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Verbena incompta (Verbenaceae), an overlooked xenophyte in Europe

Abstract

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Verbena incompta, of presumed South American origin, is reported as a naturalised but overlooked xenophyte in Italy and Spain. The affinity of the species is discussed, emphasising on its separation from the related *V. bonariensis* and *V. brasiliensis* in *V.* series *Pachystachyae*, and ecological and chorological notes are added. The three species are illustrated by digitised representative herbarium specimen.

Additional key words: *Verbena* ser. *Pachystachyae*, taxonomy, Italy, Spain

Introduction

Verbena series *Pachystachyae* Schauer (1847) comprises c. 45, predominantly South American species (O’Leary & al. 2007; or only 15 species according to Nesom 2010a) with relatively short and thick, dense inflorescence spikes, closely overlapping fruits and unlobed leaves (Nesom 2010a). It includes reputed environmental weeds such as *V. brasiliensis* Vell. but also popular ornamentals such as *V. bonariensis* L. and *V. rigida* Spreng. Despite the existence of a recent monograph of the series *Pachystachyae* (O’Leary & al. 2007), the taxonomy and nomenclature of the *V. bonariensis* complex remains very controversial (compare with Michael 2008; Nesom 2010b).

In the course of a floristic inventory of the coastal area around Pietra Ligure (prov. Savona, Liguria, Italy) in September 2004, I was confronted with several populations of a tall, apparently non-native species of *Verbena*. It was easily identified as the South American *Verbena brasiliensis*, an increasing environmental weed in several parts of Europe (see for instance Verloove 2003, 2005, 2006). However, some plants were characterised by sessile-amplexicaul leaves and therefore did not correspond with the usual circumscription of this taxon (typically with attenuate-petiolate leaves). These plants appear to be in some respects intermediate between *V. bonariensis*

and *V. brasiliensis* and were recently described as a species new to science, *V. incompta* P. W. Michael (1995). Identical plants were seen in abundance in the surroundings of San Sebastian (prov. Guipúzcoa, Spain) in September 2006.

Verbena incompta, much more reputed as a weed than *V. bonariensis* and without any ornamental value, possibly has been confused so far in parts of southern Europe, where the latter is claimed as a naturalised alien (in Italy, Portugal, Spain, also in Macaronesia). Given its incipient invasive behaviour, it seems important to draw attention to this confusion and provide identification aids for the distinction of these three closely related non-native species of *Verbena*.

Taxonomy

Verbena incompta P. W. Michael in *Telopea* 6: 181. 1995 – Fig. 1.

Description. — Erect herb of indefinite duration (annual to perennial; in the latter case usually flowering in the first year), 50–200 cm tall. *Stem* sharply 4-angled, hispid on the angles. *Leaves* sessile, semi-amplexicaul to subauriculate, lanceolate, up to 15 × 3 cm, sharply and irregularly serrate, entire towards the base, rugose-scabrous on

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Herbarium Filip VERLOOVE N° 6600
 Loc.: *N.H. between Zamora and Pavia, close to Orléans,*
prov. Guipuzcoa, SPAIN
 Hab.: *road verge (ditch)* Alt.:
 Remar.: *locally abundant, also seen in Pavia and*
San Sebastian; corolla minute, leaves simple
 Date: *11.09.2006*
 Family: *Verbenaceae*
 Name: *Verbena incompta P.W. Michael*
dupl. MA

Fig. 1. *Verbena incompta* – representative individual; herbarium specimen collected in Spain.



Fig. 2. *Verbena bonariensis* – representative individual; herbarium specimen collected in France.

both surfaces. *Inflorescence* corymbose to spicate. *Spikes* subcylindrical, 3–10 in number, up to 5(–7) cm long and up to 5 mm wide at maturity. *Flowers* small, numerous, opening together in a circle immediately below the apex of the spike. *Floral* bracts ovate-lanceolate, 2–3 mm long, eglandular or with minute and very sparse stalked glands. *Calyx* 5-angled, pubescent, 5-toothed at apex. *Corolla* blue to purplish, limb c. 2.75–3.75 mm wide tube 2.75–3.25 mm long, slightly curved and hardly exceeding the calyx tube. Upper anthers inserted above the middle of the corolla tube. *Fruit* included in the persistent calyx tube, glabrous, splitting into 4 cylindrical-oblong brown mericarps; *mericarps* 1.3–1.5 mm long, ribbed on outside, weakly reticulate at the distal end with abundant verrucose papillae on their inner commissural faces.

Relationships and delimitation. — Michael (1995) discussed the relationship of *Verbena incompta* with *V. bonariensis* and *V. brasiliensis*, but the affinities of the species remain more or less obscure. Yeo (1990), who contemplated describing it as a new species, recognised it as an aberrant but widespread form of *V. brasiliensis*, characterised by sessile leaves, thence considerably broadening its traditional circumscription. Munir (2002), in turn, thought Michael's *V. incompta* to be conspecific with *V. bonariensis* and reduced it to synonymy of the latter. His view was later followed by O'Leary & al. (2007) but this was entirely based on a different, erroneous interpretation of the Linnaean type of *V. bonariensis* (Michael 2008; Nesom 2010b). The absence of any intermediacy between the latter and *V. incompta* despite their broad sympatry (Nesom 2010b) indicates that it is reproductively isolated. As a result, *V. incompta* is accepted, beside *V. bonariensis* and *V. brasiliensis*, in scheduled volumes of important floras such as Flora of North America (Nesom 2010b).

Verbena incompta (Fig. 1) indeed much resembles *V. bonariensis* (Fig. 2) as well as *V. brasiliensis* (Fig. 3). With the former it has the sessile-amplexicaul leaves in common, whereas it shares the inconspicuous corollas, small mericarps and long inflorescence spikes with *V. brasiliensis* (compare Fig. 1–3). Like the latter, it lacks ornamental value because of its tiny corollas. The corollas of *V. brasiliensis* and *V. incompta* are only slightly narrower than in *V. bonariensis* (c. 2.75–3.75 mm versus 4.25–5.5 mm according to Yeo 1990), but they are hardly expanded from the calyx tube and most become even virtually invisible in herbarium specimens. Moreover, ripe mericarps of *V. incompta* (and *V. brasiliensis*) are smaller than in *V. bonariensis*. According to Munir (2002) this character is variable and therefore unreliable (“nutlets are not uniform within these taxa”). However, Yeo (1990) showed that “when the sample means are plotted for both characters the area of overlap is small”. As a consequence, “(...) discrimination of *V. brasiliensis* (incl. *V. incompta*) from *V. bonariensis*, is thus nicely supported”.

Michael (1995, 2008) provides some additional characters to distinguish between *Verbena bonariensis* and *V. incompta*. In the latter two species, minute stalked glands on calyx tube and pedicels are absent or very sparse, whereas glands are more or less abundant in *V. bonariensis*. Finally, the insertion level of the upper stamens in the corolla tube slightly differs: they are inserted above the middle in *V. incompta* but beneath the middle in *V. bonariensis*.

Good photographs of *Verbena bonariensis* and *V. incompta* (as “*V. brasiliensis*”) are presented by Shimizu & al. (2001). They perfectly show the very different guise of both species (and the close resemblance in general habit of *V. brasiliensis* and *V. incompta*). Reliable pictures are further available in several different internet sources, for instance: <http://had0.big.ous.ac.jp/plantsdic/angiospermae/dicotyledoneae/sympetalae/verbenaceae/dakibaarechihanagasa/dakibaarechihanagasa.htm> or <http://mikawanoyasou.org/data/dakibaarechihanagasa.htm>.

In the following identification key the three tall species of *Verbena* currently found in Europe are distinguished:

1. Leaves (sub-)petiolate, distinctly tapering to base. Corollas not showy, limb c. 2.75–3.75 mm wide, tube 2.75–3.25 mm long, hardly exerted from calyx tube *Verbena brasiliensis*
- Leaves sessile-amplexicaul, not tapering to base; corollas either inconspicuous as above or showy 2
2. Corollas not showy, limb c. 2.75–3.75 mm wide, tube 2.75–3.25 mm long, hardly exerted from calyx tube; mericarps 1.2–1.5 mm long; inflorescence spikes slender and subcylindrical, usually up to 5(–7) cm long *V. incompta*
- Corollas showy, limb c. 4.25–5.5 mm wide, tube 5.5–7 mm long, well exerted from calyx tube; mericarps 1.5–2.1 mm long; inflorescence spikes usually short and thick, frequently congested at maturity, rather rarely more than 1.5 cm long *V. bonariensis*

Herbarium specimens examined. — ITALY: PROVINCE OF SAVONA: Pietra Ligure, river Maremola, dry riverbed, very common, 11.9.2004, *F. Verloove* 5858 (RO; herb. Verloove; herb. Eric J. Clement; herb. P. W. Michael); Pietra Ligure, torrente Maremola, sinistra idrografica, presso l'incrocio con via della Repubblica, 8°17'12", 44°9'15", greto di torrente, con *Verbena litoralis* var. *brasiliensis*, c. 10 m, 17.7.2006, *G. Galasso s.n.* (BR, MSNM, sub *V. bonariensis*).

SPAIN: PROVINCE OF GUIPÚZCOA: N1 between Irun and Pasaia, close to Oiartzun, road verge (ditch), locally abundant, 10.9.2006, *F. Verloove* 6600 (MA; herb. Verloove); San Sebastian, N1 east of the city, road verge, abundant, 10.9.2006, *F. Verloove* 6601 (herb. Verloove).

Distribution and origin. — *Verbena incompta*, *V. bonariensis* and *V. brasiliensis* are most likely widespread native South American taxa, occurring in Argentina,



Herbarium Filip VERLOOVE N° 5797
 Loc.: Pietra Ligure, river Maremola
 prov. Savona, Italy
 Hab.: dry riverbed
 Remar.: Very common, behaving to like an invasive
 weed
 Date: 11.09.2004
 Family: Verbenaceae
 Name: *Verbena brasiliensis* Vell.

Herb. Horti Bot. Nat. Belg. (BR)
 BR - S.P.

920 249

Acc. 1004

Fig. 3. *Verbena brasiliensis* – representative individual; herbarium specimen collected in Italy.

Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru and Uruguay (Yeo 1990; O'Leary & al. 2007). *V. incompta* is introduced in North America and more widespread there than *V. bonariensis* s.str. (O'Leary & al. 2007 as *V. litoralis* var. *brevibracteata* p.p.; Nesom 2010b). Outside America, *V. incompta* is introduced in Australia, where it is prominent in eastern New South Wales (and from where it was originally described) but also present in the Northern Territory, Queensland, South Australia and Victoria. It is also present in South Africa, Papua New Guinea, New Zealand, Fiji and Norfolk Island (Michael 1995), Congo, Kenya, Tanzania, Zimbabwe, Mozambique, Malay Peninsula, Indonesia, Cook Islands and Nouvelle-Calédonie (Yeo 1990 as *V. brasiliensis* "with amplexicaul leaves"). Yeo (1990) makes a single reference to the species in Europe, which was formerly repeatedly recorded as a wool alien in Great Britain. To our current knowledge, these first European records of *V. incompta* remained strictly ephemeral.

At present, *Verbena incompta* is known in Europe from Italy (Liguria) and Spain (Basque Country), but expected to be present elsewhere in southern Europe where *V. bonariensis* and/or *V. brasiliensis* have been reported. In Liguria (and Tuscany), *V. brasiliensis* doubtlessly is the more widespread taxon (pers. obs. 2004–2006; pers. comm. A. Soldano), but former records of 'V. bonariensis' (see for instance Peccenini & al. 1991 for an overview of Italian records) are possibly suspect and might be partly or wholly referable to either *V. incompta* or *V. brasiliensis*. Likewise, 'V. bonariensis' is increasingly reported from the Spanish Basque Country. Aizpuru & al. (1997) provide records for Hernani, Lasarte and even Pasaia (from where *V. incompta* is reported in the present paper); all these records are probably also referable to *V. incompta*. According to Aizpuru & al. (1997) 'V. bonariensis' is in expansion in the coastal areas of the Spanish provinces of Guipúzcoa and Viscaya. Indeed, in addition to the herbarium specimens cited above, we have seen *V. incompta* in the harbour area of Pasaia. Without any doubt, it is fully naturalised and expanding in this area.

The origin of *Verbena incompta* in Europe remains unclear. Unlike *V. bonariensis*, it has no ornamental value, which is also reflected in its epithet, *incomptus* meaning untrimmed, untidy. Wann (2000) surprisingly cites *V. incompta* as "sometimes cultivated" in European gardens. Given its inconspicuous corollas and weedy appearance this seems rather unlikely and cultivation will probably be restricted to botanical gardens. As a rule, it must be regarded as an unintentionally introduced weed outside its native distribution range. The remarkable concentration of records in the wider Pasaia harbour area in the Spanish Basque Country makes an introduction with foreign goods seem very likely there.

Worthwhile mentioning is that genuine *Verbena bonariensis* is the species with the most restricted native distribution of the three. According to Nesom (2010b)

it is confined to southern Brazil, Uruguay, Paraguay and northern Argentina. Hence and a priori, it is less likely to occur as a weedy casual outside its native range. However, because of its showy flowers it is a popular garden plant nowadays in Europe and it is increasingly found as a garden escapee across Europe (even in northern Europe) but often remains an ephemeral casual up to present.

Ecology and habitat. — *Verbena incompta* is found in a more or less wide range of habitats. It predominantly occurs in dry river beds, ditches, by road verges or, more rarely, in ruderal areas. Its habitats are always, at least temporarily, moist and are, up to present, confined to coastal areas. Quite often they are regularly disturbed. The species here concerned are often said to be perennials but, in fact, they more often behave like annuals.

Accompanying species are usually rather ubiquitous and reflect the preference of *Verbena incompta* for moist habitats. In Spain, *Calystegia sepium* (L.) R. Br., *Cyperus eragrostis* Lam., *Epilobium hirsutum* L., *Lythrum salicaria* L., *Paspalum dilatatum* Poir. and *Pulicaria dysenterica* (L.) Bernh. were noted. In Italy *V. incompta* was accompanied by, among others, *Bidens frondosa* L., *Chenopodium ambrosioides* L., *Eupatorium cannabinum* L., *Lycopus europaeus* L., *Lythrum salicaria* and *Piptatherum miliaceum* (L.) Coss.

Verbena incompta is a declared noxious weed in many temperate and subtropical areas worldwide. Monitoring of the future spread of this species and *V. brasiliensis* in southern Europe seems appropriate.

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