

HAEMATOXENUS VERIFELUS UILENBERG 1964 INFECTION OF N'DAMA CATTLE IN THE REPUBLIC OF ZAIRE

by

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Summary — The occurrence of *Haematoxenus verifelus* in Zaïre is reported for the first time. Details are given on the prevalence of this parasite and of associated trypanosome infections in N'Dama cattle. The role of some predisposing or debilitating factors on the course of *H. verifelus* infections is discussed.

KEYWORDS : *Haematoxenus verifelus*; Cattle Diseases; Trypanosomiasis, Animal; Zaïre.

Introduction

Haematoxenus verifelus, a *Theileria*-like parasite, was first described in Madagascar from splenectomised Renitelo calf (hybrid of Afrikander, Limousin, Zebu) (Uilenberg, 1964). Further studies demonstrated its transmissibility to non-splenectomised animals as well as the receptivity of other races of cattle. The possible role of *Boophilus* sp. as a vector was then suggested (Uilenberg, 1965a, 1965b).

While investigating on the prevalence of animal trypanosomiasis in the Bandundu region, locality of Mushie, we came across a Hematozoa looking like a *Theileria*. It was identified as *H. verifelus*.

The occurrence and prevalence of this Hematozoa in Western Zaire constitute the subject of the present report.

Material and methods

Only the trypanotolerant N'Dama cattle have been investigated (Mortelmans J. and Kageruka P., 1976). None of the animals included in this study have been splenectomised. Four herds living in different nutrition conditions were sampled.

Blood films were made with blood taken from the marginal ear vein of adults and jugular vein of calves. The blood films and the lymph node material were stained by the May-Grünwald Giemsa technique.

Although Asuntol (*) was used sometimes as a insecticide by mechanical aspersion, ticks were also collected for identification.

Results

Among 141 blood films of N'Dama cattle examined 116 (82.2 per cent) harboured, at different degrees, *H. verifelus* parasite. Sixteen animals (11.3 per cent) showed a high rate of erythrocytes invaded. On the other hand, no lymph node juice preparation showed parasites.

TABLE 1
Prevalence of *Haematoxenus verifelus* in herds

Herds	Number of examinations		Number positive		Trypanosoma mixed infection
	Young	Adult	Young	Adult	
N'Dana	6	9	5	6	4
Gandjaka	19	29	13	24	8
Lebaka	38	17	34	11	4
Mbala	23	—	23	—	0
	86	55	75	41	16

As shown in table 1, the prevalence of infection among the herds sampled was variable. It was found to be respectively 73.3 per cent, 77 per cent, 81.8 per cent and 100 per cent. The mean rate of infection was 85.2 per cent (68.4-100 per cent) in young and 74.5 per cent (64.7-82.7 per cent) in adult animals. The rate of infection of animals grazing on poor pastures was respectively 73.3 per cent and 77 per cent. It was, on the other hand, 81.8 per cent and 100 per cent for herds of cattle grazing on improved pastures.

Microscopic examination revealed polymorphic parasites. Rod, annular or ring and coma-shaped forms were observed; sometimes a velum on some parasites was also seen. The position of the parasites within erythrocytes was variable and some of them seemed to be attached on the external surface of the red cells membrane.

Haematoxenus verifelus was diagnosed in association with trypanosome infection in 16 cases (11.3 per cent). It was found 10 times with *Trypanosoma (Nannamonas) congolense*, 3 times with *Trypanosoma (Duttonella) vivax* and 3 times with a mixed infection of the two species.

Discussion

Haematoxenus verifelus has been found in four countries of West and East Africa. These are respectively Madagascar (Uilenberg, 1964), Nigeria (Folkers and Kuil, 1967), Uganda and Kenya (Buys and Folkers, 1969). The present work is the first published report on *H. verifelus* infection diagnosed in Zaire.

The prevalence of infection in this country was found high (82.2 per cent) among the cattle investigated. The same observation was made in Madagascar, where 20 out of 27 animals (74 per cent) revealed the presence of the parasite after using the immunodepressant method (Uilenberg, 1965b). In Uganda and Kenya however only 1 out of 40 (2.5 per cent) thin blood smears examined was positive (Buys and Folkers, 1967). Again in Nigeria 1 out of 4 cattle investigated showed *H. verifelus* parasite (Folkers and Kuil, 1969). Recent research carried out in Uganda demonstrated a high rate (68.4 per cent) of parasitized buffalo *Syncerus caffer* (Young, Irvin and Payne, 1973).

Since the discovery of *H. verifelus* parasite in 1964, its pathogenicity has not yet been demonstrated. Most of the infections observed showed

(*) 3-chloro-4-methyl-7-oxycoumarine-0,0-diethylthiophosphate.

only slight parasitaemia. In Madagascar and Nigeria diagnosis was made after removing the spleen as to increase parasite numbers in the peripheral blood.

During our survey the majority of non-splenectomised animals showed a slight parasitaemia. Sixteen animals were found to harbour a heavy parasitaemia. Among these 9 were young and 7 were adults. The latter cases suggest that some predisposing and/or debilitating factors have favoured the evolution of *H. verifelus*.

The rate of *H. verifelus* infection was found to be high in young as well as in adult animals. Nevertheless, the prevalence was more important in young than in adult cattle. Although the prevalence was high in both ages, it appeared that young animals were more receptive.

Taking into account the nutritional conditions prevailing among the herds sampled during the period of investigation, it was observed that the lowest rate of infection was found in animals grazing on poor pastures. Under these conditions adult animals (78 per cent) were more infected than young ones (72 per cent). Whereas among cattle grazing on improved pastures the rate of infection was found to be higher, details of this group pointed out that young animals (93 per cent) were more sensitive than adults (64 per cent). It appeared therefore that in debilitating conditions adult animals were more receptive.

Among other debilitating factors infection should be taken into account. The literature reports the diagnosis of *H. verifelus* in association with *Theileria mutans*, *Babesia bigemina* and *bovis*, *Anaplasma marginale*, *Eperythrozoon* sp. parasites. These subsidiary Hematozoa infections did not have a favourable effect on the course of *H. verifelus*. It appeared that the more important *H. verifelus* parasitaemia observed in our study was related to neither *T. (N) congolense* nor *T. (D) vivax* infection.

H. verifelus is so far classified in the family of *Theileridae* (Levine, 1973). Some intra-erythrocyte forms without velum are *Theileria* sp. like. The principal species found in Zaire especially in the East of the country are : *Theileria parva* and *Theileria mutans*. The differentiation of *Theileria* sp. from *H. verifelus* should take into account the clinical aspect of the disease, the microscopic diagnostic stages and the morphology of the parasites.

Th. parva, aetiological agent of East Coast Fever, is responsible for high morbidity and mortality in livestock. Microscopic examination reveals gametocytes in thin blood films and schizonts in lymph node preparations. *Th. mutans* gives rise to a benign theileriosis. Gametocytes are seen in blood smears and schizonts are sometimes encountered. *H. verifelus* seems to be non-pathogenic and microscopic examination shows only the intra-erythrocytes forms. No schizonts are demonstrated. The presence of parasites provided with a velum is very characteristic for the diagnosis.

Because of inadequate insecticide application, it was not difficult to obtain ticks especially under the tail. As only *Ambryomma* sp. were collected, their role as a vector seems likely in this region.

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L'infection à *Haematoxenus verifelus* Uilenberg 1964 dans le bétail N'Dama au Zaïre.

Résumé — L'auteur signale l'existence de *H. verifelus* au Zaïre. Il fournit des données sur la prévalence de l'infection dans le bétail N'Dama et ses associations avec des infections dues aux trypanosomes. Dans la discussion il examine l'influence de certains facteurs prédisposants ou débiliteants sur l'évolution des infections causées par *H. verifelus*.

***Haematoxenus verifelus* Uilenberg 1964 infectie bij N'Dama vee in Zaïre.**

Samenvatting — De auteur beschrijft het voorkomen van *H. verifelus* in Zaïre. Hij verstrekt gegevens over de prevalentie van de besmetting bij N'Dama vee alsook zijn associatie met trypanosomen infecties. In de bespreking onderzoekt hij de invloed van bepaalde voorbeschikkende of ongunstige factoren op de ontwikkeling van de ziekte veroorzaakt door *H. verifelus*.

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