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Original scientific paper

ANISANTHA DIANDRA (ROTH) TUTIN AND OCHLOPOA INFIRMA (KUNTH) H. SCHOLZ - NEW SPECIES OF POACEAE FAMILY IN REPUBLIC OF MACEDONIA

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The horological data for two new plant species of the flora of the Republic of Macedonia are presented - *Anisantha diandra* (Roth) Tutin and *Ochlopoa infirma* (Kunth) H. Scholz (Poaceae). The species *Anisantha diandra* is registered in several localities in the Republic of Macedonia (Skopje, Ohrid, Tetovo), while the species *Ochlopoa infirma* was found only in the vicinity of Bogdanci. A short description is given of the differential morphological characteristics of both species, as well as the habitats to which they are registered. Both species can be considered as native autochthonous for the flora of the Republic of Macedonia.

Key words: *Anisantha diandra*, *Ochlopoa infirma*, Poaceae, Flora, Distribution, Republic of Macedonia

INTRODUCTION

The Poaceae family is not yet processed in the edition "The Flora of the Republic of Macedonia". It is one of the unresearched groups of vascular plants on the territory of the Republic of Macedonia. Besides the comprehensive contributions to the genera *Poa* and *Festuca* [1–5], in the last 30 years, certain data on the distribution of several rare taxa from this family are cited in the literature [6–9].

In the paper, new horological data of the species *Anisantha diandra* (Roth) Tutin and *Ochlopoa infirma* (Kunth) H. Scholz for the flora of the Republic of Macedonia are presented. Both genera have complicated nomenclatural history [10–13] and cover a relatively small number of annual plants, mainly prevalent in the wider area of the Mediterranean.

EXPERIMENTAL SECTION

Herbarium specimens of the species *Anisantha diandra* and *Ochlopoa infirma* from the Macedonian National Herbarium at the Faculty of

Natural Sciences and Mathematics in Skopje (MKNH) were used, which provide basic geographical and environmental data about the localities and habitats where they were collected.

When determining the herbarium material, appropriate literature was consulted (Prodromus Florae peninsulae Balcanicae, III [14]; Flora Europaea, V [15, 16], and other regional floras). The taxonomy and nomenclature is consistent with Euro+Med Plant base [17, 18].

Besides that, an attempt has been made to determine the level of nativeness of each species according to the CABI site - Invasive Species Compendium [19], as well as their status of endangerment in Europe, according to IUCN [20].

RESULTS AND DISCUSSION

***Anisantha diandra*(Roth) Tutin**

[Syn.: *Bromus diandrus* Roth; *Bromus gussonei* Parl.]

Mk Skopje: Settlement Aerodrom, Reonski Centar, ruderal habitat; 41°58'40.71"N, 21°28'37.54"E, 23.05.2018 (leg. et det. M. Kostadinovski) (MKNH);

Skopje: Settlement Aerodrom, Reonski Centar, in front of the market "Kam". 41°58'47.82"N; 21°28'28.87"E 235 m. 4.06.2010 (leg. et det. M. Kostadinovski) (MKNH); Ohrid: Ljubanište, ruderal habitat next to the camp, 40°55'24.85"N; 20°45'52.06"E, 25.06.2008 (leg. V. Matevski & M. Kostadinovski) (MKNH); Tetovo: village Sarakino, the right bank of the river Vardar. 12.09.2010; 41°58'45.48"N; 21° 2'54.35"E 4016 m (leg. et det. M. Kostadinovski) (MKNH).

The genus *Anisantha* is widely distributed in Europe, which includes annual herbaceous plants. Key differential morphological characteristics in which the genus *Anisantha* is differentiated from the genus *Bromus* is the appearance of the spikelet (which are wider towards the top than in the middle), as well as the length of the awn (which is longer than the length of the karyopsis). The genus *Anisantha* in Europe is represented by 10 species, from which the species *A. sterilis* and *A. tectorum* have been known in Macedonia so far [15, 17].

The species *Anisantha diandra* spreads to the Mediterranean and Southwestern Europe (Balears,

Corsica, Crete, France, Greece, Spain, Italy, the former Yugoslavia), Portugal, Sardinia, Sicily, Tunisia [*Az Be Br Rs (K)] [15, 17]. This species is also cited as a native for North Caucasus, the north of the European part of the Russian Federation and Ukraine [17]. In some countries, such as England, Germany, Ireland, Belgium and Luxembourg and others, the species is introduced, and in other countries it may also have invasive status (Syria, Jordan, Australia, Mexico and others) [19].

So far there is no assessment of the status on the IUCN Red List for Europe [20].

Anisantha diandra is very similar to the widespread species *A. sterilis*, which often comes to the same habitat. This similarity may be the reason that so far the species *A. diandra* has been unnoticed. *A. diandra* from *A. sterilis* separates with the larger dimensions of the elements of the spikelet and the flower, especially with larger glume, lemma and lemma's awn. Quite clear differences are also found in the characteristics of sheaths indumentum and the leaves, as well as the stem directly below the inflorescence.

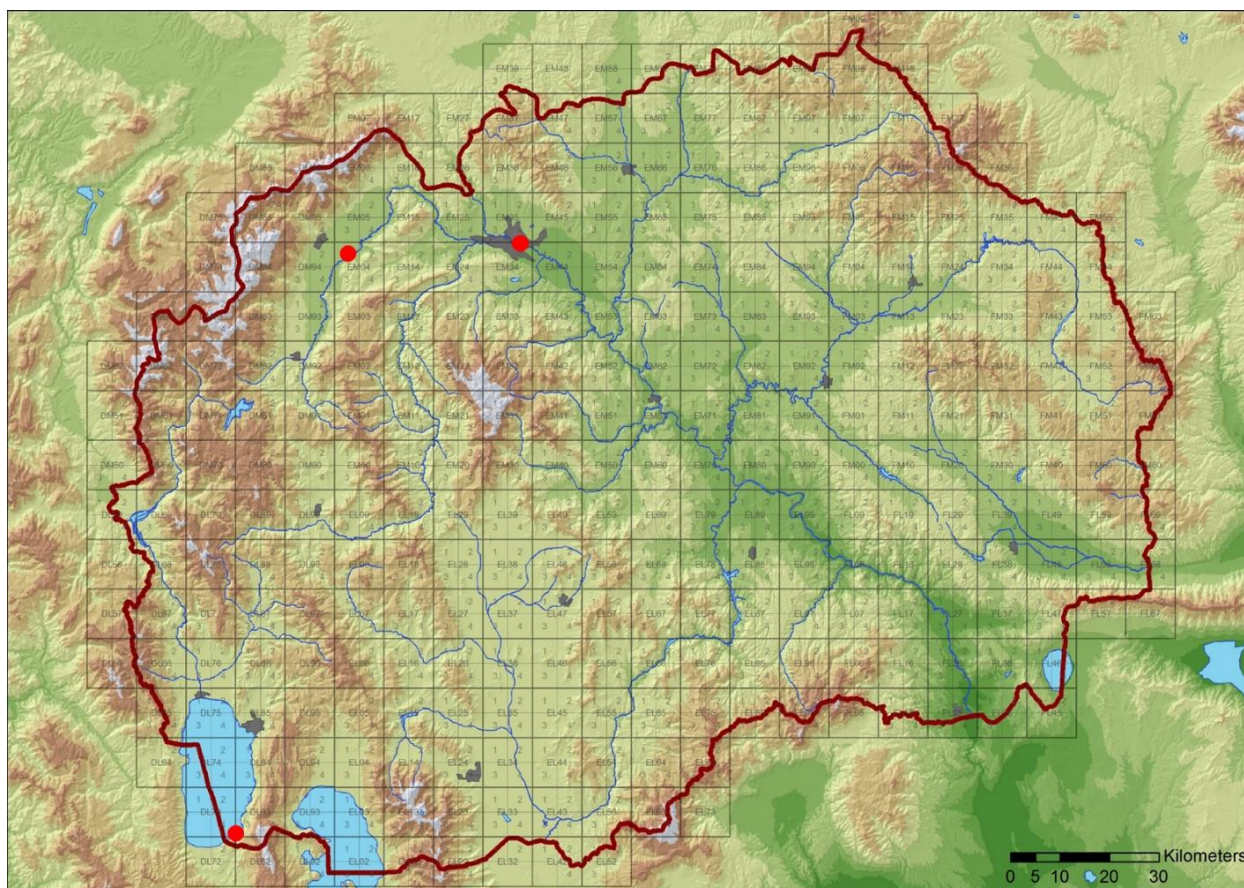


Figure 1. *Anisantha diandra* – Map of distribution in the Republic of Macedonia

Herbarium specimens of *A. diandra* were collected in the city of Skopje (Settlement Aerodrom, the district of Reonski Centar), in the vicinity of the village of Sarakino (Tetovo) and along the coast of Ohrid Lake near the village of Ljubaniste (Ohrid) (Figure 1). It grows in ruderal habitats, often near to the water bodies. In pioneering ruderal communities in which it occurs in Skopje, dominant species are *Cynodon dactylon*, *Chenopodium album*, *Anisantha sterilis*, *A. tectorum*, *Diplotaxis muralis* and others. For now, it is not possible to determine with certainty the degree of nativity, although its range in Europe ([15], [17]), and the environmental requirements, suggest that the species is considered as native in the flora in Macedonia.

***Ochlopoa infirma* (Kunth) H. Scholz**

[Syn. *Poa infirma* Kunth in Humb.; *P. annua* subsp. *exilis* (Tommasini) Murb.).]

Mk Bogdanci: near to the damp Paljurci (13.04.2001; 12.04.2003 leg. V. Matevski); Bogdanci: next to the river Gabroška Reka in the zone with *Quercus coccifera*; (41°13'11.16"N; 22°35'56.44"E; 117 m, 12.03.2011, leg. M. Kostadinovski).

The genus *Ochlopoa* in Europe is represented by eight species of annual plants [16], [17]. Interestingly, in Euro+Med Plant Base [17], not a single species of this genus is mentioned for Macedonia, although the species *O. annua* is very often plant in various grassland phytocenoses in our country ([21], [22], [23], [24]).

The species *Ochlopoa infirma* spreads mainly in the Mediterranean region of Europe, Africa and Asia (including the Black Sea), Portugal and the United Kingdom. With the status of introduced species is in Austria [19].

The species is still not endangered according to IUCN Red List in Europe.

In the Republic of Macedonia, the species has been registered on several occasions in the vicinity of Bogdanci. It develops on trampled habitats and other open habitats in the pseudomaquis belt, which are strongly with Mediterranean influence. From the nearby *O. annua* it differs with the spikelets with rather distant florets, and with the smaller anthers [16].

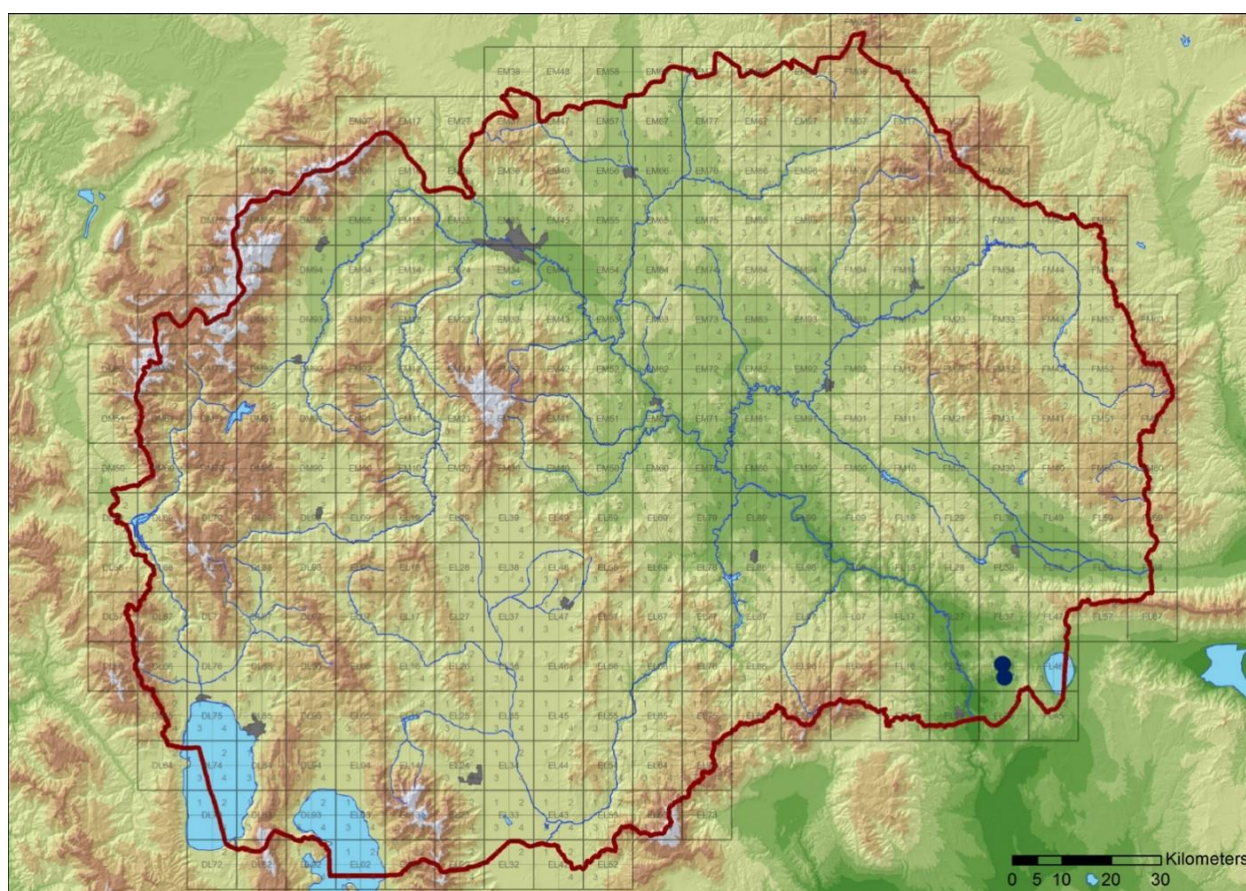


Figure 2. *Ochlopoa infirma* – Map of distribution in the Republic of Macedonia

REFERENCES

- [1] M. Lazareva, Taxonomy and chorology of the genus *Poa* L. in the Debar Valley, with the Deshat and Krchin mountains, master thesis, 1998.
- [2] M. Kostadinovski, Some mesophilic taxa from the genus *Festuca* L. in the flora of the Republic of Macedonia, *God.zb.Biol.*, **49** (1996), pp. 73–83.
- [3] M. Kostadinovski, *Festuca peristerea* (Vett.) Mgf-Dbg and *F. korabensis* (Jav. ex Mgf-Dbg) Mgf-Dbg in the flora of Republic of Macedonia. Zbornik radova V Simpozijuma o flori jugoistočne Srbije (1998), pp. 309–318
- [4] M. Kostadinovski, *Festuca micevskiana* Kostadinovski (*Festuca* gr. Halleri, Poaceae) a new species from Republic of Macedonia, *God.zb.Biol.*, **55/56** (2002/03), pp. 11–19
- [5] M. Kostadinovski, *Festuca jacupicenis* Kostadinovski spec. nova (Poaceae) in the flora of Republic of Macedonia. Collection of Papers Devoted to Academician Kiril Micevski, MASA (2007) pp. 209–222
- [6] V. Matevski, K. Micevski, M. Kostadinovski, Prilog za florata na Republika Makedonija. *God. zb., Biol.* **45** (1992), pp. 167–174
- [7] V. Matevski, M. Kostadinovski, Prilog za florata na Makedonija II. *God.zb.Biol.*, **50** (1997), pp. 25–39
- [8] V. Matevski, A. Čarni, M. Kostadinovski, Contribution to the flora of trampled habitats on the territory of the Republic of Macedonia. 75 years Maced. Mus. Nat. Hist. (2001), pp. 237–244
- [9] A. Teofilovski, Contributions to the flora of the Republic of Macedonia, Priv. ed., Skopje, (2011) p.142. (In Macedonian)
- [10] N. N. Tzvelev, Zlaki SSSR, Nauka Publishers, Leningrad, Russia, 1976.
- [11] L. J. Gillespie, R. J. Soreng, A phylogenetic analysis of the Bluegrass genus *Poa* based on cpDNA restriction site data. *Syst. Bot.*, **30** (2005), pp. 84–105.
- [12] J. Lynn Gillespie, A. Archambault, J. Robert Soreng, Phylogeny of *Poa* (Poaceae) Based on trnT–trnF Sequence Data: Major Clades and Basal Relationships, *Aliso: A Journal of Systematic and Evolutionary Botany*, Vol. **23**: Iss. 1, Article 33 (2007)
- [13] H. Scholz, Some comments on the genus *Bromus* (Poaceae) and three new species, *Willdenowia*, BGBM Berlin-Dahlem, **38** (2008), pp. 411–422.
- [14] A. Hayek, *Prodromus Florae Peninsulae Balcanicae*, II. Feddes Repert., Beih., **30** (1928–1931), Dahlem bei Berlin.
- [15] P. M. Smith, *Bromus* L. in: Tutin, T. G., et all. (Eds), *Flora Europaea*, **5**, Cambridge, 1980 p. 183.
- [16] J. R. Edmondson, *Poa* L. in: Tutin, T. G., et all. (Eds), *Flora Europaea*, **5**, Cambridge, 1980 p.161.
- [17] Euro+Med Plant Base <http://ww2.bgbm.org/EuroPlusMed/query.asp>
- [18] B. Valdés. & H. Scholz, The Euro+Med treatment of Gramineae – a generic synopsis and some new names. – *Willdenowia* **36** (2006), pp. 657–669, BGBM Berlin-Dahlem.
- [19] CABI - Invasive Species Compendium <https://www.cabi.org/isc/datasheet/10032>
- [20] <http://www.iucnredlist.org>
- [21] Ž. Jurišić, Prilog flori južne Srbije, Srpske Kraljevske Akademije, **60** (1923), pp. 1–45.
- [22] R. Drenkovski, Pregled na florata na Vodnenska Planina. *God. Zbor. PMF - biolog.* **21** (1969), pp. 163–184.
- [23] J. Matvejeva, Ruderalnata vegetacija na SR Makedonija, Makedonska akademija na naukite i umetnostite, Oddelenie za biološki i medicinski nauki, **70** (1982), pp. 64–66.
- [24] A. Čarni, M. Kostadinovski, V. Matevski, Vegetation of trampled sites in the Republic of Macedonia, *Hacquetia* **1/2** (2002), pp. 209–221.

ANISANTHA DIANDRA (ROTH) TUTIN И OCHLOPOA INFIRMA (KUNTH) H. SCHOLZ - НОВИ ВИДОВИ ОД ФАМИЛИЈАТА РОАСЕАЕ ВО ФЛОРАТА НА РЕПУБЛИКА МАКЕДОНИЈА

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За прв пат за флората на Република Македонија се наведуваат податоци за хорологијата на видовите *Anisantha diandra* (Roth) Tutin и *Ochlopoa infirma* (Kunth) H. Scholz (Poaceae). Видот *Anisantha diandra* е регистриран на неколку локалитети во Република Македонија (Скопје, Охрид, Тетово), додека видот *Ochlopoa infirma* е најден само во околината на Богданци. Даден е краток опис на диференцијалните морфолошки карактеристики на двата вида, како и на живеалиштата (хабитатите) на кои се регистрирани. И двата вида можат да се сметаат за автохтони за флората на Република Македонија.

Клучни зборови: *Anisantha diandra*; *Ochlopoa infirma*; Роасеае, флора; распространување; Република Македонија