

ORCHIDS OF GREAT NICOBAR ISLAND AND THEIR CONSERVATION¹

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The paper lists 33 taxa of orchids recorded so far from the Great Nicobar island, emphasising the field observations, habitat and ornamental potentialities. Phytogeographical affinities of the species has been drawn up. Strategies and measures on conservation of orchid species in the island has also been proposed. Several species are illustrated with photographs.

INTRODUCTION

The Great Nicobar Island is a continental island belonging to the Andaman and Nicobar group of islands. It occupies a phytogeographically strategic position in the SE Asian tropics, situated between mainland India, on the one hand and Sumatra and Malay peninsula on the other. The island has an area of 1045 sq. km. and lies between 6°45'N and 7°15'N latitudes and 93°37'E and 93°56'E longitudes. This southernmost Indian land area is hardly 145 km away from Sumatra.

The topography of the island is highly rugged. It has long narrow stretches of flat land scattered along coasts and hilly ranges running in north-south and east-west directions. The different hill ranges culminate in the peak called Mount Thullier which is 670 m high above m.s.l. The island is basically mountainous with several rivers and perennial streams. At some places the coastal areas are fringed with coral reefs extending almost from the shoreline to some considerable distance out to the sea. There are no deep lagoons bet-

ween the reef and shore. Dense forests occupy about 85% of the whole island, starting from the coastal forest zone to right up to the peaks.

The climate of the island is purely tropical. The daily temperature ranges from 22°—32°C with mean relative humidity of about 82%. The annual rainfall ranges from 300 to 380 cm. April is the hottest month of the year. The island is subjected to gales and cyclonic winds changing in direction with the monsoons and due to sudden depressions in the sea around.

The forests of Great Nicobar Island are mainly evergreen with a few deciduous elements. They consist of mostly tall trees, palms, climbers, epiphytes and ferns. The dense vegetation supports much diversity in its species content. The vegetation can be classified into six major types : 1) Beach formations, 2) Saline swamps, 3) Lowland littoral swamp forests (mixed with a few deciduous elements), 4) Riverain vegetation, 5) Inland forests of hills and low mountains (mixed with a few deciduous elements), and 6) Secondary vegetation. There is hardly any aquatic vegetation on the island due to lack of freshwater ponds and lakes. Pure grasslands are not found, although a few weeds come up very fast as secondary formations due to the deforestation in certain areas of the island.

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These continental islands of the Andaman and Nicobar islands, which lie in the tropical zone are very little explored, due to their isolation and inaccessibility. But several expeditions were undertaken to this island by botanists like Kurz (1876), Sahni (1953), Thothathri (1973) and Balakrishnan (1976-78). Between 1979 and 1981, six field trips were undertaken, each lasting more than a month, in order to intensively study the floral constituents of the island. All these field trips provided rich collections and the orchids are enumerated here in the following inventory.

All together 33 taxa of orchids belonging to 26 genera have been recorded so far from this island. The number of species is the highest among the monocotyledonous families so far known from this island. Some of these species were studied earlier and categorised as rare, endemic and endangered by Balakrishnan (1977, 1978).

In the enumeration of the species below, emphasis is given on the habit, field observations on flowers, frequency of distribution, habitats along with suggestions for introduction into gardens, and full citation of specimens with localities and the herbaria in which they are housed.

ENUMERATION

1. *Aerides emericii* Reichb. f. in Gard. Chron. 18(2): 586. 1882; Hook. f., Fl. Brit. India 6: 47. 1890.

Epiphyte, inflorescence slender, c. 20-30 cm long; flowers pinkish. Frequent in coastal as well as inland forests. Suitable for cultivation in gardens.

Flowers. April-May.

Fruits. June-July.

Specimens. 36 km on East-West road, Balakrishnan 3956 (PBL); Campbell Bay, Balakrishnan 5514 (PBL); Campbell Bay,

Hore 7281 (PBL, CAL); Kopenheat, Hore 8216 (PBL).

Distribution. Endemic to Nicobar Islands.

2. *Anoectochilus nicobaricus* Balakr. & P. Chakrab. in Bull. Bot. Surv. India 20: 80. 1978.

Terrestrial, erect herb, c. 15-30 cm; leaves 3-4, dark purplish with golden reddish reticulate venation above, dark brownish below; inflorescence 4-8 flowered, solitary, terminal; sepals greenish purple; lip white. In shaded places on the inlands mixed forest floor. Rare and hence necessary to propagate them in Botanic Gardens. Commonly known as 'Jewel orchid', this ornamental orchid can be cultivated in gardens.

Flowers. November-December.

Fruits. Unknown.

Specimens. 6 km on East-West road, P. Chakraborty 3226 (PBL); Galathea river bank, N. G. Nair 7147 (PBL).

Distribution. Endemic to Great Nicobar Island.

3. *Appendicula reflexa* Bl. Bijdr. 301. 1825.

Epiphyte, inflorescence mostly axillary; peduncles short; flowers greenish white, c. 15 cm long, few-flowered. Rare in forests of marshy coastal areas as well as shaded inland forests.

Flowers. June-July.

Fruits. July onwards.

Specimens. 20 km on North-South Road, Balakrishnan 3834 (PBL, CAL); Campbell Bay to Chengappa Bay, Balakrishnan 6082 (PBL); Galathea river mouth, N. G. Nair 7125 (PBL).

Distribution. Great Nicobar Island, Thailand, Sumatra to New Guinea.

4. *Ceratostylis subulata* Bl. Bijdr. 206. 1825.

Epiphyte, stem clustered, 15-20 cm; flowers creamy-white or yellow, minute. Scarce in shaded inland forests.

Flowers. August-December.

Fruits. Unknown.

Specimens. Campbell Bay, *Thothathri & Banerjee* 11419 (CAL); 17 km on East-West Road, *Balakrishnan* 3033 (PBL, CAL, L); Near Galathea Bridge on East-West Road, *N. G. Nair* 7185 (PBL, CAL); Laful forest, *Hore* 8785 (PBL).

Distribution. Great Nicobar Island, Burma, Malaya and Java.

5. *Cleisostoma uraiense* (Hayata) Garay & Sweet in Orch. S. Ryukyu Isl. 156. 1974. *Sarcanthus uraiensis* Hayata, Ic. Pl. Formos. 8 : 130, f. 58. 1919.

Epiphyte; flowers on 15-20 cm long panicles, on upper leaf axils; flowers greenish white; lip white; fruits black when dry. Sparsely distributed in coastal, littoral as well as inland forests.

Flowers. July-August.

Fruits. September-October.

Specimens. Campbell Bay, *Thothathri & Banerjee* 11346 (CAL, PBL); Campbell Bay, *Balakrishnan* 2937 (PBL, CAL, L); Galathea river to Pygmalion Point, *Balakrishnan* 3869 (PBL); Chengappa Bay, *Hore* 7721 (PBL); 4 km on North-South Road, *Hore* 8287 (PBL).

Distribution. Philippines, Taiwan and Formosa. Probably introduced and naturalized in Great Nicobar Island.

6. *Corymborkis veratrifolia* (Reinw.) Bl. in Coll. orch. Arch. Ind. 125 : tt. 42 E & 43. 1859. *Hysteria veratrifolia* Reinw. in Bot. Zeit. 2 : 5. 1825.

Terrestrial, c. 1 m or more, erect or a little slender; flowers white in axillary panicle; fruits greenish. Common in certain localities in shaded inland and coastal littoral forests. Valued as febrifuge in treating Malaria.

Flowers. June-July.

Fruits. August-September.

Specimens. Casuarina Bay and Pulokunio,

Thothathri & Banerjee 11559 (CAL); 20 km North-South Road, *Balakrishnan* 3829 (PBL, CAL, L); 25 km East-West Road, near Galathea river, *Balakrishnan* 5797 (PBL); Pulo Kunyi, *Hore* 8260 (PBL); Pygmalion Point, littoral forest, *Hore* 8835 (PBL).

Distribution. Peninsular India, NE India, Burma, Malaysia, Singapore, Java and Sri Lanka.

7. *Cymbidium pubescens* Lindl. in Edw. Bot. Reg. 26 : Misc. 75, 27, t. 38. 1841; Hook. f. Fl. Brit. India 6 : 11. 1890.

Epiphyte; inflorescence racemose, c. 15 cm; stalk arising from rootstock, few flowered; flowers brownish red; perianth with yellow margins; lip with yellow spot at middle on disc. An ornamental orchid, suitable for cultivation; rare in shaded places in inland forests.

Flowers. August-September.

Fruits. Unknown.

Specimens. Campbell Bay, *Balakrishnan* 2799 (PBL, CAL).

Distribution. Great Nicobar Island, Burma, Thailand, Malaya, Singapore and Indonesia.

8. *Dendrobium anceps* Sw. in Vet. Act. Holm. 246. 1800.

Epiphytic slender herb; flowers from leaf axils, solitary or paired, white or creamy yellow; lip yellowish inside. Common in inland mixed or evergreen forests.

Flowers. June-December.

Fruits. Not known.

Specimens. Campbell Bay, *Balakrishnan* 2948 (PBL, CAL); 30 km on East-West Road, *Balakrishnan* 4012 (PBL, CAL); Campbell Bay to Chengappa Bay, *Balakrishnan* 5696 (PBL, CAL); 26 km on East-West Road, *N. G. Nair* 7189 (PBL, CAL); Chingenh, *Hore* 8850 (PBL).

Distribution. NE. India, Burma, Thailand and Indo-China.

9. **Dendrobium crumenatum** Sw. in Schrad. J. Bot, 2 : 237. 1799.

Epiphyte, often leafless when in flowers, pseudobulb 20-45 cm; flowers from naked nodes, solitary, white, sweet-scented. Scattered along coastal and inland forests in shaded places. An ornamental herb, popularly known as 'Pigeon Orchid', can be cultivated in gardens.

Flowers. April-August.

Fruits. Unknown.

Specimens. Campbell Bay, *Balakrishnan* 2933 (PBL); Kopenheat to Koshindon, *Balakrishnan* 4028 (PBL, CAL); 14-15 km on North-South Road, *Balakrishnan* 5845 (PBL); Galathea Bay, *Thothathri & Banerjee* 11480 (CAL); Campbell Bay, *Hore* 8820 (PBL).

Distribution. Sri Lanka, India, Burma, Indo-China, Taiwan, Malaya, Java and the Philippines.

10. **Dendrobium pensile** Ridl. in J. Linn. Soc. 32 : 253. 1896 et Fl. Mal. Pen. 4 : 40. 1924.

Epiphytic, drooping herb; leaves alternate; flowers axillary, small, white. Scarce in low-land forests near coastal areas.

Flowers. June-July.

Fruits. August-September.

Specimens. 15 km on North-South Road, *Balakrishnan* 6081 (PBL); 41 km on East-West Road, *Hore* 8235 (PBL).

Distribution. Nicobar Islands, Malaya and Singapore.

11. **Eria bractescens** Lindl. in Edw. Bot. Reg. 27. 1841, et Misc. 18: 30, t. 29. 1844.

Epiphyte; inflorescence in spikes, c. 10-13 cm long, showy; flowers white; lip with reddish lamellae on disc; column with red patches. Scattered in beach and inland forests. Ideal orchid for gardens as they can be easily cultivated.

Flowers. May-June.

Fruits. July-August.

Specimens. Galathea Bay, *Thothathri and Banerjee* 11466 (CAL); Great Nicobar Island, *Balakrishnan* 5627 (PBL, CAL).

Distribution. NE India, Andaman & Nicobar islands, Burma, Malaya, Singapore, Java and the Philippines.

12. **Eria bractescens** Lindl. var. **kurzii** Hook. f. Fl. Brit. India 5: 797. 1890.

Epiphyte; flowers white with pinkish brown lip. Mostly seen in beach forests associated with ferns; can be introduced into gardens.

Flowers. March-May.

Fruits. Unknown.

Specimens. Campbell Bay, *Thothathri & Banerjee* 11312 (CAL).

Distribution. Endemic to Andaman & Nicobar islands.

13. **Flickingeria fimbriata** (Bl.) Hawkes in Orch. Weekly 2, 46 : 454. 1961. *Desmotricum fimbriatum* Bl. Bijdr. 329. 1825.

Epiphyte; flowers solitary from leaf axils; petals and sepals creamy white or white; lip fringed with purple or brown-red spots on up-curved lateral lobes. Scarce along mixed low-land forests. Prolonged flowering plant suitable for introduction into gardens.

Flowers. June-December.

Fruits. Unknown.

Specimens. Pulo babi, *Sahni* 23018 (DD); Near Kopenheat, *Balakrishnan* 3904 (PBL, CAL); 25 km on East-West Road, *Balakrishnan* 5789 (PBL); 31 km on East-West Road, *Hore* 8232 (PBL).

Distribution. India, Sri Lanka, Malaya, Java and the Philippines.

14. **Goodyera procera** (Ker-Gawl.) Hook. f. in Exot. Fl. 1 : 3, t. 39. 1823 et Fl. Brit. India 6 : 111. 1890. *Neottia procera* Ker-Gawl. in Bot. Reg. 8 : t. 639. 1822.

Terrestrial, erect herb, c. 0.2-0.3 m, inflorescence a terminal spike; flowers greenish-white, fragrant. Popularly known as 'Rattle snake'

Orchid. Seen along rocky, shaded, stream-sides in humid places; very rare in the island.

Flowers. May-June.

Fruits. July-August.

Specimens. Navy Dera, *Hore* 7592 (PBL).

Distribution. India, Sri Lanka, Burma, Indo-China, Malaya, Java, the Philippines, Taiwan and Japan.

15. *Hetaeria obliqua* Bl. in coll. Orch. Arch. Ind. 104, t. 34, f. 1. 1858.

Terrestrial orchid, c. 1 m high; flowers in terminal spikes; petals creamy; column yellow. Rare in inland forests on shaded humus covered forest floors.

Flowers. March-April.

Fruits. Unknown.

Specimens. Campbell Bay, *Thothathri* & *Banerjee* 11416 (CAL); Casuarina Bay, *Thothathri* & *Banerjee* 11566 (CAL).

Distribution. Nicobar Islands, Malaya and Indonesia.

16. *Hetaeria oblongifolia* (Bl.) Bl. in Coll. Orch. Arch. Ind. 102, t. 32. 1858. *Etaeria oblongifolia* Bl. Bijdr. 410, f. 14. 1825.

Terrestrial herb, c. 0.5 m erect; flowers in terminal spike, whitish yellow; dried fruits brown. Rare in low hilly moist forest floor.

Flowers. March-April.

Fruits. May onwards.

Specimen: Laful forest, *Hore* 7782 (PBL).

Distribution: Nicobar Islands, Bangladesh, Burma, Thailand, Malaya, Java, the Philippines, New Guinea and Australia.

17. *Luisia teretifolia* Guad. in Freyc. Voy. Uranie et Physic. Bot. 427, t. 37. 1829.

Crowded epiphyte without pseudobulb, rigid, terete; leaves terete; flowers small, few in axillary spikes, short peduncled, purplish green; fruits pale greenish yellow. Scarce along low inland forests.

Flowers. May-June.

Fruits. July.

Specimens. Kopenheat to Koshindon, *Balakrishnan* 4031 (PBL, CAL); 4 km on East-West road, *R. P. Dwivedi* 8507 (PBL).

Distribution. Sri Lanka, Peninsular India, NE. India, China, Burma, Malaysia, Indonesia, the Philippines and New Caledonia.

18. *Nervilia punctata* (Bl.) Makino in Bot. Mag. Tokyo 16 : 199. 1902. *Pogonia punctata* Bl. Mus. Bot. Lugd.-Bat. 1 : 32, 1849.

Terrestrial, rhizomatous herb, c. 11 cm; leaf solitary, simple, palmate, slightly reddish, purple beneath; flowers pale yellowish green with a few scattered purplish spots inside. Scarce in inland hill forests, prefers shade and grows well on humus covered soil. A plant suitable for pot culture. Used as medicine in Asiatic tropics.

Flowers. April-May.

Fruits. Unknown.

Specimens. Campbell Bay to Chengappa Bay, *Balakrishnan* 5709 (PBL, CAL); Near Shompen hut, 36.8 km on East-West Road, *Balakrishnan* 5817 (PBL, CAL).

Distribution. Great Nicobar Island, Thailand, Malaysia and Indonesia.

19. *Phalaenopsis speciosa* Reichb. f. in Gard. Chron. n.s. 15 : 562 1881; Hook. f. Fl. Brit. India 6: 30. 1890.

Epiphyte with long aerial roots, inflorescence stalk c. 15-30 cm; peduncle 2.5-3 cm long; flowers spreading, c. 3-3.5 × 4-4.5 cm; lip with deep purple or reddish tinge. Scarce in deep interior of inland forest. Flowers longlasting and useful in cut-flower trade. Conservation in botanic gardens is necessary as the wild population is restricted and endangered and threatened with extinction.

Flowers. May-August.

Fruits. Unknown.

Specimens. Laful forest, *Hore* 7767 (PBL).

Distribution. Endemic to Andaman & Nicobar islands.

20. **Phalaenopsis speciosa** Reichb. f. var. **tetraspis** (Reichb. f.) Sweet in Amer. Orch. Soc. Bull. 37: 1092. 1968. *Phalaenopsis tetraspis* Reichb. f., Xenia Orchid. 2: 146. 1868; Hook. f. Fl. Brit. India 6: 30. 1890.

Epiphyte; inflorescence stalk c. 12-40 cm, long; flowers in spikes, white reddish transverse patches inside; lip yellowish, hairy. Rare and rather uncommon in dense inland forests. Flowers longlasting, hence suitable for cultivation in gardens.

Flowers. May-November.

Fruits. Not known.

Specimens. 17 km towards East-West Road, P. Chakraborty 3212 (PBL, CAL, AMES); Navy Dera, Hore 7289 (PBL).

Distribution. Andaman & Nicobar islands and Java.

21. **Pholidota pallida** Lindl. in Bot. Reg. sub. t. 1777. 1836.

Epiphyte, pseudobulb oblong; inflorescence in spike, longer than leaf length; flowers white. Rare in beach and littoral forests.

Flowers. August-October.

Fruits. November-December.

Specimens. Way to Chengappa Bay, Thothathri & Banerjee 11437 (CAL); Campbell Bay, Balakrishnan 3028 (PBL, CAL, L); Baludera, Hore 6763 (PBL, CAL); Dogmar river bank, Hore 7972 (PBL).

Distribution. Andaman and Nicobar island, Burma, Indo-China, Malaya, Java, the Philippines and Australia.

22. **Plocoglottis javanica** Bl. Bijdr. t. 21. 1825; Hook. f. Fl. Brit. India 6: 22. 1890.

Terrestrial, slender or erect herb, c. 60 cm; leaves arising from rootstock; petioles c. 20 cm long; inflorescence longer than leaves; peduncle reddish green; flowers pale yellow

or white with purple or red spots inside. Sparsely distributed in shaded humus covered forest floor in dense inland forests.

Flowers. July-November.

Fruits. Unknown.

Specimens. 35 km on East-West Road, Balakrishnan 3989 (PBL, CAL); Laful to Navy Dera, Hore 7743 (PBL).

Distribution. Great Nicobar Island, Burma, Thailand, Malaya, Sumatra and Java.

23. **Podochilus microphyllus** Lindl. Gen. Sp. Orch. 234. 1835; Hook. f. Fl. Brit. India 6: 81. 1890.

Epiphyte; flowers solitary, terminal, white with a combination of purple lines on each sepal and purple patches at the centre of petals. Few or scattered in shaded inland forests and edges of forests.

Flowers. December.

Fruits. July.

Specimens. 35 km on East-West Road, Balakrishnan 3892 (PBL, CAL); 30 km on East-West Road, N. G. Nair 7204 (PBL).

Distribution. Great Nicobar Island, Burma, Thailand, Malaya, Sumatra and Java.

24. **Pomatocalpa andamanicum** (Hook. f.) J. J. Smith in Nat. Tijdschr. Ned. Ind. 72: 103. 1912. *Cleisostoma andamanicum* Hook. f. Fl. Brit. India 6: 71. 1890.

Epiphyte; flowers white; fruits green. Rare in Great Nicobar Island, found in beach forests.

Flowers. March-May.

Fruits. April onwards.

Specimens. Campbell Bay, Thothathri & Banerjee 11313 (CAL); Campbell Bay, Balakrishnan 2937 (PBL, CAL, L).

Distribution. Endemic to Andaman & Nicobar Islands.

25. **Pomatocalpa wendlandorum** (Reichb. f.) J. J. Smith in Nat. Tijdschr. Ned. Ind. 72: 108. 1912. *Cleisostoma wendlandorum* Reichb.

f. in Otto & Dietr. Allgemein. Gartenz. 24: 219. 1856; Hook. f. Fl. Brit. India 6: 74. 1890.

Epiphyte; inflorescence 5-10 cm, arising from root axils; flowers in racemes, creamy yellow with pinkish-brown striations; fruits green. Frequent in beach forests. Can be cultivated in gardens.

Flowers. March-April.

Fruits. May onwards.

Specimens. Way to Chengappa Bay from Campbell Bay, *Thothathri & Banerjee* 11436 (CAL); Laful, *Hore* 7590 (PBL, CAL).

Distribution. Andaman and Nicobar islands, Assam and Burma.

26. *Pteroceras berkeleyi* (Reichb. f.) Holtt. in Kew Bull. 14 (2): 269. 1960; *Thrixspermum berkeleyi* Reichb. f. in Gard. Chron. ser. 2, 17: 557. 1882.

Epiphyte; inflorescence axillary racemes, 17-20 cm long, somewhat pendulous; peduncles 2-2.5 cm; flowers white, delicate; fruits c. 14 cm long, needle-like. Rare in dense inland humid forests. This orchid with attractive flowers is suitable for cultivation in gardens.

Flowers & Fruits. May-June.

Specimens. Laful, *Hore* 8722 (PBL).

Distribution. Andaman and Nicobar islands and Malaya.

27. *Spathoglottis plicata* Bl. Bijdr. 401, t. 76. 1825.

Terrestrial, erect herb, c. 60-100 cm high; inflorescence stalk directly arising from the rootstock and about double the length of the leaves; flowers pink, velvety purple or reddish, crowded at apex, fruits oblong. Open sunny hillslopes, at 25-200 m altitude; frequently seen in large populations. Very easily cultivable and suitable for gardens.

Flowers & Fruits. June-November.

Specimens. 12 km on East-West Road, *P. Chakraborty* 3214 (PBL); 36 km East-West

Road, *Balakrishnan* 3957 (PBL); 33 km East-West Road, *Balakrishnan* 5741 (PBL, CAL); 27 km East-West Road, *Hore* 6770 (PBL, CAL); 39 km East-West Road, *Hore* 8207 (PBL).

Distribution. Andaman and Nicobar Islands, Thailand, Cambodia, Vietnam, Taiwan, Malaya, Java, the Philippines and New Guinea.

28. *Thelasis pygmaea* Lindl. in J. Linn. Soc. 3: 63. 1859; Hook. f. Fl. Brit. India 6: 86. 1890; Yoganarasimhan *et al.* in Curr. Sci. 50: 284, 1981.

Small epiphyte; flowers small, crowded, pale green. Rare in roadside forests and edges of forests.

Flowers. April-May.

Fruits. Not known.

Specimens: North-South Road, near Campbell Bay, *Simhan et al.* 659 (RRCBI).

Distribution. NE India, Sikkim, Nicobar Islands, Nepal and Burma.

29. *Thrixspermum hystrix* (Bl.) Reichb. f. in Trans. Linn. Soc. 30: 14. 1874. *Dendrocolla hystrix* Bl. Bijdr. 291. 1825.

Epiphyte; inflorescence arising directly from leaf axils; stalk 4-6 cm long; flowers yellow; fruits 6.5-8 cm long, pointed at both ends. Rare in dense inland forests.

Flowers. May-June.

Fruits. July-August.

Specimens. Laful, *Hore* 8782 (PBL).

Distribution. Andaman and Nicobar islands, Burma, Thailand, Malaya, Sumatra, Java and Borneo.

30. *Trichoglottis cirrhifera* Teysm. & Binn. in Nat. Tijdschr. Ned. 493. 1853.

Epiphyte; flowers solitary, axillary; sepals and petals pinkish brown but labellum white with 2-lilac spots. Rare in beach forests.

Flowers. March.

Fruits. Not known.

Specimens. Campbell Bay, *Thothathri* & *Banerjee* 11307 (CAL).

Distribution. Nicobar Islands, Thailand, Malaya and Java.

31. *Trichoglottis orchidea* (Koenig) Garay in Bot. Mus. Leaf. Harvard Univ. 23(4): 209. 1972. *Epidendrum orchideum* Koenig in Retz. Observ. Bot. 6: 48. 1791.

Epiphyte, pendulous; flowers solitary arising from a little above of the leaf; flowers c. 1.5 cm long; sepals and petals reddish orange; lip white with pink spots at middle; spur white. Frequent in shaded inland forests; can be cultivated in greenhouses.

Flowers. August-February.

Fruits. Not known.

Specimens. Campbell Bay, *Balakrishnan* 2912 (PBL, CAL); 41 km on East-West Road, *R. P. Dwivedi* 7870 (PBL).

Distribution. Peninsular India, Nicobar Islands and Malaya.

32. *Vanilla andamanica* Rolfe in Kew Bull. 237. 1918.

Climber; leaves 15-20 × 3.5-4.5 cm, opposite, acuminate; capsule 15 × 2.5 cm, green. Common in shaded places in inland forests. The capsules can be used for extraction of *Vanilla* essence if properly cured; potentially useful for cultivation.

Flowers. April-June.

Fruits. July-August.

Specimens. 20 km on North-South Road, *Balakrishnan* 3833 (PBL, CAL, L)

Distribution. Endemic to Andaman and Nicobar Islands.

33. *Vrydagzynea albida* (Bl.) Bl. in Orch. Arch. Ind. 75, t. 19. f. 2. 1858; Hook. f. Fl. Brit. India 6: 97. 1890.

Etaeria albida Bl. Bijdr. 410. 1825.

Terrestrial, decumbent herb, c. 20 cm; leaves alternate; flowers terminal and condensed to-

gether, white. Rare along shaded streamsides on clayey loam.

Flowers. July-August.

Fruits. September-October.

Specimens. 37 km on East-West Road, on Path to Shompen village, *Balakrishnan* 3979/1 (PBL).

Distribution. Great Nicobar Islands, Bangladesh, Burma, Thailand, Vietnam, Malaysia, Indonesia and the Philippines.

PHYTOGEOGRAPHY

The phytogeographical relationship of the flora of Great Nicobar Island was not sufficiently known to the botanical world. The conjecture of Jacobs (1978), that the flora may be closely related to the Sumatran flora, is now found to be true. Based on the Orchids we find that the floristic affinities of the island are predominantly Indonesian and Malaysian and to some extent related to Burmese-Thailand elements. From the geographic situation of the island, the Malaysian and Indonesian elements are certainly to be expected in its flora.

Rapid accumulation of data regarding the orchid elements in this island and those of adjacent regions or countries greatly help us for a better understanding of the phytogeography of individual genera and species. It is now known that some genera are highly developed in distant regions but have single or a few representatives in the Malaysian region. Thus, *Cleisostoma uraiensis* earlier reported only from the Philippines, Taiwan and Formosa, is now found in fairly good populations in this island.

The orchids of Nicobar Islands show closer affinities with the Indonesian rather than Burmese-Andamanese elements. A few endemic species like *Eria bractescens* var. *kurzii*, *Phalaenopsis speciosa*, *P. speciosa* var. *tetraspis*,

Pomatocalpa andamanicum, *Pteroceras berkeleyi* and *Vanilla andamanica* occur both in Andaman and Nicobar group of islands. While *Aerides emericii* is restricted to the Nicobar group of island. *Anoectochilus nicobaricus* is restricted to the Great Nicobar island only.

Representatives of even more widely distributed species such as *Corymborkis veratrifolia*, *Dendrobium crumenatum*, *Goodyera procera*, *Luisia teretifolia*, *Pholidota pallida* and *Vrydagzynea albida* which extends up to Sri Lanka and peninsular India occur in this island. Some of these reach even the Himalayan regions also. *Spathoglottis plicata* is distributed almost throughout Malaysia, but does not extend northwards beyond Tenasserim in Burma. *Thelasis pygmaea*, a Himalayan species has been recently discovered from this island.

Except for *Spathoglottis plicata* (up to 100 m altitude), there is no altitudinal restriction for orchid habitats in the island. *Phalaenopsis speciosa* prefers a rather humid climate.

CONSERVATION

The conservation of threatened species serves the positive purposes of providing genetic reservoirs, making significant contributions to modern agriculture, horticulture, pharmaceuticals and industrial processes in all parts of the world.

Human activities threaten some species and habitats more than others. As man's number increases and as each generation becomes more demanding, his environment and plant heritage will be affected. In this process man finds himself creating inexorable changes. In case of orchids, Beckner (1979) estimated that a possible 200 billion orchid plants are being destroyed every year due to human activities either through agricultural land clearing around

the world, or collection for horticultural trade. Naturally, the need for conservation of orchid species is of paramount importance today. Many articles have been written (Ayensu 1975, Hunt 1968, Melville 1971, Peterson 1974, Pradhan, M. G. 1974, Pradhan, U. C. 1975), expressing intense concern and awareness of the orchid conservation problems. As a major step on conservation strategy and its execution and regulation of trade in wild orchids, the criteria discussed by Ayensu & Defilipps (1981) are worth following.

Though the Great Nicobar Island is small with an area of about 1045 sq. km, there exists many valuable wild orchids in the primary forests, occupying about 85% of the land area. At present only about 40% of the land area has been botanically explored and this itself yielded about 33 orchid taxa so far. No doubt more species would be collected when the unexplored areas are intensively surveyed.

Despite our limited knowledge about the genetic reservoirs, it is a certainty that this island contains germ-plasm materials of many wild relatives of cultivated species in localized pockets. Hence their conservation *in situ* is indispensable and simultaneously it is necessary to ascertain frequently their protection status also. The primary objective of a rational conservation policy is to preserve viable population of as many species as possible that inhabit the pristine primary forests. To achieve this the following steps are suggested :

- 1) To preserve and protect a large area, rather than only small pockets of habitats. This is easy because three fourths of the forest area of the island is still virgin. It should be effectively buffered against human onslaught and natural disasters. For this a large area of primary virgin forests should be declared as Biosphere reserve with sufficient buffer zone around.

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- 2) To check the growth of human population by putting a complete stop on any further settlement on the island.
 - 3) To maintain in botanic gardens, species suggested for ornamental propagation along with their range of genetic diversity is necessary. This is extremely important as emphasized by Schöser (1977).
 - 4) To conduct field research and data collection on pollination biology of orchid species is another interesting aspect which can be done successfully only in this undisturbed wild conditions.
- Only through this, it would be possible to save the rare valuable species of orchids of Great Nicobar Island.

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