

EXPERIMENTAL TRANSMISSION OF TICK-BORNE ENCEPHALITIS (TBE)
VIRUS BY *HAEMAPHYSALIS CONCINNA* TICKS

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Haemaphysalis concinna is a widely distributed tick species in the forests of temperate Eurasia. In the whole area of its distribution it prefers light, humid leafy or mixed forests with bush undergrowth, forest clearings and margins of oak forests. In Central Europe it also occurs on shore vegetation. Conversely, in the Far East it occurs in the forest steppe region. The life cycle of *H. concinna* lasts prevalently 3 years (1). TBE virus was isolated from adult *H. concinna* near Neusiedler-Lake in Austria (2) and northeastern Altai in the U.S.S.R. (3). Experimental data on *H. concinna* as vector of TBE virus are scarce (4, 5).

We studied *H. concinna* ticks from two laboratory breeds: one established in our Institute and the other by Dr. S. P. Chunikhin, Institute of Poliomyelitis and Viral Encephalitis, U.S.S.R. Academy of Medical Sciences, Moscow. Our breed has been derived from individuals collected in Podunajské Biskupice in the Danube region (Czechoslovakia), the second from individuals collected by Dr. Leonova in the Primorsky region (U.S.S.R.).

Tick larvae were infected by feeding on viraemic 4–6 days old suckling white mice that had been inoculated intraperitoneally with TBE virus strain 204 (6), isolated from *Ixodes ricinus* (8th mouse passage), namely with 0.03 ml of a 10% mouse brain suspension (titre $10^{8.2}$ i.e. mouse LD₅₀) diluted 10^{-2} . Suspensions from engorged larvae and nymphs were prepared each individually in 1 ml of basal Eagle's medium with 10% inactivated bovine serum. Suckling mice 1–3 days old were used for virus isolation and titration. Transmission of TBE virus by viruliferous *H. concinna* nymphs to white mice weighing 8–10 g was carried out by placing 3 nymphs each into translucent feeding capsules.

Six engorged larvae from each group were examined. All contained virus in titres from 10^1 – 10^2 i.e. mouse LD₅₀/0.01 ml. The virophoric period in nymphs from our and Dr. Chunikhin's breed lasted 56 and 97 days, respectively. *H. concinna* nymphs from both breeds transmitted the virus to adult white mice. The mice showed clinical symptoms of illness and died on the 7th or 8th day, respectively. The infection rate in nymphs ranged from 10–20% and the transmission rate amounted to 12%. The virus titre in individually examined engorged nymphs ranged from 10^1 – 10^3 i.e. mouse LD₅₀/0.01 ml.

Our studies on experimental transmission of TBE virus by viruliferous nymphs of *H. concinna* of both Central Europe and Far Eastern origin showed that *H. concinna* may act as vector in the whole area of its distribution. The transmission rate in both cases was equal. The relatively low transmission rate may have been due to the age of mice. The results (7) with *Ixodes persulcatus* showed that the transmission and infection rates depend on the age of the host.

H. concinna can be considered as a complementary vector in the natural foci of TBE.

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