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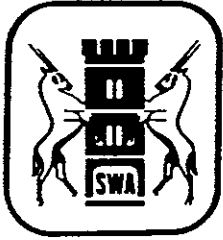
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# Invasive alien organisms in South West Africa/Namibia

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Edited by C J Brown, I A W Macdonald and S E Brown

This report results from a workshop organized by the Directorate of Nature Conservation and Recreation Resorts in Windhoek, and is produced in conjunction with the Council for Scientific and Industrial Research

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## CHAPTER 8 SOME INVASIVE ALIEN PARASITES IN SOUTH WEST AFRICA/NAMIBIA

H C Biggs and I G Horak

### INTRODUCTION

Some parasites currently well established in SWA/Namibia have clearly originated outside the territory. Because certainty can be attached to the origin of parasites which are largely or totally restricted to alien hosts, and because parasites have been more intensively studied in such animals, this report deals with parasites of domestic mammals and man. Certain parasites which may have been expected, but have failed, to establish locally are also discussed.

The following parasites which occur in SWA/Namibia but are definitely alien, are dealt with:

- (1) Oestrus ovis, the nasal bot fly of sheep, goats and closely related species.
- (2) Biting lice of the genus Damalinia and sucking lice of the genera Linognathus and Haematopinus, which infect domestic ruminants.
- (3) Taenia saginata, a tapeworm of man with its cystic larval stage (measle) Cysticercus bovis occurring in cattle.

Other parasites which fall into this category but are not dealt with here due to paucity of information with regard to their status in this country, are:

- (4) Taenia solium, a tapeworm of man with its cystic larval stage (measle) Cysticercus cellulosae occurring in pigs.
- (5) Gasterophilus intestinalis, one of the bot flies of horses.

### CURRENT AREA INFESTED AND DENSITY OF INFESTATION.

- (1) Oestrus ovis is found wherever sheep and goats occur. As might be expected, dense infestations (10's of larvae/head in season) occur in the sheep farming areas in the south of the country.
- (2) The lice that infest domestic ruminants are found wherever their respective hosts (sheep, goats, cattle) are farmed. Louse infestations in late winter can be high (100's per animal) if hosts are nutritionally stressed; this stress usually results from overgrazing.

- (3) Taenia saginata may be present wherever man and cattle are found. The prevalence of man-cattle measles is light (abattoir incidence < 3%) throughout most of the territory, except in Owambo where it is slightly higher as would be expected considering the higher human and cattle densities there. The low prevalence generally of C bovis cysts in SWA/Namibia can possibly be attributed to the low human density and the effect of the hot climate on the egg stage on the veld.

#### RELATIVE EASE OF CONTROL

Although these three groups of parasites are all reasonably easy to control, it is doubtful whether any of them could be entirely eradicated.

- (1) O ovis. Sheep and goats introduced from surrounding countries are almost certain to be infested. In addition the adult fly can probably travel several kilometres or more in search of a host, and in this way can cross national and farm boundaries. This species can be controlled fairly easily, however, if sheep and goats are treated with the correct larvicidal drugs during the major larval peak, although this may be a relatively short and changeable period.
- (2) Cattle, sheep and goats purchased from neighbouring countries can introduce lice. Ruminant lice are probably easiest to control as these are host-specific, permanent parasites, unable to survive away from their host for any length of time. Dipping the entire host population on a farm or in a region at the same time during autumn, winter or spring is probably the most effective method of control.
- (3) The tapeworm T saginata has a final host (man) and an intermediate host (cattle). Humans can be dewormed with an anthelmintic but only the permanent cessation of eating raw or poorly cooked meat of bovine origin by the whole population would halt transmission. Continual reintroduction of tapeworms by visiting or immigrating humans would be almost impossible to control.

#### POTENTIAL HABITAT AND RATE OF SPREAD

The sheep nasal bot fly, ruminant lice and the tapeworm of man all depend entirely on the distribution and spread of their host animals.

#### IMPACT ON THE ECOSYSTEM

Sheep nasal bot fly and louse infestations could be favourable from an ecological point of view in that they place a brake on overpopulation by domestic livestock. O ovis does this by reducing the breeding success as the larvae in the nasal passages and sinuses interfere with the ram's ability to find ewes in season. Heavy louse burdens during winter could result in the death of domestic stock which is already nutritionally stressed. None of the parasites mentioned have been recovered from indigenous hosts in SWA/Namibia and presumably do not threaten these hosts locally.

## PARASITES WHICH HAVE NOT ESTABLISHED IN SWA/NAMIBIA

Several alien parasites have not established with their hosts in SWA/Namibia, presumably for environmental reasons. These include:

- (1) Osterstagia spp (the brown stomach worms of ruminants); and Boophilus microplus (the pantropical blue tick) with its associated protozoan Babesia bovis (which causes Asian redwater). It seems probable that neither this tick nor the worms can survive in this country due to the sensitivity of free-living stages of the life-cycle to dessication.
- (2) Hyalomma marginatum turanicum (a Russian tick which has become established in the cold arid karoo). It is thought that this species has not become established in this country as the winters are not sufficiently cold.
- (3) Fasciola hepatica (the non-African liver fluke of ruminants). It would appear that the lack of suitable habitat (semi-aquatic, montane, cool) for its intermediate snail host Lymnea trunculata has prevented the establishment of this host, which has in turn prevented the fluke from becoming established in this country.

## DISCUSSION

Several ecological principles can be seen to emerge from this study. It would appear that the harsh climate of SWA/Namibia makes this country relatively immune to invasion by alien parasites. Only those closely associated with the host for their whole life cycle (eg lice), those relatively environmentally resistant during their free-living stages (eg tapeworms), and those whose life cycle is synchronized to coincide with advantageous environmental conditions (ie versatile gaiting ploys, eg Oestrus ovis) seem able to survive. In general, if the effect of the indigenous parasites on exotic hosts (well known, but not discussed here) is considered, it is clear that this is often far more dramatic than the effect of exotic parasites on indigenous hosts.

An alien parasite in its new environment is often able to continue fulfilling the same ecological role (with respect to its introduced host) as in its native habitat.

## CONCLUSIONS

As a result of discussion during the workshop session (and subsequent plenary session) on alien parasites in SWA/Namibia, the following conclusions were reached:

- (1) Control of alien parasites entering SWA/Namibia with game is recommended as a safety measure to reduce the (small) chance of such parasites causing undesirable ecological damage, for instance by infesting other species. Current legislation is sufficient to allow for this, but it is becoming apparent that game smuggling on a small scale is taking place and this could negate all control efforts. It was generally felt that adequate control would only be possible if there was control at the border posts with South Africa.

- (2) It should be clearly emphasized that parasite treatment is for various reasons not infallible in preventing the establishment of a parasite which is particularly suited to a new habitat, but can reduce the risk considerably.
- (3) The risk incurred in the importation of alien host species should therefore be considered to include the risk of introducing alien parasites.
- (4) While treatment of game moving from area to area within the country might be desirable, it would be impractical as control would be very difficult to implement. It should also be remembered that in the past natural migrations took place over large areas of the country, presumably disseminating parasites.
- (5) More attention should be paid to monitoring the possible introduction of alien parasites with game in situations where such parasites may have become established.
- (6) The grazing of game with domestic stock is a procedure which potentially enhances disease and parasite transmission and should be discouraged.
- (7) Although every veterinary authority has lists of countries from which animals should not be accepted for reasons of disease risk, control of this is almost impossible as importers find ways of overcoming the rules, for example, by importing via a 'neutral' country.
- (8) Tick-susceptible species such as eland Taurotragus oryx can be introduced into habitats to which they are poorly adapted, and if not eliminated by parasites can act as amplifiers of tick populations.
- (9) Parasites do play a role in population regulation and introduced host-specific types such as lice may be considered as neutral or even desirable in years to come.

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