

BACTERIAL MICROBIOTA OF THE SPINY EAR TICK (*Otobius megnini*) IN DURANGO, MEXICO WITH EMPHASIS ON POTENTIAL PATHOGENS FOR CATTLE AND HUMANS

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Introduction

Ticks are reservoirs of the largest number of bacterial symbionts compared to other blood-feeding arthropods; they are also the main vectors of animal diseases and the second most important vector that affects humans after mosquitoes. The spiny ear tick (Argasidae: *Otobius megnini*) is an ectoparasite of cattle, but human bites have also been reported in the United States, South Africa, and India. The Comarca Lagunera de Durango, Mexico, is one of the most important livestock regions in the country, where many families breed cattle in non-technified stables.

Materials and methods

In 2021, *O. megnini* ticks were collected from rangeland cattle at Ceballos, Bermejillo and Nazas, Durango, Mexico. The objective was to determine the taxonomic composition, relative abundance and pathogenic/zoonotic potential of bacterial taxa present in the viscera of *O. megnini*.

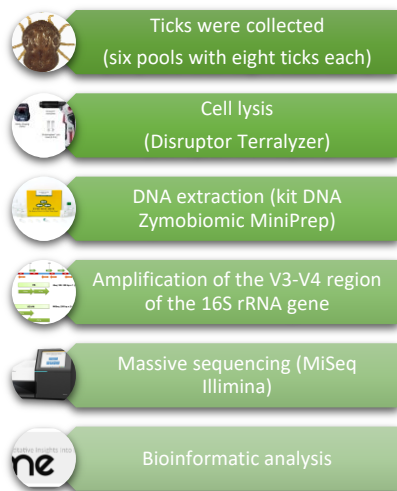


Fig 1. *Otobius megnini*.

their great abundance. Three bacterial taxa with pathogenic potential for cattle were detected: *Anaplasma* sp., *Coxiella burnetii*, and *Bartonella* sp., as well as four potentially zoonotic taxa: *Anaplasma* sp., *C. burnetii*, *Ehrlichia* sp., and *Bartonella* sp.

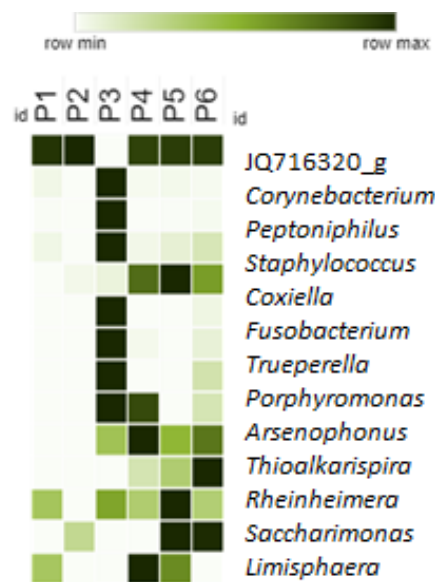


Fig. 3. Heatmap representing the relative abundance (%) of the dominant bacterial genera for the spiny ear tick (*Otobius megnini*) pools in the Comarca Lagunera de Durango.

Discussion

In the present study, it was recorded that the dominant bacterial phyla in the viscera of *O. megnini* were Proteobacteria ($x = 99.0\%$), Actinobacteria ($x = 0.6\%$) and Firmicutes ($x = 0.2\%$). These phyla coincide with what was reported in similar studies carried out on other species of the Argasidae family. Seven species of *Coxiella* were recorded (one of them the pathogen *C. burnetii*, five non-cultivable and one unknown). In this case, it is likely that the nonculturable and the unknown *Coxiella* are also endosymbionts of this tick, as reported for *O. turicata* (Barraza-Guerrero et al. 2020) and *A. persicus* (Duan et al. 2022). Likewise, *Arsenophonus arthropodicus* and *Ar. sp.* in the microbiota of *O. megnini*, which is also reported as an endosymbiont of arthropods (Nováková et al. (2009).

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Results

An average of 15,067 operational taxonomic units (OTUs) was obtained. A total of 17 bacterial phyla were recorded (Proteobacteria, 99.0%), 33 classes (Gammaproteobacteria, 99.0%), 66 orders (Thiotrichales, 98.9%), 105 families (JQ716320_f, 98.9%), 181 genera (JQ716320_g, 98.9%), and 216 species (28 known, 32 non-cultivable and 156 unknown). The dominant genus JQ716320_g is likely to be an endosymbiont, as well as the seven *Coxiella* species found in the microbiota of *O. megnini*. Endosymbionts are inherited from the mother and provide nutrients to the tick; hence

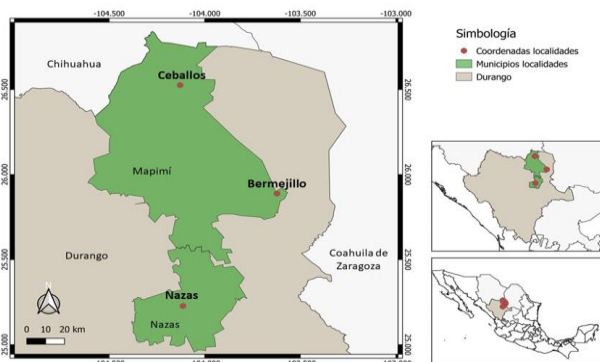


Fig 2. Study areas.