

P78 Molecular screening for *Midichloria* in hard and soft ticks reveals different prevalences and horizontal transmission

Alessandra Cafiso 1, Olivier Plantard 2, Valentina Serra 3, Anna Maria Floriano 1, Claudio Bandi 3, Davide Sasseria 1, Chiara Bazzocchi 3 4

1 Dipartimento di Biologia e Biotecnologie "L. Spallanzani", Università degli Studi di Pavia, Pavia, Italy. 2 INRA - ONIRIS - ENVN, UMR 1300 BioEpAR Biologie, Epidémiologie et Analyse du Risque. Centre de recherche Angers-Nantes, Nantes, France. 3 Dipartimento di Medicina Veterinaria and Dipartimento di Bioscienze, Università degli Studi di Milano, Milano, Italy. 4 Pediatric Clinical Research Center "Romeo ed Enrica Invernizzi" and EpiSoMi Research Center, Università degli Studi di Milano, Milano, Italy.

The family *Midichloriaceae* is a clade within the order *Rickettsiales* (which includes the etiological agents of important diseases and symbionts of arthropods and nematodes). In ecological terms, this new family is possibly even more complex than the sister families *Rickettsiaceae* and *Anaplasmataceae* and its hosts range from protozoa to parasitic arthropods (ticks, fleas, bedbugs). *Midichloria mitochondrii*, symbiont of the sheep tick *Ixodes ricinus*, was the first described member of the family *Midichloriaceae*, with a prevalence of 100% in females and ~50% in males. Most *M. mitochondrii* bacteria are localized in the cells of the ovary, either in the cytoplasm or within intermembrane space of the mitochondria. The bacterium is vertically transmitted from the mother to the offspring; nevertheless, there are some molecular and serological evidences suggesting that transmission to the vertebrate host can occur after the tick blood meal. Recent reports are expanding the view of *Midichloriaceae*, now including numerous bacteria of biological and medical interest, indicating a widespread distribution with an increasing range of hosts, with ticks being highly represented. A molecular screening on 17 tick species was performed, detecting and quantifying bacteria of the family *Midichloriaceae* in nine of them, including the first report of a representative of this family in a soft tick (Argasidae), *Ornithodoros maritimus*. Based on sequence identity and phylogenetic analysis we propose that all these bacterial symbionts of ticks could be members of the genus *Midichloria*. The performed screening highlights different prevalences and variable bacterial loads in different tick species including one, *Ixodes aulacodi*, where the bacterium is present in all examined individuals, like in *I. ricinus*. The obtained results prompt us to hypothesize different roles of *Midichloria* and the horizontal spread of these bacteria amongst ticks.