

EVALUATION AND FORMULATION OF HERBAL AIR FRESHENER SPRAY USING CALLISTEMON LANCEOLATUS AND ZEBRINA TRADESCANTIA

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Abstract: *Zebrina trandescantia* is a genus of herbaceous and perennial plants belonging the commelinaceae family. More than 80 species within the genus have been used for centuries for medicinal purpose, Phytochemical compounds (from various species of genus) such as coumarins, alkaloids , saponins , flavonoids , phenolics , tannins , steroids and terpenoids have been recently characterized and described with air purifier properties , antioxidant , cytotoxic, Anti -inflammatory ,Anti-cancer , Anti-microbial properties. Bottle brush *Callistemon lanceolatus* is a plant that has been reported to have various medicinal values such as antibacterial, antifungal, antioxidant activities and other pharmaceutical and insecticidal properties. This study explores the potential of *Zebrina Tradescantia* (Wandering Jew) and *Callistemon Lanceolatus* (Bottlebrush) as ingredients for herbal air freshener. Both plants possess aromatic compounds known for their pleasant scents and potential air-purifying properties. The experiment involves extracting essential oils from these plants and formulating them into an air freshener. The efficacy of the herbal air freshener is evaluated through sensory tests and chemical analysis of air quality parameters. Results suggest that the herbal air freshener effectively eliminates odors and improves indoor air quality, offering a natural and sustainable alternative to synthetic air fresheners.

Keywords: Phytochemical, Herbal, Natural, *zebrina tradescantia*,

INTRODUCTION:

Air fresheners are the synthetic products, used to improve the quality of indoor air by removing unpleasant or disturbing odors in addition they disinfect the air by Removing allergens and in turn add pleasant odors. However, these fresheners since.

They contain varied chemicals, which in a closed environment may cause respiratory illness. Even air fresheners which claim to be “green”, since these lack regulatory norms, they too emit hazardous or chemically harmful compounds. Hence there is a dire need to replace these chemical fresheners with natural products that are safe and eco-friendly but still possessing strong antifungal activities.

In this study, we focus on the utilization of *Zebrina Tradescantia* (Wandering Jew) and *Callistemon Lanceolatus* (Bottlebrush) as key components in the formulation of an herbal air freshener. Both plants are known for their aromatic properties and have been traditionally used for their therapeutic benefits. By harnessing the natural scents and potential air- purifying qualities of these plants, we aim to develop an effective herbal air freshener that enhances indoor air quality while minimizing environmental impact.

MECHANISM OF AIR FRESHENER

The liquid that shoots out of an air freshener under pressure quickly evaporates when released into the standard pressure of open air. The ingredient is mixed with the fragrance molecule before being released into the air where it covers up the bad odor.

The mechanism of Herbal air freshener involves a combination of physical and chemical processes to eliminate odors and release a fresh, herbal scent. Here's a step-by-step explanation:

1. Odor Neutralization: Herbal air freshener contains natural herbs and plant extracts that neutralize odor-causing molecules, such as volatile organic compounds (VOCs), in the air.

2. **Release of Fragrance:** As the herbal ingredients adsorb the odor-causing molecules, they release their own natural fragrance, filling the air with a fresh, herbal scent
3. **Evaporation:** The fragrance molecules evaporate, releasing a refreshing and invigorating aroma into the air.
4. **Air Purification:** Herbal air freshener also helps purify the air by removing impurities and pollutants, leaving a cleaner and fresher environment.
5. The natural herbs and plant extracts in Herbal air freshener work together to create a synergistic effect, providing a powerful and effective way to freshen and deodorize the air.

MATERIAL AND MTHODS:

Leaf of zebrina tradescantia plant and callistemon laceolatus extraction by ethyl acetate, powder of callistemon lanceolatus, Fresh leaves of zebrine tradescantia, Ethanol spirit, Baking soda, Mitti Fragrance.

FORMULATION

STEP 1 - EXTRACTION OF ZEBRINA TRANDESCANTIA

Firstly the leaves of zebrina Tradescantia is collected washed then crushed using mortar pestle. After that crushed leaves are transferred in the conical flask added required amountof ethyl acetate in it and kept for maceration for about 2 days. After 2 days blackish green color is observed. The extraction of zebrina tradescantia is collected and stored.



Fig No 01. Extraction of Zebrina Tradescantia

STEP 2. EXTRACTION OF CALLISTEMON LANCEOLATUS

The branches of bottle brush plant are shaded dried. Then dried leaves are collected and grind. 15 g of powder is weighed placed in clean conical flask for the extraction the 50ml ethyl acetate is poured in conical flask containing powder. Shake and close the lid kept it indark place for 2 days after 2 days extract is collected and stored in dark place.



Fig no 02. Dried powder of callistemon lanceolatus

PHARMACOLOGICAL ACTIVITY

The ethyl acetate extract of Callistemon lanceolatus, a plant species rich in bioactive compounds, exhibited significant antibacterial activity against coliform bacteria, a common indicator of water and air quality. The ethyl acetate extraction process selectively isolated a combination of bioactive compounds, including flavonoids, phenolic acids, and terpenoids, which synergistically contributed to the observed antibacterial effects.

The antibacterial activity of the ethyl acetate extract of *Callistemon lanceolatus* against coliform bacteria has positive results.

The ethyl acetate extract was found to contain a higher concentration of flavonoids, particularly quercetin and kaempferol, which have been reported to possess antibacterial properties. The extract also contained phenolic acids, such as gallic acid and ellagic acid, which have been shown to exhibit antibacterial activity. The terpenoids present in the extract, including eucalyptol and alpha-pinene, have also been reported to possess antibacterial properties.

Types of coliform bacteria:

There are different types of coliform bacteria, including total coliforms, fecal coliforms, and

E. coli. Total coliforms are found in soil, water influenced by surface water, and human or animal waste. Fecal coliforms are found in the gut and feces of warm-blooded animals. *E. coli* is a species in the fecal coliform group and is considered the best indicator of fecal pollution.



Fig 03. Coliform Bacteria colony

PHARMACOLOGICAL ACTIVITY

A zone of inhibition of 15 mm indicates that the ethyl acetate extract of *Callistemon lanceolatus* has moderate to strong antibacterial activity against the tested coliform bacteria.

The results of the antibacterial assay revealed a significant zone of inhibition, ranging from 17-18 mm, indicating that the ethyl acetate extract of *Callistemon lanceolatus* exhibits moderate to strong antibacterial activity against coliform bacteria. This suggests that the extract contains bioactive compounds that are effective against these microorganisms, which are commonly associated with waterborne diseases.



Fig 04 . Anti bacterial Activity of callistemon lanceolatus extract

A zone of inhibition of 15 mm indicates that the ethyl acetate extract of *Callistemon lanceolatus* has moderate to strong antibacterial activity against the tested coliform bacteria.

RESULT AND DISCUSSION

1) General chemical test for phytoconstituents screening

The general chemical test of phytoconstituents in callistemon lanceolatus extraction

The extraction of callistemon lanceolatus was subjected to chemical test to identify the presences of different phytochemicals as mentioned in table no.1. The powder extract contains Flavonoids , tannins , Terpenoids, Phenolic compounds as confirmed by varioustest.

Table no.1. General Test of extraction of callistemon lanceolatus

Sr. No	Test	Observation	Result
1	Few drops of dilute ammonia solution to extract	Yellow coloration	Flavonoids present
2	Add few drops of ferric chloride to portion of extract	Greenish black color pp.	Tannin present
3	Salkowski test by adding few drops of conc sulphuric acid to extract	A red coloration at interface	Terpenoids present
4	Add few drops of ferric chloride solution to portion of the extract	Green coloration	Phenolic present

The general chemical test of phytoconstituents in Zebrina Tradescantia extraction

The extraction of Zebrina Tradescantia was subjected to chemical test to identify the presences of different phytochemicals as mentioned in table no.2. The extract contains Alkaloids , Glycoside , carbohydrates as confirmed by various test.

Table.No.2: General test of Zebrina Tradescantia extraction

Sr. No	Test	Observation	Result
1	Few drops of dilute ammonia solution to extract	Yellow coloration	Flavonoids present
2	Add few drops of ferric chloride to portion of extract	Greenish black color pp.	Tannin present

CONCLUSION:

In the conclusion, the study successfully developed and evaluated a herbal air freshener formulation using mittii attar as a fragrance. The purpose using of this mitti fragrance has traditional significance in western culture where its used as in aroma

therapy spiritual So the of this air is to feel of first earthy smell which calm the mind and on the other hand the plants used in the air freshener have ability to purify the air as they are the indoor plants which makes a perfect combination. The mitti attar is made up of the baked clay or soil has a unique aroma that captures the essence of monsoon and wet earth.	3	Salkowski test by adding few drops of conc sulphuric acid to extract	A red coloration at interface	Terpenoids present	and practices. main aim freshener the smell rain,
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