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Structural identification of mulberry forms anatomical features

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ABSTRACT

The article discusses the new forms of mulberry that have been studied for the structural-anatomical, identification, and coefficient characteristics of the leaf. The analysis shows that the mulberry forms N1 and N3 were obtained from the diploid origin of *Morus alba* Linn species, while N7 belongs to the natural polyploid. Form N1 is recommended for use in leaf direction-silkworm breeding, while Forms N3 and N7 are more effective for canning purposes. Also, mulberry forms N1 and N3 can be propagated in the leaf blight multiplication zone as high-endurance donors (number of soft leaves 14.8; 14.4, respectively).

Key words: Correlation mesophyll, Laphanum, Cytolith, Stalk, Mesopetsy, Mulberry.

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Introduction

The anatomical structure of the mulberry plant is genetically determined point, which does not change under the influence of external factors, is manifested by various chemical-physiological processes and is reflected in the potential durability and productivity of the variety, thus the study of anatomical structure is one of the essential fields for the identification of the mulberry variety and shape and for the preliminary prediction of scientific indicators.

Mulberry is an important crop not only in silk industry but also in terms of use in pharmacology and canning. Recently, highly productive breeding species have become extinct and degenerated in neglected plantations, resulting in numerous new forms of natural breeding that deserve to be used in production. Morphological anatomical and biochemical methods are used to identify them.

One of the methods is to study the high productivity and durability of the individuality of the species by studying the diagnostic structural-anatomical features [1,2].

In the practice of breeding, the identification of the species is obtained by the shape and volume of the cystolites in the leaf mesophyll, and the amount of extra soft leaf (> 10) in the medullary part of the stalk is used as a marker of phytoplasmic disease resistance to leaf rot [1,3].

The study of the forms and varieties of mulberry with phenotypic signs, anatomical and chemical analysis methods, together allows to find out the direction and expediency of their use [4].

Material and methods

Mulberry forms with conditional numbers N1, N2, N3 were selected as the object of research. N1 of them is a male plant in Imereti region

(shadow-2) N3 is a female plant selected in Shida Kartli (Saguramo), and N7 in Samtskhe-Javakheti (Vardzia 7) is a medium-sized plant with dark fruits. With green and leaves of good consistency. From their leaf specimens, lumps were prepared on a microtome with a thickness of 9 mk, treated with a 24-hour exposure to francanum solution, and examined by stereomicroscope using MBI-6.

Results and discussion

The shape of mulberry N 1 is bifacial with the anatomical structure of the leaf, the length of the plate is 10.8.9 cm, the thickness of its assimilating tissue is 75.8 on average, the upper and lower epidermis

are single-limbed. And the cloud parenchyma is 41.9 (Table) Form N1 is characterized by a small, closely interconnected parenchyma. The number of drusions of different sizes in the tissue of the upper epidermis, the small size and the size of the intracellular space have a substantial effect on the leaf viability and permeability of the leaf.

The stalk structure of Form N1 is characterized by frequent thickening, medium-thick cuticle, the permeable system is arcuate and intermittent. In the edular part are located the vital type cells with an additional soft larynx, 14.8 units are found in the acid crystals of acid-druze, which substantially affects the acidity of the leaf [4].



Fig. 1. *Mulberry form N 1 Constituent elements of the anatomical structure of the stalk and twig. Extra soft lap.*

Mulberry form N 3 (Saguramo) is an abundant female form. Its leaf blade is quite thick - 111.5 mesophilic - 85.3 - the upper and lower epidermis is single-stemmed. The tissue of the upper epidermis is 20.3, while the lower 8.2 mesenteric parenchyma is bilayer, its thickness is equal to 31.8, and the thickness of the cloudy parenchyma is 42.2.

The leaf of N 3 is characterized by a dense cellular structure, located in the upper epidermis, cysts of one

type and different sizes are observed in small numbers, characterized by a frequent arrangement of simple conductive tissue, the conductive vessels are spiral, rarely circular. The leaf is unbroken, the trichomes are fixed only on the abaxial side of the leaf. It is of two types: simple-conical, erect and simple glandular spheres. Leaf ventilation apparatus belongs to the ascending type Medium-sized baguettes are located chaotically on the underside.

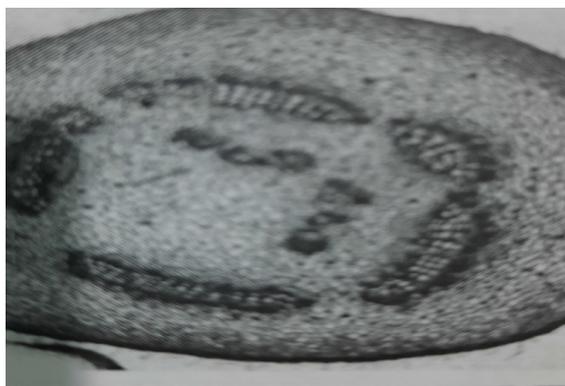


Fig. 2. *Mulberry Form N 2 Donziventral mesophyll of leaf bifacial plate. Meseric, meserial, cloudy parenchyma*

The leaf stalk is almost indistinguishable, with rarely slightly curved simple trichomes. The cuticle is of medium thickness, with a dense cellular structure. The conductive system is arranged in a

circle. Chadian rays are found in the wood. The leaf stalk also has a small number of druids, the number of soft laurels is 14.4 units.

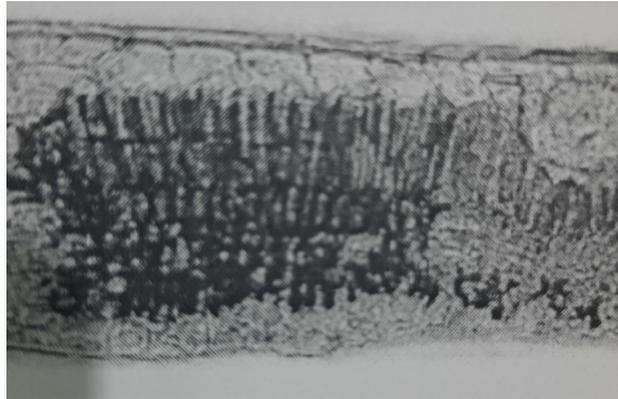


Fig. 3. *Mulberry form N 3 Transverse incision of the stalk: trichomes, cuticle, continuous tissues of the plate colenchem and mesoderm*

The leaf of the mulberry form N 7 (Vardzia) is bifacial, the sisike of the plate is 75.9. The upper and lower epidermis are single. The thickness of the upper epidermis is 22.3, and the lower epidermis is 10.6. Messernier parenchyma is two-layered with a thickness of 33.08 Cloudy parenchyma-42.4.

Mulberry form N7 leaf is characterized by a sharply mottled and dense cellular structure of mesophyll. Two types of cystoliths are located in the

upper epidermis, their size is heterogeneous. Druses are fixed in average numbers. The thickening of the conductive skin is spiral, rarely it is also found in the ring, the leaf is weakly covered with trichomes fixed on the apical side of the leaf. There are both types - both simple conical and simple glandular - spherical.

Ventilation device - bug is found on the lower epidermis of the leaf, asecta type. It is characterized by medium-sized chaotically located bugs.

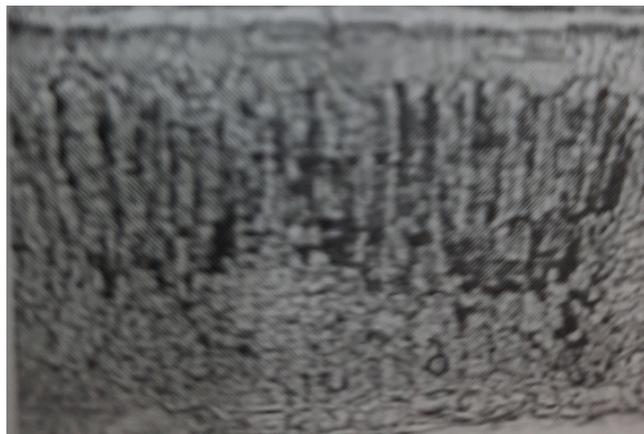


Fig. 4. *Mulberry Form-7 Lower cells of the lower epidermis with ascending type buds*

The leaf stalk of these forms of mulberry (N7) is characterized by weak sheath, dense cellular epidermis, voluminous tissues of the colenchyma and mesoderm. Lapis fibers and mesoderm tissue of different sizes are lined up, and giant-sized druids are also observed in units. Spiral

vessels and radial rays are differentiated in wood. Extra soft tissue cells are equal to 10.7 units per mesopectol (Fig. 4). The digital material of the constituent elements of the leaf mesophyll structure of the above forms is given.

Table. *Mulberry is a new form of leaf mesophyll dimensions*

Name of mulberry forms	N1, Male	N2, Female	N3, Female
Leaf plate thickness, μ	108,9	111,5	130,3
Mesophilic thickness, μ	75,8	85,3	75,9
Thickness of mesenteric tissue, μ	29,0	31,8	33,0
Thickness of cloudy tissue, μ	41,9	42,2	42,4
Thickness of the upper epidermis, μ	20,2	20,3	22,3
Quantity of Extra soft lap points	14,8	14,4	10,7

Conclusion

According to structural-anatomical identification studied by us and by analyzing the correlation characteristics it becomes clear that:

Mulberry forms N1 and N3 were obtained from diploid origin of *Morus alba* Linn species, while N7 should be attributed to natural polyploidy;

Form N1 should be used as a leaf-oriented silk industry, while Forms N3 and N7 will be more effective for canning purposes;

Mulberry forms N1 and N3 can be propagated in the leaf blight multiplication zone as high-endurance donors (number of soft leaves 14.8; 14.4 respectively).

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