Fifth International Meeting on *Trypanosoma evansi*: Report of the Working Group

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Summary: During its Fifth Meeting, held at the OIE Headquarters, the group reviewed the epidemiological situation and the progress report of the Secretary; evaluation and impact of *T. evansi* infections in infected countries; development of research on practical diagnostic methods in the field; research work carried out in various laboratories on trypanocidal drugs; and trypanosome banks. Laboratory and field tests are being carried out (Thailand) on the standard card agglutination test (CATT), which is commonly used in the field to diagnose sleeping sickness, with a view to adapting this test for *T. evansi* diagnosis. Original research is also being carried out in liaison with the WHO research group on tropical diseases, with the objective of developing new trypanocidal drugs.


**EPIDEMIOLOGICAL SITUATION AND PROGRESS REPORT OF THE SECRETARY**

Several meetings were held between May 1985 and May 1986 on human and animal trypanosomes, with the participation of one or several members of the Working Group:

- The 23rd Seminar on trypanosomes organised by the British Society for Parasitology, Salford University (United Kingdom), from 26 to 28 September 1985;

- FAO meeting on new techniques for the control of African animal trypanosomes, held in Bamako (Mali), from 9 to 13 December 1985;

- Round-table on current research for the development of new chemotherapeutic products for African trypanosomes (UNDP/World Bank/WHO special programme for research and training in tropical diseases) organised by WHO in Geneva, on 10 March 1986;

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Round-table on "Cellular and molecular biology for trypanosomes", Annual Meeting of the Société Française de Parasitologie, held in Poitiers (France) from 6 to 8 May 1986.

Important epidemiological data were collected in Asia and Africa.

Asia

Additional information received by mail from Thailand and India was presented on trypanosomiasis in buffaloes. In Thailand, Dr K.F. Loehr and Dr S. Pholpark, working on a GTZ programme at the Tha Pra laboratory in the north-east of the country, reported that *T. evansi* provokes abortions and induces immunodepression, triggering haemorrhagic septicaemia in areas affected by this epizootic disease. In India, Dr S. Nedunchelliyan of the Madras Veterinary School isolated *T. evansi* strains from aborted foetuses of buffalo cows.

Africa

The presence of epimastigomates of *T. evansi* was demonstrated by J.L. Jacquemin in *Cephalopinus titillator* parasites found in the nasal cavities of camels infected with 'debab' in Algeria.

Two strains of *T. evansi* were isolated at the Bamako Veterinary Laboratory (Director: Dr M. Touré) by Dr O. Diall from dromedaries living in the north-west of the country and close to the border with Mauritania.

**EVOLUTION AND IMPACT OF *T. EVANSI* IN INFECTED COUNTRIES**

Dr A.M. Osman recalled that in Sudan the disease has a considerable impact among camels. As the vectors are difficult to identify, the use of insecticides does not give entirely satisfactory results. Active drugs such as quinapyramine (Antrycide®) and suramin (Antrypol®) are difficult to obtain.

In Ethiopia, Dr Zelleke Dagnatchew has found evidence that leads him to suggest that cattle may act as reservoirs of *T. evansi* for dromedaries. Suramin (Naganol®) continues to be the most commonly used drug, but a new product may be tested in the near future in Ethiopia; if this is the case, the results of these tests will be presented at the next meeting of the Working Group.

Dr E. Zweygarth stated that the most commonly used trypanocidal drugs in Kenya also are suramin (Naganol) and quinapyramine. Melarsoprol (Mel B = Arsobal®) has also been tested on experimentally-infected dromedaries, with very positive results, as reported in a thesis published by Dr P.H. Clausen (6).

Dr F.W. Brückle observed that trypanosomiasis in dromedaries is frequently reported by field workers in the Islamic Republic of Mauritania. However, Dr M. Clair indicated that it is very difficult to find evidence of *T. evansi* in the blood of camel cows in the area around Nouakchott.

Recent publications in the People's Republic of China report the presence of *T. evansi* in horses and buffaloes (9) and also in cattle (10).

In South America, a strain of trypanosome similar to *T. evansi* was isolated in cattle in the Chaco province in the Republic of Argentina; however, it was not possible to identify this strain with certainty (letter dated 23 May 1986).
DEVELOPMENT OF RESEARCH ON DIAGNOSTIC METHODS

Dr P.H. Clausen described the work being carried out at the Free University of Berlin, at the Institute of Parasitology and Tropical Veterinary Medicine (Director: Prof. Dr F. Hörchner). This work can be summarised as follows:

- Research on the pathogenic and immunogenic properties of *T. evansi* in different animal species (horses, dogs, ruminants, rabbits) (7, 8);
- The pathogenic properties of the various strains;
- Antigenic variation in cloned populations of *T. evansi* (1, 2);
- Immune response (differentiation of the various lymphocyte populations);
- Interferon production (2).

Dr E. Zweygarth, working in Kenya with the GTZ team ("Chemotryp" project) mentioned two studies which are in the process of publication, the first on *in vitro* cultivation of African strains of *T. brucei evansi* (12) and the second on the use of the enzyme-linked immunosorbent assay (ELISA test) for detecting *Trypanosoma (Trypanozoon) brucei evansi* antibodies in camels (13).

Prof. N. Van Meirvenne (Institute of Tropical Medicine, Prince Leopold, Antwerp) briefly presented the research in progress at his laboratory, as follows:

a) the immune trypanolysis test using cryopreserved reference sets of live trypanosomes of distinct Variable Antigen Type (VAT) appears to be the most reliable serological test method;

b) several experimental reagents for direct agglutination tests with stained trypanosomes are in the process of being evaluated:
   - the standard card agglutination test (CATT) using trypanosomes of defined Variable Antigen Type (VAT);
   - a microtray agglutination test with de-coated bloodstream form trypanosomes;
   - a microtray agglutination test with trypanosome procyclic cultures.

At the Brussels Institute of Molecular Biology, Prof. R. Hamers is pursuing research in various areas:

a) the performance of the standard card agglutination test (CATT) on buffaloes and pigs in Thailand showed that:
   - this test, which was developed for human *T. gambiense* infections, works after modifications;
   - a test in buffaloes correlates well with the complement fixation test;
   - a test in pigs correlates well with haemagglutination;
   - a survey of tested cattle herds suggested correlation between *Brucella* infection and trypanosomiasis.

b) pulsed fluid electrophoresis can be used as a tool to distinguish chromosomes of different strains of *T. evansi*;
c) ELISA assay has been developed for detecting antibodies induced by melarsoprol (Arsobal®).

RESEARCH ON TRYPANOCIDAL DRUGS

The seminar organised by WHO in Geneva on new potential trypanocidal compounds (supra) provided interesting and encouraging information on this subject.

Prof. J. Perié, of the Paul Sabatier University in Toulouse (France) reported on his work on glycolysis inhibition in trypanosomes (4), and his assistant, Dr D. Betbeder, described a method of quantitative determination of suramin in biological fluids (5).

Prof. T. Baltz presented a brief report on screening for drugs using axenic cultures of trypanosomes. After describing the culture medium used, he presented the test, which is carried out on a 24-well tray and gives results within twenty-four hours. He demonstrated the efficacy of melarsoprol and pentamidine (Lomidine®) on several T. brucei strains. In agreement with Prof. Perié, he was able to verify that pentamidine has very high cytotoxic properties at between 2 and 20 nanograms per ml of medium; in other words, it is considerably more potent than diminazene aceturate and suramin, which require concentrations of 200 nanograms per ml.

Prof. Van Meirvenne noted that nifurtimox (Lampit®), which was thought to be active only on Trypanosoma cruzi, has recently been successfully tested in Sudan on human T. gambiense infections. However, he did not have any further information on the possible potency of this compound on other brucei trypanosomes.

Dr Ali Yousuf Ahmed added that Lomidine is used in Somalia on humans but that he had no experience of this product in animals.

In reply to a question raised by Dr Zweygarth, Dr L. Touratier stated that in his opinion, melarsoprol, which gave positive results in dromedaries experimentally infected with T. evansi at a dose rate of 3.6 mg/kg body weight, could be used at a lower dosage, by analogy with the successful tests currently being carried out under WHO supervision in monkeys infected with T. gambiense at a dose rate of 1.8 mg/kg body weight.

Prof. Hamers recalled that the binding of trypanocidal drugs to plasma proteins can, in the case of melarsoprol, lead to the formation of antibodies. Research currently being carried out at his laboratory on these antibodies may contribute to explaining the mechanism of arsenical encephalopathy which is frequently fatal in humans overdosed with melarsoprol. Dromedaries treated by high doses of melarsoprol became intoxicated, as reported during the third meeting of the Working Group by Dr D. Schillinger who was working with the GTZ in Kenya at the time. Brain smears were obtained during necropsy and fixed in formalin. These brain smears were given to the Secretary of the Group by Dr Zweygarth so that histopathological tests could be performed. The results will be of interest not only in regard to veterinary treatment but also to the treatment of humans, as was emphasised during the meeting of the Group of experts on trypanocidal drugs organised by WHO in Geneva in March 1984.

The report by Dr Purnomo Ronohardjo, Director of the Bogor Research Institute for Veterinary Science, Indonesia, provided detailed information on research carried out in Bogor on T. evansi infections, namely:
- Epidemiological studies on buffaloes and cattle;
- Chemotherapy of *T. evansi* infections in Indonesia (tests on a new arsenical derivative);
- Stabilate bank (collection of fifty trypanosome strains);
- Experimental infection of susceptible large animals;
- Three-year research programme in conjunction with the Centre for Tropical Veterinary Medicine in Edinburgh, which has made available an expert.

Dr A.M. Osman mentioned the research being carried out in Sudan on chemotherapy (3).

**OTHER TOPICS COVERED**

A discussion took place on *Trypanosoma evansi* banks and exchanges of stocks between research institutes. It would appear that the only practical means of transporting these stocks is their being carried by travellers, in containers used for artificial insemination, since the sending of unaccompanied stocks is too risky and uncertain.

The Secretary received three requests for the typing of strains during the year from Mali, India and Argentina.

A trypanosome bank will be set up in France.

An item on *Trypanosoma evansi* and the organisation of a specialised conference was included in the programme of the Conference of Institutions of Tropical Veterinary Medicine organised by the Selang Selanger University, Malaysia, from 18 to 22 August 1986, to stress the importance of these infections, particularly in Asia and Africa.

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**REFERENCES**


