

CHAPTER-I

INTRODUCTION

Reptilian biology for long was a neglected discipline. Whether this negligence stems from man's inherent repugnance to, and suspicious and superstitious regard of reptiles, is speculative, but the fact surely remains in the assumption that, reptiles represent a condition more akin to the amphibians in all respect. Actually in earlier days it was the habit to state reptilian condition by slight modification that of amphibians or mammals.

Fairly recently, the surviving reptiles accorded relatively greater attention and many of the workers are engaging themselves to elucidate this procrastinated part of the biology. The last thirty years have shown the exponential increase in the number of articles dealing with the taxonomy, anatomy, physiology, behaviour, population dynamics etc. Still many of the intriguing problems answered by reference to concepts based upon mammalian or amphibian condition await explicit solution.

Haematology is a vast important but confusing chapter of reptilian biology. It actually begins with a consideration of blood and blood forming organs. Whatever may be the subject and object of reptilian haematology, it differs from other animals. Haematology of reptiles differs considerably from the homeothermal animal and also from other poikilothermal animals. The disparities are now supported by the accumulated research evidences. Again, Dessauer (1970) considered that at this present state of knowledge it is very difficult to define strictly basal condition for the

reptilian haematology, as there is no creature like "typical reptile". Cytological, chemical, physiological and genealogical findings on blood impress upon to accede to the differences among the major groups.

A full and a quarter century have already elapsed to develop the present state of knowledge about the reptilian haematology. Within this period considerable number of investigators have spent their valuable time to the problems of blood cytology, chemistry, physiology and even genealogy. A voluminous literature is already heaped up. At first sight there seems to exist no discrepancies, no lacunae at all. But thorough study reveals the problems one by one. Further, Dessauer (1970) suggested that the biologist interested in evolution may find in blood a source of much information on speciation and interrelationship of living forms.

The earliest works on the reptilian haematology (e.g. Mandl, 1839; Gulliver, 1840, '42, '75; Milne-Edwards, 1856, '57; Hayem, 1879; Pappenheim, 1909; Werzberg, 1910; '11; Zylberszac, 1937) described mainly the structure of blood corpuscles often comparing with those of other vertebrates. Beside descriptions of the different circulating blood cells, other aspects of reptilian haematology were also considered.

Study on the particular characteristic of reptilian blood in relation to age, sex, seasonal variation etc. was although old enough (e.g. Baker and Kline, 1932; Carmichael and Petcher, 1945), but recent interests (e.g. Hutton and Goodnight, 1957; Kaplan and Rueff, 1960; Duguy, 1963a,b; Sheeler and Barber, 1964; Goin and Jackson, 1965; Hutchison and Szarski, 1965; Szarski and Czopek, 1966) have exposed many confusion too.

Different problems of the reptilian haematopoiesis (e.g., Jordan and Flippen, 1913; Jordan and Speidel, 1929; Jordan, 1938; Pienaar, 1962) and the effect of blood parasites (e.g. Wood, 1935; Ryerson, 1949; Pienaar, 1962), starvation (e.g. Hirschfeld and Gordon, 1961), cold stress (e.g. Musacchia and Sievers, 1956;

Richard and Nardone, 1957) on blood and haematopoietic mechanism were studied by few workers. But all these studies were from a variety of reptiles belonging to a diverse groups. Only few monographs were (Pienaar, 1962) found to consider the detailed haematology of single species.

It appears that inspite of extensive information available on the haematological aspects of various species of reptiles especially of cold and subtropical climates, except some studies on African group, scanty or scarce information is available on some typical species of tropical area..

Three recent reviews of blood parameters (e.g. Dessauer, 1970; Duguy, 1970; Saint Girons, 1970) emphasize the paucity of Indian representatives.

Dessauer's (1970) tabulation of packed cell volume and certain organic constituents of blood indicated that haematological studies were carried out only on two Indian species.

Saint Girons (1970) summarized morphology of red cells where he considered 76 species but only one Indian example.

Duguy (1970) reviewed the number of blood cells and factors causing changes in their abundance but represented no data from Indian species.

Thus, it is felt pertinent to pursue a thorough investigation on the haematology of typical Indian species. In this connection it may be noted that Calotes versicolor (Daudin) is a variety of lizard especially of tropical climate, widely used in teaching in Undergraduate classes, but systematic analysis of its haematology is still not available. This prompted the present investigator to study in detail the haematology of Calotes versicolor.

In view of the fact, the present dissertation deals exclusively with the haematology of common Indian garden lizard, Calotes versicolor (Daudin) on which no comprehensive survey has been made, and essentially consists of following chapters :

- Chapter II. Review on reptilian haematology, which embodied a general account of the earlier literature proving the relative importance of haematological study on Calotes versicolor, and a detailed account on the progress made on the various important aspect of the reptilian haematology.
- Chapter III. Technical consideration involving general consideration of the animal, technical procedures and experimental design.
- Chapter IV. Mature blood cells in the peripheral circulation.
- Chapter V. Immature blood cells in the peripheral blood and probable haematopoietic loci.
- Chapter VI. Blood cells and haematopoietic loci under haemoparasite infection, starvation, cold exposure and clove oil anaesthesia.
- Chapter VII. General Conclusion.