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PHARMACOGNOSTICAL STUDIES ON MELILOTUS INDICA ALL LEAF

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ABSTRACT: *The present study deals with the pharmacognostic studies on the leaves of Melilotus indica. The drug shows the presence of tannins, Xanthoprotein, starch, cystine, sterols, triterpenoids, reducing sugars, saponins and alkaloids.*

Introduction

The plants *of Melilotus indica* "BanMethi" are used as a discultient and emollient. Externally is use as a fomentation, poultice or plaster for swellings. The seeds are useful in bowel complaints and infantile diarrhoea (Chopra, Nayar & Chopra, 1956). As a complete pharmacognosy has not so far been reported, an attempt has been initiated.

Material and Methods

Plants *of Melilotus indica* were collected from University Campus. Macro and Microscopical characters were observed. Quantitative study of the middle portion of of the leave, viz. palisade ratio, vein-islet numbers, vein-termination number and stomatal index was done according to the method described by Wallis (1960). The powder and its behaviour on treatment with different Chemical reagents was studied (Table III). The physical constant values were determined (Table I) and preliminary phytochemical tests were performed according to the method described in I.P. (Anon,(1966) (Table III & IV). Fluorescence characters of the powdered drug and alcoholic extract of the powder were observed under uv light (Table II) following the method given by Chase and Pratt (1949) and Kokoski et. Al. (1958).

Observations

Macroscopical Characters: The leaves of *Melilotus indica* are 3- Foliolate; petioles 2-4 cm long; stipules 6mm long, lancedate, 3-nerved, very acute, adnate to the petiole, leaftets 12-15 x7-10mm, coarsely toothed, oblanceolate, truncate or retuse at apex, glabrous or with a few scattered hairs on both sides; petiolules of terminal leaf-lets 1 mm long, of lateral leaflets smaller.

Microscopical Characters:

Petiole: It contains an are of three vascular bundles, Hypodermal region is collenchymatous and the remaining ground tissue is parenchymatious (Fig. A).

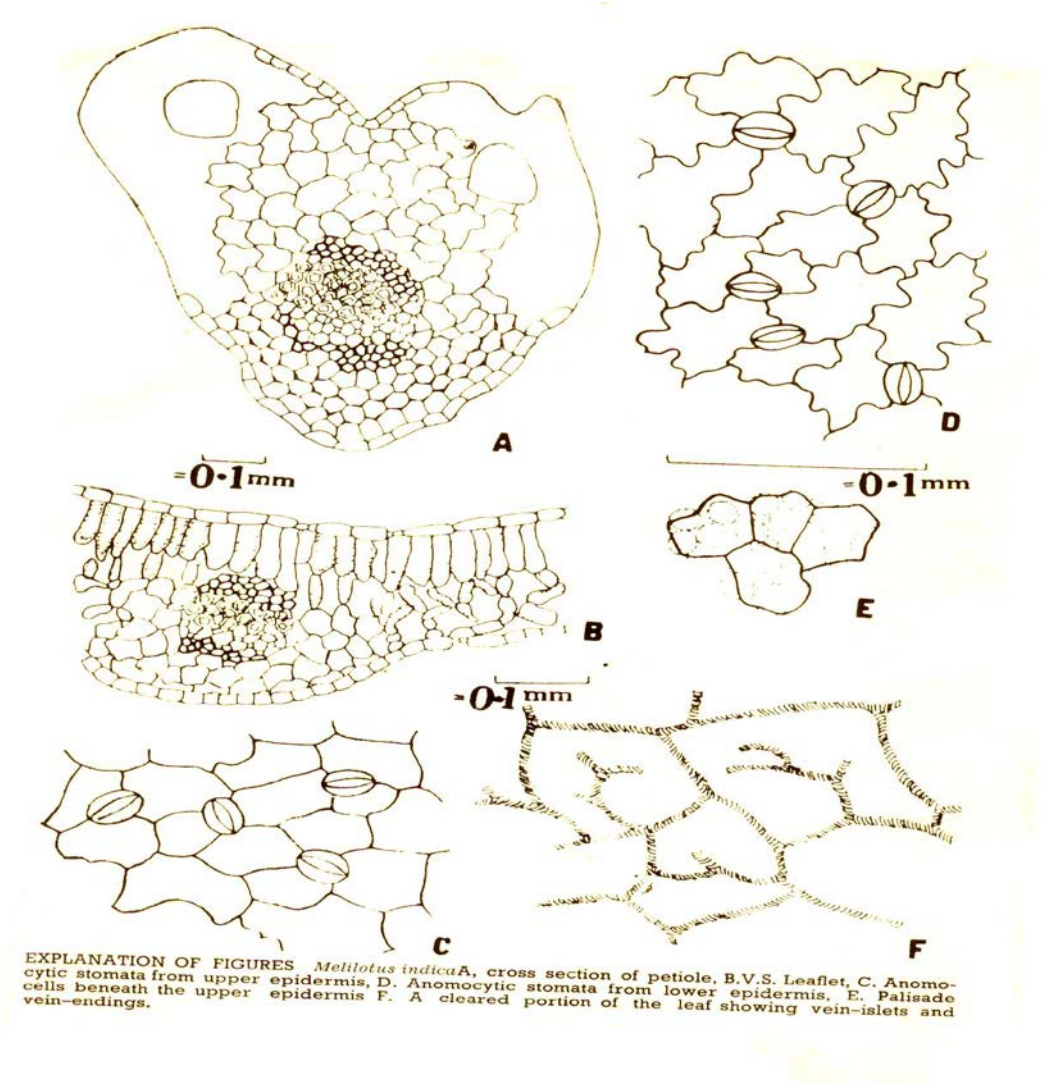
Leaf: The mid rib contains a single vascular bundle mesophyll is differentiated into palisade and spongy parenchyma. Palisade

layer is continuous in the midrib region (Fig B).

Epidermal Cells are polygonal with straight anticlinal walls on upper surface (Fig. C.) and wit arched anticlinal walls on lower surface (Fig. D). Leaves are amphistomatic. Mature stomata are anomocytic (Fig. C.D). Palisade cells are rounded with intercellular spaces (Fig E). The veinislets are pentangular with branched vein endings (Fig. F).

Quantitative Study:

The palisade ratio, stomatal index, vein-islets and vein-termination numbers of middle portions of nature leaf were determined.



EXPLANATION OF FIGURES *Melilotus indica* A, cross section of petiole, B.V.S. Leaflet, C. Anomocytic stomata from upper epidermis, D. Anomocytic stomata from lower epidermis, E. Palisade cells beneath the upper epidermis F. A cleared portion of the leaf showing vein-islets and vein-endings.

The data recorded are as follows :

Stomatal index – upper	27.04
Lower	32.66
Palisadae ratio	4.69
Vein-islets number	11.36
Vein-termination number	17.98

Powder:

Microscopically it shows fragments of epidermal cells, stomata, palisade cells, straight and single-celled trichomes. Sclerenchyma cells with highly thickened wall, narrow leumen and with pointed tips were also observed. The powder on treatment with different chemical reagents show different reactions and the result are recorded in Table III.

TABLE – I

Physical Constant Values in Percentages

Total ash	-8.480
Water soluble extractive	-79
Acid insoluble ash	-21
Alcohol soluble extractive	-58

TABLE – II

Fluorescence Analysis

S.No	Treatment with different Chemicals	Fluorescence emitted
1	2	3
1.	Colour of the Alcoholic extract in visible light.	Cool green
2.	Colour of the Alcoholic extract in u.v light.	Brown
	Test I	
3.	Colour with one drop of saturated aquous solution of AgNo3(I)	Orange red
4.	Colour with 3 drops of 1.N NaoH+	Black
	Test II	
5.	Colour with 2 drops of . 1 N NaoH	Peppermint green
6.	Colour with 1 drops of 5% $Hgcl_2$	Cool green
7.	Colour with 1 drops of 5% $Hgcl_2$	Dark green
8.		Blackish green

	Colour with 2 drops of 5% $Hgcl_2$	
1.	**From dried foliage part (Powdered Drug)**	
2.	Drug ad such	Yellowish green
3.	Drug + NaoH (1N) in methanol	Peppermint green
4.	Drug treated with 1N NaoH aquous	Olive green
5.	Drug treated with 1N Hcl	Yellowish green
6.	Drug + 50% H_2So_4	Dark brown
	Drug + 50% Hno_3	

TABLE – III

Behaviour of powdered leaf of Melilotus indica on treatment with different chemical reagents

S.No	Treatment	Behaviour	Content Present
1	2	3	4
1.	Powder dissolved in CHcl3 + 1 drop of H2So4 + 1 ml of Acetic anhydride	Gives a blue colour which changes to green	Sterol
2.	Powder boiled in 2% Hcl for 2 hours and filtered. Extract tested with wagner's Mayer's reagents.	Gives thick precipitate	Alkaloids
3.	Powder +5% Iodine Solution	Blackish Brown	Iodine
4.	Powder + 5% Fecl3	Black with greenish tinge	Tannins
5.	Powder + conc. HNO3 + excess of Ammonia.	Reddish orange	Xanthoprotein
6.	Powder + equal Vols. Of 40% KOH + 10% Lead acetate.	Brown	Cystine
7.	Powder + hexane	Greenish Black sticky	Triterpenoids

8.	Powder + benzene	Greenish Black	“
9.	Powder + alcohol	No reaction	-
10	Powder + water	Light brown brittle	Trannin, Red, sugar saponins.

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