

## Further notes on the distribution of *Dittrichia graveolens* (Asteraceae) in Poland

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Further notes on the distribution of *Dittrichia graveolens* (Asteraceae) in Poland. – Acta Mus. Siles. Sci. Natur., 66: 259-262, 2017.

**Abstract:** The paper presents a new record of *Dittrichia graveolens* in Poland. This alien species was found growing on roadside verges in Głogoczów, West-Beskidian Piedmont, southern Poland, in 2016. An updated map of distribution of *D. graveolens* is provided based on the ATPOL cartogram method, and its pathway of spread along the roads is highlighted. Moreover, the Polish vernacular names “omanowiec” and “omanowiec wonny” are proposed for the genus *Dittrichia* and the species *D. graveolens*, respectively.

**Key words:** alien species, biological recording, naturalization, road transport.

### Introduction

The genus *Dittrichia* Greuter (Asteraceae, Inuleae) comprises five species and is closely related to the genera *Jasonia* Cass., *Pulicaria* Gaertn. and *Inula* L. It can be easily distinguished from the other genera of the tribe Inuleae by its pappus which is composed of barbellate bristles united at the base in a cupule-like structure (Andenberg *et al.* 2005). *Dittrichia graveolens* (L.) Greuter is the only annual species of the genus and differs from the other congeners mainly in having the involucral bracts with hyaline margins, curved outwards outer involucral bracts, and short ligula in ray flowers. It grows up to a height of 50 cm and its leaves, which are densely covered with glandular hairs, smell strongly of camphor (Brullo & Marco 2000, Thong *et al.* 2008). It is native to Mediterranean area, extending to the Western Atlantic European coast and to Middle East (Iran, Iraq, Afghanistan and NW India) (Brullo & Marco 2000). It is well naturalized in Northwestern and Central Europe, North America, South Africa, and Australia, and is also considered as invasive in Australia and South Africa (Brownsey *et al.* 2013, Király *et al.* 2014, Kocián 2015, Randall 2017 and the literature cited therein). In its native range and some regions of its introduction, *D. graveolens* is found in riparian woodlands, on margins of tidal marshes, vernal pools, and alluvial floodplains. In introduced areas, it occurs frequently in anthropogenic habitats such as arable and abandoned fields, wasteland, roadsides, levees and gravel mines (Given 1984, Brullo & Marco 2000, Brownsey *et al.* 2013, Király *et al.* 2014), being associated with synanthropic vegetation typical of nitrophilous communities of the class *Stellarietea mediae* (Brullo & Marco 2000). It is worth mentioning that *D. graveolens* can cause poisoning in livestock and contact allergic dermatitis in humans (Philbey & Morton 2000, Thong *et al.* 2008).

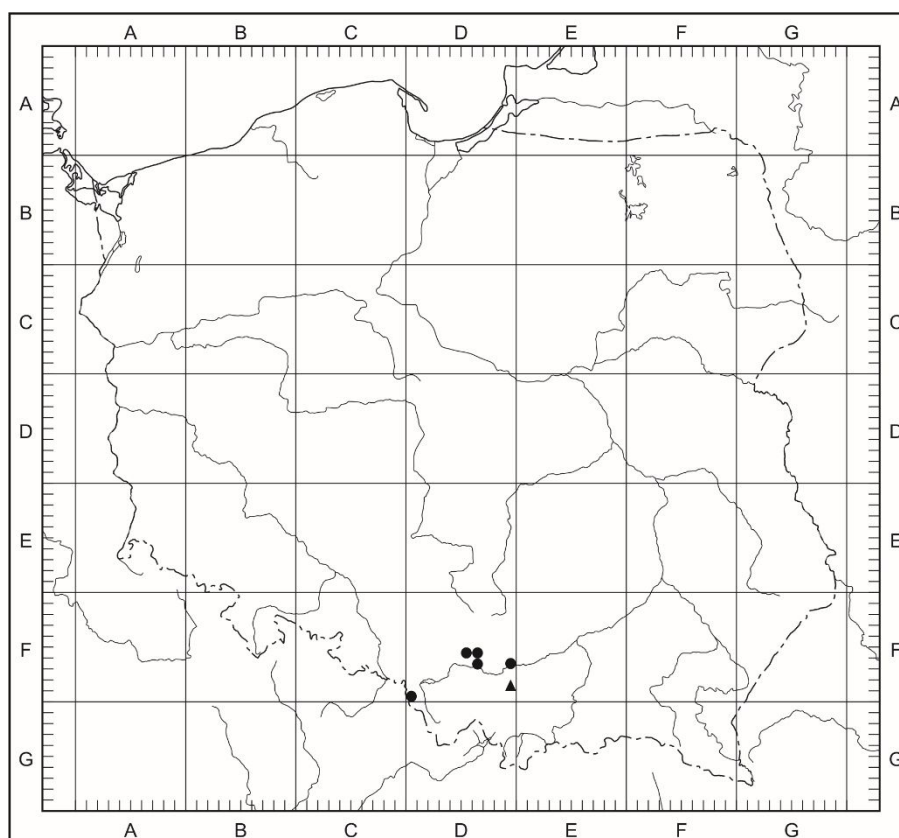
Within the last decades, *D. graveolens* has been spreading rapidly along the highways in several countries in Central Europe, including Austria, Germany, Slovenia, the Czech Republic, and Slovakia (Frajman & Kaligarič 2009, Király *et al.* 2014, Kocián 2015 and the literature cited therein). The first locality of *D. graveolens* in Poland was discovered by Kocián (2015) in 2013. Recently, Wróbel & Nobis (2017) confirmed the spread of this species in the southern part of the country, indicating that it is an established alien plant in the Polish flora. In this paper, a new record of *D. graveolens* is presented.

## Material and methods

Identification of *Dittrichia graveolens* was based on morphological characters provided by Brullo & Marco (2000) and Thong *et al.* (2008). A map of distribution was prepared using the ATPOL cartogram method (Zajac 1978). The records of known occurrence of *D. graveolens* in Poland followed Kocián (2015) and Wróbel & Nobis (2017). The voucher specimens of *D. graveolens* (leg. A. Pliszko) are deposited in the Herbarium of the Institute of Botany of the Jagiellonian University in Kraków (KRA).

## Results and discussion

In September 2016, a new locality of *Dittrichia graveolens* was registered in Głogoczów (GPS coordinates: 49°55'2.46"N, 19°52'40.38"E; altitude: 251 m a.s.l.), West-Beskidian Piedmont, southern Poland. This site is located within the unit DF89 (a square of 10-km side) of the ATPOL cartogram grid (Fig. 1). *Dittrichia graveolens* was found growing on roadside verges, at both sides of Zakopianka road, along a stretch of about 50 m. The approximate size of the population was about 100 flowering individuals. It was associated with *Ambrosia artemisiifolia* L., *Cirsium arvense* (L.) Scop., *Glechoma hederacea* L., *Leontodon autumnalis* L., *Pastinaca sativa* L., *Plantago major* L., *Polygonum aviculare* L., *P. hydropiper* L., *Puccinellia distans* (Jacq.) Parl., *Setaria pumila* (Poir.) Roem. & Schult., *Sonchus oleraceus* L., *Tanacetum vulgare* L., and *Tussilago farfara* L.



**Fig 1:** Distribution of *Dittrichia graveolens* in Poland using the ATPOL cartogram method (● – known localities; ▲ – new locality).

Considering the recently published data (Kocián 2015, Wróbel & Nobis 2017), *D. graveolens* is now distributed in Silesian Province and Lesser Poland Province, the southern part of the country, with a total of seven localities which are situated within the six cartogram units of the ATPOL grid (Fig. 1). The locality of *D. graveolens* near Ogrodzona in Silesian Province

(Kocián 2015) is situated along the S52 expressway (formerly S1), near the border with the Czech Republic. The S52 expressway is connecting the cities Cieszyn and Bielsko-Biała and merges with the Czech motorway network. The new locality in Głogoczów is situated along the No. 7 national road which is (with the No. 52 national road) part of the national road network connecting the cities Bielsko-Biała and Kraków. Moreover, the localities of *D. graveolens* registered by Wróbel & Nobis (2017) are mostly situated along the A4 expressway, and the No. 7 national road is connected with this expressway. The above-mentioned road network in southern Poland is used by long-distance road transport while hauling goods in the west-east direction. *Dittrichia graveolens* is fast spreading along the motorways in the bordering Czech Republic and is able to abridge long distances in a very short time (Kocián 2014). Thus, it is very likely that long-distance road transport introduced the propagules to the locality in Głogoczów and other localities in southern Poland (Wróbel & Nobis 2017).

A relatively high number of flowering individuals, which were repeatedly recorded during a few years by Kocián (2015) near Ogrodzona, suggest that *D. graveolens* is able to sustain the self-replacing populations in the wild. Such ability is essential for the establishment of alien plant species; however, the confirmation of the establishment of an alien species should be followed by an observation period of at least 10 years (Pyšek *et al.* 2004). Nevertheless, the recently provided data (Wróbel & Nobis 2017) allowed us to reach the conclusion that *D. graveolens* is at the early stage of naturalization in the Polish flora. Moreover, a further spread of the species along the roads is expected in the future, and its impact on native vegetation and human health should be monitored.

Finally, since the genus *Dittrichia* has no Polish vernacular name, the first author proposes the name “omanowiec” due to its close relation to the genus *Inula*, which is called “oman” in Polish. In addition, the first author also proposes the name “omanowiec wonny” as a Polish vernacular name for *D. graveolens*.

**Acknowledgements:** The study was financially supported by the Institute of Botany of the Jagiellonian University in Kraków (K/ZDS/006305).

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