Conservation of wild orchids in Sri Krishnadevaraya University Botanic Garden, Anantapur, Andhra Pradesh, India

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Sri Krishnadevaraya University Botanic Garden was established in 1975 and is being maintained by the Department of Botany. The garden extends over 20000sq.m within the university campus and located 10km away from Anantapur City. The garden is situated at 14^{0}36'43.67"N and 77^{0}38'42.34"E at an altitude of 377m. The area receives moderate annual rainfall of about 538mm and experiences a mean daily maximum temperature of 28.7^{0}C (in summer season it is 38–40 ^{0}C). The garden currently harbours about 300 indigenous and exotic taxa including endemics. Orchids collected from different parts of the Eastern Ghats are being maintained by the research group of Biodiversity Conservation Division (BCD) of the Department of Botany.

Orchids are one of the largest groups in the plant kingdom comprising 22,075 species (APG 2009), of which 1331 taxa are found in India (Misra 2007). In the state of Andhra Pradesh, 77 species have so far been reported to occur in different habitats (Raju et al. 2008), however, most of them are encountered in the forests of the Eastern Ghats. Orchids are experiencing major threats in terms of habitat destruction due to over grazing, forest fires, encroachment of forest land for agriculture and plantation purposes. This situation in Andhra Pradesh prompted the ex situ maintenance of selected orchid species in the botanic garden.

At present, 32 orchid species collected from different parts of the Eastern Ghats of Andhra Pradesh are being maintained in the botanic garden green house and the epiphytic ones are on trees within the garden premises (Table 1). Of the 32 species, 13 are epiphytic and 19 are terrestrial ones. The terrestrial orchids are potted by using red soil mixed with pieces of brick, charcoal and manure (3:2:2:3). The epiphytic orchids are grown in pots using bricks, charcoal, coir pieces with fresh cattle dung (3:3:2:2) and are tied on the trunk of living trees with the help of a gunny-bag fill of the above materials (Image 1). Watering of the plants is done every day in summer and every 2–3 days in a week during the rainy season.

Of the 32 orchid species, five are endemic to India (Ahmedullah et al. 1986) and they are: *Cirrhopetalum neilgherrense, Habenaria longicornu, H. panigrahiana, H. rariflora* and *H. roxburghii*; *Cirrhopetalum neilgherrense* is categorised as Vulnerable (Nayar & Sastry 2000); *Eulophia graminea* is relocated after eight decades in Andhra Pradesh (Sadasivaiah et al. 2010); one species, *Eulophia flava* is a new distributional record for the Eastern Ghats (Rao et al. 2010); *Geodorum recurvum* is a new record for the southern Eastern Ghats (Prasad & Rao 2010); *Habenaria panigrahiana*, *Liparis nervosa* and *L. paradoxa* are new distributional records for Andhra Pradesh (Sadasivaiah et al. 2009; Prasad et al.

Date of publication (online): 26 July 2012
Date of publication (print): 26 July 2012
ISSN 0974-7907 (online) | 0974-7893 (print)

Editor: K. Ravikumar

Manuscript details:
Ms # o2928
Received 27 August 2011
Final received 06 June 2012
Finally accepted 28 June 2012

Citation: Prasad, K., B. Sadasivaiah, S.K. Basha, M.V.S. Babu, V.S. Rao, P. Priyadarshini, D. Veeranjaneyulu & B.R.P. Rao (2012). Conservation of wild orchids in Sri Krishnadevaraya University Botanic Garden, Anantapur, Andhra Pradesh, India. *Journal of Threatened Taxa* 4(7): 2705–2708.

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Acknowledgements: The authors are grateful to the Department of Biotechnology (BT/PR6603/NDB/ 51/089/2005), New Delhi for financial assistance. Thanks are due to Andhra Pradesh Forest Department officials for their help in field work.

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Table 1. List of orchids conserved in Sri Krishnadevaraya University Botanic Garden

	Binomial	Habit	Distribution in Andhra Pradesh	Endemic/ Threat status	Medicinal value
1	*Acampe praemorsa* (Roxb.) Blatter & McCann	E	Ch, Eg, Ku, Pr, Sr, Vi & Wg		+
2	*Aerides odorata* Lour.	E	Eg, Vi & Wg		
3	*Cirrhopetalum neilgherrense* Wight	E	Ch	PI-VU	+
4	*Cymbidium aloifolium* (L.) Sw.	E	Ch, Eg, Sr, Ne, Vi, Wg & Vj		+
5	*Dendrobium aphyllum* (Roxb.) C.E.C. Fischer	E	Eg, Sr & Vi		
6	*Dendrobium macrostachyum* Lindley	E	Ch, Ku & Vi		+
7	*Eulophia epidendraea* (Koenig ex Retz.) C.E.C. Fischer	T	Ch, Ka, Ne, Sr & Vi		+
8	*Eulophia flava* (Lindley) Hook. f.	T	Ch & Ka		
9	*Eulophia graminea* Lindley	T	Ch, Ka, Ma & Ne		
10	*Eulophia explanta* Lindley	T	Eg & Vi		
11	*Eulophia* sp.	T	Pr		
12	*Geodorum densiflorum* (Lam.) Schltr.	T	Common		+
13	*Geodorum recurvum* (Roxb.) Alston	T	Eg, Ku, Ma, Pr & Vi		
14	*Goodyera procera* (Ker-Gawler) Hook.	T	Ch, Ka & Vi		
15	*Habenaria longicornu* Lindley	T	Ch	PI	+
16	*Habenaria panigrahiana* S. Misra	T	Ch, Eg & Ku	PI	
17	*Habenaria rariflora* A.Rich	T	Ch	SI	
18	*Habenaria roxburghii* R. Br.	T	Ad, Ku, Me, Ne, Ni & Vj	IND	+
19	*Liparis deflexa* Hook. f.	T	Eg & Ku		
20	*Liparis nervosa* (Thunb.) Lindley	T	Ch & Vi		
21	*Liparis paradoxa* (Lindley) Reichb. f.	T	Ch & Ku		
22	*Luisia trichorhiza* (Hook.) Blume	E	Eg, Ku & Vi		+
23	*Nervilia aragoana* Gaudich.	T	Eg, Kh, Ku, Vi &Vj		+
24	*Nervilia crociformis* (Zoll. & Moritzi) Seidenf.	T	Eg & Vi		
25	*Oberonia ensiformis* (Sm.) Lindley	E	Eg, Sr, Vi & Vj		
26	*Oberonia mucronata* (D.Don) Ormer. & Seidenf.	E	Sr, Vi & Vj		
27	*Polystachya concreta* (Jacq.) Garay & Sweet	E	Vi		
28	*Rhynchostylis retusa* (L.) Blume	E	Eg, Sr & Vi		+
29	*Seidenfia versicolor* (Lindl.) Marg . & Szlach	T	Ch, Eg, Sr & Vi		+
30	*Vanda tessellata* (Roxb.) Hook. ex G. Don	E	Common		+
31	*Vanda testacea* (Lindley) Reichb. f.	E	Ch, Eg, Ku, Ma, Ne, Sr, Vi & Vj		+
32	*Vanilla walkeriae* Wight	V	Eg & Ch		

Habit: (E - Epiphyte, T - Terrestrial, V - Vine); Distribution in Andhra Pradesh: (Ad - Adilabad, Ch - Chittoor, Eg - East Godavari, Kh - Khammam, Ka - Kadapa, Ku - Kurnool, Ma - Mahaboobnagar, Me - Medak, Ne - Nellore, Ni - Nizamabad, Pr - Prakasam, Sr - Srikakulam, Vi - Visakhapatnam, Vj - Vijayanagaram, Wg - West Godavari); Endemics/Threat status: (IND - India, PI - Peninsular India, SI - South India, VU - Vulnerable).

2010). Of the 32 species, 14 species are reported with medicinal values (Reddy et al. 2005; Raju et al. 2008). All the 32 species are listed in Table 1 with their habit, distribution pattern in Andhra Pradesh, endemic status and medicinal value.

REFERENCES

Ahmedullah, M. & M.P. Nayar (1986). *Endemic Plants of the Indian Region—Vol. 1*. Botanical Survey of India, New Delhi, 261pp.

APG (2009). An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Bot. Journal of Linnean Society* 161: 105–121.

Misra, S. (2007). *Orchids of India - A Glimpse*. Bishen Singh

Image 1. a & b - Interior of the Garden; c - *Cymbidium aloifolium*; d - *Dendrobium aphyllum*; e - *Eulophia flava*; f - *Goodyera procera*; g - *Liparis paradoxa*; h - *Oberonia ensiformis*. © BCD Group

Mahendra Pal Sing, Dehra Dun, India, 390pp.

Nayar, M.P. & A.R.K. Sastry (2000). *Red Data Book of Indian Plants—Vol. 1*. Botanical Survey of India, Calcutta, 367pp.

Prasad, K., M.V.S. Babu, B. Sadasivaiah & B.R.P. Rao (2010). Two species of *Liparis* L.C. Richard (Orchidaceae), new distributional records to Andhra Pradesh, India. *The Journal of the Economic Taxonomic Botany* 34(3): 514–516.

Prasad, K. & B.R.P. Rao (2010). *Geodorum recurvum*, new distribution record to southern Eastern Ghats of India. *Indian Journal of Forestry* 33(1): 119–121.

Raju, V.S., C.S. Reddy, K.N. Reddy, K.S. Rao & B. Bahadur (2008). Orchid Wealth of Andhra Pradesh. *Proceedings of Andhra Pradesh Akademi of Sciences* 12(1&2): 180–192.

Rao, B.R.P., B. Sadasivaiah, K. Prasad, S.K. Basha, A. Miria, A.B. Khan & M.V.S. Babu (2010). *Eulophia flava* (Lindl.) Hook.f. (Orchidaceae), in Eastern Ghats, India. *Indian Journal of Forestry* 33(3): 403–404.

Reddy, K.N., G.V. Subbaraju, C.S. Reddy & V.S. Raju (2005). Ethnobotany of certain orchids of Eastern Ghats of Andhra Pradesh. *EPTRI-ENVIS Newsletter* 11(3): 5–9.

Sadasivaiah, B., K. Prasad, V.S. Rao & B.R.P. Rao (2009). *Habenaria panigrahiana* S. Misra - a new distributional record to Andhra Pradesh, India. *The Journal of the Swamy Botanical Club* 26: 1–2.

Sadasivaiah, B., K. Prasad, S.K. Basha, M.V.S. Babu, V.S. Rao & B.R.P. Rao (2010). *Eulophia graminea* Lindl., *E. ochreata* Lindl. and *Habenaria barbata* Wight ex Hook.f. - Relocated in Andhra Pradesh after Eight Decades. *Indian Journal of Forestry* 33(2): 211–214.