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NAGAKESARA – A COMPARATIVE PHARMACOGNOSY

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ABSTRACT: *Dried floral buds of Mesua ferrea Linn, dried fruits of Dillenia pentagyna Roxb and dried fruiting inflorescence of Cinnamomum wightii Meissn are used as Nagakesara in different regions of India. This elaborate study presents to the pharmacognosy of these three different drugs of Nagakesara.*

INTRODUCTION

Nagakesara in Indian system of medicine is used as deodarant, diaphoretic and stimulant. It is a brain tonic appetizer, antiemetic, anthelmintic, aphrodisiac diuretic and antidote.

Nagakesara is mostly attributed to the stamens or the flowers of Mesua ferrealinn of the family Guttiferae. (Dymock 1885, Kirtiker and Basu B. D. 1918, Nadkarni K. M. 1908, Chopra, R. N. 1956, Chunekar. K. C. 1969). Recently the usage of dried fruiting inflorescence of cinnamomum wightii Meissn of the family Lauraceace and dried fruits of Dillenia pentagyna Roxb of the family Dilleniaceae has been reported (Usman. S. Ali 1967).

MATERIALS AND METHODS:

Nagakesara was collected from North India, Malabar and Madras crude drug trade. Their Botanical sources were identified (Gamble. J. S.1935 and Hooker J. D. 1882). Their macroscopical and microscopical characters were studied and (Trease. G. E. and Evans. W. C. 1966, Johansen D. A. 1939) are tabulated.

OBSERVATION AND RESULTS

Sl. No.	Character 1	Malabar Nagakesara 2	Madras Nagakesara 3	North Indian Nagakesara 4
1.	Source	*Dillenia pentagyna Roxb.* Dilleniaceae	*Cinnamomum wightii Meissn.* Lauraceae	*Mesua ferrea* Linn. Guttiferae
2.	Useful Part	Dried fruit enclosed by calyces	Dried fruiting inflorescences, immature fruits and falls	Dried floral buds.
3.	Macroscopical characters	Five accrescent calyces are polysepalous, fleshy but pliable, curve imbricately and cover the fruit. They form 70% of the drug.	Immature fruits : They are in panicles. Branches end in dichasis with middle large flower. Pedicel: it is thick, 2 – 9 mm. long. Peduncle: It is 3 – 72 mm. long and pubescent.	Buds : They are pedicellate, complete, bracteate, regular, actinomorphic, hypogynous, tetramerous, polygamous, light brown, spherical with small projection at apex. 2 – 6 mm. dia.
		Fruit : it is pentacarpellary apocarpous gynoecium, mature indehiscent carpels with thin walls enclosing 3 – 6 black seeds in each fruit with permanent style on its ventralsuture	Fruit : It is salted on cup shaped perianth tube which is 2 – 6 mm. dia. Six sub equal lobes are in 2 whorls of 3 each, imbricate aestivation. The surface is brittle and wrinkled. It is blackish brown.	Pedicle : It is slender, 4 – 22 mm. long. Bracts are 2 to 3 and cordate. Sepals are fused with bud. Corolla is polypetalous tetramerous.
		Seed : It is black in colour and glacous. It is ovoid in shape. When fruit is removed a rosette of androecial remnant is visible	Fruit is globose, smooth, minutely apiculate due to remnant of style and single seeded.	Stamens are numerous upto 48 Filament: Filament is wiry, basifixed, anthers are dithecous.

		Drug is slightly sweetish and mucilaginous. There is no aroma.	Galls are mucilaginous. Drug has cinnamomeous odour.	Carpels are bicarpellary syncarpous, bilocular with 4 ovules in axile placentation. Style is simple and stigma is peltate. Drug is odourless and astringent.
4.	Microscopical Characters:	Epidermis is single layered, rarely with unicellular trichomes.	Epidermis is single layered with rarely unicellular – trichomes. They contain tannin	Epidermis is single layered without any trichome. Cells contain tannin.
	Pedicel:	Cortex is with 11 layers of collenchyma, rest, parenchyma. Secretory cells and idioblasts with raphides of calcium, oxalate are present.	Cortex is parenchymatous. Many scattered stone cells and oil cells are present. Cells also contain tannin.	Cortex is parenchymatous. Oil cells are present. All cells contain tannin.
		Pericylic fibres: It is continous or discontinous. It is made of thick walled parenchyma with pitted wall.	Pericyclic fibre forms caps; over vascular bundles.	Pericyclic fibre is absent.
		Vascular bundles are 9 – 13 in a circle, sometimes with extra bundles enclosed by sclerenchymatous bundle	Vascular bundles are 12 to 17 in a circle.	Vascular bundles are in two circles, outer whorl with 6 and inner whorl with 8.

		sheeth.		
		Pith is parenchymatous with Secretory cells and idioblasts. Tannin is present.	Pith is a parenchymatous with oil cells. Some contain tannin.	Pith is parenchymatous with oil cells. Tannin is present.
	Perianth	Sepal – surface view shows angular epidermal cells with Ranunculaceous stomata and stellate trichomes.	Perianth lobe in surface view is sclerenchymatous with thick walled unicellular trichomes.	Sepals and petals both in surface view are with thick walled epidermis. In whole mount longitudinal oil ducts between veinlets can be seen.
		In cross section epidermis is single layered on both upper and lower ends. Trichomes are up to 104 microns long. Hypodermis is 5 to 12 layered on both sides. Most of the cells contain tannin.	In cross section the epidermis is sclerenchymatous. There is no hypodermis. Cells contain tannin.	In cross section both have a single layered epidermis which contain tannin.
		Ground tissue is parenchymatous with numerous oil cells. Idioblasts with raphides of calcium oxalate crystals are seen. All cells contain tannin.	Ground tissue is parenchymatous. Many oil cells, more on the inner side are present.	The ground tissue is parenchymatous. Many oil cells are present. Idioblasts contain sphaerocrystals. Tannin is present. Small concentric.

		Vascular strand is in a line enclosed by thick walled sheath.	Vascular strands are concentric. Tracheids are spirally thickened with simple perforation.	Vascular strands are seen.
	Fruits and Seeds:	Fruit wall is thin and parenchymatous. Testa of seed contains colour pigments. Cells are cutinized and Sclerenchymatous. Endosperm is parenchymatous with oil globules and protein granules.	Fruit wall in surface view shows small epidermal cells. The ground tissue is parenchymatous with scattered stone cells. Oil cells are abundant. Endosperm has spirally thickened parenchyma cells.	Not found
	Other Parts:	Nil	Peduncle: Epidermis is one layered. It is cutinized and rarely with unicellular trichomes. Cortex is parenchymatous with numerous oil cells. They also contain tannin. Pericyclic fibre is discontinuous. Stele is made of collateral bundles in a continuous ring. Phloem has many oil cells. Vessels are spirally thickened with scalariform or simple perforation. Pith is parenchymatous with oil cells. *Galls:* Epidermis is cutinized and one layered. Trichomes	Nil

			are unicelled. Cortex is parenchymatous with many oil cells and few stone cells. Pericyclic fibre is discontinuous. Vascular strand is made of very few vessels and mostly of fibres. Fibres contain starch granules. Rays coverage to protoxylam ends where fibres and stone cells are present. Pith is sclerosed. Parenchyma cells are few and pitted. Stone cells are scattered. Central portion of the pith is almost dissolved.	
5.	Histochemical Studies: Starch:	In calyces and fruit starch is absent.	Galls have starch granules. Pedicels, perinath lobe and fruits have no starch granules.	In sepal and petal starch is absent.
	Fatty matter:	Ground tissue, phloem of calyces and cortex and pith of pedicel contain fatty matter.	Cortex, phloem, pith, xylem of peduncle, cortex, phloem, pith, xylem of pedicel; ground tissue of perianth; endosperm of fruit; cortex, phloem, xylem and pith of galls contain oil cells.	Cortex, phloem and pith of pedicel and the ground tissue of perianth contain fatty matter.

	Tannin:	Epidermis, hypodermis, cortex, phloem, pith of pedicel and fruit wall contain	Epidermis, cortex, phloem, pith and xylem of peduncle; epidermis, cortex, phloem, pith, xylem of pedicel; epidermis and ground tissue of perianth; epidermis, ground tissue, phloem, xylem, pith of galls contain tannin.	All cells of pedicel and epidermis and ground tissue of perianth contain Tannin.
	Calcium oxalate crystals	Cortex and pith of pedicel contain raphide of crystals.	Absent	Ground tissue of perianth only contain sphaerocrystals.

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