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Serodiagnosis of African trypanosomiasis using a chemiluminescent enzyme immunoassay

Short communication

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The diagnosis of African trypanosomiasis in animals is difficult under field conditions because the infection in local breeds is often chronic. This chronic state is accompanied by low parasitemia and generally parasites are rarely detectable in the blood. In these cases the diagnosis usually requires serological aid. However, most serological test methods depend on suitable laboratories with sophisticated equipment and, therefore, these immunoassays are not applicable under field situations.

Recently, a new rapid chemiluminescent test based on the microscale enzyme linked immunosorbent assay (ELISA) has been developed for the diagnosis of several parasitic and viral infections (Kricka and Thorpe, 1986).

We investigated the possibility of extending this serological test for diagnosis of African trypanosomiasis. The assay was performed according to the method of Wang et al. (1986) using a cameraluminometer and microtiterplates (MTP) from Dynatech (Denkendorf, Germany). Briefly, MTP-wells sensitized with extract-antigen of *Trypanosoma congolense* and *T. evansi* (5–30 µg) were incubated for 15 min with serial serum dilutions. After washing 3 times, the MTP-wells were incubated for 15 min with anti-IgG horseradish-peroxidase (HPO) conjugate in a moist chamber at room temperature and further washed 3 times. Thereafter, the MTP-wells were filled with Tris-buffer (pH 8.5) containing luminol, peroxide and 4-iodophenole. Then the MTP were placed into the cameraluminometer (Kricka and Thorpe, 1986). The HPO catalyses the chemiluminescent oxidation of luminol in the presence of an enhancer (4-iodophenole) and the resulting light emission is recorded by exposure (3–15 sec) of a high speed Polaroid film (ASA 20000, Type 612).

We have tested with the above mentioned method different serum samples taken from somalian camels and cattle, which were naturally infected with

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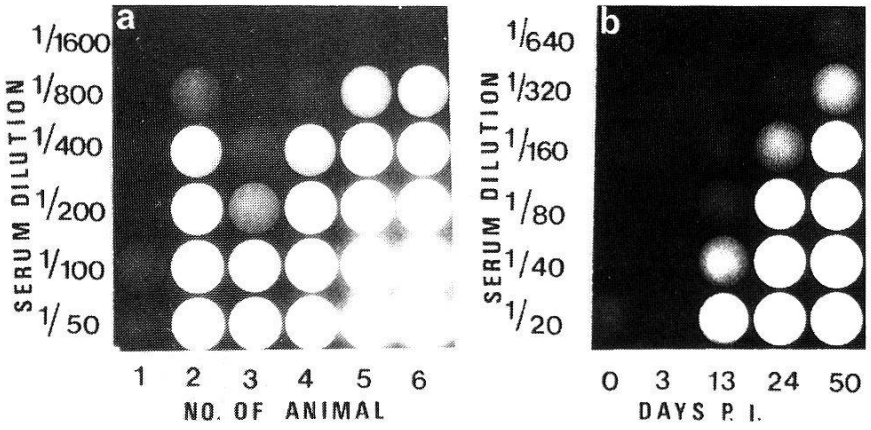

Fig. 1. Photographic results of the chemiluminescent immunoassay: a) after 4 min of incubation; time of exposure 15 sec. No. 1 shows the negative reference. Nos. 2–6 show the reaction of serum samples taken from naturally *T. evansi*-infected camels. b) After 4 min of incubation; time of exposure 5 sec. Results of serum samples taken before and after an experimental *T. evansi* infection of a horse.

T. evansi and serum samples taken from horses and dogs, experimentally infected with *T. evansi* or *T. congolense,* respectively.

Results from 6 camels are given in Fig. 1a. Serum samples of 2 camels had antibody titers of 1:800, two of 1:400 and another one of 1:200. No light emission was seen in the uninfected reference. Fig. 1b shows the results of serum samples taken during the course of experimental *T. evansi* infection of a horse. The first specific antibodies were found on the 13th day p.i. with a continuous increase until the 50th day p.i.

We believe, that the chemiluminescent enzyme immunoassay could represent under field conditions a proper completion to direct parasitological methods, such as the haematocrit centrifuge technique (Woo, 1969) or the miniature anion-exchange centrifugation technique (Lumsden et al., 1979). The test can be executed in a short time (approx. 1 h) without expensive technical equipment, is sensitive and all results are documentable on instant films.

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