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Comparative study of certain phytochemical properties of *Murraya koenigii* (L.) Spreng. and *Mentha spicata* L.: Two aromatic edible medicinal plants of Darrang district, Assam

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Abstract
Certain phytochemical properties of two aromatic medicinally important edible plants of Darrang district, Assam, viz. *Murraya Koenigii* (L.) Spreng and *Mentha spicata* L., has been studied using six different extract solutions- Methanol, Chloroform, Petroleum ether, Benzene, Hexane and water. Both the plants contain more or less amount of tannin, flavonoids, phenol and alkaloid. Saponin is absent in *Murraya koenigii.* Anthraquinone, steroid, reducing sugar and resin are absent in both the plants. *Mentha spicata contains trapezoid.*

Keywords: *Murraya Koenigii* (L.) Spreng, *Mentha spicata* (L.), pharmacognosy, phytochemistry, aromatic plant, medicinal plant

1. Introduction
Medicinal plants have been used as traditional treatments for numerous human diseases for thousands of years. Medicinal properties of plants are due to the active chemical constituents present in different parts of the plant. Compounds such as carbohydrates, proteins, enzymes, fats, oils, terpenoids, flavonoids, sterols simple phenolic compounds etc. are present in ample amount (Handral *et al.* 2012) [1]. Since from the beginning of this century, there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world.
Leaves of *Murraya koenigii* (L.) Spreng (Rutaceae) (Mitha neem, Narasingha) are commonly used as flavoring agent in Indian curry preparation since ancient times. The medicinal value of the leaf has been reported as antibacterial (Thomas *et al.,* 1999), anti-inflammatory, antifeedant etc. The leaves also reported as antidysentric, externally cures eruptions, ant vomiting, tonic & stomachic purposes (Srivastava, *et al.,* 1993).
Mentha spicata Linn (Labiatae) is a common edible and aromatic perennial herb used widely for flavouring foods and beverages. It is used as a contraceptive (Shah *et. al*.), carminative, antispasmodic, anti-peptic ulcer agent, and has been given to treat gastrointestinal disorders, common cold, musculoskeletal pain, indigestion, skin diseases, coughs and colds in folk medicine (Sharma *et. al*.).

2. Material and methodology
2.1 Collection of plant material
Plants were collected from Mangaldai, Darrang district, Assam, India and identified by IBT Hub, Mangaldai College. Collected plants were washed with water and dried in the ventilated shed area in the lab. Grind powder was used for determination of powder microscopy, physiochemical characteristics and phytochemical analysis.

2.2 Powder Microscopic Examination
Glycerol reagent as per WHO guideline was prepared. Small amount of powder was taken on the slide to this mixture was added and covered with cover slip and examined under microscope.

2.3 Determination of Extractive Value
The powdered plant material was used for cold extraction using various solvents. Solvents are evaporated off using hot water bath. Weight of the dried extract was recorded and the extractive yield was calculated as,

Extractive value= $\frac{\text{final weight of the extract}}{\text{initial weight of the dry matter}} \times 100$

Presence of phytochemicals in the solvents are expressed according to their intensity of presence using '+' signs.

2.4 Phytochemical Analysis of Leaf of the Plant

The cold extract of the plants were subjected to phytochemical analysis for secondary metabolites like tannin, saponin, flavonoid, phenol, cardiac glycoside, alkaloid, anthraquinone, trapezoid and steroid, reducing sugar and resins.

3. Result and Discussion

Powder analysis shows significant micromorphological features present in the tissue of both the plants (Fig: A-G).

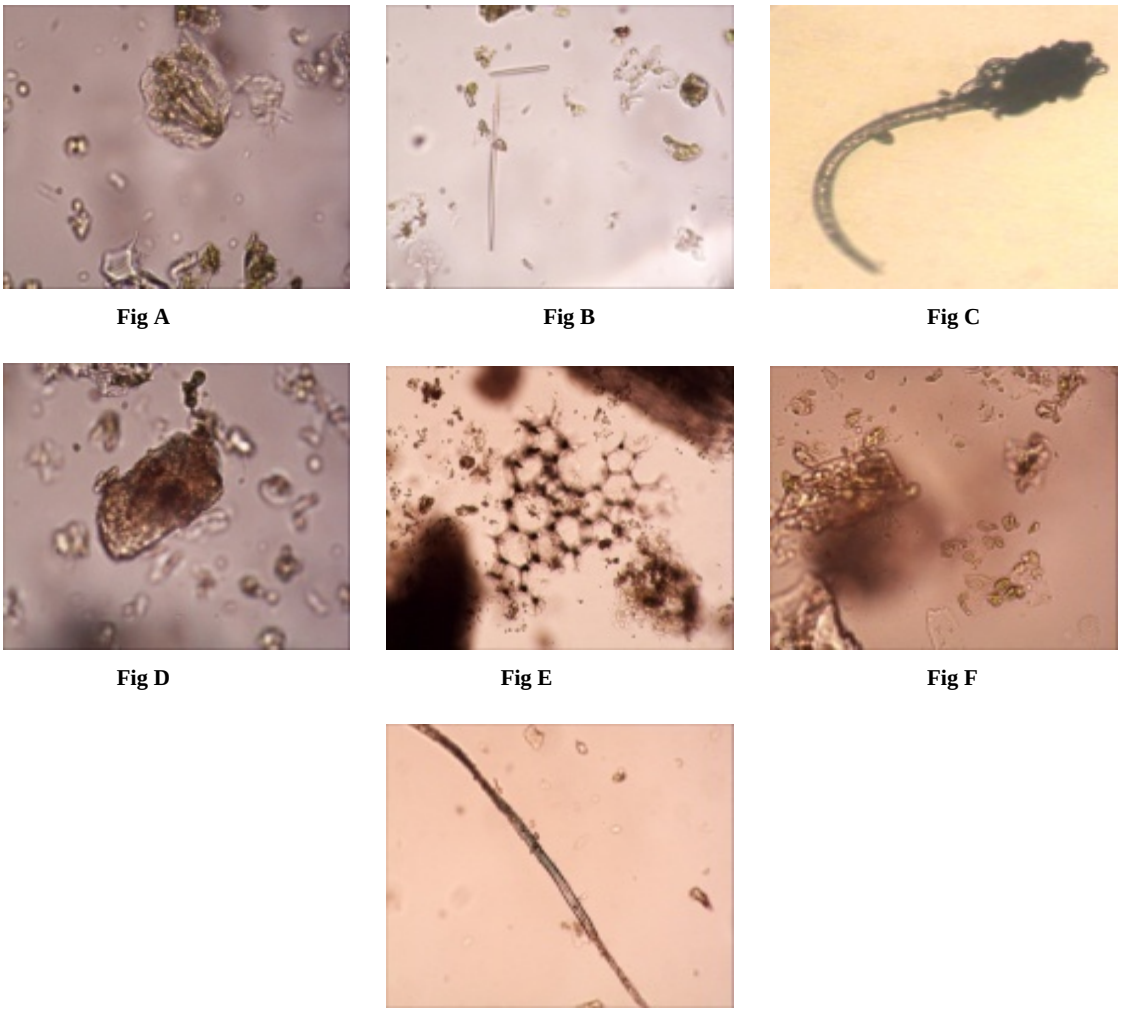


Fig A **Fig B** **Fig C**

Fig D **Fig E** **Fig F**

Fig G

Fig 1: Powder analysis of *Murraya koenigii*(A-D): A. Microsphenoidal Crystals, oil droplets and stomata, 40x, B. Microsphenoidal crystals, few pulp cells, 40x, C. Trichome, 40x, D. Large druse of calcium oxalate and volatile oil droplets, 40x. Powder analysis of *Mentha spicata* (E-G): E. Parts of tissue, 40x. F. Loose Chloroplast and volatile oil droplets, Microsphenoidal crystals, few pulp cells, 40x, G. Long fibre, 40x.

Both the plants contain several microsphenoidal crystals and druses which indicates the rich secondary metabolite content and the high medicinal potentiality of the plants. Structures like stomata, trichome and fibres are also distinct in powder analysis. Presence of pulp cells coincides with the good food quality of the leaves. Presence of volatile oil droplets indicates the strong aromatic property of both the plants.

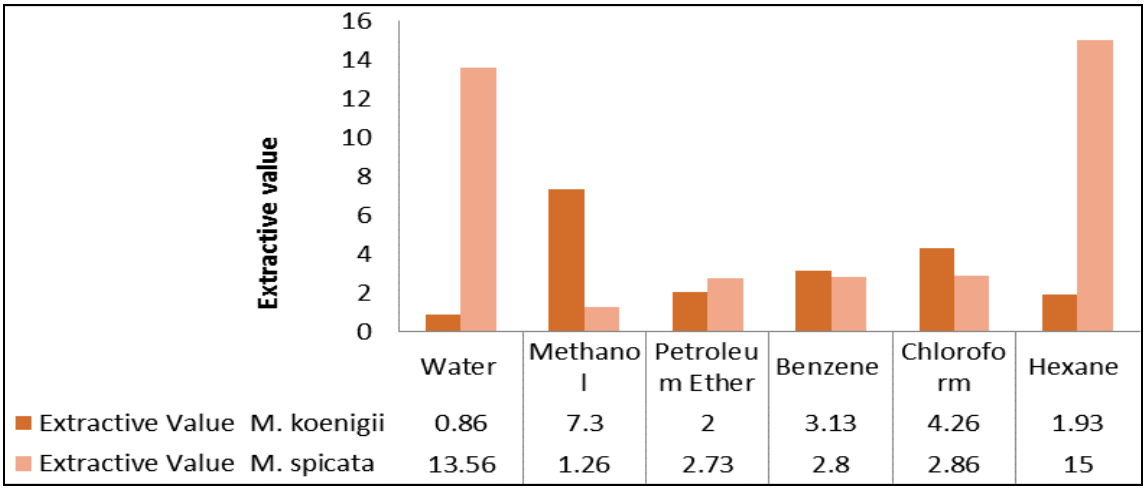
Table 1: Data showing the presence or absence of various phytochemicals in *M. koenigii*

Chemicals	Methanol	Water	Chloroform	Benzene	Hexane	Petroleum
Tannin						
a)$FeCl_3$ test	--	--	--	--	--	+
b)$PbAc_3$ test	+	--	+	+	+	++
Saponin	--		--	--	--	--
Flavonoid						
a) NaOH test	+	+	--	--	+	+
b)NH_4OH vapour test	+	+	--	--	+	+

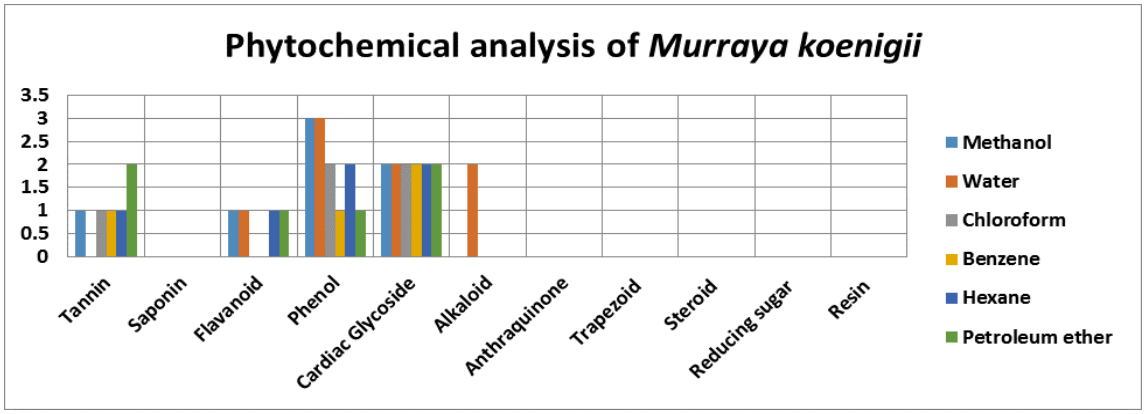
Phenol	+++	+++	++	+	++	+
Cardiac glycoside	++	++	++	++	++	++
Alkaloid						
a)Hager's test	--	++	--	--	--	--
b)Wagner's test	--	--	--	--	--	--
Anthraquinone	--	--	--	--	--	--
Trapezoid	--	--	--	--	--	--
Steroid	--	--	--	--	--	--
Reducing sugar	--	--	--	--	--	--
Resin						
a)HCl test	--	--	--	--	--	--
b)$FeCl_3$ test	--	--	--	--	--	--

Table 2: Data showing the presence or absence of various phytochemicals in *M. spicata*

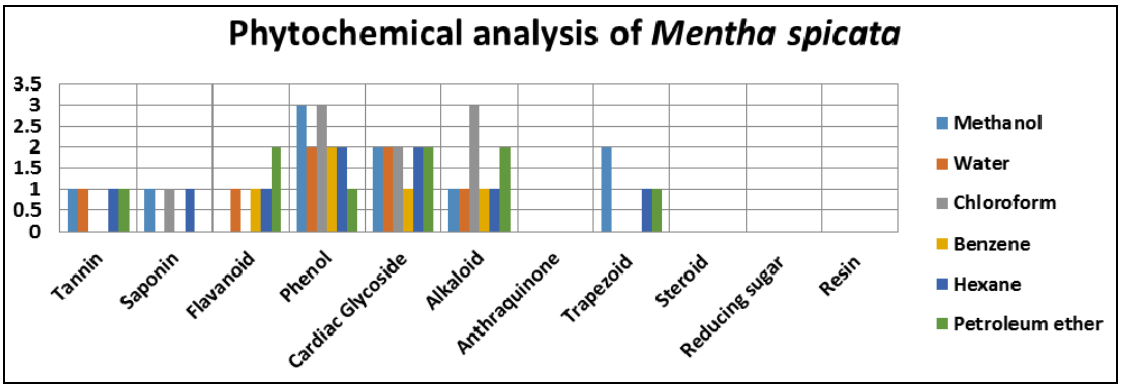
Phytochemicals	Methanol extract	Water extract	Chloroform extract	Benzene extract	Haxane extract	Petroleum extract
Tannin						
1.$FeCl_3$ test	-	-	-	-	-	-
2.lead acetate test	+	+	-	-	+	+
Saponin	+	-	+	-	+	-
Flavonoid	-	+	-	+	+	++
Phenol	+++	++	+++	++	++	+
Cardiac glycoside	++	++	++	+	++	++
Alkaloid						
1.Hager's test	+	+	+	+	+	++
2.Wagner's test	+	-	+++	+	+	++
Anthraquinone	-	-	-	-	-	-
Trapezoid	++	-	-	-	+	+
Steroid	-	-	-	-	-	-
Reducing sugar	-	-	-	-	-	-
Resin	-	-	-	-	-	-



Graph 1: Extractive values of different solvents



Graph 2: Phytochemical analysis of *M. koenigii*



Graph 3: Phytochemical analysis of *M. spicata*

Methanol is the best extractive solution for *M. koenigii*. Water serves as less extractive solvent for *M. koenigii*. But *M. spicata* shows good extractive value in water and hexane. Both the plants contain good amount of tannin, alkaloid and flavonoid. Tannin content is higher in *Murraya* whereas alkaloid and flavonoid content are similar in both. Phenol present in highest amount than other phytochemicals in both the plants. Saponin is absent in *M. koenigii*. *Mentha* contains very less amount of trapezoid which is completely absent *Murraya*.

4. Acknowledgement

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