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New data about the genus *Artemisia* L. (*Asteraceae*) in Armenia**Abstract**

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The known distribution area of *Artemisia tournefortiana* in Armenia is enlarged and the indigenosity of this species in Armenia concluded from its observed occurrence in associations of typical dry montane steppe elements. As an adventitious species, *A. verlotiorum* is reported for the first time from both Armenia and the Caucasus, and the chromosome number of Armenian plants ($2n = 48$) is given.

Introduction

Sixteen species of *Artemisia* L., including the widely cultivated *A. dracunculus* L., are known from Armenia (Gabrielian & Handžjan 1986, 1995). Several species occur in the lower montane zone, in the Ararat valley, which is extremely poor in precipitation (not exceeding annually 150–200 mm in the Southeast and reaching 300 mm in Vedy, Artashat, Echmiadzin), as well as at the foothills, where the annual precipitation varies from 300 to 500 mm. Other species occur in the medium and upper montane zone, and more rarely in the alpine zone.

Most widely distributed species, such as the very polymorphic *A. fragrans* Willd., *A. absinthium* L., *A. armeniaca* Lam., and *A. austriaca* Jacq., form pure sagebrush formations or mixed coenoses. *A. fragrans*, e. g., which grows at altitudes between 400 and 2000 m, forms mixed associations with halophytic or psammophytic species on very saline or sandy soils. Very rare species in Armenia are, e. g., *A. abrotanum* L., which is restricted within the Caucasus to the Ciscaucasus and was found in Armenia not long ago (Grigorian 1985), and the Caucasian endemic *A. szovitziana* (Besser) Grossh., which is confined to the E Transcaucasus (Grossheim 1934, 1949) and has only recently been discovered in Armenia (Gabrielian & Handžjan 1995).

During a botanical expedition carried out in Armenia from August 11 to 31, 1995, organized by the Institute of Botany of the Armenian Academy of Sciences, the Botanical Institute of Barcelona and the Laboratory of Botany of the Faculty of Pharmacy of the University of Barcelona, the authors made some findings concerning the distribution of two *Artemisia* species in Armenia which are reported here.

***Artemisia tournefortiana* Reichenb., a species indigenous in Armenia**

Artemisia tournefortiana is an annual, dark-green plant, often reaching a height of 2(–3) m, with a long, straight-erect, very narrow synflorescence and branches appressed to the stems;

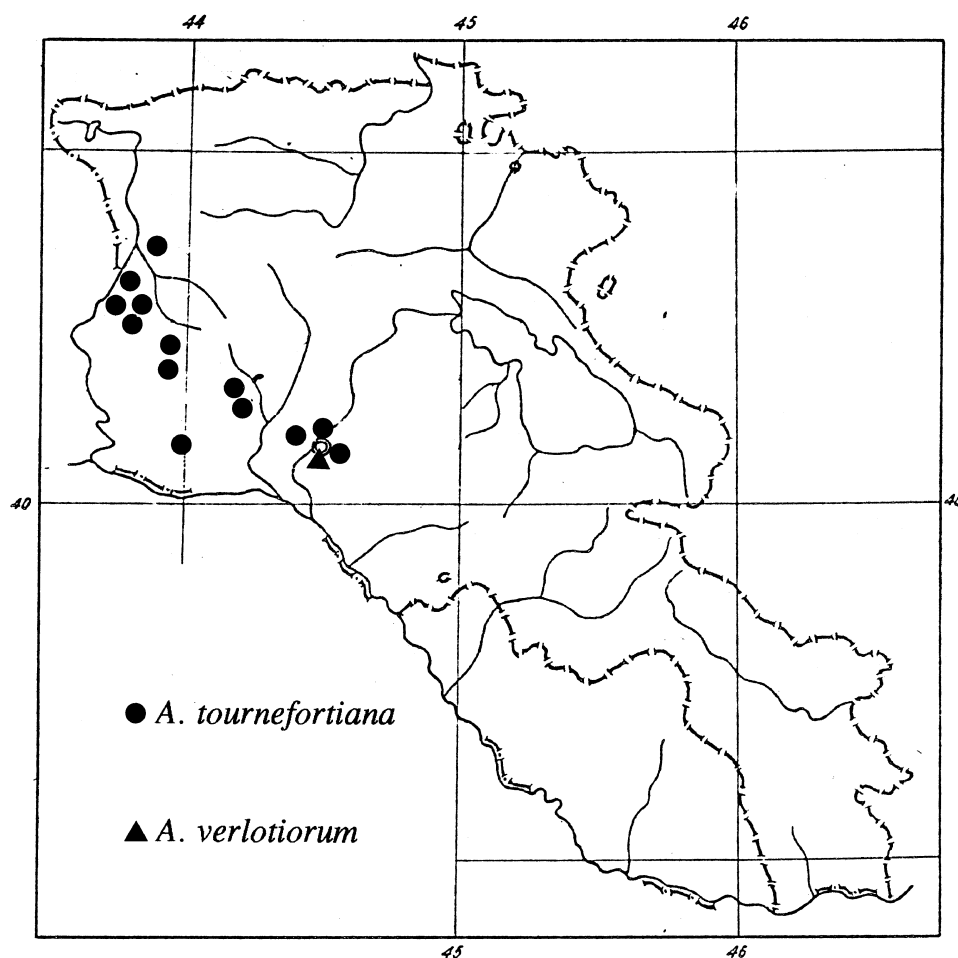


Fig. 1. Distribution area of *Artemisia tournefortiana* and *A. verlotiorum* in Armenia.

abundant glandular trichomes make this species sticky and strongly fragrant. Considered by Podlech (1986) as a synonym of *A. biennis* Willd., *A. tournefortiana* is maintained as a separate taxon, closely related to the latter, by many authors (Lawalrée 1956, Wagenitz 1968, Ling 1992, Meusel & Jäger 1992, Bremer & Humphries 1993, Gabrielian & Handžjan 1995). The main distribution area of the species is in Central and E Asia (Meusel & Jäger 1992, Bremer & Humphries 1993), and several isolated localities have been reported for Central and S Europe (Żukowski 1971, Lawalrée 1956, Rainha 1959, Navarro & Sánchez 1982, Vallès Xirau 1985, Mosyakin 1990).

This species was indicated for the flora of the Caucasus by Grossheim (1934, 1949) only from the environs of Yerevan in the canyon of the river Zanga (now Hrazdan) and by Tahtadžjan & Fedorov (1972) from the neighbourhood of the village of Parakar. Later, Gabrielian collected it on dry rocky hillsides in the vicinity of the villages of Dzorap and Tegher, at the foot of the Aragatz mountain and near Talin (Gabrielian & Handžjan 1995). On August 26, 1995, we found *A. tournefortiana* lushly growing also in other parts of the Shirak floristic region (e. g., Tzamarasar, Bagravan, Bayandur, and Mastara; specimens have been deposited in ERE). The known localities are situated in the lower and medium montane zone, at altitudes between

800 and 1500 m. The distribution of *A. tournefortiana* in Armenia is shown in Fig. 1.

Grossheim (1949) considered *A. tournefortiana* as adventitious in the Caucasus. However, its ecogeographical distribution in Armenia testifies, in our opinion, the contrary. The species occurs mainly on the Shirak plateau, more or less far from populated areas, and grows in the so-called “chingils”, which are extended boulder or rubble fields (Felsenmeere) from stiffened post-tertiary lava effusions, met all over Armenia from the semidesert to the alpine zone. In the medium montane zone, we found *A. tournefortiana* growing in chingils inhabited by typical representatives of the dry montane steppe vegetation. In chingils comprising scattered, not closely clinging stones, where the species composition is particularly rich, *A. tournefortiana* is accompanied by species such as *Centaurea hajastana*, *C. carduiformis*, *C. glehnii*, *Serratula erucifolia*, *Stipa capillata*, *S. transcaucasica*, *Agropyron trichophorum*, *A. cristatum*, *Alcea sophiae*, *Salvia verticillata*, *Marrubium parviflorum*, *M. persicum*, *Phlomis pungens*, *Nepeta navaschinii*, *Melilotus officinalis*, *Medicago coerulea*, *M. sativa*, *Onobrychis transcaucasica*, *Thalictrum minus*, *Gypsophila bicolor*, and *Artemisia absinthium*. These findings strongly indicate that *A. tournefortiana* is an indigenous species of Armenia.

***Artemisia verlotiorum* Lamotte, an adventitious species new for Armenia and the Caucasus**

Artemisia verlotiorum is an invasive weed, widespread in W Central and S Europe and also distributed in E Europe, the Mediterranean, North Africa, Central and E Asia (Brenan 1950, Żukowski 1971, Gutte & Pyšek 1972, Malato-Béliz 1973, Tutin & al. 1976, Pignatti 1982, Aeschiman & Burdet 1989, Ling 1992, Meusel & Jäger 1992, Bolòs & Vigo 1996). Pampanini (1930) postulated a Chinese origin for this species, but this assumption, even though repeated by several authors since (e. g., Malato-Béliz 1973, Mosyakin 1990, Meusel & Jäger 1992), has not actually been demonstrated. Alternatively, the possibility of an origin in S France or N Italy by hybridization has been brought up (Gams 1928). Once introduced, *A. verlotiorum* is very difficult to eliminate due to its sprouting rhizomes. The species is very closely related to *A. vulgaris* L., from which it differs by the features stated in Tab. 1.

We recently found this species spontaneously growing in several parks of Yerevan (Fig. 1); specimens have been deposited in BCF (41216, 41217). It is quite abundant there and it may have been misidentified up to now as *A. vulgaris* because of the similarity between some forms of this extremely polymorphic species and *A. verlotiorum*. The Yerevan populations, however, clearly belong to *A. verlotiorum* by all its features (morphology, scent, phenology). This identification could furthermore be confirmed by chromosome counts of $2n = 48$ (Nalbandian street population, Fig. 2). *A. vulgaris* and *A. verlotiorum* evidently differ in their cytotypes ($2x$ and $6x$), and even if morphological features are often overlapping, the plants clearly belonging to *A. verlotiorum* are always hexaploid (Vallès Xirau, in prep.). B chromosomes and aneusomy are frequent in this species (Martinoli & Ogliotti 1970, Vallès Xirau 1987 and unpubl. data) and

Tab. 1. Distinctive features of *Artemisia vulgaris* and *A. verlotiorum*.

	<i>A. vulgaris</i>	<i>A. verlotiorum</i>
Growth form	rhizoms absent or present, plant not stoloniferous	rhizoms present, plant strongly stoloniferous
Leaves	dark green	lighter green
Lobes of adult leaves	ovate-lanceolate and toothed	lanceolate and entire
Synflorescence	brownish, erect	green, nodding
Connective above anther	acute	acuminate
Scent	not aromatic	aromatic
Flowering period	July-September	September-November
Chromosome number	$2n = 16$	$2n = 48$

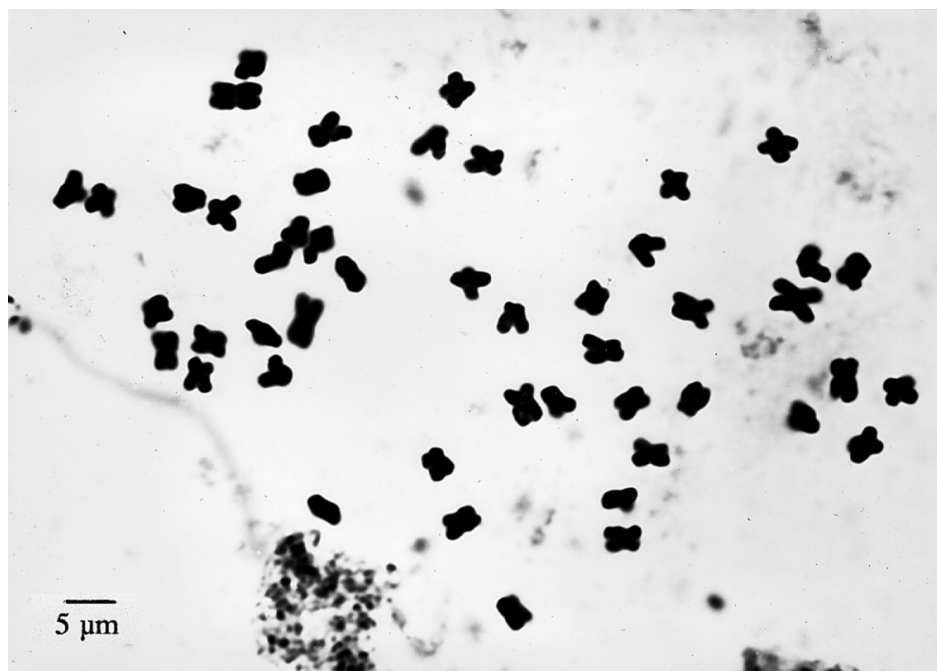


Fig. 2. Mitotic metaphase of *A. verlotiorum* (Yerevan, Nalbandian street; $2n = 48$).

explain deviating reports of $2n = 54$ (Vignoli 1945, Sokolovskaya 1960). The reports of $2n = 16$ and $2n = 18$ chromosomes – the latter more surprising – by Kawatani & Ohno (1964) may be due to misidentification of the material, as it was the case by Oliva Brañas & Vallès Xirau (1991), who counted $2n = 16$ in a Russian population determined as *A. verlotiorum*, a determination later corrected to *A. vulgaris* in a more detailed work on the same population (Oliva Brañas & Vallès Xirau 1994).

A. verlotiorum was never before reported from Armenia and the whole Caucasus (Grossheim 1934, 1949, Gabrielian & Handžjan 1995), and was not even included in the Flora of the USSR (Poljakov 1961), although Gams (1928) reported the species as a weed from the “Garten von Nikita” on the Crimea, Ukraine. In Poljakov’s work only the closely related *A. umbrosa* Turcz. is reported from Siberia and the Far East. Leonova (1987), in a conspectus of the genus *Artemisia* in the European part of the USSR, then reported *A. verlotiorum* from Latvia, the Leningrad region, Udmurtia, Byelorussia, and – with a question mark – from the Crimea; Gudžinskas (1990) reports *A. verlotiorum* also from Lithuania. Mosyakin (1990), in contrast, assigns the specimens from the Leningrad region, Udmurtia and Byelorussia kept in LE to *A. umbrosa*, but confirms the existence of *A. verlotiorum* on the Crimea, based on material recollected in the same garden by Dubovik in 1979.

The known localities of *A. verlotiorum* nearest to the Yerevan populations are those rather recently found at Rize in coastal NE Anatolia, which are at the same time the only localities of this species given for Turkey (Davis & al. 1988).

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