

# ***Physalis ixocarpa* Brot. ex Hornem. and *Verbena litoralis* Kunth, new Spanish xenophytes and records of other interesting alien vascular plants in Catalonia (Spain)**

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**Resumen:** Verloove F. *Physalis ixocarpa* Brot. ex Hornem. y *Verbena litoralis* Kunth, dos nuevos xenófitos en España y datos sobre la flora alóctona vascular en Cataluña (España). *Lazaroa* 24: 7-11 (2003).

La investigación florística respecto a la flora sinantrópica de los alrededores de Blanes (Cataluña, provincias de Barcelona y Gerona) reveló la presencia de varias especies de interés particular. Se estudia la distribución y grado de naturalización actual de diez táxones, de los cuales dos, probablemente, hayan sido encontrados por primera vez en España (*Physalis ixocarpa* y *Verbena litoralis*).

**Abstract:** Verloove F. *Physalis ixocarpa* Brot. ex Hornem. and *Verbena litoralis* Kunth, new Spanish xenophytes and records of other interesting alien vascular plants in Catalonia (Spain). *Lazaroa* 24: 7-11 (2003).

A floristic survey of the synanthropic flora in the surroundings of Blanes (Catalonia, provinces of Barcelona and Gerona) revealed the presence of several interesting species. The present paper deals with the present distribution and degree of naturalization of ten taxa, two of them presumably new to Spain (*Physalis ixocarpa* and *Verbena litoralis*).

## **INTRODUCCIÓN**

Catalonia has always had a rich tradition upon its exotic vascular flora. CASASAYAS (1989) summarized all up to then known taxa in an extended catalogue. Especially the coastal area (and even more the surroundings of major industrial or tourist settlements) has proven to harbour considerable amounts of non-native vascular plants. Due to the continuing and even increasing intercontinental trade the number of introductions is still augmenting. Hence, every year new additions are reported for the Catalanian exotic flora, both in agricultural or other man-made habitats as in (semi-) natural environments.

## **MATERIALS AND METHODS**

A seven-days field trip in September 2002 yielded, again, several acquisitions for the allochthonous flora of Catalonia. Moreover, two taxa turned out to be new to Spain. The studied area encompasses the coastal strip between Blanes and Tossa de Mar, further inland reaching up to Hostalric and Vidreres (ca. 70 km NE of Barcelona; provinces of

Barcelona and Gerona). Particular attention was paid to the floristic composition of riverbanks, especially of the river Tordera and, to a lesser extent, of the Riera d' Arbúcies, the Riera de Lloret, the Riera de Can Lloranes and the Riera de Tossa.

Voucher specimens of most cited taxa have been deposited in the herbaria of the Real Jardín Botánico de Madrid (MA), the National Botanic Garden of Belgium (BR), the herbarium of the University of Liège, Belgium (LG) and/or the private herbarium of the author.

The nomenclature follows CLEMENT & FOSTER (1994) and RYVES & al. (1996) for taxa treated by these authors. For few other taxa the nomenclature is based on most recent insights in the countries of the species' origin.

## **RESULTS**

Only the most interesting records are dealt with in detail. The number of well-established and widespread taxa in Catalonia is high; the following exotic taxa were seen frequently and have become rather or even quite common: *Ailanthus altissima*, *Amaranthus bli-*

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*toides*, *A. blitum* subsp. *emarginatus*, *A. graecizans*, *Anredera cordifolia*, *Araujia sericifera*, *Artemisia verlotiorum*, *Aster squamatus*, *Bidens frondosa*, *B. pilosa*, *B. subalternans*, *Bromus catharticus*, *Chenopodium ambrosioides*, *Conyza bonariensis*, *C. sumatrensis*, *Coronopus didymus*, *Cuscuta campestris*, *Cyperus eragrostis*, *Datura ferox*, *Ehrharta longiflora* (Blanes), *Eleusine indica*, *E. tristachya*, *Euphorbia maculata*, *E. prostrata*, *E. serpens*, *Galinsoga ciliata*, *Guizotia abyssinica*, *Ipomoea indica*, *Lycopersicon esculentum*, *Mirabilis jalapa*, *Panicum dichotomiflorum*, *P. miliaceum*, *Paspalum dilatatum*, *P. distichum*, *Pennisetum villosum* (Vidreres), *Phyla filiformis*, *Phytolacca americana*, *Setaria parviflora*, *Solanum chenopodioides*, *Sporobolus indicus* and *Stenotaphrum secundatum*.

Several (other) horticultural species are recently escaping and are frequently not mentioned yet in floristic accounts: *Broussonetia papyrifera*, *Canna x generalis*, *Cortaderia selloana*, *Parkinsonia aculeata* (one specimen in a road verge near Santa Christina),...

#### **Amaranthus palmeri** S. Watson .....

**Gerona:** Lloret de Mar (Fenals), main road towards Blanes (GI-682), ca. 15 m, UTM DG81, ruderal road verge, 15.IX.2002, *F. Verloove* 5213 (MA).

Known as a rare ephemeral American casual in Spain (CASTROVIEJO & *al.*, 1990) but likely to become established. Several female plants were seen in a ruderal, nitrophilous road verge on the outskirts of the city.

#### **Catalpa bignonioides** Walter

**Gerona:** Tossa de Mar, Can Seca, riverbed of Riera de Tossa, near main road Tossa de Mar – Llagostera (GI-681), ca. 100 m, UTM DG92, gravelly river bed of river Tossa, 17.IX.2002, *s.c.*

Subspontaneous occurrences of the North American tree species *Catalpa bignonioides* are recently increasing, especially along riverbeds (see also VIVANT & *al.*, 1998). In Tossa de Mar two juvenile specimens were seen; parental plants were not seen in the vicinity.

#### **Cotula australis** (Sieber ex Spreng.) Hook f.

**Gerona:** Lloret de Mar, les Plateres, main road Blanes towards Tossa de Mar (GI-682), ca. 15 m,

UTM DG81, foot of small wall in the city, 15.IX.2002, *F. Verloove* 5208 (priv.herb., MA).

A small population of this tiny Asteraceae was found in sandy cracks at the foot of a small wall. The species is recently expanding in this area (see for instance FONT & *al.*, 1998) and in adjacent France (VERLOOVE & VANDENBERGHE, 2002). *Cotula australis* was believed to be an ephemeral casual up to now but it is clearly becoming naturalized. In Colera (see FONT & *al.*, l.c.) we were able to confirm this species in June 2002; it thrives like an invasive weed in olive yards. The species is native in Australasia but has become naturalized in many parts of the world.

#### **Dichondra micrantha** Urban

**Gerona:** Fenals (Lloret de Mar), main road towards Blanes (GI-682), ca. 15 m, UTM DG81, ruderal road verge, 15.IX.2002, *F. Verloove* 5209 (priv.herb.).

The Asian *Dichondra micrantha* was frequently seen in Lloret de Mar, where it is locally sown in lawns but also occurs in ruderal road verges. Apparently, the species has been mentioned before in Catalonia in the surroundings of Barcelona and in Alt Emporda (CASASAYAS, 1989). Other Spanish records are available for Alicante and Murcia (RÍOS & *al.*, 1992).

#### **Einadia nutans** (R. Br.) A. J. Scott

**Gerona:** Lloret de Mar, Punta des Capdells, ca. 5 m, UTM DG81, rocks, road verges, fences,..., 14.IX.2002, *F. Verloove* 5205 (priv.herb.).

The Australian *Einadia nutans* was first mentioned from this area (i.e. the vicinity of the Blanes Botanical Garden 'Mar i Murtra') by BOLÒS & VIGO (1979). Subsequently the species was able to expand in the neighbourhood: CASASAYAS FORNELL (1990) reported about the species' expansion in the coastal area comprised between Blanes and Tossa de Mar. Apparently, *Einadia nutans* has considerably spread ever since and was found abundantly in the studied area, especially between Blanes and Lloret de Mar. *Einadia nutans* occupies a wide range of habitats (confined however to a narrow coastal strip), ranging from man-made habitats (nitrophilous road verges, foot of walls and fences,...) to

semi-natural ones (pine-woods, rock crevices near the sea,...). In the latter case, *Einadia nutans* seems to behave like an aggressive invader. The species' invasiveness was not yet taken into account by SANZ ELORZA & *al.* (2001).

### ***Eragrostis curvula* (Schrud.) Nees**

**Barcelona:** Tordera, riu Tordera near main road Tordera – Fogars de la Selva (BV-5122), 45 m, UTM DG71, gravelly riverbed of river Tordera, 16.IX.2002, *F. Verloove* 5207 (priv.herb., LG). **Gerona:** Vidreres, Can Sala, main road Vidreres – Lloret-de-Mar (GI-680), 80 m, UTM DG82, road verge, 19.IX.2002, *s.c.*; Hostalric, Can Tia Camps, W of bridge over riu Tordera, ca. 100 m, UTM DG72, gravelly riverbed of river Tordera, 20.IX.2002, *s.c.*; Hostalric, les Brugueres, ca. 75 m, UTM DG62, gravelly riverbed of Riera d' Arbúcies, 20.IX.2002, *s.c.*

CASASAYAS I FORNELL & FARRÀS I DE BLÀS (1985) reported about the first Catalanian (and Spanish) occurrence of *Eragrostis curvula* in Baix Llobregat. Nowadays, in the investigated area, *Eragrostis curvula* is fully naturalized and seems to spread rapidly, especially in the Tordera river-basin (and its affluents) and to some extent along road verges. *Eragrostis curvula* was particularly invasive on the sandy banks of Riera d' Arbúcies where literally thousands of plants were seen. *Eragrostis curvula*, originally native in South Africa, has been sown along many motorways in NE-Spain and was able to spread in the surroundings subsequently (comm. J. Font 2003).

### ***Eragrostis virescens* J. Presl**

**Gerona:** Hostalric, Can Tia Camps, west of bridge over riu Tordera, UTM DG72, ca. 100 m, gravelly riverbed of river Tordera, 20.IX.2002, *F. Verloove* 5222 (LG); Hostalric, les Brugueres, ca. 75 m, UTM DG62, gravelly riverbed of Riera d' Arbúcies, 20.IX.2002, *s.c.*

*Eragrostis virescens* is one of the up-coming weedy species in SW-Europe, recently also recorded repeatedly in adjacent France (VERLOOVE & VANDENBERGHE, 2002). MASALLES & *al.* (1996) reported about the first Catalanian occurrence of *Eragrostis virescens*. Near Hostalric a restricted number of specimens was seen. The species is indigenous in South America.

### ***Paspalum sauræ* (Parodi) Parodi**

**Gerona:** Tossa de Mar, Can Seca, riverbed of Riera de Tossa, near main road Tossa de Mar – Llagostera (GI-681), ca. 100 m, UTM DG92, grassy border of river Tossa, 17.IX.2002, *F. Verloove* 5226 (priv.herb., BR, LG, MA).

A well-established small colony of this tropical (originally South American) grass species was found at the border of the river Tossa. CARRETERO (1987), who mentioned this species for the first time in Europe near Valencia, already predicted its future expansion. Subsequently it was found in the province of Alicante (CAMUÑAS & CRESPO, 1998) and now for the first time in the province of Gerona.

*Paspalum sauræ* is often poorly distinguished from *P. notatum* Flüge and is probably better treated at varietal rank under the latter species, as var. *sauræ* Parodi.

### ***Physalis ixocarpa* Brot. ex Hornem.**

**Gerona:** Hostalric, Can Tia Camps, west of bridge over riu Tordera, ca. 100 m, UTM DG72, gravelly riverbed of river Tordera, 20.IX.2002, *F. Verloove* 5221 (priv.herb., MA).

This is apparently the first true Spanish record of a species that has been much confused taxonomically with *Physalis philadelphica*. WATERFALL (1967) erroneously considered *Physalis ixocarpa* and *P. philadelphica* as synonyms and in his earlier revision covering North America (WATERFALL, 1958) plants with diacritic characteristics of *P. philadelphica* were keyed out as *P. ixocarpa*. As a matter of fact both are very distinct and should be segregated (for differences, based on morphological as well as cytological analyses, see FERNANDES, 1970). At present the recognition of *Physalis ixocarpa* as an autonomous taxon is widely accepted (KARTESZ & GANDHI, 1994; STACE, 1997;...). The plants from the river Tordera are identical with those described from Portugal (see FERNANDES, l.c.) where *Physalis ixocarpa* is a well-established xenophyte. The species seems to be recently expanding in the Mediterranean: AUTHIER (1989) reported about the occurrence of *Physalis ixocarpa* in Greece and BÜKÜN & *al.* (2002) recorded the species as a noxious weed in Turkish cotton fields (sub *P. philadelphica* var. *immaculata* but according to their description, their plants are doubtlessly referable to *P. ixocarpa*).

On the gravelly and sandy banks of the river Tordera two abundantly flowering and fruiting specimens were recorded. There is a good chance that the species occurs elsewhere in this river basin and that it will be able to naturalize.

*Physalis ixocarpa* is yet another American xenophyte in Catalonia. CONESA & RECASSENS (1987) and MASALLES & al. (1996) already pointed out that New World species represent an important group in Catalonia. The exact origin of the plants from the Tordera-basin remains uncertain.

*Physalis philadelphica*, closely related and much frequently cultivated as a minor fruit, is considered as fully naturalized in Spain, especially in the central area (DEL MONTE, 1988; DEL MONTE & SOBRINO, 1993). Previous Spanish records of *Physalis ixocarpa* (see for instance RON, 1971) could be ascribed to *P. philadelphica* (DEL MONTE, l.c.).

### **Verbena litoralis** Kunth

**Barcelona:** Tordera, riu Tordera near main road Tordera – Fogars de la Selva (BV-5122), 45 m, UTM DG71, gravelly/sandy riverbed of river Tordera, 16.IX.2002, *F. Verloove* 5211 (priv. herb., MA). **Gerona:** Hostalric, Can Tia Camps, W of bridge over riu Tordera, ca. 100 m, UTM DG72, gravelly riverbed of river Tordera, 20.IX.2002, s.c.; Hostalric, les Brugueres, ca. 75 m, UTM DG62, gravelly riverbed of Riera d' Arbúcies and nearby ruderal road verge, 20.IX.2002, s.c.

The South American *Verbena litoralis* was found repeatedly in the surroundings of the Tordera riverbed, each time in small numbers but seen in every investigated locality. Hence, it is believed to be recently naturalized and it should be looked for elsewhere in this area. It resembles more or less

*Verbena bonariensis* —also recently recorded in Catalonia; see CONESA (1991)— but has central stem leaves not auriculate-clasping and less showy, tiny flowers making it not appropriate for ornamental purposes.

All Catalanian plants seen belong to var. *brasiliensis* (Vell.) Briq., characterized by the condensed spikes and the loose and freely branched inflorescence. Formerly this taxon was considered at specific level (as *Verbena brasiliensis* Vell.; see for instance YEO, 1990) but recent taxonomists have placed it at varietal rank under *Verbena litoralis* (MUNIR, 2002). It seems to be another recent arrival from the Americas, susceptible for a rapid expansion. Its mode of introduction remains uncertain. In Italy the species recently occurred after road works (SOLDANO, 2000; sub *Verbena brasiliensis*).

### DISCUSSION

Once again a small area with high anthropogenic influences has proved to harbour a considerable amount of non native plant species. Recent research has revealed that the interaction of various features such as high mean temperatures, the abundance of riparian systems, the presence of biotopes with favourable water balance and high human pressure can cause an over-representation of alien plants (SOBRINO & al. 2002). Obviously, the studied area represents optimal conditions for the introduction and spread of aliens.

The degree of naturalization of some of the cited taxa remains dubious and will require future confirmation. Doubtlessly the early detection of aliens in general and invaders in particular is important; hence it seems appropriate to signalize the (recent) presence of the above mentioned taxa in Catalonia.

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