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Morphological-Anatomical Peculiarities of the *Alhagi pseudalhagi* L.

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Abstract: Morphological and anatomical descriptions of the Alhagi pseudalhagi L. have been given in the paper. Under the influence of environmental factors this plant acquired such structural features as the strong development of the central cylinder, strong omission, the presence of numerous and small conduction beams, thick cuticles, small and numerous stomata. These properties are typical for xerophytes.

Keywords: Alhagi pseudalhagi L., xerophytes, xylem, phloem, lysogenic receptacles, parenchyma

Today, the issues of environmental protection, rational use of natural resources and prevention of negative impacts of human activities on the environment are given increased attention [Mammadov, 2007; Butnik et al., 2009].

Azerbaijan has an exceptionally large potential for natural fodder land. These plants are characterized by high nutritional value. An integrated approach to the study of these plants will make it possible to comprehensively understand their nature and to develop ways of their rational use on the basis of known regularities [Nabiyeva et al., 2011].

The main goal of the research have been study morphological, anatomical characteristics and morphogenesis of *Alhagi pseudalhagi* L. species spread on winter pastures of Azerbaijan.

Materials and methods

Objects of the research – the camel thorn is the highest quality forage plant, widely distributed in the winter pastures of Azerbaijan.

Samples for anatomical studies have been taken at various morpho-physiological stages of plant development. From this samples also were prepared herbariums, and samples were fixed in 70% alcohol for anatomical studies [Barykina, 2004; Gumbatov et al., 2015; Nukhimovsky, 2002]. Temporary and permanent preparations have been made on the basis of conventional methods. Morphological features of the vegetative organs of the plant were investigated by binocular loupe, and the preparations by the microscopes “Mİ-4100DHD” and “Motic”.

Results and Discussion

The research data will be used in the development of scientific foundations and in carrying out practical measures to increase the productivity of rangelands (pastures). The research materials can be used in the classification of semi-desert vegetation of Azerbaijan.

Morphological and anatomical analysis of the *Alhagi pseudalhagi* L.

The camel's thorn is perennial, by 30-70sm tall. Stem is branchy; the branches are glabrous, green, thin, extending upward at an acute angle. Lower spines strong, short, by 1-2sm long, others thin, slightly elastic, by the end of summer stronger and longer, by 2-3sm long, obliquely upward. Leaves are oblong - lanceolate or oval, by 5-28mm long, and by 1-8 mm wide, obtuse, usually fading at the time of fruiting, glabrous or absent-mindedly dropped. Flowers on the spine by 3-8. Calyx campanulate, glabrous, with widely triangular, unobtrusive teeth. Corolla pink; the flag is longer than the boat, bent backwards; the wings are slightly shorter than the boat. Beans are curved or straight, glabrous, crispy, with 1-10 seeds. Blooms from May to late autumn, the fruits begin to ripen from July. The inflorescence has a complex brush. Root system extending to the depth of 5-6, sometimes 14 meters is assisted to camel thorn in anhydrous conditions [Flora of Azerbaijan, 1961]. The grass contains Flavonoids, saponins, sugars, tannins, vitamins C, K and B groups, carotene, ursolic acid, traces of alkaloids, essential oil, colorants, resins are contains in grass.

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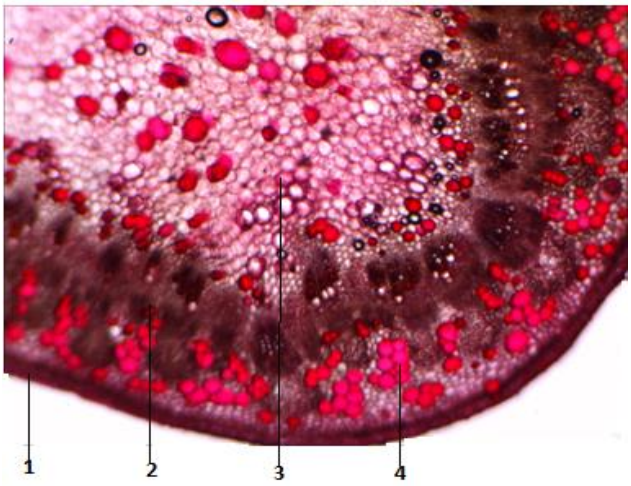

Figure 1. Anatomic structure of the stem
1. Epidermis; 2. Conductive bundle; 3. Core; 4. Lysogenic container

Stem. The stem is rounded on the transverse section. Young perennial stems are smooth and light red, the parenchyma core is clearly distinguished, collateral conduction beams located along the ring, essential oil reservoirs of schizogenic character and periderm, consisting from thin-walled parenchymal cells. Numbers of conducting beams are 30-32. Cambial ring is formed simultaneously with the beginning of the growth of the stem, the cells of which, dividing, lay the elements of the secondary phloem and xylem. The periderm consists from 2-3 layers of rounded shape cells. A strong accumulation of essential oil is observed in the cells of the stem [Tutayuk, 1980].

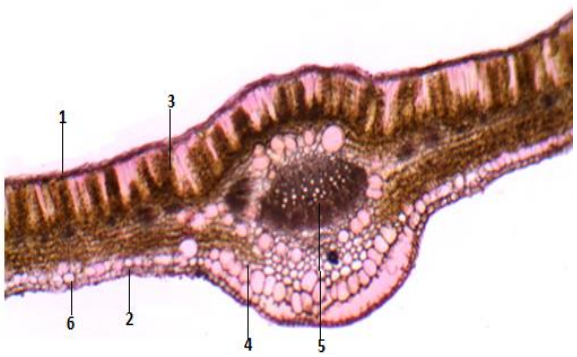

Figure 2. Anatomical structure of the leaf
1. Upper epidermis; 2. The lower epidermis; 3. Columnar parenchyma; 4. Spongy parenchyma; 5. Median beam; 6. The stomata

Leaf. A leaf has dorsoventral structure. The epidermis is single-rowed. Epidermal cells are 3-4-angular on the paradermal sections, with slightly sinuous walls. Stomach - anemocytous, located on the adaxal side and slightly submerged. Mesophyll from the upper side by 2-3 rows of narrow palisade cells, the spongy parenchyma occupies the entire mesophyll of the leaf. On the lower side it is more friable. Under the median bundle, a small protrusion is formed due to the development of the sclerenchyma lining. The epidermal cells of the lower side are larger than the upper ones. The lateral bundles on the transverse section are small, few. The vessels are located to the abaxal side in the medial bundle [Vasilevskaya, 1954].

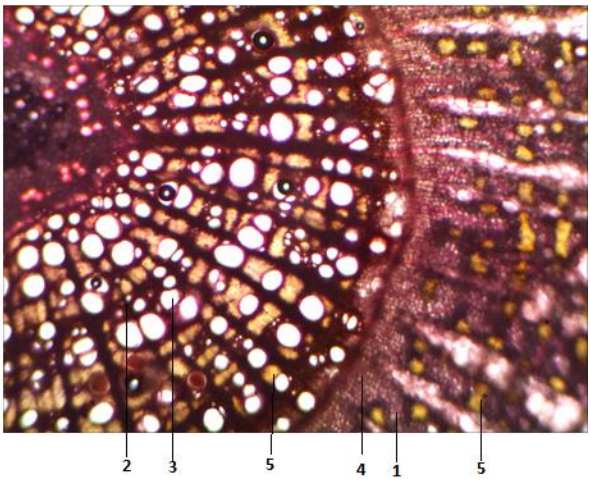

Figure 3. Anatomical structure of the root
1. Coronary parenchyma; 2. The central cylinder; 3. Xylem; 4. Phloem; 5. Excretory containers

Root. The root is covered by externally with thin periderms. The parenchyma is highly developed. Endoderm clearly stands out. Pericycles cells are small. The location of the primary conducting elements is diarchic. Cambium functions in the central cylinder, secondary xylem and secondary phloem formed in small groups. The terminal and diffuse parenchyma are more developed in the root system in contrast to the base of the stem [Gumbatov, 2002].

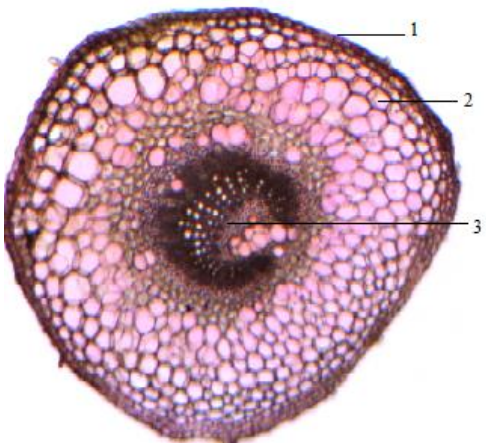

Figure 4. Anatomical structure of petiole
1. Epidermis; 2. Parenchyma; 3. Conductive beam

Petiole. The petiole by round-shaped globule, externally covered with a thick-walled single-layered epidermis. Medial conducting beam of arc-shaped shape is in the center. Elements of the beam are arranged in a fan-shaped manner. Vessels are plentiful, especially in the crust with thickened walls. Dilation of radial rays is observed with age.

Conclusions

Thus, the structural elements of *A. pseudalhagi* are located in the strong xerophysis type. Xerophytes - plants are able in the process of individual development to adapt to the effects of drought, to perform in these conditions normal growth and reproduction due to the variety of adaptations that have arisen in the process of evolution under the influence of conditions of existence. Large variety of structures arose, a reconstruction of physiological, biochemical processes and energy balance took place as a result of the process of xerophilization.

Data about anatomical structure of the camel's thorn will help to identify the diversity of anatomical structures of plants in winter pastures by the stages of their ontogeny, the compilation of their complete biological character, the determination of the adaptive and evolutionary level of the representatives of different families.

References

1. Barykina R.P. (2004) Reference book on botanical microtechnology. Bases and methods. Moscow, (by russian) p.311
2. Butnik A.A., Ashurmetov O.A., Nigmatova R.N., Begbaeva G.F. (2009) Ecological anatomy of desert plants of Central Asia. Tashkent.vol.3, (by russian) p.149
3. Gumbatov Z.I., Aliev B.M., Alieva I.F. (2015) Methods of teaching and research on botany. Baku. (by russian) p.158
4. Gumbatov Z.I. (2002) Morphology and anatomy of plants. Ganja. (by russian) p.117
5. Nabiyeva F.Kh., İbadullayeva S.J., Ibrahimova A.Sh. (2011) Fodder resources of winter pastures // Agrarian science. ISSN 0869-8155, Moscow, pp.10-12 (by rus.)
6. Mammadov G.Sh. (2007) Social, economic and ecological basis of effective use of land resources of Azerbaijan, Baku, Public House "Elm", 854p.(by azerb.)
7. Flora of Azerbaijan (1961) Volume 5 Baku. (by russian) p.345
8. Nukhimovsky E.L. (2002) Fundamentals of biomorphology of seed plants. Moscow. P.858
9. Tutayuk V.Kh. (1980) Anatomy and morphology of plants. Moscow. (by russian) p.316
10. Vasilevskaya V.K. (1954) Forming a leaf of drought-resistant plants. Ashgabat. (by russian) p.183