

R. El Mokni, M. Kasri & M. H. El Aouni

***Volkameria inermis* (Lamiaceae) a new alien species naturalized to the Tunisian coast, first record for North-Africa**

Abstract

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Volkameria inermis L. (Lamiaceae), originating from India, Ceylon, Burma, Malaya, tropical Australia, Polynesia and Philippine Islands, was found naturalized in a coastal area of Hammamet-South (North-East of Tunisia). This report represents the first record for Tunisia and for the North-Africa.

Key words: Alien flora, xenophytes, North-Africa.

Introduction

The genus *Clerodendrum* L. (Lamiaceae, *Teucrioideae*) is very widely distributed in tropical and subtropical regions of the world and is comprised of small trees, shrubs and herbs (Cantino & al. 1992). The first description of the genus was given by Linnaeus in 1753, with identification of *C. infortunatum*. After a decade later in 1763 Adanson changed the Latin name “*Clerodendrum*” to its Greek form “*Clerodendron*”; in Greek Klero means chance and dendron means tree i.e. chance tree which means the tree which does not bring good luck like *Clerodendron infortunatum* or the tree which brings good luck like *C. fortunatum* (Shrivastava & Patel 2007). Later on after a span of about two centuries in 1942, Moldenke readopted the Latinized name ‘*Clerodendrum*’, which is now commonly used by taxonomists for the classification and description of the genus and species (Moldenke 1985; Rueda 1993; Hsiao & Lin 1995; Steane & al. 1999). *Clerodendrum* L. is a very large and diverse genus and till now five hundred and eighty species of the genus have been identified and are widely distributed in Asia, Australia, Africa and America. A high degree of morphological and cytological variation among the species, suggesting the paraphyletic or polyphyletic origin of the genus. Molecular systematic studies based on chloroplast and nuclear DNA also indicate polyphyletic origin of the genus (Steane & al. 2004).

Owing to morphological variations like length of the corolla tube, size of leaves, and type of inflorescence some authors have classified the genus into two major sub-genera,

Clerodendrum and *Cyclonema* (Steane & al. 1999) while others have classified it into five subgenera and each subgenus is again subdivided into many sections (Moldenke 1985).

Similarly many species of the genus have been described by more than one author and hence are denoted in the literature with the name of different authors.

The genus *Volkameria* L., well as some other, has been segregated from a formerly polyphyletic *Clerodendrum* L. (Yuan & al. 2010). By molecular analysis, this author distinguished three groups of species clearly separated by geography, one Asian, one African, and one coastal PanTropical group. All the species of the old genera *Volkameria* are included in this coastal group. *Volkameria inermis* L. is originating from India, Ceylon, Burma, Malaya, tropical Australia, Polynesia and Philippine Islands (Jayaweera 1982). It grows near the seashore in tropical Asia and the Pacific (Turner & Wasson 1997). It is widely distributed throughout India, South and South East Asia, Australia and Pacific islands. It is popularly known as “Seaside Clerodendron” in English (cf. Manoharan & al. 2008). It was introduced in all tropical and inter-tropical countries in the world (cf. N’guessan & al. 2010).

In North Africa, neither *Clerodendrum* L. (Before 2010) nor *Volkameria* L. (After 2010) was reported in any flora (Quèzel & Santa 1963, Pottier-Alapetite 1981, Valdés & al. 2002) even in some recent index floristic updating (Le Floc’h & al. 2010, Dobignard & Chatelain 2012). The present work confirms the occurrence of *Volkameria inermis* L. and reports the actual distribution on the Tunisian territory. The discovery of this new naturalized taxon constitutes, up to now, the first citation for North Africa.

Description of the species

Volkameria inermis L. [= *V. neriifolia* Roxb., *Clerodendrum inerme* (L.) Gaertn., *Clerodendrum neriifolium* (Roxb.) Schauer] is an evergreen erect bush, often scrambling or scandent that can reach up to 3 m tall but sometimes a liana and measures up to 13 m long. The branches and branchlets are slender while the nodes are not annulated. The leaves are elliptical or narrowly lance-shaped, measuring 2.3-10 cm × 0.8-4.5 cm, acute at the base, obtuse or shortly acuminate at the apex, entire, glabrate above, almost glabrate beneath, aromatic and with the petiole is 0.5-1 cm long. The cymes are axillaries or supra-axillaries with 3-7-flowered, solitary, opposite and measure 4.5-9.5 cm long. The sepal is bell-shaped; with tube is about 4 mm long, 5-toothed and green. The petal is hypocrateriform, slender tube, measures (1.5-) 2-3.5(-4) cm long, with lobes measuring 0.4-0.8(-1.1) cm long, white or tinged purple and fragrant (Fig. 1A, 1B). The stamens are long exerted (Fig. 1C, 1D) pubescent at base of filaments, reddish to purple and the fruiting green sepal, accrescent to 1.5 cm in diameter. Style and ovary glabrous. Drupes gray-yellow, bright green but turns black or brown, obovoid to subglobose, 6-19 mm in diameter and 10 mm long, 4-lobed. (Jayaweera 1982; Wu & al. 1994; Wagner & al. 1999; Mabberley 2004; Yuan & al. 2010).

Chromosome number

From $2n=24$ to $2n=184$ (Steane & al. 2004).

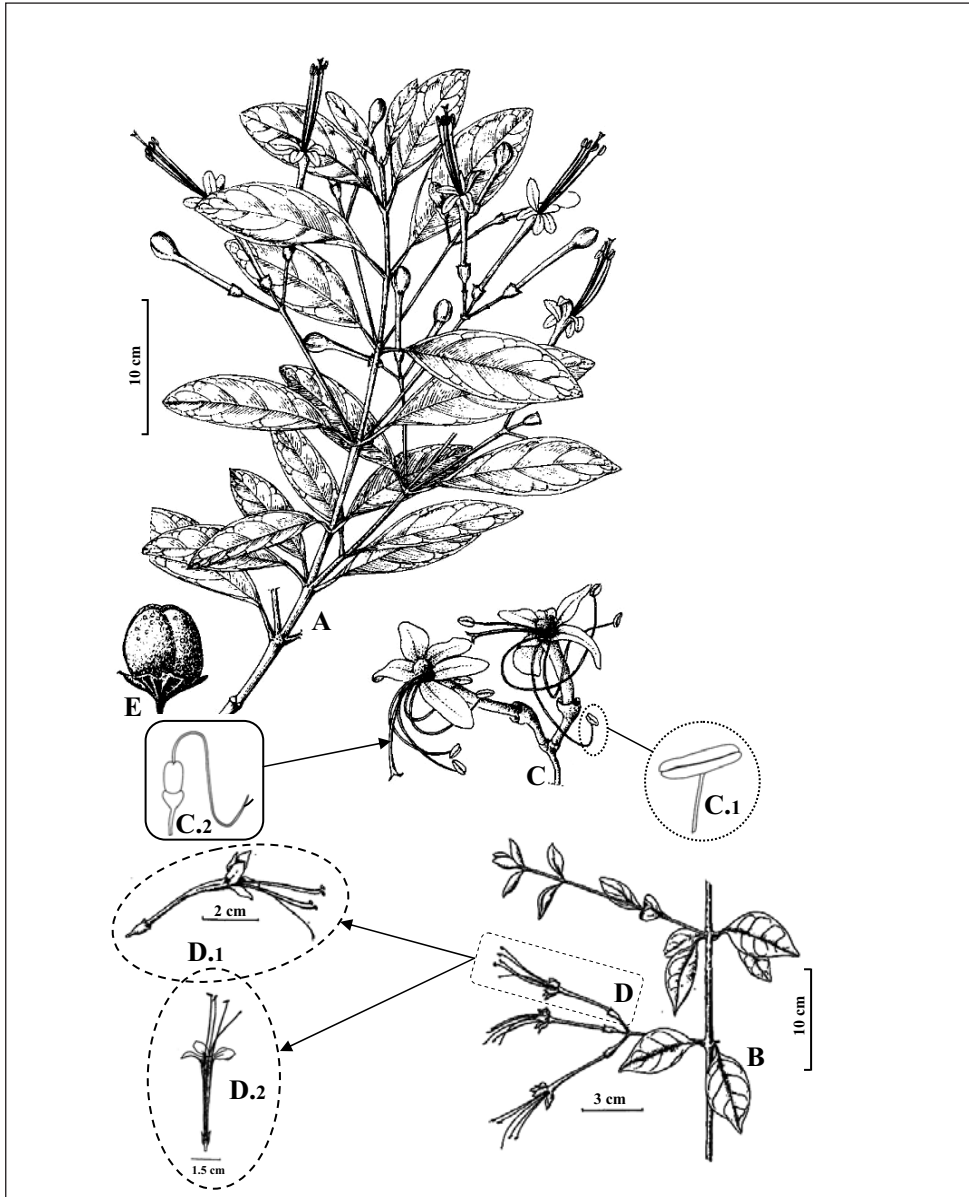


Fig.1. *Volkameria inermis*; sarmentous microphanerophyte with (A) a part of a stem with simple, entire and opposed penninervous leaves with flowers clustered in biparous cymes (B) flowers slightly zygomorphic gathered in groups of three (C) biparous cyme with opened flowers; each flower (D) has 5 sepals fused into a campanulate calyx, 5 overlapping petals in the form of corollary tube, 4 stamens didynamous, much exserted with (C.1) anther at longitudinal dehiscence, style purplish and bifid (C.2) surmounting a superior ovary 2-locular with 2 ovules in each loculus with an axile placentation; (D.1 & D.2 are respectively a lateral view and a longitudinal section view of a flower). (E) Fruit (a pyriform ellipsoidal drupe) very blunt, dry, smooth, brown, splitting into 4 woody pyrenes.



Fig. 2-5. *Volkameria inermis*; Fig. 2. Sarmentous stem with simple, entire and opposite penninervous leaves with flowers clustered in biparous cymes, Fig. 3. Zygomorphic flower with white petals, long exserted didynamous stamens and a long purplish style, Fig. 4. Axillary 3-flowered biparous cyme, Fig. 5. Stems parasitized by an exotic dodder (*Cuscuta* sp.) in a coastal area of the Hammamet-South region, North-East of Tunisia (Photos of Ridha El Mokni, December 2011).

Etymology

Empr. to lat. sc. *Volckameria* (1744 Linnaeus Syst. Nat. p. 44), formed on the name of the botanist J. G. Volckamer [1616-1693]. The specific epithet refers to that the plant has no spines or means of defense.

Distribution

Volkameria inermis, native to the sea coasts of India, Sri Lanka (Ceylon than Ceylan), Burma, Malaya, tropical Australia, Polynesia and Philippine Islands (Jayaweera 1982), is known only from one locality in a coastal area of Hammamet-South (North-East of Tunisia).

Ecology

Growing essentially in the sandy coastal dunes with *Achillea maritima* (L.) Ehrend. & Y.P. Guo, *Ammophila arenaria* (L.) Link., *Cakile maritima* Scop., *Carpobrotus edulis* (L.), *Centaurea sphaerocephala* L., *Cutandia divaricata* (Desf.) Asch. & Barbey, *Cyperus capitatus* Vand., *Eryngium maritimum* L., *Imperata cylindrica* (L.) Raeusch., *Launaea fragilis* (Asso) Pau., *Medicago marina* L., *Pancreatium maritimum* L., *Plantago afra* L., *Polygonum aviculare* L., *P. maritimum* L., *Rumex bucephalophorus* L., *Rumex roseus* L., *Salsola kali* L., *Silene colorata* Poir., etc.), amplified over the past three years by a still undetermined dodder (*Cuscuta* sp.!).

Phenology

Flowering and fructification from July to December. Drupes ripening from the beginning of March.

The Tunisian find

The Hammamet-South report represents the first record for Tunisia and for the North Africa. Plants of *V. inermis* were observed in 2008, for the first time, during an extended regular field excursion on the coast of Hammamet-South (North-East of Tunisia) in search of some psamphilous species indicators of the stage of progression of dune plant groups, the authors noted the abundance of a shrub without flowers. It was, probably, introduced by way of ornamental odoriferous plants. Since, regular seasonal botanical surveys maintained in the same region have reported the extension of its area with a specific dune floristic cortege as mentioned above.

Our recent observations (December 2011; fig. 2-5) show that *V. inermis* is still present, behaves as a perennial species and continues to reproduce and spread gradually. Its spread and distribution is so far strictly linked to the coastal area of Hammamet-South.

Specimina visa:

Tunisia: Hammamet-South, sandy costal dunes near hotels, 36° 21'53.59" N 10° 32'14.37" E, 1 m a.s.l., 20.12.2011, R. El Mokni (TUN, PAL).

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References

- Austin, D. F. 2002: Plant Resources in South-East Asia. N°.12 (2). Medicinal and Poisonous Plants 2. – Econ. Bot. **56** (3): 297-297.
- Cantino, P. D., Harley, R. M. & Wagstaff, S. J. 1992: Genera of *Labiatae*: Status and Classification. – Pp. 511-522 in: Harley, R.M. & Reynolds, T. (eds), *Advances in Labiatae Science*. – Kew.
- Dobignard, A. & Chatelain C. 2012 : Index synonymique de la flore d'Afrique du Nord. Volume 4. *Dicotyledoneae, Fabaceae à Nymphaeaceae*, compris *Lamiaceae*. En cours de rédaction. [Publication hors-série N° 11c.] – Genève.
- Hsiao, J. Y. & Lin, M. L. 1995: A Chemotaxonomic study of essential oils from the leaves of genus *Clerodendrum* (*Verbenaceae*) native to Taiwan. – Bot. Bull. Acad. Sinica **36**: 247-251.
- Jayaweera, D. M. A. 1982: Medicinal Plants (Indigenous and Exotic) Used in Ceylon, **5**. – Colombo.
- Le Floch, E., Boulos, L. & Vela, E. (ed.) 2010: Catalogue synonymique commenté de la flore de Tunisie. – Tunis.
- Mabberley, D. J. 2004 : *Clerodendrum* L. Pp. 53–57 in Tirel, C. & C. Pisivin, (eds.), *Flore de la Nouvelle-Calédonie et Dépendances*, **25**. – Paris.

- Manoharan, S. H., Kavitha, K., Balakrishnan, S. & Rajalingam K. 2008: *Clerodendron inerme* protects cellular integrity during 7, 12-dimethylbenz[a]-anthracene induced hamster buccal pouch carcinogenesis. – Afr. J. Trad. **5(2)**: 213-222.
- Moldenke, H. N. 1985: Notes on the genus *Clerodendrum* (Verbenaceae). IV. – Phytologia **57**: 334-365.
- N'guessan, K., Zirih, G. N. & Mea A. 2010: Hypotensive effect of aqueous extract of *Clerodendron inerme* leaves on the arterial pressure of rabbits. – Int. J. Pharm. Biomed. Res. **1(2)**: 73-77.
- Pottier-Alapetite, G. 1981: Flore de la Tunisie, **2**. – Tunis.
- Quèzel, P. & Santa S. 1963 : Nouvelle Flore de l'Algérie et des régions désertiques méridionales, **2**. – Paris.
- Rueda, R. M. 1993: The genus *Clerodendrum* (Verbenaceae) in Mesoamerica. – Ann. Missouri Bot. Gard. **80**: 870-890.
- Shrivastava, N. & Patel, T. 2007: *Clerodendrum* and Healthcare: An Overview. – Med. Aromat. Pl. Sci. Biotechnol. **1(1)**: 142-150.
- Steane, D. A., Scotland, R. W., Mabberley, D. J. & Olmstead, R. G. 1999: Molecular systematics of *Clerodendrum* (Lamiaceae): its sequences and total evidence. – Amer. J. Bot. **86**: 98-107.
- , De Kok, R. P. J. & Olmstead, R. G. 2004: Phylogenetic relationships between *Clerodendrum* (Lamiaceae) and other Ajugoid genera inferred from nuclear and chloroplast DNA sequence data. – Molec. Phylogenet. Evol. **32**: 39-45.
- Turner, R. J. & Wasson, E. 1997: Botanica. – Mynah, USA.
- Valdés, B., Rejdali, M., El Kadmiri, A. A., Jury, S. L. & Montserrat, J. M. 2002 : Catalogue des plantes vasculaires du nord du Maroc, incluant des clés d'identification, **2**. – Madrid
- Wagner, W. L., Herbst, D. R. & Sohmer, S. H. 1999: Manual of the Flowering Plants of Hawaii, **2**. Honolulu.
- Wu, Z. Y., Raven P. H. & al. (ed.) 1994) : (consulté le 12/12/2011). Flora of China, 17: 42, *Volkameria inermis* L. [Sp. pl. 2:637. 1753] (= *Clerodendron inerme* (L.) Gaertn.). Flora of China (English edition). [Flora of China @ efloras.org](http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200019333) [http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200019333]
- Yuan, Y. W., Mabberley, D. J. Steane D. A. & Olmstead R. G. 2010: Further disintegration and redefinition of *Clerodendrum* (Lamiaceae): implications for the understanding of the evolution of an intriguing breeding strategy. Phylogeny of *Clerodendrum* and allied genera. – Taxon **59(1)**: 125-133.

Addresses of the authors:

Ridha El Mokni,

University of Jendouba, Sylvo-Pastoral Institute of Tabarka, Tabarka 8110, Jendouba-Tunisia. University of Carthage, Laboratory of Botany and Plant Ecology (SNA-214), Department of Life Sciences, Faculty of Sciences of Bizerte, Jarzouna 7021, Bizerte-Tunisia.

E-mail of corresponding author: riridah@yahoo.fr

Mohamed Hédi El Aouni,

University of Carthage, Laboratory of Botany and Plant Ecology (SNA-214), Department of Life Sciences, Faculty of Sciences of Bizerte, Jarzouna 7021, Bizerte-Tunisia.

Mounir Kasri,

University of Tunis El Manar, Society of Natural Science of Tunisia (SSNT). Faculty of Sciences of Tunis, University Campus, El Manar II, 2092 Tunis, Tunisia.