

Short Communication

Allergy to pollen of urban cultivated plants

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Abstract

Pollens of many plants located in public or private gardens may cause pollinosis in predisposed individuals. There is evidence that the prevalence of sensitization to “new” tree pollens (Betulaceae, Corylaceae, Cupressaceae, Taxodiaceae, and other families) is increasing in the recent years in Italy. Allergenic plants are often imported from foreign countries, therefore low-allergenic species must be recognized in order to prevent new pollen sensitizations. In this study we suggest a list of recommended and not-recommended plants for public and private green.

1. Introduction

In the last decades, the prevalence of pollen-related allergies, asthma and rhinitis, has increased worldwide. Several causes of this phenomenon have been suggested, such as air pollution, infections and other environmental factors. Without doubt, the amount of allergens, and possibly their allergenicity, has increased and therefore the number of allergic reactions may also be enhanced. Allergic symptoms are related to the composition, timing and abundance of airborne allergenic material, together with other environmental and genetic risk factors. A definition of the concept of “allergenic plant” is hard to frame. Most allergenic plants are anemophilous and disperse pollens by air currents. However, in small groups of people under local conditions zoophilous plants, which pollens are transported by animals, (more commonly insects), may be responsible for pollinosis symptoms.

2. Materials and methods

The allergenic identified species and their families (Ciampolini and Cresti, 1981; De Leonardi et al., 1985–87; Feliziani, 1986; Mandrioli and Puppi, 1978; Poldini, 1991), were named according to Pignatti (1982) and Hooker et al. (1843) and Nicholson (1899).

Criteria for not allergenic plants selection was:

1. Entomophilous or zoophilous plants
2. No evidence of specific sensitization as reported in the literature, or only anecdotal case-reports about few cases of allergy.

3. Results

Not-allergenic plants may be both autochthonal and allochthonal. Some exotic plants are also recommended in order to avoid sensitization. The adaptation of foreign plants to new climate conditions and environment is not easily predictable. In particular local condition, in which high pollen concentration can be reached, the possibility of sensitization in small groups of peoples must be kept in mind. Table 1 and Table 2 summarize

Table 1. Not-recommended plants

FAMILY	GENUS	SPECIES	Flowering period
Aceraceae	<i>Acer</i>	<i>campestre</i> L.	4–5
	<i>Acer</i>	<i>monspessulanum</i> L.	4
	<i>Acer</i>	<i>negundo</i> L.	4–5
	<i>Acer</i>	<i>pseudoplatanus</i> L.	4–5
Aquifoliaceae	<i>Ilex</i>	<i>aquifolium</i> L.	4–5
Betulaceae	<i>Alnus</i>	<i>cordata</i> (Loisel.) Desf.	3–4
	<i>Alnus</i>	<i>glutinosa</i> (L.) Gaertner	3–4
	<i>Alnus</i>	<i>incana</i> L. Moench	3–5
	<i>Alnus</i>	<i>viridis</i> (Chaix) DC	5–6
	<i>Betula</i>	<i>pendula</i> Roth	4–5
	<i>Betula</i>	<i>pubescens</i> Ehrh.	4–5
Bignoniaceae	<i>Catalpa</i>	<i>bignonioides</i> Walt.	5–6
Casuarinaceae	<i>Casuarina</i>	<i>equisetifolia</i> L.	10
Corylaceae	<i>Carpinus</i>	<i>betulus</i> L.	5–6
	<i>Carpinus</i>	<i>orientalis</i> Miller	4–5
	<i>Castanea</i>	<i>sativa</i> Miller	5
	<i>Corylus</i>	<i>avellana</i> L.	3–4
	<i>Ostrya</i>	<i>carpinifolia</i> Scop.	4–5
Cupressaceae	<i>Chamaecyparis</i>	<i>lawsoniana</i> L.	4–5
	<i>Cupressus</i>	<i>arizonica</i> Green	2–5
	<i>Cupressus</i>	<i>sempervirens</i> L.	2–5
	<i>Juniperus</i>	<i>communis</i> L.	2–4
	<i>Juniperus</i>	<i>nana</i> Willd.	5–7
	<i>Juniperus</i>	<i>oxycedrus</i> L.	2–4
	<i>Juniperus</i>	<i>phoenicea</i> L.	3–4
	<i>Juniperus</i>	<i>sabina</i> L.	4–6
	<i>Juniperus</i>	<i>virginiana</i> L.	4–6
	<i>Thuja</i>	<i>occidentalis</i> L.	3–4
Fagaceae	<i>Thuja</i>	<i>orientalis</i> L.	3–4
	<i>Fagus</i>	<i>sylvatica</i> L.	5
	<i>Quercus</i>	<i>cerris</i> L.	4–5
	<i>Quercus</i>	<i>coccifera</i> L.	4–5
	<i>Quercus</i>	<i>frainetto</i> Ten.	4
	<i>Quercus</i>	<i>ilex</i> L.	4–6
	<i>Quercus</i>	<i>petraea</i> (Mttuschka) Liebl.	4–5
	<i>Quercus</i>	<i>pubescens</i> Willd.	4–5
	<i>Quercus</i>	<i>robur</i> L.	4–5
	<i>Quercus</i>	<i>suber</i> L.	4–5
Hippocastanaceae	<i>Aesculus</i>	<i>hippocastanum</i> L.	4–5
Juglandaceae	<i>Juglans</i>	<i>regia</i> L.	4–5
Lauraceae	<i>Laurus</i>	<i>nobilis</i> L.	3–4
Leguminosae	<i>Acacia</i>	<i>cyanophylla</i> Lindley	3
	<i>Acacia</i>	<i>dealbata</i> Link.	2–3
	<i>Acacia</i>	<i>retinoides</i> Schlecht.	3
	<i>Albizzia</i>	<i>julibrissin</i> Durazzo	6–8
	<i>Robinia</i>	<i>pseudoacacia</i> L.	5–6
Moraceae	<i>Morus</i>	<i>alba</i> L.	4–5
Myrtaceae	<i>Eucalyptus</i>	<i>globulus</i> Labill.	11–6

Table 1. Continued

FAMILY	GENUS	SPECIES	Flowering period
Oleaceae	<i>Fraxinus</i>	<i>excelsior</i> L.	3–4
	<i>Fraxinus</i>	<i>ornus</i> L.	4–5
	<i>Fraxinus</i>	<i>oxycarpa</i> Bieb.	11–1
	<i>Ligustrum</i>	<i>lucidum</i> Ait.	7–8
	<i>Ligustrum</i>	<i>vulgare</i> L.	4–5
	<i>Olea</i>	<i>europaea</i> L.	4–5
	<i>Phyllirea</i>	<i>angustifolia</i> L.	3–5
	<i>Phyllirea</i>	<i>latifolia</i> L.	3–6
	<i>Syringa</i>	<i>vulgaris</i> L.	4–5
Palmae	<i>Chamaerops</i>	<i>humilis</i> L.	5–6
	<i>Phoenix</i>	<i>canariensis</i> Chab.	7–8
	<i>Phoenix</i>	<i>dactylifera</i> Miller	3–5
Pinaceae	<i>Cedrus</i>	<i>atlantica</i> (Endl.) Carrière	2–5
	<i>Cedrus</i>	<i>deodara</i> (D.Don) G.Don	2–11
	<i>Cedrus</i>	<i>libani</i> A.Richard	7–11
	<i>Picea</i>	<i>excelsa</i> (Lam.) Link	4–5
	<i>Pinus</i>	<i>brutia</i> Ten.	3–5
	<i>Pinus</i>	<i>nigra</i> Arnold	5–7
	<i>Pinus</i>	<i>pinea</i> L.	4–5
	<i>Pinus</i>	<i>strobus</i> L.	5–7
Platanaceae	<i>Platanus</i>	<i>hybrida</i> Brot.	4–6
Salicaceae	<i>Populus</i>	<i>alba</i> L.	2–3
	<i>Populus</i>	<i>canadensis</i> L.	3–4
	<i>Populus</i>	<i>nigra</i> L.	3–4
	<i>Salix</i>	<i>alba</i> L.	2–4
	<i>Salix</i>	<i>babylonica</i> L.	4–5
Simaroubaceae	<i>Ailanthus</i>	<i>altissima</i> (Miller) Swingle	6–7
Taxaceae	<i>Taxus</i>	<i>baccata</i> L.	4–5
Taxodiaceae	<i>Cryptomeria</i>	<i>japonica</i> (L.fil.) Don	3–4
Tiliaceae	<i>Tilia</i>	<i>americana</i> L.	6–7
Ulmaceae	<i>Celtis</i>	<i>australis</i> L.	4–5
	<i>Ulmus</i>	<i>minor</i> Miller	2–3

the list of not recommended and recommended plants with their flowering period, in Italy.

4. Conclusions

Many of the plants cultivated in urban areas turn out to be responsible – alone or in association with other plants or other allergens (acaruses, animal by-products, mycetes, foods, etc.) – for pollinosis or mixed allergies and their importance in this field seems to be constantly increasing. It certainly does not seem logical to eliminate, strong and well-settled trees located in city areas, it would be desirable and important

instead that the town councillorships in charge of public parks and garden, farmers, breeders, gardeners, always keep in mind also these characteristics (other than shape, colour of foliage, morphology of leaves, flowers, fruits, etc.) of the species they plant, in order to avoid a problem that causes suffering to many people, and the loss of many working hours.

The most important species which should be avoided now are mostly those causing sensitizations, indicated as springtime allergies (*Acacia* sp. pl., *Alnus* sp. pl., *Carpinus* sp. pl., *Corylus avellana*, *Cryptomeria japonica*, *Cupressus* and *Fraxinus* sp. pl.), on the other hand, other species should not be overlooked. It is still unknown why a species, considered for a

Table 2. Recommended plants

FAMILY	GENUS	SPECIES	Flowering period
Berberidaceae	<i>Berberis</i>	<i>julianae</i> C.K. Schneider	5
	<i>Mahonia</i>	<i>acquistifolium</i> (Pursh) Nutt.	4–5
Bignoniaceae	<i>Tecoma</i>	<i>radicans</i> (L.) Juss.	6–9
Calycanthaceae	<i>Chimonanthus</i>	<i>praecox</i> (L.) Link	12–2
Caprifoliaceae	<i>Viburnum</i>	<i>opulus</i> L.	5–6
	<i>Viburnum</i>	<i>rhytidophyllum</i> Hemsl. Ex Forb & Hemsl.	5
	<i>Viburnum</i>	<i>tinus</i> L.	5
Cornaceae	<i>Cornus</i>	<i>mas</i> L.	2–4
	<i>Cornus</i>	<i>sanguinea</i> L.	5–6
Ebenaceae	<i>Diospyros</i>	<i>kaki</i> L. fil.	5–7
Ginkgoaceae	<i>Ginkgo</i>	<i>biloba</i> L.	7–8
Labiatae	<i>Lavandula</i>	<i>angustifolia</i> Miller	7–9
	<i>Rosmarinus</i>	<i>officinalis</i> L.	4–8
Leguminosae	<i>Caratonia</i>	<i>siliqua</i> L.	9–11
	<i>Cercis</i>	<i>siliquastrum</i> L.	3–4
	<i>Gleditsia</i>	<i>triacanthos</i> L.	5
	<i>Sophora</i>	<i>japonica</i> L.	6–7
Lythraceae	<i>Lagerstroemia</i>	<i>indica</i> L.	7–9
Magnoliaceae	<i>Liriodendron</i>	<i>tulipifera</i> L.	4–5
	<i>Magnolia</i>	<i>grandiflora</i> L.	5–6
	<i>Magnolia</i>	<i>soulangiana</i> Hort (ex Thieb.)	5–7
	<i>Magnolia</i>	<i>stellata</i> Maxim	4
Malvaceae	<i>Hibiscus</i>	<i>syriacus</i> L.	6–8
Moraceae	<i>Ficus</i>	<i>carica</i> L.	11–9
	<i>Maclura</i>	<i>pomifera</i> (Rafin.) C.K. Schneider	5–6
Musaceae	<i>Musa</i>	<i>basjoo</i> Siebold	
Oleaceae	<i>Forsythia</i>	<i>viridissima</i> Lindl.	3–4
Palmae	<i>Trachycarpus</i>	<i>fortunei</i> (Hooker) Wendel.	3–4
Punicaceae	<i>Punica</i>	<i>granatum</i> L.	4–5
Rosaceae	<i>Crataegus</i>	<i>monogyna</i> Jacq	4–5
	<i>Eryobrotrya</i>	<i>japonica</i> (Thunb.) Lindley	10–11
	<i>Malus</i>	<i>domestica</i> Borkh.	4–5
	<i>Mespilus</i>	<i>germanica</i> L.	4–6
	<i>Prunus</i>	<i>laurocerasus</i> L.	4–5
	<i>Pyrus</i>	<i>communis</i> L.	4–5
	<i>Spiraea</i>	<i>vanhutteii</i> Zabel	5
Scrophulariaceae	<i>Paulownia</i>	<i>tomentosa</i> (Sprengel) Steudel	5–6
Tamaricaceae	<i>Tamarix</i>	<i>gallica</i> L.	4–6

long time of low allergenicity can suddenly increase its importance (as it happened, for example, with *Corylus avellana*).

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