons. Among the stations studied, the fish collected from S III, showed maximum reduction in above said parameters than the other stations. The SGOT, SGPT and cortisol showed increasing trend. The maximum elevation was observed during summer than the other seasons. Among the stations studied, the fish collected from S III showed significant increases in SGOT and SGPT than S I and S II.

Metabolic Enzymes

Metabolic enzymes such as G6PDH and LDH in liver, muscle and gill tissues of fish *M. cephalus* showed increasing trend. The maximum increase was observed in summer than the other season. Among the stations studied, the fish collected from S III showed increased level of analysed metabolic enzymes than S I and S II.

Steroid Hormones

The steroid hormones such as 17β –Estradiol, testosterone and progesterone level in male and female fishes showed significant variations among the stations. The 17β –Estradiol level in the male and female fishes were found to be decreased maximum during summer than the other season. Among the stations studied, the fish collected from S III showed maximum reduction than S I and S II. In testosterone level in male fish showed decreasing whereas female showed increasing trend. Among the stations studied, maximum reduction was observed in S III than SI and SII. The progesterone in male fish showed increasing trend, whereas female showed decreasing trend. Among the station studied, the fish collected from S III showed maximum fluctuation than S I and S II.

Gonado-Somatic Index

In the current report, the GSI values of both male and female of *M. cephalus* showed a decreasing trend. Among the seasons studied summer season showed maximum reduction in GSI level than other seasons. Among the stations studied, the fish collected from S III showed maximum reduction than S I and S II.

Hepto-Somatic Index

In the current report, the HSI values of both male and female of *M. cephalus* showed decreasing trend. Among the seasons studied summer season showed maximum reduction in GSI level than other seasons. Among the stations studied, the fish collected from S III showed maximum reduction than S I and S II.

Histology

The histoarchitecture of gill, liver, muscle, kidney, gonad and brain tissues of fish *M. cephalus* collected from different stations of Uppanar River showed variations. The observed alteration in above said tissues were more pronounced in summer whereas less in monsoon. The stationwise alteration in the histology of the studied tissues of the test fish showed pronounced changes in S III than S I and S II.

Abnormality

The morphological abnormalities of fish *Mugil cephalus* collected from different stations of Uppanar River, the prevalence of deformities such as split fins, lower lip extension and gill deformities were apparent in the present report. Also externally apparent spinal deformity, head deformity, tumours and fin deformities, and skin erosion were observed. Among the stations studied the abnormalities were found to be more pronounced in S III than S I and S II.