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[Mini Review] Viburnum: an overview in relation to risks of allergy

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Abstract

The genus *Viburnum* comprehends more than 230 species of high ecological value. Some species have been considered for contact sensitivity and the pollen allergenicity. The literature shows that some species can give contact hypersensitivity and *V. opulus* can determine pollen allergy

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Abbreviations

VPA — Value of Potential Allergenic

Introduction

The genus *Viburnum*, of the botanical family of Adoxaceae, includes species from different parts of the world, widely used in forestry and gardening, as an ornamental plant of high ecological value. It comprehends more than 230 species of evergreen, semievergreen, or deciduous shrubs and small trees. It is of scientific interest due to the chemical components and diverse biological activities. Although frequently used as an ornament, the Viburnum species show biological

properties with health-promoting effects. Fruits, flowers, and barks of certain species are used for pharmaceutical purposes or as cooking ingredients, hence containing biochemical compounds with health-promoting activity such are carotenoids, polyphenols, and flavonoids (Sharifi-Rad, 2021). In the *Viburnum* genus the leaves are arranged in opposite pairs on the twigs; they are oval; the flowers are small, with five whitish petals, arranged in large round terminal cymes; the flowers have both female and male parts (hermaphrodite), actinomorphic and united in showy compound tops, flowering is in general in late spring; the fruit is a drupe or a berry.

Methods

The following values were considered useful for floriculture and forestry: distribution area, presence of flowers and fruits, main uses of the plant. In the use of this genus in gardening, however, there are reports of dermatopic sensitization by contact and by pollen allergens (Dambra, 2000). Therefore, the following parameters were considered: contact sensitivity and the pollen allergenicity as fundamental for a complete gender review. It was considered also the classification of the plants in the Ogren Plant Allergy Scale (OPALS), an allergy rating system for plants that measures the potential of a plant to cause allergic reactions in humans (Ogren, 2000) and the International Union of Immunological Societies (IUIS) database.

In fact it is essential, in ornamental use in parks, gardens, schools, and sports facilities, to consider the impact on public health of the type of green chosen; where the choice of one species rather than another can determine the difference, the parameters of the plant&human health relationship must be taken into first consideration. Bibliographic searches relating to the genus Viburnum were carried out with the following keywords: Viburnum+allergen; Viburnum. Species were investigated at pollenlibrary.com. Furthermore, the most recent databases published on the most common trees and shrubs in the Mediterranean areas were consulted (Cariñanos, 2021).

Results and Discussion

The species can give the probability of adverse reactions upon contact, because the stems cointain trichomes that cover the leaves and branches. In gardening it is necessary to use long gloves to handle these plants. The hypersensitivity is evident for example in *Viburnum rhytidophyllum* (Dambra P, 2000).

V. dilatatum - Linden Arrow-Wood or linden viburnum – It is native to eastern Asia, and can be found as an introduced plant in the mid-Atlantic regions in the U.S from New York to Virginia. The stems are pubescent. The leaves have shallowly toothed margins, usually are pubescent and they drop in late autumn. The fruit is a red glabrous fleshy round drupe that, on the plant from September to early December. No allergy has been reported for this species. Usage of Plant: it attracts butterflies.

V. lantana – Wayfaring-Tree - Native to Central, Southern and Western Europe (S-Europ-Pontic), Northwest Africa, and Southwestern Asia. The fruit is an oblong drupe 8 mm (0.31 in) long, green at first, turning red, then finally black at full

maturity, and contains a single seed. It is spontaneous in the deciduous wood (with *Quercus pubescens* expecially) from 0 to 1000 m.a.s.l. (meters above sea level). No allergy has been reported for Wayfaring-Tree species. Usage of Plant: used as a colored dye; it attracts butterflies. In the phytotherapeutic use, the V lantana bud extract is an effective natural remedy for the treatment of allergic asthma.

V. lentago - nannyberry, sheepberry, or sweet viburnum - This species is native to North America north of Mexico. Flowering is in late spring. The fruit is a small round blue-black drupe. No allergy has been reported for Nanny-Berry species. Usage of Plant: it attracts butterflies.

V. opulus (sin. *V. trilobum*)– Highbush-Cranberry, European cranberrybush or guelder-rose, Eurasiat-temperata. This species includes one or more native variety (or subspecies) to North America AND one or more introduced variety (or subspecies). The leaf buds are green, with valvate bud scales. Glabrous and shiny stems. The hermaphrodite flowers are white, produced in corymbs. The fruit is a globose bright red drupe containing a single seed. The seeds are dispersed by birds. **Highbush-Cranberry (Viburnum opulus) is a mild allergen** Pharmacological usage of the plant: used in medicine or pharmacological research to treat aliments such as cough, colds, tuberculosis, rheumatic aches, ulcers, stomach, and kidney problems, among others (Kajszczak D, 2020) and for Vitamin C (Rop O, 2010); The fruit is edible in small quantities, with a very acidic taste. Butterfly Plant: A plant that is known to attract butterflies.

V. plicatum – Japanese snowball bush. The Latin specific epithet *plicatum* means “pleated”, referring to the texture of the leaves on the surface. It is native to mainland China, Korea, Japan, and Taiwan. Some of the more popular cultivars are selected for having all of their flowers large and sterile with few or no fertile flowers. No allergy has been reported for this species. The fruit is an ovoid blue- black drupe 8–10 mm long.

V. rhytidophyllum - leatherleaf viburnum. Native to Asia. The plant is an evergreen shrub or small tree with a suckering habit. The leaf stems are fuzzy brown. In spring, fragrant creamy-white flowers bloom in clusters. Blue berries form in June and become glossy black through September. There aren’t allergens in pollen, but the hypersensitivity is evident (Dambra P, 2000).

V. rufidulum - Rusty Blackhaw - This species is native to North America and to North Mexico. The drupes are purple or dark blue, glaucous, globose or ellipsoid and they mature in mid to late summer. The edible fruit has been said to taste like raisins and attracts birds. No allergy has been reported for Rusty Blackhaw species. Usage of Plant: it attracts butterflies.

V. tinus – laurustinus, laurustine or laurestine; native to the Mediterranean area of Europe (Steno-Medit) and North Africa. It is most commonly found in the western Mediterranean due to a shorter drought season and is one of the dominant species of Mediterranean sclerophyllous shrubland. It has also been introduced to Australia, Pakistan, California, Oregon and Tajikistan. It is evergreen, with glabrous stems, the fruit is a dark blue-black drupe. Use of the Plant: *V. tinus* has been used for its traditional medicinal properties for the viburnin and tannis. The leaves when infused have antipyretic proprieties, but tannis can cause upset stomach.

Conclusion

Some species in the genus *Viburnum* most used in floriculture and forestry have been here considered with their allergenic potential. The literature shows that some species can give contact hypersensitivity for the trichomes on the stem, and *V. opulus* determined some pollen allergy.

Tables

Table 1. *Viburnum*, some species most used in floriculture and forestry and their allergenic potential

Scientific name	Common name	flowers	Flowering period	Allergenicity - OPALS	Allergenicity Carinanos 2021	Allergenicity - https://www.pollenlibrary.com/	Sensitivity
Viburnum plicatum	Japanese snowball bush	few fertile (external) or no fertile		low	-	No allergy	Hypersensitivity by contact
Vibunrum lantana	Wayfaring-Tree	all fertile	Spring to Summer.	low	-	No allergy	-
Viburnum opulus (=V trilobum)	Highbush-Cranberry	few fertile (external) or no fertile	Spring to Summer.	low	-	Mild allergen: pollenlibrary	Hypersensitivity by contact
Viburnum tinus	laurustinus, laurestine	all fertile	Spring to Summer.	low	Low VPA=1	No allergy	Hypersensitivity by contact
Viburnum rhytidophyllum		all fertile	Spring to Summer.	low	-	No allergy	Hypersensitivity by contact
Viburnum dilatatum	Linden Arrow-Wood	all fertile	Spring to Summer.	low	-	No allergy	-
Viburnum lentago	Nanny-Berry	all fertile	Spring to Summer.	low	-	No allergy	-
Viburnum rufidulum	Rusty Blackhaw	all fertile	Winter to Summer.	low	-	No allergy	-

Conflict of interest

There are not any economic interest and any conflict of interest

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Links

- https://www.pollenlibrary.com/Specie/Viburnum+rufidulum/
- http://allergen.org/