**Supplementary Table 1: Composition of VL-70 + Cactus Extract Agar (VLCEA) medium**

|  |  |
| --- | --- |
| **Ingredients** | **Quantity/ L distilled water** |
| 3-(N-morpholino) propanesulfonic acid | 2.09 g |
| MgSO4 / MgSO4 . 7H2O  | 24.09 mg / 49.3 mg |
| CaCl2 / CaCl2 . 2H2O  | 66.61 g / 88.2 g |
| K2HPO4 | 27.02 mg |
| Growth substrate (Starch) | 0.5g |
| Selenite tungstate solutiona | 1mL |
| Trace element solution SL-10b | 1mL |
| Agar  | 18 g |
| Cactus root/shoot extract (Filter sterilized and added after autoclaving)  | 10 mL |
| pH  | 7.2 ± 0.2 |

aSelenite tungstate solution (Per litre stock solution)

|  |  |
| --- | --- |
| NaOH  | 0.5 g |
| Na2SeO3·5H2O | 3 mg |
| Na2WO4·2H2O | 4 mg |
| Distillated water | 1 L |

Stored at 4°C

bTrace element solution SL-10 **(**Per litre stock solution)

|  |  |
| --- | --- |
| HCL (25%, 7.7 M) | 10 mL |
| FeCl2·4H2O / FeCl3·6H2O | 1.5 g / 2.04 g |
| ZnCl2 | 70 mg |
| MnCl2·4H2O | 100 mg |
| H3BO3 | 6 mg |
| CoCl2·6H2O | 190 mg |
| CuCl2·2H2O | 2 mg |
| NiCl2·6H2O(or NiCl2 13mg) | 24 mg |
| Na2MoO4·2H2O | 36 mg |
| Distilled water | 990 mL |

Stored at 4°C



1. (b)

**Supplementary Figure 1: Representative pictures showing the emergence of colonies of endophytic actinobacteria on the isolation media plates [HVA medium (a) and MSA medium (b)] from the surface sterilized root bits of cactus.**



 Back side view Front side view

**Supplementary Figure 2: Representative picture showing growth of endophytic actinobacteria on the N-free Jensen medium.**



 Back side view Front side view

**Supplementary Figure 3: Representative picture showing orange-yellow halo zone representing the siderophore production trait of the endophytic actinobacteria on the modified CAS medium.**

**Supplementary Figure 4: Figure showing no detectable nitrogenase activity among the selected root-endophytic actinobacterial isolates, except positive control [*A. chroococcum* isolate (Ac-EPS-1)] in the acetylene reduction assays performed using GC-FID.**



**Supplementary Figure 5: Agarose gel picture showing no amplification of *nif*H gene from endophytic actinobacterial isolates, which showed growth on the N-free Jensen medium (*nifH* primers used: IGK3/ DVV [34, 35]; Lane Lane M- 1 kbp ladder; Lane 1-10 selected endophytic actinobacterial isolates; Lane 11- *Bradyrhizobium diazoefficiens* USDA 110, used as a positive control for carrier of *nif*H gene; Lane 12- Negative control).**