

Abstract

Microorganisms associated with plant seeds have recently gained increased attention due to their pivotal role in enhancing plant health through the acquisition of nutrients and plant growth promotion. Although rattlepods (*Crotalaria* spp.) are widely consumed, information regarding the bacterial diversity and functional roles within their seeds remain unexplored. This study isolated, identified, and characterized endophytic and epiphytic culturable bacteria from seeds of Kenyan rattlepods. A total of 118 seed-associated bacterial isolates were cultured from the rattlepods (*Crotalaria* spp.), and 20 of them were identified using 16S rRNA gene sequencing. The isolates belonged to two distinct phyla: Proteobacteria and Firmicutes. The isolates belonged to four genera: nine *Bacillus*, nine *Proteus*, one *Lysinibacillus*, and one *Morganella*. BLAST analysis of partial 16S rRNA gene sequences (763-1273bp) showed that 19 of the 20 isolates exhibited high similarity (>99%) to previously described species, whereas one isolate showed low similarity (< 0.05) higher protease and cellulase. Isolates 4EnA1/2/1 (*P. mirabilis*) and 9EnA (*P. mirabilis*) were the highest significant amylase producers, whereas isolates 3EnB3/3 (*Proteus* sp. [in enterobacteria]) and 10EnA 2/1 (*P. mirabilis*) were the highest significant lipase producers. Most seed-associated bacteria isolated from *Crotalaria* spp. were identified as known species; however, some isolates may represent novel taxa and could serve as promising candidates for the production of biotechnologically important extracellular enzymes under mesophilic conditions.