

## Three Alien Species New to the Flora of Turkey

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Received: 20.01.1997

Accepted: 19.09.1997

**Abstract:** *Sporobolus fertilis* (Steud.) W.D. Clayton (Gramineae), *Physalis pubescens* L. (Solanaceae) and *Ambrosia elatior* L. (Compositae) are added to the flora of Turkey following the collection in August 1995 of three specimens from Northeast Anatolia where well-established populations now exist. They are housed at the Herbarium of the Faculty of Pharmacy of İstanbul University (nos. 69298, 69309, 69357). Observations on the alien plants of the cited area are appended.

**Key Words:** *Sporobolus fertilis*, *Physalis pubescens*, *Ambrosia elatior*, Turkish alien plants.

### Türkiye Florası İçin Yeni Üç Yabancı Tür

**Özet:** Kuzeydoğu Anadolu'dan Ağustos 1995 te toplanmış olan ve İstanbul Üniversitesi Eczacılık Fakültesi Herbaryumu'nda saklı bulunan üç örnekle (69298, 69309, 69357), *Sporobolus fertilis* (Steud.) W.D. Clayton (Gramineae), *Physalis pubescens* L. (Solanaceae) ve *Ambrosia elatior* L. (Compositae) türleri Türkiye florasına ilave edilmiş, adı geçen bölgede tabiileşmiş olarak rastlanan yabancı bitkilerden bahsedilmiştir.

**Anahtar Sözcükler:** *Sporobolus fertilis*, *Physalis pubescens*, *Ambrosia elatior*, Türkiyenin tabiileşmiş yabancı bitkileri.

### Introduction

An increasing number of adventive plants occur as naturalized populations in N.E. Anatolia. Those known up to 1988 are cited in P.H. Davis' Flora of Turkey (1). Subsequent botanical investigations have supplied additional records to the alien flora of the region (2). The following three specimens collected and brought to ISTE in August 1995 by one of the authors (A.J.B.) represent yet further adventive species, new to the alien flora of N.E. Anatolia and Turkey as a whole. These records are as follows

1. *Sporobolus fertilis* (Steud.) W.D. Clayton (Gramineae). A8 ARTVIN: Kemalpaşa, beach W. of river mouth, sandy dry grassland behind beach, 5m. 17. viii. 1995, A.J. Byfield and S.Atay (ISTE 69298). det.T.Cope (Kew).

2. *Physalis pubescens* L. (Solanaceae). A8 ARTVIN: Kemalpaşa, same locality, habitat and date as the above cited *Sporobolus* specimen, A.J. Byfield and S. Atay (ISTE 69309).

3. *Ambrosia elatior* L. (Compositae). A7 TRABZON: 1 km W. of Çarşıbaşı, damp roadside grassland, 10-20 m., 23. viii. 1995, A.J. Byfield and S. Atay (ISTE 69357).

None of these three species are included either in Flora of Turkey (1) or in relevant publications that have appeared since (3). In this article it is claimed that these are first records to be added to the adventive flora of Turkey. In each case, the species occur as viable populations of more than hundred plants and compete well with the native vegetation of the locations at which they occur.

### Results and Discussion

The following descriptions are based on the three specimens cited above.

1. *Sporobolus fertilis* (Steud.) W.D. Clayton in Kew Bull. 19(2): 291 (1965).

Glabrous perennial herbs, with numerous leafy shoots at base. Flowering stems erect, thin, stiff,

20-60 cm (incl. inflorescence). Cauline leaves 3-4, upper sheath long, up to 16cm, occasionally with margins shortly ciliate in upper part, blade erect to spreading, 3-5cm. Lower leaves and shoot leaves with much shorter sheath and much longer spreading blade up to 15cm. Basal sheaths 2-4 mm broad. Leaf-blades flat, basally 2-3 mm wide, attenuate towards top with inrolled margins. Ligule a fringe of short dense hairs. Inflorescence pale green, a contracted linear-cylindrical spike-like panicle, 3-20 cm long, 2-4 mm wide, branches crowded, adpressed to axis, 0.5-2.5 cm long, the lower ones being the longest and remote, up to 2 cm apart. Spikelets single flowered, 1.5 to nearly 2 mm, on slender pedicels 0.2 - 10 mm. Glumes membranous, the lower veinless, obtuse, 0.5 mm, the upper with obscure mid-vein, acute, nearly 1 mm. Lemma membranous, 1.8 mm, acute, with obscure mid-vein. Palea hyaline, 2-keeled, subequal to lemma, apex finely denticulate. Anthers 0.5 mm. Stigma plumose. Caryopsis shorter than lemma, seed enclosed in a free mucilaginous pericarp, swelling when wetted and easily separating from the seed, obovoid-elliptical, truncate at apex, ca. 1 x 0.5 mm, brownish with darker base and darker embryo, embryo about half the length of the grain.

*S. fertilis* is treated by Clayton as one of the eleven separate species he recognised within the very polymorphic *S. indicus* complex (4). It is characterized by long, stiff, linear-cylindrical, spike-like contracted inflorescence, spikelets at most 2 mm long, upper glume half as long as spikelet, seed ovoid-elliptical, truncate, shorter than lemma, ca. 1 x 0.5 mm.

*S. fertilis* is an Asiatic grass distributed in India, Burma, Ceylon, Thailand, Indo-China, Malaya, Indonesia, Philippines, China and Japan, as stated by Clayton (4).

One of the other members of the complex, *S. indicus* (L.) R. Br., is an American plant with a distribution given by Clayton as the Southeastern United States, Mexico, Central America, West Indies, Bolivia, Columbia, Ecuador, Brazil and Paraguay (4). It occurs naturalized in South Europe (5) and also in the West Caucasus (6). Considering that W. Caucasia and N. E. Anatolia have many plants in common, a comparative examination of their specimens belonging to the *S. indicus* complex would be appropriate.

## 2. *Physalis pubescens* L., Sp. Pl. 183 (1753).

Annual, softly villous, with glandular and eglandular hairs. Stem erect, branched nearly from base, 30-35 cm. Leaves alternate, petiolate, 1-4 x 0.8 - 2.5 cm,

limb thin, broadly ovate to rounded, mostly acute, with 4-5 lateral veins on each side, base cordate to truncate, often obliquely so, margins entire to shallowly and unequally dentate, hairs on both surfaces, mainly on veins and margins, petiole glandular-pubescent, 0.5 - 2.5 cm. Flowers axillary, solitary, pedicel 2-5 mm. Calyx campanulate, 3.5 - 4 mm, divided to halfway into 5 triangular acute teeth, with glandular and eglandular hairs mainly on teeth margins. Fruiting calyx membranaceous, enlarged and inflated, subglobose, 2.5 cm long (incl. teeth), 1.5 - 1.7 cm wide, densely reticulate, 5 angled, with 5 basal auricles standing above the depressed base, teeth connivent, unequal, the longest 5 mm. Corolla yellow, villous outside with long glandular and eglandular hairs, 7-8 mm, with a tubular basal part for 3 mm, then expanded in a subentire, rotate limb ca. 12 mm in diameter, bearing 5 dark purple spots at the limb base, corolla throat with a dense hairy ring. Anthers purple, oblong, 2 mm, filaments 5 mm, inserted into the base of corolla tube. Berry globose, yellow, many seeded, 10 mm in diameter (not fully ripe), edible.

*P. pubescens* is a native of tropical America (7), introduced and naturalized in North and South America, Mexico (7) and Europe: mainly Italy, Romania, Central and West Russia (8) and Germany (9), the West Caucasus and Far East (Ussurysk) (10). In this paper, N. E. Anatolia is added to its general distribution.

## 3. *Ambrosia elatior* L. Sp. Pl. 987 (1753), (*A. artemisiifolia* L. var. *elatior* (L.) Decourtils).

Annual, monoecious. Stem erect, branched, more than 40 cm, adpressed long hairy. Leaves bipinnatisect, triangular to ovate-lanceolate in outline, up to 10 cm, lower ones opposite and petioled, petiole up to 2 cm, upper ones alternate and sessile, leaves with short adpressed hairs, short glands and additional long soft hairs (2-3 mm) mainly on basal portions. Staminate capitula in spike-like, bractless, terminal racemes, elongating at anthesis up to 12 cm, width 4-6 mm; capitula small, hemispherical, drooping, 10-15 flowered, pedicel 1mm; involucre gamophyllous, cup-shaped, 2-4 mm broad, crenately lobed, shortly hairy and glandular; receptacle scaly, scales narrowly linear-attenuate, with scattered glandular hairs; corolla yellow, regular, tubular, glandular, 1.5 - 2 mm, with 5 long-acuminate teeth; stamens 5, anthers oblong, 0.8 mm, with a broadly triangular apical appendage; gynoecium rudimentary with a short style bifid at apex Pistillate capitula 1-2, in axils of the uppermost leaves just beneath the male inflorescence, each with a single

floret; involucre 4mm, apically beaked; corolla and pappus absent; style deeply 2-cleft, exerted from involucre; mature capitula not seen.

*A. elatior* L. is treated as conspecific with *A. artemisiifolia* L. in Flora von Mittel-Europa (11), Flora der Schweiz (12) and Flora Europaea (13), with the difference that in Flora der Schweiz the accepted name is *A. elatior*, whereas in the two other floras *A. artemisiifolia* is the accepted name.

Gray's Manual of Botany (14) gives *A. elatior* a varietal rank and distinguishes it from the typical *A. artemisiifolia* by the characters it mentions in the following key:

- 1- Leaves simple, coarsely pinnatifid or rarely bipinnatifid; staminate involucre 3-7 mm broad.....*A. artemisiifolia* (typical)
- 1- Leaves bi - tripinnatifid with small segments; staminate involucre 1.5-5 mm broad
  - 2- Staminate involucre
    - 2.5 - 5 mm broad.....var. *elatior* (naturalized in Europe)
  - 2- Staminate involucre
    - 1.5 - 2.5 mm broad.....var. *paniculata*

According to this key, the specimen ISTE 69357, with bipinnate leaves and staminate involucre 2-4 mm broad, belongs to var. *elatior*. Illustrations exist in Flora von Mittel-Europa (11) and in Flora der Schweiz (12).

*A. artemisiifolia* in the broader sense is a North American plant, locally naturalized mainly in Central and South Europe (13) and in the West Caucasus (15). Gray's Manual of Botany (14) and Flora der Schweiz (12) comment that it is var. *elatior* (*A. elatior*) which has become naturalized in Europe.

The discovery of these three species in N. E. Turkey represents the latest in a long line of taxa alien to the Turkish flora that have become extensively naturalized in the area, i.e. the area covered by the square A7 and further east. The following are examples of the most widely naturalized species:

*Ailanthus altissima* (Miller) Swingle, *Artemisia verlotiorum* Lamotte, *Aster squamatus* (Sprengel) Hieron., *A. subulatus* Michaux, *Conyza canadensis* (L.) Cronquist, *Corylus maxima* Miller, *Crassocephalum crepidioides* (Benth.) S. Moore, *Cynoglossum glochidiatum* Wallich, *Dichrocephala integrifolia* (L. fil.) Kuntze, *Duchesnea indica* (Andrews) Focke, *Eleusine*

*indica* (L.) Gaertner, *Erigeron annuus* (L.) Pers., *Galinsoga parviflora* Cav., *Hydrocotyle ramiflora* Maximow., *Juncus tenuis* Willd., *Lepidium virginicum* L., *Matricaria matricarioides* (Less.) Porter ex Britton, *Oldenlandia capensis* L., *Oxalis corniculata* L., *Paspalum dilatatum* Poir., *P. paspalodes* (Michaux) Scribner, *P. thunbergii* Kunth ex Steudel, *Phytolacca americana* L., *Polygonum nepalense* Meissner, *P. perfoliatum* L., *P. thunbergii* Sieb. et Zucc., *Robinia pseudoacacia* L., *Tagetes minuta* L.

The list is predominated by the composites. About half of the species are restricted to the region. All these species (with the one possible exception of *Corylus maxima*) occur in large freely reproducing populations, most typically at low altitudes (below ca. 500 m), and often in relatively natural habitats (such as on river gravel banks, agriculturally unimproved meadows and coastal beaches).

This presents botanists and conservationists with two problems. The most serious is that these species are now competing very effectively with native species, resulting in marked changes to the vegetational composition of valued wildlife-rich habitats, and potentially, in the longer term, to the total loss of native species. Nationally rare plant species such as *Rhamphicarpa medwedewii* Albov and *Scabiosa sosnowskyi* Sulak. are especially at risk.

In addition, the degree to which many undoubtedly alien species have become an established part of the vegetation brings into question the status of existing plants presumed to be native to the area (e.g. *Lindernia diffusa* (L.) Wettst., *L. procumbens* (Krocker) Philcox, *Oldenlandia capensis* and *Rhamphicarpa medwedewii*) and makes it very difficult to assess the exact status of new discoveries in the area, for example, the recently discovered *Kyllinga brevifolia* Rottb., which is now known to occur in scattered localities along the Turkish Black Sea coast between A3 Sakarya: Karasu and A8 Artvin; Kemalpaşa, localities lying some 900 km apart. The discovery of this species as new to Turkey will be reported in a separate paper by A. J. Byfield.

The whole issue of the establishment of aliens along this coastline would be very worthy of a fuller study, and the existing populations should be monitored with some care. Ultimately, however, the marked presence of species of aliens as an integral part of the flora of coastal N. E. Turkey is something that botanists and conservationists will have to come to terms with.

### Acknowledgement

The authors are indebted to Mr. T. A. Cope (Kew) for the identification of the *Sporobolus* specimen, and to Miss Suna Atay (of the Society for the protection

of Nature - DHKD) for help in the field. The work of one of the authors (A.J.B.) is generously funded by Fauna and Flora International (Cambridge, UK) and Glaxo Wellcome (UK).

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