

Commentary

Human Babesiosis Caused by *Babesia odocoilei*: A Confirmed Zoonosis

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Abstract: *Babesia odocoilei* has been gaining attention as a novel agent of tick-borne disease. Researchers allege that the American dog tick is a vector of *B. odocoilei*, but supportive evidence for this contention is absent. Likewise, *B. odocoilei* was allegedly found in two European patients, but supportive evidence for this postulate is lacking and it appears that the patients were infected with a close member of a sister group, *Babesia venatorum*. In contrast, a study by Scott *et al.* in two Canadian patients provides molecular evidence for the first-ever confirmed cases of human babesiosis caused by *B. odocoilei* anywhere in the world.

Keywords: *Babesia odocoilei*, Babesiosis, Ticks, Canada, *Ixodes*

Maggi *et al.* (2024) claim that *Babesia microti* is the predominant *Babesia* species in central and eastern North America, but this assumption is incorrect. Creditable scientific findings show that the intraerythrocytic piroplasmid *Babesia odocoilei* is the predominant *Babesia* species in Canada. Tick researchers found that the ratio of *B. odocoilei* to *B. microti* is 60-1 (Scott *et al.*, 2024) and *B. odocoilei* is the predominant *Babesia* species in *Ixodes scapularis* ticks nationwide. Maggi *et al.* (2024) state that *B. odocoilei* has been reported in Canada but incorrectly cited Herwaldt *et al.* (2003). In reality, Scott *et al.* discovered the *B. odocoilei* archetype in Canadian ticks (Scott *et al.*, 2022).

Although Maggi *et al.* (2024) claim that the American dog tick, *Dermacentor variabilis*, is a primary vector of *B. odocoilei*, none of the references cited in their study substantiate *D. variabilis* as a vector of *B. odocoilei*. This single-celled, red blood cell parasite causes malaria-like, febrile symptoms in humans who have been bitten by *B. odocoilei*-infected *Ixodes* ticks. After a comprehensive review of the scientific literature, there are no peer-reviewed references that show transstadial passage (larva to nymph and/or nymph to adult) of *B. odocoilei* in *D. variabilis*. In reality, it appears that the western black-legged tick, *Ixodes pacificus* and the black-legged tick, *Ixodes scapularis*, are the primary vectors of *B. odocoilei* in North America.

Maggi *et al.* (2024) intimated that two male patients in Austria and Italy were the first patients to be infected with *B. odocoilei*. However, the babesial strains that were recovered from the two patients clustered with a related sister *Babesia* group, EU-1 (*Babesia venatorum*), and the amplicons from the two patients failed to meet the current

molecular criteria for *B. odocoilei*. Maggi *et al.* (2024) mistakenly alluded to the supposition that *B. odocoilei* amplicons from Europe mimicked those from people in Canada and the United States, but the researchers mistakenly used a reference out of context and netted a miscitation. The archetypal reference for human infection with *B. odocoilei* is Scott *et al.* (2021).

Based on molecular characterization and patient symptomology, Scott *et al.* (2021) are the first research team to confirm that *B. odocoilei* causes human babesiosis. *Babesia* amplicons from these Canadian patients had 99.77 and 99.55% similarity with *B. odocoilei* type strains in GenBank. Phylogenetically, the amplicons from the two Canadian study participants are well within the accepted molecular range of a valid *B. odocoilei* species. These convincing findings verify that Scott *et al.* (2021) have described the first-ever confirmed cases of human babesiosis caused by *B. odocoilei*.

Conflicts of Interest

The author has no competing interests.

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