

P A R T - II

Pharmacognosy, Pharmacology and Phytochemistry
of
some miscellaneous plants.

CHAPTER - X

Pharmacognosy of the fruits of the

'Khandala' variety of

CAEPARIS MOONII Wight

Cressa critica (Convolvulaceae), is known as 'rudanti' and its fruit are recommended in respiratory diseases (Thakar, 1952). Capparis moonii Wight (Capparidaceae) is also known as 'rudanti'. It grown wild in the Western Ghats, especially in the Canara District of Mysore State (Cooke, 1905). The fruit of the latter plant are used for healing sores, burns and wounds in the countryside. According to Murty (1958), half mature fruit of C. moonii are effective in the pulmonary tuberculosis. Sheth and Murty (1959) distinguish two varieties of C. moonii, viz. the 'Khandala' and the 'Konkan' varieties. They consider the fruits of the latter variety to be more effective. Bundeally and Bellare (1960) find that only the fruit of the 'Konkan' variety possess tuberculostatic property. Recently, l-stachydrine, rutin and β -sitosterol have been isolated from the fruit of the same variety (Kanthamani, Narayanan and Venkataraman, 1960).

Description of the plant:

Capparis moonii ('Khandala' variety, (Plate XVI)



P L A T E - X V I

Herbarium specimen of Capparis moonii Wight.

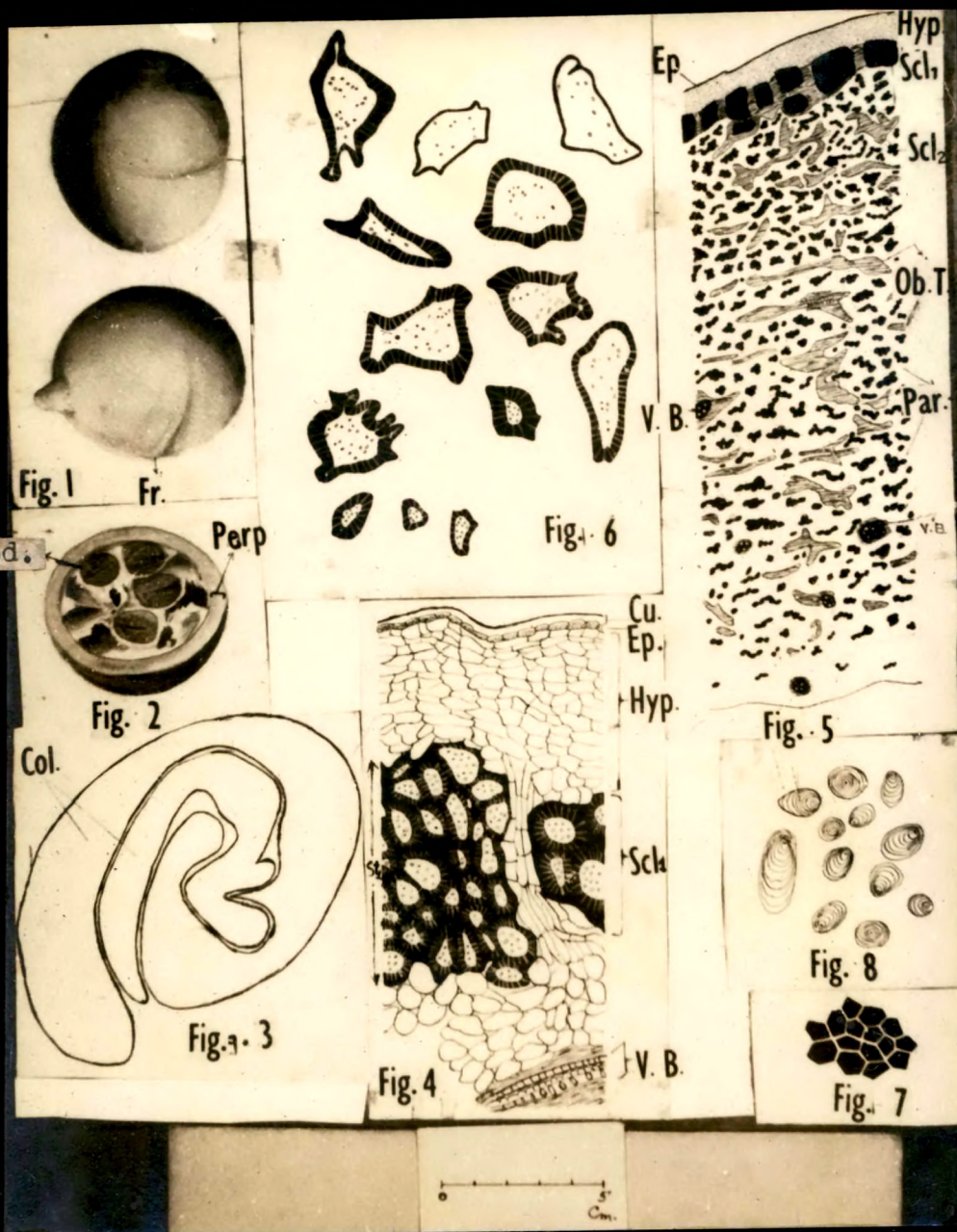
Capparis moonii Wight

is a large climbing shrub with the stem attaining a maximum diameter of about 15 cm. Young branches are purple, glabrous and shining. Leaves are elliptic-oblong and glabrous; upper surface is shining while the lower one is pale green. They measure 7.5 - 10 cm. in length and 3.7 - 5 cm. in width. The stout, glabrous and flattened petiole is 1.2 - 2 cm. long. Stipular thorns are short, stout and hooked. The flowers are arranged in a terminal corymb. Pedicel is 4 - 6.5 cm. long, stout, glabrous and flattened. Sepals are obbicular, deeply cupped and hairy outside. Petals are white. Stamens are many. The ovoid and glabrous ovary is raised on a gynophore, 5 - 7.7 cm. long. Fruit is sub-globose, pointed and seated on a much thickened woody stalk. Seeds are numerous; each measures 2 cm. in diameter.

M O R P H O L O G Y

'Khandala' variety of Capparis moonii Wight has a stalked berry which measures 5 - 10 cm. in diameter. Colour is green-grey to red. Young fruit is smooth while the older one is granular rough. At times, a prominent ridge is seen half way round the circumference (Plate XVII, 1).

The berry has a hard woody pericarp which is about 0.7 - 0.8 mm. thick. Many reniform, exalbuminous seeds are embedded in the pulp (Plate XVII, 2). A seed



P L A T E - XVII

(Figs. 1 - 8 : Capparis moonii Wight)

- Fig. 1 - Entire fruits. x 1.
- Fig. 2 - Portion of the fruit showing pericarp
and seeds. x 1
- Fig. 3 - Embryo showing two big and convoluted
cotyledons. x 7.
- Fig. 4 - T.s. pericarp, showing the tissues of
the outermost region. x 320.
- Fig. 5 - T.s. entire pericarp (diagrammatic). x 350.
- Fig. 6 - Sclereids of various sizes and shapes. x 356.
- Fig. 7 - Epidermis in surface view. x 330.
- Fig. 8 - Starch grains. x 330

X-X-X-X-X-X-X

Cot. - cotyledon; Cu. - cuticle; Ep. - epidermis;
Fr. - fruit; Hyp. - hypodermis; Ob.T. - obliterated
tissue; Par. - parenchyma; Perp. - pericarp;
Scl₁ & Scl₂ - sclereids; Sd. - seed; V.B. - Vascular
bundle.

Capparis moonii Wight

measures 1.7 cm. in diameter. It contains a large embryo having folded cotyledons (Plate XVII, 3). Fracture of the pericarp is granular; colour is light to dark brown. The central pulp is pinkish red. Taste is slightly astringent and smell is strong and foetid.

H I S T O L O G Y

A thick layer of cuticle protects the pericarp epidermis. Its cells are filled with a brown pigment (Plate XVII, 4 & 7). The hypodermis consists of 12-18 layers of tangentially elongated parenchymatous cells (Plate XVII 4). Large sclereid groups are dispersed at intervals. These groups unite to form a small strip or get separated by radially elongated parenchymatous cells (Plate XVII, 4).

The subhypodermal parenchyma may also include sclereid groups. The Parenchyma cells around the sclereids are isodiametric. This tissue also shows a few vascular bundles cut transversely, longitudinally or obliquely (Plate XVII,4). The phloem of the vascular bundle and the surrounding parenchyma usually get crushed. This part appears yellow or yellow-grey in the dry fruit (Plate XVII, 5). Groups of subhypodermal sclereids are bigger and more numerous towards the outer side while they are smaller and fewer towards the inner side (Plate XVII,5).

Capparis moonii Wight

The crustaceous testa consists of 4 - 6 layers of sclereids only. Tegmen is thin and papery. Cotyledons contain a fixed oil which gives coloration with sudan red.

Flourescent analysis :

When examined under ultraviolet light, the whole fruit externally was yellow; the broken pericarp, deep red and the central pulp, brownish pink.

Microchemical tests :

Starch : The section of the pericarp shows equitable distribution of starch grains when treated with iodine water.

Alkaloid : Powdered drug was extracted with ammoniacal chloroform and the extract evaporated. The residue was dissolved in dilute HCl. The resultant solution was tested with Meyer's, Dragendorff's, Hager's, Marme's and tannic acid solutions. All the above tests were negative, indicating absence of alkaloids.

Powdered drug :

Powdered drug shows presence of the following structures under the microscope :

Capparis moonii Wight

(1) Sclereids of various shapes and sizes. They show numerous pits on their thick and lignified cell walls. They measure 32-64-100-142-160 μ in diameter (Plate XVII, 6).

(2) Epidermal cells in surface view are penta-or hexagonal; the cells are filled with a brown pigment (Plate XVII, 7).

(3) Simple starch grains are also present. The shape is oval, spherical or obovoid with a concentric or eccentric hilum. They generally measure 19-38 μ in diameter. A few grains are 60 μ or 72 μ in diameter (Plate XVII, 8).

(4) Spiral, annular and reticulate vessels are present. They measure 92-114-174-256-308 μ in length and 16-24-28 μ in width.

Botanical identity of the 'Konkan' variety of Capparis moonii :

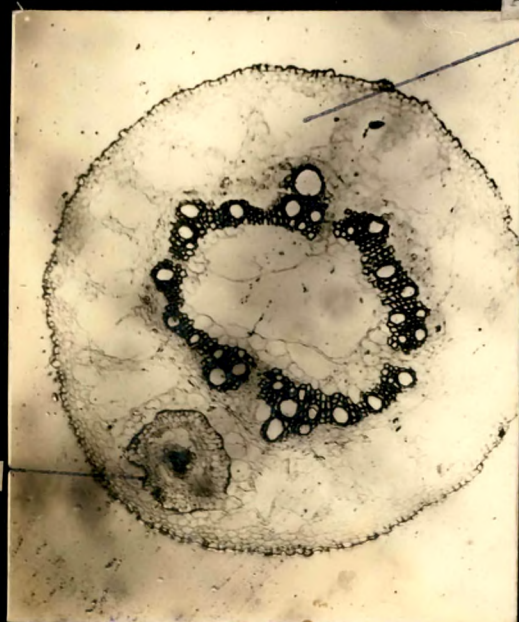
Fruit of the supposed 'Konkan' variety of C. moonii were obtained from authentic sources and studied morphologically. The diameter of the fruit of the 'Konkan' variety (2.5 - 4 cm.) is less than that of the fruit of the 'Khandala' variety studied above.

The description of Sheth and Murty (1959) leads to the suspicion that the 'Konkan' variety may not belong to C. moonii Wight. Investigations of entire



XVIII, 1

A.Sp.



Rt.

XVIII, 2



P.Xy.

XVIII, 3

P L A T E - XVIII

(Fig. 1 : Herbarium specimen of Capparis horrida Linn.) :

(Figs. 2 & 3 : Photomicrographs of Merremia emarginata
Hallier)

Fig. 1 - Herbarium specimen of Capparis horrida Linn.

Fig. 2 - T.s. rhizome; note transversely cut
lateral root. x 57.

Fig. 3 - T.s. old root; note pentarch stele and
large air spaces in cortex. x 130.

x-x-x-x-x-x-x-x-x

A.Sp. - air space;

P. Xy. - primary xylem;

lt. - root.

Capparis moonii Wight

authentic plants, herbarium sheets and fruits of both the varieties confirm that the fruit of the 'Konkan' variety are obtained from C. horrida Linn. and not from C. moonii Wight.

Description of Capparis horrida Linn. (Plate XVIII):

It is a large climbing shrub. Young parts are clothed with reddish-brown hairs. Leaves are elliptic-oblong, obtuse, acute or retuse and narrowed at the base. They measure 2.5-7.5 x 2-5 cm. Each one is glabrous and has a shining upper surface. Petiole is 0.75 cm. long and stipular spines are hooked. Flowers are solitary or are arranged in groups of two or three, one above the other in a supra-axillary position. Sepals are concave and hairy outside. Petals are twice as long as sepals and are densely vilous. Gynophore is 3 cm. long. Ovary is ellipsoid and apiculate. Fruit is obovoid, 3 cm. in diameter and is born on a greatly thickened and obtusely four angled stalk. Colour of the fruit is red-brown. It possesses many seeds.

The morphological characters described by Sheth and Murty (1959) for the two varieties show wide differences as shown below:-

Capparis moonii Wight

TABLE - 24

'Khandala' variety	'Konkan' variety
Sub-globose fruit; 5-10 cm. in diameter.	Obovoid in shape; 2.5 - 4 cm. in diameter.
Axis (fruit) is straight and woody.	Axis curved and bent
Leaves elliptic-oblong in shape; dark green; measures 7.5 - 10 cm. x 3.7-5 cm.	Leaves less broad and light coloured; measures 2.5-7.5 cm. x 2-5 cm; very thin.
Thorn short, hooked and less curved	Thorns longer, more recurved and its base orange coloured.
Internodes are long and stem erect	Internodes are shorter, leaves appear crowded; branches not rigid

It may be concluded that the morphology of Capparis moonii Wight and C. horrida Linn. tally with the descriptions given by Sheth and Murty (1959) for the 'Khandala' and the 'Konkan' varieties of C. moonii respectively.



XVIII, 1

L. M. COLLEGE OF PHARMACY
AHMEDABAD
Name: *Capparis indica*
Family: CAPPARIDACEAE
Locality:
Collected by:
Date of Collection:

A. Sp.



Rt.

XVIII, 2



P. Xy.

XVIII, 3

P L A T E - XVIII

(Fig. 1 : Herbarium specimen of Capparis horrida Linn.) :

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Capparis moonii Wight

S U M M A R Y

Isodiametric sclereids with many pit canals, polygonal epidermal cells in surface view with brown pigment as well as obliterated mass of phloem and surrounding parenchyma are the characteristic features of pericarp. Single and compound starch grains and spiral, annular and reticulate vessels are also present.

Flourescent analysis and microchemical tests have also been made. Alkaloid has been found to be absent.

By a comparison of the authentic samples of the fruits and entire plants of the 'Khandala' and the 'Konkan' varieties of Capparis moonii, it has been shown that the botanical identity of 'Konkan' variety is Capparis horrida Linn. Thus, all properties and chemical constituents of the 'Konkan' variety should be attributed to Capparis horrida Linn.