

Wild legume root nodules as a potential reservoir for human pathogenic bacteria

Rosella MURESU^{1*}, Elisa POLONE², Piero CAPPUCCINELLI³, Giuseppe DELOGU³, Anna Maria SCARPA⁴, Andrea SQUARTINI²

¹ C.N.R., Istituto per il Sistema Produzione Animale in Ambiente Mediterraneo (ISPAAM), Sede territoriale di Sassari, Trav. la Crucca 3, località Baldinca, 07040 Li Punti, Sassari, Italy

² Dipartimento di Biotecnologie Agrarie, Università di Padova, Viale dell'Università 16, 35020 Legnaro (Padova) Italy

³ Dipartimento di Scienze Biomediche, Divisione di Microbiologia Clinica e Sperimentale, Viale S. Pietro 43 B, 07100 Sassari, Italy

⁴ Dipartimento di Scienze Agronomiche e Genetica Vegetale Agraria, Università degli Studi di Sassari, Via Enrico de Nicola, 07100 Sassari, Italy

A previous finding by our group (Benhizia *et al.*, 2004) shows that root nodules from wild legumes, besides their natural rhizobium symbionts, can host and multiply bacteria belonging to species pathogenic to humans. These include *Enterobacter cloacae*, *Enterobacter kobei*, *Escherichia vulneris*, *Leclercia adecarboxylata*, *Pantoea agglomerans*. As these taxa were repeatedly found in nodules from three plant species, differing by habitat ecophysiology, and harvested in independent natural sites which are spaced apart up to 150 Km from each other, we believe that the phenomenon can be a general feature and have potentially significant impacts for the epidemiology of bacteria of clinical interest. In the sole Italian territory nearly four hundred species of wild leguminous plants are known, whose microbiological interactions are largely unknown. These plants can nevertheless develop abundant root nodules, which are optimal sites for bacterial multiplication. Wild legume distribution can span over a series of habitats, ranging from urban-synanthropic, to agricultural, and to the majority of natural habitats. In light of the above findings, yielding five Enterobacterial taxa of potential danger to humans from the analysis of only three species of wild plants, one could envisage the biomass of wild legumes as possible strategic niche for the survival and active multiplication of clinical pathogens in hosts alternative to mammals.

Keywords: legume, human pathogenic bacteria.

References:

Benhizia Y., Benhizia H., Benguedouar A., Muresu R., Giacomini A., Squartini A. (2004). Systematic and Applied Microbiology, 27: 462-468.