



SECOND INTERNATIONAL CONFERENCE «INTEGRATION NETWORK OF THE PHARMACEUTICAL ECOLOGY - 2024»

Microscopy of vegetative organs of *Cyclachaena xanthiifolia* (Nutt.) Fresen. in secondary area

Gritsyk Aleksandra, student; Lyubov Fedorova, senior lecturer

Full name of the speaker Gritsyk Aleksandra

First Moscow State Medical University, Moscow, Russia

Introduction. Currently, scientists are focusing on invasive species and their adaptation to new territories, as well as the threat to biological diversity in areas of their settlement. One of these species is the *Cyclachaena xanthiifolia* - a natural flora of North American prairies, brought to Russia in the collection of botanical gardens in 1870. Since then, the plant has adapted well to new conditions, making it an interesting object for invasive species research.

Cyclachena pollen is a serious allergen, causing seasonal disease of mucous membranes of respiratory epithelium, eyes, skin, besides Quincke's edema is possible. At the same time *cyclachena* has diuretic, cardiotoxic and anti-inflammatory properties because of biologically active substances. And its pollen is used in the diagnosis and immunotherapy of pollinosis and atopic bronchial asthma.

This study aimed to investigate the anatomical structure features of the vegetative organs of *Cyclachaena xanthiifolia* (Nutt.) Fresen.) in the secondary area.

Materials and research methods. Specimens of *Cyclachaena xanthiifolia* were collected in Orekhovo-Zuyevo, Moscow Region, on the railroad track near Shkolny proezd in September 2022 (fig.1). The study was conducted on the material fixed in 70% alcohol. A binocular microscope LOMO "MIKMED-5" and a LeicaDM2500P microscope were used for microscopy. The slices were photographed using the Leicaapplicationsuite program (LeicaDM2500P microscope application).

fig.1 Sample collection site



fig.2 The cross-section of root

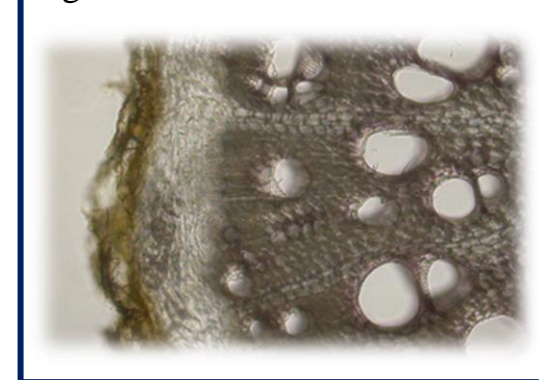
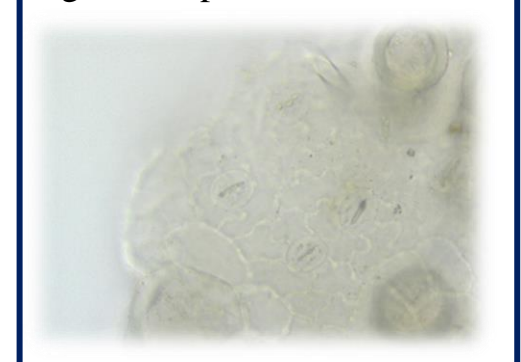


fig.5 The epidermis of leaf



Results. The section of the main root is round and it has a typical secondary structure (fig.2). In the central axial cylinder two primary phloem rays [2] are visible between two primary xylem rays (fig.3). There are large areas of lignified parenchyma in the secondary cortex[1].

The cut in cross-section stem is round-shaped. The epidermis is single-layered, has a cuticle with thickness of 6 microns.

The primary cortex consists of three tissues: angular collenchyma, had 7-14 layers of cells [3], chlorenchyma, located in separate sites with 3-4 layers of large cells [4], and endoderm [5]. The primary cortex is separated from the central axial cylinder by the layers of pericyclic sclerenchyma [6]. The central axial cylinder has about 32 pronounced vascular bundles connected by sections of elongated, strongly sclerotized cells into a single ring of conducting tissues (fig. 4). The stem is represented by a parenchyma [7].

The leaf's epidermis is represented by large curly cells. There are multicellular hairs on both sides of the leaf. Stomates are anomocytic, surrounded by five epidermis cells (fig.5). On a transverse section of the leaf's petiole histochemical reactions revealed starch grains in the lining of conductive bundles. (fig.6) Accordingly, the *Cyclachaena xanthiifolia* has C-4 photosynthesis pathway.

Conclusions.

1. The root has secondary structure, two-rayed. Lignified cells are found in the parenchyma of the secondary cortex.
2. The stem has a transitional type of structure.
3. The leaves are amphistomatic, with an anomocytic type of stomatal apparatus.
4. *Cyclachena* has a C-4 photosynthetic pathway.

fig. 4 The cross-section of stem

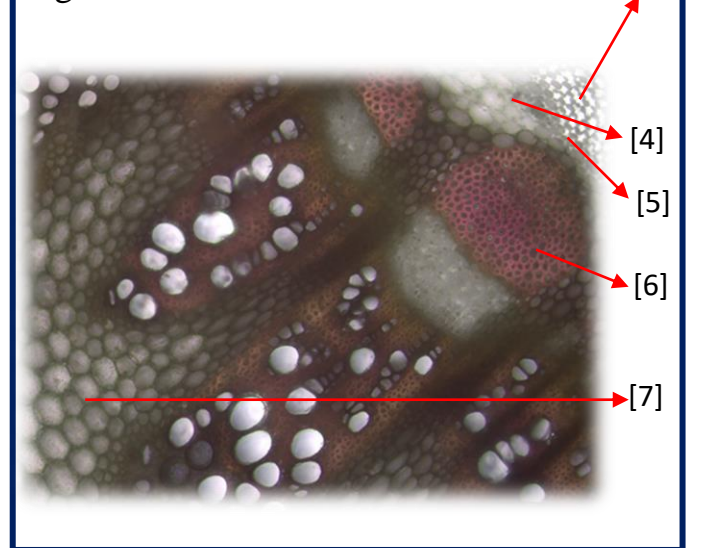


fig.3 The phloem ray of the main root

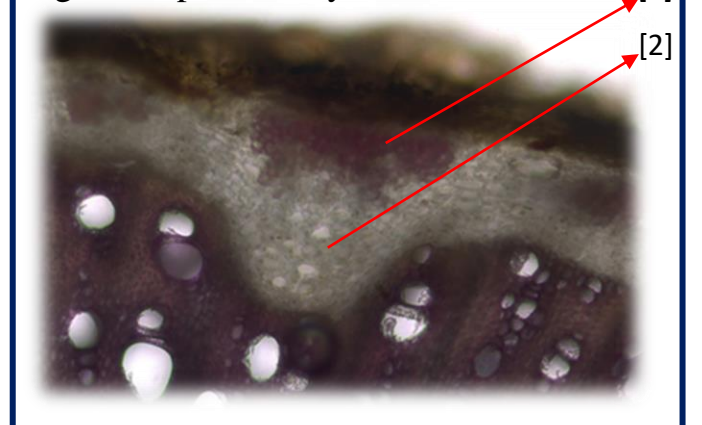


fig.6 A transverse section of the leaf's petiole

