Summary and Conclusion

OVARY

- In the year 2008, during the pre-spawning season April, May and June in *Mystus vittatus* the values of the Gonadosomatic index (GSI) of the
ovary increased. The total protein content of the ovary in *Mystus vittatus* increased and the glycogen and cholesterol content decreased.

- The fish subjected to 20% salinity during the pre-spawning season April, May and June, the Gonadosomatic index (GSI) and the total protein, glycogen and cholesterol content of the ovary was significantly increased when compared to the value of the controls.

- During the spawning season July, August and September, the values of the Gonadosomatic index and the values of the total protein, glycogen and cholesterol content increased in July and further increased in August and September.

- The fish subjected to 20% salinity during the spawning season July, August and September, the Gonadosomatic index and the total protein, glycogen and cholesterol content of the ovary significantly increased when compared to the value of the controls.

- During the post-spawning season October, November and December the total protein, glycogen and cholesterol content of the ovary decreased along with the decrease in the Gonadosomatic index (GSI). This trend was further decreased with the advancement of the end of the resting season January, February and March 2009.

- The effect of 20% salinity during the post-spawning season October, November and December and resting season January, February and March 2009 on the total protein, glycogen and cholesterol content of the ovary increased when compared to the value of the controls.

**TESTES**

- In the year 2009, during the pre-spawning season April, May and June in *Mystus vittatus* the Gonadosomatic index (GSI) of the testes and the value of the total protein, glycogen and cholesterol content, increased in
the month of April and in the month of May and June it further increased.
● During the pre spawning season April, May and June, in the fish subjected to 20% salinity the value of the Gonadosomatic index (GSI) of the testes and the value of the total protein, glycogen and cholesterol content of the testes of the fish subjected to 20% salinity increased when compared to the values of the control fish.
● During the spawning season, the value of the Gonadosomatic index and the total protein, glycogen and cholesterol content in the month of July, increased and in August and September, it further increased.
● During the spawning season July, August and September, the value of Gonadosomatic index and the total protein, glycogen and cholesterol content of the testes of the fish subjected to 20% salinity increased when compared to the values of the Gonadosomatic index and the total protein, glycogen and cholesterol content of the testes of the control fish.
● During the post spawning season October, November and December and in the resting season January, February and March 2010, the value of the Gonadosomatic index and the value of total protein, glycogen and cholesterol content of the testes decreased.
● During the post spawning season October, November and December and during the resting season January, February and March 2010, the value of Gonadosomatic index of the testes and the value of the total protein, glycogen and cholesterol content of the testes increased in the fish subjected to 20% salinity when compared to the values of the control fish.

OVARY AND LIVER
● In the year 2010, during the pre spawning season April, May and June the Gonadosomatic index of the ovary increased and Hepatosomatic index of the liver decreased in *Mystus vittatus*. The value of the total protein, glycogen and cholesterol content of the ovary increased and in liver it decreased.

● During the pre spawning season April, May and June, in the fish subjected to 20% salinity, the Gonadosomatic index and the total protein, glycogen and cholesterol content of the ovary and Hepatosomatic index of the liver significantly increased when compared to the value of the controls.

● During the spawning season July, August and September, the value of the Gonadosomatic index of the ovary increased and Hepatosomatic index of the liver decreased. The total protein, glycogen and cholesterol content of the ovary increased and in liver it decreased.

● During the spawning season July, August and September, in the fish subjected to 20% salinity the value of the Gonadosomatic index of the ovary and Hepatosomatic index of the liver and the value of the total protein, glycogen and cholesterol content of the ovary and liver significantly increased when compared to the value of the controls.

● During the post spawning season October, November and December, and during the resting season January, February and March 2011, the value of the Gonadosomatic index and the total protein, glycogen and cholesterol content of the ovary decreased and Hepatosomatic index and the total protein, glycogen and cholesterol content of the liver increased.

● During the post spawning season October, November and December and during the resting season January, February and March, in the fish subjected to 20% salinity, the Gonadosomatic index of the ovary and
Hepatosomatic index of the liver and the total protein, glycogen and cholesterol content of the ovary and liver significantly increased when compared to the value of the controls.

TESTES AND LIVER

- In the year 2010, during the pre spawning season April, May and June the value of the Gonadosomatic index of the testes increased and Hepatosomatic index of the liver decreased. The value of the total protein, glycogen and cholesterol content of the testes increased and in liver it decreased.
- During the pre spawning season April May and June in the fish subjected to 20% salinity the Gonadosomatic index of the testes and Hepatosomatic index of the liver and the value of the total protein, glycogen and cholesterol content of the testes and liver increased when compared to the value of the controls.
- During the spawning season July August and September, the Gonadosomatic index of the testes increased and Hepatosomatic index of the liver decreased. The value of the total protein, glycogen and cholesterol content of the testes increased and in liver it decreased.
- During the spawning season July August and September in the fish subjected to 20% salinity, the Gonadosomatic index of the testes and Hepatosomatic index of the liver and the total protein, glycogen and cholesterol content of the testes and liver significantly increased when compared to the value of the controls.
- During the post spawning season October, November and December, and during the resting season January, February and March 2011, the value of the Gonadosomatic index of the testes decreased and Hepatosomatic index of the liver increased. The value of the total
protein, glycogen and cholesterol content of the testes decreased and in liver it increased.

- During the post spawning season October, November and December, and during the resting season January, February and March 2011, in the fishes subjected to 20% salinity, the value of the Gonadosomatic index of the testes and Hepatasomatic index of the liver and the value of the total protein, glycogen and cholesterol content of the testes and liver significantly increased when compared to the value of the controls.

**Conclusion**

The present study has been undertaken to correlate the seasonal variations in biochemical composition of protein, glycogen and cholesterol content of the ovary, testes and liver to its reproductive seasons in freshwater catfish *Mystus vittatus*. This attempt has been made to find out whether the biochemical constituents i.e. protein, glycogen and cholesterol content of *Mystus vittatus* at different seasons, could be related to reproductive cycle of this fish. The biochemical variations have resulted from the biological features of the species. In the life span of fish, one of the most important biological process is reproduction.

Liver is the sensitive tissue where several metabolism takes place during reproduction. Knowledge of biochemical composition of liver helps to elucidate seasonal changes in the contents of liver, found in several fish species which is related to the growth of gonads and other processes associated with spawning.

Knowledge of biochemical composition of fish assists in elucidating its environmental, physiological and nutritive status. The Gonadosomatic index (GSI) is the ratio of the fish gonad weight to body weight. The
GSI is particularly helpful in identifying days and seasons of spawning, as the ovaries of gravid females swiftly increase in size just prior to breeding season. This information can be helpful for better management of freshwater fisheries and prevention of fish capture in breeding season to conserve the diversity of the fish *Mystus vittatus*. This fish is an important commercial food fish which plays an important role in nutrition, income and employment.

The biochemical composition of gonads and liver helps to analyse whether the fish is in good condition. The high protein content in gonads shows that healthy fish are likely to be more successful in breeding.

The present study on the effect of salinity shows that salinity influences gonadal maturation. The species *Mystus vittatus* showed relatively adapted to the saline environment, which may be recommended for culturing in such water bodies on a mass scale by the farmers. Thereby providing the information for the selection process of hatchery for the artificial propagation of this fish. This information is important for the development of optimal culture techniques aimed at increasing larval survival and growth. This information can be helpful to the overall techniques and knowledge of aquaculture in the country.