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Standardization and Quality Evaluation of Kampilla

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Abstract – Kampilla is an important herbal drug of indigenous system of medicine. Fruit dust of *Mallotus philippensis* Muell-Arg constitutes the genuine drug Kampilla. However, due to limited distribution of this plant and its high medicinal value, the drug is heavily adulterated with the cheaper substances. Hence the present study was undertaken to evaluate both the authentic and market samples. The drug consists of resin glands and trichomes. Resin glands are lined by a delicate yellowish thin membrane and bear a pore at the tip. Quantitative standards of the drug powder showed 82.50% yield in total ash while alcohol soluble extract of market and authentic sample exhibit 0.97% and 3.458% respectively. The main adulterant noticed in the market sample is brick powder. Simple methods are suggested to identify the genuine drug.

Key words – Quality evaluation, *Mallotus philippensis*, Kampilla.

Introduction

Kampilla, one of the well-reputed herbal drug, is being used extensively in the indigenous system of medicine and is attributable to *Mallotus philippensis* Muell-Arg. belonging to the family Euphorbiaceae. The plant is very famous for its dust occurred on the surface of its fruits in the form of a powder comprising the resin glands and hairs. The fruit dust is pungent and works as a purgative, styptic and carminative. It lessens intestinal pain useful in alexia, head ulcers, wound, tumours, and bronchitis and in disease of the abdomen and enlargement of spleen (Kirtikar and Basu, 1987). The powder is also used as aphrodisiac, lithotriptic and as an antiseptic in blisters in the ear (Anonymous, 1976). In some parts of India it is used in snakebite. In Ayurvedic system of medicine it is used as a purgative and anthelmintic drug (Anonymous, 1992. Gupta *et al.*, 1984). In Unani system of medicine it is the main ingredient of Marham Kamela and Itrifal Quimbeel. Due to its tremendous use and less availability, the powder available in the market is heavily adulterated with cheaper substances. Therefore the present study is undertaken to investigate both the authentic and market samples of Kampilla to fill that lacuna in our knowledge. Methods are being proposed to identify the genuine drug.

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Materials and Methods

Authentic sample was collected from the hills of Pavagdh, Gujarat. and the market sample was procured from the local market, Nadiad, Gujarat. Powder analysis through microscopy was carried out according to Leelavati *et al.* (1988).

For Scanning Electron Microscopic study the dust (Powder) occurring on the surface of *M. philippensis* fruit was collected and fixed on the stubs with double sided adhesive tape. The specimen was coated with thin layer of Gold-Palladium using SEM coating unit (Polar coating equipment) and scanned by using SEM Stereos can 250 MK III, Cambridge Instrument, Ltd., U.K.

Ash values, quantitative values were carried out according to the methods described in The Ayurvedic Pharmacopoeia of India (1989)

Results and Discussion

M. philippensis is a small but much branched tree growing at a height of five to eleven meters. Fruits are 0.3 cm to 0.5 cm in diameter. On the surface of the fruits and pedicels occurrence of brick red coloured particles can be seen. It is made of resin glands. Besides, hairs (trichomes) are also present.

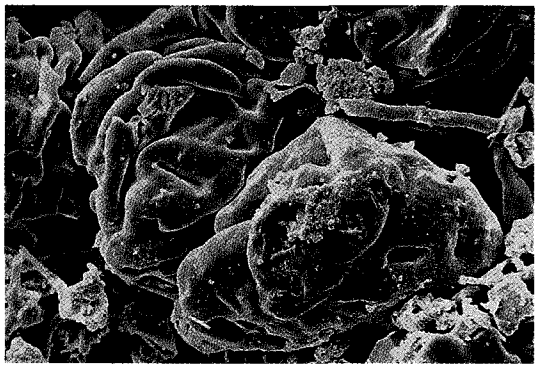

Plate 1. SEM Photograph of resin glands of *M. philippensis* showing pore (arrowed) on its surface 5170x.

The resin glands and trichomes since they occur on fruit surface are collectively called fruit dust.

Microscopic examination reveals that the powder consists of no cellular structures except the characteristic glands and hairs. The glands are oval to spherical in shape possessing a pore/s on their surface (Plate 1). The peripheral region of each gland is lined by a delicate yellowish thin membrane and densely filled with dark reddish resinous substance (Fig. 1).

Trichomes are ranging from 36-290 μm in length. The eglandular unicellular trichomes are of simple (Fig. 5i), conical (Fig. 5ii) and hooked type (Fig. 5iii).

Multicellular trichomes are simple uniseriate filliform (Fig. 3). Different shapes of stellate hairs are observed. They are palm shaped (Fig. 4) possessing

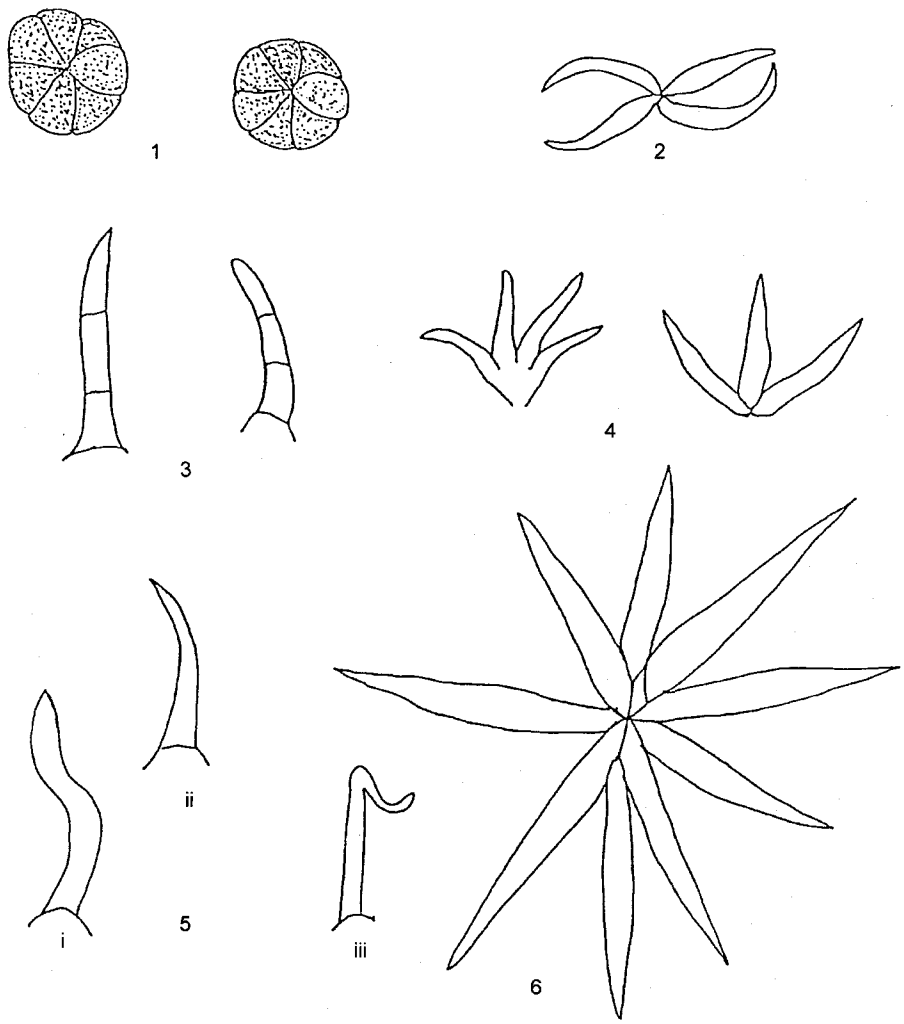

Fig. 1. Resin glands 550x. **Fig. 2, 4 & 6.** Stellate hairs 550x. **Fig. 3.** Eglandular uniseriate multicellular trichomes 550x. **Fig. 5.** Eglandular unicellular simple (I), Conical (II) and hooked (III) type of trichomes 550x.

Table 1. Fluorescence analysis of drug powder of *M. philippensis* (Authentic Sample)

Treatment	Day light	U.V. light
Drug powder (DP) as such	Brick red	No change
Dp + aq. 1N NaOH	Brick red	No change
Dp + alco. 1N NaOH	Reddish brown	No change
Dp + !N HCl	Light yellow	No change
Dp + 50% H_2SO_4	Brick red	Dirty blue

Table 2. Fluorescence analysis of drug powder of *M. philippensis* (Market Sample)

Treatment	Day light	U.V. light
Drug powder (DP) as such	Brick red	No change
Dp + aq. 1N NaOH	Brick red	No change
Dp + alc. 1N NaOH	Red	No change
Dp + !N HCl	Red	No change
Dp + 50% H_2SO_4	Brick red	No change

three or four projections. The four-armed stellate hair possessing two projections on one side and the rest are on the opposite side (Fig. 2). Stellate hairs having multiple projections (Fig. 6) are also seen.

Fluorescence analysis of the drug powder of both authentic and market samples are tabulated in Table 1 and 2 respectively. Authentic sample showed dirty blue colour when it was treated with 50% H_2SO_4 and seen under U.V. light. While the market sample didn't respond to any such test.

Quantitative standards of the drug powder are tabulated in Table 3 and 4. Market sample yielded 82.50% ash while alcohol soluble extract of market and authentic sample showed 0.97% and 3.458% respectively.

The main adulterant seen in the market sample is brick powder. Since the colour of the drug powder is exactly similar to that of brick powder, it is used as substitute. The particle weight of the brick powder is heavy. Thus it settles down in the water where as the drug powder due to its lightweight particles floats on the surface of the water. But in general, most of the resins are having the specific gravity more than one and heavier than water. Since the resins possess more carbon atoms when ignited it burns with cracking smoky flame. If a line is drawn on a white

Table 3. Quantitative standards of authentic sample

Foreign matter	: 0.5%
Total ash	: 39.020%
Acid insoluble ash	: 30.019%
Alcohol soluble extractive	: 3.458%
Water-soluble extractive	: 10.300%

Table 4. Quantitative standards of market sample

Foreign matter	: 78.0%
Total ash	: 82.501%
Acid insoluble ash	: 68.111%
Alcohol soluble extractive	: 0.970%
Water-soluble extractive	: 4.500%

paper with moisture drug powder it shows yellowish -red marking while with adulterant it would not appear because the resinous substance is having a compound methyelene-*bis*-methyl fluoroacetophenone which is yellow in colour. With the help of these tests, one can easily check the adulteration.

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