SUMMARY
1) *Channa* (*Ophicephalus*) *striatus* (Bloch), an air breathing teleost, commonly available in this locality is selected as the test animal.

2) Preliminary observations on the morphometry made. Gonadosomatic indices are calculated.

3) The biochemical analysis of total proteins, free amino acids (TNPS), aminotransferases (ALAT and AAT), ammonia, urea, GDH and arginase in the selected tissues and the excretory pattern of ammonia and urea into the medium is analysed in relation to the two size groups, big and small fish. There seem to be no significant variation
in the two size groups, except for some tissue specific variations.

4) An attempt is made to evaluate protein breakdown and utilization under dehydration stress in the selected tissues. The total protein content increased in all the tissues in both the size groups.

5) The total ninhydrin positive substances as an index of free amino acids increased in all the tissues. A significant increase in big fish is observed. High amino acid levels in liver and muscle indicates that these protein catabolic products play a significant role in osmotic, acid-base balance and energy metabolism under altered environmental conditions.

6) The glucogenic aminotransferases (ALAT and AAT) are estimated. Increase in ALAT activity level in all tissues and increase in AAT activity in all tissues of small fish and slight decrease in big fish observed. This increased transamination process suggests increased mobilisation of alanine and aspartate in the form of pyruvate
and oxaloacetate respectively into the TCA cycle for further oxidation.

7) An attempt is made to estimate the level of enzymes responsible for ammonia production like GDH for oxidative deamination and AMP-deaminase for nucleotide deamination. The activity levels of GDH, an important enzyme which links the metabolism of amino acids with carbohydrates is found to increase suggesting increased oxidation of glutamate by this enzyme.

8) The activity level of purine nucleotide cycle enzyme, AMP-deaminase estimated. Unlike GDH, the decreased activity of this enzyme in tissues exposed to aerial stress indicated decreased deamination of purine nucleotides resulting in the decrease of ammonia, a toxic metabolic.

A comparative evaluation of the activity level of these enzymes indicate that ammonia production is mostly contributed by oxidative deamination rather than nucleotide deamination
in almost all the selected tissues. Since both pathways, namely, nucleotide deamination and oxidative deamination are responsible for ammonia production and since the concerned enzyme systems are active, having variable propensities in relation to tissue specificity and function, it becomes essential to look into the fate of ammonia produced. So an attempt is made to estimate the conversion of ammonia to urea and glutamine in the biosystem and excretion of ammonia and urea.

9) The toxic metabolite, ammonia is found to be decreased in all tissues during emersion, indicating its increased mobilization towards urea synthesis or glutamine to combat ammonotoxic effects.

10) The levels of urea and arginase are estimated. The increase in urea and arginase found to be significantly high and statistically significant. The increased levels of urea in brain, muscle and gill could be due to its transportation from the hepatic tissue. Increase in arginase content suggesting augmented urea synthesis in the tissues through ornithine cycle to ward off excess ammonia.
11) The presence of both ammonia and urea in the ambient medium indicate that ammonia besides its conversion to urea is also excreted.

12) The level of glutamine increased in all tissues during imposed dehydration stress. Increase is high in hepatic tissue followed by brain tissue indicating the prevalence of Ornithine-glutamate reaction system. Since the operation of urea cycle in the brain tissue is incomplete, the conversion of ammonia to glutamine will be utilized for the synthesis of GABA and energy through glutamate formation and transaminase reaction. While in the case of liver tissue it seems to be arginine-ornithine reaction system. Thus a diversion is seen in ammonia conversion in the two tissues, where ammonia conversion to glutamine is processed through ornithine system in the brain tissue, while in the case of liver it is through urea cycle.