

Jianu, Sorin; Buruiană, Daniela Laura; Tănăsie, Ștefania Eliza; Chiriac, Alexandru

**Conference Paper**

## The study of plant *Sambucus Ebulus* L. (Caprifoliaceae) from spontaneous flora- and its benefic obtained effects

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## THE STUDY OF PLANT *SAMBUCUS EBULUS* L. (CAPRIFOLIACEAE) FROM SPONTANEOUS FLORA- AND ITS BENEFIC OBTAINED EFFECTS

<sup>1</sup>JIANU SORIN, <sup>2</sup>DANIELA LAURA BURUIANĂ, <sup>3</sup>TĂNASIE ȘTEFANIA ELIZA,  
<sup>4</sup>ALEXANDRU CHIRIAC

**Abstract:** In this paper, the authors had presented a study made on the leaves of *Sambucus ebulus* L. and they tried to give a higher trust of naturist products, especially because these are plants from the spontaneous flora of our country. Because the results obtained over the time from these plants are satisfactory, with the condition of rational consumption, the determinations made at this plant fit in normal ranges, in order to be used with trust, especially against constipation and emetic in certain cases [Olimpia Pandia., Sărăcin I, Dinu Mariana, Chiriac Al.]. The marketing of these products, in different forms, also comes to complete a sure income and easy to be obtained.

**Key words:** flora, spontaneous, chlorophyllian pigments, naturist product.

### INTRODUCTION

**The small elder** (*Sambucus ebulus* L.) Fam. Caprifoliaceae is known under the name of bozie, boj, small elder. In Romania, the species *Sambucus ebulus* L. is common; being met in all zones of country, in different places and it is not pretentious at climate and soil. This plant is found in the spontaneous flora of our country in three species [Geissman T. A.]: *Sambucus nigra* L. (black elder); *Sambucus ebulus* L. (small elder); *Sambucus racemosa* L. (red elder).

From the species of *Sambucus* genus are used in medicine, the flowers and sometimes the fruits. The black elder flowers have an ancient usage in scientific and popular medicine. They have an sudorific, diuretic, galactogen, expectorant action, are used against obesity, cold, cough [Berger FR; Constantinescu C.; Davidek C., Titin N. V]. Externally, black elder flowers have emollient, being recommended in baths, poultices, boils, pharyngitis, laryngitis, and the small elder ones have anti-phlogistic effects [Berger FR;]. The black elder flowers are parts of anti-rheumatic, depurative and sudorific tea [Davidek C.,].

The small elder is a perennial plant, known as the step-brother of elder, and it measures up to 1.6 m, the flowers are white and the fruits are black. The radicular system is strong and presents a deep rooting; being the most used part in therapeutic interest.

The small elder is usually used in diets, it is a very good diuretic, painkiller, inflammatory, antispasmodic, emetic, expectorant.

The small elder also contains: fatty acids, phytosterols, ursolic acid, glycosides, iridoid compounds. It is distinguished by a repulsive smell of leaves, stems and roots.

### MATERIAL AND METHOD

Because the leaves have purgative and emetic proprieties, for establishing their importance for naturist medicine there were made studies in 2013, on 10 lots of small elder plants, harvested from 10 different places from S-V Oltenia area, more precisely from Grecești village, Dolj county, in august, and preponderant soil in this area is argic chernozem.

For the determinations there were made soil analyses and analyses of *Sambucus ebulus* L. leaves, in order to determine the chlorophyll pigments, nitrogen, phosphorus, potassium and dried substance. 10 soil samples were taken from the places where the small elder leaves will be harvested.

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<sup>1</sup>Dr. Jianu Sorin, Executive director at DSVSA Mehedinți

<sup>2</sup> Conf.univ.dr. Daniela Laura Buruiană, Dunărea de Jos University from Galați

<sup>3</sup> Doc. Tănăsie Ștefania Eliza, UMF Craiova

<sup>4</sup> Prof.univ.dr. Alexandru Chiriac, Dunărea de Jos University from Galați

Table 1. Determination of chemical proprieties of argic chernozem harvested from the study area

Sample no.	pH	Nt	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Ah	SB	Humus
1.	6,15	0,191	4,1	11,5	2,71	16,8	2,16
2.	6,34	0,224	5,4	21,4	1,80	19,4	2,19
3.	6,46	0,21	5,2	14,8	2,16	19,2	2,14
4.	6,20	0,211	4,2	16,9	2,76	16,8	2,21
5.	6,25	0,216	3,8	17,5	2,14	18,0	2,24
6.	6,18	0,188	5,5	16,6	3,60	15,5	2,19
7.	6,20	0,210	4,2	16,8	2,72	16,7	2,20
8.	6,22	0,214	4,3	17,1	2,65	16,9	2,21
9.	6,27	0,219	4,0	18,1	2,17	17,6	2,26
10.	6.30	0,222	5,1	20,8	1,92	19,1	2,17

### The preparation of plants samples for analysis

The harvested samples (leaves) do not present visual symptoms of nutrition disorders and they are prepared for the established analyses program. Some leaves which have presented slight traces of dust have been wiped with a gauze or cotton pad softened in distilled water.

### The mineralization of vegetal material for determining nitrogen

For determining nitrogen was been used Kjendal method, by mineralization with sulfuric acid.

#### Procedure

From the sample of dried vegetal material and finely chopped it is weighed at analytical balance 1 g of material and it is introduced in a 250 ml Kjendal disintegration balloon. 5 g of catalyst mixture and 12.5 ml of concentrated sulfuric acid are added. The balloon is covered with a pear or glass funnel and the violent boil is avoided. The mineralization is considered done when the balloon content fades from brownish-yellow to colorless or slight green hue.

### The determination of gross protein. Total nitrogen

Total nitrogen content from the vegetal material is determined by wet mineralization, the sulfuric acid being widely used, in different variants of classical Kjendal method.

### The calculation and results expression

For the calculation of N content in % the next formula is used:

$$N_t \% \text{ from DS} = (V_1 - V_2) \cdot f \cdot 1000 \cdot 100 / m \cdot 1\,000\,000$$

where:

- DS = dried substance
- $V_1$  = ml of sulfuric acid used at titration of the analyzed sample
- $V_2$  = ml of sulfuric acid n/14 used at titration of the blind sample
- f = the factor of n/14 sulfuric acid solution
- m = the quantity of vegetal material taken for analysis in g
- 100 = the factor of percent reporting
- 1000= the factor for transformation of micrograms of N in g of N

In these conditions, the formula has the simplified form:

$$N_t \% \text{ from DS} = (V_1 - V_2) \cdot f \cdot 0,1$$

### The determination of phosphorus

The prepared materials are determined and read at the spectrophotometer when they are yellow, using the formula:

$$P\% = C \times V_t \times 100 / V_a \times m \times 1\,000\,000$$

where:

- C – the content of P in micrograms of the aliquot part used at color metering
- m – the quantity of vegetal material used at mineralization in grams

V<sub>t</sub> – the total volume of extract obtained at mineralization in ml

V<sub>a</sub> – the volume of aliquot part used in color metering

100 – the factor of percent reporting

1 000 000 – the factor of transformation of micrograms in grams



Figure 1. The determination of phosphorus from small elder plant

**The determination of K** is made by calcination, and the dosage of K is made by photometry of flame emission or potentiometry with selective electrode ion.



Figure 2. The extracts and the equipment used for determining K with flame photometer

The results obtained at the total K dosage from the vegetal material are expressed in percent from the dried substance.

$$\text{K\% from DS} = C \times V \times r \times 100 / m \times 1000\ 000$$

$$\text{K\% from DS} = C \times V \times r / m \times 10\ 000$$

where:

**C** – the concentration in micrograms K per ml, found on the calibration curve

**V** – the volume of diluted solution used at the dosage in ml

**r** – the dilution report used

**m** – the quantity of vegetal material used at mineralization in grams

### The determination of carotene and chlorophyll pigments

5 g from the fresh substance from the analyzed plant sample is weighted and milled very well, then 25-30 ml of ethyl alcohol are added, in small glasses of 50 ml.

The next day this is filtered and brought at the sign (50 ml) with alcohol. The readings are made at the photo-colorimeter and the results are introduced in the calculation formula.

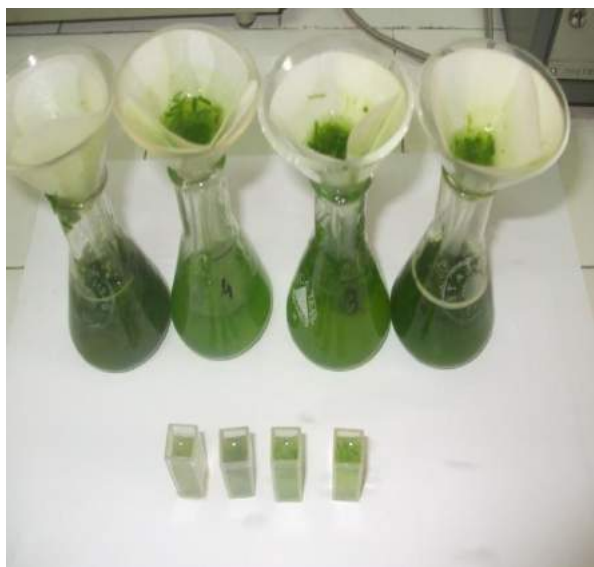


Figure 3. The preparation of samples for determinations



Figure 4. The sample reading at the photo-colorimeter



Figure 5. The extract used for determining the carotene



## RESULTS AND DISCUSSIONS

Table 2

The biochemical determinations obtained from *Sambucus ebulus* plant

Variant	Nitrogen %	Protein %	P <sub>2</sub> O <sub>5</sub> %	K <sub>2</sub> O %	Chlorophyll pigments			Dried substance g %
					Ca	Cb	K	
1	3,11	19,4	1,96	1,65	10,615	4,722	3,962	28,53
2	3,02	19,4	1,91	1,58	10,215	4,658	3,891	28,51
3	3,07	19,5	1,93	1,61	10,428	4,719	3,944	28,54
4	3,11	19,02	1,95	1,64	10,602	4,718	3,955	28,52
5	3,09	19,2	1,94	1,63	10,602	4,709	3,951	28,50

6	3,12	19,01	1,96	1,65	10,617	4,720	3,949	28,52
7	3,07	19,5	1,93	1,62	10,528	4,702	3,953	28,52
8	3,09	19,6	1,94	1,63	10,609	4,711	3,952	28,53
9	3,13	19,2	1,90	1,65	10,587	4,723	3,950	28,51
10	3,10	19,01	1,92	1,64	10,602	4,718	3,900	28,50

## CONCLUSIONS

- The biochemical substance from the leaves of indigenous species of *Sambucus* genus were studied qualitative and quantitative.
- From leaves a 5% infusion can be made, being used as diuretic, sudorific, for cough and for cleaning heavy throat.
- A certain limit must not be overcome because it becomes emetic.
- For laxative purposes a cup of infusion per day can be served.
- The small elder effect is very strong, because of that must not overcome the recommended dosage.
- The small elder, as plant used like naturist remedy, is contraindicated for weak persons, suffering of diarrhea, IBS, hyperacid gastritis, persons with stressed emetic sensation.

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