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HEMATOLOGICAL STUDY OF SIKA DEER (*CERVUS NIPPON YESOENSIS*)

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Hematologic investigations were carried out on forty-three wild Sika deer (*Cervus nippon yesoensis*) from Nakanoshima Island, Hokkaido, Japan. Blood samples were collected from animals anesthetized under two different conditions, i. e., excitation and resting. The deer anesthetized when excited showed significantly higher values than those anesthetized while resting for erythrocyte counts (RBC), leukocyte counts (WBC), hematocrit values (Ht), and hemoglobin concentrations (Hb). However, there were no statistical differences in mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), or total plasma protein concentration (TPP).

The hematologic values (means \pm S. D.) for adult Sika deer at rest were as follows: RBC, $900 \pm 113 \times 10^4 / \mu\text{l}$; WBC, $2,300 \pm 790 / \mu\text{l}$; Hb, 10.7 ± 2.1 g/dl; Ht, 28.0 ± 3.2 %; MCV, 31.0 ± 2.1 fl; MCH, 12.0 ± 1.6 pg; MCHC, 38.0 ± 4.1 %, and TPP, 5.6 ± 0.6 g/dl. In addition, sickling of erythrocytes was observed in all animals when their blood was mixed with phosphate-buffered saline, pH 7.8.

Biochemical analyses were performed on the erythrocytes of these deer. It was demonstrated that the Sika deer were divided into two groups with regard to their hemoglobin types. These were separated by isoelectric focusing. Most of the deer had four hemoglobin types designated I, II, III, and IV. In some deer, however, hemoglobins II, III, and IV were each separated into two isoforms. On sodium dodecyl sulfate polyacrylamide electrophoresis gel, the erythrocyte membranes from Sika deer contained some predominant polypeptides in addition to the major proteins commonly observed in erythrocyte membranes from all vertebrates. The contents of cholesterol and phospholipids in erythrocyte membranes were 0.22 ± 0.03 mg/mg protein, and 0.53 ± 0.06 mg/mg protein, respectively. Thus, the cholesterol/phospholipid ratio was 0.42 ± 0.03 . Erythrocyte phospholipids consisted of phosphatidylethanolamine (32.7%), phosphatidylserine (13.5%), phosphatidylinositol (4.0%), and sphingomyelin (49.9%). The concentration of reduced glutathione (GSH) and the activities of several enzymes associated with the oxidation-reduction system of erythrocytes were as follows: GSH, $2.02 \pm 0.08 \mu\text{M}$; glutathione peroxidase, $55.4 \pm 6.4 \mu\text{mol/min/g Hb}$; glutathione reductase, $1.2 \pm 0.1 \mu\text{mol/min/g Hb}$; catalase, $12,000 \pm 1,100$ U/g Hb; superoxide dismutase, $2,069 \pm 59$ U/g Hb; and NADH-methemoglobin reductase, $8.7 \pm 3.3 \mu\text{mol/min/g Hb}$.