SUMMARY
The effect of organophosphate pesticide, phosphamidon, on some physiological aspects of Indian major carp *Labeo rohita* is studied in the present investigation with special emphasis on ambient temperature.

1. The experimental fish *Labeo rohita* were collected from local ponds in and around the Anantapur and adapted to the laboratory conditions. The entire data of this investigation on phosphamidon toxicity was analysed with special emphasis on environmental temperature in *Labeo rohita*.

2. The studies on toxicity were conducted to determine the LC\(_{50}\) (TLM) values of organophosphorous insecticide, phosphamidon, through probit analysis and the LC\(_{50}\) values in ppm are found to be at normal temperature (28°C), higher temperature, and lower temperature, respectively. This indicates that phosphamidon is more toxic at higher temperature than at the lower temperature.

3. From the LC\(_{50}\) values of phosphamidon 30 ppm was chosen as the common and safe sub-lethal concentration for all the temperature studies. For further physiological studies of this investigation, fishes were exposed to 30ppm sub-lethal concentration of phosphamidon for a period of 30 days and fishes in fresh water without phosphamidon were served as controls.

4. In all the temperatures studied, the time course in the rate of oxygen consumption of *Labeo rohita* during sub-lethal exposure of phosphamidon exhibit an initial shoot up at the
exposure of 24-hrs. This initial increase in $O_2$ consumption at different temperatures ($15^\circ C$, $28^\circ C$, $35^\circ C$) might be attributed due to increased locomotory activity arising out of animal's tendency to escape from the stress media. This situation is termed as 'escape reaction of the animal'. Later, at 7-day period there is a gradual decline followed by a maximal decrease at 15-day exposure period. Towards the end of phosphamidon exposure, the $O_2$ consumption raised, i.e., at 30-day nearer to the control medium. The time course of oxygen consumption perfectly adapted (1) 'Hierarchical modelling of adaptation process' and (2) Nashamohiddeen's principle of 'Stress and adaptation'. The fish has capacity to recover and adapt for new environment. Thus the sub-lethal concentration of phosphamidon could suppress the oxygen consumption, hence, oxydative metabolism at different temperatures, during the first half, reaching maximum at middle period and to a lesser extent during the later half reaching nearer to normal at sub-lethal exposure period of 30-day. This indicates the removal of the inhibition on oxygen consumption towards the end of the sub-lethal period.

5. In all the temperatures of this investigation ($15^\circ C$, $28^\circ C$, $35^\circ C$) the RBC number is reduced when exposed to sub-lethal concentration of phosphamidon at 24-hrs period. But, there is gradual rise in RBC number at 7-day period and at 15-day a maximum percent increase was noticed. Later, at the end of 30-day, sub-lethal exposure period, the RBC number reached nearer to control value. Thus, the decrease in $O_2$ consumption
and the increase in RBC number during different sub-lethal exposure periods of phosphamidon might be due to the prevalence of hypoxic conditions resulted due to the pesticide exposure. Thus, the haematological parameters like RBC number could serve as sensitive and good indicators of pollutional stress at sub-lethal level of phosphamidon.

6. In all the temperatures, the rate of opercular activity is raised at 24-hrs period, then at 7 day period, there is a suppression and a maximum % suppression was recorded at 15-day period of exposure. But in the later half of the 30-days exposure period, the opercular activity increased towards the end of 30 day period, reaching nearer to control value.

7. The rate of cardiac activity at all the temperatures, is decreased at 24-hrs period and at 15-day maximum suppression was recorded. Later, in the half of 30-days period, the cardiac activity increased towards the end of 30-day nearer to the control value.

8. The sub-lethal concentration (30ppm) of the pesticide could cause the physiological systems (O₂ consumption, RBC number, opercular activity and cardiac activity) to oscillate outside its normal range of variations, mostly suppressive, yet with time (within 30-days) the physiological systems could show indications of its return to the normal state without suffering lasting effects leading to the maintenance of homeostasis during the exposure of phosphamidon.
9. The present investigation also reveals that there appears to be a differential toxicity of phosphamidon based on temperature in this fish, Labeo rohita, in that, temperature is found to have profound effects on the potency and toxicity of phosphamidon in this carp. Thus, the % mortality, hence the LC50 values, the extent of changes (both initial raise and subsequent suppression) in O2 consumption, RBC number, opercular activity and cardiac activity at different sub-lethal exposure periods of phosphamidon are significantly greater in higher temperature (35°C) than in the lower temperature (15°C). But, the extent of recovery in all the above physiological systems at 30-day period of sub-lethal exposure period of phosphamidon, is significantly greater at lower temperature than at the higher temperature. Thus, at higher temperature (35°C) more the fish sensitive and susceptible but less was found to be than at the lower temperature (15°C). Thus these temperature differences in the Indian major carp during phosphamidon exposure revealed that the toxicity of phosphamidon is significantly influenced by the ambient temperature in that the toxicity of phosphamidon increases with increasing with environmental temperature.