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Mediterranean flora in some botanic gardens and parks in Portugal

Abstract

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In Portugal there are several remarkable botanic gardens and parks. The aim of this communication is to present some of the taxonomic studies done by the authors in "Jardim-Museu Agrícola Tropical" (Tropical Agricultural Museum-Garden), "Tapada da Ajuda" (Royal Park of Ajuda), "Parque da Pena" (Pena Park) and "Estufa Fria de Lisboa" (Cold Greenhouse of Lisbon). These spaces are located in Lisbon, except the Pena Park that is located in Sintra, near Lisbon. All these places have historical value. Plant collections of Mediterranean Region are kept in the above mentioned spaces. Species and the infraspecific taxa are indicated, as well their wild, some of their uses and their location in the mentioned areas. These Botanic Gardens and Parks are privileged spaces for the preservation of biodiversity *ex situ* and *in situ*. The potentiality to conserve species from several regions of the world, namely from the Mediterranean Region, makes these green spaces very important for research, as well as for didactic and educational programmes.

Introduction

In Portugal there are several botanic gardens and parks. This paper only concerns some Mediterranean species which grow in: "Jardim-Museu Agrícola Tropical", "Tapada da Ajuda" and "Estufa Fria de Lisboa", these in Lisbon, and "Parque da Pena", in Sintra. All these spaces have historical value, and several research projects, including the phytotaxonomic study of the above mentioned green areas, have been developed by the authors (Caixinhas 1994; Liberato 1994; Liberato & al. 1999; Lousã & Vasconcelos 1998).

The "Jardim-Museu Agrícola Tropical", founded in 1906, is integrated in the monumental Belém area, near Jerónimos monastery; since 1912. It includes a botanic garden of about 5 ha, with a botanic park and greenhouses. It has been promoting the introduction of economic and exotic plants. Presently, it keeps about 430 species (Almeida J. de 1924; Instituto de Investigação Científica Tropical 1983).

The botanical park of "Tapada da Ajuda" covers about 80 ha. It belongs to Instituto Superior de Agronomia since 1918. In this area about 600 taxa of perennial species are currently being grown. The wild flora of Lisbon is well represented in the "Reserva Botânica Natural D. António Pereira Coutinho" (Coutinho 1956).

The "Estufa Fria de Lisboa" was opened to the public in 1933 and consists nowadays of more than one ha, protected by a fence, with 250 taxa from several origins. It is considered to be a living museum of exotic flora (Caixinhas 1994).

The “Parque da Pena” has a total 210 ha. However, the current study has covered only 85 ha, where about 500 perennial species are grown (Franco & al. 1996). According to the criteria established at the Convention Concerning the Protection of the World-Wide Cultural and Natural Patrimony, the park was one of the fundamental values to Sintra to be classified by UNESCO as World-Wide Patrimony at 1995.

The goal of this work concerns the presentation of the Mediterranean species growing in these man-made ecosystems in order to facilitate conservation of urban biodiversity.

Materials and methods

The species growing in the green areas: “Jardim-Museu Agrícola Tropical” (JMAT), “Tapada da Ajuda” (TA), “Estufa Fria de Lisboa” (EFL) and “Parque da Pena” (PP) were identified following Bailey (1975), Franco (1971-1984), Huxley & al. (1992) and Tutin & al. (1964-1980) and compared with verified herbarium specimens. Their wild origin, some uses and IUCN threat categories to the conservation status in the wild were also searched (Walter & Gillett 1998).

Results

Taxa, IUCN threat categories referring to their conservation status in wild, their origin, some uses, and the distribution in the studied green areas are presented on Table 1. The presentation order of classes (*Pteridopsida*, *Pinopsida*, *Magnoliopsida* and *Liliopsida*) follows Kubitzki (1990-1998) with few small exceptions. Families, species and infraspecific taxa are listed alphabetically.

Conclusions

We can reach the following conclusions:

- The overall number of taxa growing in the green areas studied includes 105 species, of which 3 are *Pteridopsida*, 13 *Pinopsida*, 62 *Magnoliopsida* and 27 *Liliopsida*.
- Among the studied taxa *Abies pinsapo* and *Tetraclinis articulata* have the status of Rare, *Picea omorika* that of Vulnerable and *Narcissus calcicola* the status of Indeterminate, according to the IUCN Red List Categories.
- Among the studied taxa *Antirrhinum majus* subsp. *linkianum*, *Narcissus calcicola* and *Prunus spinosa* subsp. *insititoides* are endemic to Portugal.
- The studied taxa provide a wide range of uses: timber, cork, resins, tanning, pulpwood, food, aromatics, edible fruits, liqueurs, essential oils, medicinals, cosmetics, acorns, fodders, forage, fuelwood, street trees, hedges, ornamentals, thatching and baskets.
- The presented botanic gardens and parks are privileged spaces for the preservation of biodiversity *ex situ* and *in situ*. They are very important for research, as well as for didactic and educational programmes.

Table 1. Species of the Mediterranean Region in some green areas

TAXA	IUCN CAT.	ORIGIN	USE	GREEN AREAS
PTERIDOPSIDA				
Aspleniaceae				
<i>Asplenium ceterach</i> L.		W Mediterranean	ornamental	PP
<i>Asplenium hemionitis</i> L.		SW Europe, N Africa & Atlantic Is.	ornamental	PP
Blechnaceae				
<i>Woodwardia radicans</i> (L.) Sm.		S Europe to Creta, Atlantic Is.	ornamental	EFL,PP
PINOPSIDA				
Cupressaceae				
<i>Cupressus sempervirens</i> L.		Mediterranean & SW Asia	essential oil, ornamental, timber resin, timber	JMAT, TA
<i>Tetraclinis articulata</i> (Vahl) Mast.	R	Malta, Spain & N Africa		TA
Pinaceae				
<i>Abies cilicica</i> (Antoine & Kotschy) Carrière		S & NW Turkey, NW Syria, Lebanon	ornamental	PP
<i>Abies nordmanniana</i> (Steven) Spach		Caucasus & NE Turkey	ornamental	PP
<i>Abies pinsapo</i> Boiss.	R	S Spain	ornamental	PP
<i>Cedrus atlantica</i> (Endl.) Carrière		Morocco & Algeria	ornamental	JMAT, TA, PP
<i>Picea omorika</i> (Panèia) Purk.	V	Serbie, Bosnia & Herzegovina	ornamental, timber	PP
<i>Picea orientalis</i> (L.) Link		Turkey & Caucasus	ornamental, timber	PP
<i>Pinus halepensis</i> Mill.		Mediterranean	ornamental, timber	TA
<i>Pinus nigra</i> Arn.		S Europe & SW Asia	ornamental, timber	JMAT, TA
<i>Pinus pinaster</i> Aiton		Mediterranean	ornamental, timber	TA
<i>Pinus pinea</i> L.		Mediterranean	food, timber	TA,PP
Taxaceae				
<i>Taxus baccata</i> L.		Europe & N Africa	medicinal	JMAT,T A, EFL,PP
MAGNOLIOPSIDA				
Acanthaceae				
<i>Acanthus mollis</i> L.		Mediterranean	ornamental	JMAT,T A, EFL,PP
Anacardiaceae				
<i>Pistacia lentiscus</i> L.		Mediterranean except NE Africa	ornamental	TA
<i>Pistacia vera</i> L.		W Asia	edible nuts	JMAT

TAXA	IUCN CAT.	ORIGIN	USE	GREEN AREAS
Apocynaceae				
<i>Nerium oleander</i> L.		Mediterranean	ornamental	JMAT, T A, EFL, PP TA, PP
<i>Vinca difformis</i> Pourr.		SW Europe, Morocco & Algeria	ornamental	
<i>Vinca major</i> L.		Mediterranean & W Asia	ornamental	TA
Asteraceae				
<i>Cynara cardunculus</i> L.		Mediterranean	curdle milk, vegetable ornamental	TA
<i>Senecio cineraria</i> DC.		W & C Mediterranean	ornamental	TA
Betulaceae				
<i>Alnus glutinosa</i> (L.) Gaertn.		Europe to Caucasus, Siberia & N Africa	timber, tanning, medicinal	TA, PP
<i>Betula pendula</i> Roth		Europe to Asia Minor	ornamental	PP
<i>Carpinus betulus</i> Roth		Europe to W Asia	ornamental, hedges	PP
Buxaceae				
<i>Buxus sempervirens</i> L.		S Europe, W Asia & N Africa	ornamental, hedges, timber	JMAT, TA, EFL, PP
Caesalpiniaceae				
<i>Ceratonia siliqua</i> L.		Mediterranean, Arabia & Somalia	fodder, timber	TA
<i>Cercis siliquastrum</i> L.		E Mediterranean	ornamental	JMAT, T A, EFL
Caprifoliaceae				
<i>Viburnum tinus</i> L. subsp. <i>tinus</i>		Mediterranean	ornamental	JMAT, TA, EFL, PP
Ericaceae				
<i>Arbutus unedo</i> L.		Mediterranean & Ireland	tanning, timber, liqueurs	TA, PP
Fabaceae				
<i>Coronilla valentina</i> L. subsp. <i>glaucia</i> (L.) Batt.		Mediterranean	ornamental	JMAT, TA
<i>Hedysarum coronarium</i> L.		S Europe	forage	TA
<i>Retama monosperma</i> (L.) Boiss.		Mediterranean	ornamental	TA
<i>Retama sphaerocarpa</i> (L.) Boiss.		Mediterranean	forage, ornamental	TA
<i>Spartium junceum</i> L.		Mediterranean	ornamental	TA
Fagaceae				
<i>Castanea sativa</i> Mill.		Balkans to Iran	edible nuts, timber	JMAT, TA, PP
<i>Quercus cerris</i> L.		S Europe & W Asia	timber	TA, PP
<i>Quercus coccifera</i> L.		W Mediterranean, S Europe & NW Africa		TA, PP

TAXA	IUCN CAT.	ORIGIN	USE	GREEN AREAS
<i>Quercus faginea</i> Lam.		Spain & Portugal	ornamental	TA
<i>Quercus ilex</i> L.		Mediterranean	acorns, timber, fuelwood	TA
<i>Quercus rotundifolia</i> Lam.		Spain & Portugal	acorns, timber, fuelwood	TA
<i>Quercus pyrenaica</i> Willd.		SW Europe	tanning, ornamental	PP
<i>Quercus robur</i> L.		Europe, N Africa, W Asia	tanning, timber	TA, PP
<i>Quercus suber</i> L.		S Europe & N Africa	cork, acorns	TA, PP
Hippocastanaceae				
<i>Aesculus hippocastanum</i> L.		Balkan Peninsula	ornamental	TA, PP
Juglandaceae				
<i>Pterocarya fraxinifolia</i> (Lam.) Spach		Caucasus to Iran	street tree, ornamental	TA
Lamiaceae				
<i>Lavandula angustifolia</i> Mill.		Mediterranean	perfume	TA
<i>Lavandula dentata</i> L.		Spain & N Africa	medicinal	TA
<i>Rosmarinus officinalis</i> L.		Mediterranean	aromatic, medicin:	JMAT, TA, PP
<i>Teucrium fruticans</i> L.		W Mediterranean	medicinal	TA
Lauraceae				
<i>Laurus nobilis</i> L.		Mediterranean	culinary leaves	JMAT, TA EFL, PP
Moraceae				
<i>Ficus carica</i> L.		Mediterranean	fruit tree	JMAT, TA PP
Myrtaceae				
<i>Myrtus communis</i> L.		Mediterranean	aromatic	JMAT, TA PP
Oleaceae				
<i>Fraxinus angustifolia</i> Vahl		S Europe & N Africa	ornamental	JMAT, TA
<i>Fraxinus excelsior</i> L.		Europe to Caucasus	ornamental	PP
<i>Fraxinus ornus</i> L.		S Europe & Asia Minor	ornamental	PP
<i>Olea europaea</i> L.		Mediterranean	fruits, oil, timber	JMAT, TA PP
<i>Jasminum fruticans</i> L.		Mediterranean & W Asia	ornamental	TA
<i>Phillyrea angustifolia</i> L.		Mediterranean	ornamental	TA, PP
<i>Phillyrea latifolia</i> L.		Mediterranean	ornamental	JMAT, TA
Platanaceae				
<i>Platanus hispanica</i> Münchh.		Mediterranean	street tree	TA, PP
Rhamnaceae				
<i>Paliurus spina-christi</i> Mill.		Mediterranean	ornamental	TA
<i>Rhamnus alaternus</i> L.		Mediterranean	ornamental	TA, PP
<i>Rhamnus lycioides</i> L. subsp. <i>oleoides</i> (L.) Jahand. & Maire		Mediterranean	ornamental	TA
Rosaceae				
<i>Crataegus monogyna</i> Jacq.		Mediterranean	ornamental	TA

TAXA	IUCN CAT.	ORIGIN	USE	GREEN AREAS
<i>Prunus laurocerasus</i> L.		SE Europe to SW Asia	ornamental	JMAT, TA PP
<i>Prunus lusitanica</i> L. subsp. <i>lusitanica</i>		NW Mediterranean	timber, hedges	JMAT, EFI PP
<i>Prunus spinosa</i> L. subsp. <i>insitoides</i> (Fic. & Cout.) Franco		Portugal	liqueurs, ornamental	TA
<i>Pyracantha coccinea</i> M. Roem		Italy to Asia Minor	ornamental	TA
Salicaceae				
<i>Populus alba</i> L.		S, C, E Europe, N Africa to C Asia	timber, pulpwood	JMAT, TA, EFL
<i>Populus nigra</i> L.		C, E, W Europe & N Africa	timber, pulpwood	JMAT, TA, EFL
Scrophulariaceae				
<i>Antirrhinum braun-blanquetii</i> Rothm.		NW Spain & NE Portugal	ornamental	TA
<i>Antirrhinum majus</i> L. subsp. <i>linkianum</i> (Boiss. & Reut.) Rothm.		WC Portugal	ornamental	TA, PP
Tiliaceae				
<i>Tilia petiolaris</i> DC.		SE Europe to W Asia	ornamental	JMAT
Ulmaceae				
<i>Celtis australis</i> L		Mediterranean & Middle East	street tree	JMAT, TA
Urticaceae				
<i>Soleirolia soleirolii</i> (Reg.) Dandy		W Mediterranean Is. & Italy	ornamental	EFL, PP
LILIOPSIDA				
Alliaceae				
<i>Allium carinatum</i> L.		N Mediterranean	ornamental	TA
<i>Allium neapolitanum</i> Cirillo		Mediterranean	ornamental	TA
<i>Allium triquetrum</i> L.		W Mediterranean	ornamental	TA
Amaryllidaceae				
<i>Narcissus calcicola</i> Mendonça	R	Portugal	ornamental	TA
<i>Narcissus fernandesii</i> Pedro		Portugal	ornamental	TA
<i>Narcissus triandrus</i> (Salisb.) D.A. Webb subsp. <i>triandrus</i>		Portugal, Spain & NW France	ornamental	TA
Arecaceae				
<i>Chamaerops humilis</i> L.		Mediterranean	ornamental	TA
<i>Phoenix dactylifera</i> L.		N Africa	edible fruits, forage, thatching, baskets	JMAT, TA
Asparagaceae				
<i>Asparagus albus</i> L.		Mediterranean	ornamental	TA, PP
Iridaceae				
<i>Gynandriris sisyrinchium</i> (L.) Parl.		Mediterranean	ornamental	TA
<i>Iris albicans</i> Lange		N Africa, Iberian & Arabian Penins.	ornamental	TA

TAXA	IUCN CAT.	ORIGIN	USE .	GREEN AREAS
<i>Iris cretensis</i> Janka		Crete & Greece	ornamental	TA
<i>Iris foetidissima</i> L.		NE Spain, S France & Italy	ornamental	TA,PP
<i>Iris germanica</i> L.		E Mediterranean	ornamental	TA
<i>Iris lutescens</i> Lam.		W Mediterranean	ornamental	TA
<i>Iris pallida</i> Lam.		Slove., Croatia, Montenegro & Macedonia	ornamental	TA
<i>Iris reticulata</i> M. Bieb.		Caucasus, Iraq, Iran & Turquey	ornamental	TA
<i>Iris spuria</i> L. subsp. <i>halophila</i> (Pall.) Math. & Wendelbo		S Romania to E. Ukraine	ornamental	TA
<i>Iris spuria</i> L. subsp. <i>carthaliniae</i> Fomin.		Anatolia & E Mediterranean	ornamental	TA
<i>Iris suaveolens</i> Boiss. & Reut.		C & NE Balkan peninsula	ornamental	TA
<i>Iris unguicularis</i> Poiret		E Mediterranean & N Africa	ornamental	TA
<i>Iris xiphium</i> L. var. <i>lusitanica</i> Ker.		Portugal & Spain	ornamental	TA
<i>Iris xiphium</i> L. var. <i>taitii</i> Foster		Portugal & Spain	ornamental	TA
Hyacinthaceae				
<i>Hyacinthoides hispanica</i> (Mill. Rothm.		SW Europe & N Africa	ornamental	TA
<i>Scilla peruviana</i> L.		Mediterranean	medicinal, ornamental	JMAT,TA, PP
Ruscaceae				
<i>Ruscus hypophyllum</i> L.		S Spain, SE France & N Africa	ornamental	JMAT, TA EFL, PP

IUCN Red List Categories: R-Rare, V-Vulnerable, I-Indeterminated

References

- Almeida, J. de 1924: Jardim Colonial. — Pp. 401-402 in: Proença, R., Guia de Portugal. — Lisboa.
- Bailey, L. H. 1975: Manual of cultivated plants, ed. 15. — New York.
- Caixinhas, M. L. 1994: Flora da Estufa Fria de Lisboa. — Lisboa.
- Coutinho, M. P. 1956: A Tapada da Ajuda. Da tapada real a parque botânico. — Agros **19**: 137-144.
- Franco, J. A. 1971-1984: Nova flora de Portugal (Continente e Açores). — Lisboa.
- , Caixinhas, M. L., Monjardino, J. & Nascimento, C. 1996: Património botânico. — In: Andresen, T. & al., Plano de recuperação, gestão e reflorestação do Parque da Pena. Anexo A – Levantamento e diagnóstico. — Lisboa.
- Huxley, A., Griffiths, M. & Levy, M. 1992: The new royal horticultural society. Dictionary of gardening, **I-IV**. — London & Basingstoke.
- Instituto de Investigação Científica Tropical 1983: O Jardim-Museu Agrícola Tropical. — Pp. 181-193 in: Da Comissão de Cartografia (1883) ao Instituto de Investigação Científica Tropical (1983). 100 anos de história. — Lisboa.
- Kubitzki K. 1990-1998: The families and genera of vascular plants, **I-IV**. — Berlin, Heidelberg, New York.

- Liberato, M. C. 1994: Catálogo de plantas do Jardim-Museu Agrícola Tropical. — Lisboa.
- , Vasconcelos, T. & Caixinhas, M. L. 1999: The gymnosperms germplasm collections in some botanic gardens and parks in Lisbon. — Pp. 483-488 in: Andrews, Leslie & Alexander (eds), Taxonomy of cultivated plants: third international symposium. — Kew.
- Lousã, M. & Vasconcelos, T. 1998: The Tapada da Ajuda Botanic Park (Lisbon). — Pp. 79-80 in: V Simpósio da Associação Ibero-Macaronésica de Jardins Botânicos. — Funchal.
- Tutin, T. G., Heywood, V. H., Burges, N. A., Valentine, D. H., Walters, S. M., Moore, D. M. & Webb, D. A. 1964-1980: Flora Europaea, I-V. — Cambridge.
- Walter, K. & Gillett, H. 1998: 1997 IUCN red list of threatened plants. — Gland & Cambridge.

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