

Short communication

First Italian record of *Paspalum notatum* Flügge (Poaceae) and its typification

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Abstract: In the present work the presence of *Paspalum notatum* Flügge (Poaceae) in Italy was reported for the first time. It is a neophyte native to America, known for applications in phytoremediation. Its typification, ecology and invasiveness status are also presented.

Keywords: alien species, invasiveness, phytoremediation, vascular flora

Introduction

The genus *Paspalum* L. (Poaceae) comprises about 330 species (Zuloaga and Morrone 2005) and is chiefly distributed in tropical and temperate regions of America (Zuloaga et al. 2003). It includes small to robust perennial, rarely annual, herbs that are usually cespitose, but may creep via rhizomes or stolons, and have filiform to lanceolate leaf blades, which may be flat, plicate, or involute. The inflorescence is racemose, unilateral, with solitary or paired spikelets. The lower glume is commonly absent, the upper one and the lower lemma are herbaceous to membranous, and the upper antherium is indurate to membranous.

In the European vascular flora 10 species have been recorded (Valdés et al. 2009–2014), among which 6 are present in Italy, all aliens (Celesti-Grappow et al. 2009a, b, Soldano and Verloove 2015): *P. dilatatum* Poir., *P. distichum* L., *P. exaltatum* J. Presl & C. Presl, *P. paucispicatum* Vasey, *P. quadrifarium* Lam. and *P. vaginatum* Sw. From recently, another two alien species are in course of reporting in Italy: *P. dasyleurum* Kunze ex Desv. and *P. thunbergii* Kunth ex Steud. (Banfi and Galasso 2015)

In this paper the neotropical neophyte *P. notatum* Flügge (Bahigrass) is recorded for the first time in Italy. Its typification, ecology and invasiveness status are also presented.

Materials and methods

Field research in Southern Italy was undertaken from 2013 to 2015. Species was identified according to Zuloaga et al. (2004), Zuloaga and Morrone (2005), and Allen and Hall (2002). The Flügge's (1810) protologue was also examined. Collected specimens are kept in Herbarium Porti-

cense (PORUN, acronym according to Thiers 2011) and Museo di Storia Naturale di Milano (MSNM). Geocoding of the Italian locality of the plant was performed with the use of a portable GPS device (GPS map 60CSx, Garmin, USA), calibrated beforehand (geographic system UTM WGS84).

Italian literature was examined to detect previous indications of the species in Italy (e.g. Fiori 1923, Zangheri 1976, Pignatti 1982, Conti et al. 2005, 2007, Celesti-Grappow et al. 2009a, b, 2010). The degree of naturalization (status) was defined according to Richardson et al. (2000) and Pyšek et al. (2004) through the monitoring of the Italian population. In detail was observed the presence of the species and its ability to spread in the field in three consecutive years (2013–2015).

Results and discussion

Paspalum notatum Flügge (sub *Paspalus notatus*), Gram. Monogr., Paspalum: 106(–108, 207–208). 1810 [5.V.1810].

Typus, *hic designatus*: United States Virgin Islands, St. Thomas, *E. P. Ventenat s.n.*, 1802; lectotypus in BM-ex Herb. Nolte (picture in SI!), isolectotypus in US-2855762! (fragm. ex BM). We were not able to find the duplicates kept in B, KIEL, MO, P-LA, presumably being destroyed during the Second World War. The present typification is a consequence of the fact that Koning and Sosef (1985: 313) indicated isolectotypi on a set of several herbaria, while Zuloaga and Morrone (2005: 180) did not establish a valid typification as they didn't use the phrase “designated here” (*hic designatus*) or an equivalent (Art. 7.10 of ICN, McNeill et al. 2012).

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= *Paspalum notatum* var. *saurae* Parodi, Revista Argent. Agron. 15(1): 55 (fig. 1b). 1948.
 ≡ *Paspalum saurae* (Parodi) Parodi, Darwiniana 15(1–2): 106. 1969 [30.I.1969].

Typus: Argentina, Entre Ríos: Concepción del Uruguay, L. R. Parodi 12670, January 1937; holotypus in BAA, isotypus in US-1721333!



Fig. 1. Distribution of *Paspalum notatum* in Europe (including Azores and Canary Islands) with the first Italian record (star) and previous reports (circles: 1 – Scholz 2002; 2 – Pyke 2003; 3 – Verloove 2003; 4 – Verloove 2005; 5 – Böhling and Scholz 2004; 6 – Silva et al. 2005; 7 – Sánchez Gullón et al. 2006; 8 – Valdés et al. 2007; 9 – Verloove and Reyes-Betancort 2011; 10 – Siverio Núñez et al. 2013).

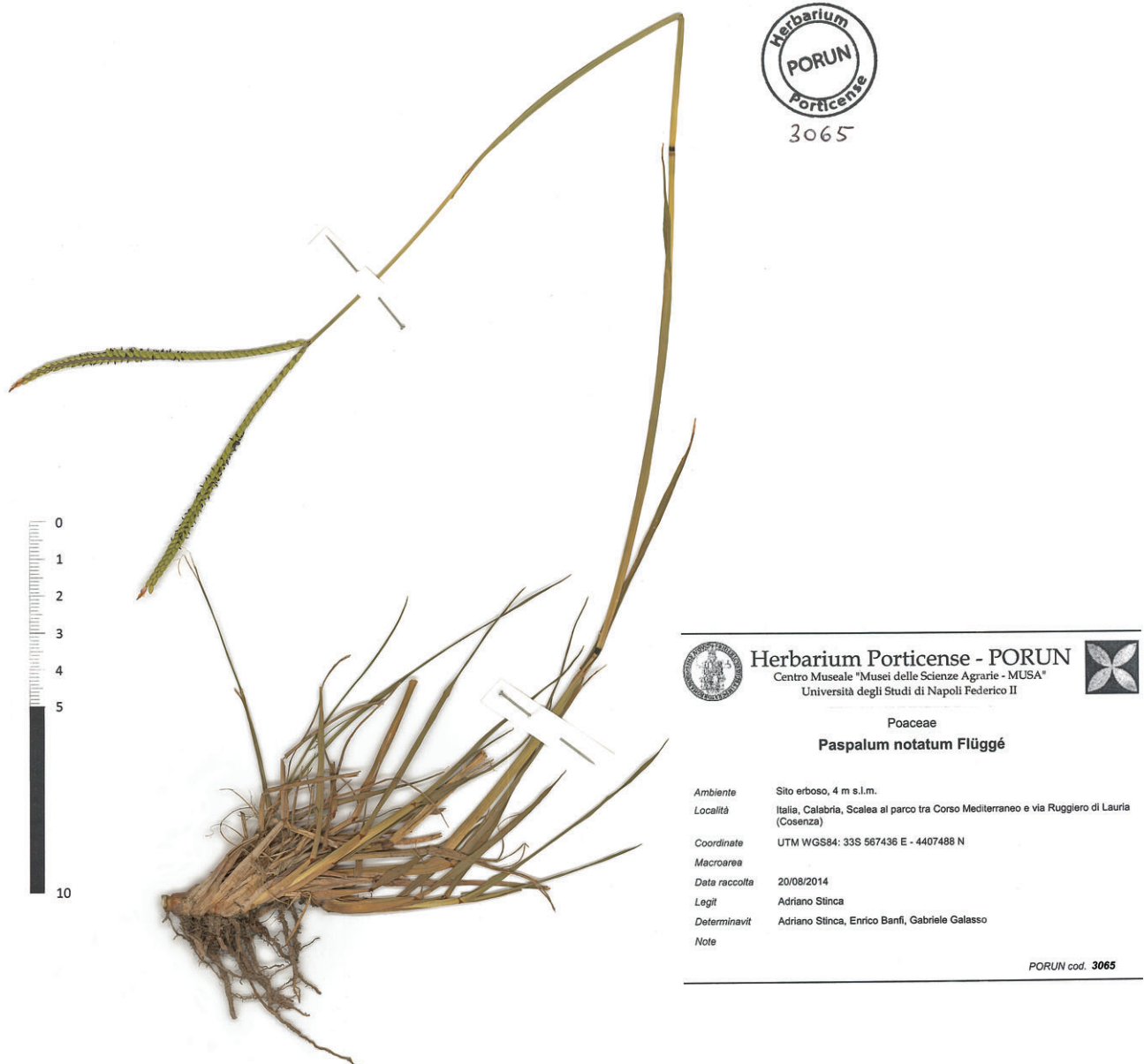


Fig. 2. Italian specimen of *Paspalum notatum* preserved at PORUN.

P. notatum is common in pastures along the belt warm and temperate American regions, from central Mexico to Uruguay (e.g. Quarín et al. 1984). It was introduced in tropical and subtropical areas of the world for purposes of turf establishment, forage crop growth, erosion control and slope stabilization (e.g. Busey 1992, Ogura et al. 2005). In recent years, this grass has been found effective in renaturation of vegetation of mined lands, uptake of heavy metals and even removal of radioactive elements (phytoremediation) (e.g. Xia 2004, Huang et al. 2009). In addition, laboratory experiments have shown that pollen of this plant cause allergic respiratory diseases (Davies et al. 2012).

P. notatum was collected at Scalea (province of Cosenza) in Southern Italy. The site is located on the Tyrrhenian coast of the Calabria region in the northern sector of the Lao river plain, at 4–5 m a.s.l. (UTM WGS84: 33S 567494 E – 4407547 N, 33S 567436 E – 4407488 N, and 33S 567427 E – 4407484 N).

Climate (thermopluviometric data from Fiumefreddo meteorological station, 220 m a.s.l., about 65 km from the studied site) belongs to the Mediterranean type characterized by average annual temperature of 16.7 °C, average annual rainfall of 1,141 mm, and drought summer period ranging from May to August (Brandmayr et al. 1991).

P. notatum was found in very disturbed grassland sites. This alien species was probably introduced via seeds to create lawns and therefore subsequently spread. The discovered population covers an area of approximately 300 m². It shares the place with *Avena barbata* Pott ex Link, *Cynodon dactylon* (L.) Pers., *Dactylis glomerata* L. subsp. *glomerata*, *Oxalis corniculata* L., *Parietaria judaica* L., *Reichardia picroides* (L.) Roth, *Solanum nigrum* L., *S. villosum* Mill., *Sonchus oleraceus* L., and with other aliens, i.e. *Chamaesyce maculata* (L.) Small, *Erigeron sumatrensis* Retz., *Paspalum dilatatum* Poir., *P. distichum* L., that emphasize the human impact.

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Today in Europe (Fig. 1) *P. notatum* has been reported in Greece (Scholz 2002), Spain (Böhling and Scholz 2004, Sánchez Gullón et al. 2006, Valdés et al. 2007), and Azores Islands in Portugal (Silva et al. 2005). In Spain (Pyke 2003, Verloove 2003, 2005, Verloove and Reyes-Betancort 2011) and Canary Islands (Siverio Núñez et al. 2013, finding confirmed by Verloove and Reyes-Betancort 2011) the var. *saurae* (synonym by *P. notatum* according to Allen and Hall 2002) was also recorded, and it presents the same morphological features of the new Italian population.

In Italy *P. notatum* was detected for three consecutive years (2013–2015), showing a noticeable vegetative propagation. According to Richardson et al. (2000) and Pyšek et al. (2004), the observation period is too short to understand the real success of vegetative propagation and declare a state of naturalized species. Therefore it must be considered an alien casual, waiting for further field investigations to achieve the proper status attribution.

Specimina visa

ITALY: Calabria, Scalea (Cosenza), park between Corso Mediterraneo and via Michele Bianchi (UTM WGS84: 33S 567494 E – 4407547 N), mowed lawn, 5 m a.s.l., no exp., 14 Aug 2013, leg. A. Stinca, det. E. Banfi & G. Galasso (PORUN-3063, MSNM-44681); Calabria, Scalea (Cosenza), park between Corso Mediterraneo and via Ruggero di Lauria (UTM WGS84: 33S 567436 E – 4407488 N), grassy site, 4 m a.s.l., no exp., 20 Aug 2014, leg. A. Stinca, det. A. Stinca, E. Banfi & G. Galasso (PORUN-3064-3065, MSNM-45057) (Fig. 2); Calabria, Scalea (Cosenza), park between Corso Mediterraneo and via Ruggero di Lauria (UTM WGS84: 33S 567427 E – 4407484 N), grassy site, 4 m a.s.l., no exp., 16 Aug 2015, leg. A. Stinca & M. Ravo, det. A. Stinca (PORUN-3577).

USA: United States Virgin Islands, St. Thomas, *E. P. Ventenat s.n.*, 1802 [BM (picture in SI, US-2855762 (fragm. ex BM))].

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