BIOLOGY OF SAMBAR DEER (*Cervus unicolor* Kerr, 1792) IN NEW ZEALAND WITH PARTICULAR REFERENCE TO DIET IN A MANAWATU FLAX SWAMP

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ABSTRACT

This MSc. thesis is the first detailed account of the biology of sambar deer (Cervus unicolor Kerr, 1792) in New Zealand. Observations were made for fifteen months on approximately 35 animals inhabiting flax swamp at Moutoa, southern Manawatu.

Sambar are shy and cautious, mostly nocturnal and prefer dense cover. Methods used to overcome problems of direct observation of sambar are described and their relative effectivenesses are compared. Habitat requirements are also discussed.

Diet of Moutoa deer was determined by analysing monthly faecal samples supported by direct observation of feeding and examination of feeding evidence. A quantitative method of faecal analysis based on the area of plant cuticle present is described. Seasonal changes in diet composition are detailed. Flax and rank grasses comprise the greatest proportion of the diet, while ryegrass was present in low proportions and clover was absent from the faeces. Evidence is presented suggesting sambar deer do not compete with domestic stock for high quality forage.

The eight most frequent forage species found in faeces were sampled seasonally and analysed for Acid Detergent Fibre, energy, nitrogen (crude protein) and water content. There was no correlation between changes in forage quality throughout the year and seasonal changes in diet composition. Other factors involved in forage selection are discussed.

The Moutoa breeding population is viable and had an estimated average age structure of 36% adult males, 46% adult females and 18% juveniles.

In New Zealand sambar appear to breed throughout the year with two peaks of increased rutting activity in June, July and August, and in November.

Evidence is presented that the majority of stags shed their antlers annually, in contrast to the previously accepted belief that they hold antlers for two or more years. Antler-cycle is closely associated with the breeding

cycle, most sightings of stags in hard antler occurring from June to November. Examination of available information on breeding and antler cycles in Australian sambar revealed similar cycles to those in New Zealand, whereas in India it appears a single peak in rutting occurs from October to December, with a corresponding antler cycle.

Herds are loosely structured and generally comprise small family groups, commonly a hind, yearling and fawn. Young stags generally form groups of two to four individuals while old stags evidently lead solitary lives except in the breeding season when they were often observed with one or two hinds. Rutting stags are territorial with olfactory and visual cues apparently serving to exclude rivals. Roaring or fighting, apparently common in India during the rut, is rare in New Zealand.

Evidence is presented that some hybridisation with rusa deer (Cervus timorensis Blainville, 1822) occurs in the Bay of Plenty. A comparison of cranial characters between Manawatu and Bay of Plenty deer was inconclusive because of insufficient numbers of skulls. Sexually dimorphic cranial characters are given for animals from the Manawatu area. Sambar deer skulls were aged by counting the number of annuli in the cementum pad of molariform teeth.

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