ISOLATION OF *Azospirillum* spp. AND THEIR EFFECT ON GROWTH AND FLOWERING OF *Catharanthus roseus* (L) G. Don

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Introduction. The genus *Azospirillum* has been widely recognized as plant growth promoting rhizobacteria (PGPR). Plant growth promotion has been attributed to atmospheric nitrogen fixation and production of auxins (1). In filed *Azospirillum* increases root development and enhances its capacity to use nitrogen from soil. This study was carried out to evaluate the effect of native strains of *Azospirillum* spp. on growth and flowering of *Catharanthus roseus* (L) G. Don.

Methods. Twenty-six samples were isolated from roots of the grass *Cenchrus echinatus*. Isolates were characterized morphologically (1). For molecular identification, PCR reaction was performed using specific primers for the genus *Azospirillum* as documented by Shime–Hattori *et al*. (2011). *Catharanthus roseus* seeds were immersed in 48-h liquid cultures of *Azospirillum* sp. Cell suspensions were adjusted to $1x10^7$ ufc mL^{-1}. Variables evaluated included height, stem diameter, fresh and dry matter, root volume, leaf area, total nitrogen, flower buds, day to bloom, anthesis and number of opened flowers.

Results. Three isolates were morphologically characterized as *Azospirillum*: P10, P13 and P22. The amplification products of the 16S rDNA gene showed a DNA fragment of 640-650 bp, corresponding to the expected size for the genus (Fig. 1). Inoculation *Azospirillum* showed no significant effects on plant height, stem diameter, fresh matter, and total nitrogen of leaves. Significant effects, however, were observed in dry matter, leaf area, and root volume (Table 1), as well as on time to bloom and time to the appearance of first flower buds. Plants inoculated with the strain P13 reached anthesis 31 days after transplant. We also found significant differences in the number of flower buds and open flowers. Higher number of flower buds was observed in plants inoculated with strain P13 (39.3 flower buds) compared to that observed in the control plants (18.3 flower buds). The highest number of flowers was observed in plants inoculated with strain P13 (7.3 flowers).

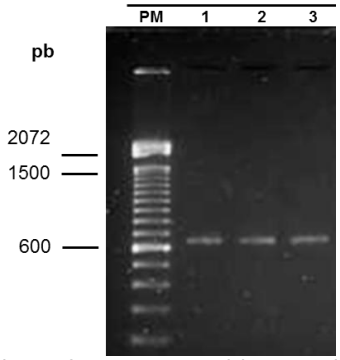

Fig 1. Products of PCR generated by *Azospirillum* spp. lane 1, strain P10; lane 2 strain P13; lane 3, strain P22; lane PM, 1kb DNA ladder.

Table 1. Effects of *Azospirillum* spp. on growth of *C. roseus* plants

Strains	Dry matter (g)	Leaf area (cm^2)	Root volume (cm^3)
P10	4.5±0.8ab	643±174ab	11.0±0.04a
P13	4.8±0.8ab	1625±1183a	9.5±1.7ab
P22	5.0±0.4a	722±116ab	11.8±1.5a
AZO	4.2±0.4ab	627.7±315ab	8l.8±0.5ab
Control	3.5±0.7b	379±645b	7.3±1.7b

Means with the same letter within columns do not differ significantly (Tukey, P= 0.05). AZO: *Azospirillum brasilense* (control strain).

Conclusions. Three strains of *Azospirillum* spp. were isolated. All strains showed effects on growth of *C. roseus.*

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