Preliminary Investigation of Some Plants of Ornamental Value from Wild Flora of Shimla

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Around 90 plants of various ornamental utility *viz.* annuals, herbaceous perennials, climbers, shrubs trees, hedges, foliage and bulbous plants, etc. were shortlisted apart from those suited to rock garden and dry flower arrangements. The category ' herbaceous perennial' had a maximum number of plants followed by shrubs. Plants such as *Delphinium denudatum* wall., *Spermadictyon suaveolens* Roxb., *Reinwardtia indica* Dumort., *Caryopteris wallichiana* Schuer and *Buddleia paniculata* Wall., seemed to suit to the requirement of cut flower. Most of the weedy grasses can find a place in dry flower arrangements. It became visible that almost all kinds of ornamentals are available over different seasons from these native wild plants. Emphasis can be given for those plants flowering all the year round, during lean season and over longer period. Problems related to their domestication and the ways to proceed further have also been discussed.

Key words: Domestication, Ornamentals, Wild plants

Recently, there has developed a wide interest on the part of many people to grow plants as hobby, or decoration and livability in homes are under priority for cultivation as well as decoration. In due course of time, many of them got naturalized and some become notorious weeds. When we look back to history, it was only through discovering, utilizing and altering the native biotic resources, the locally adapted distinct human races developed. Hence it has been felt that promoting the inclusion of native wild plants of diverse ornamental uses might pave way for diversification of floriculture in light of following points.

1. Since man is curious and generally likes to find things new, any unusual plants suiting to his merit will soon be popularized.
2. Since native plants are well established in their localities on account of their tolerance to biotic and abiotic stresses, their use may reduce the cost incurred.
3. Many potential native plants are in the danger of extinction due to urbanization, climate change, and invasion of alien flora before being utilized by human beings. Keeping in mind the above points, a preliminary investigation on the wild plants with an ornamental look was made in and around Shimla.

Materials and Methods

Areas ling within the radius of 15 km from the heart of the Shimla city were taken into consideration. The surveyed areas ranged from altitude above men sea level of 1750m (from southern, northern and western parts) to 2450m (eastern parts) representing typical temperate climate. Trips were made during different seasons for two consecutive years (March 2003 to 2005). Wild plants which are already popular among gardeners (domestic and foreign) are conifers, *Rhododendron arboreum*, *Hedera helix*, etc; those with other better uses and naturalized exotic flora were not considered for study. Herbarium specimens of appealing plants were made along with the notes on their distribution, flowering time, flower colour, habitat, aggressiveness, their present use, etc. Since both art and science are involved in the selection of plants, hence expert opinion was also made.

Results and Discussion

The chosen plants are listed in respective categories based on their nature and utility in landscape (Table 1 & 2)

Annuals

Their flowers lasted for at least a month. Rainy season herbs (*Impatiens*) in temperate hills were found to be gregarious in nature. These plants can well be accommodated in flowerbeds (*Impatiens, Cynoglossum),* rock garden (*Silene, Impatiens),* herbaceous border, hanging baskets, pot culture (*Chirita),* etc.

Herbaceous perennials

More number of the selected plants belongs to this category. Extreme cold during winter might have favoured these perennials to survive with subterranean root system. They are hardier that annuals but can be used in more or less similar fashion. Apart from that, some plants had potential as groundcover (*Thymus, Ajuga*) and for foliage as well as floral values

Table 1. List of wild plants as annual, herbaceous perennials, climber, shrubs and trees from Shimla

S.No.	Plant species	Flowering season	Flower colour	Remarks
A.	**Annuals**			
1.	*Delphinium denudatum* Wall.	April-June	Blue	Bee pasturage, needs moist locality
2.	*Silene conoidea* L.	April-May	Pink	Very attractive, insect trapper
3.	*Impatiens sulcata* Wall.	July-Sept.	Pink	Rainy season weed; suit to plant around big trees
4.	*I. scabrida* DC.	May-Sept.	Yellow	-do-
5.	*Senecio nudicaulis* Buch.-Ham.	May-June	Yellow	Weedy
6.	*Cynoglossum furcatum* Wall.	June-Sept.	Pale blue or white	Suited to flower garden
7.	*Chirita biflora* Don	July-Sept.	Blue	Plant with curious basal leaf and slender stem; needs moist and shade
8.	*Aneilema divergens* C.B. Clarke	July-Aug.	Red-blue	Rainy season succulent plant
B.	**Herbaceous Perennials**			
1.	*Anemone vitifolia* Buch.-Ham	June-Sept	White	Tuber bearing; needs shade
2.	*Ranunculus laetus* Wall.	May-Sept.	Yellow	Moist and shade loving; in borders
3.	*Aquilegia pubiflora* Wall.	May-June	Pale Purple	Bee pasturage; shade loving; in borders
4.	*Viola pilosa* Blume	April-July	Lilac	Semi-shade loving; as edge and bedding plant
5.	*V. canescens* Wall.	April-Nov.	Lilac	-do-
6.	*Geranium wallichianum* Sweet.	July-Sept.	Blue-Purple	In window boxes, borders
7.	*Valeriana wallichii* DC.	March-May	White	Needs semi-shade; in borders; also medicinal
8.	*Gerbera lanuginosa* Benth.	May-Oct.	Pinkish	Pot and garden plant; wooly in look
9.	*Erigeron bellediodes* (Buch.-Ham.) Benth.	All the time	White	As edge plant; in borders and rocky walls
10.	*Primula denticulatus* Sm.	March-April	Dark purple	Window boxes; shade loving
11.	*Strobilanthes dalhousianus* C.B. Clarke	July-Sept.	Dark blue	Weedy; very attractive flower and leaves; mass effect in group planting
12.	*Thymus serphyllum* L.	May-Oct.	Purple	As ground cover; fragrant aromatic plant
13.	*Persicaria capitata* (Buch.-Ham.) Gross	March-Nov.	Pink	Potted plant; in hanging baskets
14.	*Rumex hastatus* D.Don	April-Aug.	Reddish	Weedy; gives mass effect if in groups
15.	*Bergenia ciliata* (Haw.) Sternb.	March-July	Red	Very hardy; foliage plant; medicinal
16.	*Ajuga bracteosa* Wall.	April-Oct.	Lilac	Foliage plant; shade loving; as groundcover
17.	*Mertensia racemosa* Benth.	March-April	White	Very attractive; shade loving
18.	*Potentilla nepalensis* Hook.	July-Aug.	Dark crimson	Shade loving; in borders
19.	*Oxalis latifoloa* Humb.	July-Sept.	Pink	Notorious weed; in window boxes
C.	**Climbers**			
1.	*Clematis montana* Buch.-Ham.	April	White	Climber; in pillars, trellises and arches
2.	*Parthenocissus himalayana* (Royle) Planchon	April-May	Greenish	Woody rambler; for fence or over trees; foliage turns reddish in autumn
3.	*Vigna vexillata* Sm.	April-June	White	Twinner; potted plant in veranda
4.	*Rubus paniculata* Sm.	April-June	White	Evergreen; pendulous shoots as screen or curtain; also in fence
5.	*Rosa macrophylla* Lindl.	April-May	Pink	Shrubby climber; hips attractive
6.	*Rosa moschata* Mill.	April-June	White	Rambler; very common in fences
7.	*Jasminum dispermum* Wall.	April	Pink	Climber; flowers fragrant; for trellis, arches; attractive black fruits
8.	*Jasminum officinale* L.	May-July	White	Evergreen climber; also foliage and loose flower value
9.	*Trachelospermum lucidum* (D.Don) Scheumann	April-July	White	Fragrant; in trellises; needs partial shade
10.	*Cymbalaria muralis* P. Gaertn.	March-June	Purple	Creeper; in hanging baskets and as ground cover
D.	**Shrubs**			
1.	*Hypericum oblongifolium* Choisy	Feb.-April	Yellow	Choice plant; very attractive and more common
2.	*Reinwardtia indica* Dumort.	Nov.-May	Yellow	Successive flowering; lean season flower for room decoration
3.	*Cotinus coggygria* Scop.	April-June	Pale Purple	Grace thread-like floral parts; very attractive
4.	*Indigofera heterantha* Wall.	May-June	Pink	Under shrub for shrubberies; fodder
5.	*Deutzia staminea* R. Brown	March-June	White	Prolonged flowering period; fragrant; suited for planting along small roads
6.	*Woodfordia floribunda* Salisb.	Feb.-April	Bright Red	Medicinal; bee pasturage; dye yielding

Contd.

Table 1. Contd.

S.No.	Plant Species	Flowering season	Flower colour	Remarks
7.	*Viburnum cotinifolium* Don.	April-May	White	Upright flower stalk; very attractive
8.	*Lonicera quinquelocularis* Hardw.	April-June	Yellow	Hedge; fragrant; very common
9.	*Spermadictyon sauveolens* Roxb.	Oct-March	Blue	Offseason flower, fragrant; wide adaptation
10.	*Jasminum humile* L.	May-Oct.	Yellow	Evergreen; graceful foliage
11.	*Buddleia paniculata* Wall.	March-April	Pink	Highly fragrant; very pleasnat flower colour; also foliage value
12.	*Caryopteris wallichiana* Schauer	March-April	Dark blue	Big inflorescense
13.	*Daphne cannabina* Wall.	March-Oct.	White	Evergreen; good foliage; fibre value
E.	**Trees**			
1.	*Aesculus indica* Colebr.	April-May	Pinkish-White	Avenue plant; fodder; very attractive; fast growing; globular-shaped tree
2.	*Acer oblongum* Wall.	Feb.-April	–	For specimen planting; attractive red foloage while emerging and senescing; avenue tree
3.	*Acer caesium* Wall.	March-May	–	-Do-
4.	*Albizzia julibrissin* Durazz.	April-May	Pink	Avenue plant; fine textured leaves
5.	*Pyrunus cerasoides* D.Don	Oct.-Nov.	Pink	Very attractive lean season bloomer; specimen plant
6.	*Pyrus pashia* Buch.-Ham.	April-May	Whitish	Bee pasturage; pear rootstock; noted red foliage while emerging and senescing
7.	*Swida macrophylla* Wall. (Sojak)	April-June	Greenish Yellow	Very attractive; for specimen planting
8.	*Wendlandia exserta* DC.	May-June	White	Very attractive
9.	*Lyonia ovalifolia* (Wall.) Drude	April-May	White	Evergreen
10.	*Populus ciliata* Wall.	Feb.-April	Greenish	Foliage plant; new flush with catkin very attractive; windbreak; suited for marshy lands.

Table 2. List of wild plants as hedge, bulbous and foliage plant from Shimla

S.No.	Plant Species	Remarks
A.	**Hedge Plants**	
1.	*Prinsepia utilis* Royle	Armed; fruits blackish and showy; seed oil edible
2.	*Berberis lycium* Royle	Armed; specimen bush; pale yellow flowers; evergreen; foliage and bluish fruits during autumn very attractive
3.	*B. aristata* DC.	-Do-
4.	*Spiraea canescens* Don.	Branches archiong; flowers white during May-June
5.	*S. bella* Sims.	Pink flowers during April-July
6.	*Pyracantha crenulata* (D. Don) M. Roemer	Armed; White flower; flower during April-May; showy fruit
7.	*Cotoneaster microphylla* Wall.	Bonsai; edge plant; flowers white with persistent fruits
8.	*Rubus ellipticus* Sm.	Evergreen; armed; fruits laden plants; very attractive
9.	*Elaeagnus umbellata* Thunb.	Topiary; very attractive pendulous flowers; during April-May
10.	*Myrsine africana* L.	Topiary; as edge and under-planting; graceful leaves as cut green
11.	*Euonymus* spp.	Topiary; foliage plant; fruits attractive; dark green leaves
B.	**Foliage Plants**	
1.	*Fragaria vesca* L.	April-June; flowers also attractive; also as groundcover
2.	*R. purpurea* Sm.	-Do-
3.	*Hedychium acuminatum* Wall.	Medicinal; creamy white flowers during rainy season
4.	*Ophiopogon intermedius* Don	Foliage value; Dark green leaves; in window boxes, hanging baskets, conservatory; as groundcover
5.	*Iris nepalensis* Don.	Lilac flowers during April-June; very attractive; shade loving
6.	*Arisaema jacquemontii* Bl.	Green striped plant; inflorescense very attractive; shade loving

(*Strobilanthes, Bergeia*). Most of these plants bloomed over considerable period. They are easy to grow and can be propagated either through seeds or vegetative propagation.

Climbers

This group includes those plants, which climb, trial, creep, twine, ramble, straggle, etc. Trailers and creepers (*Cymbalaria*) can find use in hanging baskets whereas

climbers (*Jasminum, Trachelospermum)* in clothing trellises, arches for shade in garden. Ramblers and stragglers (*Rosa*) can best be fitted as screens, boundaries as fence, and for covering bare tree trunks. In this perusal, species of *Rosa, Jasminum* and *Trachelospermum* were noted for their fragrance.

Shrubs

There are excellent plants potential as cut flowers (*Reinwardtia, Viburnum* and Buddleia) while many others had both graceful foliage and flowers. These shrubs can be suited for boundaries, backgrounds and also for specimen planting. A few species flowering during lean season (*Spermadictyon* and *Reinwardtia)* i.e. winter needed a mention since most of the others remain dormant at that time in Shimla.

Trees

There were only a few trees worth to mention as their merit to give colourful landscape. Apart from their multiple uses, many had the merit of attractive foliage (*Swida, Acer, Albizzia, Lyonia, Populus).* They can be planted along roadside as avenue plant (*Aesculus, Albizzia)* and also as accent plant (*Aesculus*) in garden. They can require comparatively less care than the annual and shrubs. It is special to mention about *Pyrunus cerasoides* D. Don, which flowered during the lean season (October to November) while all other deciduous trees had started shedding their leaves. *Acer oblongum* Well. and *Pyrus pashia* Buch.-Ham. were noticed for their attractive red coloured emerging as well as senescing leaves.

Hedges

Many plants under this group were under-shrubs with arm. Some were amenable for topiary (*Elaeagnus, Myrsine, Euonymus and Cotoneaster*) due to their small, densely packed leaves with good rejuvenation capacity after shearing. Some had attractive flowers (*Berberis, Elaeagnus*) and/or fruits (*Berberis, Prinsepia*), which are showy. Fine textured leaves of *Mysine* and *Euonymus* can have potential as cut green.

Foliage plants

This group of plants are quite tolerant to low light intensity hence can be accommodated indoors. The plants short-listed are *Fragariavesca* L., *Begonia amoena* Wall., B. *picta* Sm., *Anthriscus nemorosa* Spreng and *Artemisia vulgaris* L. They were noted for pretty graceful foliage and some were borne with nice-looking flowers. These can well be exploited in rock garden, pots, interior decoration, and sometimes in flower arrangements (*Artemisia*).

Bulbous plants

Horticulturally, a simple stemmed plant arising from bulbs, corns, tubers or thickened rhizomes is termed as bulbous plant. Usually, the aerial stem disappears during autumn and reappears at the time of melting of snow. They can be suited for mass planting and for pots. They are quick in growth with showy bloom, hence of unceasing favourites with gardeners.

Plants for dry flower arrangements

The beautiful flowers, grasses, sedges, flower-skeletons, seeds, ferns, foliages, sedges, nuts, fruits, pods etc. can be dried, preserved and used in more eco-friendly decoration and in various flower arrangements. It also offers ample employment opportunity. Attractive inflorescence of species belonging to genera of *Bromus, Poa, Agrostis, Avena, Alopecurus, Erianthus*, and *Polypogon* can be used for this purpose. In this way, many weedy grasses can effectively be utilized. Apart from them, culms and leaves of *Phragmitis* sp., unopened inflorescence of *Gnaphalium* and *Anaphalis* spp. can also be used as everlastings. The attractive leaves of *Adiantum, Polypodium, Pteris,* and *Selaginella* spp. can be dried (after glycerine treatment) and used for various flower arrangements (Singh, 2003).

Plants for rock garden

Since the area under investigation is in Himalaya, there are ample plants of saxicolous nature suiting to this type of garden: Plants belonging to the genera such as *Bergenia, Sedum, Androsace, Anemone, Aquilegia, Corydalis, Cotoneaster, Iris, Potentilla, Primula, Saxifraga,* and *Thymus* may be exploited for this purpose.

Miscellaneous

Dryness and cold winter leave only terrestrial orchids in Shimla. Only two species viz. *Habenaria edgeeworthii* Hook.f. (yellow-flowered) and *Satyrium nepalense* Don (pink-flowered) were attractive and they appeared during rainy season. A weed, *Polygonum aviculare* L. Can be used as bedding plant in carpet beds because of its attractive reddish green foliage with creeping nature while *Poa annua* L., *Festuca myuros* L. and *Lolium* spp. can be used as lawn grasses on account of their excellent sod forming nature with wider adaptation and attractiveness. Ferns and their allies found in Shimla belonging to the genera *Selaginella, Adiantum, Lygodium, Davallia,*

Polypodium and *Equisetum* can be introduced into fernery. Many seemed to be suitable for indoor culture and in hanging baskets. So far mentioned wild ornamentals are either weeds in cultivated premises or the plants found wild in feral areas. Like cultivated plants, these untamed plants are also evolved under the control of natural selection but without the patronage of planter. Hence, accompanying of some undesirable traits with these plants is always expected, which needs to be addressed. Apart from some specific constraints in each utilitarian group, most of the general constraints include comparatively small size of flower and seed, violent seed shattering, erratic seed germination, variable growth and development of plants which is not desirable for commercial cultivation and many of them show reluctance to changed ecological niche. It is more pronounced in temperate wild plants than their tropical counter partners. This calls for the need of domestication. Domestication in native climate is much easier since soil-climate complex remains more or less same. According to Kupzow (1980), weeds of convergent adaptation (those imitating crop plants) and anthrophilous wild plants (plants liking human interferences) are easy to domesticate. Diligent observation is therefore needed to find the behaviour of these plants. It is once we start cultivating these plants, wider diffusion of these plants into cultivated area is possible due to struggle for existence. This will result in genetic changes in the composition of population due to acclimatization hence it offers scope for subsequent for better types of our choice. If plants are more averse and divergent in adaptation, then transmutation through mutagens or genetic transformation may facilitate the above process. During our investigation, we have found considerable morphological variability in *Valeriana wallichii* DC., *Reinwardtia indica* Dumort., *Rubus ellipticus* Sm., *Jasminum humile* L. and *Thymus serphyllum* L. Collection and characterization of this variability can be the first step for domestication process. Influence of altitude-underlined parameters with respect to time of flowering was also noticed in many plants. Usually, 20-30 days difference in flowering was noticed in plants occurring among the lower limit (very early) and other areas (late) such as *Aesculus indica* Colebr., *Berberis lycium* Royle, *Rosa moschatta* Lindl. and *Pyrus pashia* Buch.- Ham.. This observable fact can well be exploited by setting out production centers in different elevations so that staggered harvest of flowers can be possible for those wild ornamentals having wide range of adaptation. Enormous plasticity of high altitude plants such as *Bergenia ciliata* (Haw.) Sternb. and *Valeriana wallichii* DC. At elevation as low as 1300m, may help in promoting these plants in untraditional areas too. For cut flower purpose, long flower stalk with large number of big-sized flowers lasting for at least a week is desired. In this context, an initial try can be made on the species like *Delphinium denudatum* Wall., *Rosa moschata* Mill., *Spermadictyon suaveoloens* Roxb., *Reinwardtia indica* Dumort., *Caryopteris wallichiana* Schauer and *Buddleia paniculata* Wall., since they appear to suit the requirements. Simultaneously, experiments on increasing their stalk length, vase life and for betterment of packing can be conducted. In case of foliage plants mutation studies can yield best results. These selected plants can be tried in temperate hills of India keeping in view the season. In this regard, those plants flowering more or less throughout the year (*Thymus serphyllum* L.), *Erigeron belledioides* (Buch.-Ham.) Benth, during lean season i.e. late autumn (*Prunus cerasoides* D. Don) and winter (*Reinwardtia, Spermadictyon*) and those with considerably long period of flowering can be given more attention. Promotion is very easy of those plants having multiple uses particularly in homestead garden. Now it is too early to recommend propagation methods and cultivation practices since it needs further experiments. Careful examination of the table 1 and 2 reveals that almost all kinds of flowers with different hues over different periods and situation occur in this hilly resort. So in our opinion, there is no dearth of wild flowers from this area for beautification. At the same time, it is awesome to note that many beautiful plants mentioned in the famous 'Flora Simlensis' of Collet (1902) are now difficult to trace out. For instance, *Aconitum heterophyllum* Wall. and *Lilium polyphyllum* D.Don are a few to mention. This ultimately calls for the need for conservation. National Bureau of Plant Genetic Resource Regional Station. Shimla has just made an initiative in this regard. Establishing a botanical garden comprising these wild ornamentals may gratify this reality. These wild plants also reduce the maintenance cost involved there in compared to exotic flora.

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