

Short communication

Aristida oligantha – a new alien species on the eastern Adriatic coast

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Abstract – An alien and potentially invasive species of North American origin *Aristida oligantha* Michx. was found in the hinterland of Velika plaža, a sandy beach in the town of Ulcinj (Montenegro), the second known record of this plant in Europe. Here we describe the *Aristida oligantha* community. Further monitoring is suggested in order to evaluate its invasiveness and to plan appropriate eradication measures.

Keywords: *Aristida oligantha* community, invasive species, northeastern Mediterranean, sandy beach, south Montenegro

Introduction

Genus *Aristida* L. is one of the exotic grasses in the European flora. It belongs to the subfamily *Aristidoideae*, which consists of three genera: *Aristida* L., *Stipagrostis* Nees and *Sartidia* De Winter, being easily recognisable by one-flowered spikelets, with 3-awned lemmas, involute margins, a sharp pointed callus, and a line of hairs for a ligule (Cerros Tlatilpa et al. 2011). So far, *Stipagrostis* and *Sartidia* have not been reported in Europe, while the genus *Aristida* has been noted as having two representatives: *A. adscensionis* L. and *A. oligantha* Michx. (Euro+Med 2006, Rakaj and Pagad 2020). The first was been recorded in Spain, Italy, Greece (Euro+Med 2006), Belgium (Desmet et al. 2020) and France (Thevenot et al. 2020), while the second was recently reported in central part of Albania (Rakaj and Pagad 2020).

Within its native area of distribution, which includes North America, *Aristida oligantha* grows on waste or bare ground, old fields and dry hills (Allred 1986). It is considered an extremely aggressive weed species, which is rather dangerous for cattle, since its awns and sharp callus cause injuries to the mouth, nostrils, and eyes. It disperses in two ways, by wind or by attachment to passing animals thanks

to its retrorsely-barbed, pointed callus (Owensby and Launchbaugh 1977).

Finding of the species in the hinterland of the Velika plaža sandy beach in the town of Ulcinj (Montenegro) represents its first record along the eastern Adriatic coast.

Aim of this paper is to warn of the newly discovered alien species *Aristida oligantha*, to present the new records, as well as the species composition and structure of the *Aristida oligantha* plant community.

Material and methods

The collected plant material was deposited in the Herbarium Collection at the University of Montenegro, Podgorica, Montenegro (TGU), under the voucher number: TGU 1570528. The specimens were identified according to Allred (1986).

Phytosociological relevés were recorded according to the method of Braun-Blanquet (1964), stored in a Tubroveg (Hennekens and Schaminée 2001) and incorporated into the vegetation database of Montenegro (EU-ME-001, <http://www.givd.info/ID/EU-ME-001>). The nomenclature of the taxa follows the Euro+Med (2006).

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Results and discussion

Aristida oligantha (Fig. 1) was recorded in full bloom during the autumn field survey at sandy beach of Velika plaža in town of Ulcinj (Montenegro), just along the narrow road that passes through the hinterland. The plant builds almost monodominant stands in rather anthropogenized but poorly trampled sites, at which *Brachypodietalia* dune grasslands with annuals (Annex I habitat type, code 2240) dominate during the spring. From the roadside, *Aristida* stands are mainly connected with a narrow line of trampled vegetation dominated by *Cynodon dactylon*, and on the opposite side there is either forest vegetation of planted mari-

time pines or the association *Eriantho-Schoenetum nigricantis* (Pignatti 1953) Géhu in Géhu et al. 1984 within which *Aristida* colonizes the area between tussocks of *Schoenus nigricans* (Tab. 1). The substrate is mostly sandy; exceptionally it is of crushed stones, which are used in this area as construction material for both car parks and paths. The total vegetation cover is mostly greater than 90%. In the *Aristida oligantha* community, the most frequent taxa were *Cynodon dactylon*, *Erigeron canadensis* (100%), *Artemisia campestris*, *Tragus racemosus*, *Petrorhagia saxifraga* and *Verbascum sinuatum* (77.7%, Tab. 1). The combination of late summer and autumn species, notably *Cynodon dactylon*, *Tragus racemosus* and *Euphorbia maculata* define the

Tab. 1. Phytosociological table of the *Aristida oligantha* community (rels. 1-9) and the *Eriantho-Schoenetum nigricantis* association (rel. 10). See Appendix for place of the relevés.

Relevé no.	1	2	3	4	5	6	7	8	9	10
Plot size (m ²)	10	25	25	10	25	25	25	25	25	25
Vegetation cover (%)	95	100	90	97	95	90	50	97	90	100
<i>Aristida oligantha</i>	5	4	5	5	4	4	3	5	5	2
<i>Cynodon dactylon</i>	2	2	1	1	1	1	1	+	+	1
<i>Erigeron canadensis</i>	1	+	+	+	+	+	+	+	1	+
<i>Tragus racemosus</i>	1	.	1	1	+	2	2	1	.	.
<i>Verbascum sinuatum</i>	+	1	.	+	.	+	1	+	1	.
<i>Petrorhagia saxifraga</i>	1	+	.	1	+	+	.	+	+	.
<i>Plantago lanceolata</i>	+	+	1	+	1	+	.	.	.	2
<i>Tortella tortuosa</i>	2	+	2	1	1	1	.	.	.	1
<i>Euphorbia maculata</i>	1	+	1	.	2	2	1	.	.	.
<i>Artemisia campestris</i>	1	3	1	+	2	.	.	2	1	.
<i>Prospero autumnale</i>	+	1	+	+	.	+	.	.	.	+
<i>Scirpoides holoschoenus</i>	.	.	1	1	1	+	+	.	.	1
<i>Crepis foetida</i>	1	+	1	.	.	.	.	+	+	+
<i>Trifolium lappaceum</i>	1	+	.	+	1	1	.	.	.	.
<i>Tripidium ravennae</i>	.	.	+	1	+	.	+	+	.	.
<i>Sanguisorba minor</i> subsp. <i>muricata</i>	.	.	.	+	1	.	+	1	1	.
<i>Hypericum perforatum</i> subsp. <i>veronense</i>	1	+	+	.	+	.	.	.	.	.
<i>Bothriochloa ischaemum</i>	1	.	+	.	+	.	.	+	.	.
<i>Alkanna tinctoria</i>	1	.	.	1	.	.	+	1	+	.
<i>Lomelosia argentea</i>	+	.	+	+	+	.	.	.	.	.
<i>Dittrichia graveolens</i>	.	.	+	.	+	.	+	.	+	.
<i>Dittrichia viscosa</i>	.	+	+	.	.	.	.	.	.	+
<i>Teucrium capitatum</i>	1	.	.	.	.	.	.	.	+	.
<i>Asphodelus ramosus</i>	.	.	.	+	+	.	.	.	.	.
<i>Echium plantagineum</i>	.	.	.	+	.	.	.	+	.	.
<i>Digitaria ciliaris</i>	.	.	.	.	.	+	+	.	.	.
<i>Oenothera biennis</i> aggr.	.	.	.	.	.	.	+	.	.	+
<i>Rubus ulmifolius</i>	.	.	.	.	.	.	+	.	.	1
<i>Helianthemum jonium</i>	.	.	.	.	.	.	.	+	+	.
<i>Schoenus nigricans</i>	.	.	.	.	.	.	.	.	.	5

Sporadic taxa: rel. 1 – *Salsola kali* (1), *Setaria viridis* (1), *Ajuga chamaepitys* (+), rel. 2 – *Trifolium stellatum* (+), *Odontites vernus* ssp. *serotina* (+), *Scolymus hispanicus* (+), rel. 3 – *Plantago arenaria* (+), *Hypochaeris radicata* (+), rel. 6 – *Medicago minima* (1).



Fig. 1. *Aristida oligantha* Michx.: A – habitus, B – spikelets

syntaxonomic affiliation of this community to the alliance *Eragrostion* of the order *Eragrostietalia* and class *Digitario sanguinalis-Eragrostietea minoris*.

Aristida oligantha was recently reported in Albania as a new alien species in European flora (Rakaj and Pagad 2020). Actually, the species was recorded from the banks of the Osum River, near the town of Berat, South Albania, in 2013 (Marash Rakaj, *pers. comm.*). As the sites are far apart, the introduction is probably independent. Nevertheless, due to the extremely close connection between the municipality of Ulcinj and Albania (trade, construction, tourism, and vigorous cross-border traffic), it is possible that species was imported from Albania. Introduction of species via construction material is a common means of spreading invasive species in Montenegro, as has been demonstrated by the spread of *Ambrosia artemisiifolia* (Stešević et al. 2014).

In autumn, in the hinterland of the Velika plaža beach, *A. oligantha* was recorded in monodominant stands – *A. oligantha* community (Tab. 1), as well as within the association *Eriantho-Schoenetum nigricantis*, which represents the vegetation type equivalent of NATURA 2000 habitat 2190 Humid dune slack.

Taking into consideration the great invasive potential of this species, we propose further monitoring and assessment of its invasive status and the planning of eradication measures. In order to deepen our knowledge on the synecology of this species beyond the boundaries of its natural range, as well as to describe any new association that might arise, it is necessary to do more detailed phytocenological research within the boundaries of the secondary range, which up to now covers only Albania and Montenegro in Europe.

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Appendix

Date and coordinates (WGS84) of the relevés (Tab. 1). All relevés were collected at 1 m a.s.l. Rel. 1 – 2019/10/06, 41.90632 N, 19.26582 E; Rel. 2 – 2019/10/06, 41.89915 N, 19.2901 E; 3 Rel. – 2019/10/06, 41.90543 N, 19.26919 E; Rel. 4 – 2019/10/06, 41.90363 N, 19.27509 E; Rel. 5 – 2019/10/06, 41.90321 N 19.27589 E; 6 Rel. – 2019/10/06, 41.90544 N, 19.27069 E; Rel. 7 – 2019/10/06, 41.90127 N 19.28215 E; Rel. 8 – 2019/10/06, 41.90242 N, 19.27777 E; Rel. 9 – 2019/10/06, 41.90249 N, 19.27758 E; Rel. 10 – 2019/10/06, 41.90542 N 19.26927 E.

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