



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

## Morphological variability of aboveground shoots of *Sambucus ebulus L.* at introduction.

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**Introduction: *Sambucus ebulus L.*** - A perennial herbaceous plant with an unpleasant odor, formerly classified in the Caprifoliaceae, and currently in the Adoxaceae family. This is a tall plant, up to 150 cm, with decussately opposite leaf arrangement, imparipinnate compound leaves with 5-9 or 11 leaflets and small actinomorphic flowers with a double four- or five-membered perianth. Thus, *Sambucus ebulus L.* exhibits polymorphism in the structure of the leaf and corolla, what determines the relevance of our study.

**Aim of the work.**

The aim of this work was to identify the variability of leaves and flowers of *Sambucus ebulus L.* in result of introduction.



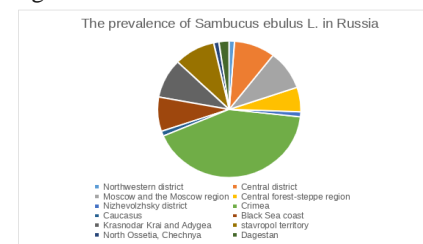
**Fig. 1 *Sambucus ebulus L.* on Beketovsky zasekah**

**Materials and methods**

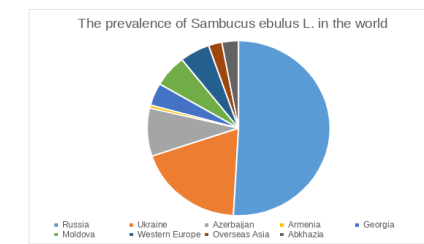
Specimens of *Sambucus ebulus L.* were studied in a natural population in the Shakhmatovo estate museum of the Solnechnogorsk district of the Moscow region at the Beketovsky abatis in 2024. During the study, 12 plants of generative age were examined. In this place, *Sambucus ebulus L.* was planted by Andrei Nikolaevich Beketov (1825 – 1902), a famous Russian botanist, geographer, professor, rector of the St. Petersburg University, and grandfather of A. A. Blok.

**The place of distribution of *Sambucus ebulus L.***

*Sambucus ebulus L.* is a synanthropic plant that grows near houses, roads and parks. Having analyzed the data of the digital herbarium of Moscow State University, it was revealed that the largest part of the area of distribution of *Sambucus ebulus L.* is concentrated in the eastern part of Europe (Russia, Ukraine, Abkhazia, Georgia, Moldova, Armenia) and the northern part of Asia (Fig. 3). In Russia, this species most often grows in Crimea, to a lesser extent in Moscow, Krasnodar Krai, Stavropol Krai, the Central region of Russia and the Black Sea coast (Fig. 4).



**Fig. 3 Distribution of *Sambucus ebulus L.* in the world**



**Fig. 4 Distribution of *Sambucus ebulus L.* in Russia**

**Flowers of *Sambucus ebulus L.***

The flowers of *Sambucus ebulus L.* are small, actinomorphic with a double perianth, collected in flat apical corymbose-paniculate inflorescences. The calyx is regular and consists of small, free sepals equal in number to the petals. The corolla is regular, sympetalous, wheel-shaped, and includes 3-5 white rounded petals. Androecium is polyfraternal. Gynoecium is coenocarpous. There are 3 varieties of corolla: with 3, 4 and 5 petals. Having studied a sample of 1158 flowers in a natural population according to the trait “the number of corolla petals”, the frequency of occurrence of flowers with different numbers of petals was revealed, among which the least common are flowers with 3 petals (5:1158=0.0043) and flowers with 4 petals (143:1158=0.1234). The most common are flowers with 5 petals (1010:1158=0.8722).



**Fig.5 Flower with 5 petals**



**Fig.6 Flower with 4 petals**



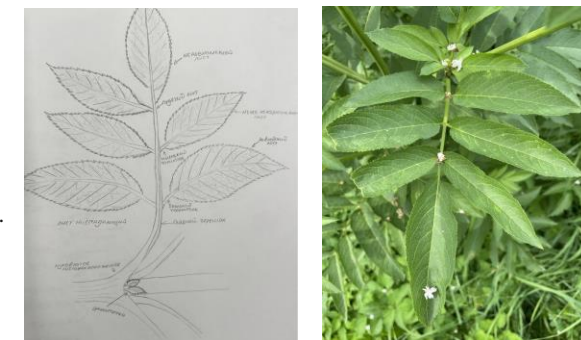
**Fig.7 Flower with 3 petals**

**Leaves of *Sambucus ebulus L.***

The Leaves of *Sambucus ebulus L.* are compound imparipinnate. The upper leaflets are unequalsided and sessile; the lower they are on the leaf, the more equalsided they become and acquire a petiolule, which also varies in size depending on its position on the rachis. Dissection of the outer leaflets on the lowermost leaves was observed in some specimens. The number of leaves on plants varies from 6 to 12 pieces, the number of leaflets on the leaves varies - from 5 to 13. The studied sampling consisted of 120 leaves. The frequency of occurrence of the trait “number of leaflets in a leaf” ranges from 0.0167 to 0.383. It was found that leaves with 9 or 11 leaflets occur more often, leaves with 5, 7, 10 and 13 leaflets occur less often. The frequency of occurrence of leaves according to observations:

- With 13 leaflets 0.0167
- With 11 leaflets 0.275
- With 10 leaflets 0.0416
- With 9 leaflets 0.383
- With 7 leaflets 0.183
- With 5 leaflets 0.1

Variability in the size of *Sambucus ebulus L.* leaflets was studied on a sampling of 20 leaves from different plants. The average value of leaflet width is 3.0477+-0.0680. The average value of leaflet length is 9.8580+-0.2365. Coefficient of variation of leaflet width 25.8490, of leaflet length 27,7740. Variation curves were plotted (Fig. 8)



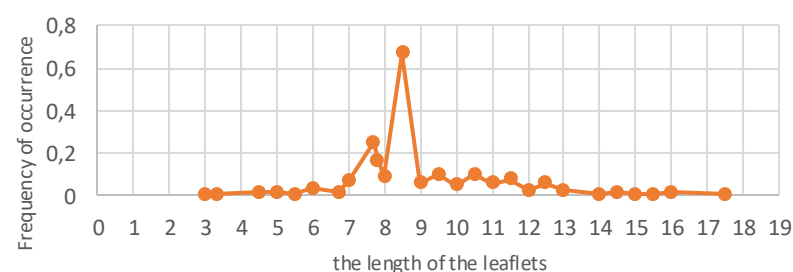
**Fig.8 *Sambucus ebulus* leaf**

**Frequency of occurrence of leaflets per leaf in individual plants**

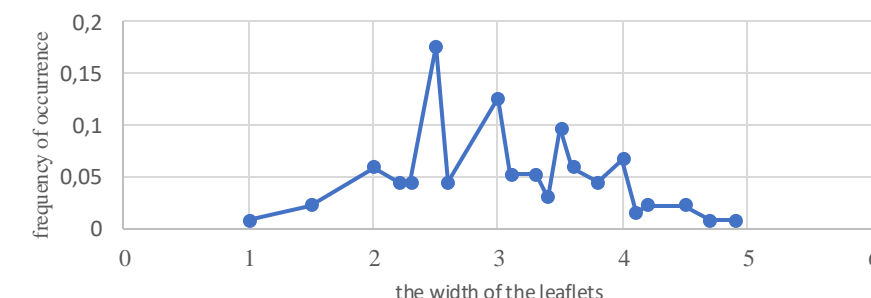
**Table 1.**

| Quantity leaflets | №1   | №2   | №3  | №4  | №5  | №6   | №7  | №8   | №9  | №10 | №11  | №12 |
|-------------------|------|------|-----|-----|-----|------|-----|------|-----|-----|------|-----|
| 13 leaflets       | 0,17 | 0    | 0   | 0   | 0   | 0    | 0   | 0    | 0   | 0   | 0    | 0   |
| 11 leaflets       | 0,6  | 0    | 0,4 | 0   | 0   | 0,5  | 0,2 | 0,33 | 0   | 0   | 0,67 | 0,7 |
| 10 leaflets       | 0    | 0    | 0   | 0   | 0   | 0    | 0   | 0    | 0,4 | 0   | 0    | 0,1 |
| 9 leaflets        | 0,33 | 0,5  | 0,4 | 0,2 | 0,8 | 0,25 | 0,4 | 0,33 | 0,6 | 0,6 | 0,17 | 0   |
| 7 leaflets        | 0    | 0,17 | 0,2 | 0,8 | 0,2 | 0,25 | 0   | 0,33 | 0   | 0,4 | 0    | 0   |
| 5 leaflets        | 0    | 0,33 | 0   | 0   | 0,2 | 0    | 0,2 | 0    | 0   | 0   | 0,17 | 0,2 |

**The variation curve of the variability of the length of the leaflets of the *Sambucus ebulus L.***



**Variation curve of leaflets width variability**



**Graph 1 and 2 Variation variability of leaflets length and width**

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