



Arundo Micrantha Lam. (Poaceae), the Correct Name for Arundo Mauritanica Desf. and Arundo Mediterranea Danin

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Arundo micrantha Lam. (Poaceae), the correct name for Arundo mauritanica Desf. and Arundo mediterranea Danin

Laurent Hardion, Régine Verlaque, Martin W. Callmander & Bruno Vila

Abstract

HARDION, L., R. VERLAQUE, M. W. CALLMANDER & B. VILA (2012). *Arundo micrantha* Lam. (Poaceae), the correct name for *Arundo mauritanica* Desf. and *Arundo mediterranea* Danin. *Candollea* 67: 131-135. In English, English and French abstracts.

Arundo micrantha Lam. (Poaceae) was validly published by Lamarck in 1791 but has been overlooked in the literature. Based on recent taxonomic and phylogenetic studies, this name is rehabilitated to designate a circum-Mediterranean taxon, with *Arundo mauritanica* Desf. and *Arundo mediterranea* Danin as later synonyms. For the first time, *Arundo micrantha* is recorded in the Flora of France based on two rediscoveries (Golfe-Juan and Ste-Lucie Island) and identifications in the wild, thanks to indications of older specimens in herbaria G, MARS, MPU and P. However, these two populations of *Arundo micrantha* are under severe threats and this species must be considered as Critically Endangered in France following IUCN Red List Categories.

Key-words

POACEAE – *Arundo* – Typification – Taxonomy – IUCN Red List

Résumé

HARDION, L., R. VERLAQUE, M. W. CALLMANDER & B. VILA (2012). *Arundo micrantha* Lam. (Poaceae), nom valide pour *Arundo mauritanica* Desf. et *Arundo mediterranea* Danin. *Candollea* 67: 131-135. En anglais, résumés anglais et français.

Arundo micrantha Lam. (Poaceae) a été validement publié par Lamarck en 1791, mais ignoré dans la littérature. Sur la base de récentes études taxonomiques et phylogénétiques, ce nom est réhabilité pour désigner un taxon circum-méditerranéen ayant pour synonymes postérieurs *Arundo mauritanica* Desf. et *A. mediterranea* Danin. Le recensement inédit d'*Arundo micrantha* dans la flore de France a été effectué grâce à la consultation d'échantillons issus des herbiers G, MARS, MPU et P, puis à la redécouverte *in situ* de deux stations (Golfe-Juan et Ile Ste-Lucie) et à leur identification. Cependant, ces deux populations d'*Arundo micrantha* sont très menacées et cette espèce doit être considérée comme en Danger Critique en France, d'après les catégories de la Liste Rouge de l'IUCN.

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Introduction

Before 2004, three distinct species were included in the genus *Arundo* L. (*Poaceae*): (1) *A. donax* L., the cosmopolitan Giant Reed from Sub-tropical Asia to the Mediterranean Basin, introduced in many regions; (2) *A. formosana* Haeck., a decumbent grass endemic from Taiwan, and (3) *A. plinii* Turra, a circum-Mediterranean taxon. *Arundo plinii* was revisited by DANIN (2004) and divided into three entities: (a) *A. plinii* s.s., a sub-endemic taxon from Southern France (Var: Fréjus; Aude: Sainte-Lucie Island) and northern Italy (Bologna: *locus classicus* following TURRA, 1780); (b) *A. collina* Ten., an Italo-Balkan *Arundo* described from Naples (TENORE, 1822), and (c) *A. mediterranea* Danin (*locus classicus*: Nahal Sorek, Israel, following DANIN, 2004), a new species corresponding to a branched reed from Algeria, Cyprus, Greece and Palestine.

On the basis of Art. 53.1 of the International Code of Botanical Nomenclature (ICBN) (MCNEIL & al., 2006), DANIN (2004) published the new species *A. mediterranea* in order to replace *A. mauritanica* Desf. described from Algeria by DESFONTAINES (1798). In fact, this latter name is an illegitimate homonym of *A. mauritanica* previously used by POIRET (1789) to describe a species actually named *Ampelodesmos mauritanicus* (Poir.) T. Durand & Schinz (DURAND & SCHINZ, 1895). However, Desfontaines had distributed many duplicata of his Algerian collection among European herbaria such as P, B, G, K and MPU. One of these exsiccata was given to his friend Jean-Baptiste de Lamarck, as mentioned both on the label and the diagnosis (“D. Desfontaines” [D. = Dedit], “ill. gen.” [= “Illustration des Genres”]; Fig. 1 and 2). On the basis of this specimen, LAMARCK (1791) described *A. micrantha* Lam. (Fig. 2), seven years before the publication of DESFONTAINES (1798). Strangely, Lamarck’s name has been overlooked over the past centuries, and this binomial was generally considered as a synonym of *A. mauritanica* Desf. under *A. plinii* s.l.

A recent molecular phylogenetic study based on AFLP markers showed that all considered samples of *A. micrantha* are clearly monophyletic and belong to a well supported species (MARIANI & al., 2010; as *A. mediterranea*). DNA content analysis by flow cytometry and chromosome counts confirmed this singularity. In fact, this taxon exhibits a specific chromosome number of $2n = ca. 72$ (North-Africa and Crete) vs $2n = 76$ for *A. plinii* from Italy (HARDION & al., 2011). This chromosome number has been recently confirmed for various other populations from several Mediterranean countries (unpublished data).

Following Art. 11.4 of ICBN, *A. micrantha* remains the prevalent name of this species attached to the holotype housed in Lamarck’s Herbarium (P-LA). Considering that *A. micrantha* and *A. mauritanica* are not based on the same holotype,

the latter must be considered as synonym of *A. micrantha* (see Art. 8.1, 52.1 and 52.2 of ICBN). It is nevertheless impossible to know if they belong to the same gathering and we therefore consider isotypes of each taxon as hypothetical.

Taxonomy and nomenclature

Arundo micrantha Lam., Tabl. Encycl. 1: 196. 1791 (Fig. 1).

Typus: “Ex AFRICA”: *Desfontaines s.n.* (holo-: P-LA [P00564266]!; iso-: B [W02223]!, G [G00074067]!, K [K000366972]!, MPU [015598]!, P [P00307101]!).

= *Arundo mauritanica* Desf., Fl. Atlant. 1: 106. 1798 [non Poir., Voy. Barbarie 2: 104. 1789. = *Ampelodesmos mauritanicus* (Poir.) Durand & Schinz]. **Typus: ALGERIA:** “Herbier de la Flore Atlantique”, *Desfontaines s.n.* (holo-: P [P00307101]!; iso-: B [W02223]!, G [G00074067]!, K [K000366972]!, MPU [015598]!, P-LA [P00564266]!).

= *Arundo mediterranea* Danin in Wildenowia 34: 362. 2004. **Typus: ISRAEL:** Nahal Sorek, 8 km east of Gedera, 18.IX.2004, *Danin s.n.* (holo-: HUU!; iso-: B [1001822322, 100182323]!, E [00205435]!, MARS [00007, 00008]!).

Additional specimens examined. – **FRANCE. Languedoc-Roussillon:** Sainte Lucie, *Requien s.n.* (MARS-Ardoino [00011]); Aude, Coteau à Sainte-Lucie, près de Narbonne, 21.IX.1818, *Gautier s.n.* (G-DC); Sainte-Lucie, 19.V.1828, *Requien s.n.* (G); In insula St Luciae, X.1829, *Eudrefs s.n.* (P [P03161112, P03161120]); Ile Sainte-Lucie, près de Narbonne, 25.VIII.1864, *Gautier s.n.* (MPU, P [P03626575]); Ile Sainte-Lucie, 12.IX.1877, *Bonneau s.n.* (MPU); Ile Sainte Lucie, près de Narbonne, molasse marine, 15 m, 27.IX.1882, *Doumergue s.n.* (G, MARS [00012], MPU, P [P02656180, P02656198, P03161077, P03235090, P03626594]); Sainte-Lucie, 1891, *Requien s.n.* (MPU); Aude, Ile Sainte-Lucie, IX.1893, *Jonas-Martyr s.n.* (G, MPU, P [P02421019, P02421020, P02421021, P03161074, P03168006, P03235087, P03626559, P03626580]); Ile Sainte-Lucie, IX.1893, *Martin s.n.* (P [P03626574]); Ile Sainte-Lucie, IX.1893-94, *Sevittien & Sevittien s.n.* (G, MPU, P [P02421022, P03161075, P03235086, P03242364, P03242365, P03235079, P03626551, P03626552, P03626579]); Aude, Ile Sainte-Lucie, près de la station de chemin de fer, 20.II.1921, *Neyraud s.n.* (MPU); Port-la-Nouvelle, Ile Sainte-Lucie, between the island and railway, ca. 2 m, 43°03' 25"N 03°01'52"E, 5.VIII.2011, *Hardion & al. s.n.* (MARS [00013], MARS [00014]). **Provence-Alpes-Côte d’Azur:** entre Cannes et Antibes, dans le Golfe de Juan, *Gay s.n.* (MPU); Golfe de Juan, 24.IX.1821, *Gay s.n.* (G); Route d’Antibes à Cannes, devant la villa “Jean Reynaud”, 10.X. 1868, *Thuret s.n.* (G); Golfe-Juan, 28.X.1868, *Moggridga s.n.* (P [P03626544]); Golfe-Juan, bords des ravines, 31.X. 1868, *Thuret s.n.* (G, P [P03161108]); Golfe Juan, non loin de la gare, presque en face du Château Robert, 27.X.1874, *Bernardin s.n.* (G, MPU, P [P02420203, P02656199, P03161104, P03626558]); Golfe-Juan, 5.XI.1878, *Consolat s.n.* (G); Golfe-Juan, XII.1904, *Mader s.n.* (G); Vallauris Golfe-Juan, in beach back, between road and railway, ca. 4 m, 43°33'48"N 7°04'07"E, 21.IX.2011, *Hardion & al. s.n.* (MARS [00015], MARS [00016]).

Morphology. – Our observations in the wild confirmed that *A. micrantha* is characterized by clearly branched stems, as previously emphasized by DESFONTAINES (1798) and DANIN (2004), coupled with a tussock habit and high culms (2–4 m) as described



Fig. 1. – Holotypus of *Arundo micrantha* Lam.

[Desfontaines s.n., P-LA] [© MNHN CRHST-CNRS. Reproduced with permission]

by DANIN (2004). However, these features are rarely present on herbarium specimens. On exsiccata, *A. plinii* complex (including *A. micrantha*) differs from *A. donax* by its spikelets with 1- (2) vs 3-5 flowers as mentioned by LAMARCK (1791). Moreover, our study on many herbarium exsiccata (G, MARS, MPU, P) shows that *A. micrantha* differs from the rest of *A. plinii* complex by a larger culm diameter under the panicle (> 5 mm vs < 4 mm). This new morphological character allows us to consider *A. micrantha* holotypus of Lamarck as conspecific with *A. mauritanica* Desf. and *A. mediterranea* Danin.

However, a broad morphological investigation coupled with a phylogenetic analysis on a Mediterranean sampling is needed to clarify the complex taxonomic delimitations in this genus. Because of many erroneous identifications in Herbarium exsiccata, this study will have to provide more discriminating characters, useful on vegetative as well as on reproductive material.

Ecology, distribution and conservation. – Notes on exsiccata labels gave us insights into the ecology of *A. micrantha* and its affinities with wetlands. This species mainly occurs on riverbanks and beach backs, in addition to ruderal sites. Because of its former synonymy under *A. plinii* s.l. and its resemblance to *A. donax*, the *A. micrantha* distribution was dramatically underestimated in the Mediterranean basin. Since 2004, it has been reported from Algeria, Crete, Cyprus, Greece, Lebanon, Morocco, Palestine and Rhodes (DANIN, 2004; DOBIGNARD & CHATELAIN, 2010). The careful examination of several specimens of *A. plinii* s.l. (G, MARS, MPU and P) allowed us to rediscover and identify wild populations in Golfe-Juan (Provence-Alpes-Côte d'Azur) and Sainte-Lucie Island (Languedoc-Roussillon) as *A. micrantha*. This discovery adds for the first time this species to the Flora of France, in addition to *A. donax* and *A. plinii* (sensu DANIN, 2004) from Fréjus-Saint-Raphaël. Our field observations of these restricted populations revealed their highly threatened status. In Golfe-Juan, two patches (10 m²) subsist on the urban littoral of French Riviera, between the back beach road and the railway, endangered by a project to extend train rails. According to numerous exsiccata, the population of Sainte-Lucie Island was the most visited of the French localities. Already impacted by human activity in the 19th century (as indicated on P [032 42232]), this population is now drastically reduced to 4 m², without flowering for at least three years. In addition, other localities of *A. plinii* s.l. as Salses-le-Château (Languedoc-Roussillon) and Saint-Tropez (Provence-Alpes-Côte d'Azur) respectively mentioned by GAUTIER (1912-1913) and CAMUS & CAMUS (1912), have never been seen again. *Armando plinii* s.l. being protected at regional scale (Provence-Alpes-Côte d'Azur and Languedoc-Roussillon), *A. micrantha* must be included under this status. However, *A. micrantha* needs urgent specific protection on French territory and may be considered as Critically Endangered (CR A1a, c; C1; D) in France following IUCN Red List Categories and Criteria (IUCN, 2001).

1087. ARUNDO *micrantha*.
*A. calycibus unifloris acuminatis, panicula
 erecta densa flavescente, vaginis ore pilosis.*
 E. Barbaria. *Comm. D. Desfontaines.*

Fig. 2. – The *Arundo micrantha* Lam. diagnosis.

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References

- CAMUS, E. G. & A. A. CAMUS (1912). *Florule de Saint-Tropez et de ses environs immédiats*. Paul Lechevalier, Paris.
- DANIN, A. (2004). *Arundo* (Gramineae) in the Mediterranean reconsidered. *Willdenowia* 34: 361-369.
- DESFONTAINES, R. (1798). *Flora Atlantica, Sive Historia Plantarum, Quae in Atlante, Agro Tunetano et Algeriensi Crescunt*. Vol. 1. Paris.
- DOBIGNARD, A. & C. CHATELAIN (2010). *Index Synonymique, flore d'Afrique du Nord, Vol. 1: Pteridophyta, Gymnospermae, Monocotyledonae*. Conservatoire et Jardin botaniques de Genève.
- DURAND, T. & H. SCHINZ (1895). *Conspectus florae Africae ou Énumération des plantes d'Afrique*. Vol. 5. Bruxelles.
- GAUTIER, G. (1912-1913). *Catalogue de la flore des Corbières, mis en ordre par L. Marty*. Société d'études scientifiques de l'Aude, Carcassonne.
- HARDION, L., R. VERLAQUE, A. FRIDLINDER & B. VILA (2011). Chromosome data 11. *Taxon* 60: 1221.
- IUCN (2001). *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission, IUCN, Gland & Cambridge.
- LAMARCK, J. B. A. P. M. DE (1791). *Tableau Encyclopédique et Méthodique des trois règnes de la nature: Botanique*. Vol. 1. Paris.
- MARIANI, C., R. CABRINI, A. DANIN, P. PIFFANELLI, A. FRICANO, S. GOMARASCA, M. DICANDILO, F. GRASSI & C. SOAVE (2010). Origin, diffusion and reproduction of giant reed (*Arundo donax* L.): a promising weedy energy crop. *Ann. Appl. Biol.* 157: 191-202.

MCNEILL, J., F. R. BARRIE, H. M. BURDET, V. DEMOULIN, D. L.
HAWKSWORTH, K. MARHOLD, D. H. NICOLSON, J. PRADO, P. C.
SILVA, J. E. SKOG, J. H. WIERSEMA & N. J. TURLAND (2006).
International Code of Botanical Nomenclature (Vienna Code).
Regnum Veg. 146.

POIRET, J. L. M. (1789). *Voyage en Barbarie*. Vol. 2. Paris.

TENORE, M. (1822). *Flora Napolitana*. Vol. 3. Napoli.

TURRA, A. (1780). *Florae Italicae Prodrromus*. Vicenza.

