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The Role of Free-Living Amoebae in Supporting the Persistence of Atypical Brucella spp. in the Environment

Inhalt

Classical *Brucella* are host-adapted, zoonotic pathogens that replicate within macrophages of their hosts. Recently, atypical *Brucella* strains have been isolated from rodents, amphibians and soil. These *Brucella* isolates are genetically more similar to environmental *Ochrobactrum* spp., raising questions about their niches and zoonotic potential. This study explores whether free-living amoebae, which share phagocytic traits with macrophages, serve as reservoirs for these atypical *Brucella*.

We tested *B. microti*, three amphibian-derived *Brucella* isolates and two *Ochrobactrum* isolates for growth under different abiotic factors, as well as their interactions with amoeba (*Dictyostelium discoideum* and *Acanthamoeba castellanii*). All tested bacteria tolerated acidic culture conditions. The temperature optimum for *B. microti* and *Ochrobactrum* was at 28℃, but it varied for the other isolates. Preliminary data from macrophage infection assays confirmed intracellular replication of *B. microti* and amphibian-derived isolates. The latter resisted phagocytosis on an amoeba monolayer. In buffer, two of the amphibian-derived isolates showed increased proliferation in co-cultures with *D. discoideum*.

These findings suggest that atypical *Brucella* benefit from amoebae and thus might support their persistence in the environment. The ability of atypical *Brucella* to withstand acidic conditions, to adapt to lower temperatures, and to replicate in macrophages supports the hypothesis of a dual lifestyle in environmental and host-associated niches.

Keywords

Brucella, Ochrobactrum, Amoebae, Infection, Host cell interaction

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