JAMES RENNIE BEQUEST

REPORT ON EXPEDITION/PROJECT/CONFERENCE

Expedition/Project/Conference Title: Parasites of *Oryx gazella gazella* in the Klein Karoo .....

Travel Dates: 4th July – 25th July 2004.....

Location: Sanbona Wildlife Reserve (S33° 43' E20° 36'), Western Cape, R.S.A .....

Group Member(s): Matthew B. Ellis.....

Aims: To document, and quantify where possible, the parasites of Oryx gazella gazella in the Klein Karoo within the Western Cape of the Republic of South Africa.....

Introduction

This research was carried out at the Sanbona Wildlife Reserve, in the Western Cape of the Republic of South Africa approximately 200km east of Cape Town. The reserve is composed of Montagu Shale rhenosterveld, transitional area North Langeberg sandstone fynbos and western little (klein) karoo.

The Warmwaterberg mountain range runs roughly east-west (Figure 1) through the middle of the reserve effectively cutting it in two. This leads to a variation in climate and vegetation in the north and south.

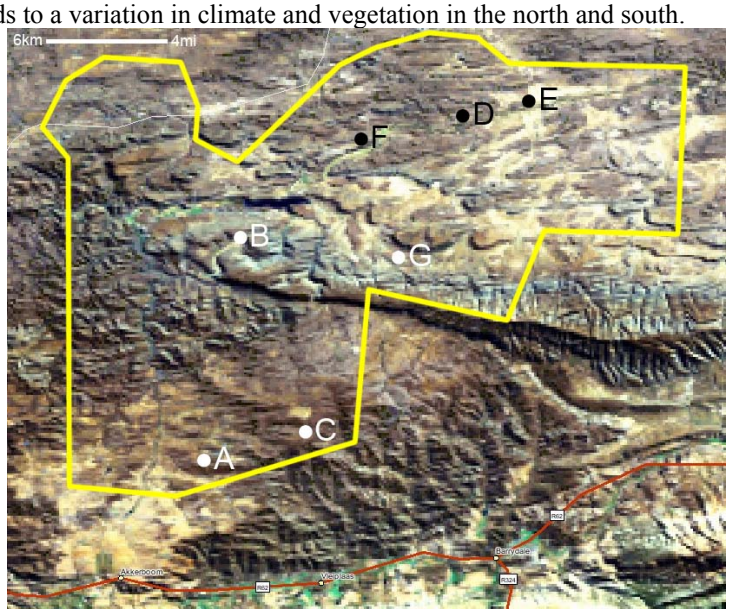

Figure 1: Satellite view of Sanbona reserve (marked in yellow) showing the Warmwaterberg division and the locations of the culls. Gemsbok marked in white, duiker in black

Gemsbok are a large antelope of the Hippotragini tribe, along with the seven surviving species in genera *Oryx*, *Addax* and *Hippotragus*. Members of this tribe are typically large, stocky animals with large, ridged horns, and within the *Oryx* genus these horns are straight. Members of the *Oryx* genus live throughout Africa in semi-desert and desert areas (Figure 2), but the gemsbok is found mainly in the south in areas with rainfall between 200-600mm annual rainfall (Ellis M, 2004)

Aims

There are few data regarding recorded parasitic species and distribution for this particular species (Table 1) and the primary aim of this expedition was to provide fresh data on parasitic species and typical burdens. This would include tick and other ectoparasite collection, helminth adults and faecal egg counts and pasture contamination levels.

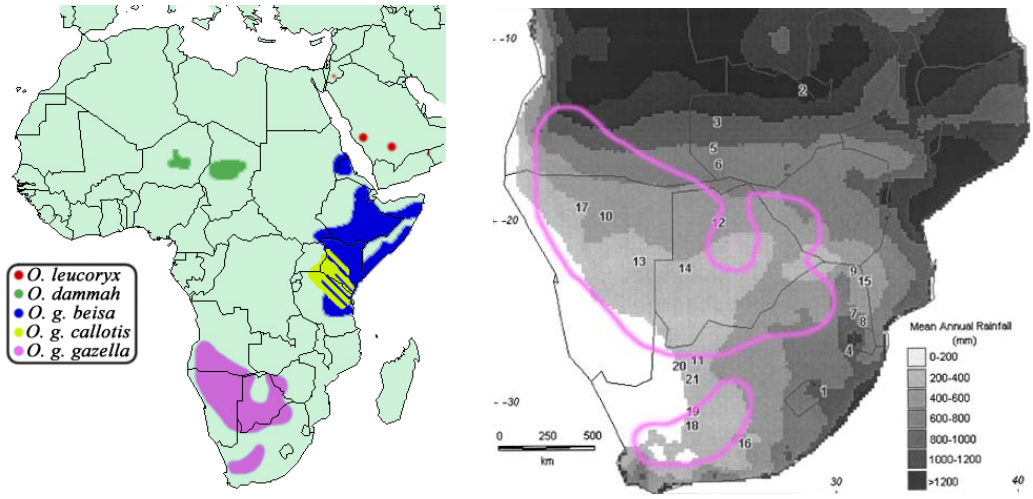

Figure 2: Distribution of Oryx spp. in Africa (left), and distribution of Oryx gazella gazella in southern Africa in relation to annual precipitation. Rainfall data from Swap R. J. et al (2003)

Table 1: Recorded parasites of Oryx spp. from around the world

Parasite Species	Host Species	Location	Reference
Eimeria oryxae	*O. dammah*	Saudi Arabia	Alyousif M. S., *et al.* (2002)
Mycobacterium tuberculosis	*O. g. beisa*	Jackson (MS. N.Am)	Lomme J. R., *et al.* (1976)
Agriostomum equidentatum	*O. g. gazella*	Kalahari-Gemsbok NP	Boomker J., *et al.*(1986)
Coernus cyst	*O. g. gazella*	Windhoek	Bohrmann R. (1990)
Haemonchus contortus	*O. g. gazella*	Kalahari-Gemsbok NP	Boomker J., *et al.*(1986)
Nematodirus spathiger	*O. g. gazella*	West Coast NP	Boomker J., *et al.*(2000)
Nematodirus spp	*O. g. gazella*	New Mexico	Bender L. C., *et al.* (2003)
Teladorsagia hamata	*O. g. gazella*	W. S.Af.	Boomker J., *et al.* (2003)
Trichostrongylus Looss	*O. g. gazella*	Kalahari-Gemsbok NP	Boomker J., *et al.*(1986)
Camelostrongylus spp	*O. leucoryx*	Antwerp	Goossens E. [17.02.2004]
Haemonchus spp	*O. leucoryx* *O. g. callotis*	---	FDA (1990)
Sarcoptes scabiei	*O. leucoryx*	Israel	Yeruham I, *et al.* (1996)
Toxoplasma gondii	*O. leucoryx*	Saudi Arabia	Mohammed O.B., *et al.* (1994)
Trichostrongylus spp	*O. leucoryx*	Antwerp	Goossens E. [17.02.2004], FDA (1990)
Trichuris spp	*O. leucoryx*	Antwerp	Goossens E. [17.02.2004], FDA (1990)

Methodology

As Moredun Research Institute standard operating procedures.

Results

Overall a lot of data was collected, and some of this is still being analysed. However the bulk has been collated and is shown and discussed below.

Table 2: Summary of culled individuals

Animal	Species	Sex	Age (yrs)	Weight (kg)	Cull Date	Location
A	*O. g. gazella*	f	6	170	09.07.04	S33 51.190 E20 33.069
B	*O. g. gazella*	f	6	140	12.07.04	S33 44.406 E20 34.160
C	*O. g. gazella*	f	4	120	16.07.04	S33 50.073 E20 36.519
D	*S. grimmia*	m	1	17	20.07.04	S33 40.422 E20 41.868
E	*S. grimmia*	m	1	20	20.07.04	S33 39.896 E20 44.334
F	*S. grimmia*	f	3	30	20.07.04	S33 41.308 E20 38.449
G	*O. g. gazella*	m	8	180	21.07.04	S33 44.965 E20 39.791

Helminths

Table 3: Helminth species found in the abomasum, shown as total worms per animal

Animal	*H. contortus*	*O. ostertagi*	*T. rugatus*
A	10	-	70
B	-	-	30
C	20	50	-

Table 4: Helminth species found in the ileum, shown as total worms per animal

Animal	*Agriostomum*	*Cooperia sp.*	*H. contortus*	*N. spathiger*	*O. ostertagi*	*T. rugatus*
A	50	-	-	30	-	20
B	-	-	-	-	-	-
C	-	50	50	120	40	80

Table 5: Helminth species found in the duodenum, shown as total worms per animal

Animal	***Agriostomum***
A	-
B	-
C	>1000

Unfortunately I was unable to recover any male *Cooperia* sp. and so it was not possible to identify to species level. It was possible to collect cysticercae from the mesenteries of animals C (gemsbok) and F (duiker), at time of publication these are still under analysis.

Ticks

Due to time constraints I was only able to obtain qualitative data (Table 7). However *Rh. gertrudae* was by far the most commonly encountered and widely distributed of the species found.

Table 6: Tick species and location recovered from animal **s.**

Species	**Location**
Ixodes rubicundus	Anus, Back, Belly, Feet, Flank, Legs
Rh. (Boophilus) decoloratus	Back, Belly, Ear Feet, Legs
Rhipicephalus gertrudae	Anus, Belly, Ear, Flanks, Feet, Legs, Neck, Tail
Rhipicephalus glabroscutatum	Feet

It should also be noted that although there is no quantitative data to support it, it was noted that animals with heavy parasite loads were usually infested with concurrently high tick and helminth burdens.

Pasture Samples

Table 7: Data from site of each animal cull. Animals D-F were collected at night and so pasture sampling was not possible. Units per Kg herbage.

Site	**A**	**B**	**C**	**G**
Eggs	292.9	226.2	1507.9	1159.5

These data show a clear divide between the north and south of the reserve, with the north having pasture contamination more than five times higher than the south. This is unexpected as the population is higher in the south due to greater access to water and herbage. However until recently the reserve was subdivided into many farms with the north being predominantly pasture and the south being set aside for orchards, and so it is possible that the extra egg contamination may be due to previous livestock contamination.

Duiker haematoprotozoa

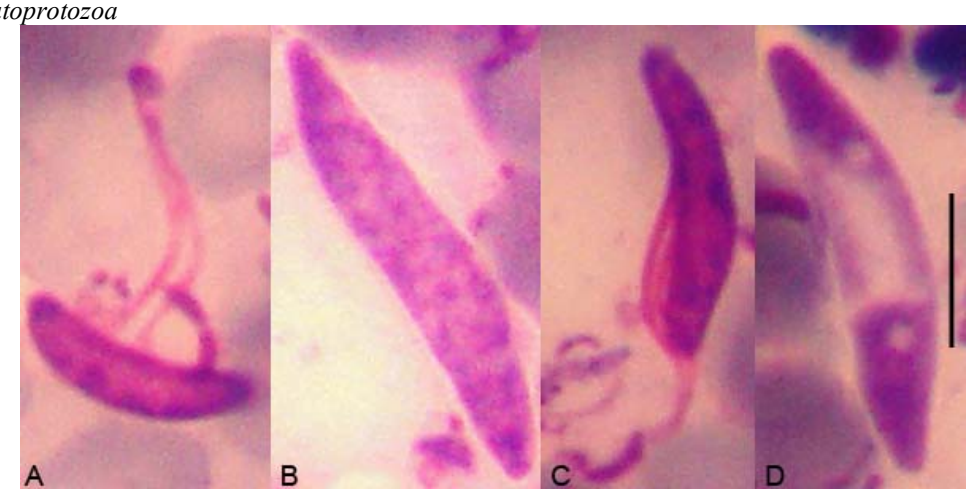

Figure 3: Haematoprotozoa recovered from duiker (*Sylvicapra grimmia*) blood films in Sanbona Wildlife reserve. Measure bar = 5µm

It has not been possible to identify these as all samples are fixed smears (Figure 3) and DNA extraction is no longer an option. However it was possible to measure a subset with similar morphology to specimen C (Table 9).

Table 8: Measurements (in µm) of various parameters (Penzhorn 1996) of the haematoprotozoa of type C found in the blood smear of three duiker (***Sylvicapra grimmia***) from Sanbona Wildlife reserve (n=25)

	mean	max	min	variance	SD
Body length	8.41	10.00	6.00	2.14	1.46
Body breadth	2.73	4.00	1.50	0.47	0.68
Flagellum length	9.76	13.00	6.00	6.57	2.56
Kinetoplast length	0.90	2.00	0.50	0.24	0.49
Distance from anterior end of body to kinetoplast	0.16	0.75	0.00	0.06	0.25

As these smears were taken at night and promptly after death I do not believe these are from infected arthropods feeding on the carcass, rather these are in fact a duiker parasite. It is worth noting that none of the culled duiker had any attached ectoparasitic arthropods.

Discussion

There is still a lot of data left to analyse from this expedition, including identifying the cysticercae with the help of Dr M. Blaxter and Dr T. Littlewood, identifying the *Cooperia* and unknown duiker helminth species and identifying the haematoprotozoa. *Agriostomum equidentatum* has previously been recorded in gemsbok and kudu (*Tragelaphus strepsiceros*) in the Kruger National Park (Boomker et al. 1986, 1989), as well as springbok (*Antidorcas marsupialis*) in the Western Cape (Horak 1982), so this confirms predictions that it should be present in gemsbok in this area. I can confirm the presence of *H. contortus* (Boomker 1986), *N. spathiger* (Boomker 2000) in gemsbok and add the klein karoo to their distribution. However *O. ostertagi* and *T. rugatus* appear to be a new parasite relationship.

Unlike previous studies (Horak 1998), I found that *R. glabroscutatum* was quite rare, but in accordance with MacIvor (1985) was very selective about feeding sites, being found only between the hooves, and in relatively small numbers. Data from the other tick species also confirms all previous reports and shows presence of the species within the klein karoo.

Acknowledgements

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