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PROMOÇÃO:



Nodulation and nitrogen fixation by *Mimosa* spp. in the cerrado and caatinga biomes of Brazil

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A survey of nodulation in the genus *Mimosa* was undertaken in three highland areas in the Cerrado (Chapada dos Veadeiros, Serra dos Pirineus, Chapada dos Guimarães), a savannah region in central Brazil which is typified by acidic and Al-rich soils, and in one highland area in the Caatinga (Chapada da Diamantina), another savannah region in the North East of Brazil, but with Fe-rich soils. Nodules were collected from 65 of the 68 *Mimosa* spp. found. Twenty one species were endemic only to localities where they were collected, 14 were endemic to the Cerrado/Caatinga as a whole, and the others were widespread in Brazil and elsewhere in the tropics. Forty five of the species, including all endemics, except for *M. blanchetii* from the Caatinga were newly reported as nodulating. Nodules from 47 species were examined by light and electron microscopy, and all had a structure typical of effective *Mimosa* nodules. The endosymbiotic bacteria in nodules from most of the *Mimosa* spp. were identified as *Burkholderia* using *in situ* immunolabelling with an antibody against *Burkholderia phymatum* STM815. All nodules tested were shown to contain nitrogenase by labelling with an antibody to the nitrogenase *nifH* protein. Attempts to quantify nitrogen fixation using the $\delta^{15}\text{N}$ (^{15}N natural abundance) technique were more successful in the Caatinga than in the Cerrado owing to the low $\delta^{15}\text{N}$ signature of the Cerrado soil. It is concluded that: 1. Nodulation in the large genus *Mimosa* is a generic character; 2. The preferred

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symbionts of Brazilian *Mimosa* species are *Burkholderia*; 3. Their ubiquity in the Cerrado and Caatinga combined with their ability to fix N₂ means that they probably make a valuable contribution to the N-budgets of these fragile and much-threatened biomes; 4. This is also the first study to demonstrate N₂ fixation by Beta-rhizobial symbioses in the field.

Key-words: nodules, *Burkholderia*

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