SUMMARY

Chapter 1

Effect of hypophysectomy on the rate of growth, changes in the histological features (if any) of the regenerate and time taken by it to reach each stage during tail regeneration in the lizard, Hemidactylus flaviviridis have been investigated. Removal of hypophysis has significantly affected the time taken to attain each of the different phases (wound healing, blastema, differentiation and growth) during tail regeneration. The rate of tail regeneration is considerably slowed down due to hypophysectomy. The histological observations on muscle, connective and adipose tissues and cartilage of the neural canal of the regenerate in the hypophysectomized lizards revealed poor development and differentiation.

Chapter 2

The relative levels of glycogen in the regenerate, liver and muscle and the corresponding levels of glucose in the blood have been examined during different phases of tail regeneration in the hypophysectomized and sham

operated lizards, Hemidactylus flaviviridis. Significant reductions in the levels of glycogen in regenerate, liver and muscle and glucose in blood during different phases of tail regeneration in hypophysectomized lizards have been observed. An attempt is made to establish correlation between inadequate availability of carbohydrates to the regenerate and its poor development and growth, following hypophysectomy.

Chapter 3

Quantitative determinations of lactate dehydrogenase (LDH) were carried out in the hypophysectomized and sham operated lizards, Hemidactylus flaviviridis during the course of their tail regeneration. Lower levels of enzyme activity in the regenerate and the liver in the hypophysectomized lizards underscore a hormonal dependence of the enzyme activity. Slow rate of growth and the defects in the structural lay out observed in the tail regenerates in the hypophysectomized lizards have been discussed in light of the significant involvement of LDH in metabolic interactions during tail regeneration.

Chapter 4

Acid and alkaline phosphatases were estimated quantitatively in the hypophysectomized, sham operated

and unoperated lizards (Hemidactylus flaviviridis) during different phases of their tail regeneration. Low concentrations of these hydrolases in the hypophysectomized lizards may be due to interference in mechanism of their synthesis. The resultant inadequate activities of these enzymes and consequent derangement in the metabolism and structural layout of the tail regenerate tissues in the hypophysectomized lizards have been discussed.

Chapter 5

Quantitative determinations of ascorbic acid (AA) in the regenerating tail, liver and kidney of the hypophysectomized and sham operated lizard, Hemidactylus flaviviridis, were carried out.

Involvement of AA in tail regeneration during various phases in the hypophysectomized animal has been discussed. The consistent maintenance of high levels of AA in the liver, kidney and tail regenerate during the course of regeneration in the hypophysectomized animals is though apparently enigmatic, seems to be due to the defect in utilization of this vitamin in absence of hypophysial hormone/s; and is probably an attempt to offset the consequent metabolic imbalance.

Chapter 6

Qualitative and quantitative analyses of free amino acids during tail regeneration in the normal unoperated lizards, Hemidactylus flaviviridis, have been carried out. Seventeen amino acids were detected in the adult, normal caudal tissues. During the blastema and differentiation phases of the regenerate all these amino acids could be detected. However, concentrations of some of them viz., aspartic acid, glutamic acid, valine, isoleucine, leucine, tyrosine, phenylalanine, proline were elevated, whereas those of others, viz., threonine + serine, glycine, methionine, lysine and histidine were depleted. These results are discussed in the light of utilization of free amino acids in synthesis of proteins, mucopolysaccharides and other macromolecules in the regenerate at different phases of tail regeneration; and suggestions are offered implicating them in morphogenetic changes that occur during regeneration.