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Pharmacognostical study of *leonotis nepetifolia* (L.) R. BR., A wild medicinal plant of lamiaceae

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Abstract
Lionotis nepetifolia (L.) R. Br., is one of the wild members of the family Lamiaceae. The plant has been known for ages for its anti-cold, anti-phlegm, anti-inflammatory and anti-diarrheal properties and is used as ethnomedicine by local tribal communities. The present study is an attempt to investigate the initial phytochemical composition of this plant. The results reveal the presence of bioactive components containing alkaloids, flavonoids, phenolics, tannins, glycosides, steroids, and saponins in various solvents. The medicinal potential of this plant can be correlated with the presence of these phytochemicals.

Keywords: *Leonotis nepetifolia*, phytochemical composition, ethnomedicine

Introduction
Leonotis nepetifolia (L.) r. Br., is a wild vegetative plant belonging to the mint family (family-Lamiaceae). It usually grows during the rainy season on the roadside or in patches with barren unused agricultural waste land. The mature plant attains a height of up to 2 meters. The orange yellow coronated verticillister inflorescence and the smell of various plants are among the unique characters of this plant.
This plant is being used as ethno medicine on various diseases by the local people and tribals of Shahdol. Infusion of leaves is traditionally being used by the tribals to cure cough and colds. The plant is also being used for its anti-inflammatory, anti-diarrheal properties in the Indian subcontinent and by various communities throughout the world. The present study was designed to evaluate the basic phytochemical components of this wild medicinal plant.

Material and mathods
Plant material was collected from waste and agricultural land of Shahdol (M.P.). The plant was identified by local taxonomists and with the help of the flora of Marathwada (Naik, 1986)[1]. Voucher specimens of vegetation are deposited in the herbarium of the Department of Botany Pt.S.N.S. P.G. College, Shahdol (MP).
Extraction: The leaves of the plants were washed thoroughly and dried in shade. Dried leaves are powdered in shade and the powder is used for further phytochemical analysis. The powders were then subjected to soxhlet extraction with different solvents (petroleum ether, benzene, acetone, chloroform, methanol, and water) according to their increasing polarity. Each time the powder material was dried in an air oven below 500C, before being extracted with new solvent. The final extracts of each solvent were used to analyze the presence of various phytochemical components (Harborne, 1973) [2]. The methods employed for quantification of various phytochemicals are described below-
Alkaloid: 5g of sample was taken in 250 ml of 20% acetic acid in ethanol and kept for 4hrs. This was filtered and the extract was concentrated using a water bath until the volume was reduced to a quarter of the original volume. Concentrated NH4OH was then added drop-wise to the extract, until the precipitation was complete. The entire solution was allowed to settle and was collected by filtration and weight (Harborne, 1973; Obadoni and Ochuko, 2001) [2-3].
Tannin: The 500mg sample was weighed in a 100 ml plastic bottle, 50 ml of distilled water was added and shaken in a mechanical shaker for 1h. It was filtered in a 50 ml volumetric flask and formed up to the mark. Then 5 ml of the filtrate was pipetted into a tube and mixed with 3 ml 0.1M FeCl3 in 0.1 M HCl and 0.008 M potassium ferrocyanide.
The observance was measured with a spectrophotometer at 120nm wavelength within 10mins. A blank sample was prepared without plant extracts and absorption was recorded at the same wavelength. A standard was prepared using tannic acid to achieve 100 ppm and measured the absorbance (Van-Burden and Robinson, 1981) [4].
Phenols: The fat-free sample was boiled with 50 mL of ether for 15mins. The 5 ml extracts were piped into a 50 ml flask, and then 10 ml distilled water was added. 2 ml of ammonium hydroxide solution and 5 ml of concentrated amyl alcohol were also added. The sample was made up to the mark and left to react for 30 min. Absorption of the solution was recorded using a spectrophotometer at 505nm (Harborne, 1973; Obadoni and Ochuco, 2001) [2-3].
Flavonoid: A 10-gram plant sample with 100% 80% aqueous methanol at room temperature was extracted repeatedly. The entire solution was filtered through Whatman filter paper number 4 (125 mm). The filter was subsequently transferred to a crucible and evaporated to dryness on a water bath and loaded (Boham & Kosipai, 1994) [5].

Results and discussion
The extraction of leaf powder was carried out in five different solvents namely petroleum ether, chloroform, acetone, methanol, and water. Petroleum ether extracts were light green, chloroform extracts were creamy, acetone extracts were pale green, methanol extracts were light green while water extracts were creamy yellow (Table-1).

Table 1: Successive solvent extraction of shade dried leaves of *L. nepetifolia*

S.No.	Solvent system	Color of extract
1.	Petroleum ether	*Light green*
2.	Chloroform	Creamy
3.	Acetone	Yellowish green
4.	Methanol	Light green
5.	Aqueous	Yellowish-creamy

Table 2: Qualitative chemical examination of various extracts

S.No.	Phytochemicals	PE	Ch	Ac	Me	W
1.	Alkaloids	-	+	-	-	+
2.	Phenolics	-	+	-	+	+
3.	Glycosides	-	+	-	+	-
4.	Flavonoids	-	+	-	+	+
5.	Tannins	+	-	-	-	-
6.	Steroids	+	-	+	-	-
7.	Saponins	+	-	-	-	+

PE= Petroleum ether, Ch= Chloroform, Ac= Acetone, Me= Methanol, W= Water

Table 3: Quantification of major phytochemicals from leaves of *L. nepetifolia*

S.No.	Phytochemicals	Quantity (mg/100g dry wt)
1.	Alkaloid	1.42±0.14
2.	Flavonoids	1.48±0.13
3.	Phenols	1.22±0.22
4.	Tannin	0.13±0.82

The results are average of triplicate estimation ± standard error.

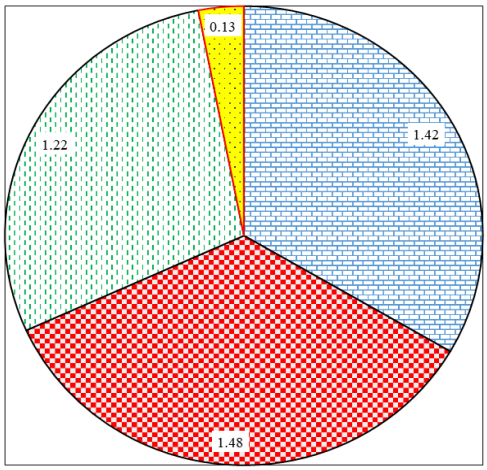

Fig 1: Graphics analysis of Quantification of major phytochemicals form leaves of *L. nepetifolia*.

Preliminary phytochemical analysis noted the presence of alkaloids, phenolic, flavonoids, tannins, steroids, glycosides, and saponins. However, not all these chemicals were extractable in a solvent. Alkaloids, phenolic, flavonoids, and glycosides were present in chloroform extracts; Tannins, steroids, and saponins were found in the petroleum ether extract; Methanolic extracts contained phenols, flavonoids, and glycosides; Alkaloids, phenolic, flavonoids and saponins were found in aqueous extracts, while acetone extracts showed only the presence of steroids (Table-2). Quantitative analysis indicated that the plant has significant levels of alkaloids, phenolic, flavonoids, and tannins (Table-3 & Fig. 1).

The availability of specific phytochemicals in the plant gives it specific medicinal properties. Therefore, the presence of the above phytochemicals in *L. nepatifolia* can be correlated with its pharmacological potential. Similar reports on the phytochemical composition of various medicinal plants have previously been reported by many workers Chopra *et al.* (1956) [6]; Del- Rio *et al.*, (1997) [7]; Obadoni and Ochuco (2001) [3]; Oququé, (2001, 2004) [8-9] and Koche *et al.*, (2010) [10]. However, it is very necessary to separate bioactive fractions from these major groups so that it can be further used in designing specific drugs.

6. Acknowledgement

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