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Features of the Anatomical Structure of the Stem and Pedule With Preserved and Fallen Fruit Elements of the Cotton Plant

Shokirova Gavkharkhan Nazirgulomovna (PhD)
Masodigova is the daughter of Mokhidabonu Abduvohijon assistant
Fergana State University

Asadova Muxabbat Qudratovna
Masodigova is the daughter of Mokhidabonu Abduvohijon assistant
Fergana State University

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***Abstract*:**

The purpose of this study is to identify the presence or absence of differences in the anatomical structure of the stem with high (25-35 pieces) and low productivity, i.e. partially fallen fruit elements (8-16 pieces), as well as in the stalks of fallen and unfallen fruit elements. For this purpose, microtome and hand sections of the transverse, tangential and radial direction of 5-6 internodes were prepared after the fruit elements fell off. Before preparing preparations of the stem and stalks, pieces 0.5-1 cm long were taken and softened in a mixture of glycerin, ethyl alcohol and glacial acetic acid in a ratio of 1:1:1 in a thermostat at a temperature of 70% for a week.

After preparation, the sections were stained in an aqueous solution of safranin and temporary preparations were prepared. The sections were studied on an MBI-3 microscope; the drawings were made under 11x16 magnification (16x objective, 11x eyepiece) using a RA-6 drawing apparatus (1.5x).

The structure of the stem. The stem wood of the studied plants is light and loose, as it is rich in vessels and parenchyma. False “growth rings” are sometimes found on cross sections, of course, associated with watering and treatments.

The general anatomical structure of the wood of stems with preserved and fallen fruit elements is similar: it is rich, as was above, in vascular lumens, the number of which per 1 mm2 of area reaches 38-50 with a lumen diameter from 30 to 80 μm with a total area of 27-35% of the diameter stem. The lumens of the vessels are less often located singly, in most cases in chains from 2-5 to 8-14 (Fig. 1, 2). The length of the vessel segments does not exceed 264 microns, mainly within the range of 210-250 microns, with a thickness of the side walls of about 2.2-2.8 microns.

However, the stems of these plants differ in the number and arrangement of vascular segments: in the stem of plants with unfallen fruit elements per 1 mm2 of cross-sectional area, the number of lumens is 35-42, less often located singly, mainly in a chain of 3-5 and 5-7, their diameter is within 65-80 microns in late wood and 30-45 microns in early wood. In the stalks of unfallen fruit elements, the gaps are located in a chain of 3-5 (Fig. - 3), their diameter in early wood is 30-40 microns, in late wood 49-65 microns.
The total area of the lumen of the vessels in cross section and the stem and stalk is 27-28%. In plants with fallen (or partially fallen) fruit elements, the number of vascular lumens per 1 mm2 of the cross-sectional area of the stem is slightly greater than in plants with preserved fruit elements - 45-55, they are located in a chain of 2-7, the length of the vascular segments is equal to or almost equal to that of plant stems with unfallen fruit elements.
As for the stalks of fallen fruit elements, the lumens of the vessels are located in a chain of 9-12, sometimes their number in rows reaches 14, per 1 mm2 of area no less than 55-60, but the diameter is somewhat smaller in both early and late wood - within 18-35 microns, their area is 30-33% of the total cross-sectional area of the stem and 34-36% of the stalk.
It should be noted that if in wild species of cotton the mechanical tissue of wood - libriform - makes up the bulk of the wood (Dariev, 1980), then in the plants studied this pattern is not always manifested in the wood of the stem with preserved fruit elements; it is really well developed and makes up 42%, in the stem with fallen fruit elements it is less developed and accounts for 25-30% of the total cross-sectional area. The walls of the cleto libriforma are thinner than those of the stem and peduncle with preserved fruit elements; their pairs are located only on the radial walls, in trihedral or cross-shaped slits. The ends of libriform cells lack pores, are often forked, sometimes serrate.
The length of the cells of this tissue in plants of both groups is the same and ranges from 900-1100 microns.
The woody parenchyma in all studied plants is vasicentric (directly connected to the vascular segments); in early wood, the cells of the vasicentric parenchyma form one row around the vessels, in late wood - 1-2 rows. Sometimes libriform cells are wedged into the ring of its cells. In general, the xylem of plants with fallen fruit elements is richer in woody parenchyma than that of plants with preserved fruit elements. In addition to the vasicentric parenchyma, there is also metatracheal parenchyma (not associated with vascular segments), but this is especially noticeable in wood with fallen fruit elements.
Woody parenchyma cells are located mainly singly, sometimes in groups of 2, their diameter is 1.5 times greater than the diameter of the surrounding libriform cells.
On a cross section in early wood, the cells of the rays are located in 1-2 rows, their width in most cases is narrower or equal to the diameter of the lumens of the vessels; in late wood, in plants with unfallen fruit elements, the rays are 2-3 (4) rows, their width is equal to diameter of the lumen or slightly wider, in plants with fallen plants they are 3-5 rows, the width is generally greater than the diameter of the lumens, less often equal to their diameter, in the stalks the width of the rays is always greater than the diameter of the lumens of the vessels.
It should be noted that in plants with high productivity and preserved fruit elements in the wood of both organs, the rays consist mainly of recumbent (radially elongated) cells, while in plants with fallen fruit elements (low productivity) - of erect (vertically elongated) and square cells, while rays from recumbent cells are rare. The height of the rays does not exceed 15 rows. In both the stem and the peduncle of all studied plants, the thickness of the ray cell walls is 0.4-0.6 μm. Sometimes single large crystals-idioblasts of calcium oxalate are found in the cells of the rays.
Analysis of the data obtained from studying the stem and stalk of restenia with unfallen and fallen (or partially fallen) fruit elements leads to the following conclusion.
In the secondary - late wood of the stem of plants with fallen fruit elements, vascular segments with relatively wide lumens are first formed, then - with a relatively narrow diameter in the wood, the stalks are mostly narrow-lumen. The specific gravity of the lumens of blood vessels and parenchyma is greater than that of plants with unfallen fruit elements. Consequently, in the former, parenchymalization predominates. In the latter, the rate of formation of mechanical tissue dominates the rate of formation of

wood parenchyma.
The reason for the circumstance may be: a) different quality of seeds;
b) in the influence of certain agrotechnical measures, c) in the presence of both reasons.
Therefore, it is necessary to create optimal conditions conducive to enhancing the process of parenchymalization, which inhibits abscission.

References

1. Нурматов Ш.Н., Мирзажонов Қ., Авлиёқулов А. ва б. Дала тажрибаларини ўтказиш услублари. – Тошкент, 2007. – 147 б.
2. Успенский Ф.М. Паутинный клещ и система приёмов борьбы с вредителями хлопчатника. – Ташкент: Фан, 1970. – 304 с.
3. Хўжаев Ш.Т. Ўсимликларнинг зараркунандалардан уйғунлашган ҳимоя қилишнинг замонавий усул ва воситалари. – Тошкент: “Навруз”, 2015. – 552 б.
4. Хўжаев Ш.Т., Маматов К., Курязов Ш., Дурдиев К. Айрим агротехник чора-тадбирларнинг ғўза тунлами ривожланишига таъсири //Мақолалар тўплами. – Тошкент: Талқин, 2008. – Б. 35-40.
5. Хўжаев Ш.Т., Курязов Ш., Юсупова М. Ғўзани чилпиш ва кўсак қурти //Мақолалар тўплами. – Тошкент: Талқин, 2008. – Б. 40-44.
6. Яхонтов В.В. Экология насекомых. – Москва: Высшая школа, 1969–487 с.
7. Шакирова Г.Н. Хужаев Ш.Т Важность агротехнический методов против вредителей растений //Универсум: технические науки: научный журнал. – Москва, 2020. - №7. – С.-25.
8. Ш.И Маматожиев, М.А.Мирзаева, Г.Н.Шокирова Влияние технологии допосевной обработки на содержание влаги в почве //Универсум:технические науки: научный журнал. – Москва, 2021. - №6(87). – С.46-49.