

**PLANT IDENTIFICATION AND LEARNING: A DIGITAL PEDAGOGY CASE STUDY FROM
A SANGAM UNIVERSITY CAMPUS IN INDIA*****Dr. Reena Modi**

Department of Botany, Sangam University, Rajasthan, India

Received 04th December 2025; **Accepted** 09th January 2026; **Published online** 23rd February 2026

Abstract

Plant identification and the memorization of scientific names and uses remain persistent challenges in botanical education. Traditional classroom teaching and field based instruction often provide limited opportunities for repeated visual reinforcement, resulting in low longterm recall among students. Simultaneously, the general public, despite daily interaction with plants, remains largely unaware of plant identities and their ecological significance. This study presents an education focused case study documenting the development and implementation of a digital plant identification repository using YouTube Shorts on a sangamuniversity campus in India. Short-form videos (15–30 seconds) were created for campus plant species, highlighting common names, scientific names, families, and major uses through visual presentation and concise narration. The Targeted groups included undergraduate and postgraduate students (18–25 years) and members of the general public interested in plants and gardening (25–45 years). Learning outputs were examined using platform analytics and learner feedback rather than controlled experimentation. Initial observations indicate improved engagement, enhanced recall of plant identities, and increased public awareness of plant uses. The study demonstrates that short-form digital repositories can serve as effective supplementary pedagogical tools in botany, supporting experiential learning, accessibility, and community outreach while maintaining academic integrity.

Keywords: Digital pedagogy, Plant identification, Botanical education, YouTube Shorts, ICT in education.

INTRODUCTION

Plant identification, along with the retention of scientific names, families, and uses, forms the foundation of botanical education. However, students frequently experience difficulty recalling plant identities during examinations, fieldwork, or spontaneous discussions, even after formal instruction. This challenge is often attributed to an overreliance on rote memorization and limited opportunities for repeated, visually engaging learning experiences. Beyond academic settings, the general public despite constant interaction with plants in daily life often lacks basic knowledge of plant identity, medicinal value, or ecological importance. In recent years, digital technologies have transformed teaching learning practices, particularly in higher education. Learners increasingly prefer concise, visually rich, and technology-mediated content that aligns with their attention patterns. Short-form video platforms have emerged as powerful tools for informal and supplementary learning, yet their application in structured botanical education remains limited in scholarly documentation. Within this context, the integration of information and communication technology (ICT) into plant science education offers opportunities to enhance engagement, improve recall, and extend learning beyond classroom boundaries. The present study addresses this gap by documenting a digitally implemented pedagogical model developed at Sangam University. By creating a structured digital repository of campus plants using YouTube Shorts, the study explores how short-form video content can complement traditional teaching methods and support both student learning and community-level awareness.

Objectives of the Study

The objectives of the present study were to:

1. Develop a digital repository of plant species present on a university campus using short-form video content.
2. Facilitate easier identification and memorization of scientific names, families, and uses of plants among botany students.
3. Identify the primary target groups and age categories benefiting from the digital repository.
4. Examine learning outputs and engagement patterns using digital analytics and qualitative feedback.
5. Evaluate the potential of short-form digital media as an education focused pedagogical tool rather than a popularity driven platform.

Target Population and Expected Learning Outputs**Target Population**

The digital repository was designed to benefit two major groups:

- A. Academic learners:** Undergraduate and postgraduate students of botany, generally aged 18–25 years, enrolled in courses related to taxonomy, ecology, and applied plant sciences.
- B. General public:** Non-specialist viewers aged 25–45 years, including gardening enthusiasts, nature learners, and individuals interested in traditional plant uses and biodiversity awareness.

***Corresponding Author: Dr. Reena Modi**

Department of Botany, Sangam University, Rajasthan, India

Table 1. Plant repository created as YouTube Shorts for identification and learning

Youtube Link	Common Name	Botanical Name	Family	Uses / Properties	References
https://youtube.com/shorts/OSHD6ac8vOo?si=M2JG7gV4GQqIirN	Moringa / Drumstick tree	<i>Moringaoleifera Lam.</i>	Moringaceae	Leaves rich in vitamins & minerals (nutritional supplement); seeds purify water; roots, bark, pods used in traditional medicine (anti-inflammatory, antimicrobial); seed oil ("Ben oil") for cosmetics & cooking.	Fahey, 2005; Anwar et al., 2007; Mbikay, 2012
https://youtube.com/shorts/OSHD6ac8vOo?si=M2J-G7gV4GQqIirN	Neem	<i>Azadirachtaindica A. Juss.</i>	Meliaceae	Leaves & bark have antimicrobial, antifungal, anti-inflammatory effects; seeds yield neem oil (pesticidal& medicinal); used in skin disorders & oral care.	Subapriya&Nagini, 2005 Agarwal&Modi 2024
https://www.youtube.com/watch?v=lohSaKIrMg&list=PLw7DvLoMFa5Li6fmTobZ4FJVqTFKOr68h&index=40	Sadabahar (Periwinkle)	<i>Catharanthusroseus (L.) G. Don</i>	Apocynaceae	Source of alkaloids vincristine & vinblastine (anticancer drugs); also used in diabetes management & wound healing.	Noble, 1990; van der Heijden et al., 2004
https://youtube.com/shorts/mjMvWGL4LII?si=I3Bj-usS-IN-UiGX	Arjuna	<i>Terminaliaarjuna Wight & Arn.</i>	Combretaceae	Bark used in Ayurveda for cardiovascular diseases; antioxidant & anti-inflammatory properties.	Dwivedi, 2007
https://youtube.com/shorts/Xam4eNBaXx4?si=jfCLv0kJ-_d4dYX2	Shisham / Indian Rosewood	<i>DalbergiasissooRoxb.</i>	Fabaceae	Bark & leaves used in skin diseases; timber valued in furniture.	Kaur et al., 2013
https://youtube.com/shorts/gMy1r1az3y0?si=ogKKGrJNkQOfBSxY	Jamun	<i>Syzygiumcumini (L.) Skeels</i>	Myrtaceae	Seeds used in traditional medicine for diabetes; fruits rich in antioxidants.	Ayyanar&Subash-Babu, 2012
https://youtube.com/shorts/jLKS_wJ3vk?si=TUu7mH3bgfqmSpwn	Marigold	<i>Tageteserecta L.</i>	Asteraceae	Flowers have antimicrobial & anti-inflammatory compounds; used in eye health, cosmetics, and as ornamentals.	Singh & Kumar, 2011
https://youtube.com/shorts/cbhLbi69Cww?si=c5uKAuUSlwNsV37	Rangoon Creeper	<i>Quisqualisindica L.</i>	Combretaceae	Used as an anthelmintic (expels worms), ornamental climber.	Khare, 2007
https://youtube.com/shorts/qE3MIQdSlzs?si=D6Jex3hnFX7Kb7gd	Purple Allamanda	<i>Allamandacathartica L.</i>	Apocynaceae	Ornamental; latex traditionally used as purgative.	Duke, 2009
https://youtube.com/shorts/Utefczk5v_A?si=coOJcbfqzMWjc4eT	Phyllanthus / Bhumiamla	<i>Phyllanthusniruri L.</i>	Phyllanthaceae	Known for hepatoprotective effects (liver health), used in jaundice & kidney stones.	Patel et al., 2011
https://youtube.com/shorts/XTpSjz6V8l0?si=NrX30Mp1EhzzhTKn	Spider Lily	<i>Hymenocallisittoralis</i>	Amaryllidaceae	Bulbs used in traditional medicine (antimicrobial, anti-inflammatory); ornamental.	Vieira et al., 2016
https://youtube.com/shorts/ccxNcxsbhzM?si=_jjSS7-FzVWpAL7	Lady Palm	<i>Rhapisexcelsa</i>	Arecaceae	Ornamental palm; improves indoor air quality.	Wolverton, 1997
https://youtube.com/shorts/BzthdElxO6c?si=RJMVZU1R2aeU-f3t	Teak Tree	<i>TectonagrandisL.f.</i>	Lamiaceae	Medicinal bark extracts (antifungal, antibacterial); highly valued timber.	Kaur et al., 2010
https://youtube.com/shorts/PyJn3RNeAGc?si=NU4bHz0C8r8w2G2Z	Mogra / Jasmine	<i>Jasminumsambac (L.) Aiton</i>	Oleaceae	Flowers used in perfumery; mild sedative and aphrodisiac properties.	Khan et al., 2010
https://youtube.com/shorts/SKeQZcDLZDE?si=93oCwACMMqU2WyW9	Chia	<i>Salvia hispanica L.</i>	Lamiaceae	Seeds rich in omega-3 fatty acids, fiber, protein; used as health food.	Ullah et al., 2016
https://youtube.com/shorts/7yfRRuiUVz4?si=M8Lk2L_E7-IiiBdf	Star Jasmine	<i>Trachelospermumjasminoides</i>	Apocynaceae	Ornamental, fragrant flowers; mild traditional medicinal uses.	Duke, 2009
https://youtube.com/shorts/YbReyCgI_nI?si=rdBF-g8VjYshpel	Bougainvillea	<i>Bougainvillea glabra</i>	Nyctaginaceae	Ornamental; leaves sometimes used in cough & sore throat remedies.	Sharma et al., 2012 Agarwal&Modi 2024

https://youtube.com/shorts/QR8wgsap0?si=TzzmUcnEA3mnUHLc	Talking Plant / Sensitive Plant	<i>Mimosa pudica</i> L.	Fabaceae	Leaves show rapid folding movement; medicinally used in wound healing, anti-inflammatory.	Sharma & Singh, 2013
https://youtube.com/shorts/RAE0Is_kZBE?si=hfh_vAFdTSXz1XI	Flax	<i>Linum usitatissimum</i> L.	Linaceae	Seeds rich in omega-3, fiber, lignans → used in cardiovascular health.	Goyal et al., 2014
https://youtu.be/GjcvfF32usk?si=0NQEB22gblAfxSci	vidya(Thuja)	<i>Thuja occidentalis</i>	Cupressaceae	(Vidya is a popular ornamental hedge plant. Its essential oil is valued for antimicrobial properties and is used in traditional medicine.	Kirtikar&Basu, 1987; Plants of Indian Tradition Agarwal&Modi 2024
https://youtu.be/ve2I7MLOvlw?si=ZBRgCcP_ajSb06tB	Karanj tree	<i>Pongamia pinnata</i>	Fabaceae	It is well known for biodiesel production, medicinal applications in skin diseases, and as a nitrogen fixer enriching soil fertility.	Ayurvedic Pharmacopoeia of India
https://youtu.be/ZgqnHYDeg3c?si=gp7iiuodDU5tUSEa	White champa	<i>Plumeria alba</i>	Apocynaceae	White Champa is grown as an ornamental and religious plant. Its fragrant flowers are used in offerings, perfumery, and essential oil industries.	The Wealth of India, CSIR
https://youtube.com/shorts/fujUbOILyWg?si=gqrBcJtj4yuDagUL	Palash Tree	<i>Butea monosperma</i>	Fabaceae	Popularly called Palash or Flame of the Forest, is valued for its vibrant flowers used as dye. The plant provides gum ("Butea gum"), fodder, and has medicinal properties like anti-inflammatory and antidiabetic activity.	Medicinal Plants of India, ICMR. 1987; Kumar et al., 2011
https://youtu.be/TZfak1JyYaE?si=71OPfSNyq8yuwYzr	Eucalyptus	<i>Eucalyptus globulus</i>	(Family: Myrtaceae), known as	Its leaves provide essential oil with expectorant and antiseptic qualities, while the wood is used in pulp and timber industries	Sharma, 2010; Singh & Kumar, 2019)
https://youtu.be/LP47hEkrQjc?si=IG3JWjerEiwUrwy7	Cat walk creeper	<i>Aristolochia elegans</i>	Aristolochiaceae	Cat Walk Creeper, is a decorative vine grown in gardens and landscapes because of its unique flowers	Singh & Singh, 2004
https://youtu.be/TZfak1JyYaE?si=71OPfSNyq8yuwYzr	pomgranate	<i>Punica granatum</i>	Lythraceae	The Pomegranate is valued as a fruit crop. The fruits are rich in antioxidants and have documented benefits for cardiovascular health, cancer prevention, and antimicrobial action	Jurenka, 2008; Trivedi, 2006
https://youtu.be/rrm23MEWVe0?si=adsAqQB0OFQOU86Q	Silki Oak	<i>Grevillea robusta</i>	Proteaceae	Silky Oak, is planted for timber, shade, and ornamentation. It is fast-growing and widely used in agroforestry	Sharma, 2010
https://youtu.be/Eb0AoShKbLA?si=XCgTVBVossMavamS	Cassava	<i>Manihot esculenta</i>	Euphorbiaceae	Cassava or Tapioca, is a staple food crop in tropical regions. The starchy tubers are eaten directly or processed for industrial starch and biofuel production	(FAO, 2013; Burns et al., 2010
https://youtu.be/7yfRRuiUVz4?si=Lyr6n8J34XjnPNPg	star jasmine	<i>Trachelospermum jasminoides</i>	Apocynaceae	Star Jasmine, is a climbing ornamental with highly fragrant flowers. It is widely cultivated for decorative and landscaping purposes	Singh & Singh, 2004
https://youtu.be/EwdxYYj50ko?si=CeHVtB2vr66vQNYT	Tridax Daisy	<i>Ipomea pes digridis</i>	Asteraceae	Tridax Daisy is a weed with several medicinal applications. It has been studied for wound healing, antimicrobial action, and antidiabetic potential.	Vashistha & Sharma, 2015
https://youtube.com/shorts/pBdN3AEB19A?si=jCyoSv5XtHRdwPG5	Bottle Brush	<i>Callistemon citrinus</i>	Myrtaceae	Bottle Brush, is planted for its ornamental value. Its essential oils have antimicrobial properties, and its flowers attract bees and birds, enhancing pollination	Prabhu et al., 2013

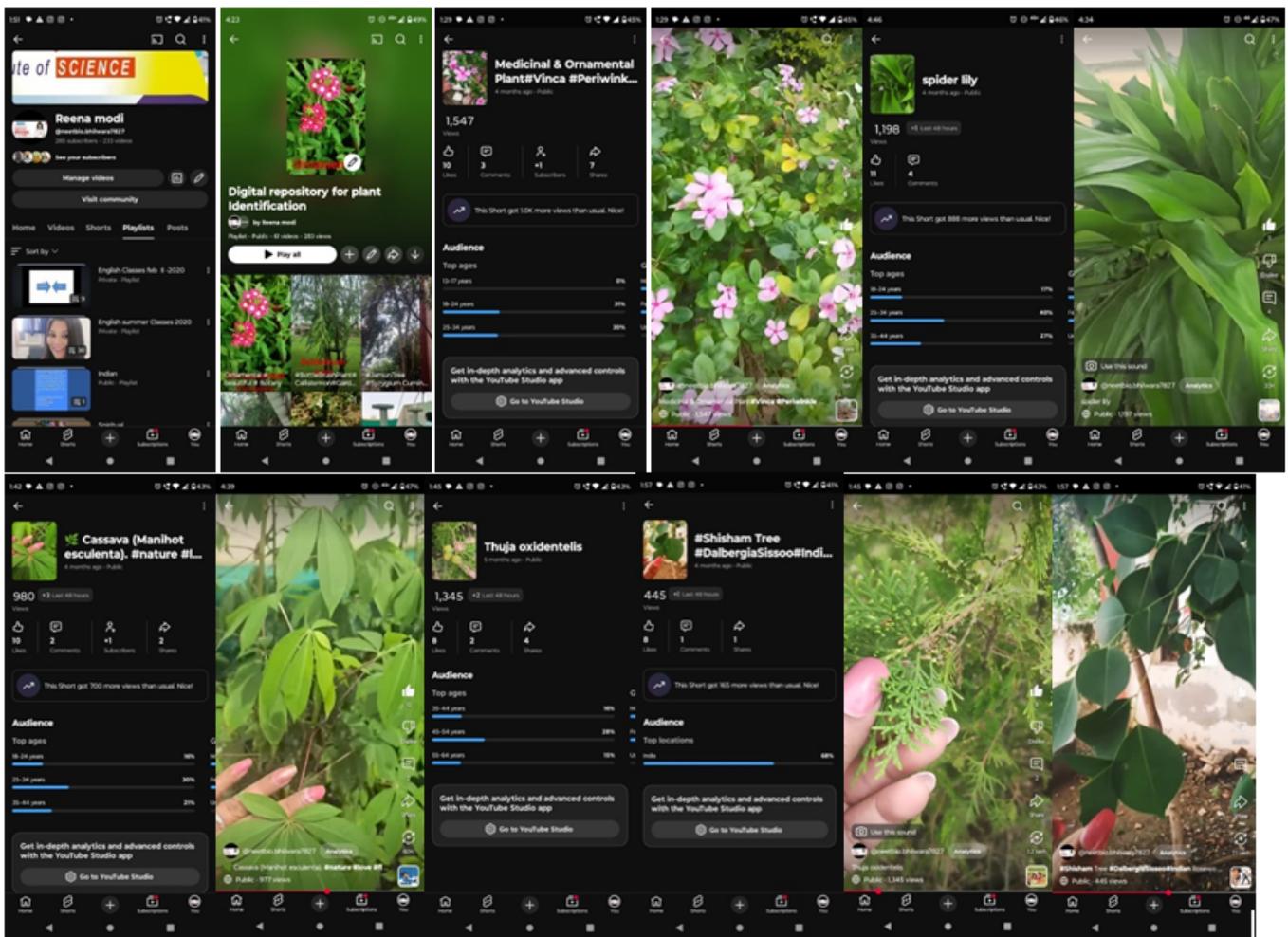


Figure 1. Some Screenshots of mobile-based short videos, playlists, and analytical content for selected plant species developed as part of a digital plant learning repository to support innovative teaching–learning in higher education

Expected Learning Outputs

The expected outcomes of the initiative included improved recall and recognition of plant species, enhanced understanding of the relationship between plant identity and practical uses, increased learner engagement beyond classroom hours, and wider dissemination of botanical knowledge at the community level.

METHODOLOGY

Study Area

The study was conducted on the Sangam University campus, Rajasthan, India, which supports a diverse range of ornamental, medicinal, avenue, and locally significant plant species.

Plant Identification

Plant species were documented during routine field visits conducted with students. Scientific names and family affiliations were confirmed using standard floras, reference books, and authenticated literature sources.

Development of Digital Content

For each identified plant, a short video of 30–60 seconds was prepared. Each video included clear visuals of the plant,

on-screen text indicating the common name, scientific name, family, and major uses, and brief narration supported by background music to enhance attention and recall. All videos were uploaded to a dedicated YouTube channel titled *Genebotany* and systematically organized into a playlist named *Digital Repository for Plant Identification*. The platform was used solely for educational purposes, without monetization or promotional intent.

Data Documentation

A structured table was prepared to document plant details, references, and corresponding video links, ensuring transparency and academic traceability.

Plant Repository: Digital Video Data

Observation and Analysis

A representative sample of 55-60 short videos from the repository was analyzed to examine engagement patterns and preliminary learning indicators. Collectively, these videos recorded approximately 16,380 views in few weeks after uploads, along with measurable interaction through likes, comments, shares, and subscriber growth. Viewer demographics revealed that the 18–24-year age group formed the most active audience, followed by the 25–44-year group. Engagement trends indicated greater interest in medicinal plants, ornamental species, and plants with distinctive

morphological features. The average watch time of 15–20 seconds per video exceeded typical short-form retention benchmarks, suggesting effective audience engagement. Although the analysis represents an initial snapshot, continued growth in views and interactions indicates sustained outreach potential.

RESULTS AND DISCUSSION

Student Engagement and Learning

Student feedback indicated increased confidence in identifying plants during field visits and informal assessments. Repeated visual exposure and easy access to the videos enabled stress-free revision and supported experiential, self-paced learning.

Accessibility and Community Outreach

The digital repository extended botanical knowledge beyond academic settings. A substantial proportion of viewers originated from India, reflecting strong regional relevance and community engagement with the content.

Contribution to Digital Pedagogy

The digital repository demonstrates that short-form digital media can be effectively repurposed for academic learning. Unlike entertainment-driven content, the videos were structured to prioritize conceptual clarity and educational value, reducing dependence on rote memorization.

Limitations

The study is presented as an education-focused case study rather than a controlled experimental investigation. Learning outcomes were inferred from engagement analytics and qualitative feedback, and long-term cognitive impact warrants further systematic evaluation.

Conclusion

The present case study demonstrates that YouTube Shorts can serve as an effective supplementary pedagogical tool for plant identification and botanical learning when implemented with clear academic intent. The digital repository developed at Sangam University successfully bridges classroom instruction, field observation, and community outreach, making botanical knowledge more accessible and engaging. The model is low-cost, scalable, and replicable, offering a practical framework for integrating ICT into botanical education while maintaining scholarly integrity.

Scope and Recommendations

The digital repository model can be extended to other science disciplines involving fieldwork and practical observation. Future developments may include multilingual content, QR-code-based campus learning, integration with e-herbaria, and structured learner feedback mechanisms. Scaling such repositories at institutional or regional levels has the potential to support inclusive, learner-centered, and sustainable education.

REFERENCES

1. Agarwal, M., Modi, R. Comprehensive study of ornamental flowering plants at Sangam University: A botanical, economic and morphological analysis. *International Journal for Multidisciplinary Research-2024*, 6(3), 1–8.
2. Ali, M., Khan, S., Ahmad, I. *Hibiscus rosa-sinensis* L.: Traditional uses, pharmacological potential and phytochemistry. *J. Med. Plants Res.*2011, 5, 101–108.
3. Anwar, F., Latif, S., Ashraf, M., Gilani, A.H. *Moringaoleifera*: A food plant with multiple medicinal uses. *Phytother. Res.*2007, 21, 17–25.
4. Ayyanar, M., Subash-Babu, P. *Syzygiumcumini* (L.) Skeels: A review of traditional uses, phytochemistry and pharmacology. *J. Ethnopharmacol.*2012, 141, 275–286.
5. Burns, A., Gleadow, R., Cliff, J., Zacarias, A., Cavagnaro, T. Cassava: Current and potential uses. *Ind. Crops Prod.*2010, 32, 109–116.
6. Duke, J.A. *Handbook of Medicinal Plants of the World*; CRC Press: Boca Raton, FL, USA, 2009.
7. Dwivedi, S. *Terminaliaarjuna* Wight & Arn.: A review on pharmacological activities. *Phytomedicine*2007, 14, 291–300.
8. Fahey, J.W. *Moringaoleifera*: A review of the medical evidence for its nutritional, therapeutic, and prophylactic properties. *Trees Life J.*2005, 1, 1–15.
9. Goyal, A., Sharma, V., Upadhyay, N., Gill, S., Sihag, M. *Flax (Linumcatissimum L.)* seed: Nutritional and medicinal importance. *J. Food Sci. Technol.*2014, 51, 1633–1643.
10. Jurenka, J.S. Therapeutic applications of pomegranate (*Punicagranatum L.*): A review. *Altern. Med. Rev.*2008, 13, 128–144.
11. Kaur, N., Kaur, S., Singh, P. *DalbergiasissooRoxb.*: Uses and pharmacological aspects. *J. Pharm. Res.*2013, 6, 765–770.
12. Kaur, N., Singh, B., Sharma, R. *TectonagrandisL.f.*: Timber and medicinal properties. *Int. J. Wood Prod.*2010, 15, 200–207.
13. Khare, C.P. *Indian Medicinal Plants: An Illustrated Dictionary*; Springer: Berlin/Heidelberg, Germany, 2007.
14. Mbikay, M. Therapeutic potential of *Moringaoleifera* leaves in chronic hyperglycemia and dyslipidemia: A review. *Front. Pharmacol.*2012, 3, 24.
15. Noble, R.L. *Catharanthusroseus* (L.) G. Don: Chemistry and pharmacology of vincristine and vinblastine. *Med. Res. Rev.*1990, 10, 275–305.
16. Patel, S.S., Patel, T.R., Shah, D.K. *Phyllanthusniruri L.*: Pharmacological and hepatoprotective review. *Int. J. Pharm. Sci. Res.*2011, 2, 125–131.
17. Prabhu, K., Arumugam, P., Ramesh, S. *Callistemon citrinus*: Ornamental and antimicrobial properties. *J. Hortic. Sci. Biotech.*2013, 88, 351–356.
18. Sharma, P., Singh, R. *Bougainvillea glabra*: Uses and pharmacological aspects. *J. Plant Biol.*2012, 39, 45–52.
19. Sharma, P., Kumar, A. *Eucalyptus globulus*: Essential oil and timber uses. *J. Med. Plants Stud.*2010, 2, 34–41.
20. Subapriya, R., Nagini, S. Medicinal properties of *Azadirachtaindica A. Juss.* *Curr. Med. Chem. Anticancer Agents*2005, 5, 149–156.
21. Ullah, M., Nadeem, M., Ahmad, S., Khalid, N. *Salvia hispanica L. (Chia)*: Nutritional and medicinal potential. *Int. J. Food Sci. Nutr.*2016, 67, 233–240.
22. Vashistha, V., Sharma, S. *Ipomeapes-digridis* (Tridax Daisy): Ethnobotanical and pharmacological properties. *J. Ethnopharmacol.*2015, 168, 150–157.
23. van der Heijden, R., Jacobs, D.I., Snoeijer, W., Hallard, D., Verpoorte, R. *Catharanthus alkaloids*: Biosynthesis and pharmacology. *Phytochem. Rev.*2004, 3, 263–276.
24. Vieira, R.F., Skorupa, L., de Carvalho, J.E. *Hymenocallis littoralis*: Traditional uses and pharmacology. *Rev. Bras. Farmacogn.*2016, 26, 345–350.
25. Wolverton, B.C. *Interior Landscape Plants for Indoor Air Pollution Abatement*; NASA/Greenspring: Washington, DC, USA, 1997.