



The Eco-Anatomical Research of the Type of Ordinary Chamomile (*Matricaria Chamomillae* L.) in Ex and In Situ Conditions.

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KEYWORDS

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ABSTRACT:

Introduction: The article presents the eco-anatomical study of the type of ordinary chamomile in ex and in situ conditions. It has been determined that there are different structural indicators related to environmental conditions of the same species taken from different areas during the research.

Objectives: The materials of the research are samples of the ordinary chamomile (*Matricaria chamomillae* L.) type taken from ex and in situ conditions. The plant has been studied systematically and morpho-anatomically.

Methods: A large number of cuttings prepared from the vegetative organs of the type have been thoroughly analyzed. Both fresh and permanent medicines were prepared from cuttings made by cutting by hand according to the accepted methods in anatomic practice. The preparation of the medicines was carried out according to the generally accepted methods (Barikina and others. 2000-2004).

Results: In result of anatomic studies, it was identified that there are structural varieties in the comparative anatomical analysis of types taken from ex and in situ conditions in all vegetative organs of *Matricaria chamomillae* L. plant. Main parenchyma tissues among types grown in ex condition are placed tighter and mechanical tissues have developed stronger. At the same time, the excretion places of this type are relatively bigger in shape.

Conclusions: In conclusion of microscopic analyzes, it was identified that sender balls in stem and leaves of this type are collateral type, it is surrounded by surrounding cells in one layer from the outside, the root of the plant is in the second structure and covered with peridermic cells. Result identified from comparative anatomic research has scientific and practical significance in systematic and anatomy field.

1. Introduction

An annual herb; a species of the genus (lat. *Matricaria chamomilla*) Chamomile (*Matricaria*) of the *Asteraceae* (*Compositae*) family, a type species of this genus. Taproot, weakly branched, light brown. Stem erect, 15 to 60 cm high, usually branched from the base, less

often simple, ribbed-furrowed, hollow inside, and leafy to the top. Leaves are alternate, sessile, slightly widened at the base, broadly lanceolate or ovate in general outline.

**Table 1. Morphological biometric dimensions of the species *Matricaria chamomillae***

Morphological sign	Dimensions (sm)										Average size (sm)
Trunk height	15	18	21	32	28	46	65	57	36,4	60	42,3
width of the leaf	2	2,1	1,2	4,3	5,6	1,7	1,3	2,1	4,8	2,7	2.4
Flower	2	2,8	3	3,2	2,8	2,3	3,8	3	2,8	2,7	2,6

The leaves are sessile, double-triple-feathered, and arranged alternately on the trunk. The flowers are collected in a group of inflorescences located at the end of the stem with diameter of 5-8mm. the edges of the dressing leaves are curtain-shaped. The serrated flowers on the edges of the basket are white, the middle flowers are tubular, yellow biennial, and their crown has 5 teeth. The basket is conical and empty inside. The fruit is a 3-ribbed seed. The seeds are slightly depressed in the middle; the tip is blunt, up to 1mm long. The plant blooms in June-July and bears fruit in July-August. In folk medicine, flower baskets of the plant (*Flor. Matricaria chamomillae*) are used. The collected baskets are dried in a well-ventilated place and contain up to 0, 5% of essential oil, cytosterol, choline, flavonoids, coumarins, glycosides, isovalerian and other organic acids. 10% xamazulene was found in the essential oil of the plant. *Matricaria chamomillae* is used in gastric spasm, eczema and neurodermatitis, cholecystitis, in the regulation of metabolism, nervous system, insomnia.

The essential oil of chamomile flower, which contains chamazulen, has a disinfectant and anti-inflammatory effect. The flowers contain flavonoids, organic acids, coumarin, terpenes-valuable matrix, matricarin and chamazulin, sesquiterpenes, resin, 0,8% essential oil. In addition, polysaccharides, carotenoids and ascorbic acid were found.

Chamomile decoction is taken orally in intestinal spasms, inflammatory diseases of the liver, inflammatory diseases of the biliary and urinary systems, painful menstruation, hysterical reactions, neuroses, neurotic seizures, trigeminal neuralgia. Chamomile infusion improves the activity of the central nervous system, accelerates reflex functions, dilates

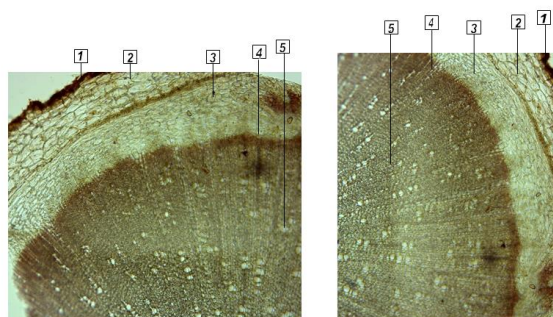
cerebral blood vessels, and accelerates heart and respiratory rhythms. Chamomile is usually prescribed for the complex treatment of gastritis, colitis, gynecological diseases, rheumatism, bronchial asthma, angina. Chamomile normalizes the digestive system in the body, accelerates the flow of bile, reduces itching and prevents sweating. Chamomile has an ant allergic effect on the body.

**Picture 1. *Matricaria chamomillae*.**

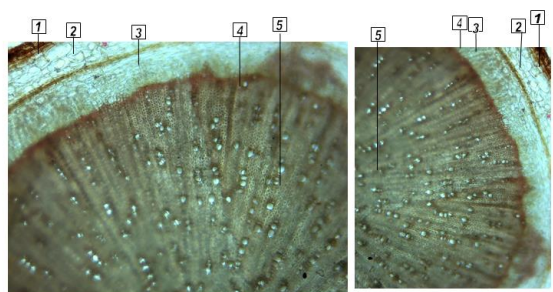
Root. The root of *Matricaria chamomillae* plant is in the second structure and is covered with peridermic cells from the out site. Mainly, the bark part of the root has a peculiar structure found in very few cases. Thus, there is a circular ring consisting of columnar and impressed cells in two rows along horizontal middle part of the bark part and this divides the bark part into two parts as if were. The structure of the cells in the both separated bark part is varied. The parenchyma cells of the bark in the section towards the peridermic layer are relatively oval and very large and consist of 4-5 layers. The bark area located at the limits of central cylinder is composed of smaller and oval various cells consisting of 12-14 rows. The central



cylinder has developed better. It consists the two-thirds part of the horizontal cut of total root. Due to microscopic analysis of the root of *Matricaria chamomillae* plant, it has been determined that core lines are polyarx type for their law of origin.



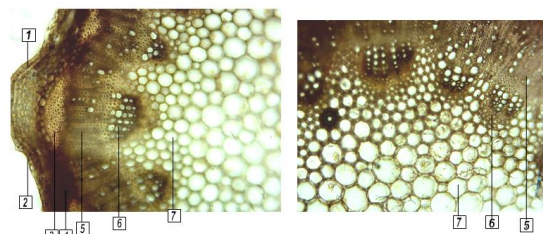
Picture 2. Anatomical structure of the root In situ.
1-periderm, 2-bark parenchyma, 3-phloem, 4-cambiu, 5-xylem.



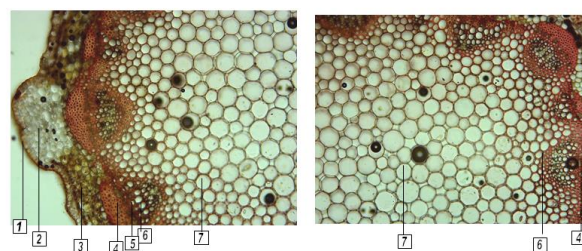
Picture 3. Anatomical structure of the root Ex.
1-periderm, 2-bark parenchyma, 3-phloem, 4-cambiu, 5-xylem.

Stem. Anatomical analyzes were carried out on the stem of the samples taken from *Matricaria chamomillae* plant in phenophase period. A large number of anatomic cuttings have been obtained from the stem and cuttings differing for their more accurate structural elements were microscopically analyzed. The strong development of parenchyma tissue on the stem of type is determined. The sender system is ball-shaped and has a collateral type. Stem is circular form with rib-like edges in the horizontal cut. These rib-like parts faced to outward forms collenchim cells group related to mechanical tissue. At the same time, better developed balls of sclerenchyma cells that emerged in the part of sender balls toward the bark has caused the stem to swell outside. Xylem pipes have been developed well in the sender system. It can be noted that according to the results of anatomical analyzes sclerenchyma cells cover balls totally. A number of sclerenchymas (7-8 layers) have been formed toward bark part. A sclerenchyma cell consists of 3-4 layers in part of core limited with

sender ball. The presence of sclerenchyma cells in inters-balls is observed because of this sender system located part of stem is surrounded by sclerenchyma ring. Main parenchyma cells are bigger in the centre of the core. Relatively smaller shape parenchyma cells are observed in the part limited with sender system.



Picture 4. Anatomical structure of the trunk In situ.
1-collenchima, 2-epidermis, 3-sclerenchima, 4- bark parenchyma, 5-phloem, 6-xylem, 7-primary parenchimal cells.



Picture 5. Anatomical structure of the trunk Ex
1- epidermis, 2-collenchima, 3- bark parenchyma, 4-sclerenchima, 5-phloem, 6-xylem, 7-primary parenchimal cells.

Microscopic studies have shown that excretion places with schizogen nature have been emerged in the bark part of stem of the member of *Matricaria chamomillae* type grown in the ex condition. This sign indicator is a diagnostic feature of the type and has scientific and practical significance. The stem is surrounded from the outside by tightly located, relatively in round structure epidermis cells in one row. Collenxim as a well developed mechanical cells group have been emerged below epidermis cells at the swollen part of stem to outside, this is an anatomic sign indicator that is guarantee for plant protection. This collenxim consists of 8-10 rows. The formation of anatomical structural elements of the stem of this type corresponds to its morphological structure appropriately.

Leaf: The leaves of this type are dorzoventral structured. One big sender ball is located in the centre. Sender ball is collateral type. *Sclerenchyma* has been formed both in the upper and lower parts of the ball. A number of sclerenchyma cells emerged in the lower surface are higher. The fibrous-tube sender system is surrounded by relatively bigger surrounding cells from



the outside. The membranes of surrounding cells are thickened. It has been studied that light-brown colored biological active substance had been gathered in the main parenchyma cells of the leaves of *Matricaria chamomillae* type and this is proving sign indicator of this plant's pharmacological importance. The leaf is covered by relatively round epidermis cells from the outside. In the majority, the upper epidermis cells in the most of leaves are bigger. However, the epidermis cells specifically located in the lower surface of the leaves of this type are bigger in shape. By anatomic researches, it was detected that there is formation of excretion places with sxizogen nature between parenchyma cells. The mouth pieces have been emerged on the lower surface of the leaf.



Picture 6. Anatomical structure of the leaf In situ

1-epidermis, 2-columnar parenchyma, 3- sponge parenchyma, 4-secretory localization, 5-xylema, 6-phloema, 7-surrounding cells



Picture 7. Anatomical structure of the leaf Ex.

1- secretory localization, 2- epidermis, 3- sponge parenchyma, 4-columnar parenchyma, 5-xylema, 6-phloema, 7-surrounding cells

2. Objectives

The materials of the research are samples of the ordinary chamomile (*Matricaria chamomillae* L.) type

taken from ex and in situ conditions. The plant has been studied systematically and morpho-anatomically. Classical and modern botanical-floristic, systematic, ecological and so on. methods, "Flora of Azerbaijan" (1950-1961), "Flora of Caucasus" (Grossheim,1967) determinants and Internet websites have been used for processing herbarium materials of this plant taken from region. Phenological observations have been carried out for studying morpho-anatomical features of *Matricaria chamomillae* L.plant. The stem, leaf and root of plant grown in natural condition in region were taken after reaching full morphological maturity.

3. Methods

Biomorphological research was conducted on the basis of Kuperman and Serebryakov methodologies (Serebryakov, 1952: Kuperman, 1917). A large number of cuttings prepared from the vegetative organs of the type have been thoroughly analyzed. Both fresh and permanent medicines were prepared from cuttings made by cutting by hand according to the accepted methods in anatomic practice. The preparation of the medicines was carried out according to the generally accepted methods (Barikina and others. 2000-2004). Cuttings were taken from fresh or fixed parts of the plant. Alcohol or formalin was used to fix the plant. Cuttings were prepared by sharp blade. At this time, little objects were placed to the core of stem. Horizontal cuttings were prepared from the leaves and cylindrical organs (root, stem) of the plant. In order to get more effective results, the object is professionally squeezed between the two fingers of the left hand and thin cuttings have done. Cuttings are added in colored water solution in Petri cups, the thinner cuttings are put into clean experiment glass and water solution with color substance added onto it. After some minutes (it depends on dense of this color substance), cuttings are several times washed in water or solution of 50% ethyl alcohol to clean the color. This process was controlled under the microscope.

Then, washed cuttings are placed one by one on experiment glass with melted drops of glycerin-gelatin prepared beforehand. Canadian balm has also been used to study the cell contours. Prepared anatomic medicines were investigated by modern special digital and camera microscopes ("MBU-6", MBU-1, MBU-3, Germany-made Motic mark, XSP 91-06-DN digital). It is possible



to transfer the drawing of original images of any material through any memory devices to the memory of the computer by a special apparatus mounted on these microscopes. Then, with the help of Photoshop software and after the lighting level has been increased and reduced, original microscopic photographs have been archived and used. By the help of digital camera microscopes the live material of the plant has been studied naturally without painting. It makes an opportunity to get more accurate and complete result. During anatomic researches, safranin in a 1% alcohol solution was used to determine the degree of woodening elements of mechanical tissues. Structure and types of epidermis and parenchyma cells were studied according to Tutayug (1967), Gasimov (2010), Humbatov (2007) and others. Biometric dimensions plants of the were studies leaf according to the methods of G.PH.Lakin.

4. Results

In result of anatomic studies, it was identified that there are structural varieties in the comparative anatomical analysis of types taken from ex and in situ conditions in all vegetative organs of *Matricaria chamomillae* L. plant. Main parenchyma tissues among types grown in ex condition are placed tighter and mechanical tissues have developed stronger. At the same time, the excretion places of this type are relatively bigger in shape.

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