This study provides a detailed characterization of the rhizospheric and endophytic microbiomes associated with three native desert plants--Vachellia gerrardi, Haloxylon salicornicum, and Ziziphus spina-christi--across three contrasting arid regions (Tabuk, Hail, and Arar) within the King Salman Royal Reserve.Harnessing stress-resilient bacterial and fungal taxa identified in this study could contribute to the development of microbe-based strategies for sustainable agriculture, ecological restoration, and land reclamation in arid and semi-arid regions, aligning with national efforts to enhance environmental sustainability and food security.Fungal taxa such as Trichoderma, Chaetomium, and arbuscular mycorrhizal groups further highlight the potential of desert-derived microbes as biological tools for enhancing plant resilience, improving soil fertility, and supporting ecosystem functioning in degraded drylands.

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