

CONTROL OF INTESTINAL PARASITISM OF OKAPI

by

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INTRODUCTION

One of the aspects of the management of Okapi in captivity is the control of intestinal parasitism which can lead directly or indirectly to the death of the animal. In particular *Monodontella giraffae* is known to cause a serious hepatitis.

The administration of anthelmintics prior to export from Africa is not possible, and many animals have died either during their journey or shortly after arrival at their destination from causes directly attributable to intestinal parasitism. It is interesting to note that air transport has reduced the death rate firstly from injury but also from intestinal parasitism because it is possible speedily in captivity to administer anthelmintics. It is possible after arrival for anthelmintics to be administered regularly, and for a high standard of hygiene to be observed which will reduce intestinal helminthiasis to a minimum and whilst this routine will keep the animals healthy for a good time it is still the case that post mortems reveal quite heavy intestinal parasitism.

Some observations have been made on a pair of Okapi which arrived first in Germany from the African Congo September, 1961. The male (Aloto) which was thought to be about one to one and a half years of age, and the female (Anabella) approximately 2 years of age. They arrived in Amsterdam in March 1962 and regular anthelmintic treatment was administered from the beginning (Table 1). Faecal examinations for parasitic infestation were conducted at Amsterdam (Table 2) and Bern (Table 3). The results of the laboratory examinations and the clinical treatments are summarized in Fig. 1.

The infestation of the newly arrived animals can be qualified as being rather light. With Phenothiazin and Piperazin adipate we succeeded in stabilizing the

faecal counts. The importance of hygienic precautions is rather clear. The faeces were removed several times a day as soon as the keeper found them and two times a week the stable was carefully washed and scrubbed. The other days it was swept in the normal way; the straw-bedding was completely renewed daily. Even so the faecal counts rose during the winter season, when the animals had to stay more in their stable, getting to the lowest level in summer (compare July 1962 with December). The first time that a real success was achieved was with the use of the rather dangerous drug Mintic (= 2-(beta-methoxyethyl) pyridine sulphate 47,9% (methyridine)).

The eradication of the parasites was attained with Thiabendazole. That the finding of only very few eggs and larvae in the faeces did really concur with a very low rate of infestation was proved after the death of the female. At the autopsy (SMITS c.s. 1965) no parasites at all could be found in the intestinal tract even after the most careful scrutiny. In part of the liver only a few *Monodontella giraffae* were found.

Since July 1964 no treatment has been considered necessary.

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Table 1

		Male (Aloto)	Female (Anabella)
date	drug	dose gramme per day	dose gramme per day
1961			
Sept. 22-26	Phenothiazin	5	5
Okt. 16-20	"	5	5
Okt. 30-Nov. 3	"	5	5
Nov. 7	Piperazin adipate	20	20
Nov. 20-Dec. 4	Phenothiazin	1.5	1.5
Dec. 5-9	"	5	5
Dec. 10-11	"	1.5	1.5
Dec. 16	Piperazin adipate	20	20
Dec. 29-31	Phenothiazin	1.5	1.5
1962			
Jan. 1-Febr. 13	"	1.5	1.5
Apr. 18-22	"	5	5
Apr. 30	Piperazin adipate	20	20
Dec. 3	Mintic	95 cm ³	125 cm ³
1963			
March 2	Thiabendazole	7.5	10*
March 25	"	7.5	10
April 1	"	7.5	10
July 12	"	7.5	10
July 25	"	7.5	10
Nov. 10	"	7.5	10
Nov. 24	"	7.5	10
1964			
July 15	"	7.5	10
July 29	"	7.5	10

* about 40 mg/kg bodyweight

Anthelmintics administered to okapi.

Table 3

Parasite	Male (Aloto)			Female (Anabella)		
	10.26 '61	1.24 '62	10.10 '63	10.26 '61	1.24 '62	10.10 '63
Monodontella giraffae	++	++	+	+++	++	+
Haemonchus contortus	++	++	—	++	++	—
Ostertagia spec.	++	+	+	++	+	—
Cooperia spec.	+	+	—	++	+	—
Trichostrongylus spec.	+	+	+	+ - ++	—	—
Strongyloides pallosus	+	—	—	—	—	—
Trichuris spec.	—	—	+	—	—	—

Number of eggs or larvae:

— = not present; + = very low; ++ = important; +++ = very high

Determination of the number of the different species of parasites in faeces by cultivation of the larvae, Naturhistorisches Museum, Bern, Switzerland (Dr. H. A. Kreis)

Table 2

date	Male (Aloto)						Female (Anabella)					
	in 4 samp.		conc. F.B.		conc. T		in 4 samp.		conc. F.B.		conc. T	
	eggs	larvae	eggs	larvae	eggs	larvae	eggs	larvae	eggs	larvae	eggs	larvae
1961												
Sept. 13	5	4	10	27	31	27	5	—	67	—	45	—
Sept. 18	8	—	11	—	41	—	4	12	—	3	2	93
Oct. 25	6	2	17	—	27	1	11	1	47	1	73	7
Nov. 27	5	—	47	1	41	7	4	—	16	—	13	—*
1962												
Jan. 22	2	9	23	4	162	22	2	4	41	13	51	6
Feb. 19	1	1	11	3	30	4	8	2	80	3	40	2
March 29	6	—	68	1	45	—	7	—	38	2	25	1
May 14	4	4	82	13	30	—	6	1	46	5	25	2
July 2	3	1	24	—	44	3	1	1	20	1	48	1
Aug. 13	1	—	31	2	98	2	1	—	18	—	30	—
Nov. 22	4	8	77	8	80	4	8	5	65	14	50	10
1963												
Jan. 8	5	2	33	5	32	6	7	2	56	7	40	1
Feb. 13	2	—	25	—	13	—	4	—	17	4	13	2
March 12	—	—	12	—	10	—	2	—	9	—	10	—
April 8	2	—	37	5	15	2	1	—	5	2	4	2
June 5	1	—	7	5	12	—	—	1	28	1	14	—
Aug. 1	—	—	2	—	3	—	—	—	2	—	2	—
Sept. 20	—	—	2	1	2	—	—	—	4	—	2	—
Dec. 2	—	—	1	—	1	—	—	—	1	—	2	—
1964												
Jan. 15	2	—	4	—	not determined		1	—	5	—	not determined	
April 7	—	—	1	2	determined		—	—	1	1	determined	
June 1	—	—	1	4	determined		—	—	—	7	determined	
Aug. 5	—	—	1	1	determined		—	—	—	1	determined	
Nov. 16	—	—	—	2	determined		Dead		—	—	determined	
1965												
March 12	—	—	—	1	determined		determined		determined		determined	

* It is believed that these records have been transposed inadvertently.

Faecal counts.

It is generally accepted that these figures are not be relied upon as an indication of the parasitic load of the animal.

Four samples are about 4 to 5 mg (about $\frac{1}{16}$ grain) of faeces.

For the concentration methods about 0.3 gram (about $\frac{1}{4}$ grain) is used. Method Faust-Bijlmer: Faeces mixed in a mortar with $ZnSO_4$ solution 33%. If necessary filtered through cambric and then decanted in a centrifuge tube. After filling with $ZnSO_4$ 33% centrifuged for two minutes. Material from the top is studied mixed with iodine solution (BIJLMER, 1947).

Method Telemann: faeces mixed in a mortar with 5 cm³ of water; after which 5 cm³ of a 25% solution of HCl is added and mixed. Filtered through cambric in a centrifuge tube. An equal volume of ether is added and mixed. Centrifuged for 10 minutes (2500 r.p.m.). Decanted and the sediment collected is studied (SWELLENGREBEL C.S., 1961).

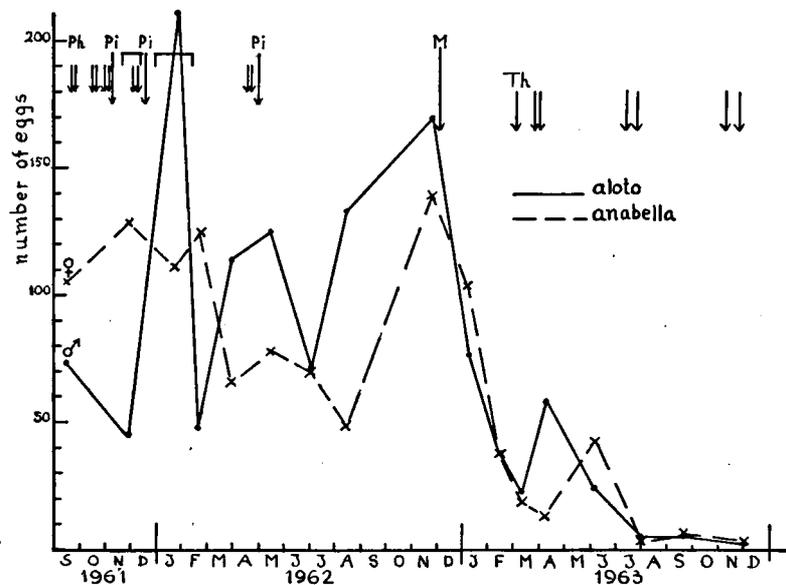


Fig. 1. Variation in faecal counts from a pair of Okapi. The figure given is the total number of eggs and larvae found in both methods of concentration (Table 2). September 13 and 18 are combined; November 9, 1961 is not used. The arrows on top indicate administration of drugs (Table 1). Ph. = Phenothiazin, Pi = Piperazine adipate, M = Mintic and Th = Thiabendazole.

Summary

The results are given of different anthelmintics administered to control intestinal parasitism in two okapis. With Mintic (oral) and Thiabendazole (oral) complete eradication was achieved clinically which was subsequently confirmed at the post-mortem of the female.

Zusammenfassung

Die Wirkung verschiedener Medikamente zur Be-

kämpfung von Parasiten beim Okapi werden mitgeteilt. Mintic und Thiabendazol führten schliesslich zu einem vollen Erfolg, wie die Obduktion des weiblichen Okapi ergab.

Résumé

Les résultats des différents médicaments antiparasitaires utilisés chez l'okapi sont communiqués. Mintic et Thiabendazole donnent des résultats parfaits qui ont pu être contrôlés à l'occasion de l'autopsie.

LITERATURE

- APPELMAN, F. J., 1962: On the progress of strongylids in a pair of Okapi. Zool. Garten 26, 310.
- BAER, J. C. 1950: Etude critique des helminthes parasites de l'Okapi. Acta tropica 7, 164.
- BIJLMER, J., 1947: Over het opsporen van protozoën en eieren van enkele wormsoorten in de menselijke faeces. Acad. Boekh. P. H. Vermeulen, Amsterdam.
- GIJZEN, A., 1959: Das Okapi. Neue Brehm-Bücherei 231.
- GIJZEN, A. et MORTELMANS, J., 1962: Notice complémentaire sur l'okapi sur sa reproduction et ses maladies au Jardin Zoologique d'Anvers. Anvers, Zoological Garden.
- SMITS, G. M., MISDORP, W. and JACOBI, E. F., 1965: Report on the death of an okapi. Bijdr. Dierk. 35, 141.
- KREIS H. A., 1950: Die Diagnose des Nematodenbefalles beim lebenden Tier, mit besonderer Berücksichtigung der Befunde beim Okapi "Bambe". Acta tropica 7, 151.
- SWELLENGREBEL, H. N. and STERMAN, M. M., 1961: Animal parasites in Man, D. van Nostrand Cy, Inc., New York. Telemanns Method of Acid-ether centrifugation, 576.