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LEUCAS BIFLORA: REVIEW AND PHARMACOLOGICAL ACTIONS

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ABSTRACT

Perennial plants like *Leucas biflora* are found all over India. It belongs to the Lamiaceae family. The leaf of *Leucas biflora* has various pharmacological action The silver nanoparticles (LbLE-Ag-NPs) from leaf extract was treated with breast cancer cell line MDA-MB-231 and the results showed an efficient dose-dependent anti-cancerous action. The lowest inhibitory concentration (IC50) value was 95 ± 0.21 µg/ml. Fluorescence-based labeling provided additional evidence that the therapy had induced apoptosis. In vitro tests were conducted to determine the scavenging capacity of Leucas biflora's ethanolic leaf extract. The IC50 values for DPPH and ABTS radical scavenging were 15.35 and 13.20 µg/ml, respectively and they have dose-dependent cytotoxicity against HELA cervical cancer cells and A549 lung cancer cells. Leucas biflora ethanolic leaf extract dramatically reduces the viability of both HELA and A549 cells in vitro cytotoxicity assays. Testing Leucas biflora ethanolic extract against A549 lung and HELA cervical cancer cell lines, respectively, reveals viability rates of 23.76% and 29.76%. These extracts had somewhat different IC50 values, 95.80 and 90.40 µg/ml. In the disc-diffusion assay, the plant extract exhibited antibacterial properties against gram-positive and gram-negative bacteria. The methanolic leaf and stem extract of Leucas biflora (Vahl) R.Br. had an anti-inflammatory impact on endotoxin-induced uveitis in Swiss Albino rats.

KEYWORDS: *Leucas biflora*, Lamiaceae, Pharmacology, Anti-Cancer, Anti-inflammatory.

INTRODUCTION

Leucas biflora is a perennial herb that can be found throughout India. It is a member of the Lamiaceae family and often grows along riverbanks and on rocky, moist soil. When conjunctivitis strikes, mature leaf decoction from *Leucas biflora* is traditionally applied as an

eye drop twice daily. When a woman has white discharge, four to five leaves are also recommended to chew with a Piper betel leaf. Mature leaves are ground in a 2:1 ratio with leaves of Centella asiatica, and the juice extracted from this mixture is applied directly to stop nose bleeding.[1]

Leaf of Leucas biflora

Flower of Leucas biflora

Pharmacological activity of *Leucas biflora*

Anti-cancer activity

The silver nanoparticles (LbLE-Ag-NPs) from leaf extract of Leucas biflora (Vahl)Sm. as a possible anticancer drug utilizing a straightforward green chemistry method. Analytical data revealed that the synthesized LbLE-AgNPs were crystalline, with a zeta potential of −0.138 mV, and a hexagonal shape within a size range of 40-98 nm. The screening revealed that the functional groups bonded with LbLE-Ag-NPs were C-Br, C-Cl, OH, C-O-C, and C = C, among others. The breast cancer cell line MDA-MB-231 was treated with LbLE-AgNPs, and the results showed an efficient dose-dependent anti-cancerous action. The lowest inhibitory concentration (IC50) value was 95 ± 0.21 µg/ml. Fluorescence-based labeling provided additional evidence that the therapy had induced apoptosis. After a thorough examination, the resulting LbLE-Ag-NPs may be employed as a substitute agent in the anticancer treatment.[2] The study is to evaluate Leucas biflora phytocompounds for their potential anticancer properties against the apoptotic regulator target protein, which is crucial for the advancement of cancer. Major phytocompounds including tetracosahexaene, squalene, phytol, 22-stigmasten-3-one, stigmasterol, fluorene, and 1,4-dihydro were found in the ethanolic leaf extract of Leucas biflora by gas chromatography–mass spectrometry analysis. The ethanolic leaf extract of Leucas biflora was tested for its ability to scavenge free radicals in vitro using its IC50 values for DPPH and ABTS radical scavenging, which were 15.35 and 13.20 µg/ml, respectively. We observed dose-dependent cytotoxicity against A549 lung cancer cells as well as HELA cervical cancer cells. In vitro cytotoxicity tests, Leucas biflora ethanolic leaf extract significantly lowers the viability of both HELA and A549 cells. The

ethanolic extract of Leucas biflora exhibits viability rates of 23.76% and 29.76% when tested against A549 lung and HELA cervical cancer cell lines, respectively. The IC50 values of these extracts varied slightly, at 95.80 and 90.40 μg/ml. Lung cancer target protein–ligand complex 5Y9T-16132746 demonstrated sustained binding affinity and interactions among all screened complexes, resulting in a maximum score of −14 kcal/mol in molecular docking study. Two reference standard medicines and nine phytocompounds from Leucas biflora were selected for additional analysis based on the docking score. The fluorene, 1,4-dihydro has good ADMET, bioactivity, and density functional theory indices, according to additional validation.[3]

Antimicrobial Activity

The metabolites found in the crude methanolic extract of Leucas biflora were identified and described. In the disc-diffusion assay, the plant extract exhibited antibacterial properties against gram-positive and gram-negative bacteria. The extract contained nine different kinds of high and low molecular weight chemical entities in varied amounts, according to the results of gas chromatography-mass spectrometry (GC-MS). Two compounds exhibiting multi-target-directed activity were found using an in silico target-fishing technique. Two possible bacterial targets, FabH and DNA gyrase B, were inhibited by two metabolites: 3-Oxo-18-Nor-ent-ros-4-ene-15.alpha., 16-acetonide and 4-Dehydroxy-N-(4,5-methylenedioxy-2-nitrobenzylidene)-tyramine.[4]

Anti-Inflammatory activity

The methanolic leaf and stem extract of Leucas biflora (Vahl) R.Br. had an anti-inflammatory impact on endotoxin-induced uveitis in Swiss Albino rats. animals with 1.0 mg/kg lipopolysaccharide (LPS)-induced uveitic animals treated orally with methanolic leaf and stem extract (200 mg/kg), Dexamethasone (5 mg/kg), or normal saline (0.1 ml/kg) had their clinical symptoms, such as miosis, flares, hyperemia, and iris, monitored and counted. Following a variety of techniques, the protein content and levels of tumor necrosis factor-α (TNF-α) in the aqueous humor were also ascertained. Leucas biflora (Vahl) R. Br. leaf and stem extract in methanolic solution, along with dexamethasone treatment, greatly decreased a number of uveitis symptoms, including hypermia, flare, anterior chamber, pus, and miosis.[5]

DISCUSSION

Perennial plants, such as Leucas biflora, can be found throughout India. It belonged to the Lamiaceae family. The leaf of Leucas biflora has different pharmacological actions. The

silver nanoparticles (LbLE-Ag-NPs) from the leaf extract were treated with the breast cancer cell line MDA-MB-231, and the results revealed an effective dose-dependent anti-cancer effect. The minimum inhibitory concentration (IC50) was 95 ± 0.21 µg/mL. Fluorescence-based tagging revealed additional evidence that the therapy had caused apoptosis. The ethanolic leaf extract of Leucas biflora was tested in vitro for its scavenging potential. The IC50 values for DPPH and ABTS radical scavenging were 15.35 and 13.20 µg/ml, respectively and they have dose-dependent cytotoxicity against HELA cervical cancer cells and A549 lung cancer cells. In vitro cytotoxicity experiments, ethanolic leaf extract of Leucas biflora significantly lowers the viability of HELA and A549 cells. The viability rates of Leucas biflora ethanolic extract against the A549 lung and HELA cervical cancer cell lines are 23.76% and 29.76%, respectively. The IC50 values for these extracts varied between 95.80 and 90.40 µg/ml. In the disc-diffusion assay, the plant extract was bactericidal against both gram-positive and gram-negative bacteria. The methanolic leaf and stem extract of Leucas biflora (Vahl) R.Br. exhibited an anti-inflammatory effect on endotoxin-induced uveitis in Swiss albino rats.

Conflict of Interest

The authors declare no conflict of interest.

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