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Morphological and cytogenetic characterization in native populations of *Hedeoma multiflorum* Benth

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ABSTRACT

The great diversity of environments that characterizes Argentina allows the development of an important floristic richness, represented by a high proportion of aromatic and medicinal plants. About forty native species are for industrial use. One of them is *Hedeoma multiflorum* Benth. known as "Tomillito de las Sierras", an aromatic herb highly required for their digestive properties. This species is harvested by collecting wild plants, which generates little sustainable forms of extraction that leads to the risk of genetic erosion and disappearance of species. Therefore, is necessary to deepen the basic knowledge of the species both cytogenetic and the characteristics of germination and growth for better management. The objectives of this study were to know the chromosome number and determine culture conditions of *Hedeoma multiflorum* Benth. populations growing in the province of Córdoba. For populations under study the chromosome number was confirmed 2n = 72 chromosomes cited for the species, and found that in different substrates remain differences among populations in both germination and height of plants.

Keywords: *Hedeoma multiflorum*, somatic chromosomic number, cultivations conditions

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Introduction

Hedeoma multiflorum Benth. is an aromatic herb highly required for their digestive properties. This species is harvested by collecting wild plants (Barboza *et al*., 2006). This situation generates little sustainable forms of extraction that lead to the risk of genetic erosion and extinction of species (FAO, 1996; López, 1996). Because of the rudimentary and partial use of Tomillito de las Sierras, like most species of native flora, is indispensable its systematic study, for which is necessary to deepen the basic knowledge of the species both cytogenetic and the characteristics of germination and growth for better management. The objectives of this study were to know the chromosome number and determine culture conditions of *Hedeoma multiflorum* Benth. populations growing in the province of Córdoba, Argentina.

Experimental

Seeds of *Hedeoma multiflorum* were collected from wild plants from different regions of the province of Córdoba, which were named as follows: Population 1: from Salsacate, Pocho Department; Population 2: from Villa Las Rosas, San Javier Department; and Population 3: from Santa María, Punilla Department. To determine the condition of propagation and production of seedlings the development of the three populations was compared in different substrates:
Substrate 1: sterilized soil + vermicompost + hydrophilic beads
Substrate 2: black soil + sand + small stones

For sowing, plastic trays were used of 5 cm high and 16 cm wide and 23 cm long. On each tray 30 seeds were sown of one population, and there were two replicates per treatment. All three populations were characterized in relation to: germination %, plant height in the different substrates used, among others.

For mitotic chromosome counts rootlets were used of 0.5 cm in length, pretreated with saturated solution of paradichlorobenzene and stained with Feulgen technique (Matzke *et al*., 1994).

Each of the characters was statistically analyzed by ANOVA, and differences between means were determined through the Fisher LSD test.

Results and discussion

For populations under study the chromosome number was confirmed 2n = 72 chromosomes cited for the species (Fig. 1).

In Argentina there are very few aromatic species of our native flora, for which a count was made of chromosomes, which are generated basis for progress in cytological characterization of the species and populations.

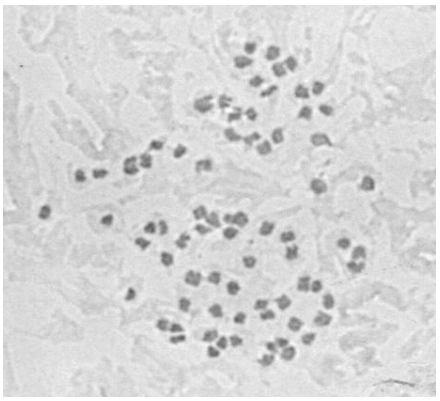

Figure 1: Somatic chromosomic number for *Hedeoma multiflorum*

It was found that in different substrates remains differences among populations in both germination and height of plants, having a better development in the Substrate 1 (Fig. 2, Fig. 3 and Fig. 4). As to germination, Population 3 presented the highest percentage of germination in the Substrate 1, being the one that germinated to a lesser extent in Substrate 2 (Fig.2 and Fig.3). In the test conducted with different substrates, number 1 could be selected because it allowed germination levels of 40% or more depending on the population.

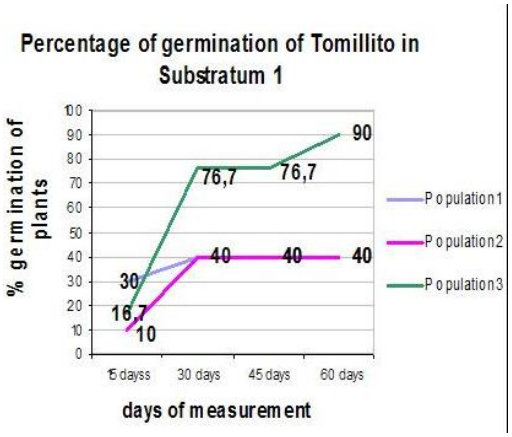

Figure 2: Germination percentage of the three populations of *H. multiflorum* in Substrate 1.

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Regarding to plant growth, Population 1 showed further development (Fig.4). Also found statistically significant differences between populations of *H. multiflorum* under study, among substrates and in the interactions for other characters analyzed. Differences have been established among populations in the characters evaluated in this work, which encourages us to continue with studies in other aspects, with the aim of domesticating these species.

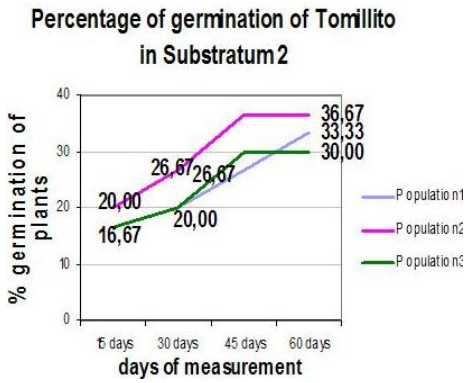

Figure 3: Germination percentage of the three populations of *H. multiflorum* in Substrate 2

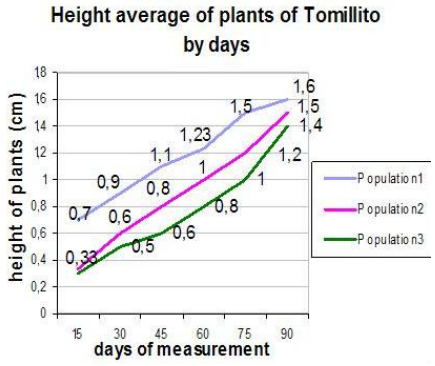

Figure 4: Height average of plants of the three populations of *H. multiflorum* in Substrate

The response of each population against the different substrates is expected in native species, due to the adaptation showed to the different environments where they develop, many times leading to the generation of ecotypes.

Conclusion

The determination of the somatic number of the species was performed. It was established that there are differences between populations, and that they respond differently depending on the substrate.

All this, along with the study of culture conditions of *H. multiflorum*, constitute an important contribution in relation to the characterization of native germplasm of aromatic and medicinals species.

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Note: Part of this study was presented at the 'II Reunión de Biotecnología aplicada a plantas medicinales y aromáticas' (Second Biotechnology Meeting on Medicinal and Aromatic Plants), Córdoba, Argentina, 2009.

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