

ATTEMPT TO INFECT *HUNTERELLUS HOOKERI* HOWARD
(HYMENOPTERA, ENCYRTIDAE), AN ENDOPARASITE OF TICKS, WITH *COXIELLA*
BURNETII

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Based on up to 70 % infestation of *Ixodes ricinus* L. ticks with encyrtid wasp, *Hunterellus hookeri*, in some localities near Bratislava (Řeháček, unpublished data), we consider this hyperparasite as an important regulator of tick populations in south-western Slovakia. Because the number of ticks harbouring rickettsiae, in particular *Coxiella burnetii* in this region is relatively high (1, 2), it would be interesting to determine whether this hymenopterous parasite, whose complete developmental cycle proceeds directly in ticks could eventually play a role in the circulation of *C. burnetii* among ticks in nature. To study this problem starved *I. ricinus* nymphs parasitized with *H. hookeri* wasps were obtained and the possibility of infection of the wasps with *C. burnetii* during their development within infectious ticks was examined.

I. ricinus ticks were collected in forests near Bratislava on May 8–10, 1991. They were engorged on laboratory white mice which were intraperitoneally inoculated with *C. burnetii*, phase I, strain Nine Mile EP₃ in a dose of 10⁴ EID₅₀/0.25 ml. During the feeding on May 22–27, 1991 the level of rickettsiae in blood of these donors varied between 10² – 10⁴ EID₅₀. An interval of about 28–42 days elapsed between the date when ticks detached from mice and the emergence of adult parasites from ticks. To verify whether coxiellae penetrated into ticks, (a) the antibody response to *C. burnetii* of white mice inoculated with suspensions from faeces of blood – feeding nymphs; (b) visual presence of the agent in ticks adults emerging from engorged nymphs and (c) the antibody response in white mice inoculated with suspensions from whole bodies of hatched adult ticks were followed. The presence of *C. burnetii* in wasps was traced in smears from whole bodies of adult parasites stained by Gimenez method any by isolation experiment carried out in yolk sacs of chick embryos.

In total, we succeeded to complete the engorgement on rickettsaemic mice of 320 *I. ricinus* nymphs. From this number 183 adult ticks and 130 wasps emerged. Several engorged nymphs perished during the metamorphosis but since the reason of their death was not the *H. hookeri* parasitisation, it was out of our interest. The *C. burnetii* infection of engorging nymphs was confirmed by the detection of the agent in all 3 pools prepared from their faeces. The transmission of the agent to adult ticks was proved by haemocyt test in 30 % of examined specimens and in all 6 samples of ticks (each pooled from 10 specimens), inoculated into white mice. However, the transmission of *C. burnetii* to *H. hookeri* wasps, (examined in smears from 20 specimens and by isolation attempt from 110 endoparasites in 3 separate pools) was unsuccessful.

The obtained results do not support the possibility of the contamination of *H. hookeri* wasps with *C. burnetii* in nature as well as their eventual role in the circulation of this agent among tick populations. However, complementary investigations are necessary to verify this assumption.

References

1. Řeháček, J., Kováčová, E., and Bázliková, M.: Proceedings of the conference "Importance of zoological research in anthropogenic activity and protection of environment", pp. 342–345, Bratislava 24. – 28. 8. 1981 (in Czech).
2. Řeháček, J., Úrvölgyi, J., Kocianová, E., Sekeyová, Z., Vavreková, M., and Kováčová, E.: *Eur. J. Epidemiol.* 7, 299–303, 1991.