

A NEW REGISTRATION IN THE VASCULAR FLORA OF MOLDOVA (EASTERN ROMANIA): *ALLIUM INAEQUALE*

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Abstract: The presence of species *Allium inaequale* in the flora of Moldova (eastern Romania), has been reported in this paper, based on specimens collected by authors on the field, as well as on specimens stored in public herbaria. The species has been identified in arid grasslands of two nature reserves from the Central Moldavian Plateau (Vaslui County), namely: “Coasta Rupturile” Tanacu and “Movila lui Burcel” Micleşti. This is a very rare plant species in Romania, found at the most western limit of its general range, and should be included, as vulnerable, in the Romanian Red List of Vascular Plants. We have also found that the registration of the species *A. moschatum* in the flora of Moldova was due to misidentification. Based on the current data, *A. moschatum*, should be replaced in the flora of this historical province by *A. inaequale*.

Keywords: Coasta Rupturile, Movila lui Burcel, Red List of Vascular Plants, section *Scorodon*

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Introduction

Allium inaequale Janka, *Linnaea* 30, 603 (1860), is a Central Asian - West Pontic plant species (Vvedenskii 1968). It is distributed in the Aralo-Caspian basin (Central Asia) (Vvedenskii 1968; Fedorov 1979), the Southern and Central European Russia (Vvedenskii 1968; Fedorov 1979; Didukh *et al.* 2018), Ukraine (Donetsk, Crimea) (Prokudin *et al.* 1987), the Republic of Moldova (Fedorov 1979; Negru 2007; Ghendov & Ciocârlan 2015; Pînzaru & Sîrbu 2016; Cassir *et al.* 2020) and Romania (Ciocârlan 1994, 2009; Sârbu *et al.* 2013).

Towards the western limit of its natural area, *A. inaequale* is more and more rare and, as a consequence of isolated populations and the destruction of habitats, increasingly vulnerable (Ghendov 2014; Ghendov & Ciocârlan 2015). Accordingly, it has been listed in the *IUCN Red List categories of vascular plant species of the Ukrainian flora*: Least-concern (LC) (Onyshchenko *et al.* 2022); the *Red Book of the Republic of Moldova*: Vulnerable (VU) (Ghendov 2014; Ghendov & Ciocârlan 2015; Cassir *et al.* 2020), and the *European Red List of Vascular Plants*: Data deficient (DD) (Bilz *et al.* 2011).

Regarding ecological preferences, *A. inaequale* is known (Sârbu *et al.* 2013) as heliophilous, thermophilous, xerophilous and saxicolous (calciphilous) – L₉T₈U₁R₈ (see also Ciocârlan 1994).

Beyond the eastern border of Romania, this species grows on dry rocky steppe grasslands (on limestone, chalk, and sands) (Vvedenskii 1968; Fedorov 1979; Ghendov 2014; Ghendov & Ciocârlan 2015), as well as in steppe areas with loess soils (Ghendov

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2014; Ghendov & Ciocârlan 2015; Cassir *et al.* 2020). Within the areas of Don and Volga River basins, *A. inaequale* is a diagnostic species for the EUNIS Habitat type R15 – *Continental dry rocky steppic grassland and dwarf scrub on chalk outcrops* (Chytrý *et al.* 2020), with usually open vegetation of the ord. *Thymo cretacei-Hyssopetalia cretacei* Didukh 1989 (see Didukh *et al.* 2018).

In Romania, *A. inaequale* has been known so far on stony, calcareous places, from only a few localities in Dobrogea (Constanța and Tulcea Counties) and Muntenia (Prahova County). Although Zahariadi (1966) stated that it is possible for *A. inaequale* to be present in Romania (Dobrogea), evidences were brought only since 1994, when Ciocârlan first reported *A. inaequale* in the country, from Baltăgești (Constanța County), on the Alah Bair Hill (Herb. Inst. Agron. București, no. 22711). According to the cited author, in this locality *A. inaequale* is accompanied by other saxicolous species such as *A. saxatile*, *Agropyron brandzae*, *Hedysarum grandiflorum*, etc. Subsequently, Negrean (2011) reported *A. inaequale* in three other localities as follows: Tulcea County, at Greci (Herb. GN, Măcin Mountains, *in saxosis*, 08.1963, *legit. et det.* G. Negrean, as *A. moschatum*) and north of Baia (Herb. GN no. 3136, *cariera vetusta, in saxosis calcareis, legit. et det.* G. Negrean, 23.08.2002); Prahova County, at Stâncă Tohanilor (Herb. GN, *in saxosis calcareis, legit. et det.* G. Negrean, as *A. moschatum*, 03.10.1966 and 06.08.1967). According to Sârbu *et al.* (2013), in Romania, *A. inaequale* is diagnostic for the alliance *Pimpinello-Thymion zygioides* Dihoru et Doniță 1970, which includes xerophilous rocky steppic dwarf-shrub rich grasslands on steep calcareous slopes of Dobrogea and north-eastern Bulgaria (see Coldea 2012 and Mucina *et al.* 2016).

Among the 25 indigenous species of *Allium* reported from Romania so far (Sârbu *et al.* 2013), *A. inaequale* is most similar to *A. moschatum* L. (a species with a native range in the Mediterranean region) (Zahariadi 1966; Vvedenskii 1968; Stearn 1980; Ciocârlan 1994), with which it was actually misidentified, in some cases, as already shown by Negrean (2011). Related to this, it is worth noting that, according to Vvedenskii (1968), “The typical *A. inaequale* occurs beyond the Volga. The form growing to the west in the southern part of the European USSR displays characteristics of transition towards *A. moschatum*, although still closer to *A. inaequale*”. The two species are the only representatives of sect. *Scorodon* Koch in the flora of Romania (Stearn 1980).

The botanical description of both species and the differences between them are presented (including by identification keys), in numerous relevant references, such as: Vvedenskii (1968); Fedorov (1979); Stearn (1980); Prokudin *et al.* (1987); Ciocârlan (1994, 2009); Sârbu *et al.* (2013). According to these authors, *A. inaequale* is characterized by pedicels of 10-30 (-40) mm, very unequal, (2) 3-6 (-10) times as long as perianth; tepals of 4-5 (-6) mm long; stamens ca. 2/3-3/4 as long as tepals; leaves wilting before anthesis (*versus* pedicels of 10-15 mm, \pm equal, up to 2 times longer than perianth; tepals of 6.5-7.5 mm long; stamens ca. 1/2-2/3 as long as tepals; leaves persistent nearly to fruiting, in *A. moschatum*).

The purpose of this paper is to document the presence of *A. inaequale* in Moldova (eastern Romania), and to demonstrate that this species has been previously reported as *A. moschatum* within THE NAME OF province.

Material and methods

Species has been identified by analysing herbarium specimens collected during our own field work (2018), but also of existing specimens in public herbaria in Romania: I, IAGB, IASI, CL, BUC, BUCA (abbreviations according to Holmgren *et al.* 1990).

The geographic coordinates were recorded on the field using the OsmAnd application, available at <https://osmand.net/>.

Species identification and nomenclature followed main references on the genus *Allium*, such as: Vvedenskii (1968); Fedorov (1979); Stearn (1980); Prokudin *et al.* (1987); Ciocârlan (2009); Sârbu *et al.* (2013).

Voucher specimens were deposited in the Herbarium of the University of Life Science “Ion Ionescu de la Brad” of Iași (IASI).

Results and discussion

As a result of field research carried out in 2018, we identified the species *A. inaequale* Janka in two nature reserves in the Central Moldavian Plateau, Vaslui County, namely:

- “Coasta Rupturile”, east of the Tanacu Village (N 46.66698, E 27.85064): xerophilous grassland, on arid southerly slope (Herb. IASI, no. 18050, *legit. et det.* C. Sîrbu, 10.08.2018);

- “Movila lui Burcel”, northwest of the Micleşti Village (N 46.84154, E 27.80215): xerophilous grassland, on arid, steep, westerly – north-westerly slope (Herb. IASI, no. 18049, *legit. et det.* C. Sîrbu, 19.08.2018).

All specimens collected by us have characteristics that undoubtedly fit within the variability range of the species *A. inaequale*. Even though pedicels are somewhat shorter (max. 17 mm, versus max. 30 (-40) mm), these are very unequal (the variation coefficient calculated for 5 specimens = 32.3%) and exceed the length of the perianth up



Fig. 1. Umbels of: **a)** *Allium inaequale* (“Movila lui Burcel” Nature Reserve, Herb. IASI, no. 18049, *legit. et det.* C. Sîrbu, 19.08.2018); **b)** *A. moschatum* (Ghiaur Suiciuc-Caliacra, Herb. I, no. 89889; *legit. et det.* P. Enculescu, 09.09.1934).

Scales are expressed in mm. Photos: C. Sîrbu.

to 3.8 times; tepals of 4.3-4.5 mm long; stamens of ca. 3/4 as long as tepals (Fig. 1a); leaves dried up at flowering. An umbel of *A. moschatum* is shown for comparison in Fig. 1b.

Within the above mentioned two nature reserves, the species is represented by small populations (several tens of individuals), scattered in arid grasslands of ass. *Taraxaco serotini-Festucetum valesiacae* (Răvăruț *et al.* 1956) Sârbu *et al.* 1999 subass. *bothriochloetosum ischaemi* Chifu *et al.* 2006 (all. *Jurineo arachnoideae-Euphorbion steposae* Dobrescu (1971) Coldea & Sârbu 2012; see Coldea 2012), on steep slopes, with eroded chernozems and exposed loessoid deposits (Habitat type – Nature 2000: 62C0* *Ponto-Sarmatic steppes*; see Gafta & Mountford 2008).

From the same localities, the closely related species *A. moschatum* L. was previously reported, as follows: “Tanacu on the «Coasta Rupturile», in the grassland with *Bothriochloa ischaemum*” (Ghișa & Vițalariu 1969); “in stony, strongly eroded ecotopes, on the south-eastern promontory of the «Movila lui Burcel» Nature Reserve” (Dobrescu & Leocov 1982). Beldie (1979) also reported *A. moschatum* from two other localities, namely Unțești and Satu Nou-Solești (Vaslui County), the second one located in the vicinity of the “Movila lui Burcel” Nature Reserve.

However, Ciocârlan (2009) suggested the possibility that in the cited localities from the Vaslui County there is rather *A. inaequale* instead of *A. moschatum*. Following this suggestion, during the year of 2022, we undertook a study in public herbaria (I, IAGB, IASI, CL, BUC, BUCA), in order to identify possible specimens of *A. moschatum* collected from the Vaslui County, and to verify whether the respective specimens do not actually belong to the species *A. inaequale*. As a result of this study, we found a total of five herbarium sheets, with several specimens collected from “Coasta Rupturile” and “Movila lui Burcel” Nature Reserves, all labelled as *A. moschatum* L. All these specimens have the same characteristics as those collected by us (see above) and consequently undoubtedly fit to *A. inaequale*. The five herbarium sheets are as follows:

- Herb. CL, no. 507648: Tanacu (Vaslui County), dry, arid slopes (*legit. et det.* Gh. Vițalariu & E. Ghișa, 18.08.1967, as *A. moschatum* L.; *rev.* C. Sîrbu, 25.11.2022);
- Herb. I, no. 69029 and 69036: Miclești (Vaslui County), “Movila lui Burcel” Nature Reserve (*legit. et det.* C. Dobrescu, 02.08.1972, as *A. moschatum* L.; *rev.* C. Sîrbu, 05.10.2022);
- Herb. I, no. 69017: *idem* (*legit. et det.* C. Dobrescu, 04.08.1972, as *A. moschatum* L.; *rev.* C. Sîrbu, 05.10.2022);
- Herb. IAGB, no. 18477: *idem* (*legit.* I. Căpălnășan, *det.* I. Sârbu, 09.08.1973, as *A. moschatum* L.; *rev.* C. Sîrbu & A. Oprea, 05.10.2022).

No specimen of *Allium* collected from the two localities mentioned by Beldie (1979) has been identified in the mentioned herbaria. Considering the above, we assume that Beldie's data must be reported rather to *A. inaequale* instead of *A. moschatum*.

Considering the rarity of the species *A. inaequale* in Romania, at the western limit of its general range of distribution, the small, isolated populations and the vulnerable habitats, we consider that it should be included in the Red List/ Book of vascular plants in Romania, as *Vulnerable* (VU).

Note. We also found *A. inaequale* to the west of Palazu Mic Village, Constanța County (N 44.44375, E 28.51748): xerophilous grassland, on eastern slope, with calcareous substrate (Herb. IASI, nr. 18051; *legit. et det.* C. Sîrbu & A. Oprea, 08.08.2021).

Conclusions

Based on our own field research and the review of some specimens stored in public herbaria in Romania, we report in this paper the species *A. inaequale* for the first time in the vascular flora of Moldova (eastern Romania).

This is a very rare plant, found here at the western limit of its general range of distribution, and should be included, as vulnerable, in the Red List of vascular plants in Romania.

Based on the current data, the species *A. moschatum*, which has been previously reported from Moldova as a result of misidentification, must be changed in the flora of this historical province by *A. inaequale*.

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ACALYPHA RHOMBOIDEA IN THE VASCULAR FLORA OF ROMANIA

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Abstract: In this paper, *Acalypha rhomboidea* (Euphorbiaceae) is reported for the first time, as a neophyte, in the vascular flora of Romania. We have identified small populations of this species native to North America, in the central area of the Iași city (north-eastern Romania), as a weed in a garden of ornamental plants, near the Palace of Culture. Most likely it has been introduced here accidentally, by importing contaminated growing medium for gardens. It produces viable seeds and seems to survive here for more than 10 years despite regular weed control. The morphology of this species is described based on field and herbarium specimens, and checked on literature data. The paper also includes some data on general distribution and favourite habitats of this species, as well as two identification keys.

Keywords: Acalyphoideae, alien plants, Euphorbiaceae, identification keys, neophytes

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Introduction

The genus *Acalypha* L. (Sp. Pl. 2: 1003. 1753) belongs to the family Euphorbiaceae Juss., subfam. *Acalyphoideae* Asch., tribe *Acalypheae* Dumort., subtribe *Acalyphinae* Griseb. (Webster 1975, 1994). With ca. 500 species, *Acalypha* is the third largest genus of Euphorbiaceae, after *Euphorbia* L. and *Croton* L. (Cardiel & Rodriguez 2015; Cardiel *et al.* 2022; Montero-Muñoz *et al.* 2021).

The species of *Acalypha* are distributed in the tropical and subtropical regions worldwide, with New World as home to around two thirds of them, but some species are found in temperate regions (Mohlenbrock 1931; Webster 1994; Gordillo *et al.* 2002; Cardiel & Rodriguez 2015; Levin 2016; Cardiel *et al.* 2022).

According to Webster (1994) the combination of characters by which *Acalypha* differs from other Euphorbiaceae is as follows: latex absent; leaves alternate, unlobed, stipulate; inflorescences usually spicate, bisexual or unisexual (when bisexual, pistillate flowers proximal and staminate distal, rarely vice versa); foliaceous bracts subtending the pistillate flowers usually enlarged in fruit; staminate flowers with 4 distinct tepals and 4-8 distinct stamens, with anther sacs pendulous and vermiform and pollen grains porate, rugulose; pistillate flowers with 3 (-5) distinct tepals, ovary (2-) 3 - locular, with 1 ovule per locule, styles distinct or connate basally, multifid or lacinate (rarely entire); fruit capsular; seeds ± carunculate. In addition to normal pistillate flowers, some species produce allomorphic flowers, usually long-pedicelate, ebracteate, with fewer carpels (usually 1), and the axis of the ovary turned almost 180° so that the style is sub-basal (Radcliffe-Smith 1973).

Six species of *Acalypha* have been reported as alien plants in Europe so far, all of them being monoecious annual herbs, namely:

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- *Acalypha australis* L. – native to eastern Asia (Hauxing & Gilbert 2008; Levin 2016); Caucasus (naturalised) (Poyarkova 1974), Ukraine (naturalised) (Poyarkova 1974; Shevera & Kish 2018), Italy (naturalised) (Conti *et al.* 2005; Celesti-Grapow *et al.* 2009, 2010; Galasso *et al.* 2018a,b), Switzerland (naturalised?) (Mangili *et al.* 2016), Bulgaria (naturalised; formerly mistakenly reported as *A. virginica*) (Petrova 2017), and Austria (Pilsel 2022); the species has been also reported from Turkey (Duman & Terzioğlu 2009; Uludağ *et al.* 2017);

- *Acalypha indica* L. – native to tropical Asia and Africa (Hauxing & Gilbert 2008; Radcliffe-Smith 2011): ?Caucasus (according to Poyarkova 1974, records from this area are probably incorrect since all the examined specimens determined as *A. indica* should be referred to *A. australis*); Belgium (casual) (Verloove 2006);

- *Acalypha mexicana* Müll. Arg. – native from central Mexico to Guatemala (Steinmann & Felger 1997; Levin 2016): France (naturalized) (Thellung 1912); however, not mentioned in the *Flora Europaea* (Tutin 1968);

- *Acalypha ostryifolia* Riddell – native to North America (Levin 2016): Italy (casual) (Celesti-Grapow *et al.* 2009, 2010; Galasso *et al.* 2018b);

- *Acalypha rhomboidea* Raf., native to North America (Levin 2016): Portugal (naturalized) (Almeida & Matos 2006) and Italy (naturalized) (Di Pietro *et al.* 2021);

- *Acalypha virginica* L. – native to North America (Levin 2016): France (naturalized) (Thellung 1912), Italy (naturalized to invasive) (Tutin 1968; Conti *et al.* 2005; Celesti-Grapow *et al.* 2009, 2010; Galasso *et al.* 2018b), Switzerland (naturalized) (Tutin 1968; Wittenberg 2005), Austria (naturalized) (Tutin 1968; Essl & Rabitsch 2002; Fischer 2018); however, according to Euro+Med (2006+) this species is present only in Madeira archipelago, as casual.

Based on data from the literature (Mohlenbrock 1931; Correll & Johnston 1970; Poyarkova 1974; Steinmann & Felger 1997; Rhoads & Block 2007; Hauxing & Gilbert 2008; Radcliffe-Smith 2011; Levin 2016), these six species can be distinguished as follows:

- 1a. Blade base cordate; inflorescences unisexual *A. ostryifolia*
- 1b. Blade base cuneate to obtuse; inflorescences bisexual **2**
- 2a. Pistillate bracts margins shallowly incised (crenate or repand-dentate) **3**
- 2b. Pistillate bracts margins deeply incised, at least 1/3 of the bract length (lobed) **5**
- 3a. Pistillate bracts usually 1 or 2, (10-) 14-25 mm long, ovate-cordate; allomorphic pistillate flower usually absent (if present, 2-carpellate); capsule ca. 4 mm in diam.; seeds smooth *A. australis*
- 3b. Pistillate bracts 3-9, 5-10 mm long, ovate-cordate or suborbicular; allomorphic pistillate flowers present, 1 - carpellate, at the inflorescence apex; capsule ca. 2 mm in diam.; seeds minutely puncticulate **4**
- 4a. Pistillate bracts ca. 5 mm, margins repand-dentate (teeth not rounded at the apex) *A. indica*
- 4b. Pistillate bracts ca. 10 mm, crenate (teeth rounded at the apex) *A. mexicana*
- 5a. Stems hirsute with spreading hairs. Leaves narrowly rhombic to broadly lanceolate. Pistillate bract abaxial surfaces hirsute, and sometimes stipitate-glandular, with (9-) 10-14 (-16) lobes triangular, 1/4 - 1/2 of bract length; allomorphic pistillate flowers absent *A. virginica*
- 5b. Stems glabrous or with incurved hairs. Leaves ovate to broadly rhombic. Pistillate bract abaxial surfaces sparsely pubescent, stipitate-glandular, with (5-) 7-9 (-11)

lobes lanceolate to triangular, 1/3 - 3/4 of bract length; allomorphic pistillate flowers rare, solitary in axils near base of stem *A. rhomboidea*

None of the *Acalypha* species has been reported from Romania so far (see Prodan 1953; Oprea 2005; Ciocârlan 2009; Sârbu *et al.* 2013). In this paper we report *A. rhomboidea* as a new record in the vascular flora of the country.

Material and methods

Species has been identified as a result of our field works (2021 - 2022), in north-eastern Romania. The geographic coordinates were recorded on the field using the OsmAnd application, available at <https://osmand.net/>. Species has been identified based on descriptions and identification keys published, for North America, by Mohlenbrock (1931), Correll & Johnston (1970), Levin (1999, 2016) and Rhoads & Block (2007). We also checked it in many other references concerning the genus *Acalypha*, from other world regions, as indicated below: Africa (Cardiel & Montero-Muñoz 2018); Asia (Poyarkova 1974; Hauxing & Gilbert 2008; Sagun *et al.* 2010; Radcliffe-Smith 2011; Welzen & Chayamarit 2020); Australia (Forster 1994); Europe (Tutin 1968; Poyarkova 1974); South America (Cardiel Sanz 1994; Cardiel & Rodriguez 2015; Cardiel *et al.* 2022; Cordeiro de Sousa *et al.* 2016); Western Indian Ocean Region (Montero-Muñoz *et al.* 2018, 2020, 2021). Voucher specimens were deposited in the Herbarium of the University of Life Science “Ion Ionescu de la Brad” of Iași (IASI) (abbreviation according to Holmgren *et al.* 1990). The nomenclature of the plant taxa follows Levin (1999, 2016), for *Acalypha*, and Sârbu *et al.* (2013), for accompanying species.

Results and discussion

Acalypha rhomboidea Raf., New Fl. 1: 45. 1836 (*Acalypha virginica* L. var. *rhomboidea* (Raf.) Cooper. in Michigan Bot. 23: 165. 1984) – rhombic threeseeded mercury (*Fig. 1*).

Botanical description (based on the specimens collected on the field): annual herb, 15-40 cm tall; stem erect, branched, pubescent with upward curved hairs; leaves alternate; stipules present, very small, triangular-lanceolate; petiole at least 1/3 as long as the blade, pubescence like on the stem; blade up to 4.5 × 2.2 cm, 3 - nerved at base, rhombic-ovate, base subcuneate, margins crenate-serrate, apex subacute, glabrous or covered with sparse stiff, ± adpressed hairs; inflorescences axillary, spiciform, bisexual, up to 10 mm long, the pistillate flowers proximal, staminate crowded distal; bracts subtending pistillate flowers 1 - 3 (each with 1 - 3 flowers), crowded, wider than long (10 - 12 × 5 - 6.5 mm), enlarging in fruit, abaxial surface sparsely pubescent and stipitate-glandular, cut about 1/3 to 1/2 of their length into 5 - 9 (-11) lobes oblong-lanceolate; pistillate flowers with 3 distinct tepals and 3 united carpels, styles multifid; the axis below the staminate flowers with ± adpressed hairs; staminate flowers with 4 distinct tepals and 8 stamens, pollen sacs distinct, vermiform and pendulous; capsule 3 - seeded, pubescent with stiff hairs (the apical ones with purple bulbous base) and few glandular hairs towards the top; seeds yellowish brown, with small brown spots (from the underlying layer?), minutely pitted, ovoid, 1.5 mm long, with a small caruncle.

The above features fit very well with descriptions of *A. rhomboidea* published by Mohlenbrock (1931), Correll & Johnston (1970), Levin (2016) and Rhoads & Block (2007).



Fig. 1. Acalypha rhomboidea, Iași (north-eastern Romania). Pistillate bracts deeply incised (5-9 lobed) with the abaxial surface stipitate-glandular are seen (Photo: C. Sîrbu)

As shown by Levin (2016), allomorphic pistillate flowers and fruits may be present in *A. rhomboidea*, but no such flowers and fruits were observed on our specimens.

Origin, general distribution and habitats. *A. rhomboidea* is a native to North America (south-eastern USA), where it grows in a wide range of habitats, both natural (woods, moist depressions, swampy areas, bluffs, riverbanks, moist to dry sandy sites) and anthropogenic (roadsides, agricultural fields, waste ground) (Mohlenbrock 1931; Correll & Johnston 1970; Rhoads & Block 2007; Levin 2016).

As it was already shown, the first report of this species in Europe was made by Almeida & Matos (2006). According to the cited authors, *A. rhomboidea* was introduced by culture in the Botanical Garden of Coimbra (Portugal), from where it has been escaping, becoming a naturalized alien weed in ruderal communities of gardens and roadsides. More recently, the species has been reported by Di Pietro *et al.* (2021) in Italy (Lazio), as a naturalized weed, introduced accidentally, inside and outside of a nursery garden, where it survived for at least 4 years despite various attempts of complete eradication.

Distribution and habitats in Romania. We first observed this species in August 2021, in the central area of the Iași city (north-eastern Romania), as a weed in the garden of ornamental shrubs and trees, from the park of a shopping center, near the Palace of Culture (N 47.15661, E 27.58802), but we managed to identify it barely a year later (2022) (examined specimens: Herb. IASI, no. 18047, 18048, *legit. et det.* C. Sîrbu, 20.08.2022; 02.10.2022). This is the first record of the genus *Acalypha* for Romania.

Among the accompanying weeds in the mentioned place, we registered the following ones: *Convolvulus arvensis*, *Digitaria sanguinalis*, *Euphorbia peplus*, *Eragrostis minor*, *Portulaca oleracea*, *Setaria viridis*, *Stellaria media* (native), *Erigeron canadensis*, *Euphorbia prostrata*, *E. serpens*, *Eclipta prostrata*, *Oxalis corniculata* (alien plants, some of which have been already reported from the same garden, by Sîrbu & Șuşnia 2018, and Oprea *et al.* 2021).

Possible introduction way and current status in Romania. Since *A. rhomboidea* has not been cultivated in Romania until now, we suppose that it was accidentally introduced in the garden near the Palace of Culture of Iași by growing medium imported (2010-2012) from Italy (together with various ornamental plants), which possibly has been contaminated with weed seeds. A similar introduction in the same place was assumed for *Euphorbia serpens* by Sîrbu & Șuşnia (2018), but could also be considered for other neophytes recently recorded here (e.g. *Euphorbia prostrata*, *E. serpens*, *Eclipta prostrata*).

In the mentioned place, *A. rhomboidea* grows in small populations (up to 17 individuals each) and produce viable seeds which germinate in several stages during the second part of summer and early fall, which enables it to survive (possibly for over 10 years?) despite regular weed control. Thus, it seems to be somehow naturalized in Romania, but further investigations are necessary to a better assessment of its status.

Useful resources for the species identification. Characters often used to separate *A. rhomboidea* from other congeneric similar species from North America (*i.e.* *A. deamii* (Weath.) H.E. Ahles; *A. gracilens* A. Gray; *A. monococca* (Engelm. ex A. Gray) Lill. W. Mill. & Gandhi; *A. virginica* L., all these being designated as the “*Acalypha virginica* group”), were summarised and commented by Levin (1999, 2016).

Identification keys which include *A. rhomboidea* were published by Mohlenbrock (1931), Correll & Johnston (1970), Rhoads & Block (2007) and Levin (1999, 2016).

Valuable iconography for *A. rhomboidea* is provided by Mohlenbrock (1931), Rhoads & Block (2007) and Alonge, in Levin (2016).

Comprehensive information on the taxonomy and biogeography of *Acalypha* is provided by the website “*Acalypha* Taxonomic Information System” developed by Cardiel *et al.* (<http://www.acalypha.es/>).

***Acalypha* among other Euphorbiaceae in Romania.** Three genera of Euphorbiaceae have been known in the vascular flora of Romania so far, namely (Prodan 1953; Ciocârlan 2009; Sârbu *et al.* 2013): *Euphorbia* L., *Ricinus* L. and *Mercurialis* L. *Acalypha* differs from these genera as follows (key mainly based on the data of Webster 1994):

1a. Plants with latex; inflorescence a pleiochasium of cyathia; each cyathium consists in a cup shaped involucre (more or less deeply lobed, with 4-5 glands to the top, outside) which encloses a single, central, pistillate flower (3-carpellate, with gynophore), and several staminate flowers (of a single stamen); perianth absent
 *Euphorbia*

- 1b. Plants without latex; inflorescences spiciform or paniculate; the staminate flowers with at least 4 stamens, the pistillate ones with 2-3 carpels; perianth present 2
- 2a. Leaves palmate lobed; stipules connate into a sheath, deciduous; inflorescence terminal, paniculate, with cymules of staminate flowers proximal, and pistillate flowers distal; stamens many, filaments connate into branching fascicles; capsules large, 13-15 mm; seeds carunculate *Ricinus*
- 2b. Leaves not lobed; stipules free, persistent; inflorescences axillary, unisexual or bisexual, spiciform; stamens not connate into fascicles; capsules much smaller; seeds carunculate or not 3
- 3a. Plants dioecious; leaves opposite; staminate flowers with 3 tepals and 8-12 stamens; pistillate flowers 2-carpellate, with 3 tepals, and 2 subulate nectaries, not-subtending by foliaceous bracts enlarging in fruit; anther-sacs not vermiform; pollen colpate; seeds carunculate *Mercurialis*
- 3b. Plants monoecious (as in *A. rhomboidea*) or dioecious; leaves alternate; staminate flowers with 4 tepals and 4-8 stamens; pistillate flowers (1-2-)3-carpellate, with 3 tepals (nectaries absent), subtending by foliaceous bracts enlarging in fruit; anther-sacs vermiform and pendulous; pollen porate; caruncle minute or absent *Acalypha*

Conclusions

Acalypha rhomboidea, native to North America, is reported here for the first time in the spontaneous flora of Romania, based on field and herbarium specimens.

It has been identified in the central area of the Iași city (north-eastern Romania), as a weed in a garden of ornamental plants, near the Palace of Culture.

We suppose that this neophyte was accidentally introduced in north-eastern Romania through growing medium for ornamental plants from import, contaminated with weed seeds.

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