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The thermoregulatory response of the rhinoceros (*Diceros bicornis* and *Ceratotherium simum*) and the zebra (*Equus burchelli*) to diurnal temperature change

A white rhinoceros (*Ceratotherium bicornis*), a black rhinoceros (*Diceros bicornis*) and two zebra (*Equus burchelli*) were exposed to ambient diurnal temperature changes in Kenya, East Africa. The mean maximum dry bulb temperature was 29·9°C; the mean black bulb temperature at this time was 47·5°C. Cutaneous moisture loss (CML) was recorded with a desiccant capsule, respiration frequency (RF) was recorded by counting flank movements and rectal temperature was recorded with a rectal thermometer. Each rhinoceros species was recorded at 07.00 hours, 12.00 hours and 18.00 hours; in the zebra the recordings were made hourly between 08.30 hours and 17.30 hours.

The thermo-regulatory response on the rhinoceros did not differ between species; their mean rectal temperature was 36·9°C at 07.00 hours and this increased to 37·9°C at 18.00 hours. The CML increased from 210 g/m²/h to 310 g/m²/h and the RF increased from 25 breaths/min to 56 breaths/min during this time. At 08.30 hours the rectal temperature of the zebra was 37·1°C and this increased to 38·6°C at 14.00 hours. Its CML increased from 90 g/m²/h to 291 g/m²/h and its RF increased from 27 breaths/min to 51 breaths/min during this time. The initial thermoregulatory response of the rhinoceros species was an increased CML, that of the zebra was an increased RF.

A skin sample was taken from the experimental area (right dorsal aspect of the last three ribs) of a black rhinoceros and the numerous, highly convoluted sweat glands which were found are shown in Fig. 1.

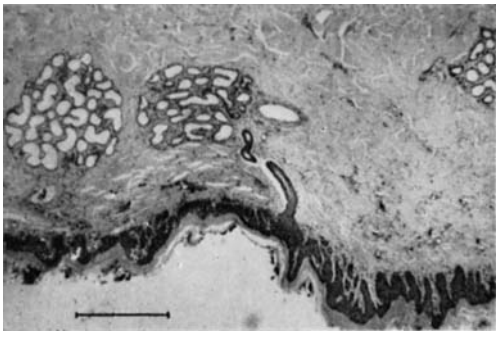

Fig. 1. A section of skin from an area overlying the right dorsal aspect of the last four ribs of the rhinoceros. Several sweat glands and the duct of one of them can be seen in the lower layers of the dermis. Scale line =2·0 mm.

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