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Research Article

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Macroscopic and microscopic analysis of stems and seeds of plants *Psoralea drupacea*

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ABSTRACT

In this paper, the morpho-anatomical and diagnostic features of the Psoraleae drupaceae stem and seeds are studied. Psoraleadrupacea Bunge is the plant of great interest among the large variety of wild medicinal plants, due to the wide spread in the Republic of Kazakhstan and the limited information in pharmacognosy study.

INTRODUCTION

*Psoraleae drupaceae*is endemic to Central Asian species, growing on the territory of the Republic of Kazakhstan. Natural bushes on an industrial scale are mainly in the south of the Republic (Moiynkum, Turkestan, Arys, the Syr Darya River floodplain, Kaplambek) and is estimated to 700-860tons. Grows mainly on dry finely earthy slopes, hills among ephemeral vegetation, sometimes in rained crops.

The purpose of the study is to find and introduce to the scientific revolution of information about the anatomy of the stem and fruit of a special type of Psoraleae is Central Asian-Iranian species grown in the south of Kazakhstan.

EXPERIMENTAL SECTION

The objects of investigation are the different morphological parts of the plant: the stems and fruits Psoralea drupacea Bunge.

The study by optical microscopy was performed to determine the botanical accessories and features anatomical structure of the stem and fruit Central Asian-Iranian species of Psoraleae. Here we used optical microscopes. Light in the inspection was artificial, reflected. Increase - from 18 to 40 fold. In such circumstances, usually clearly identified anatomical features of plants

To investigate the morphological and anatomical structure of the stem and fruit promising medical plant *Psoraleae drupaceae* in summer 2014 was harvested raw materials in the flowering stage in the South Kazakhstan region. Collected samples were dried and decorated in the herbarium.

Anatomical studies were carried out in accordance with conventional by R. P. Barykina's methodics[1]. For preparing drugs used the dried raw material. Pieces of leaves, petals refluxed in chloral hydrate solution and water (1: 1) for 5-10 minutes prior to illumination, then the subjects were placed on a microscope slide in a drop of glycerol and separated by needle in two parts. The object covered with a cover glass, examined with a microscope MC-300. Surface preparations and cross sections of the anatomical plants were prepared manually using a freezing microtome apparatus TOC-2. The thickness of the anatomical sections was 10-15 microns. Micrographs were recorded on a microscope MS-300 camera (magnification x 180, 720).

RESULTS AND DISCUSSION

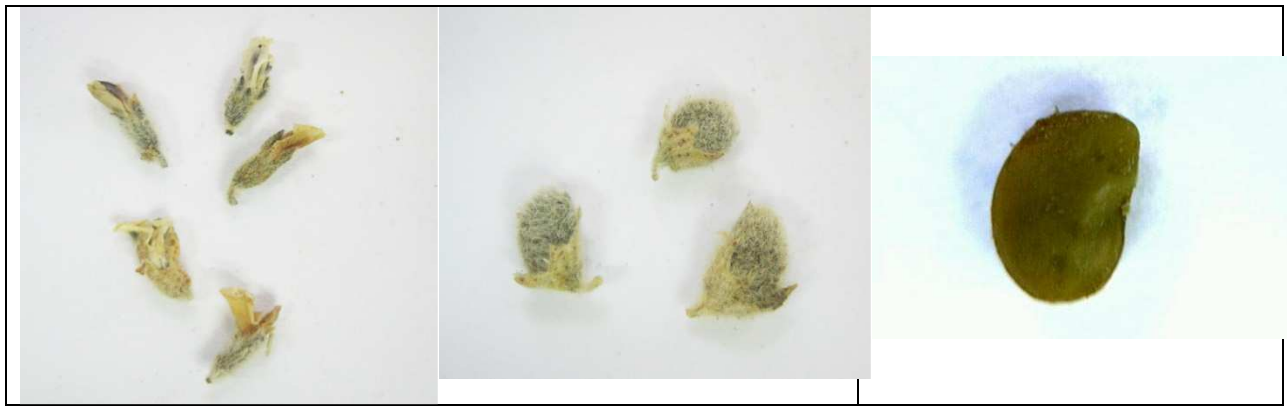
Macroscopy. Psoraleae drupaceae Bunge a representative of Fabaceae family. Central Asian endemic species. It grows mainly in the piedmont plains, foothills and low mountains, where sometimes forms almost pure thickets. It often occurs as a weed in the non-irrigated fields.

Perennial, 60-80 cm in height (pic 1). Stems erect, branched, whitish hairs and brown glands. The stems are used for fiber used to make strong, but brittle and coarse rope. In all parts of the plant are essential oils and adhesive resins, so the plant in its raw form is not eaten, despite its high nutritional value.

Picture 1- Stem of the plant Psoralea drupacea (1- essential oil glands)

The flowers are small, 4-7 mm long, on short pedicels, calyx campanulate, 3-5 mm long, densely pubescent with long hairs and glands point, its teeth shorter than tube, lanceolate, the lower a long, two short side, the top two partially fused with each other; corolla whitish-purple flag shortly ovoid, about 7 mm long, boat on the top with purple spot, a little shorter than the wings (Pic 2) .Fruit - pubescent like nutlet seeded bean, 5-6 mm long, 2.5-3.5 mm width, grayish-to mentose pubescence, 1-seeded, with adherent to the shell bean small seeds (Pic 2).

Psoralea drupacea has extended the period of flowering and fruit ripening - June-October. The first collection of fruits Psoralea drupacea conducted from late June to early August. Re-blank at the same places available in September. In manual assembly must be taken to avoid skin burns, and wear gloves. Dried fruits immediately after collecting the sun, spilling open asphalt places or on the canvas. After drying, lead to the default status, removing impurities trapped in the raw materials.



Flowers **Fruits** **Seeds**

Picture 2 -The reproductive organs Psoralea drupacea

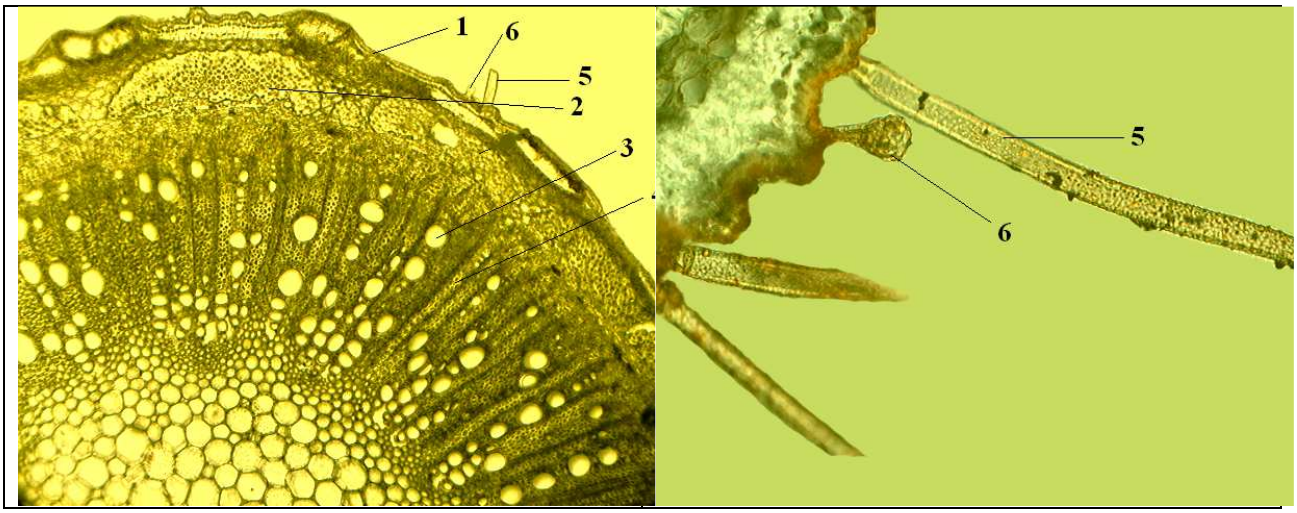
Microscopy.

The epidermis of young branches is strongly thickened, sclerotized outer cell walls, strong and pubescent on it such as a piece of glands, as in the leaf. Under the epidermis there are large groups of cells collenchyma. Cortical

parenchyma cells partially wrinkled. Tissue primary cortex and core heterogeneous. In the primary crust beneath the epidermis also found pitch receptacle (Pic. 3).

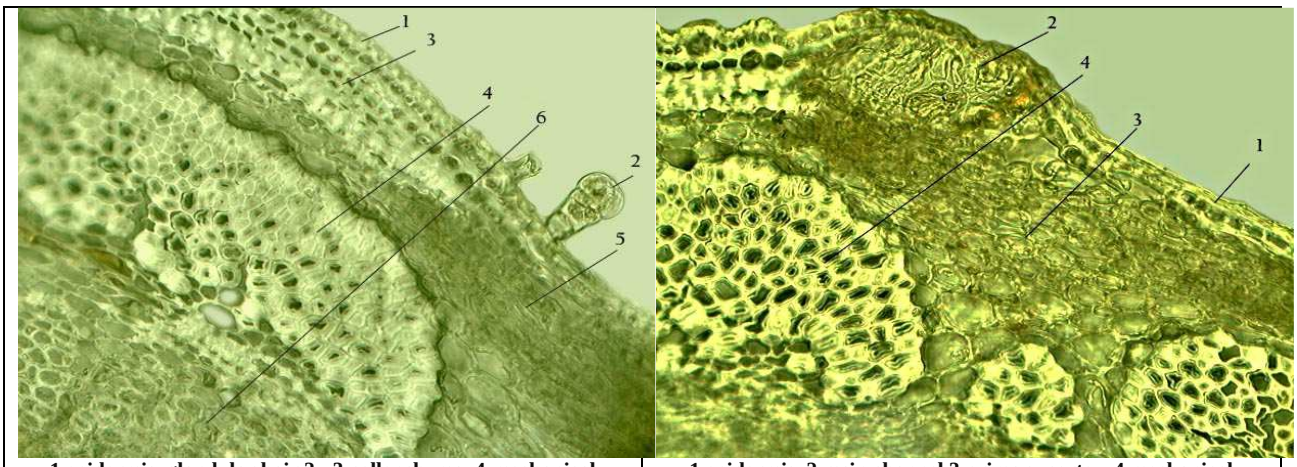
In the peripheral zone of the central cylinder are large bands of sclerenchyma. Under it there are several rows of phloem. Between phloem cells found receptacle (Pic. 4).

Ringed wood, consists of segments of blood vessels, fibrous elements, wood and wood beam parenhima. The main mass of thick-walled fibers libriform, 3-5 sided in cross-section, with oval and three-edged holes. Vessel lumen oval in cross-section, arranged singly and in groups of 2-3. Rays narrow, straight or curved, single row, end-rays are short (Pic 3, 5).



A (x180) **B (x720)**

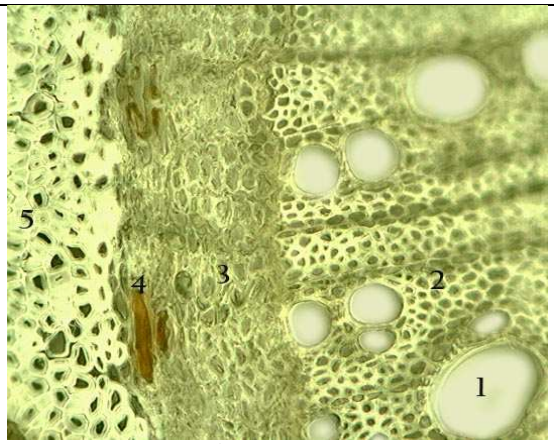
1 epidermis, 2 sclerenchyma, 3 –ksilema, 4- vascular fiber, 5 simple hairs, 6-glandular hairs Picture 3 Microscopy of the stem P.drupacea



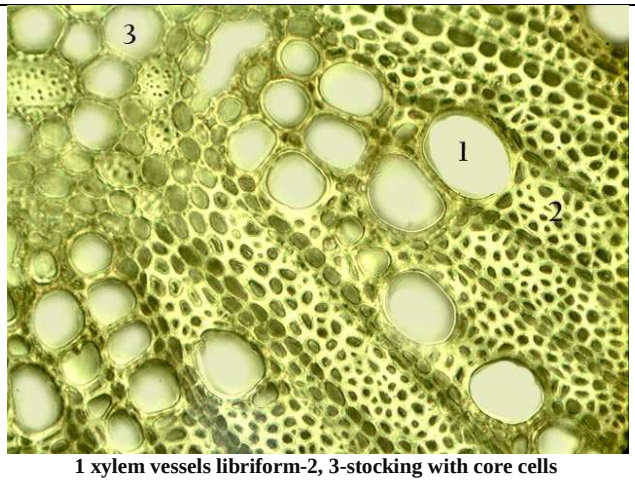
1 epidermis, glandular hair 2-, 3-collenchyma, 4-mechanical bundle sheath, 5 primary cortex,6 phloem

1 epidermis, 2 resin channel 3 primary cortex, 4 mechanical bundle sheath

Picture 4 The peripheral part of the stem P.drupacea (x720)



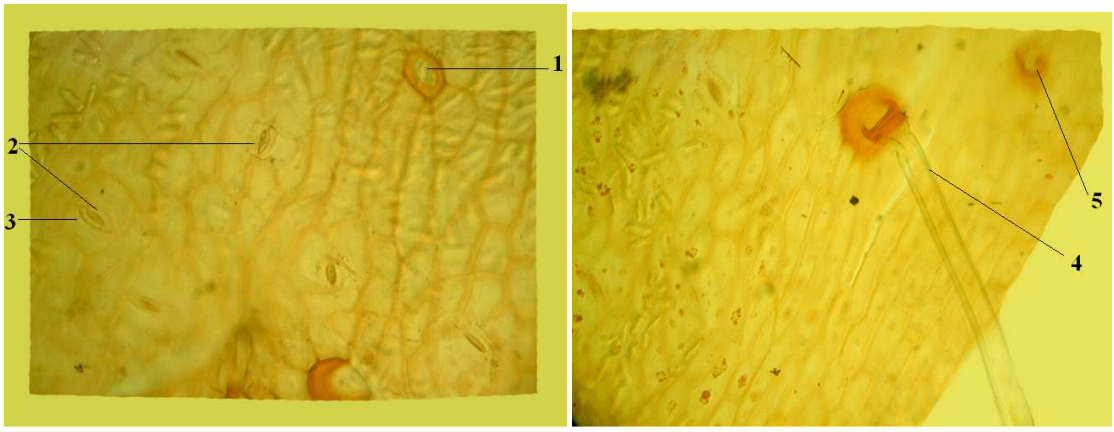
1 xylem vessels libriform 2, 3 phloem-4-skhizogennye receptacle 5-slerenhima Vascularbundle



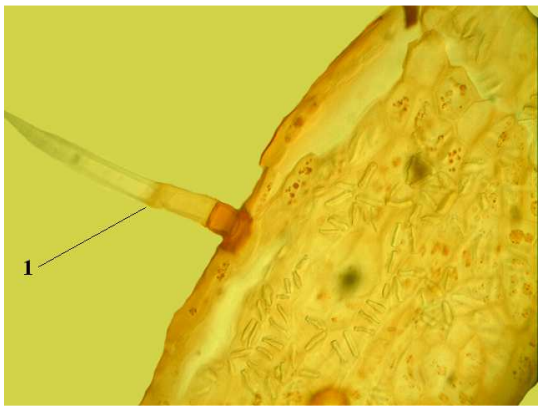
1 xylem vessels libriform-2, 3-stocking with core cells Thecoreportion

Picture 5 Microscopy stem P. drupacea (x 720)

Epidermal cells with thin beaded walls. Stomata are small, oval with conspicuous stomatal slit surrounded by 2-4 cells paracytic type. In epidermal stem cells has inclusions in the form of sand and crystalline individual crystals. The epidermis is densely hairy (simple, glandular) (pic 6,7)



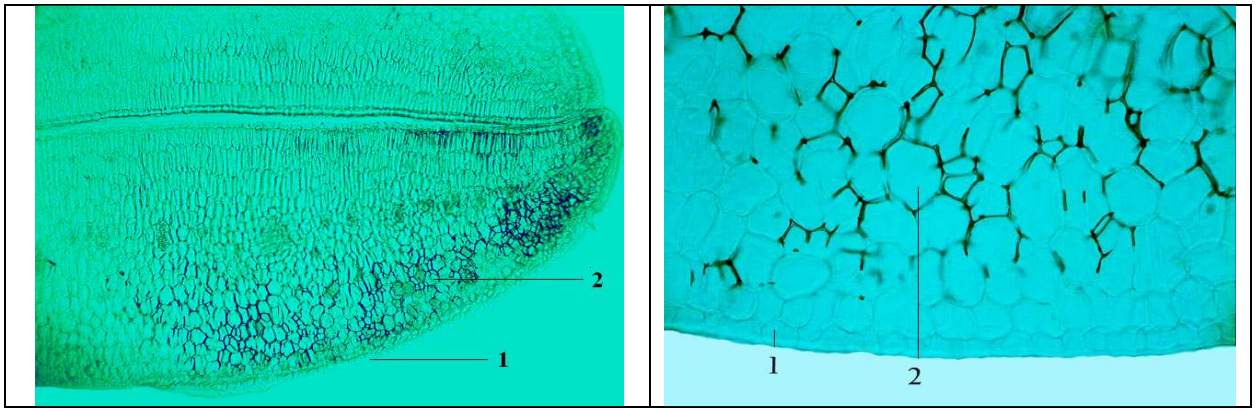
1-base glandular hairs,2 stomata , 3-about the stomatal cells 4 simple hairs, 5-base simple hairs
Picture 6 The epidermis of young stem P. drupacea (h720)



Picture 7 stem trichomes P. drupacea (x 720)

Microscopy seed. On cross-section single-row seed visible epidermis with cuticle and simple 2-5-cell warty hairs. Less common capitate hairs, consisting of 2-4 feet and 4-3 cell-cell head. Beneath the epidermis in the pericarp are major secretory containers. Epidermis has unevenly thickened seed shell.

At high magnification (h720) visible details of the structure of the seed: the cells of the outer epidermal rounded or slightly traction, cells of the inner epidermis - tangenalno greatly elongated, thin-walled. Thin-walled parenchyma cells main canal located palisade. Cotyledon consists of elongated, slightly thickened cells, endosperm - from the rounded cells - with irregularly polygonal thickened shells.



A (x180) **B (x720)**

1- epidermis, 2 - endosperm
Picture 9 - Microscopy seed P. Drupacea

The main diagnostic features of the preparation of the stem cross Psoralea drupacea are:
- Strongly thickened epidermis, the outer cell walls kutinizirovany;
- The presence of numerous simple and glandular hairs;
- Extensive development of mechanical tissue under the epidermis;
- Presence in the primary cortex Smolyan receptacles;
- Wood ringed with heavily razvitymlibriformom.
- Heart perimedullary cells and from the storage area composed of cells.

The diagnostic features of the surface preparation of the stem Psoraleae drupaceae are:
- Epidermal cells with thin beaded walls;
- Small stomata, paracytic type;
- The presence of cells of the epidermis in the form of crystalline inclusions of sand and single crystals.

The diagnostic features of seed are:
- Outer epidermis cells are round or slightly elongated, thickened outer wall;
-semyadolya consists of elongated, slightly thickened cells;
- Endosperm consists of rounded-polygonal cells with unevenly thickened walls.
Together, these features indicates that the test substance is a mixture of plant parts Psoraleaedrupaceae.

CONCLUSION

Thus, we have identified anatomical and diagnostic features of domestic raw materials necessary for its diagnosis inherent Central Asian-Iranian mind grows in southern Kazakhstan.

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