

BIOMETRICAL CONTRIBUTIONS REGARDING THE REPRODUCTIVE SYSTEM OF TWO SALIX SPECIES FROM THE CENOSIS OF PRAHOVA RIVER MEADOW (PUCHENI)

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Abstract

The biometry of female and male flowers was followed, for two species (Salix alba and Salix fragilis), with a 76 chromosomes karyotype, for which the vegetative development is different from the 38 chromosomes karyotype, in the cenosis of Prahova River, near Pucheni.

INTRODUCTION

The study followed the development of the reproductive system for two *Salix* species, frequently encountered in the cenosis of the Prahova River meadow, having as main criterion the rapid multiplication. During the flowering phenophasis, the biometry of the floral elements was evaluated.

The importance of the study is related to the rapid multiplication of the two species, which determines the soil stabilization in case of river flow fluctuation.

MATERIAL AND METODS

The biological material belongs to the *Salix* gendre, harvested from Prahova River meadow (Pucheni, the 30th of April 2010).

The two studied species were: *Salix alba* and *Salix fragilis*. The male and female catkins were analysed and the following biometrical determinations were performed: number of catkins on the shoot, length of the peduncle (mm), length of the catkin (mm), thickness of the catkin (mm); for the female catkins, the gynoecia were analysed regarding: the length of the bracteate, the length of the pedicel (mm), the length of the ovary (mm), the thickness of the ovary (mm), the shape index of the ovary (the length/thickness ratio), the length of the still (mm), the length of the stigma (mm); for the male catkins the stamens were determined, regarding the bracteate length (mm), the length of the filament (mm) and the length of the anthers (mm).

RESULTS AND DISCUSSION

Salix alba has an average of eight catkins on the shoot, the catkin being located at the basis of 3-4 leaves. The length of the catkin varies from 25 to 52 mm, with an average of 38.5 mm. The thickness of the catkin varies from 5 to 10 mm, with an average of 7.85 mm (different from the data reported by Dămăceanu)[2]. The peduncle of the catkin has a minimum length of 9 mm and a maximum length of 14 mm, with an average of 11.35 mm. The number of gynoecia of a catkin varies from 48 to 87, with an average of 68, disposed helicoidally on the axis (Figure 1).



Fig. 1. Section through the catkin ♀ of *S. alba* (a. longitudinal. b. transversal)

The length of the bracteate of the gynoecium varies from 2 to 2.8 mm, with an average value of 2.22 mm. The pedicel of the the gynoecium has a length of 0.5 mm (along with the nectaria, as reported by Dihoru and colab. 2004)[3]. The length of the ovary varies between 4 and 5 mm, with an average of 4.38 mm. The thickness of the ovary varies between 1 and 1.5 mm, with an average of 1.14 mm. The shape index of the ovary varies between 2.66 and 5, with an average of 3.94. The length of the still is comprised between 0.3 and 0.5 mm, with an average of 0.45 mm. The stigma has a length of 0.3-0.5 mm, with an average of 0.46 mm. There is an average of 11 male catkins on the shoot, which appear at the basis of 3-4 leaves (Figure 2).

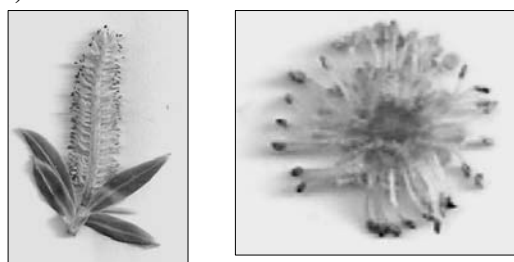


Fig. 2. Section through the catkin ♂ of *S. alba* (a. longitudinal b. transversal)

The length of the catkin varies between 30 and 53 mm, with an average of 39.6 mm (different from the data reported by Părvu 2006)[5]. The thickness of the catkin varies from 6 to 9 mm, with an average of 7.95 mm. The peduncle of the catkin has

a minimum length of 4 mm and a maximum length of 11 mm, with an average of 6,65 mm. The number of stamens from a catkin varies from 76 to 120 mm, with an average of 100 mm, disposed helicoidally on the axis. The length of the bracteate of the stamen varies from 1.8 to 3 mm, with an average value of 2.14 mm. The filament of the stamen has a length comprised between 3 and 4 mm, with an average of 3.47 mm. The length of the anther (free, as reported by Ocsksai Suzana and colab., 1973)[4] is comprised between 0.3 and 0.5 mm, with an average of 0.46 mm.

Salix fragilis has an average of 5 female catkins on the shoot, the catkin appearing at the basis of 3-4 leaves. The length of the catkin varies 30 and 70 mm (7 cm after Beldie-1996)[1], with an average of 64.65 mm. The thickness of the catkin varies between 5 and 10 mm, with an average of 7.45 mm. The peduncle of the catkin has a minimum length of 25 mm and a maximum one of 40 mm, with an average of 30.45 mm. The number of gynoecia from a catkin varies from 76 to 126, with an average of 101, helicoidally disposed on the axis (Figure 3).



Fig. 3. Section through the catkin ♀ of *S. fragilis* (a. longitudinal b. transversal)

The length of the bracteate (long and hairy, as reported by Beldie 1996)[1] of the gynoecium varies between 2 and 2.2 mm, with an average of 2.06 mm. The pedicel of the gynoecium (which represents 1/4 or 1/5 of the length of the ovary- Dihoru and colab., 2004)[3] has a 0.5 mm length. The length of the ovary is comprised between 2.8 and 3 mm. The thickness of the ovary is 1mm. The shape index of the ovary varies from 2.8 to 3, with an average value of 2.99. The still length is 0.5 mm - value confirmed by Dihoru et al., 2004[3]. The stigma has a length comprised between 0,5 and 0,7 mm, with an average value of 0.55 mm.

The male catkins appear before the leaves, or at the same time with the leaves on the shoot, and are in average of 5, located at the basis of 3-4 leaves. The length of the catkin varies between 25 and 49 mm, with an average of 39.35 mm (2-5 cm, as reported by Șofletea et al. 2001)[6]. The thickness of the catkin varies between 5 and 8 mm, with an average of 7.25 mm. The peduncle of the catkin has a minimum length 12 mm and a maximum length of 17 mm, with an average of 15 mm.

The number of stamens of a catkin varies between 58 and 81, with an average of 70 (the male flower is formed by two free stamens - Dihoru și colab 2004)[3], helicoidally disposed on the axis (Figure 4).

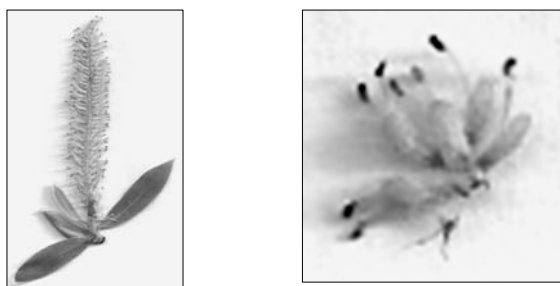


Fig. 4. Section through the catkin ♂ of *S. fragilis* (a. longitudinal b. transversal)

The length of the bracteate of the stamen is 2 mm. The length of the filament of the stamen is comprised between 2 and 3 mm, with an average value of 2.49 mm. The length of the anther is comprised between 0.5 and 1 mm, with an average of 0.685mm.

CONCLUSIONS

1. For *Salix alba*, the female catkin is around 42% smaller than the one of *Salix fragilis* and the explanation consists in the latter flowering.
2. The male catkin for both species is smaller than the female one, the explanation being related to the simpler tissular morphology.

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