

CHLORAL HYDRATE NARCOSIS FOR THE LIVE CAPTURE OF MAMMALS

By B. J. MARLOW*

[Manuscript received June 11, 1956]

Summary

Narcosis was induced in the kangaroo *Macropus robustus cervinus* Thomas by the addition of chloral hydrate to water troughs. The optimum strength, 5 oz in 8 gal, caused no deaths and gave about 4 hours' anaesthesia, during which the animals could be freely examined. On recovery, they showed considerable discoordination, but subsequent observation showed that narcosis had no permanent ill-effects.

I. INTRODUCTION

Several aspects of the study of larger mammals in the field would be much facilitated by the improvement of techniques for capture, handling, and marking. Manville (1949) reviews the various methods of capturing mammals; box traps are impractical for large animals, and jaw traps often cause damage. A new technique is now described in which chloral hydrate is used to produce temporary narcosis. Chloral hydrate is a white crystalline solid with a pungent smell of chlorine, and is very soluble in water (Martindale 1952).

II. LOCALITY

The euro or hill kangaroo, *Macropus robustus cervinus* Thomas, is a pest of pastures in the north of Western Australia. The work was carried out at "Woodstock", a property situated 110 miles south of Port Hedland. This arid region has a mean annual rainfall of 10-20 in. Midsummer temperatures of over 100°F are common; the mean temperature in January is 90°F and in July, 70°F.

The habitat consists of sandy plains with scattered granite outcrops, some of which are about 200 yd in circumference and 300 ft high. The dominant vegetation is porcupine grass or spinifex, *Triodia* spp., which grows in discrete tussocks up to 10 ft in diameter with bare sand between them. A few scattered wattles, *Acacia* spp., are also present. This flat country is intersected by occasional dry creek beds which hold water for only a few weeks in the year immediately after the summer rains. The fringe of trees along the creek beds consists of paper-barks, *Melaleuca* spp., and a few eucalypts.

III. METHOD

During most of the year water is available below the sand in the dry creek beds, and here the kangaroos dig "soaks" to a depth of about 3 ft. In the dry season, however, these dry up and the animals then come to stock troughs to drink. In each trial 8 gal of water were placed in the trough and varying amounts of chloral hydrate were added (Table 1). The solution was placed in the trough

* Wildlife Survey Section, C.S.I.R.O., Canberra.

about 1 hr before sunset, approximately 1800 hr Western Australian time, and the trough was then visited at 2100 hr and the following morning at 0500 hr. At each visit it was usual to find several kangaroos sleeping soundly in the immediate vicinity of the trough, and never more than 10 yd distant.

No estimation of the induction time was obtained, since the presence of an observer might have interfered with the natural process of drinking; nor was any attempt made to calculate the ratio of chloral hydrate ingested to body weight, since animals of varying sizes drank at the same time, and it was found that adult males (c. 60 lb), adult females (c. 25 lb), and juveniles (c. 10 lb) could all be captured with the same concentration. The optimum concentration was 5 oz chloral hydrate in 8 gal water, which produced an anaesthesia of about 4 hr, and did not result in any deaths.

TABLE 1
EFFECT OF CHLORAL HYDRATE ON THE KANGAROO

Date	Dose (oz/8 gal)	Number Captured			Deaths	Duration of Narcosis (hr)	Recaptures	Date of Previous Capture
		Adult	Juvenile	Total				
		♂ ♀	♂ ♀					
28.xi.54	2	0 0	0 0	0	0	0	0	
29.xi.54	3	0 0	0 0	0	0	0	0	
3.xii.54	8	1 3	0 3	7	1	11	0	
7.xii.54	7	0 3	1 2	6	1	7	1 J♀	3.xii.54
17.xii.54	6	0 1	3 4	8	1	5	1 A♀	7.xii.54
28.xii.54	5	1 4	0 0	5	0	4	0	
Total		2 11	4 9	26	3		2	

The animals were normally found lying on their sides in a profound sleep, breathing slowly and deeply, with the tongue protruding between the teeth. When handled, they would raise their heads, but returned to sleep when left undisturbed. During recovery they appeared to find difficulty in rising to a squatting posture, and their initial attempts at slow quadrupedal movement often resulted in a fall. As this discoordination wore off, the animal managed to stand erect and was then able to bound off on a somewhat erratic course.

IV. RESULTS

Twenty-six kangaroos were narcotized during November–December 1954. Two females were recaptured in this way, one, a sub-adult, after 4 days and the other, an adult female with a small naked juvenile in the pouch, after 10 days.

This juvenile was in good condition on recapture, and it would appear that chloral hydrate has no permanent adverse effect provided that immediate recovery occurs. Some deaths did occur at higher concentrations and it is probable that these were due to the ingestion of a fatal dose. A direct correlation existed between the duration of narcosis and the concentration (Table 1). The death rate of about 11 per cent. might be reduced by the early administration of a stomach wash, since a female kangaroo which showed the typical prolonged anaesthesia which precedes death was successfully resuscitated in this way. The stomach wash was administered by passing a rubber tube into the oesophagus and pouring water through a funnel fixed to the free end.

Thorough examination of narcotized animals was possible; even large adults could be weighed, measured, and marked with ease.

V. DISCUSSION

This technique has several advantages. The capture, handling, and examination of large mammals is made possible without the use of heavy or bulky equipment, and the risk of mechanical damage to animals is obviated. The element of fright which accompanies most standard methods of trapping is absent, and animals, which are unaware that they have been caught and handled, continue to behave normally and do not shy clear of the place of capture. The solution is simple to prepare and administer.

The risk of death to the animals and the limitation of the method, in its present form, to arid regions are the main disadvantages. Experiments are at present being conducted to discover whether narcotics can be incorporated in solid baits, so that narcosis can be employed in all habitats. The danger to humans and domestic animals makes it advisable that the narcotic should be administered only through artificial drinking-places which can be easily controlled.

VI. ACKNOWLEDGMENTS

Acknowledgment is made to my wife for invaluable assistance in the field. Mr. F. N. Ratcliffe, Dr. R. Carrick, and Mr. Ian Rowley of the Wildlife Survey Section, C.S.I.R.O., read the manuscript and gave helpful criticisms.

VII. REFERENCES

- MANVILLE, R. H. (1949).—Techniques for the capture and marking of mammals. *J. Mammal.* 30: 27–33.
MARTINDALE, W. H. (1952).—"The Extra Pharmacopoeia." 23rd Ed. Vol. 1, p. 348. (The Pharmaceutical Press: London.)