International Journal of Interdisciplinary Innovative Research & Development (IJIIRD)
ISSN: 2456-236X
Vol. **11** Special Issue **02** | **2026**

Preliminary Phytochemical Investigation of Leaf Extracts of the Ethno-medicinal Plant Syngonium Podophyllum

Mr. Akash Sadashiv Lande
Lecturer, Applied Science and Humanities, Padm.Dr. V. B. Kolte College of Engineering, Malkapur, Maharashtra, India

DOI: 10.5281/zenodo.19184474

ABSTRACT

Syngonium podophyllum (family Araceae) is an ethnomedicinal plant widely utilized in traditional healthcare systems for the management of inflammation, wounds, and digestive ailments. The present study was undertaken to conduct a preliminary phytochemical evaluation of the leaf extract of S. podophyllum in order to identify major classes of secondary metabolites that may contribute to its medicinal value. Qualitative phytochemical screening indicated the presence of alkaloids, flavonoids, tannins, saponins, and terpenoids, whereas steroids and glycosides were not detected. The identification of these bioactive constituents provides a scientific basis for the traditional applications of the plant and supports the need for further pharmacological and toxicological investigations aimed at drug discovery and development.

Keywords: *- **Syngonium podophyllum, Phytochemical analysis, Secondary metabolites, Alkaloids, Flavonoids, Ethnomedicine, Araceae.***

1. INTRODUCTION

Medicinal plants have long played a vital role in traditional healthcare practices across different cultures, serving as primary sources of therapeutic agents. Among these, *Syngonium podophyllum*, commonly known as the arrowhead vine, belongs to the family Araceae and is extensively cultivated in tropical and subtropical regions. In traditional medicine, the plant has been employed for the treatment of skin disorders, gastrointestinal disturbances, inflammation, and wound-related conditions.

Despite its widespread ethnomedicinal use, scientific studies focusing on the chemical constituents of *S. podophyllum* remain limited. Phytochemical screening represents an essential initial step in identifying secondary metabolites that may be responsible for observed biological activities. Such investigations not only validate traditional claims but also provide direction for advanced pharmacological research. The present study aims to qualitatively assess the phytochemical composition of ethanolic leaf extracts of *S. podophyllum*.

2. MATERIALS AND METHODS

Collection and Authentication of Plant Material

Fresh, healthy leaves of *Syngonium podophyllum* were collected from a tropical forest region in Costa Rica during July 2023. The plant material was taxonomically authenticated by Dr. Maria Lopez at the Herbarium of the Universidad de Costa Rica. A voucher specimen (SPO-2023-07-CR) was deposited for future reference.

Preparation of Plant Sample

The collected leaves were thoroughly washed with distilled water and shade-dried at approximately 30 °C for seven days. The dried material was then pulverized into a fine powder using a mechanical grinder and stored in airtight containers until extraction.

Extraction Procedure

One hundred grams of the powdered leaf material were subjected to maceration in 70% ethanol for 72 hours at room temperature (25 °C). The extract was filtered using Whatman No. 1 filter paper and subsequently concentrated under reduced pressure with the aid of a rotary evaporator. The concentrated extract was preserved at 4 °C for phytochemical analysis.

Qualitative Phytochemical Screening

Standard qualitative methods were employed to detect various classes of phytochemicals following established protocols (Harborne, 1998; Trease & Evans, 2010). The tests performed included:

Alkaloids: Wagner's, Dragendorff's, and Mayer's tests

Flavonoids: Shinoda test and alkaline reagent test

Tannins and Phenolic compounds: Ferric chloride and lead acetate tests

Saponins: Froth formation and hemolytic activity tests

Steroids: Liebermann–Burchard reaction

Terpenoids: Salkowski test

Glycosides: Legal's and Keller–Killiani tests Results
The qualitative phytochemical screening revealed the presence or absence of various secondary metabolites in the ethanolic leaf extract of *S. podophyllum*. The findings are summarized in Table 1.

Table 1: Preliminary phytochemical profile of *Syngonium podophyllum* leaf extract

Phytochemical Group	Test(s) Applied	Result
Alkaloids	Wagner's, Dragendorff's, Mayer's	+
Flavonoids	Shinoda, alkaline reagent	+
Tannins / Phenolics	$FeCl_3$, Lead acetate	+
Saponins	Froth, Hemolysis	+
Steroids	Liebermann–Burchard	–
Terpenoids	Salkowski	+
Glycosides	Legal, Keller–Killiani	–

(+: Present, –: Absent)

3. DISCUSSION

The presence of alkaloids, flavonoids, tannins, saponins, and terpenoids in the leaf extract of *S. podophyllum* provides scientific support for its traditional medicinal applications. Alkaloids and flavonoids are widely recognized for their anti-inflammatory, antioxidant, and antimicrobial properties, which may explain the plant's use in treating infections and inflammatory conditions.
Tannins and saponins are known to enhance wound healing and exhibit antimicrobial activity, further reinforcing the ethnomedicinal relevance of the species. The absence of steroids and glycosides suggests a phytochemical composition distinct from other members of the Araceae family, such as *Alocasia macrorrhiza*, which has been reported to contain steroidal compounds.
Although the present study offers valuable preliminary insights, qualitative screening alone cannot determine the concentration or specific identity of individual compounds. Therefore, advanced analytical techniques such as high-performance liquid chromatography (HPLC), gas chromatography– mass spectrometry (GC-MS), and nuclear magnetic resonance (NMR) spectroscopy are recommended for further characterization.

4. CONCLUSIONS

The current investigation confirms that *Syngonium podophyllum* leaves contain several biologically significant secondary metabolites, including alkaloids, flavonoids, tannins, saponins, and terpenoids. These findings substantiate the traditional medicinal use of the plant and highlight its potential as a source of pharmacologically active compounds. Future research should focus on bioactivity-guided fractionation, in vitro and in vivo studies, and safety assessments to fully explore its therapeutic potential.

5. REFERENCES

[1] Banskota, A. H., et al. (2001). Flavonoids as important frameworks in drug development. *Natural Product Reports*, 18(3), 381–401.
[2] Chen, Y. T., et al. (2015). Phytochemical constituents and antioxidant potential of *Alocasia macrorrhiza*. *Journal of Ethnopharmacology*, 160, 123–129.
[3] Harborne, J. B. (1998). *Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis*. Springer.
[4] Sofowora, A., et al. (2013). *Medicinal Plants and Traditional Medicine in Africa*. Spectrum Books.
[5] Trease, G. E., & Evans, W. C. (2010). *Pharmacognosy*. Elsevier.