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Preliminary Phytochemical Investigation and Antipyretic activity of ethanolic extract of *Blumea mollis* on Yeast induced hyperthermia in rats

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ABSTRACT

Background: *Blumea mollis* has been widely used in traditional medicinal system for the cure of various diseases. It is used by people for the treatment of fever, inflammation and infections. This plant has antioxidant, cytotoxic and antibacterial property. Present study is about *Blumea mollis* belonging to the family Asteraceae comprises physiochemical analysis and their pharmacological efficacy.

Materials and Methods: Five extracts (Pet. Ether, Ethyl acetate, chloroform, ethanolic, and aqueous) from the plants were prepared and analysed. Qualitative phytochemical tests were used to detect the presence of alkaloids, tannins, saponins, flavonoids, glycosides and phenols. Antipyretic activity was evaluated using brewer's yeast induced pyrexia model in rats. ethanolic extract were given at dose of 100, 200 and 400 mg/kg *p.o.*

Results: The results showed that all the extracts studied contain the bioactive compounds glycosides, phenols, alkaloids, flavonoïds, tannins, saponins, except aqueous extracts of *Blumea mollis. Ethanolic* extract at the doses of (100, 200 and 400 mg/kg *p.o.*) significantly decreased the rectal temperature of the rats.

Conclusion: Phytochemical analysis and their pharmacological efficacy is helpful in the standardization of drug.

Key words: Phytochemical analysis, *Blumea mollis* Antipyretic activity

1. Introduction

Blumea mollis is a plant belonging to Asteraceae family. It is an herb and annual aromatic plant and leaves are petiolate , ovate- oblong, toothed, soft glandular hairs, erect stems with pink purple colour flowers present. They are commonly found in South India and grow up to 0.4-1.2 m high. The essential oil of *B. mollis* is to consist of 39 constituents i.e. linalool, copaene, gamma-elemene, estragole, alkanes n-triacontane allo-ocimene, gamma-terpinene and allo-aromadendrene [1]. n-hentriacontane, 2, 3-dimethoxy p-cymene, methyl-5-isopropyl-1, 2-methycyclopentane carboxylate chrysanthanone, 2, 4, 5-trimethoxyallylbenzene, and caryophyllene oxide [2] The leaves of the plant are utilised for the treatment of many ailments ie skin diseases, wounds [3] and against parasite [4]. The leaves of the plant have anti-inflammatory properties antioxidant, anticancer [5], antibacterial, larvicidal [6], hepatoprotective [7], diarrhoea [8], asthma, dropsy [9].

The literature have revealed that there are no reports on the Pharmacognostical studies conducted on this plant. The present study was aimed at evaluating the phytochemical profile and antipyretic activity of *B. mollis*.

2. Material and Method

2.1. Plant material

The leaves of *B. mollis* were collected from Amauli, Fatehpur, Uttar Pradesh, India on 1 September, 2017. The plant was identified by the Dr. Ashok Kumar, Botanist, IFTM University, Moradabad, U.P. These plant specimens have been systematically documented in the Institute's herbarium, where they are now accessible with unique accession numbers, specifically, accession number 105283 for *Blumea mollis*. and accession number LWG 109567 for *Blumea mollis* L. The plant material dried in shade were powdered and subjected to Soxhlet extraction with Pet. Ether, Ethyl acetate, chloroform, ethanol and aqueous. The extract collected was evaporated and stored in a vacuum desiccator.

2.2. Drugs and chemical

The following drugs Paracetamol (Crocin), and chemicals, methanol (Merck) and acetic acid (Fisher Scientific) were used during the experimental study.

3.Qualitative analysis

Presence or absence of certain phytochemicals was confirmed by practicing standard protocols with slight modification. tannins, saponins, steroids, alkaloids, flavonoids, glycosides, carbohydrates and proteins. [10, 11]. Alkaloids and coumarins were detected by the methods as described by Labiad et al. [12].

4. Pharmacological Studies

4.1 Antipyretic Activity

4.1.2 Animals

Albino rats of either sex (150-200 g) were used for the experimental study. The animals were maintained under standard husbandry conditions in polypropylene cages and provided with

food and water *ad libitum*. The animals were kept on fasting overnight prior to the experimentation and all the procedures used in these studies were approved by the Institutional Animal Ethics Committee.

5. Results

5.1 Phytochemical analysis

The crude ethanolic extract of *Blumea mollis* showed strong positive results for presence of tannins, saponins, steroids, alkaloids, flavonoids, glycosides, carbohydrates .

5.2 Antipyretic activity

Antipyretic activity was performed by Yeast induced hyperthermia method. In this,15 rats were selected and made hyperthermic by subcutaneous injection of 12% yeast suspension at a dose of 1 ml per animal. Then the rats were divided into three equal groups. After 10 hours of yeast administration, saline was administered at a dose of 1ml per animal orally to one group. The second group required paracetamol 20 mg per animal orally. The third group was given the test drug (*B. mollis* extract), 100 mg,200 mg, 400mg per animal orally. The mean rectal temperature of the rats was recorded at 0, 1½, 3, 4½ hours after drug administration [12,13]

Statistical analysis

The data was summarized using the mean and standard deviation. Statistical analysis was performed with GraphPad Prism 9.3.1 software, utilizing one-way Analysis of Variance (ANOVA) and the Newman–Keuls test to assess all data. A significance level of ($p < 0.001$) was deemed statistically significant.

Table 1. Phytochemical screening of *Blumea mollis* plant extracts

Key : + Present - Absent

Test	Pet. Ether extract	Chloroform extract	Ethyl acetate extract	alcohol extract	Water extract
Alkaloids	_	+	_	+	+
Glycosides	_	_	_	+	+
Flavanoids	+	+	_	_	_
Steroids	_	_	_	+	+
Saponins	_	_	_	+	+
Carbohydrates	_	+	_	+	+
Protein and Amino acid	_	_	_	_	_
Fixed oil and Fats	+	+	_	_	_
Tannins	_	_	_	+	+

Thus the preliminary phytochemical screening of *blumea mollis.* plant showed the presence of:

1. Steroids: Present in ethyl alcohol and aqueous extract
2. Flavonoids: present in Pet. ether extract and Chloroform extract
3. Saponins: present in ethyl alcohol extract and aqueous extract
4. Glycoside: present in ethyl alcohol extract and aqueous extract
5. Alkaloids : present in Chloroform, ethyl alcohol and aqueous extract

Table No.2 Effect of ethanolic extract of *Blumea mollis* on Yeast induced hyperthermia in rats

Group	**Dose**	**Temperature in °C**			
		Initial	**1½ Hrs**	**3 Hrs**	**4½ Hrs**
Control	Water 1ml	38.5±0.09	38.1±0.11	37.8±0.12	37.8±0.19
Standard	Paracetamol 10 mg	38.6±0.10	36.5±0.08	35.8±0.13	35.3±0.23
EBM	100mg	38.2±0.12	38.0±0.15	37.8±0.14	37.2±0.24
EBM	200mg	38.1±0.13	37.6±0.12	36.3±0.15	36.1±0.28
EBM	400mg	38.4±0.12	37.1±0.11	36.4±0.10	35.4±0.32

5.3 Discussion:

The preliminary qualitative phytochemical analysis revealed the presence of valuable different classes of phytochemicals in leaves of *Blumea mollis* including tannins, saponins, steroids, alkaloids, flavonoids, glycosides, carbohydrates. The presence these diverse categories of bioactive compounds in *Blumea mollis* indicated the medicinal potential of *Blumea mollis* these bioactive constituents are multifunctional natural products acting through multiple targets by being antipyretic [14] It is well known that pharmaceutical companies around the world are interested in developing safer and more effective drugs to treat and fever. The present study evaluated the significant antipyretic effect of ethanolic *B.mollis* extract in animal model.

Ethanolic *B. mollis* extract significantly reduced the pyrexia induced by yeast in rats. The reference drug Paracetamol also suppressed the yeast-induced fever in rats by inhibiting the synthesis of prostaglandin E2 [15,16] results support the use of *B. mollis* as an antipyretic for the treatment of fever.

The results of this study exhibited that ethanolic *B. mollis* extract possesses antipyretic activities which may be mediated by the central and peripheral mechanisms. An activity-guided fractionation of this extract is presently being carried out. The isolation of new and effective compounds is important for both drug development and establishment of the ethno medicinal use of this plant.

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