PHARMACOGNOSTIC STUDIES OF *BERBERIS LYCIUM* ROYLE, AND ITS IMPORTANCE AS A SOURCE OF RAW MATERIAL FOR THE MANUFACTURE OF BERBERINE IN PAKISTAN

by

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Introduction. *Berberis lycium Royle locally known as "rasaunt" belongs to the family Berberidaceae. It is an erect, small rigid spiny shrub, about* 1-3.5 *metres in height with rough and light greyish bark, yellowish orange branched tap roots and violet berries. The plants are distributed throughout the hilly areas of Pakistan, from Baluchistan to Dir, Chitral, Gilgit, Hazara, Murree and Azad Kashmir at an elevation of* 900-3,000 *metres* (4).

"Rasaunt" extracted from the roots of this plant is a highly esteemed drug in the Ayurvedic and Greeco-Arab systems of medicine and is a useful household remedy in acute conjunctivities and in chronic opthalamia (1). *Washing of unhealthy ulcers and sores with "rasaunt" decoction is an ancient practice in India and Pakistan* (2). *Recently there has been a large demand of Berberis roots or its intermediate products from Japan for the manufacture of berberine. This paper reports pharmacognostic characteristics of the plant.*

Material and method. *Berberis lycium* roots were collected from Sharan (Kaghan) from an altitude of 2,520 metres. The material was cleaned and dried in shade. Samples were preserved in the fixative Formalin aceto-alcohol solution for histological studies. Physical characters of the drug, such as shape, colour, size, taste, smell and fracture were recorded. Powdered drug was prepared by grinding the roots and sieving the material through No. 22 mesh. For anatomical details sections were cut by sliding microtome and permanent slides were made by applying the method of Johnson (3).

Results. *Macroscopic Characters.* The drug consists of dried yellowish brown roots with rootlets. The dried roots are sold in the market in variable sizes from 10-20 cm in length and 1-4 cm in diameter. The roots tend to be straight or slightly curved with longitudinally wrinkled furrows. Fracture is hard tough and complete. Scars of rootlets are bulging and scattered haphazardly. The drug emits a slight characteristic odour and has bitter taste.

Microscopic Characters. The transverse section of the root shows that the cork consists of 5-10 layers of enlongated cells covering the outermost surface. Below the cork secondary cortex is present consisting of several layers of polygonal parenchymatous cells. In the secondary cortex groups of tannin and stone cells are scattered. Just below

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the cortex begins secondary phloem consisting of hard and soft bast. In between secondary phloem and secondary xylem there is a zone of 2-3 layered rectangular cambium. A broad zone of secondary xylem is present below the cambium consisting of xylem vessels and wood parenchyma. Vascular tissues are separated by 2-3 celled wide medullary rays.

Powdered Drug. Powdered drug of root is yellowish brown in colour having bitter taste and slight odour. Microscopic study of the powdered drug reveals that it contains fragments of rectangular cork cells; cortical parenchymatous cells and fibres. Fragments of spiral, pitted and reticulate vessels are present in the powder drug. Starch is in single or compound grains of two components varying in size from 2-20 microns in diameter.

Constituents. The chief alkaloids of root are umbellatine and berberine. Besides that berbamine, starch grains and tannin are also present in small quantity.

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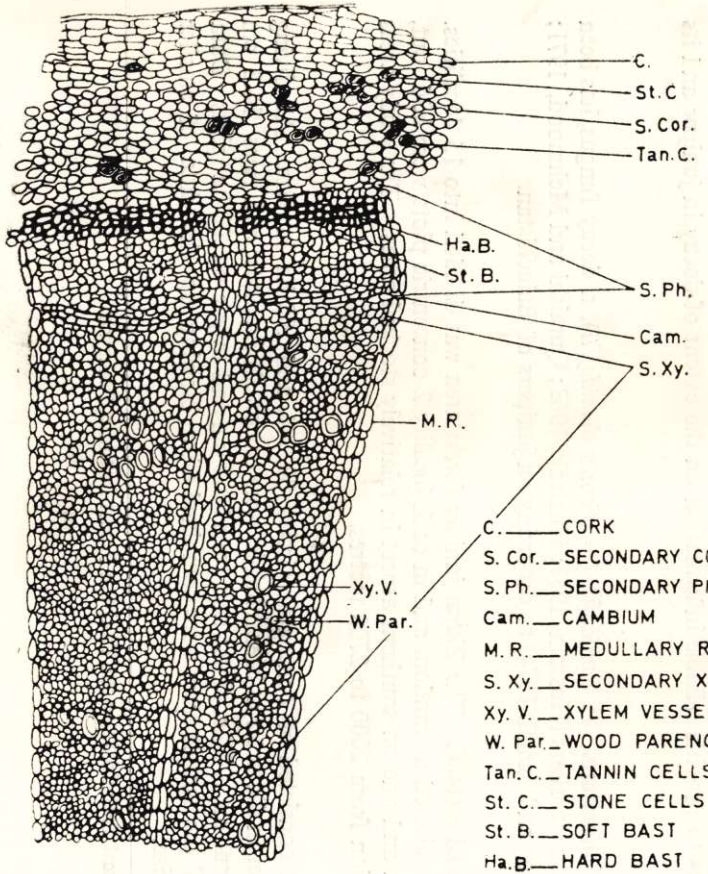
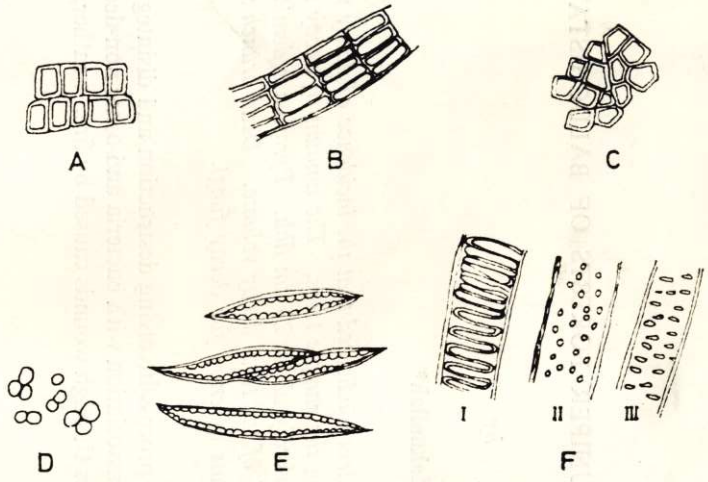


BERBERIS LYCIUM ROOT X 100

TRANSVERSE SECTION OF BERBERIS LYCIUM ROOT



POWDERED DRUG OF BERBERIS LYCIUM

ROOT X 200

A. CORK CELLS IN SURFACE VIEW.

B. CORK CELLS IN TRANSVERSE VIEW.

C. CORTICAL PARENCHYMA.

D. STARCH GRAINS.

E. FIBERS.

F. I, SPIRAL VESSEL
II, PITTED VESSEL.
III, RETICULATE VESSEL.