Plants are important sources of chemical constituents with potential therapeutic benefits. ‘Endophytes’ are the microorganisms, colonizing living internal tissues of plants without causing any immediate or overt negative effect on the host. In the current investigation, four medicinal species viz., *Cajanus lineatus* (W. & A.) Maesen, *Leucas ciliata* Benth., *Rauvolfia densiflora* Benth. ex. Hook. f., and *Gomphostemma heyneanum* Wall. ex. Benth., collected from the Talacauvery subcluster of the Western Ghats, India was subjected to phytochemical analysis, antioxidant activity and endophytic actinomycete isolations. The frequency of the actinomycete isolation was high in *C. lineatus* (47.7%) and *L. ciliata* (28.2%), followed by *R. densiflora* (13.8%) and *G. heyneanum* (10.3%). The actinomycete strains were identified by culture and by 16S rRNA gene sequences. *Streptomyces* comprised 68% of all isolates, the remaining were *Arthrobacter* (11%), *A. viscosus* (4%), *Rhodococcus* (9%), *Promicromonospora citrea* (5%) and *Patulibacter minatonensis* (3%). The phylogenetic tree constructed for the actinomycete strains revealed four groups represented by *Streptomyces, Arthrobacter, Rhodococcus-Patulibacter and Promicromonospora* clades.

The phytochemical analysis was carried out for the leaf solvent extracts of all plant species. All extracts indicated the presence of flavonoids, terpenoids, steroids and reducing sugars. Among the solvent extracts, the aqueous leaf extract of *L. ciliata* contained high total phenolics. The solvent extracts of the leaves of this species also exhibited higher antioxidant activity. The aqueous and methanol extracts of *L. ciliata* and the aqueous extract of *R. densiflora* had high Ferric reducing antioxidant power (FRAP) activity. The actinomycetes were fermented and the products screened for antioxidant assays. The ethyl acetate extracts of *S. globosus* (JQ926176) isolated from stem fragments of *R. densiflora* and *Arthrobacter* sp. (JQ926171) isolated from *L. ciliata* showed remarkable dose-dependent antioxidant activity in different in vitro assays.

Both plant and the actinomycete extracts were tested for the anti-diabetic potential by the inhibition of α-amylase activity by colorimetric assay and the insulin releasing ability and glucose uptake in the porcine hemidiaphragm model. Among the solvent extracts of medicinal plants, the methanolic extract of *L. ciliata* showed positive results in the initial screening for the inhibition of α-amylase by the Starch-
Iodine color assay. The extract was further quantified by chromogenic 3, 5-dinitrosalicylic acid (DNSA) method. The methanolic extract of *L. ciliata*, showed 72.9% inhibition. *S. longisporoflavus* (JX965948) isolated from the stem fragments of *L. ciliata* exhibited α-amylase inhibitory activity. The extract of *Streptomyces* sp. (JQ926174) from *R. densiflora* indicated glucose-uptake in the porcine hemidiaphragm. Results indicate for the first time the potential of the endophytic streptomycete extracts with anti-diabetic activity.

The extracts tested positive for the antioxidative and α-amylase inhibition was analyzed for the compounds by Gas Chromatography and Mass Spectroscopy (GC-MS). Compounds detected in the leaf methanol extract of *L. ciliata* and *S. longisporoflavus* by technique were used as ligands in molecular docking studies for the inhibition of α-amylase (receptor) enzyme activity. Acarbose™, was used as the standard α-amylase inhibitor. The binding energy of ligands to α-amylase ranged between −2.2 kcal/mol to −4.8 kcal/mol. Our study illustrated that three ligands of *L. ciliata*, viz., Topotecan (L7) Cathine (L17) and 2,5- dimethoxy-4- methyl sulfonyl amphetamine (L18) exhibited good enzyme inhibition scores (0.14-0.96) and binding energies (−4.2- 4.8). Seven ligands from *S. longisporoflavus* viz., Lucenin 2 (L), 1H-Purin-6-amine, [(2-fluorophenyl) methyl]- (CAS) (L16), Quercetin 7,3′,4′- trimethoxy (L19), Ergotaman-3′,6′,18-trione,9,10-dihydro-12′-hydroxy-2′-methyl-5′-(phenylmethyl)-, 5′α,10α (L22), Pyrrolo[1,2-α]pyrazine-1,4-dione, hexahydro-3-(phenylmethyl) (L23), 2′-De-n-methylaplysinopsin (L65) and Fumaric acid, monoamide, N-methallyl-, 2,6-dimethoxyphenyl ester (L66) possess α-amylase inhibitory activity. Among the seven inhibitors, L22 is a good α-amylase inhibitor. These molecular docking analyses could lead to the further development of potent α-amylase inhibitors for the treatment of diabetes.

Our study reports for the first time, the presence of the endophytic actinomycetes from four medicinal species. Endophytic *Arthrobacter* sp., exhibiting antioxidant activity is reported for the first time. The methanolic leaf extract of *L. ciliata* and its endophyte, *S. longisporoflavus* exhibited α-amylase inhibitory activity. Our study is the first attempt on the characterization of antioxidant compounds from the endophytic actinomycetes. This study also provides first hand information on the α-amylase inhibitory compounds from the endophytic *S. longisporoflavus* by molecular docking studies.