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METAL-TOLERANT BACTERIA ASSOCIATED WITH NATIVE PERUVIAN CACAO (*Theobroma cacao*): DIVERSITY AND CADMIUM REMOVAL POTENTIAL.

Chavez-Castillo, Jeremy I.¹ - Villegas-Mas, Jheyner¹ - Márquez-Romero, Fanny R.² - Estrella, Maria Julia³ - Sannazzaro, Analía Inés³ - Cumpa-Velásquez, Liz Marjory S.^{1,2}

1) Instituto de Investigación para el Desarrollo Sustentable de Ceja de Selva, Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Calle Higos Urco 302, Chachapoyas, Amazonas, Perú.

2) Facultad de Ingeniería Civil y Ambiental, Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Calle Higos Urco 302, Chachapoyas, Amazonas, Perú.

3) Universidad Nacional Intercultural de Quillabamba, Departamento Académico de Ingeniería Civil y Ciencias Básicas. Cusco, Perú.

4) Instituto Tecnológico de Chascomús (INTECH), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Universidad Nacional de San Martín (UNSAM), 7130, Chascomús, Argentina.

Contacto: jeremychavezcastillo@gmail.com

Native Peruvian Cacao, though highly valued, is constantly threatened by various factors that compromise its productivity. Among the significant challenges is the high concentrations of cadmium (Cd) in cacao soils, which is absorbed by the plant and inevitably translocated to its vegetative and reproductive organs. As a result, both the raw cacao and its final products can become contaminated with high levels of Cd, endangering the crop's export potential. In response to the growing need for effective cacao management strategies, a survey of Cd-tolerant rhizospheric bacteria was conducted in two of the main native cacao-producing regions (Amazonas and Piura). Four representative cadmium affected districts (Copallín, Aramango, San Jacinto and Papayal) were chosen, and 216 bacterial strains were isolated from the cacao rhizosphere. A total of 108 representative isolates were selected; these were genotyped by fingerprinting and identified by amplifying the 16S rRNA gene. After genetic profiling, 23 genotypic clades were obtained at 90% similarity, mainly belonging to genera *Cupriavidus*, *Variovorax*, *Burkholderia*, *Pseudomonas* y *Agrobacterium*. Complementarily, the cadmium tolerance capacity of the genotypically different isolates was evaluated by both replica plating and drop plate at 0, 100, 200 and 300 ppm CdCl₂, obtaining a total of 14 bacterial strains hyper tolerant to Cd (growing normally at 300 ppm CdCl₂). Finally, these strains were evaluated for their cadmium uptake capacity under in-vitro conditions at 300ppm CdCl₂. Preliminary results suggest a significant cadmium removal potential under in vitro conditions by rhizosphere bacteria associated with the native Peruvian cacao, which could be exploited as a bioremediation strategy in cadmium-contaminated cacao soil.

Palabras clave: Native Cacao - Rhizobacteria - Diversity - Tolerance - Sustainability