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Chasmophytes: the Potential plants for Rock gardening, from Velliangiri Hills of Southern Western Ghats, Tamil Nadu, India

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Abstract

The present paper highlights the 30 ornamental chasmophytic species belonging to 20 families were collected from the rock crevices of Velliangiri Hills of Southern Western Ghats of Tamil Nadu India. These potential ornamental chasmophytic plants posesess an attractive habit, foliage and flowers, it also possess certain biological peculiarities for adapting rock crevices.

Keywords: Wild ornamental, Chasmophytes, Rockery, Velliangiri Hills, Southern Western Ghats,

Introduction

Ornamental plants have naturally occurred in the forest and highly ornamental features such as flowers, foliage and fruits (Li and Zhou, 2005). Potential of wild plants have long been prized for their beauty and planted in the garden around mankind's dwelling places (Bhattacharjee, 2004). The wild ornamental potential plants play an important role in environmental planning of urban and rural areas for abatement of pollution, social and rural forestry, wasteland development, afforestation and landscaping of outdoor and indoor spaces (Kappor and Sharga, 1993).

The rockery (Rock garden) is the miniature of mountain landscape in our garden with an artificially built slope provides better opportunity for a different look in our garden. While making an artificial landscape like Rockery or Rock garden is with careful insertion of stones in a Particular area. It will give a more natural look and to prevent the washing down of soil. Most of the ornamental chasmophytes various evergreens, shrubs, cacti, ground covers are are the potential plants for rock gardening. Chasmophytes are plants rooted in clefts of rocks that are filled with detritus. The flora of the clefts varies with such prevailing factors such as exposure, width of the clefts, amount of accumulation, the presence or absence of any covering of snow during winter etc. (Alves and Kolbek, 2000).

Literature suggests that gardens carry special meanings for individual and that both gardens and gardening may have therapeutic effects. According to Bhatti (1999), gardening can be regarded as "the work of human agency, a very personal act steeped in emotion, family history and self-identity". Evidence for nature's direct relationship to psychological state is illustrated in a new classic study by Ulrich (1984) on short-term recovery from stress, in which he reports to effects of a natural view on the emotional state and physical recovery of gall bladder patients. There is a wealth of research and practices into the use of horticultural therapy, which is now a well-established form of intervention based on the therapeutic effects of gardening and of plant both in health and occupational settings. There is thus considerable scope for looking at the meaning of domestic gardens and as gardening at different in the lifespan (Heliker *et al*.,2009; Shibata and Suzuki, 2001; Harriet and Nicola 2007; Simson and Strauss 1998; Leather, 1998; Stein, 1997).

Ornamental plants are grown usually for the purpose of beauty, for their fascinating foliage, flowers and their pleasant smell (Swarup,1998). Wild plants are a striking feature of the land surface. They vary greatly in composition and density in marked contrast with domesticated plants (Raju,1998). They are the wild progenitors of the most of the present day ornamental flowers. They may be worthwhile to make use landscaping as well as house plants in suitable places (Arora,1993). The present paper highlights the 19- plants collected from rock crevices and

clefts of Coimbatore district of Tamilnadu. All the plants were collected during September 2009- November 2010.

Materials and methods

Study area

Velliangiri Hill is floristically very rich and socio-religiously important since a famous temple called 'Velliangiri Aandavar' temple also called "Thenkailayam" (South Kailas) is situated at the peak of hills (1840 m above MSL). The hill is comes under Boluvampatti reserve forest of Coimbatore District and form a major hill range in Nilgiri Biosphere Reserve. The geographical position of the study area is lies between the longitude 6°- 40′ and 7°- 10′ E and latitude 10° - 55′ and 11°-10′ N with altitudes varies from 520 and 1840 m above MSL. The average rain fall in the hill is 3500 mm at the foot hills and 4500 mm at the peak per year respectively. It forms a part of Western boundary of Coimbatore District, Tamil Nadu, bordering the Palakkad District of the Kerala.

The data presented here are the outcome of a series of extensive and intensive exploration trips conducted during September 2010- November 2011, had resulted in the documentation and collection of 36 species of wild ornamental chasmophytes taxa from Velliangiri Hills of Southern Western Ghats of Tamil Nadu. Correct nomenclature, family, habit, available vernacular names and brief description of a plant *etc*. are given for each species for further collection and easy identification. The collected specimens are deposited in the herbarium of Botany Department, Bharathiar University (BUH), Coimbatore, Tamil Nadu, India.

Enumeration

Anaphalis neelgerryana (Sch.-Bip. *ex* DC.) DC. (Malayalam- *Kalthamara*; Tamil- *Kalpundu* Family- ASTERACEAE).
Errect herb up to 60 cm high; whole plant clothed with white cottony tomentum. Leaves linear. Flowers in corymbos clusters, ray florets with filiform corolla, corolla of disc florets tubular, Pappas hairs white.

Anisochilus carnosus (L.f.) Wall. ex Benth. (Malayalam- *Karporam*; Tamil- .*Karppuravalli* Family- LAMIACEAE).
An erect herb to 50-100 cm. Leaves ovate; 6 × 5 cm. Spikes to 5 cm. Corolla tube annulate within, delicate, purple.

Anisochilus dysophylloides Benth. (Malayalam- *Kalmukki*; Tamil- *Kalthamarai*; Family- LAMIACEAE)
An under shrub. Leaves small, opposite-obovate, fulvous-tomentose, Fleshy, floral leaves and bracts often caducous. Corolla very minute.

Barleria cuspidata Heyne *ex* Nees. (Sanskrit- *Chitraka*; Hindi- Kate-*Koranti*; Malayalam- *Kallumulluchedi*; Tamil- *Kodippachalai*; Family- ACANTHACEAE).
Shrub, armed, very long straight throns; flowers showy, solitary, white yellowish.

Begonia malabarica Lam. (Sanskrit- *Kruransi*; Hindi- *Mundi*; Malayalam- *Chikkani*; Tamil- *Narayanasanjivi*; Family- BEGONIACEAE).
Shrub, stems reddish, much branched, succulent; flowers axillary, whitish.

Begonia trichocarpa Dalzell. (Tamil- *Kalthamarai*; Family- BEGONIACEAE).
Caulescent tuberous herb up to 20 cm high., cordate at base, acute at apex. Flowers white, male flowers 4, female flowers, ovary 3-lanceolate.

Biophytum longipedunculatum (Tamil- *Nilanthenae*; Malayalam- *Nilamthengu*; (Family- OXALIDACEAE).
Errect herb up to 35 cm high. Leaves Obovate, Flowers yelllow 6-8 in umbel.

Biophytum sensitivum (L.) DC (Tamil- *Mukkutti*; Malayalam- *Mukkutti poovu*; Family- OXALIDACEAE)
Herb. Leaves 1.5-8 cm; leaflets 7-15 pairs,. Umbels 5-10, each 7- 10 flowered. Flowers to 8 mm across; petals yellow.

Canscora diffusa (Vahl.) R. Br. Ex Roem. & Schult.(Tamil- *Kalluchedi*; Malayalam- *Tharva*; Family- GENTIANACEAE)

Erect profusely branched herb to 30-50 cm. Stem narrowly 4 – winged. Leaves; 2-4.5 × 1.2 cm. Panicles lax to 8 cm. Calyx lobes equal. Corolla pink to whitish.

Catharanthus roseus (L.) G. Don. (Sanskrit- *Sadaphuli*; Hindi- *Ainskati*; Malayalam- *Savamnari*; Tamil- *Nithyakalyani*; Family- APOCYNACEAE).

Herb, bushy appearance; leaves glossy, oval and dark green; flowers solitary, pale pink with a purple "eye" in their centers.

Chamaecrista kleinii (Wight & Arn.) Matthew. (Malayalam- *Parampuli*; Tamil- *Kalchikundu*; Family- CAESALPINIACEAE).
A prostrate herb. Leaves 2 cm; leaflets 8-10 pairs, oblong- elliptic, Raceme 2-flowered. Flowers 1 cm across. Petals yellow.

Commelina ensifolia R. Br. (Malayalam- *Kallupanal* ; Tamil- *Parachuvadi*; Family- COMMELINACEAE).
spreading herb. Leaves linear- lanceolate, 4-11 × 0.6-0.8 cm. Spathe 1, cucullate and ovate, blue.

Commelina hirsuta (Wight) Clarke. (Malayalam- *Kalpanal* ; Tamil- *Kalthendai*; Family- COMMELINACEAE).
Errect tuberous herb up to 30 cm high; branchlets densely hirsute,leaves,linear- lanceolat, acuminate apex, petals 3, clowed; odd one c. 7 mm, larger one 3 c.1cm.

Cyanotis arachnoidea C. B. Clarke. (Sanskrit- *Jadyari*; Hindi- *Limu*; Malayalam- *Nilapoovu*; Tamil- *Kallu vaazhai*; Family- COMMELINACEAE).
Herb, stems undeveloped, short; leaves rosette and cauline; flowers axillary, stake less, bluish.

Didymocarpus gambleanus Fischer (Malayalam- *Sivapoovu*; Tamil- *Savanaar*; Family- GESNERACEAE).
Acaulescent herb. Leaves in basal rosette,thick,ovate or obovate, ir-regularly crenate at margin,obtuse. Flowers in racemes lax 4-6, corolla companulate, thickly crispately villous.

Didymocarpus tomentosa Wight. (Sanskrit- *Koshamra*; Hindi- *Kusum*; Malayalam- *Kollinil*; Family- GESNERIACEAE).
Herb; leaves thick, densely pubescent on either side with white silky hair; flowers axillary, bluish-purple.

Euphorbia antiquorum L. (Sanskrit- *Simhunda, Vajri*; Hindi- *Tidnara-sehnd*; Malayalam- *Chaturakalli*; Tamil- *Sadura-kalli*; Family- EUPHORBIACEAE).

Shrub, stems stout, bark thick, rough, brown; branches numerous, fleshy, green, joined; leaves fleshy, glabrous, which gives the plant a leafless appearance.

Exacum wightianun Arn. (Malayalam- *Komukki* ; Tamil- *Konganipoovu*; Family- (GENTIANACEAE)
Erect herb. Leaves membranous, ovate-lanceolate. Spreading cymes; pedicels recurved. Corolla lobes apiculate; bright blue.

Hoya wightii Hook. (Malayalam- *Vallippovu*; Tamil- *Vennarai*; Family-ASCLEPIADACEAE).
Climber. Leaves opposite decussate, acuminate at apex. Flowers in umbellate cymes pollinia 5 cm,linear,cylindrical,seeds many, oblong.

Hybanthus enneaspermus (L.) Muell. (Malayalam- *Parachendu*; Tamil- *Orilaithamarai*; Family-VIOLACEAE).
Herb to 25 cm. Leaves linearly lanceolate, Flowers 8 mm across; petals rose, unequal, obovate; upper ones oblong, laterals falcate.

Indigofera linnaeii Ali. (Sanskrit- *Vasuka*; Hindi- *Lathai*; Malayalam- *Cherru-pullate*; Tamil- *Sheppunerunji*; Family- FABACEAE).
Herb; leaves velvety on both sides; flowers pea-shaped, bright red.

Kalanchoe pinnata (Lam.) Pers. (Malayalam- *Kalthamara*; Tamil- *Runakalli*; Family- CRASSULACEAE).
An errect herb to 1 m. Leaves crowded in young shoots; 3-5 foliate petiole greenish with violet blotches. Cymes panicled to 20 cm; Flowers 2-3 cm across.

Medinella malabarbica Bedd. (Malayalam- *Kalluvalli*; Tamil- *Kalnarai*; Family- MELASTOMATACEAE).
Herb up to 75 ; stem subscandent. Leaves 3-5 ribbed, entire, often fleshy,7 Flowers in axillary fascicles; peduncles 1-3 flowered. Petals 4-5, ovate-oblong.

Merremia tridentata (L.) Hallier. f. (Sanskrit- *Prasarini*; Hindi- *Dudmari*; Malayalam- *Kalluvalli*; Tamil- *Savunkodi*; Family- CONVOLVULACEAE).
Herb, thick root stock, stems elongate, prostrate; leaves linear, glabrous; flowers axillary, pale yellow.

Oxalis latifolia HBK. (Malayalam- *Pulichann*; Tamil- *Puliyarilai*; Family- OXALIDACEAE).
A annual herb to 20 cm. Leaves 3- foliate; leaflets subsessile, broadly deltoid with 2 obtuse divergent lobes, Flowers 9-12, each 1.2 cm across; pink to violet.

Peperomia dindigulensis Miq. (Malayalam- *Paarachoppu*; Tamil- *Kalsevappu*; Family- PIPERACEAE).

An erect herb to 20- 40 cm. Leaves decussate, upper ones in whorls of 3, elliptic- ovate, Spikes 1 – 2; bracts ovate, basally decurrent to peduncle.

Pilea microphylla (L.) Liebm. (Malayalam- *Parapayal*; Tamil- *Kanagai*; Family- URTICACEAE)
A small succulent monoecious herb to 20 cm. Leaves elliptic-ovate to sub-succulent, 1-nerved; raphides transverse. Flowers 4-merous.

Protasparagus racemosus (Willd.) Oberm. (Sanskrit- *Shatavari*; Hindi- *Satavar*; Malayalam- *Chataval*; Tamil- *Ammaikodi*; Family- LILIACEAE).
Herb, armed, stems scandent, woody; Leaves scaly, pine-needle shaped, greenish with numerous underground tubers; flowers whitish.

Sonerila rotundifolia Bedd. (Malayalam- *Paarachul*; Tamil- *Kalkalai*; Family- MELASTOMATACEAE) .
Herb up to 7 cm high. Leaves orbicular rounded at apex, cordate at base. Flowers purple in terminal scorpiod cymes.

Sonerila speciosa Zenk. (Malayalam- *Paarachuvadi*; Tamil- *Kalkundai* Family- MELASTOMATACEAE).
Herb up to 20 cm high. Leaves ovate, acute at apex , bristly serrate at margins, rounded at base, 7-9 ribbed. Flowers in terminal scorpiod cymes, petals 3.


A) *Anaphalis neelgerryana* DC.


B) *Didymocarpus tomentosa* Wight.


C) *Commelina ensifolia* R. Br.


D) *Hybanthus enneaspermus* (L.) Muell.


E) *Peperomia dindigulensis* Miq.


F) *Pilea microphylla* (L.) Liebm.

Result and Discussion

In the present study enumerated 30- wild ornamental potential chasmophytic plants belonging to 20- different families and 24 genera of angiosperms. It is described alphabetically with plant names, family, habit, available vernacular names if any and their brief description of a species are also given. All the specimens collected were identified with the help of floras (Gamble and Fischer, 1956; Matthew, 1983). and authentic Herbarium sheets available at MH Herbarium, Botanical Survey of India, Southern Circle, Coimbatore. Among the documented wild ornamental plants the dominant families such as Asclepiadaceae, Commelinaceae, Crassulaceae, Oxalidaceae and Melastomataceae with 3 species each. followed by Begoniaceae, Gentianaceae, Gesneriaceae and Lamiaceae having 2 species each. The remaining families having single species each. The cahsmophytic species like *Anaphalis neelgerryana*, *Anisochilus dysophylloides*, *Kalanchoe pinnata*, *Medinella malabarbica*, *Peperomia dindigulensis*, *Pilea microphylla*, *Protasparagus racemosus*, *Sonerila rotundifolia* are suggested for rock gardening for their dense and attractive foliage. While the species like *Barleria cuspidate*, *Begonia malabarica*, *Begonia trichocarpa*, *Biophytum sensitivum*, *Catharanthus roseus*, *Commelina ensifolia*, *Didymocarpus gambleanus*, *Didymocarpus tomentosa*, *Exacum wightianun*, *Hybanthus enneaspermus*, *Oxalis latifolia*, *Sonerila speciosa etc*. are having bright coloured flowers and prolonged flowering periods also. The species like *Euphorbia antiquorum and Pilea microphylla* are included based on their attractive appearance.

Conclusion

The result of the present study resulted that 30 beautiful wild ornamental potential chasmophytic plants were collected from the Velliangiri Hills of Southern Western Ghats of Tamil Nadu. Such chasmophytic plants are grown for the purpose of beauty, for their foliage, flowers and their pleasant smell. It is evident from the present study that the ornamental potential chasmophytic plants were suggested for rock gardening or rockery for their attractive foliage, bright coloured flowers and prolonged flowering periods. They can be grown in rock gardens either in small flower pots or in our gardens. Though nature has given a wealth of wild flowers and ornamental plants, unfortunately many of them have been destroyed by man to such an extent and survival of many is endangered. Some of the threatened factors like destruction of forests for grazing of animals, urban and industrial development, exploitation huge pilgrims in festive seasons, un sustainable utilization and lack of suitable management *etc*. will affect the existing biodiversity of the study area. The urgent need for safe conservation and sustainable uses of wild resources is essential for future generations.

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