

Regular Article

# The role of Botanic Gardens in the Conservation of Wild and Native Flora

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The present study highlights the role of botanic gardens in the conservation of wild and native floristic elements. It is observed that, there is a total of 33 species of plants belonging to 26 families and 28 genera. Out of 33 species, 19-species are conserved as *ex-situ* and 14-species by *in-situ* methods.

**Key Words:** Botanic gardens, Conservation, *Ex-situ*, *In-situ*, Wild and native flora

Plant diversity and its conservation assume greater importance when the world is facing unprecedented loss of biological diversity. The general role of botanic gardens in plant conservation has been widely accepted since 1970 's. The conservation of plant diversity is mainly by *in-situ* or *ex-situ* means. It prevents the loss of plant resources worldwide (Sara, 2009). The contributions of botanic gardens to conservation biology and global-change research need to be understood within the context of the traditional strengths of such gardens in herbarium collections, living collections and interactions with the public. There is an opportunity for botanic gardens to use their living collections more effectively in global-change research and for them to have a role in linking biodiversity conservation with benefits derived from ecosystem services (John & Sanbi, 2009).

Botanic gardens have become involved to a considerable degree in the conservation of plants *ex-situ/in-situ*, through the work of their staff in plant exploration and collection, scientific research and the

management of natural areas, frequently within or adjacent to the garden (Mohan Ram, 1982). Recently there has been a trend to combine these activities with their work on the *ex-situ* conservation of individual species through the development of species recovery programs. These may involve plant propagation, re-introduction, re-stocking and relocation projects or the restoration of destroyed or degraded habitats (Purseglove, 1958). The present study highlights the value of botanic gardens for the conservation of wild and native flora.

## Study area

### Government Botanic Garden, Udhagamandalam (Ooty)

The Government Botanic Garden, Udhagamandalam (Ooty) was established in 1847. The Gardens, divided into several sections, cover an area of around 22 hectares, and lie on the lower slopes of Doddabetta peak at 11°24'08.7" N and 76°44'12.2" E. The garden is maintained by the Tamil Nadu Horticulture Department. It ascends the slopes of the hill at an elevation of 2250–2500

meter above MSL. The garden enjoys a temperate climate, with an average rainfall of 140 cm, most of which is received during South-west monsoon, with frosty nights from

November to February. The maximum and minimum temperatures are 28°C and 0°C respectively (Fig.-1).



Fig.-1 View of Govt. Botanic Garden, Udhamandalam (Ooty)

### Methodology

The present investigation was undertaken with a view to list out the arborescent species which are conserved in the Government Botanic Garden, Udhamandalam (Ooty), Nilgiri District, Tamilnadu. During the study intensive and extensive field trips were made to cover different seasons. The plant specimens and photos are collected from different places and distribution of species in explored areas, initial checklist was prepared. All the important details including habit, family, distribution and their correct nomenclature were analyzed with the help of available Floras and Literature. The identified specimens were confirmed with the help of specimens deposited at Botanical Survey of India, Southern Circle, Coimbatore (MH). Finally these specimens are poisoned, pressed and mounted on herbarium sheets (Jain & Rao, 1977). The voucher specimens were placed in the Herbarium of Botany Department (BUH), Bharathiar University, Coimbatore-641 046, Tamil Nadu for future reference

### Results and Discussion

The present study highlights the importance

of botanic gardens in the conservation of floristic elements. It is observed that, there is a total of 33 species of plants belonging to 26 families and 28 genera. Among these 26 families, Lauraceae and Myrtaceae are the dominant ones with 3-species each, followed by Elaeocarpaceae, Euphorbiaceae and Meliosmaceae with 2-species each. Whereas, a total of 28 genera represented, *Syzygium* is the dominant genus with 3-species, followed by *Elaeocarpus*, *Litsea* and *Meliosma* with 2-species each. The life form analysis of these 33 species shows that, trees are more dominant (24-species) followed by shrubs (8-species) and climber (1-species).

Out of the 33 species, 19-species are conserved as *ex-situ* and 14-species by *in-situ* methods (Table 1). The garden was established in the natural habitat of Nilgiri district of Tamil Nadu. It also supports *in-situ* mode of conservation of wild and native plants which are found to grow in Nilgiris. The rare species like *Crotalaria barbata* Graham *ex* Wight & Arn. was conserved as *ex-situ*. While rare and vulnerable species like *Rhododendron arboreum* J. E. Smith var. *nilagirica* (Zenk.) Hook.f. and *Syzygium densiflorum* Wall. *ex* Wight & Arn. was conserved by *in-situ* methods. The species

such as *Cyathea nilgirensis* Holttum (Cyatheaceae), is the only representative from pteridophytes. A botanic garden is the most important form of *ex-situ* conservation, the most widely known function of botanic garden is to assemble and maintain a diversity of plant species in the open or in green houses for reference and study. They also facilitate research in diverse aspects of plant sciences.

### Conclusion

Now a day's most of our floristic elements are gradually depleted due to different anthropogenic activities such as habitat

destruction, afforestation programmes and lack of suitable management practices. In this context, the value of botanic gardens in conservation of wild and native flora is highly appreciated. More over such botanic gardens are also involved in active exploration of collecting plants and their identification, documentation of wild and native flora. It is realized that botanic gardens have an obvious and vital role to play in conserving plants and also to create general awareness among students, researchers and public.

Plate -1



A) *Crotalaria barbata* Graham ex Wight & Arn.



B) *Hypericum patulum* Thunb. ex Murray.



C) *Impatiens hensloviana* Arn.



D) *Litsea wightiana*(Nees) Hook.f.



Plate -2



E) *Mahonia leschenaultii* Takeda ex Gamble F) *Meliosma simplicifolia* (Roxb.) Walp. var. *pungens* (Wall. ex. Wight & Arn.) Beus.



G) *Strobilanthus lawsonii* Gamble H) *Cyathea nilgirensis* Holttum

**Table 1: List of plants, which are conserved in *ex-situ* or *in-situ* methods**

S.No	Botanical name	Family	Habit	Distribution	Method of conservation
1.	* <i>Crotalaria barbata</i> Graham ex Wight & Arn. (PI-1A)	Fabaceae	S	Southern Western Ghats	<i>Ex-situ</i>
2.	<i>Elaeocarpus tectorius</i> (Lour.) Poir	Elaeocarpaceae	T	Indo Malaysia	<i>Ex-situ</i>
3.	<i>Elaeocarpus tuberculatus</i> Roxb.	Elaeocarpaceae	T	Indo Malaysia	<i>In-situ</i>
4.	<i>Eurya nitida</i> Korth.	Theaceae	S	Indo Malaysia & China	<i>Ex-situ</i>
5.	<i>Fagraea ceylanica</i> Thunb.	Loganiaceae	T	Indo Malaysia	<i>In-situ</i>
6.	<i>Glochidion candolleianum</i> (Wight & Arn.) Chakrab. & M. Gangop.	Euphorbiaceae	T	India & Srilanka	<i>Ex-situ</i>
7.	<i>Hypericum patulum</i> Thunb. ex Murray. (PI-1B)	Hypericaceae	S	Nilgiris	<i>In-situ</i>
8.	<i>Ilex wightiana</i> Wall. ex Wight	Aquifoliaceae	T	Peninsular India & Srilanka	<i>Ex-situ</i>

9.	<i>Impatiens hensloviana</i> Arn. (PI.-1C)	Balsaminaceae	S	South India & Sri Lanka	<i>Ex-situ</i>
10.	<i>Ligustrum perrottetii</i> A. DC.	Oleaceae	T	Western Ghats	<i>Ex-situ</i>
11.	<i>Litsea ligustriana</i> (Nees) Hook. f.	Lauraceae	T	Southern Western Ghats	<i>Ex-situ</i>
12.	<i>Litsea wightiana</i> (Nees) Hook.f. (PI.-1D)	Lauraceae	T	Southern Western Ghats	<i>Ex-situ</i>
13.	<i>Lonicera leschenaultia</i> Wall.	Caprifoliaceae	C	Southern Western Ghats	<i>In-situ</i>
14.	<i>Mahonia leschenaultia</i> Takeda ex Gamble (PI.-2E)	Berberidaceae	S	Southern Western Ghats	<i>In-situ</i>
15.	<i>Meliosma pinnata</i> (Roxb.) Maxim	Meliosmaceae	T	Indo Malaysia & China	<i>Ex-situ</i>
16.	<i>Meliosma simplicifolia</i> (Roxb.) Walp. var. <i>pungens</i> (Wall. ex. Wight & Arn.) Beus. (PI.-2F)	Meliosmaceae	T	Indo Malaysia & China	<i>In-situ</i>
17.	<i>Michelia nilagirica</i> Zenker	Magnoliaceae	T	Western Ghats	<i>In-situ</i>
18.	<i>Myrsine wightiana</i> Wall. ex DC	Myrsinaceae	S	South India & Sri Lanka	<i>Ex-situ</i>
19.	<i>Nothopydytes nimmoninana</i> (Graham) Mabb.	Icacinaceae	T	Indo Malaysia & China	<i>In-situ</i>
20.	<i>Persea macrantha</i> (Nees.) Kostermans	Euphorbiaceae	T	Peninsular India & Sri Lanka	<i>Ex-situ</i>
21.	<i>Phoebe paniculata</i> Nees.	Lauraceae	T	India & Myanmar	<i>Ex-situ</i>
22.	* <i>Rhododendron arboreum</i> J. E. Smith var. <i>nilagirica</i> (Zenk.) Hook. f.	Ericaceae	T	South Western Ghats	<i>In-situ</i>
23.	<i>Salix tetrasperma</i> Roxb.	Salicaceae	T	Indo Malaysia & South China	<i>Ex-situ</i>
24.	<i>Strobilanthus lawsonii</i> Gamble (PI.-2G)	Acanthaceae	S	Southern Western Ghats	<i>Ex-situ</i>
25.	<i>Symplocos cochinchinensis</i> (Laur.) S. Moore ssp. <i>laurina</i> (Retz.) Nooteb.	Symplocaceae	S	Indo Malaysia & China	<i>Ex-situ</i>
26.	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	T	Indo Malaysia	<i>In-situ</i>
27.	# <i>Syzygium densiflorum</i> Wall. ex Wight & Arn.	Myrtaceae	T	Southern western Ghats	<i>In-situ</i>
28.	<i>Syzygium tamilnadensis</i> Rathkr. & Chithra	Myrtaceae	T	Southern Western Ghats	<i>Ex-situ</i>
29.	<i>Ternstroemia gymnanthera</i> (Wight & Arn.) Bedd.	Ternstroemiaceae	T	South East Asia & China	<i>In-situ</i>
30.	<i>Toona ciliata</i> M. Roem.	Meliaceae	T	Indo Myanmar	<i>Ex-situ</i>
31.	<i>Turpinia cochinchinensis</i> (Lour.) Merr.	Staphyleaceae	T	Indo Malaysia & China	<i>Ex-situ</i>
32.	<i>Vaccinium leschenaultia</i> Wight	Vacciniaceae	T	Southern Western Ghats	<i>In-situ</i>
33.	<i>Cyathea nilgirensis</i> Holtum (PI.-2H)	Cyatheaceae	T	South India	<i>In-situ</i>

\*Rare (Nayar, 1997); # Vulnerable (IUCN, 2004).

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