THE PTERIDOLOGICAL COLLECTIONS AT HANBURY BOTANIC GARDENS (LA MORTOLA): HISTORICAL RESEARCH AND A PLAN FOR RESTORATION OF THE FERNS AREA

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INTRODUCTION

In his garden at La Mortola Thomas Hanbury introduced many species of exotic ferns to experiment their acclimatization and their ornamental potential.

An historical research has been carried out on the catalogues of the plants cultivated in the garden; we obtained a list that enabled us to reconstruct, to a certain degree, the history and the dynamics of the original collection. The results of the research can help us to identify the species that could be successfully reintroduced in a project for the restoration of the Fern area.

MATERIALS AND METHODS

There are five catalogues of the plants cultivated in the garden: Cronemayer (1889) Dinter (1898), Berger (1912), Ercoli et Lorenzi (1938), Campodonico et al. (1996). The comparison of the catalogues required a nomenclatural check of plants names following NCU-3 Pteridophyta (Names in current use for extant plant genera).

RESULTS AND DISCUSSION

The historical research enabled us to compile a list of 98 taxa of Ferns (table 1); this number includes both species and infraspecific taxa, most of them native of tropical and subtropical regions.

The first catalogue of Cronemayer (1889) included 49 taxa, Dinter (1898) reported 33 taxa, Berger (1912) 29 species, Ercoli et Lorenzi (1938) 16 taxa; the most recent one (Campodonico et al., 1996) includes 48 taxa.

The comparison with the old catalogues shows that no taxa have been continuously recorded, while 10 appear in 4 catalogues and 11 taxa have been recorded in 3 catalogues; 51 taxa were recorded at least once in the complete list but not in the most recent catalogue.

Taxa	Family	Geographical distribution	1889	1897	1912	1938	1996
Adiantum aethiopicum L.	Adiantaceae	*Africa, Australia, New Zeland*					*
Adiantum capillus-veneris L.	Adiantaceae	*Europe, Asia, Africa, America*	*		*	*	*
Adiantum chilense Kaulf.	Adiantaceae	*Chile*	*				
Adiantum eriophorum ?	Adiantaceae		*				
Adiantum formosum R. Br.	Adiantaceae	*Queensland, New South Wales*	*				
Adiantum pyramidale (L.) Willd.	Adiantaceae	*W Indies*					*
Adiantum raddianum C. Presl	Adiantaceae	*Tropical America*			*		*
Adiantum tenerum Sw.	Adiantaceae	*Florida, W Indies, from Mexico to Peru*	*		*		*
Adiantum trapeziforme L.	Adiantaceae	*Tropical America, nat. Sri Lanka*					*
Cheilanthes distans (R.Br.) Mett.	Adiantaceae	*Australia, New Zealand*					*

Taxa	Family	Geographical distribution	1889	1897	1912	1938	1996
Cheilanthes sieberi Kunze	Adiantaceae	*Australia: Queensland, New South Wales, Victoria, Tasmania, Northern Territories*					*
Coniogramme fraxinea (D.Don) Diels	Adiantaceae	*India, Malaysia, Philippines, Taiwan*		*	*		
Gymnogramma massonii Loud.& Kze.	Adiantaceae		*				
Asplenium adiantum nigrum L.	Aspleniaceae	*W & C Europe*	*	*	*	*	
Asplenium bulbiferum G. Forst.	Aspleniaceae	*New Zealand, Australia, India, Mexico*			*	*	*
Asplenium cornutum ?	Aspleniaceae		*				
Asplenium dimorphum Kunze	Aspleniaceae	*Norfolk Is.*			*		
Asplenium flabellifolium Cav.	Aspleniaceae	*Australia, New Zealand*					*
Asplenium fontanum (L.) Bernh.	Aspleniaceae	*Europe, Morocco*		*			
Asplenium hemionitis L.	Aspleniaceae	*Spain, Portugal, Azores, Morocco, Algeria*					*
Asplenium lucidum G. Forst.	Aspleniaceae	*New Zealand, Norfolk Is., Lord Howe Is.*	*	*			
Asplenium marinum L.	Aspleniaceae	*Coasts W Europe, Algeria, Morocco*	*	*			
Asplenium nidus L.	Aspleniaceae	*Mauritius, India, E Africa etc.*	*				
Asplenium onopteris L.	Aspleniaceae	*W & S Europe etc.*					*
Asplenium petrarchae (Guérin) DC.	Aspleniaceae	*Portugal, Mediterranean Reg., Morocco*		*			
Asplenium ruta-muraria L.	Aspleniaceae	*Europe, Algeria, Morocco*		*		*	
Asplenium trichomanes L.	Aspleniaceae	*Europe*	*	*		*	*
Ceterach officinarum Willd. subsp. officinarum	Aspleniaceae	*W & C Europe, Mediterranean Reg., Caucasus, Middle East up to Himalaya*	*	*		*	*
Phyllitis scolopendrium (L.) Newman subsp. scolopendrium	Aspleniaceae	*Europe, Japan, N America*		*	*	*	*
Athyrium filix-femina (L.) Roth	Athyriaceae	*N temperate regions*					*
Cystopteris fragilis (L.) Bernh.	Athyriaceae	*E Asia, America, New Zealand, Northern hemisphere*		*	*	*	
Diplazium fraxinifolium C. Presl	Athyriaceae	*Himalaya, E India*	*	*			
Azolla caroliniana Willd.	Azollaceae	*America*	*		*	*	
Blechnum banksii (Hook. f.) Mett. ex Diels	Blechnaceae	*New Zealand*	*	*			
Blechnum brasiliense Desv.	Blechnaceae	*Brazil, Peru*			*		*
Blechnum chilense (Kaulf.) Mett.	Blechnaceae	*Mexico, Chile, Falkland*		*			
Blechnum discolor (G.Forst.) Keyserl.	Blechnaceae	*Australia, Tasmania, New Zealand*		*			
Blechnum fluviatile (R.Br.) E.J. Lowe ex Salomon	Blechnaceae	*Australia: New South Wales, Victoria, Tasmania, New Zealand, Guinea, Indonesia*					*
Blechnum gibbum (Labill.) Mett.	Blechnaceae	*New Caledonia, New Hebrides*					*
Blechnum nudum (Labill.) Mett. ex Luerss.	Blechnaceae	*Australia: Queensland, New South Wales, Victoria, Tasmania, South Australia*					*
Blechnum occidentale L.	Blechnaceae	*Tropical America*			*		
Blechnum valdiviense C.Chr.	Blechnaceae	*Chile*	*	*			
Doodia caudata (Cav.) R.Br.	Blechnaceae	*Australia*	*				
Lomaria auriculata = Blechnum ?	Blechnaceae		*				
Woodwardia orientalis Sw.	Blechnaceae	*Temperate areas of W Asia*					*
Woodwardia radicans (L.) Sm.	Blechnaceae	*Canary Is., Mediterranean Reg., India, China, Japan, C America*	*		*	*	
Woodwardia unigemmata (Makino) Nakai	Blechnaceae	*SW & W Asia*					*
Cyathea australis (R.Br.) Domin	Cyatheaceae	*Australia, Tasmania*			*		*
Cyathea dealbata (G. Forst.) Sw.	Cyatheaceae	*New Zealand, Lord Howe's Is.*	*	*			*
Cyathea princeps E.Mayer	Cyatheaceae	*S Mexico, Guatemala, Belize, El Salvador, Honduras*	*				*
Davallia canariensis (L.) Sm.	Davalliaceae	*Canary Is., Portugal, Morocco*			*	*	*
Microlepia platyphylla (D. Don) J.Sm.	Dennstaedtiaceae	*Sri Lanka, India*		*	*		
Dicksonia antarctica Labill.	Dicksoniaceae	*E Australia, New Zealand*	*	*	*		*
Cyrtomium falcatum (L.f.) C.Presl	Dryopteridaceae	*E Africa, India, China, Japan*	*		*	*	*
Cyrtomium fortunei J.Sm.	Dryopteridaceae	*Japan, Korea, China*					*
Dryopteris filix-mas (L.) Schott	Dryopteridaceae	*Northern hemisphere*					*
Dryopteris hirtipes (Bl.) Kuntze subsp. atrata (Kunze) Fraser-Jenk.	Dryopteridaceae	*China, India*	*				
Dryopteris sieboldii Kuntze	Dryopteridaceae	*China, Japan*	*	*			
Dryopteris villarii (Bellardi) Woyn. ex Schinz et Thell.	Dryopteridaceae	*Mountains of C Europe, Balkan Peninsula, NW Africa*					*
Polystichum aculeatum (L.) Roth	Dryopteridaceae	*Europe, Madeira, Greece, Russia etc.*		*	*	*	
Polystichum setiferum (Forssk.) T.Moore ex Woyn.	Dryopteridaceae	*W, C & S Europe, Mediterranean Reg., Asia to India and Sri Lanka*					*
Polystichum tsus-simense (Hook.) J.Sm.	Dryopteridaceae	*Japan, Korea, China, Taiwan*					*

Taxa	Family	Geographical distribution	1889	1897	1912	1938	1996
Equisetum ramosissimum Desf.	Equisetaceae	*Northern hemisphere*					*
Equisetum telmateja Ehrh.	Equisetaceae	*Northern hemisphere*					*
Equisetum arvense L.	Equisetaceae	*Northern hemisphere*					*
Pteridium aquilinum (L.) Kuhn.	Hypolepidaceae	*Cosmopolitan*	*	*	*		*
Angiopteris evecta (G.Forst.) Hoffm.	Marattiaceae	*India, Sri Lanka, Japan, Polynesia, Australia, Madagascar*					*
Marsilea macrocarpa C.Presl	Marsileaceae	*Southern Africa*					*
Marsilea quadrifolia L.	Marsileaceae	*S Europe, N America*	*				*
Nephrolepis cordifolia (L.) C.Presl	Nephrolepidaceae	*America trop., from India to Japan, Australia, New Zealand, Africa trop.*		*	*	*	*
Matteuccia struthiopteris (L.) Tod.	Onocleaceae	*Europe, Asia, E America*	*				
Onoclea sensibilis L.	Onocleaceae	*N America, E Asia*	*				
Ophioglossum lusitanicum L.	Ophioglossaceae	*Mediterranean Reg., Azores*		*			
Ophioglossum vulgatum L.	Ophioglossaceae	*Mediterranean Reg., Madeira, Iran, India, Japan*		*			
Osmunda regalis L.	Osmundaceae	*Sub Cosmopolitan*					*
Colysis pothifolia (Buch.-Ham. ex D. Don) C. Presl	Polypodiaceae	*Nepal, India, Philippines, China, Taiwan, Japan etc.*	*				
Pecluma paradiseae (Langsd. et Fisch.) M.G.Price	Polypodiaceae	*Tropical America*	*				
Platycerium alcicorne Desv.	Polypodiaceae	*Africa, Comoro Is., Madagascar, Mascarene Is.*	*				
Platycerium bifurcatum (Cav.) C.Chr. subsp. bifurcatum	Polypodiaceae	*Australia, New Guinea*	*	*		*	*
Platycerium bifurcatum (Cav.) C.Chr. subsp. willinckii (T.Moore) Hennipman & M.C.Roos	Polypodiaceae	*Java, Lesser Sunda Is.*	*				
Platycerium hillii T.Moore	Polypodiaceae	*Queensland*	*				
Platycerium superbum de Jonch. et Hennipman	Polypodiaceae	*Queensland, New South Wales, Malay Peninsula*	*				
Polypodium cambricum L.	Polypodiaceae	*S & W Europe*			*	*	*
Onychium japonicum (Thunb.) Kunze	Pteridaceae	*Japan, Taiwan, China, India, Malaysia etc.*	*				
Pteris cretica L.	Pteridaceae	*Crete, Greece, Abyssinia (Cosmopolitan)*	*	*	*		
Pteris cretica L. 'Albo-lineata'	Pteridaceae		*				*
Pteris incompleta Cav.	Pteridaceae	*Canary Is., Portugal, Morocco*			*		
Pteris multifida Poir.	Pteridaceae	*China, Japan, Indo-China*	*	*	*		
Pteris multifida Poir. var. cristata hort.	Pteridaceae		*				
Pteris tremula R. Br.	Pteridaceae	*Australia, Tasmania, New Zealand etc.*	*	*	*		
Pteris vittata L.	Pteridaceae	*Cosmopolitan*		*	*		*
Lygodium japonicum (Thunb.) Swartz	Schizaeaceae	*Japan, China*	*	*			
Selaginella denticulata (L.) Spring	Selaginellaceae	*Mediterranean Reg., Canary Is., Madeira*	*				
Cheilanthes maderensis Lowe	Sinopteridaceae	*Mediterranean Reg., Himalaya*		*			*
Notolaena marantae (L.) Desv.	Sinopteridaceae	*Madeira, Canary Is., Mediterranean Reg., S & C Europe, W & C Asia, Sudan, Abyssinia*	*				*
Thelypteris dentata (Forssk.) E.P.St.John	Thelypteridaceae	*S America, New Zealand*	*	*	*		
Thelypteris palustris Schott	Thelypteridaceae	*Europe, N America*	*				
Thelypteris patens (Sw.)Small	Thelypteridaceae	*C America, Japan, Polynesia*			*		

Table 1. List of Ferns of the Collections at Hanbury Botanical Gardens

Table 2 illustrates the geographical distribution of the taxa: 8 of them grow wild in the Garden, while 26 are spontaneous in Italy (Bernardello et Martini, 2004). The geographical distribution has been simplified in a few main areas.

Geographical areas	1889	1897	1912	1838	1996	tot
Australasia (including pacific islands)	10	7	5	2	12	21
Europe	3	6	3	5	5	9
E Asia	5	3	1		2	7
Nothern Emisphere	1	1	1	1	5	7
Tropical America	2	1	3		3	6
Mediterranean Region	1	3			2	5
S America	3	2	2	1		4

Mediterranean Region, Asia	2	2		1	2	4
Tropical Regions	2	1	3	2	2	4
Tropical Asia	1	2	2			3
Cosmopolitan	2	3	3		2	3
Eur N Am	2	1	1	2	2	3
Africa (Africa, Madagascar, Mascarene, Comoro)	1				1	2
C America	1				1	2
Asia	2	1			2	2
Canary			2	1	1	2
Sub Cosmopolitan	1		1	1	2	2
W Asia					2	2
America	1		1	1		1
N America, E Asia	1					1
Australia, Asia					1	1
Mediterranean Region, Asia, C America		1	1			1
Others	6				1	6
Total	41	33	28	17	47	92

Table 2. Geographical distribution of taxa simplified in a few main areas

In the long run there have been increases and losses; at the end of the Second World War the collection was practically ruined. In the course of the Nineties new species were introduced; the recovery took place with plants from the collection of the Botanical Garden of the University of Genoa (Binello, 1989-99). Plants had been grown in a shady position on a woodland slope of the garden, reproducing as nearly as possible the conditions in their natural habitats.

The plan of restoration of the Fern Area foresees landscaping of the slope with old logs on the ground to create a natural habitat; preparation of the soil improving the organic matter; plantation of new plants, obtained by exchanges with Botanical Gardens; a fogging system which will increase the atmospheric humidity (Fig. 1).

The Ferns Area

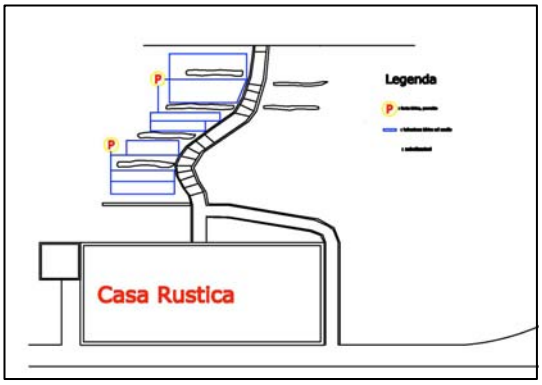

Fig.1 Plan of the irrigation system

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