FIRST RECORD OF NATURALIZED *VIBURNUM TINUS* L. (CAPRIFOLIACEAE) IN THE ISLAND OF MADEIRA (PORTUGAL)

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With 5 figures

ABSTRACT. *Viburnum tinus* L. is reported for the first time for the Island of Madeira as a naturalized plant, in the remains of poorly preserved laurel forest. In Portugal two species of the genus *Viburnum* L. (Caprifoliaceae) have been recorded, *Viburnum tinus* L. [with two recognized subspecies: *V. tinus* L. subsp. *tinus* (mainland) and *V. tinus* L. subsp. *subcordatum* (Trel.) P. Silva (Azores)] and *V. opulus* L., while in the nearby Canary Islands (Spain) there is an endemic species, *V. rigidum* Vent. The introduction of *V. tinus* L. can be a new threat to the Madeiran endemic flora and vegetation, as noted for many other non-indigenous plants over the last years.

Key words: *Viburnum*, Caprifoliaceae, new naturalized plant, Madeira.

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RESUMO. Pela primeira vez é assinalada a ocorrência, como naturalizada, da espécie *Viburnum tinus* L. na ilha da Madeira, num reduto de floresta Laurissilva degradada. Em território português estão assinaladas duas espécies do género *Viburnum* L. (Caprifoliaceae), *Viburnum tinus* L. [com duas subespécies reconhecidas: *V. tinus* L. subsp. *tinus* (Portugal Continental) e *V. tinus* L. subsp. *subcordatum* (Trel.) P. Silva (Açores)] e *V. opulus* L. Nas ilhas Canárias (Espanha) está presente uma espécie endémica, *V. rigidum* Vent. A introdução de *V. tinus* L. na ilha da Madeira pode constituir uma nova ameaça para a flora e vegetação endémicas, tal como tem acontecido com a introdução de outras plantas exóticas ao longo dos últimos anos.

Palavras-chave: *Viburnum*, Caprifoliaceae, nova planta naturalizada, Madeira.

INTRODUCTION

The flora of Madeira totals 1.204 taxa of vascular plants (species and subspecies). Of these, 29 (2,4%) are "possibly introduced" and 401 (33,3%) are introduced (Jardim & Sequeira, 2008).

The Honeysuckle family (Caprifoliaceae) totals five taxa in the Island of Madeira. Among these, one taxon is endemic from this Island (*Sambucus lanceolata* R. Br.), three taxa are introduced (*Lonicera japonica* Thunb., *Sambucus ebulus* L., *Sambucus nigra* L.) and one taxon possibly introduced (*Lonicera etrusca* Santi) (Press, 1994; Jardim & Sequeira, 2008).

According to Ruiz Téllez & Devesa (2007) the genus *Viburnum* L. has about 210 species found in the temperate and sub-tropical areas of Europe, Northern Africa, Asia and America.

In Portugal, Franco (1984) recognises two subspecies of *Viburnum tinus* L.: subsp. *tinus* (mainland Portugal) and subsp. *subcordatum* (archipelago of Azores). More recently, Aguiar & Carvalho (2003) considered also *Viburnum opulus* L. as being part of Portugal's native flora and not as a cultivated plant, as considered by Coutinho (1913).

Among the Macaronesian archipelagos the genus *Viburnum* L. is represented by two taxa. In the Azores, the endemic *Viburnum tinus* L. subsp. *subcordatum* (Trel.) P. Silva [≡ *V. tinus* var. *subcordatum* Trel., Rep. (Annual) Missouri Bot. Gard., 8: 118. 1897; ≡ *V. treleasei* Gand., Bull. Soc. Bot. France 46: 255. 1900; ≡ *V. subcordatum* (Trel.) Rivas Mart., Lousã, Fern. Prieto, E. Días, J. C. Costa & C. Aguiar, comb. superf.], occurs in all islands except Graciosa (Silva *et al*., 2005). In the Canary Islands the endemic *Viburnum rigidum* Vent. is present in all islands except Fuerteventura and Lanzarote (Acebes Ginovés

et al., 2004). Finally, in Cape Verde there are no species of *Viburnum* L. recorded (Sánchez-Pinto *et al*., 2005).

The first reference to *Viburnum tinus* L. in the Island of Madeira is given by Bewicke & Conybeare (1851), who refer to the species, vernacularly, as "louro-regio" [although these authors point to Brotero as the origin of most of the common names used, the fact is that this name is not included by Brotero (1788) in the list of Portuguese common names of plants], as growing in Funchal gardens "Palmeira and the Deanery". Later Lowe (1868) mentions *V. tinus* L. as a garden plant that "flourishes in gardens even down in Funchal". Ribeiro (1920) mentions this species calling it "loiro régio". Silva & Menezes (1965) also mention this Caprifoliaceae as a cultivated plant in the gardens of Madeira, naming it as "louro-régio", and they consider the plant as frequent. More recently Quintal (2007) also reports *V. tinus* L. as a cultivated plant in some private and public gardens in the town of Funchal.

RESULTS

The specimens of *Viburnum tinus* L. reported herein are deposited in the herbarium of Museu Municipal do Funchal (Natural History) (MADM) and were found on the north coast of the Island of Madeira, along the "levada da Fajã do Rodrigues" (Fig. 1 - a, b, c, d).

The plants, initially introduced as ornamental – there is no reference to their use in the reforesting process of Madeira by Andrada (1990) –, are perfectly naturalised, occurring on the borders of a water channel in a rather humanized micro-habitat included in the remains of poorly preserved humid laurisilva (*Clethro arboreae* - *Ocoteetum foetentis* Capelo, J. C. Costa, Lousã, Fontinha, Jardim, Sequeira & Rivas-Martínez) as described by Costa *et al*. (2004).

About 30 individuals were identified over approximately 1 km. These specimens correspond to fully flowering tall plants (up to 3 metres), some of them showing abundant rooting of lower branches (Fig. 2), suggesting that several adult plants could have resulted from this type of vegetative propagation. A few seedlings were also detected (Fig. 3).

STUDIED MATERIAL

***Viburnum tinus* L.**

- Portugal, Madeira: Levada da Fajã do Rodrigues, Ginjas, São Vicente, 15.XI.2007, Juan Silva leg., 32º 46' 23'' N, 17º 02' 28'' W, 590 m a. s. l. (MADM 415).

- Portugal, Madeira: Levada da Fajã do Rodrigues, Ginjas, São Vicente, 14.VIII.2008, Juan Silva leg., 32º 46' 23'' N, 17º 02' 28'' W, 590 m a. s. l. (MADM 1760).

- Portugal, Madeira: Levada da Fajã do Rodrigues, Ginjas, São Vicente, 18.II.2009, Juan Silva & Miguel Sequeira leg., 32º 46' 23'' N, 17º 02' 28'' W, 590 m a. s. l. (MADM 1850).

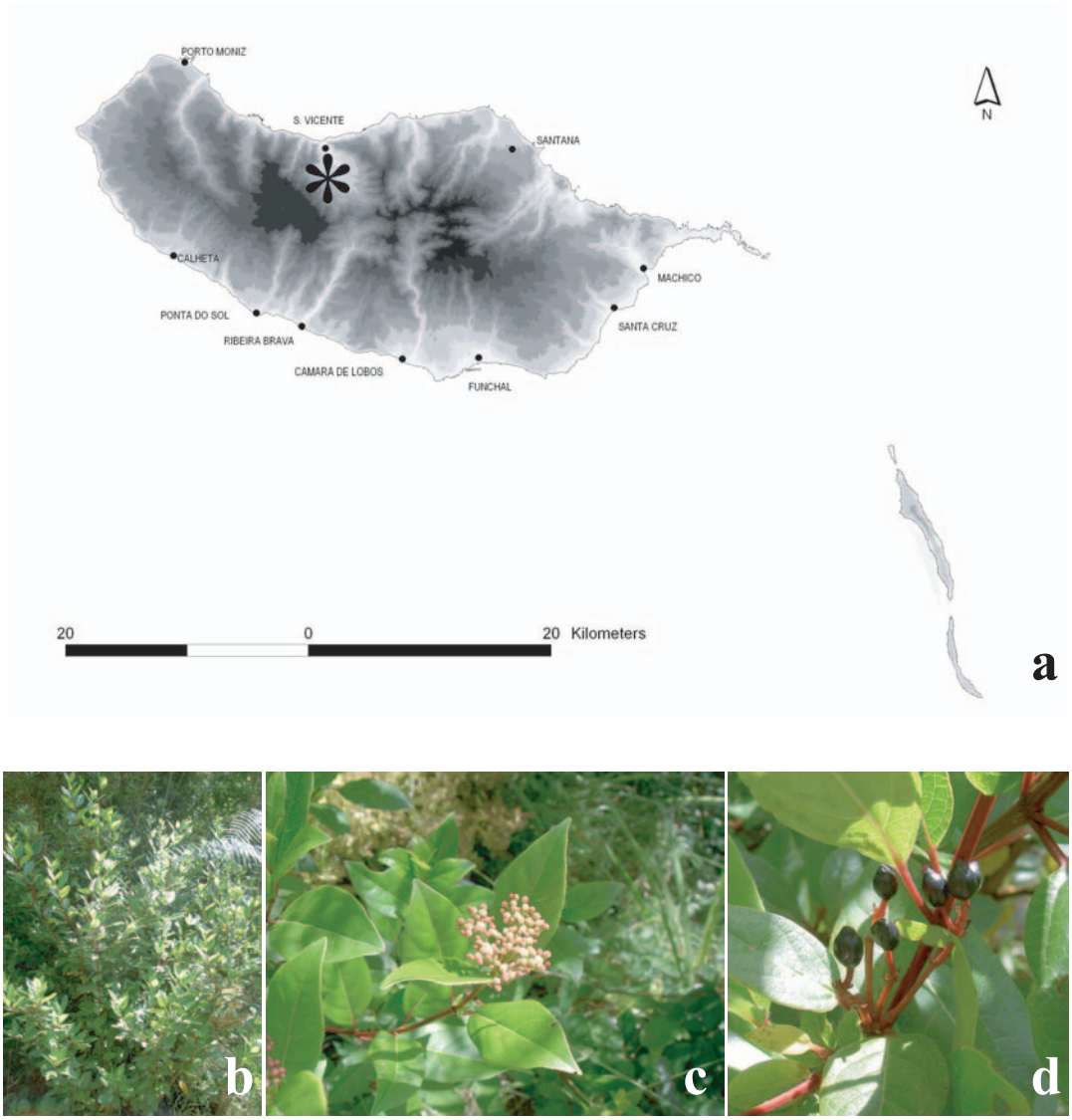

Fig. 1 - *Viburnum tinus* L. (Madeiran population): a) geographical location; b) general aspect; c) inflorescence; d) fruits.

Fig. 2 - Rooting of lower branches of *Viburnum tinus* L. from Madeira.

Fig. 3 - Seedling of *Viburnum tinus* L. (Madeira).

Fig. 4 - *Viburnum rigidum* Vent.

***Viburnum rigidum* Vent.**

- Spain, Canary Islands: La Florida, El Palmar, Buenavista del Norte (Tenerife), 03.VI.2009, Rubén Barone leg., UTM (WGS84): 28R 318728 / 3137573, 430 m a. s. l. (MADM 1933) (Fig. 4).

- Spain, Canary Islands: Las Mercedes, Cruz del Carmen, La Laguna (Tenerife), 10.VI.2009, Rubén Barone leg., UTM (WGS84): 28R 374540 / 3156980, 850 m a. s. l. (MADM 1934).

***Viburnum tinus* L. subsp. *subcordatum* (Trel.) P. Silva** (Fig. 5 - a, b).

- Portugal, Azores: Estrada para Ponta Delgada (Flores), num talude, 22.VII.2004, Miguel Sequeira leg., 39º 29, 64' N, 31º 12, 25' W, 380 m a. s. l. (MS 4485).

Fig. 5 - *Viburnum tinus* L. subsp. *subcordatum* (Trel.) P. Silva: a) leaves; b) fruits.

GENERAL DESCRIPTION

The following description is based on the one given by Ruiz Téllez & Devesa (2007):

Evergreen erect shrub (1) 2-4 (5) m high, branched from the base, glabrous or sparsely pubescent, with simple or stellate hairs (12-15 rays). Leaves opposite or exceptionally in whorls of 3, persistent, leathery, leaf blade (30) 65-122 (160) x (15) 35-68 (90) mm, elliptic to ovate, entire, with slightly revolute margins, acute, with a rounded or asymmetrically attenuate base, glossy dark green above, paler beneath, with simple or stellate hairs along the veins and, sometimes with tufts of hairs in the vein-axils; petiole (5) 10-20 (25) mm, glabrescent or sparsely hairy, with simple or stellate hairs; stipules inconspicuous. Inflorescence 5-9 cm in diameter, with (25) 95-120 (245) flowers organised in 2-3 ordered corymbs; primary rays 5-7, up to 27 (38) mm enlarging in fruit, stellate hairs; bracts 5-7, triangular, acute, sessile, with the same indumentum as primary rays; bracteoles 2. Flowers actinomorphic, more or less equal, subsessile or with 2.6-3.8 (4.8) mm pedicels, scentless, fertile; calyx (2.8) 3.6-4.5 (6.1) mm, with 5 triangular lobes, acute to obtuse, glabrescent or with stellate hairs at least on the lobes base and apex, sometimes glandular-pubescent; corolla (2.5) 3.5-5.6 (6.7) mm, white, sometimes pinkish in the bud, 5-lobed; stamens glabrous, anthers more or less spherical to ovoid, yellow; stigma capitate. Fruit an ovoid drupe (5.8) 7.9-10.6 (12.1) x (3.2) 4.4-5.7 (6.8) mm, metallic blue with stellate hairs, turning black and glabrous (except the apex) when mature; pyrene (4.2) 5.9-7 (8.6) x (2.7) 4-4.9 (5.9) mm. Flowering: All year.

Identification key of the Madeiran genera of the family Caprifoliaceae:

1. Leaves pinnate_____*Sambucus* L.
   Leaves simple_____2.

2. Woody climber, zygomorphic flowers_____*Lonicera* L.
   Evergreen erect shrub, actinomorphic flowers_____*Viburnum* L.

CONCLUSIONS

Jardim & Sequeira (2008) refer to 430 introduced (and naturalised) vascular plants in the archipelago of Madeira. According to these authors, the introduction of new taxa is one of the factors causing habitat fragmentation, local hyper diversity, niche occupancy and possible stochastic extinction; in fact, invasive plant species are the dominant element in the landscape of the Island of Madeira.

The recent introduction of some phanerophytes such as *Acacia mearnsii* De Wild., in the middle XX century [Andrada (1990)], has led to landscape domination by these invading Fabaceae, proving how fast some species can become a conservation problem.

Several new introductions and consequent naturalizations, during the second half of the XX century, were reported by Hansen (*e. g*. 1974, 1978, 1987 and 1992) and summarized by Vieira (2002). Recently, *Solidago chilensis* Meyen was confirmed as a new introduced taxon in the Island of Madeira (Gonçalves Silva *et al*., 2008).

The vegetative propagation observed in *Viburnum* associated with the extended flowering period and massive fructification (with a possible inclusion of its fruits in the local avifauna diet) could suggest a near future expansion of *V. tinus* area, increasing the threats to the native flora and vegetation. In the Canary Islands, Robins, *Erithacus rubecula* (Linnaeus, 1758), are one of the main seed dispersers of the related species *Viburnum rigidum* Vent. (Delgado, 1997). As this bird is found also in Madeiran forests, cultivations and gardens (Oliveira & Menezes, 2004), the possibility of a similar situation occurring in this island remains.

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REFERENCES

ACEBES GINOVÉS, J. R., M. DEL ARCO AGUILAR, A. GARCÍA GALLO, M. C. LEÓN ARENCIBIA, P. L. PÉREZ de PAZ, O. RODRÍGUEZ DELGADO, W. WILDPRET de la TORRE, V. E. MARTÍN OSORIO, M. C. MARRERO GÓMEZ & M. L. RODRÍGUEZ NAVARRO:

2004. Pteridophyta & Spermatophyta. In: *Lista de especies silvestres de Canarias (hongos, plantas y animales terrestres), 2004* (eds.: I, Izquierdo, J. L. Martín, N. Zurita & M. Arechavaleta), pp. 96-143. Consejería de Medio Ambiente y Ordenación Territorial, Gobierno de Canarias.

AGUIAR, C. & A. CARVALHO:

2003. De Novarum Flora Lusitana Commentarii – I: 4. *Viburnum opulus* L. – um novo arbusto indígena da flora indígena de Portugal. *Silva Lusitana*, **11** (2): 229.

ANDRADA, E. C.:

1990. *Repovoamento florestal no Arquipélago da Madeira (1952-1975)*. Ministério da Agricultura, Pescas e Alimentação. Secretaria de Estado da Agricultura. Direcção-Geral das Florestas. Lisboa. 222 pp.

BEWICKE, C. & J. C. CONYBEARE:
1851. List of cultivated plants growing in the gardens of the Palmeira and the Deanery. In: *A Sketch of Madeira; Containing Information for the Traveller, or Invalid Visitor* (ed.: E. V. Harcourt), pp. 151-164. John Murray. London.

BROTERO, F. A.:
1788. *Compendio de Botanica, ou Noçoens Elementares Desta Sciencia, segundo os melhores Escritores modernos, expostas na lingua Portugueza*. Vol. **2**. Paris.

COSTA, J. C., J. CAPELO, R. JARDIM, M. MENEZES de SEQUEIRA, D. ESPÍRITO-SANTO, M. LOUSÃ, S. FONTINHA, C. AGUIAR & S. RIVAS-MARTÍNEZ:
2004. Catálogo sintaxonómico e florístico das comunidades vegetais da Madeira e Porto Santo. *Quercetea*, **6**: 61-185.

COUTINHO, A. X. P.:
1913. *A Flora de Portugal (Plantas vasculares) disposta em chaves dichotomicas*. Lisboa. 771 pp.

DELGADO, J. D.:
1997. *Viburnum tinus*, ratas y aves: interacciones entre una planta con frutos carnosos y los vertebrados frugívoros en un bosque de laurisilva de Tenerife (Islas Canarias). Diss. Dpto. de Biología Animal (Zoología), Universidad de La Laguna. *Unpublished*, 68 pp.

FRANCO, J. A.:
1984. *Nova Flora de Portugal*. Vol. **II** *(Clethraceae – Compositae)*. Lisboa. 660 pp + 2 mapas.

GONÇALVES SILVA, J. J., J. C. SEMPLE, R. LOPEZ LAPHITZ & M. MENEZES de SEQUEIRA:
2008. First record of La Plate River Goldenrod *Solidago chilensis* Meyen (Asteraceae), in the Island of Madeira (Portugal). *Boletim do Museu Municipal do Funchal*, **58** (320): 31-36.

HANSEN, A.:
1974. Contributions to the flora of Madeira and Porto Santo. *Bocagiana*, **36**: 1-37.
1978. Contributions to the flora of the Archipelago of Madeira. *Bocagiana*, **45**: 1-18.
1987. Contributions to the flora of the Archipelago of Madeira. *Bocagiana*, **109**: 1-11.

1992. Contributions to the flora of the Azores, Madeira, P. Santo and the Canary Islands. *Boletim do Museu Municipal do Funchal*, **44** (242): 157-179.

JARDIM, R. & M. M. SEQUEIRA:

2008. As plantas vasculares (Pteridophyta e Spermatophyta) dos arquipélagos da Madeira e das Selvagens. In: *Listagem dos fungos flora e fauna terrestre dos arquipélagos da Madeira e Selvagens* (eds.: P. A. V. Borges, C. Abreu, A. M. F. Aguiar, P. Carvalho, R. Jardim, I. Melo, P. Oliveira, C. Sérgio, A. R. M. Serrano & P. Vieira), pp. 157-208. Direcção Regional do Ambiente da Madeira e Universidade dos Açores. Funchal e Angra do Heroísmo.

LOWE, R. T.:

1868. *A manual Flora of Madeira and the adjacent Islands of Porto Santo and the Desertas*. Vol. **1**. Part: IV. London.

OLIVEIRA, P. & D. MENEZES:

2004. *Aves do Arquipélago da Madeira*. Serviço do Parque Natural da Madeira / Arquipélago Verde produtos promocionais, Lda. Funchal. 111 pp.

PRESS, J. R.:

1994. Caprifoliaceae. In: *Flora of Madeira* (eds.: J. R. Press & M. J. Short), pp. 324-325. The Natural History Museum. London.

QUINTAL, R.:

2007. *Quintas, Parques e Jardins do Funchal. Estudo Fitogeográfico*. Esfera do Caos. Lisboa. 702 pp.

RIBEIRO, E.:

1920. Palavras do Arquipélago da Madeira. *Lusitana*, **23** (1-4): 131-137.

RUIZ TÉLLEZ, T. & J. A. DEVESA:

2007. *Viburnum* L. In: *Flora Ibérica. Plantas vasculares de la Península Ibérica e Islas Baleares*, Vol. XV (eds.: S. Castroviejo, J. A. Devesa, R. Gonzalo & A. Herrero), *Rubiaceae-Dipsacaceae*, pp. 197-202. Real Jardín Botánico, CSIC. Madrid.

SÁNCHEZ-PINTO, L., M. L. RODRÍGUEZ, S. RODRÍGUEZ, K. MARTÍN, A. CABRERA & M. C. MARRERO:

2005. Spermatophyta. In: *Lista preliminar de especies silvestres de Cabo Verde*

(hongos, plantas y animales terrestres), 2005 (eds.: M. Arechavaleta, N. Zurita, M. C. Marrero & J. L. Martín), pp. 40-57. Consejería de Medio Ambiente y Ordenación Territorial, Gobierno de Canarias.

SILVA, F. A. & C. A. MENEZES:
1965. *Elucidário Madeirense*. Vol. **II**. 3ª Edição. Funchal. Ed.: Junta Geral do Distrito Autónomo do Funchal. 448 pp.

SILVA, L., N. PINTO, B. PRESS, F. RUMSEY, M. CARINE, S. HENDERSON & E. SJÖGREN:
2005. List of vascular plants (Pteridophyta and Spermatophyta). In: *A list of the terrestrial fauna (Mollusca and Arthropoda) and flora (Bryophyta, Pteridophyta and Spermatophyta) from the Azores* (eds.: P. A. V. Borges, R. Cunha, R. Gabriel, A. F. Martins, L. Silva & V. Vieira), pp. 131-155. Direcção Regional do Ambiente and Universidade dos Açores. Horta, Angra do Heroísmo and Ponta Delgada.

VIEIRA, R.:
2002. Flora da Madeira. Plantas vasculares naturalizadas no arquipélago da Madeira. *Boletim do Museu Municipal do Funchal*, **Sup. n.º 8**: 5-281.

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