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PLANT GROWTH PROMOTING MERITS OF TAXODIUM RHIZOBACTERIA

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ABSTRACT

The aim of this study was to isolate and characterize a number of diazotrophs from the rhizosphere of the woody tree *Taxodium distichum* and examine their plant growth promoting effects on seedlings of three woody tree species namely, *Balanites aegyptiaca, Khaya senegalensis* and *Taxodium distichum*. Twelve diazotrophs were isolated from the rhizosphere of *Taxodium distichum* seedlings on N-free medium. All of this isolates were found to fix atmospheric nitrogen and successfully tolerate NaCl up to 12000 ppm in their growth culture medium. Two out of the 12 isolates had the highest IAA producing capability producing 7.165 and 7.592 $mg.l^{-1}$ were identified using BIOLOG 2000 as strains of *Kocuria varians* and *Enterobacter cloacae*, respectively. Results from the pot trial indicated the potential use of the two strains for enhancing seedling growth of *Balanites aegyptiaca, Khaya senegalensis* and *Taxodium distichum* as PGPR inocula strains of *Kocuria varians* and *Enterobacter cloacae*. Using composite inoculum of both arbescular mychorrhizal fungi AMF-1 (*Glomus sp.*) and AMF-2 (*Gigaspora* sp.) and the two PGPR strains had no positive effect on plant growth compared with control. A significant increase in IAA content was observed with all plants compared with untreated seedlings with the highest value recorded for the combination treatment. The increases in IAA percentages were 113.44, 60.87 and 27.51% when seedlings of *Taxodium distichum* were treated with combination; *Khaya senegalensis* were treated with *Kocuria varians* and *Balanites aegyptiaca* were treated with combination, respectively. A significant increase in nitrogen content was observed with plants compared with untreated seedlings according to plant species. The increases in nitrogen percentages were 28.3, 9.95 and 76.39 when *Balanites aegyptiaca, Khaya senegalensis* and *Taxodium distichum* were inoculated with *Enterobacter cloacae,* Mycorrhizae and combination, respectively.

Key word: *Balanites aegyptiaca, Khaya senegalensis,* Mycorrhizae, PGPR, *Taxodium distichum.*