IJSRM
INTERNATIONAL JOURNAL OF SCIENCE AND RESEARCH METHODOLOGY
An Official Publication of Human Journals

Human Journals
Research Article
April 2018 Vol.:9, Issue:2

Morphological - Anatomical Analysis of *Phleum paniculatum* Huds

IJSRM
INTERNATIONAL JOURNAL OF SCIENCE AND RESEARCH METHODOLOGY
An Official Publication of Human Journals

[1*]Sevda Tahirli, [2]İlahaAliyeva

[1]Baku State University

[2]Azerbaijan State Agrarian University

Submission: 22 March 2018
Accepted: 29 March 2018
Published: 30 April 2018

Keywords: *Phleum paniculatum*, adaptation, xeromorphic, sclerenchyma, motor cells, chlorenchyma

ABSTRACT

The article considers the characteristic features of vegetative organs of *Phleum paniculatum* Huds., which grows on the territory of the winter pastures of Azerbaijan. The analysis showed that in the general structure of the vegetative organs (leaf, stem, root), along with the signs of generality, structural adaptation to the arid conditions of growth is observed. Based on the results of the study, it was concluded that, as a result of adaptation to drought conditions, this plant showed signs of strong lyophilization.

HUMAN JOURNALS
www.ijsrm.humanjournals.com

INTRODUCTION

Phleum paniculatum is a species of plants from the family of Poaceae, sometimes forming aboveground rooting shoots. It grows well on heavy dry soils. Stems are naked, 10-20 cm high. Leaves are wide linear, from above rough. The tongue is up to 2-3 mm long. The inflorescence is narrow-cylindrical, rigid, up to 6 cm in length and 4 mm in thickness. Spikelet is 1.5-2 mm long and wedge-shaped. Floral scales are filmy, oblong, perianth twice shorter than spikelet. Seedlings - the first leaf is filiform, 20-40 mm long and 0.4 mm wide, thinly coarse at the margin, with three distinct longitudinal veins from below. The tongue is pleated, small, with hairs at the edges [Nukhimovsky, 2002].

Propagated by seeds, and each inflorescence bears from 200 to 300 spikelets on average. The species in the arid zones of Azerbaijan is extremely drought-resistant. In Azerbaijan, on winter pastures, *Phleumpaniculatum* is part of the wormwood-ephemeral associations. Thanks to its endurance to the dry and hot climate, the plant is an important fodder and medicinal plant in the winter pastures of Azerbaijan [Nabiyeva et al., 2011, 6].

MATERIALS AND METHODS

Samples for anatomical studies were taken at various morpho-physiological stages of plant development. From the samples taken, herbariums were prepared, and for anatomical studies, the samples were fixed in 70% alcohol [Gumbatov, 2015]. Temporary and permanent preparations were made on the basis of conventional methods. Morphological features of the vegetative organs of the plant were investigated with the help of a binocular loupe, and the manufactured preparations with the help of microscopes Mİ-4100DHD and "Motic". Anatomical drawings were made with the help of a microscope TAC-3.0C. The anatomical terminology of various authors was used.

RESULTS AND DISCUSSION

Comparative anatomical and morphological features of vegetative organs in different morphological types of grass are revealed as systematic signs of various ecological types, as well as the direction of structural adaptation to arid conditions.

The leaf on both sides is covered with the same epidermis. On the surface of the epidermis is visible thick cuticle, there are hairs. Cuticle layer increases very quickly. Stomata are present

in the upper and lower epidermis. On the lower epidermis, mainly around the veins, the stomata are smaller and they are much less common. The stomata are slightly submerged, which is an indicator of xerophytic properties. Cells of the parenchyma are large and well developed. The mesophyll is of a homogeneous type, filled with large and numerous chloroplasts.

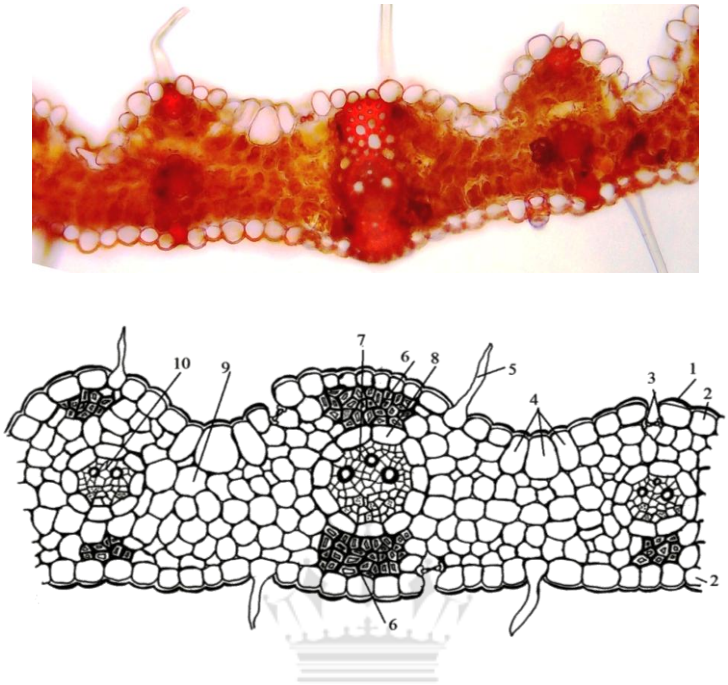

Figure 1. Anatomical structure of the leaf

1. Cuticle; 2. Upper and lower epidermis; 3. Stomata 4; Motor cells 5. Hair; 6. Sclerenchyma; 7. Big vascular bundle; 8. Bundle sheath cells; 9. Chlorenchyma; 10. Small vascular bundle

Correctly located collateral-closed vascular bundles located at a certain distance from each other are immersed in the mesophyll. Large vascular bundles on both sides are attached sclerenchyma to the epidermis, small bundles are surrounded by a spongy parenchyma. The motor cells are often fan-shaped since the median cells are usually the largest and trapezoid in shape. They are much larger than other cells of the epidermis. Cells of the lower (abaxial) epidermis, opposite the motor cells, protrude slightly above its general surface. The stomata are located in regular rows between every two longitudinal cells above the chlorophyll-bearing parenchyma, as well as in the epidermis above the sclerotized and vascular bundles. Sclerenchyma in the leaves is located in the keel [Gumbatov, 2017].

The stem is covered on the outside with a single-layered epidermis with stomata. In the outer part of the epidermis, there is a thick cuticle. The walls of the epidermal cells are usually lignified. Under the epidermis, there is a ring of lignified sclerenchyma fibers. Farther from the layer of sclerenchyma there are about 17 vascular bundles of a closed-collateral type in one row. Single small bundles are located on the periphery between the large bundles. These vascular bundles in the straw play a mechanical role. This arrangement of the vascular bundles gives stability and elasticity to the stem and is a characteristic feature of xerophytes.

The chlorophyllous parenchyma is located along the periphery of the stem, mainly under the stomata in the epidermis. More numerous and multilayered islets of chlorenchyma are observed on transverse sections of the stem. Assimilation cells differ mainly in rounded and oval projections. In the stem cells of the inner layers of the chlorenchyma may also have slightly wavy or spongy-lobate outlines [Aliyeva, 2017; Tutayuk, 1980].

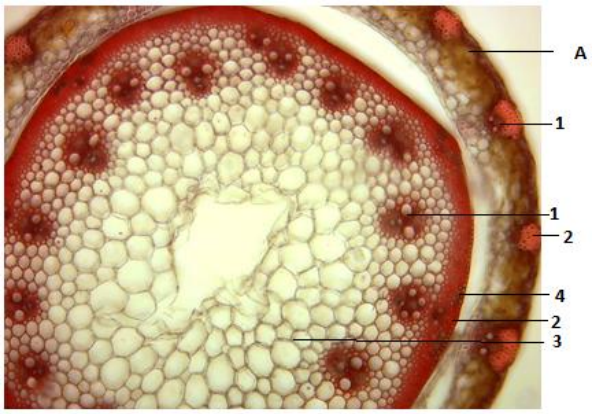

Figure 2. Anatomical structure of the stem

1. Vascular bundle; 2. Sclerenchyma; 3. Parenchyma; 4. Chlorenchyma

On the cross-section, the root of a rounded shape passed into a secondary structure. In the rhizodermis of the root, long and short cells alternate, the latter forming root hairs that extend from their apical end and are located at an acute angle to the rhizodermis surface. Outside, the root is covered with a thin peridermis. Deeper is 4 layers of parenchymal cells of different configurations. Cells of parenchyma are large and closely adjoin to each other. The last layer of the parenchyma consists of more densely located small cells and encircles the endoderm. To the center, there are elements of well-developed xylem and phloem. Two large metaxylem vessels are observed, and small protoxylem vessels are located along the periphery. Next, to

them are observed elements of phloem. The central cylinder is small in size. This is mainly due to the minimum amount of absorption and carrying out of the water.

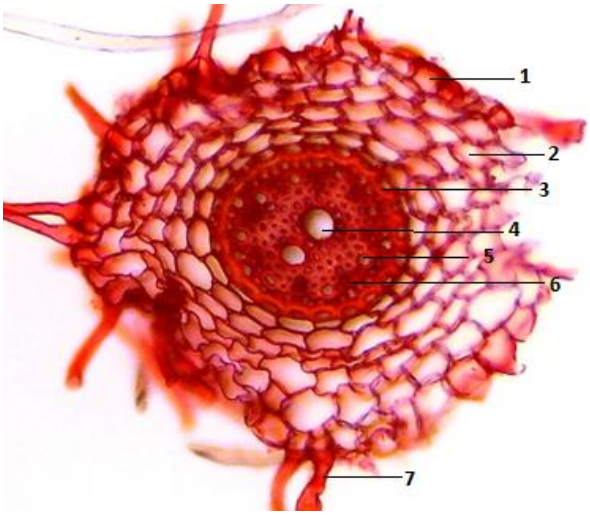

Figure 3. Anatomical structure of the root

1. Rhizodermis 2. Cortex parenchyma; 3. Endodermis 4. Metaxylem vessels; 5. protoxylem vessels6. Phloem 7. Root hairs

CONCLUSION

In the anatomical analysis of vegetative organs of *Phleum paniculatum*, the elements characteristic of xerophytic plants were found: the strong development of the central cylinder, the presence of numerous and small conducting beams, the presence of hairs, the presence of a thick cuticle, and the stomata are located on both sides of the epidermis. In wet places of growth, the number and size of stomata increase twofold.

REFERENCES

1. Aliyeva I.F. Morphological-anatomical analysis of the main fodder plants of the winter pastures of Azerbaijan. Thesis for the degree of Doctor of Philosophy in Biology. 2017
2. Flora of Azerbaijan (1961) Volume 1 Baku. (by Russian)
3. Gumbatov Z.I. (2017) Morphology and anatomy of plants. Baku. (byazerb.) p.450
4. Gumbatov Z.I., Aliev B.M., Alieva I.F. (2015) Methods of teaching and research on botany. Baku. (byazerb.) p.158
5. Nabiyeva F.Kh., İbadullayeva S.J., IbrahimovaA.Sh. (2011) Fodder resources of winter pastures // Agrarian science. ISSN 0869-8155, Moscow, pp.10-12 (by Russian)
6. Nukhimovsky E.L. (2002) Fundamentals of biomorphology of seed plants. Moscow. P.858
7. TutayukV.Kh. (1980) Anatomy and morphology of plants. Moscow. (by Russian) p.316