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Major adenohypophyseal proteins of Indian rhinoceros *(Rhinoceros unicornis)*

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Biometry of pituitary and polyacrylamide-gel (7% and 10%) electrophoretic pattern of anterior pituitary proteins of Indian rhinoceros, a species about which there is little information, are presented in this paper.

Three rhinoceros calves, 1 male (9 days old) and 2 females (3 and 4 months old respectively) separated from their mothers because of floods were shifted from the Kaziranga National Park to the State Zoo-cum-Botanical Garden, Assam. The calves died due to gastroenteritis. Their pituitaries were collected immediately after death. The pituitary gland was flat and triangular (Fig. 1), weighing 0.44 ± 0.04 mg (± SE). The brown anterior pituitary covered the pale posterior pituitary almost entirely and formed the major portion (0.35 ± 0.03 mg) of the gland. The mean length, breadth and thickness of the whole pituitary gland were 1.10 ±0.06,1.20 ± 0.06 and 0.67 ± 0.07 mm respectively. The gross anatomy of pituitary of Indian rhinoceros was comparable to that of horse (Venze 1977).

Alkaline extract (0.1M ammonium bicarbonate,pH 8.6) of fresh anterior pituitary tissue of Indian rhinoceros calves and cow (bovine) were prepared (Nath and Singh 1992). Polyacrylamide-gel (7 and 10%) electrophoresis of pituitary proteins was performed in a tube (10 cm × 0.5 cm) using tris (hydroxymethyl) methylamine glycine buffer (0.04M, pH 8.6) as described by Davis (1964). Pituitary protein (200 µg) was applied for electrophoresis. Electrophoresis was performed at a constant current of 1 mA/gel tube for 15 min and then increased to 3 mA/gel tube (200-250 V) for 2 hr till tracking dye (bromophenol blue, 0.05%) reached the lower end of the gel. The gels were stained with 1% amido black in 7% acetic acid. Destaining was done by several changes of 7% acetic acid.

The electrophoretic pattern of major anterior pituitary protein of bovine has been studied previously (Nath and Singh 1992) using standard bovine GH and bovine PRL from the National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases, Baltimore, Maryland, USA. Two major bands corresponding to GH and PRL were seen in both 7 and 10% gel (Fig. 2). The separation of 2 PRL bands in rhinoceros was not very

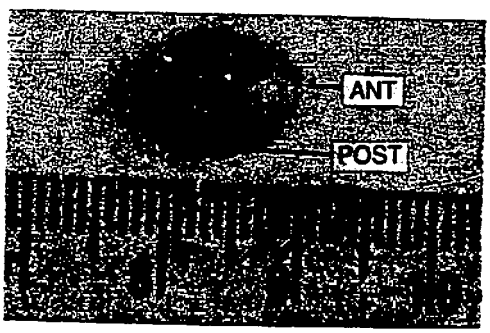

Fig. 1. Ventral view of a pituitary of male 9-day-old Indian rhinoceros calf (ANT) anterior pituitary, (POST) posterior pituitary.

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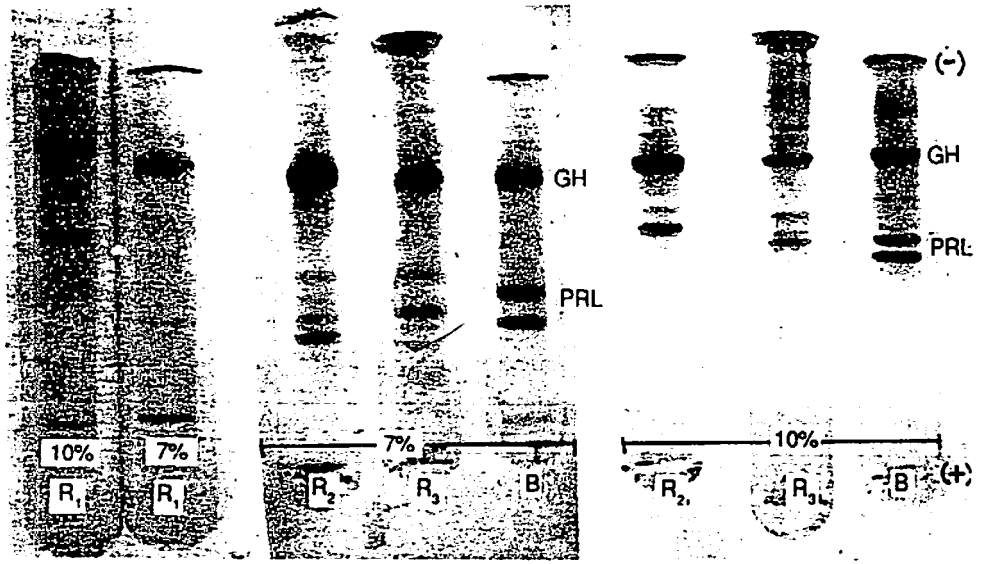

Fig. 2. Polyacrylamide-gel electrophoretic pattern of anterior pituitary alkaline tissue extractable proteins of Indian rhinoceros, (R_1) 9 day, (R_2) 3 months, (R_3) 4 months, (B) bovine, (GH) growth hormone, (PRL) prolactin.

distinct compared to the bovine. In 7% gel the relative mobility of GH for calves 9 days and and 3-4 months old were 0.27 and 0.34; in 10% gel they were 0.22 and 0.26 respectively. These mobilities in case of PRL were 0.72 (9 days) and 0.67 (3-4 months) for 7% gel, and 0.47 (9 days) and 0.42 (3-4 months) for 10% gel. Some minor protein bands were also observed in 3 and 4 months old calves. One minor protein band having electrophoretic mobility intermediate to GH and PRL was seen. This protein band was named as albumin (Sinha and Baxter 1979, Talamantes *et al.* 1981) or albumin-like protein (Nath and Singh 1992) in many other species of animals due to same molecular weight as of serum albumin (66 kd). One or two minor protein bands moving just ahead of GH and PRL were also observed in standard bovine GH and PRL (Nath and Singh 1992) and in freshly prepared anterior pituitary alkaline tissue homogenate of many species of animals (Russel *et al.* 1978, Nath and Singh 1992). Russel *et al.* (1978) and Talamantes *et al.* (1981) claimed that these doublets are probably deaminated forms of GH and PRL. These minor protein bands were not observed in the anterior pituitary protein of 9-day-old rhinoceros calf. Probably the absence of deaminated forms of GH and PRL in 9-day-old calf caused the difference in the electrophoretic mobility with that of calves 3-4 months old. The electrophoretic mobility of protein at alkaline pH was inversely related to pI values of protein. Molecular changes such as deamination or substitution of charged for an uncharged amino acid side chain would also induce such changes in pI and electrophoretic mobility (Wallis 1973).

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