

SUMMARY

Consideration of the wide use of Calotes versicolor, a most common tropical reptilian species (family Agamidae), in undergraduate studies of the Indian Universities, and the relative lack of research emphasis on its physiology demanded a detailed analysis of its different haematological observations. The present work begins with a brief account of morphology, behaviour and habitat of the animal followed by cytological analysis of the circulating blood and haematopoietic organs under various conditions prevalent in India. Effects of starvation, cold exposure and anaesthesia on blood picture and haematopoietic activity of this species have been studied.

Various mature and immature blood cells commonly appear in the peripheral circulation. The erythrocyte, leucocytes (two types of eosinophils, basophil, two types of lymphocytes, monocyte and plasma cell) and thrombocyte are clearly distinguished in the peripheral blood. Neutrophil and pigment cell are usually absent in the peripheral circulation. Azurophil appears to be immature cell.

Erythrocyte has the general elliptical shape with central elliptical nucleus. Distinct paranuclear body is absent in the erythrocyte. Vitally stained erythrocyte is non-motile and does not represent mitochondria and vacuole. Eosinophil (Espe) is largest of all leucocytes. It has multilobed nucleus and spindle shaped eosinophilic granules. Vitally stained eosinophil (Espe) represents mitochondria and vacuoles. Eosinophil (Esp1) has non-lobed nucleus and spheroidal eosinophilic granules. Vitally stained eosinophil (Esp1) also represents vacuoles and mitochondria in it. Basophil represents a mulberry appearance, packed up with deeply

basophilic spheroidal granules. Vitally stained basophil does not represent mitochondria and vacuoles. Large lymphocyte has a reniform nucleus, whereas small lymphocyte has a round nucleus. Vitally stained large lymphocyte represents few mitochondria. Monocyte has irregular shape and irregular nucleus. Vitally stained monocyte represents bacillary mitochondria. Plasma cell is spherical with a central halo. Vitally stained plasma cell does not represent mitochondria. Except for the plasma cell motility resides in all the leucocytes though variable in extent. Eosinophil (Espe) is most actively motile. Thrombocyte has spindle shaped body. Vitally stained thrombocyte does not represent mitochondria. It is slightly motile.

Morphology of the erythrocyte changes from elliptical to more circular form with the increase of age of the animal. Erythrocyte number for this species is 1.11 million per cubic millimetre. Number is higher (9%) in male than female. It is maximum in the summer months during the active part of the year for the animal. Erythrocyte number gradually increases upto certain age after which declines.

Haemoglobin value for this animal is 8.5 gm%. Haemoglobin value increases upto certain age of the animal then decreases. Mean corpuscular volume (MCV) and mean corpuscular haemoglobin (MCH) increase with the increase of age of the animal to compensate the low erythrocyte production.

Leucocyte number for this animal is  $9 \times 10^3$  per cubic millimetre. Female has 11% less leucocyte number than male. Leucocyte number increases gradually to become maximum in the adult animal then decreases in old animal even when the body weight increased. Leucocyte number is maximum in the winter months and minimum in the summer months. Proportions of the different leucocytes represent "summer type" and "winter type" leucogram. Eosinophil (Espe) is maximum in winter months and lymphocyte is maximum in summer months. Sex and age have no modifying influence on the leucocyte formulae.

Bone marrow shows the maximum haematopoietic activity. Liver plays a subsidiary role in haematopoiesis. Spleen represents a compensatory role. Differentiation and maturation of blood cells go on continuously within the circulating blood. Throughout the process of maturation an increase in cell size is recognized. Basophil is a histogenous form. Basophil of haematogenous nature seems to be absent in this animal. Two different forms of promyelocytes and myelocytes are not found in this animal for the two different types of eosinophils. Possibly two types of eosinophils have common origin. No evidence in favour of uniterian view of blood cell formation is found from this specimen.

The intracorpuseular parasite which is found to infest the erythrocyte here causes little change on the blood and haematopoietic system. Severe infestation may induce slight anaemia. Mild infestation perhaps produces a stress response with the increase of eosinophil (Espe). The animal can endure prolonged starvation without mortality. Mild starvation stimulates erythrocytogenesis from the bone marrow first then spleen. Aplasia of the bone marrow occurs under prolonged starvation which represents a depression on erythrocytogenesis. Single cold exposure induces haemodilution but repeated cold exposures produce haemoconcentration. Excessive cold temperature produces stress response with the increase of eosinophil (Espe). Temperature sensitivity and its control in this animal appear to be mainly of nervous nature. Increased leucocytopoiesis during summer due to cold exposure in this specimen suggests exogenous modification of its haematopoietic nature. Lastly, clove oil has been used as an effective anaesthetic agent with a high therapeutic index. Haematological studies of this animal under clove oil anaesthesia demonstrated no gross ill effects.