Indian J. Hort. 70(1), March 2013: 90-95

Rockery potential chasmophytes in Velliangiri hills of South-Western Ghats of Tamil Nadu

Binu Thomas* and A. Rajendran
Department of Botany, School of Life Sciences, Bharathiar University, Coimbatore 641 046, Tamilnadu

ABSTRACT

The present paper highlights the 34 ornamental chasmophytic species belonging to 20 families collected from the rock crevices of Veliangiri Hills of Southern Western Ghats of Tamil Nadu, India. Most of the ornamental chasmophytes are herbacelous which probably are the results of the harsh geographical environment in the study area. In this harsh environment chasmophytic plants develop adaptive physiological and ecological characteristics, developing into cushion plants, herbs with an attractive shape and size in cracks and fissures of rock face. Their flowers are very bright and showy and possess certain biological peculiarities of different interesting adaptations and flower colour which can attract many people have been identified for possible cultivation in rock garden for ornamental purposes and psychological beneficial.

Key words: Wild ornamental, chasmophytes, rockery, Velliangiri hills, South-Western Ghats.

INTRODUCTION

Wild ornamental plants to be those which occur naturally in the field and have highly ornamental features such as ornamental flowers, foliage and fruits (Li and Zhou, 10). Ornamental potential wild plants have long been prized for their beauty and planted in the garden around mankind's dwelling places Bhattacharjee (3). 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 (Kapoor and Sharga, 8).

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 are various evergreens, shrubs, cacti and 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, 1).

Literature suggests that gardens carry special meanings for individual and that both gardens and gardening may have therapeutic effects. According to Bhatti (4), 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 (17) 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.*, 7; Shibata and Suzuki 13; Harriet and Nicola, 6; Simson and Strauss, 14; Leather, 9; Stein, 15).

Ornamental plants are grown usually for the purpose of beauty, for their fascinating foliage, flowers and their pleasant smell (Swarup, 16). Wild plants are a striking feature of the land surface. They vary greatly in composition and density in marked contrast with domesticated plants (Raju, 12). 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, 2). The present study 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.

*Corresponding author's E-mail: binuthomasct@gmail.com

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 (1,840 m above MSL). The hill 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 varying from 520 and 1,840 m above MSL. The average rain fall in the hill is 3,500 mm at the foot hills and 4,500 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.

MATERIALS AND METHODS

The data presented here are the outcome of a series of extensive and intensive exploration trips conducted during September 2009- November 2010, 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, Coimbatore, Tamil Nadu.

RESULTS AND DISCUSSION

In the present study enumerated 34- wild ornamental potential chasmophytic plants belonging to 20- different families and 25 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, 5; Matthew, 11). 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 three species each. followed by Begoniaceae, Gentianaceae, Gesneriaceae and Lamiaceae having two 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*, and *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 *Caralluma adscendens*, *Caralluma diffusa*, *Euphorbia antiquorum*, *Pilea microphylla*, *Kalanchoe tubiflora* etc. are included based on their attractive appearance. The details of these species are given hereunder. Some of the species are shown in Fig. 1.

1. *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 corymbose clusters, ray florets with filiform corolla, corolla of disc florets tubular, Pappas hairs white.

2. *Anisochilus carnosus* (L.f.) Wall. ex Benth. (Malayalam- *Karporam*; Tamil- *Karppuravalli*, Family- Lamiaceae).

   An erect herb to 50-100 cm. Leaves ovate; 6 cm × 5 cm. Spikes up to 5 cm. Corolla tube annulate within, delicate, purple.

3. *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.

4. *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.

5. *Begonia malabarica* Lam. (Sanskrit- *Kruransi*; Hindi- *Mundi*; Malayalam- *Chikkani*; Tamil- *Narayanasanjivi*; Family- Begoniaceae).

   Shrub, stems reddish, much branched, succulent; flowers axillary, whitish.

6. *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.

7. *Biophytum longipedunculatum* (Tamil- *Nilanthenae*; Malayalam- *Nilamthengu*; (Family- Oxalidaceae).

   Errect herb up to 35 cm high. Leaves obovate, flowers yelllow 6-8 in umbel.

A) *Anaphalis neelgerryana* DC.

B) *Caralluma diffusa* (Wight) N.E. Br.

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

D) *Kalanchoe tubiflora* (Harvey) Raym-Hamet.

E) *Peperomia dindigulensis* Miq.

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

Fig. 1. Some of the potential chasmophytes collected from Velliangiri hills.

8. *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.

9. *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.

10. *Caralluma adscendens* R. Br. (Sanskrit- *Dugdhapashana*; Hind- *Khapparkadu*; Malayalam- *Prachedi*; Tamil- Muyalkombuchedi; Family- Asclepisdaceae).

Herb, stems fleshy, usually with many branches; leaves deciduous, spine like; flowers terminal, yellowish with dark purple tips to the lopes.

11. *Caralluma diffusa* (Wight) N.E. Br. (Sanskrit- *Kartkatajihva*; Hindi- *Charungli*; Malayalam- *Mrigampuli*; Tamil- *Kodippachalai*; Family- Asclepiadaceae).

Herb, stems thick, fleshy, short branched; leaves deciduous, spine like; flowers terminal, dark purplish brown with fine whitish concentric lines.

12. *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.

13. *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.

14. *Commelina ensifolia* R. Br. (Malayalam- *Kallupanal*; Tamil- *Parachuvadi*; Family- Commelinaceae).

A spreading herb. Leaves linear- lanceolate, 4-11 × 0.6-0.8 cm. Spathe 1, cucullate and ovate, blue.

15. *Commelina hirsuta* (Wight) Clarke. (Malayalam- *Kalpanal*; Tamil- *Kalthendai*; Family- Commelinaceae).

Errect tuberous herb up to 30 cm high; branchlets densely hirsute,leaves,linear- lanceolate, acuminate apex, petals 3, clowed; odd one c. 7 mm, larger one 3 c.1 cm.

16. *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, stakeless, bluish.

17. *Didymocarpus gambleanus* Fischer (Malayalam- *Sivapoovu*; Tamil- *Savanaar*; Family- Gesneraceae).

Acaulescent herb. Leaves in basal rosette,thick,ovate or obovate, irregularly crenate at margin,obtuse. Flowers in racemes lax 4-6, corolla companulate, thickly crispately villous.

18. *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.

19. *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.

20. *Exacum wightianun* Arn. (Malayalam- *Komukki*; Tamil- *Konganipoovu*; Family- (Gentianaceae).

Erect herb. Leaves membranous, ovate- lanceolate. Spreading cymes; pedicels recurved. Corolla lobes apiculate; bright blue.

21. *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.

22. *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.

23. *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.

24. *Kalanchoe olivacea* Dalz. & Gibs., (Malayalam- *Kalmunda*; Tamil- *Kalchudai*; Family- Crassulaceae).

Erect herb up to 1 m high. Leaves obovate, Flowers 1 cm across in terminal compact corymbs. Corolla white.

25. *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.

26. *Kalanchoe tubiflora* (Harvey) Raym-Hamet. (Malayalam- *Elamulachii*; Tamil- *Elaichedi*; Family- Crassulaceae).

A succulent herb to 1.5- 2 m. Leaves in whorls of 3, simple, linear, subterete, brown, glabrous. Cymes to 15 cm; Flowers 1.5-2 cm across, corolla orange to reddish.

27. *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.

28. *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.

29. *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.

30. *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.

31. *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.

32. *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.

33. *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.

34. *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.

The present study resulted in identification of 34 beautiful wild ornamental potential chasmophytic plants from the Velliangiri Hills of Southern Western Ghats of Tamil Nadu. Such chasmophytic plants can be grown for the purpose of beauty, for their foliage, flowers and their pleasant smell. They can be grown in rock gardens either in small flower pots or in gardens.

ACKNOWLEDGEMENTS

Authors are thankful to the Professor and Head, Department of Botany, Bharathiar University for providing necessary facilities to carry out the study and also thankful to the Director, Botanical Survey of India (BSI), Southern Circle, Coimbatore, for plant identification.

REFERENCES

1. Alves, R. and Kolbek, J. 2000. Primary succession on quartzite cliffs in Minas Gerais. *Brazil. Biol*. **55**: 69-83.

2. Arora, J.S. 1993. *Introductory Ornamental Horticulture*, Kalyani Publuishers, Ludhiana.

3. Bhattacharjee, S.K. 2004. *Landscape Gardening and Design with Plants*. Aavishkar Publishers, Jaipur, India.

4. Bhatti, M. 1999. The meaning of garden in an age of risk. **In**: Chapman, T. and Hockey, I. (Eds.) *Ideal Homes? Social Change and Domestic Life*. London, Routledge, pp.181-91.

5. Gamble, J.S. and Fischer, C.E.C. 1956. *Flora of the Presidency of Madras*, Adlard & Son Ltd., London.

6. Harriet, G. and Nicola, L. 2007. Landscapes of the lifespan: Exploring accounts of own gardens and gardening. *J. Env. Psych*. **27**: 225-41.

7. Heliker, D., Chadwick, A. and Connell, T. 2009. The meaning of gardening and the effects on perceived wellbeeing of a gardening project on diverse populations of elders. *Actic. Adapt. Ageing*, **24**: 35-56.

8. Kapoor, S.L. and Sharga, A.N. 1993. *House Plants*, Vatika Prakashnan, India.

9. Leather, K.M. 1998. Windows in the workplace. *Env. Behav.* **30**: 739-62.

10. Li, X.X. and Zhou, Z.K. 2005. Endemic wild ornamental plants from North Western Yunnan, China. *Hort. Sci.* **40**: 1612-19.

11. Matthew, K.M. 1983. *The Flora of Tamilnadu Carnatic*. Vol. 1-3. Rapinat Herbarium, Tiruchirapalli.

12. Raju, R.A. 1998. *Wild Plants of Indian Sub-Continent and their Economic Use*. CBS Publishers & Distributers, New Delhi.

13. Shibata, S. 2001. Effects of indoor foliage plants on subject's recovery from mental fatigue. *North American J. Psych.* **3**: 385-96.

14. Simson, S.P. and Strauss, M.C. (Eds.), 1998. *Horticulture as Therapy*, *Principles and Practices*. Haworth Press, New York.

15. Stein, L.K. 1997. Horticultural therapy in residential long term care. Applications from research on health, aging and institutional life. *Activit. Adapt. Aging*, **22**: 107-24.

16. Swarup, V. 1998. *Ornamental Horticulture*. MacMillan India Limited, New Delhi.

17. Ulrich, R.S. 1984. View through a window may influence recovery from surgery. *Science*, **224**: 420-22.

Received : November, 2010; Revised : September, 2012;
Accepted : November, 2012