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IDENTIFICATION CHARACTERISTICS OF THE RHIZOMES OF REYNOUTRIA
SACHALINENSIS (REYNOUTRIA SACHALINENSIS (F.SCHMIDT) NAKAI)

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Aim:

To establish the authenticity of *R. sachalinensis* rhizomes by determining their macroscopic and microscopic diagnostic features and conducting a qualitative phytochemical analysis of aqueous and alcoholic extracts for investigating key biologically active compounds (BACs).

Objectives:

- To perform macroscopic and microscopic analyses of whole and crushed rhizomes.
- To conduct qualitative phytochemical analysis of aqueous and alcoholic extracts for key BACs.
- To identify the characteristic authenticity markers of the raw material for future identification.

Materials and Methods:

The study was conducted on *R. sachalinensis* rhizomes collected in October 2024 in the village Yolochki, Sakhalin. Macroscopic and microscopic analysis was performed in accordance with the Russian State Pharmacopoeia (15th ed.) monographs GMP.1.5.1.0006 "Roots, Rhizomes, Bulbs, Tubers, Corms" and GMP.1.5.3.0003 "Technics of Microscopic and Micro-chemical Research of Medicinal Plant Raw Drugs." Microscopic examination was carried out using Leica DM1000 LED biological microscope (Germany) with a 10x/20 eyepiece and 10x/0.25 and 40x/0.65 objectives, using Leica LAS v4.13 software and MIKMED-6 microscope with a 10x eyepiece and 4x, 10x, and 40x objectives, equipped with a digital camera. Aqueous and alcoholic extracts from *R. sachalinensis* rhizomes were prepared to conduct standard qualitative reactions for the main groups of biologically active substances.

Conclusions:

The study characterized the authenticity of *R. sachalinensis* rhizomes through macroscopic, microscopic, and phytochemical analyses. Whole rhizomes are cylindrical, often hollow, slightly twisted, brown with longitudinal wrinkles and a light-yellow, granular fracture. The crushed material is light-yellow and brown fragments of the rhizome, passing through a 5 mm sieve.

Microscopy of the transverse section revealed a non-fascicular structure, starch-filled parenchyma in the primary cortex, sclerenchyma fibers arranged in concentric rings and a pith containing starch and crystal druses. Crushed rhizome's microscopic preparation displayed fragments of sclerenchyma fibers, cork, pitted vessels, which sometimes contained a yellow material.

Phytochemical profiling established that the rhizome extracts contain amino acids, tannins, anthracene derivatives, acidic triterpene saponins, and polysaccharides, while flavonoids and alkaloids were not detected.

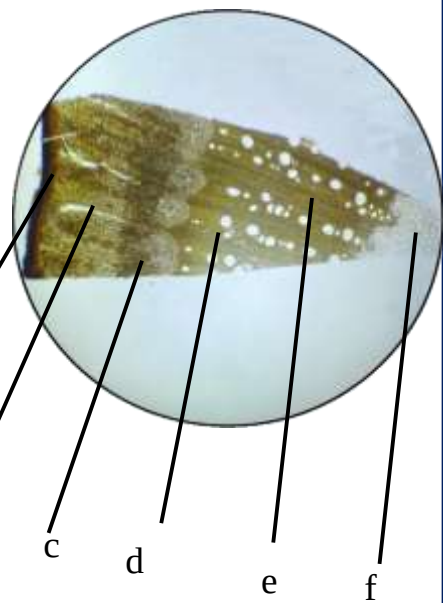
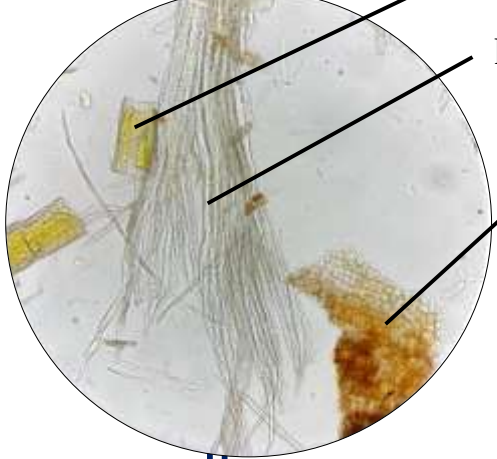
External characteristics

R. sachalinensis rhizomes are the rhizomes of the perennial wild herbaceous plant *Reynoutria sachalinensis* (F.Schmidt) Nakai, of the Polygonaceae family, collected in late autumn and dried.



Microscopic characteristics

Transverse section of the rhizome (40x): a – cork, b – primary cortex, c – sclerenchyma fibers, d – xylem vessels, e – medullary ray, f – pith.



Crushed rhizome's microscopic preparation(400x): g – fragment of a pitted vessel with yellow contents, h – group of mechanical fibers, i – fragment of a cork

Phytochemical analysis

Extract	Contents
Aqueous	Tannins, amino acids, triterpene saponins, polysaccharides, anthracene derivatives
Alcoholic	Tannins, amino acids, anthracene derivatives