
# INVESTIGATION OF THE COMPOSITION OF SEDUM L. DRY EXTRACTS. CHROMATOMASS SPECTROMETRIC METHOD

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*Sedum L, chromatomass spectroscopy, biologically active substances, extractant, dry extract.*

**ABSTRACT**

*Due to the unique chemical composition of Sedum L., its broad pharmacological effect is manifested. In order to effectively develop new medicines with the maximum concentration of biologically active substances, certain biologically active substances must be isolated for the treatment of a particular disease. To select a rational extractant and optimal extraction conditions, biologically active substances of dry extracts obtained with various solvents using chromatomas spectroscopy were studied in this work..*

**Introduction.** One of the promising sources of phytopreparations is medicinal plants containing a complex of biologically active substances; due to their wide distribution in plants and great structural diversity, these preparations can be used in the treatment of diseases of various etiologies (1, 2).

Traditional medicine widely uses sea buckthorn in the treatment of colds (3). The herb serves as a first aid during bleeding injuries. Tinctures made from sea buckthorn protect the body from the spread of inflammatory processes. St. John's wort is used to treat rheumatism, fractures, purulent wounds, normalize the functioning of the gastrointestinal tract, restore the functions of the kidneys and bladder, stabilize blood pressure during hypotension, inhibit (slow down, even stop) the growth of atypical cells, relieve pain in the stomach and intestines, reduce feverish conditions, and treat respiratory diseases. The antiviral and antibacterial effects of sedum have been proven. The medicinal properties of sea buckthorn are used to alleviate eczema and to heal trophic ulcers, ulcers, and fistulas. Anti-inflammatory effect manifests in cystitis, pneumonia, and bronchitis. Such a wide spectrum of pharmacological action is explained by the unique chemical composition of this plant, which contains ascorbic, glutamic,

citric, and malic acids, vitamins, macro- and microelements, glycosides, alkaloids, flavonoids, saponins, and carotenoids.

In order to effectively develop new agents with the maximum concentration of biologically active substances, it is necessary to select extraction conditions for treating specific diseases.

**The aim of the study** is to study the composition of dry extracts from Sedum L sea buckthorn obtained with various extractants using mass spectroscopy

**Materials and methods** Chromato-mass spectrometric analyses were conducted using the M. "Agilent technologies 7890b, GS System, mass-selective detector"5977a MDS " - Masshunter drugs_scanag-3666 chromatograph.

Sample 1 was isolated using purified water as an extractant.

Sample 2 was isolated using 70% ethyl alcohol as an extractant.

The 3rd sample was isolated using 80% ethyl alcohol as an extractant.

**Discussion of results** Determination of biologically active substances in extracts using the mass spectroscopy method was carried out by pre-dissolving the samples in methanol.

In the mass spectrum of sample 1, obtained by using water as an extractant, biologically active substances such as ethylcholate (cholic acid ethyl ester) (Fig. 1), ethylglycoside (Fig. 2), borreledin, which belongs to bile acid derivatives and possesses antimicrobial action, and astxanthin carotenoid, which exhibits antioxidant and anti-inflammatory effects, were detected (Fig. 3).

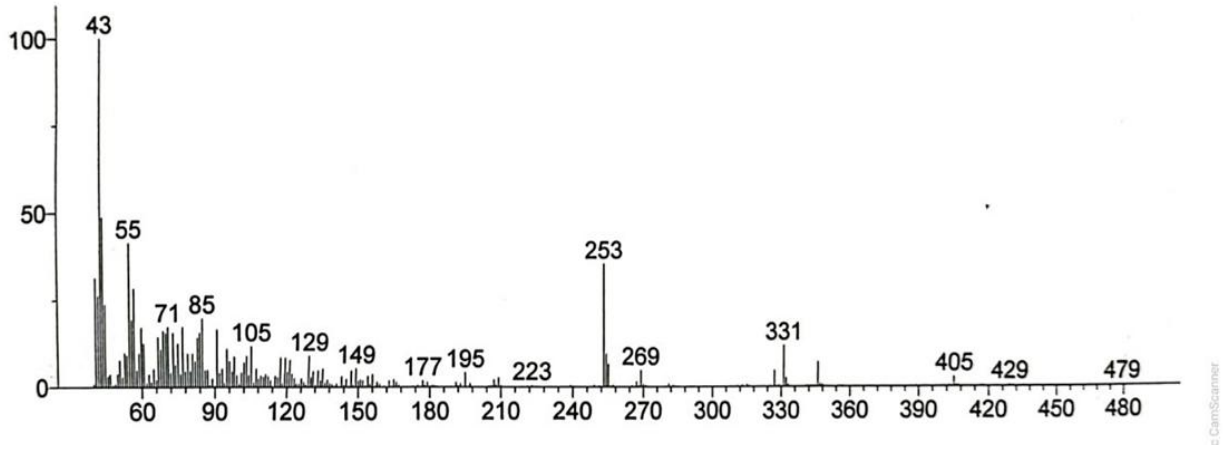


Figure 1. Ethylcholate chromatogram

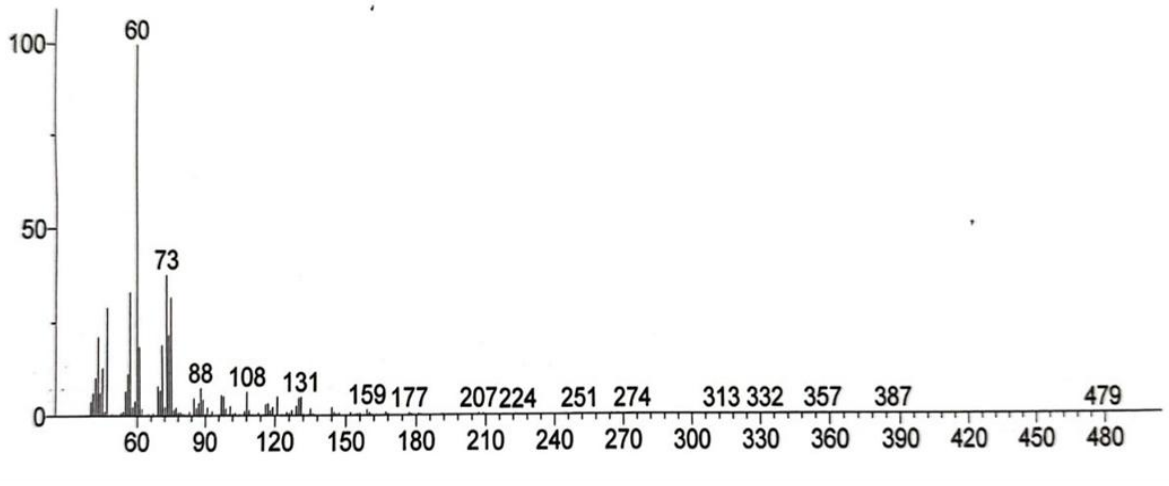


Figure 2. Ethylglycoside chromatogram

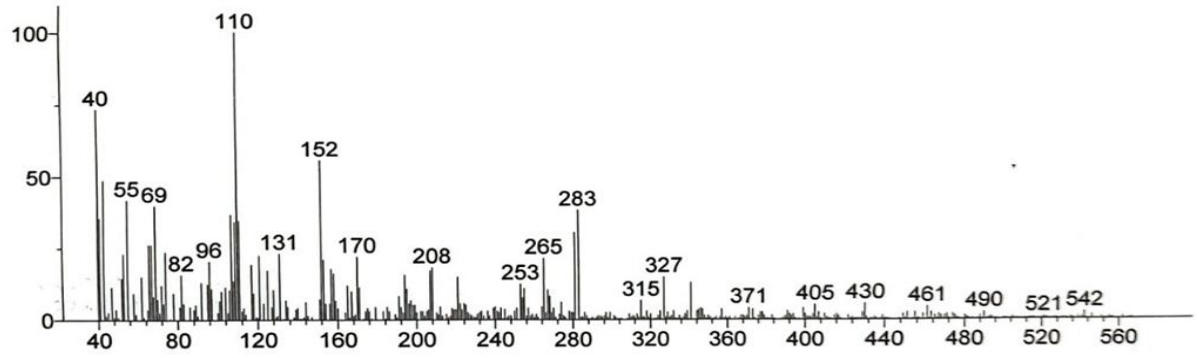


Figure 3. Borrelidine Chromatogram

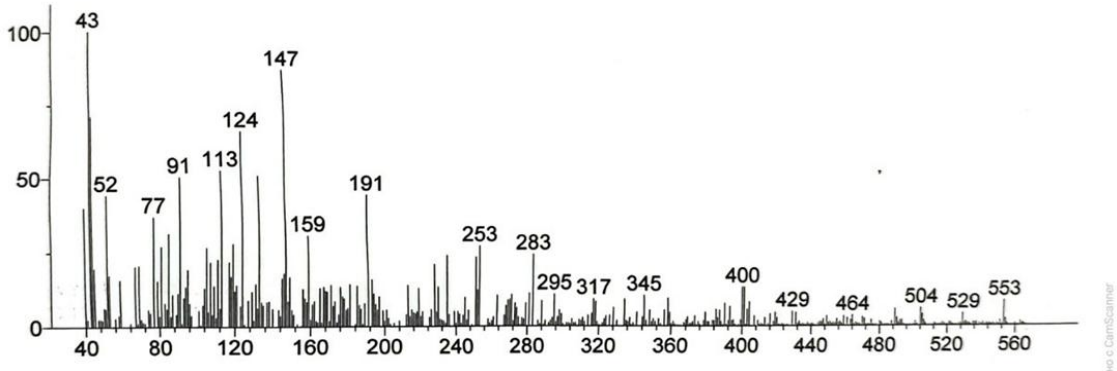


Figure 4. Chromatogram of astaxanthin

In the mass spectrum of the 2nd sample obtained by using 70% ethyl alcohol as an extractant, biologically active substances such as ethyl glycoside (Fig. 2), luxanthin, a biologically active substance that promotes proper eye function and improves vision (Fig. 5), and betulin (Fig. 6) were found to possess hepatoprotective, choleretic, antioxidant, anti-inflammatory, anti-tumor, antiviral, immunomodulatory, hypolipidemic, and gastroprotective effects, while cisterol was used to reduce high cholesterol levels.

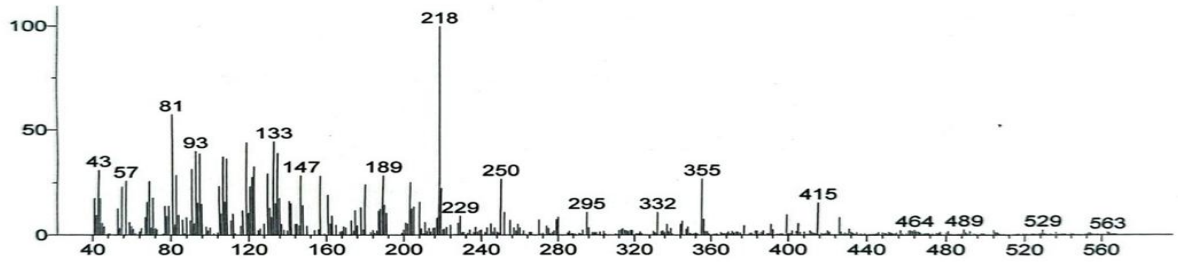


Figure 5. Luxanthin chromatogram

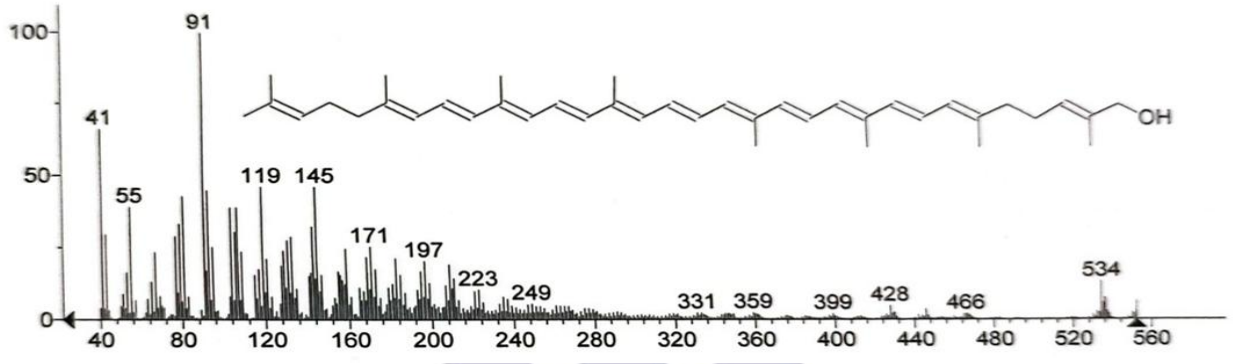


Figure 6. Betulin chromatogram

In the mass spectrum of the 3rd sample obtained by using 80% ethyl alcohol as an extractant, biologically active substances such as ethylglycoside, ethylpalmiate (Fig. 7), used as a hair and skin care agent, phytol (Fig. 8), acyclic hydrogenated di-terpene alcohol (Fig. 12), which is used as a precursor for the production of synthetic forms of vitamin E and vitamin K1, β-tocopherol (Fig. 9), γ-tocopherol (Fig. 10), methyl lignocerate (Fig. 11), β-sitosterol (Fig. 12), and various derivatives of vitamin E (Fig. 13).

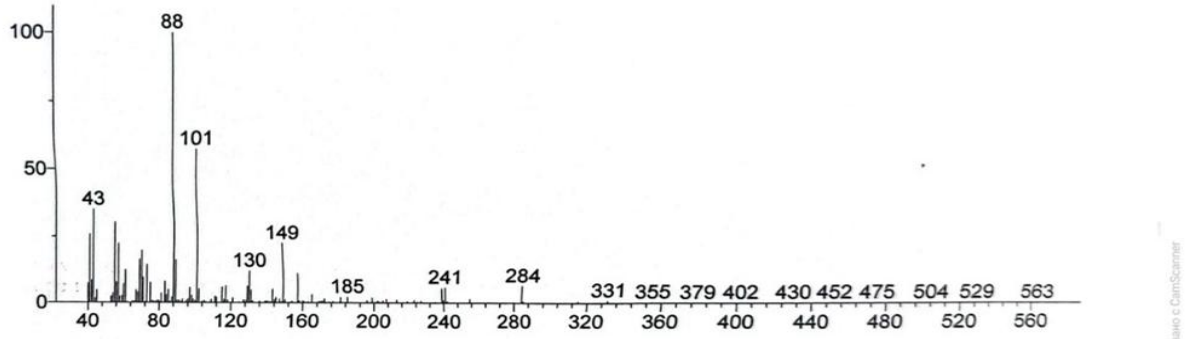


Figure 7. Chromatogram of ethylpalmiate

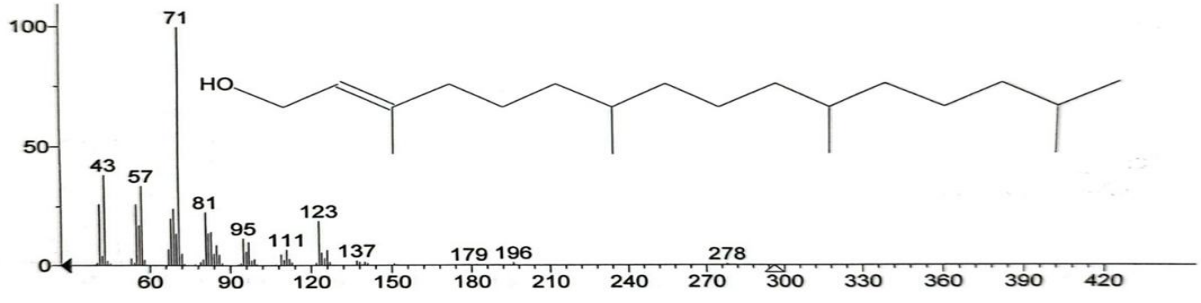


Figure 8. Phytole chromatogram

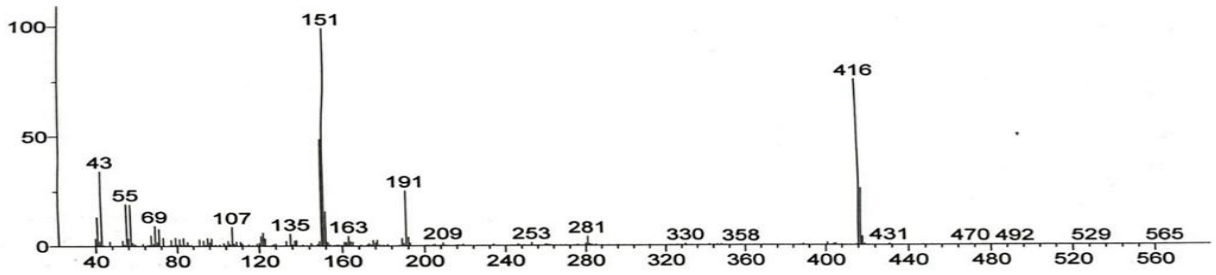


Figure 9. Chromatogram of β-tocopherol

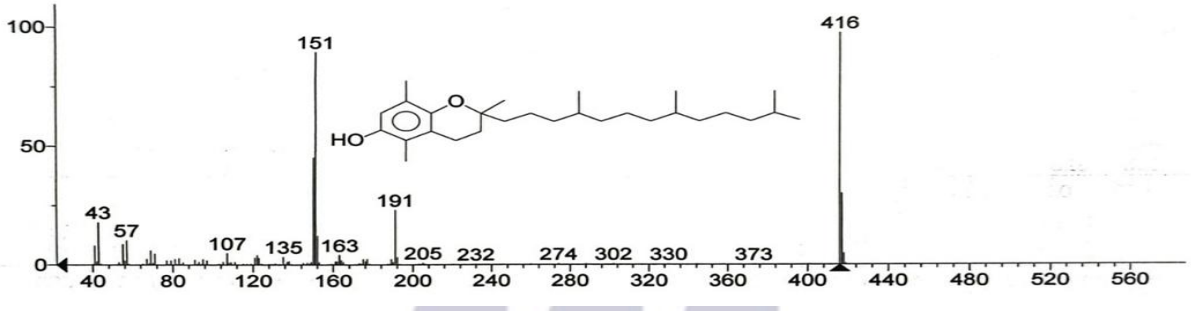


Fig. 10. Chromatogram of γ-tocopherol

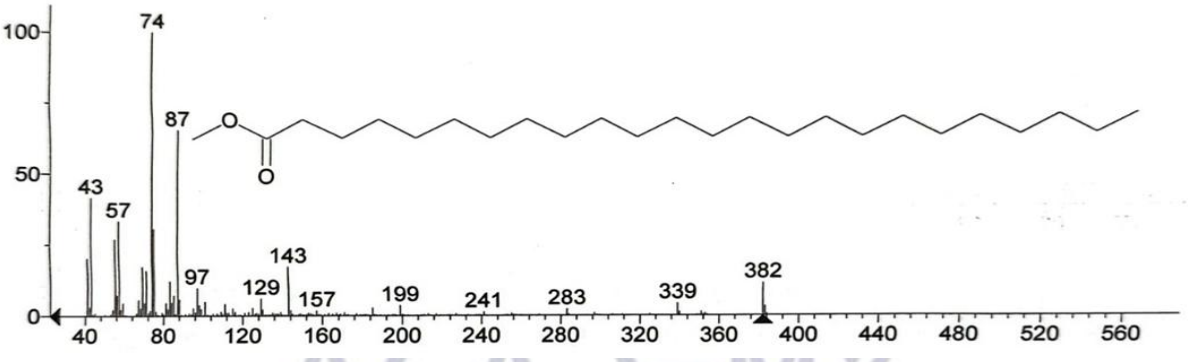


Fig.11. Chromatogram of methyl lignocerate

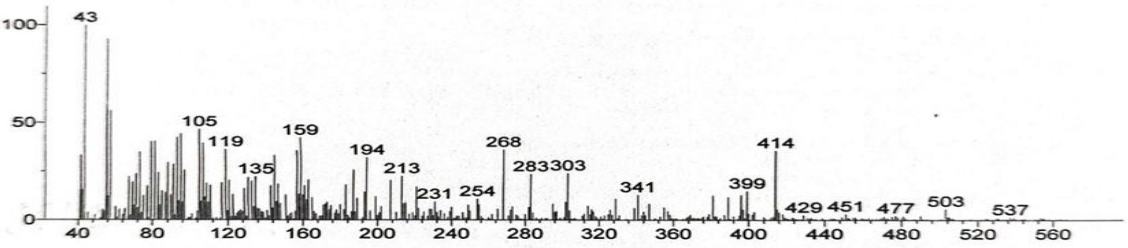


Figure 12. γ-sitosterol chromatogram

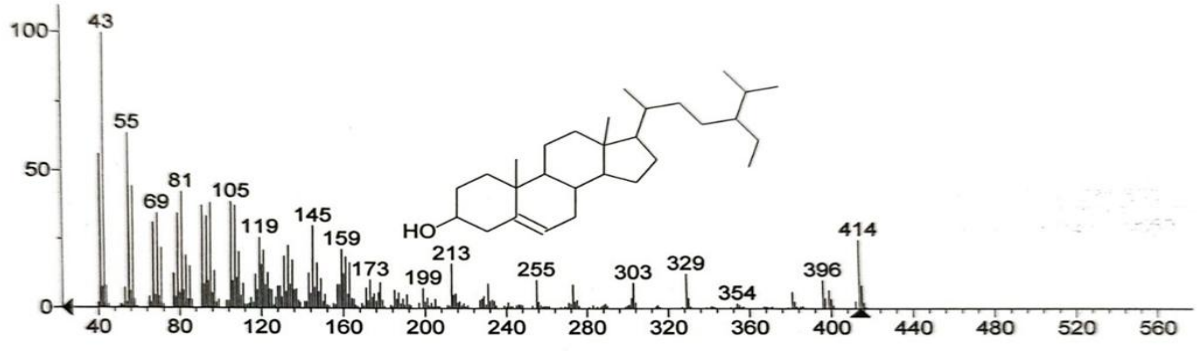

Figure 13. Chromatogram of β-sitesterol

Table 1

**Biologically active substances of Sedum L. dry extracts, chromatomas determined by spectroscopic method**

| Biologically active substances of dry extracts dissolved in methanol | | | |
|---|---|---|---|
| № | Example 1 | Example 2 | Example 3 |
| 1 | ethylcholate | luxanthin | ethylpalmiate |
| 2. | ethylglycoside | ethylglycoside | ethylglycoside |
| 3. | borreledin | betulin | phytol ( |
| 4 | astaxanthin | citesterol | β-tocopherol |
| 5 | | | γ-tocopherol |
| 6 | | | methyl lignocerate |
| 7 | | | γ - sitosterol |
| 8 | | | β-sitesterol |

**Conclusions. Sedum L.** which possesses a unique chemical composition, exhibits a wide range of pharmacological effects. To effectively develop new medicinal products from sea buckthorn with the maximum concentration of biologically active substances for treating a specific disease, it is necessary to select rational extragen and optimal extraction conditions.

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