We previously reported on the study of biologically active compounds (BACs) in the aerial part of Chinese smilax and the identification of aglycones, namely apigenin, luteolin, kaempferol and quercetin; catechins; p-coumaric, ferulic and chlorogenic acids in the acid hydrolysate.

**Aim.** The aim of the present research was to study saponins in roots of *Smilax excelsa*.

**Materials and methods.** *Smilax excelsa* roots were collected in November 2020. The sum of saponins was obtained by two methods. In the first method, Smilax roots were pre-degreased using petroleum ether to destroy the complexes of saponins and alcohols insoluble in water and aqueous alcohols. The resulting extract was treated with water-ethanol mixtures of various concentrations, then butanol saturated with water was added, the fractions were combined. The sum of saponins was isolated by adding water to the alcoholic combined solution, somewhat later saponins precipitated and were purified by re-precipitation.

In the second method, saponins were extracted from the roots using 70% alcohol and precipitated by addition of cholesterol solution; the formed cholesterol complexes were broken down by extraction of cholesterol with chloroform, and the sum of saponins was obtained.

An identification of saponins was performed by reactions based on physical (foaming index and determination of chemical nature) and chemical (precipitation and color reactions) properties.

The precipitation reagents used: lead acetate solution, solutions of copper and zinc salts; alcohol solution of cholesterol; the aglycone moiety of saponins was determined in Liebermann-Burchard test; color reactions were performed with reagents containing sulfuric acid and hydrochloric acids with acetic anhydride and other aldehydes, namely vanillin, formaldehyde, 4-dimethylbenzaldehyde with small amounts of metals’ salts, etc.: Salkovskiy reaction, Sagnier reaction, Lafon reaction.

The thin layer chromatography (TLC) studies of saponins were performed, the solvent system: chloroform/acetic acid/ethanol/water (60:40:12:8) was used. For the detection of saponins on chromatograms, vanillin (p-dimethylaminobenzaldehyde) reagent was used.

**Results and discussion.** As a result, the steroidal nature of saponins was established. Chromatographically, in all extracts from 8 to 10 substances of saponin nature were detected. According to Rf values, fluorescence, spots colour after treatment with chromogenic developer and in comparison with reliable samples, two substances were identified as spirostanol saponins: dioscin (Rf value of 0.30) and diosgenin (Rf value of 0.75).

**Conclusions.** The thin layer chromatography (TLC) studies of saponins in *Smilax excelsa* L. was performed; dioscin and diosgenin were chromatographically detected. The presence of dioscin and diosgenin justifies the prospects of in-depth studies for the development of herbal drug preparations with antitumor, hypolipidemic, hypoglycaemic properties, as well as antifungal herbal drug preparations against *Candida* spp.
anti-inflammatory and hemocathartic agents, for the treatment of hepatitis, rheumatism, gout, skin diseases; for the improvement in immune response and male reproductive function. Chinese medicine has successfully used Smilax to treat syphilis. Sarsaparilla is included in the list of dietary supplements in USP-DS (USA). The population uses smilax shoots in food as a delicacy.

*Smilax excelsa* L. is one of the characteristic plants of the Black Sea region, widespread in Northern Anatolia, Thrace and on the Mediterranean coast. *S. excelsa* is a dioecious prickly vine up to 20 m long; leaves cordate, smooth-edged or bearing small spines. Flowers unisexual, in the axils of cymes (4-10 flowers), peduncles 1.5-2 cm long. Perianth petal-shaped, six-leafed, wide open, greenish. Male flowers with 6 stamens attached to the base of the perianth. Female flowers with 1 ovarium and 3 stigmas. Fruit red spherical, 1-3 locular berry up to 1 cm in diameter. The fruits ripen in October-January; non-toxic, but inedible by humans; eaten by the birds that carry indigestible seeds over long distances (endozoochoria). The plant is propagated by seeds and rhizomes.

In Crimea, it is cultivated as ornamental plant; naturally distributed from swampy forests to limestone cliffs. The plant is common in lowlands and low mountain belt, on the edges, on slashings, in moist shady places, in riparian forests, in shrubs.

**Aim.** Chromatographically, we detected steroidal saponins in *S. excelsa* leaves and in this study, we aimed at morphological and anatomical study of *S. excelsa* leaves as a potential source of BACs.

**Materials and methods.** The object of our studies were leaves of *S. excelsa*, harvested at the vicinity of New Athos. A leaf micropreparation was prepared according to the routine techniques and examined with the compound microscope (at 40X and 100X magnifications).

**Results and discussion.** The following anatomical features of *S. excelsa* leaves were established (Fig. 1): epidermal cells with wavy walls on the abaxial side of the leaf, anisocytic and parasitic stomatal apparatus (1). The cells of the adaxial epidermis with wavy walls with fewer stomata (2). Mesophyll of the dorsiventral type, idioblasts containing phenolic compounds are located in mesophyll cells. There are two types of scleroids, columnar and astroscleroids (3, 4). Pigmented wart formations (5) located on the both sides of the leaf. Along the veins, small spines (6) are distributed.

A histochemical reaction with vanillin gave a red-cherry color of wart formations, that indicates the presence of catechins (7); after treatment with ferric chloride reagent (FeCl₃), the unicellular layer of cells under the epidermis on the edge of the leaf turned purple (8), what indicates the presence of phenolic compounds.

**Conclusions.** The morphological and anatomical features of *S. excelsa* leaves were studied. The results obtained will be used for the plant identification.
Fig. 1. Some anatomical features of S. excelsa leaves and the localization of phenolic compounds

RESEARCH IN PHENOLIC COMPOSITION OF CHAENOMELES JAPONICA SEEDS
BY THE HPLC METHOD
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Introduction. The Chaenomeles species belong to the Rosaceae family (Apple subfamily) and have been widely known in China for thousands years. In Europe, interest in these fruits has been systematically growing over the last twenty years. In vitro and in vivo studies have confirmed the anti-inflammatory, analgesic, antispasmodic, antioxidant, immunomodulatory and antibacterial effects of extracts from this fruit species. The using of the fruits of the genus Chaenomeles is recommended for a wide range of diseases such as rheumatism, beriberi disease, cholera, dysentery