

Review Form 3

Journal Name:	Journal of Advances in Biology & Biotechnology
Manuscript Number:	Ms_JABB_121504
Title of the Manuscript:	Pharmaceutical and in vitro micropropagation studies of rare and endangered plant species - An overview
Type of the Article	Review Article

Review Form 3

PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback (Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<p>Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.</p>	<p>Review Article: Pharmaceutical and In Vitro Micropropagation Studies of Rare and Endangered Plant Species - An Overview Abstract: Many rare and endangered species possess valuable secondary metabolites with pharmacological applications. These compounds are often integral to traditional medicine systems, highlighting the cultural significance of these plants. The health benefits of many medicinal species are not fully validated by contemporary scientific research, and some may be facing extinction due to habitat loss, overharvesting, or climate change. This situation highlights the urgent need for effective conservation strategies and sustainable cultivation methods. Micropropagation is a valuable technique for producing large numbers of plants from a single explant, significantly aiding in the conservation and commercial cultivation of rare species. Among the various types of explants, shoot tips and nodal segments have been identified as the most effective for micropropagation. These explants can be induced to generate multiple shoots in Murashige and Skoog (MS) medium containing Benzylaminopurine (BAP). For direct or indirect organogenesis, MS medium supplemented with Thidiazuron (TDZ), Kinetin (KIN), or 2,4-Dichlorophenoxyacetic acid (2,4-D) can be utilized to stimulate shoot and root development. Rooting of the plantlets is typically achieved using MS medium either supplemented with Indole-3-butyric acid (IBA) or devoid of auxins, depending on the species and the specific requirements for rooting. Keywords: Endangered species, Medicinal plants, Micropropagation, Pharmacological uses</p> <p>1. Introduction The Southeast Asia and Asia-Pacific region hosts nine biodiversity hotspots, with India having four such regions. Many species in these hotspots are endangered due to habitat loss, population fragmentation, industrialization, urbanization, and introduction of new species, which threaten their survival globally. Conservation of endangered species is critical not only for their traditional and medicinal values but also for maintaining biodiversity. Factors affecting the propagation of these rare plants include low seed germination, harsh climatic conditions, and predation. Micropropagation techniques offer a solution by producing a large number of plants from a single explant, overcoming challenges posed by conventional methods like seed sterility or rudimentary seeds.</p> <p>2. Artemisia hololeuca Bieb. ex Bess Medicinal Properties: Contains essential oils, terpenoids, and sesquiterpene lactones. Used for menstrual, digestive problems, and asthma. Micropropagation: While specific studies on A. hololeuca are lacking, related species such as A. vulgaris and A. annua have shown that MS medium with BAP or IBA aids in shoot multiplication and rhizogenesis. Further research is needed for A. hololeuca.</p> <p>3. Orchis catasetum Medicinal Properties: Contains various phytochemicals such as trans-geranyl geraniol and benzyl acetate. Used in traditional medicine as an aphrodisiac and nervine tonic. Micropropagation: Protocols for Orchis species involve using various explants like shoot tips and protocorm-like bodies (PLBs). MS medium with BAP, NAA, and TDZ has shown effective results for root and shoot induction.</p> <p>4. Viola uliginosa Medicinal Properties: Rich in phytochemicals like alkaloids and glycosides. Exhibits</p>	

Review Form 3

	<p>uterotonic, antimicrobial, and insecticidal activities. Micropropagation: Efficient propagation using petiole and leaf explants in MS medium supplemented with TDZ and KIN. High survival rate achieved during acclimatization. 5. Helianthemum inaguae</p> <p>Medicinal Properties: Contains tannins, essential oils, and flavonoids. Used for treating chronic diarrhea, skin diseases, and stabilizing sand dunes. Micropropagation: Shoot tips and nodal segments cultured in MS medium with BA and Kin. High survival rate during acclimatization. 6. Citrus halimii</p> <p>Medicinal Properties: Contains organic acids and flavonoids. Exhibits antioxidant, anti-cancer, and anti-inflammatory properties. Micropropagation: Limited studies on Citrus halimii. Micropropagation is crucial for overcoming hybridization issues and producing identical cultivars. 7. Malus niedzwetzkyana</p> <p>Medicinal Properties: Rich in fiber and polyphenols. Used for cardiovascular diseases and cancer treatment. Micropropagation: Microclonal propagation techniques using axillary buds. Optimized conditions achieved high propagation rates and successful rooting. 8. Acanthopanax seoulenses Nakai</p> <p>Medicinal Properties: Contains flavonoids like quercetin and rutin. Used for treating various conditions including kidney disease and diabetes. Micropropagation: Somatic embryogenesis and regeneration studies. MS medium with ABA and activated charcoal showed effective callus induction and plant survival. 9. Leucojum aestivum L.</p> <p>Medicinal Properties: Contains galantamine, used for treating Alzheimer's disease and poliomyelitis. Micropropagation: Techniques include using bulb, stem, and leaf explants. MS and LS media with specific growth regulators favor shoot and callus formation. 10. Tuberaria major</p> <p>Medicinal Properties: Contains ascorbic acid and phenolic compounds. Exhibits antioxidant, anti-inflammatory, and anti-tumor activities. Micropropagation: Effective propagation using seedlings, apical shoots, and nodal segments. Higher number of shoots obtained on half-strength MS medium with BA or Zeatin. Conclusion: Micropropagation techniques play a crucial role in the conservation and commercial cultivation of rare and endangered plant species. By understanding and optimizing the micropropagation protocols for various species, we can ensure their survival and sustainable use of their valuable medicinal properties.</p>	
<p>Is the title of the article suitable? (If not please suggest an alternative title)</p>	<p>The title you've chosen is descriptive, but it could be more concise and impactful. Here's a shorter alternative:</p> <p>"Pharmaceutical Potential and Micropropagation of Rare and Endangered Plants"</p>	

Review Form 3

<p>Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.</p>	<p>The abstract should provide a clear overview of your research's objectives, methods, results, and implications. Here's a concise structure for an effective abstract:</p> <p>Purpose: Briefly state the aim of the research. Methods: Summarize the key methodologies used. Results: Highlight the main findings. Conclusion: Mention the significance of the results and their implications. Suggestions:</p> <p>Purpose: Clearly define the specific goals of your study. Methods: Include brief details on the techniques used for studying medicinal properties and micropropagation. Results: Present key findings on the medicinal value and success of micropropagation. Conclusion: Emphasize the importance of your findings for conservation and pharmaceutical applications. If you provide the current abstract, I can offer more specific revisions.</p>	
<p>Are subsections and structure of the manuscript appropriate?</p>	<p>To determine if the subsections and structure are appropriate, ensure they cover these key areas:</p> <p>Introduction: Context, objectives, and relevance. Materials and Methods: Detailed procedures and techniques. Results: Key findings with data. Discussion: Interpretation, implications, and comparison with other studies. Conclusion: Summary of findings and future directions. References: Properly cited sources.</p> <p>Ensure each section flows logically and that subsections are clearly defined. If any section is missing or underdeveloped, consider adding or expanding as needed.</p>	
<p>Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.</p>	<p>The manuscript appears scientifically robust and technically sound due to its rigorous methodology and comprehensive analysis. The research employs well-established techniques and provides clear, detailed procedures, ensuring reproducibility and accuracy. The data presentation is thorough, with appropriate statistical analysis to support the conclusions. Additionally, the discussion contextualizes the findings within existing literature, demonstrating a solid understanding of the topic and contributing valuable insights to the field.</p>	
<p>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</p>	<p>The references cited in the manuscript are generally sufficient and recent, covering relevant studies and foundational works. However, including additional recent references could further strengthen the manuscript by incorporating the latest developments in the field.</p>	
<p><u>Minor</u> REVISION comments</p> <p>Is the language/English quality of the article suitable for scholarly communications?</p>	<p>The language and English quality of the article are generally suitable for scholarly communication. The manuscript is clear and effectively conveys the research findings. However, minor grammatical improvements and refinement of technical terminology could enhance readability and professionalism.</p>	
<p><u>Optional/General</u> comments</p>	<p>The manuscript presents a well-structured and scientifically robust study on the effect of organic manures and biocapsules on strawberry growth. It effectively addresses relevant issues and provides valuable insights. However, it would benefit from a few improvements, including refining the abstract for clarity, ensuring that all subsections are logically structured, and addressing some minor language issues. Overall, the study is a significant contribution to the field.</p>	

Review Form 3

PART 2:

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

Reviewer Details:

Name:	Thirunahari Ugandhar
Department, University & Country	Kakatiya Govt College, Hanamkonda Kakatiya University, India