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THE CHOROLOGY OF PLANTAGO MAXIMA (PLANTAGINACEAE) IN ROMANIA

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ABSTRACT

Plantago maxima belongs to the genus Plantago, which comprises herbaceous species, rarely of woody consistency (P. sempervirens).

The plant analyzed in the present study represents a native and relict taxon that is present in several settlements in Romania: Turnişor, Şura Mică, Ocna Sibiului, Şesul Măcelarilor, Drechea (Sibiu County), and Coţofenii din Faţă (Dolj County).

The present paper brings important information about the chorology of this species in Romania. It was identified within the following villages: Cârcea, Lișteava, Radomir, and Poiana Mare from Dolj county. The number of individuals identified in the new settlements is comprised between four and twenty-two. Almost all specimens have reached the fruiting stage, which proves that the populations are characterized by viability and stability. The main causes that could trigger the reduction of the populations of this species are the decrease in the water regime and the influence of the zoo-anthropogenic factor.

INTRODUCTION

Plantago maxima Juss. ex Jacq., Collect. Butt. 1: 82 (1787). (Plantaginaceae), (fig. 370). (Paucă 1961; Moore 1976). [FRE 3082 - Borza et al. 1968] represents a post-glacial (anathermal) relict that is present in the flora of Romania (Sârbu et al. 2013) and belongs to the Plantaginaceae family (Ball 1976, Ciocârlan 2000, 2009, Sârbu et al. 2013).

It is a native plant widespread from Hungary to Siberia and Mongolia (Fig. 1) (Grigoriev, 1958). According to Schneider-Binder (1978), this species has a Ponto - Pannonian - SW Siberian distribution. Since 2007, it is also mentioned in the flora of Bulgaria (Tzonev & Karakiev 2007).

In the spontaneous flora of Romania, there are eighteen species belonging to the Plantago genus. Out of these species, nine are sporadic (*Plantago scabra* Moench, *P. maritima* L., *P. tenuiflora* Waldst. et Kit., *P. altissima* L., *P. argentea* Chaix, *P. schwarzenbergiana* Schur, *P. cornuti* Gouan, *P. gentianoides* Sibth. et Sm. and *P. uliginosa* F.W. Schmidt), four are rare (*P. coronopus* L., *P. holosteum* Scop., *P. strictissima* L. and *P. maxima* Juss.), one is very rare (*P. sempervirens* Cr.; Pușcaș et al., 2003), and four are frequent (*P. lanceolata* L., *P. atrata* Hoppe, *P. media* L. and *P. major* L.) (Ciocârlan 2000, 2009, Sârbu et al. 2013) .

According to *Flora Europaea*, vol. IV (Chater & Cartier, 1976), the species *Plantago subulata* L. also grows in Romania, but the presence of this plant must be confirmed (Sârbu et al. 2013).

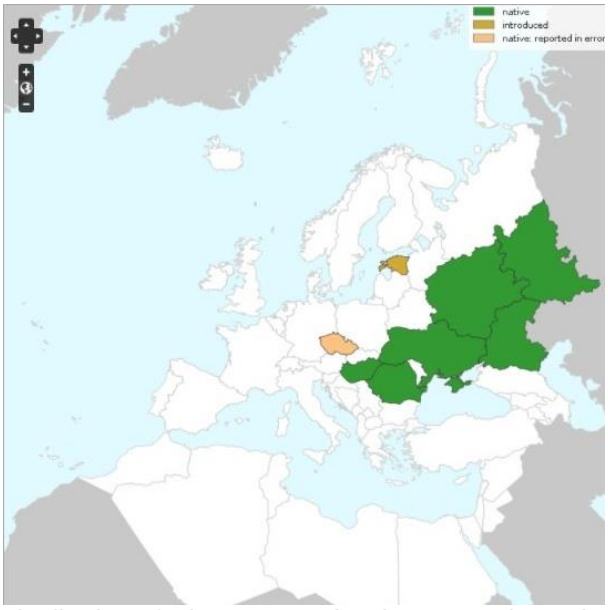

Figure 1. Distribution of *Plantago maxima* in Europe (europlusmed.org)

Ianovici N. et al. (2010) contributed with information regarding the morphology and anatomy of the species belonging to the genus Plantago within Romania.

In Oltenia, the species was mentioned from marshy areas located in the Coțofenii din Față village (Dolj County) (Buia & Popescu 1952).

MATERIAL AND METHODS

The research methods employed in carrying out this work involved numerous field trips conducted in different periods of the year, with the aim of identifying a material that would allow a correct determination. Another method dealt with the analyzes of the herborized and fresh material, followed by its comparison with the other species of the genus Plantago, which allowed us to identify the morphological characters and to highlight the differences that exist between them.

The plant material identified in different settlements of Oltenia was photographed in place and then collected (in few specimens), botanized and included in the herbarium of the University of Craiova (C.R.A.). Field and laboratory research was conducted during the period 2019-2022 and the determination of the identified material was carried out by using the Romanian and foreign specialized literature (Ball 1976; Beldie 1979; Ciocârlan 2000, 2009; Sârbu et al. 2013).

RESULTS AND DISCUSSIONS

Plantago maxima Juss. ex Jacq. is a tetraploid species (2n=24) (Magulaev 1982), with a chromosome number comprised between 82 and 83, according to IPCN (Index to Plant Chromosome Numbers).

It is easily recognized by several morphological characters, which are visible both on fresh material (ovate or up to elliptic leaves, with the petiole longer than the limb - Fig. 2, 3, 4), as well as on the herborized one (a slight blackening of the material occurs when it is dehydrated - Fig. 3, 4, 5).

The specialized field literature mentions the species from Oltenia and from the Sibiu Depression (Oprea 2005; Dihoru & Negrean 2009), i.e. DJ: Coţofenii din Faţă (Buia & Popescu 1952). SB: "between Sibiu and Şura Mică, Ocna Sibiului, Turnişor" (Paucă 1961); between Ocna Sibiului and Şura Mică (Schur 1866); "In campis humidis inter pagos Turnişor et Şura Mică", alt. c. 350 m, 4.VIII.1948, E. Ţopa [FRE 3082; BUC 308.844] (Borza et al., 1968); Turnişor towards Şura Mică, on the side of the road, alt. 270 m, 4.VIII.1948, E. Ţopa [BUC 308.845] (after Ţopa 1948 – from Dihoru & Negrean 2009); between Sibiu - Turnişor - Şura Mică - Ocna Sibiului, Pariul Ruscior!, Pariul Strâmb especially at Drenchea, Şesul Măcelarilor (Schneider-Binder 1978, 1980, Drăgulescu 2003); Sibiu (according to Ţopa & Doltu 1965, 1967 – from Dihoru & Negrean 2009); Pariul Ruscior, VII.1976, G. Negrean [BUCA].

During the four years of field research, the species was identified in several settlements located in Dolj county: Cârcea (44.261414 N; 23.877035 E; 44.261330 N, 23.877230 E), Poiana Mare (43.905434 N; 23.057091 E), Radomir (44.123775 N; 24.155525 E), and Lișteava.

At this time, the presence of the species in the Coțofenii din Față settlement - Dolj county is questionable (Răduțoiu & Ștefănescu 2021). The lack of precipitation during recent years in this part of the country and the very strong influence of the anthropogenic factor are the main factors that led to its disappearance from this location.

It grows on weakly acidic to alkaline soils (weakly acidic-neutrophilic), in wet locations, as it does not withstand prolonged dryness.

Between four and twenty-two specimens were counted in the areas where the species was identified. All of them are present on flat lands, located near streams or ponds of temporary type; these were slightly compacted, fallow areas, with no erosion and with slightly more significant humidity. An anthropic influence on these phytocenoses can also be observed.

From a phytosociological point of view, *Plantago maxima* was identified in phytocenoses belonging to the association *Trifolio-Lolietum perennis* Krippelová 1967. On the analyzed surfaces, the vegetation coverage is between 80 and 100%.

The presence of the species in areas with tourist potential can lead to the reduction of its range. Practicing quality tourism brings multiple advantages to areas with tourist potential (Călina & Călina 2022) that harbor valuable species.

Figure 2. *Plantago maxima* identified in Lișteava village (orig.)

Figure 3. *Plantago maxima* identified in Cârcea village (orig.)

Figure 4. *Plantago maxima* identified in Lișteava village (orig.)

Figure 5. *Plantago maxima* identified in Radomir village (orig.)

CONCLUSIONS

The present paper provides information regarding the chorology of the species *Plantago maxima* Juss. ex Jacq. from Romania. The absence of the plant from the Coțofeni village, where the specialized field literature mentions it, is triggered by the very strong influence of the anthropogenic factor in the respective area and by the lack of precipitation that characterized this part of Romania during recent years.

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