SUMMARY AND CONCLUSION
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The present study was conducted to explore the plant wealth of Udayagiri Hills of Nellore district, Andhra Pradesh, India from July 2011 to March 2014. The objectives of the study were to survey and document the flora with their ethnobotanical information available with the local inhabitants. Phytochemical analysis, antimicrobial and antioxidant activities were carried out in certain plant species selected based on their abundance and medicinal use.

The present study has resulted in the documentation of 476 plant species belonging to 102 families with 319 genera comprising of Angiosperms, Gymnosperms, Pteridophytes, Bryophytes, Fungi and Lichens. Out of the 476 plant species, Angiosperm flora accounts for 460 species belonging to 303 genera with 89 families. Apart from Angiosperms, One Gymnosperm, Six Pteridophytes, Two Bryophytes, Six Fungi and One Lichen species were recorded from the study area. The 16 plant species of Gymnosperms and Cryptogams were grouped under 13 families with 16 genera.

With regard to taxonomic groups of the entire flora, about 96.64% belong to Angiosperms (86.14% Dicots and 10.50% Monocots) and the remaining 3.36% are from Gymnosperm, Pteridophytes, Bryophytes, Fungi and Lichens. The collected plants were provided with the botanical names of plant species, family, vernacular name, habit and locality. APG III (2009) System of classification was followed in enumeration of plant species.

Out of 460 plant species of Angiosperms, Fabaceae dominated with a maximum of 69 plant species, Malvaceae was the second largest family having 32 species, the third largest was Apocynaceae with 23 species and the fourth was Euphorbiaceae with 22 species. High to low species
distribution pattern was found in families of Rubiaceae 18, Poaceae 16, Acanthaceae 15, Lamiaceae 14, Asteraceae and Convolvulaceae one each; Amaranthaceae 11, Cyperaceae 10, Verbenaceae and Cucurbitaceae nine each, Moraceae eight, Phyllanthaceae, Rhamnaceae, Combretaceae, Rutaceae and Solanaceae seven each, Commelinaceae, Vitaceae and Scrophulariaceae six each, Liliaceae, Menispermaceae, Nyctaginaceae, Myrtaceae, Boraginaceae and Oleaceae five each, Molluginaceae, Anacardiaceae, Sapindaceae and Bignoniaceae four each, Annonaceae, Amaryllidaceae, Capparaceae, Meliaceae and Sapotaceae three each, Aristolochiaceae, Areaceae, Dioscoraceae, Loranthaceae, Portulacaceae, Celastraceae, Putranjivaceae, Cleomaceae, Ebenaceae, Loganiaceae and Pedaliaceae two each and the remaining about 40 families are represented with only one specie each.

The 460 Angiosperm plant taxa recorded were placed under 303 genera and 89 families. With regard to number of genera, Fabaceae dominated with a maximum number of 35 genera and about 50 families were represented by only one genus. Among 303 genera, the most dominant genus was *Euphorbia* with eight species followed by *Ficus* with seven species.

Habit-wise, among the 460 Angiosperm plant species, the herbs accounted for 49.5% shrubs and under shrubs 30.2% and Trees 20.2% The flora was dominated by herbs followed by shrubs (including under shrubs) and trees.

The information provided by the local informants (teachers, herbal practitioners and shepherds) with regard to vernacular names and ethnobotanical uses of 250 plant species has been documented. Out of 250 plant species belonging to 80 families, the major species contributing
families were Fabaceae (14.8%); Apocynaceae (5.6%); Euphorbiaceae (4.8%); Poaceae (4.8%); Rubiaceae (4.0%) and Amaranthaceae (3.6%). Acanthaceae, Lamiaceae and Verbenaceae (each 2.8%); Cucurbitaceae, Malvaceae and Moraceae (each 2.4%); Liliaceae, Phyllanthaceae and Asteraceae (each 2.0%). With regard to the representation of minor species contributing families, two families - each four plant species; nine families - each three plant species; 12 families - each two plant species and 36 families - each one plant species.

- Ethnobotanical evaluation revealed that, among the plant parts used to cure various diseases, mostly the leaves are used followed by whole plant, root bark, stem bark, stem, seed, flower, fruits and underground parts.

- Screening for phytoconstituents, antimicrobial activity and antioxidant potential of 18 plant parts of 14 selected plant species were carried out. The plant parts selected for the screening were leaves, stem bark, fruits and whole plant in the case of stem parasites such as Cassytha filiformis, Dendrophthoe falcata and Viscum articulatum.

- Phytochemical screening was carried out on plant extracts in ethanol, methanol and water. It revealed the presence of alkaloids, terpenoids, flavonoids, phenols, tannins, coumarins, quinines, glycosides, saponins steroids, phytosteroids and cardiac glycosides. Among the three extractants employed, ethanol proved to be a better solvent compared to methanol and water in this study.

- The quantification of phenols, tannins, saponins and flavonoids was carried out as they were proved as responsible phytoconstituents in antimicrobial activity as well as antioxidant potential. The results revealed that, generally
the quantum or yield of phenols, tannins, saponins and flavonoids varied in different organs of the same plant and in the same organ of different plants.

Antimicrobial activity of plant extracts in Ethanol, Methanol and Water in three different concentrations i.e. 50mg/ml, 100mg/ml and 150mg/ml was carried out by Agar disc diffusion method against six known human pathogenic organisms. The six test microbes include *Escherichia coli*, *Pseudomonas aureginosa* the two Gram –ve bacterial strains, *Staphylococcus aureus*, *Bacillus cereus* and *Bacillus subtilis*, the three Gram +ve bacterial strains and one Deuteromycetes fungus, *Candida albicans*. It was observed that the plant extracts showed significant antibacterial activity against the tested bacterial strains but very little effect against the tested fungus.

Among 18 plant parts of the 14 plant species screened, the strongest antioxidant activity of 94.7% was shown by *Dendrophthoe falcata* (whole plant- ethanol). The second highest activity of 92.1% was observed in Ethanol extract of three plant parts i.e. *Mucuna atropurpurea* - fruit, *Cassytha filiformis* - whole plant and *Cardiospermum macrocarpum*-leaf. *Strychnos nux-vomica* (leaf extract in methanol), *Hemidesmus indicus* (leaf extract in methanol) and *Delonix elata* (leaf extract in ethanol) exhibited high antioxidant potential scoring 90.7%, 89.4% and 88.1% , respectively. It was interesting to note that the stem parasites i.e. *Cassytha filiformis* and *Dendrophthoe falcata* and to some extent *Viscum articulatum* proved to be strong and promising antioxidants. The remaining plant parts were also potent source of natural antioxidants, except for the fruits of *Dioscorea oppositifolia* and *Strychnos potatorum*.
The findings of the present study revealed that the strongest/highest antioxidant activity was exhibited by ethanol plant extracts (ten plant parts) compared to extracts in methanol (five plant parts) and in aqueous (three plant parts) solvents. The corroboration between phenolics (flavonoids and terpenes) and strong antioxidant activity of extracts was observed.

Among 18 plant parts, whole plant of *Dendrophthoe falcata*, *Cassytha filiformis* and and the fruit of *Mucuna atropurpurea* exhibited high antimicrobial activity as well as antioxidant potential. Hence, the crude extracts of the above cited three plant parts in ethanol were further subjected to GC-MS to probe the active principles (bioactive compounds) responsible for their high level of biological activities. The integration events of the spectrum of GC-MS has shown the presence of 26 compounds in whole plant extracts of *Dendrophthoe falcata*, 10 in *Cassytha filiformis* and 36 compounds in the fruit extract of *Mucuna atropurpurea*. The major phytocmpounds in all the three plant parts were carene, phytol, squalene, beta-tocopherol, gamma-tocopherol, vitamin E, alpha-amyrin, beta-amyrin, gamma-sitosterol, eicosane and olean. Abundance-wise, among the six compounds recorded in *Dendrophthoe falcata*, four were terpenes, one vitamin and one sterol; in *Cassytha filiformis*, out of four compounds, three were vitamins and one sterol and in *Mucuna atropurpurea* out of six compounds, four were terpenes, one vitamin and and one alkane. The presence of various above mentioned bioactive compounds justified the high level of antimicrobial and antioxidant activity in all the three plant parts i.e., *Dendrophthoe falcata*-whole plant, *Cassytha filiformis*-whole plant and *Mucuna atropurpurea*-fruit.
However, isolation, identification, characterization and elucidation of the structure of individual phytochemical compounds and subjecting them to definite biological activity will definitely yield promising results. All the three plant parts could be considered as most promising source for phytopharmaceutical importance. However, further studies need to be undertaken to ascertain fully their bioactivity and toxicity profile to confirm our findings.

The documentation of traditional knowledge from different sources and various healing methods is very much needed before they are lost forever. The valuable traditional knowledge of herbal medicines require scientific validation for discovery of novel drugs and compounds.

The medicinal plants required in Pharmacological industry are mostly wild and harvested from the forests. The over exploitation of medicinal plants has resulted in depletion of biological resources. It necessitates introduction of policies to promote and patronise conservation of plant diversity. Awareness among the local inhabitants with regard to conservation of medicinal plants and education to develop medicinal gardens in the villages, will not only cater to their basic needs but also provide a source of income by selling the plants to village vaidyas and other plant collectors. In this regard National Biodiversity Authority (NBA) had initiated to organize Biodiversity Management Committees (BMC) through State Biodiversity Boards (SBB). All India Coordinated Research Project on Ethnobiology (AICRPE) is also vested with a special responsibility to safeguard and manage the biodiversity wisely.
To mention a few plants like *Andrographis paniculata*, *Curculigo orchioides*, *Putranjiva roxburghiana*, *Centella asiatica*, *Mucuna atropurpurea*, *Asparagus racemosus*, *Gloriosa superba*, *Dendrophthoe falcata*, *Cassytha filiformis*, *Limonia alata*, *Strychnos nux-vomica*, *Strychnos potatorum*, *Commiphora caudata*, *Putranjiva roxburghii*, *Delonix alata* along with certain ferns like *Actinopteris dichotoma*, *Adiantum incisum*, *Hemionites arifolia*, *Dryopteris filix mas*, *Lygodium flexuosum* and *Selaginella* sp. require protection, sustainability, preservation and propagation.

The intrinsic (genetic) and extrinsic (climatic conditions, age, growing stage, harvesting, drying, storage, plant parts used etc) factors affect the chemical profile of medicinal plants. Therefore, it is a challenge for the researchers to produce reproducible results. Most of the earlier phytochemical and pharmacological studies were focused with out bothering about their genetic. So, it is high time for the scientists to give a serious thought to these issues and to come out with certain suggestions or guidelines to help the future researchers in ethnobotany.

Variuos indigenous medicinal formulations and practices employed by the herbal healers and traditional Practitioners should be evaluated by pharmacological validation.