

AN ENUMERATION TO THE ORCHIDS AND THEIR CONSERVATION STATUS IN GREATER SYLHET, BANGLADESH

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Abstract

The present investigation deals with enumeration including diversity, ecology and conservation of the family Orchidaceae of greater Sylhet region of Bangladesh. Extensive field trips were made at 11 different sites of this region during early monsoon, late monsoon and winter seasons. Relevant literature and different herbaria were consulted to gather information about the orchids of this region. Orchidaceae is represented in greater Sylhet by 75 species under 49 genera. Out of these, 25 species are terrestrial, 48 are epiphytic, one is saprophytic and one is hemiepiphytic. Presence of 37 monotypic genera indicates a narrow diversity in Orchidaceae of this area. The present investigation revealed that 26 orchid species are restricted and distributed only in Sylhet region in Bangladesh. The currently accepted taxonomic nomenclature, synonyms, habit, flowering time, present conservation status and geographical distribution are provided under each taxon.

Introduction

Orchidaceae is one of the largest flowering plant families, represented by about 1000 genera and 20,000 species with cosmopolitan distribution, primarily in the tropics and rarely in arctic regions (Chowdhery, 1998). A preliminary checklist of family Orchidaceae for Bangladesh was made by Huda *et al.* (1999) with an enumeration of 160 species and 2 varieties under 63 genera for Bangladesh. Of them, 106 taxa were epiphytic and remaining 56 were terrestrial. Huda *et al.* (2001) added some new records for the family of Orchidaceae from Bangladesh. The distribution of terrestrial orchids in Bangladesh was compiled as a check list mainly on the basis of previous records, literature survey and herbarium collections (Khanam *et al.*, 2001).

Diversity and ecology of the orchids in the south-eastern part of Bangladesh have also been studied by Huda (2000). Earlier reports indicate that Sylhet region was rich in orchid diversity (Hooker 1890a, b; Prain, 1903). Some research works on orchids from Bangladesh were done sporadically, *viz.* Huda *et al.* (1999), Huda (2000, 2008, 2008a), Ahmed and Pasha (1993, 1993a, 1994, 1998, 1998a, 1998b, 1999) as part of their floral exploration but focus has not been given to the diversity and ecology of orchids of Sylhet region. Valuable herbarium specimens of orchids from the greater Sylhet regions, collected by many taxonomists of Bangladesh are housed at the different herbaria of Bangladesh, *viz.* Bangladesh National Herbarium (DACB), Dhaka University Salar Khan Herbarium (DUSH), Herbarium of Chittagong University (HCU), Herbarium of Bangladesh Forest Research Institute (HBFRI) and Herbarium of BCSIR laboratory (HBCSIR). The present study was, therefore, undertaken with a view to examine the previous specimens and relevant literatures, and also to conduct field investigation for collecting specimens of the family occurring in the area, particularly in the greater Sylhet region mainly in the forest areas of Sylhet,

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Moulavi Bazar, Sunamganj and Habiganj of Bangladesh for a taxonomic treatment of the family Orchidaceae.

Materials and Methods

Study area

The floristic study of the family Orchidaceae was conducted from July 2006 to January 2010 in Lawachara National Park, Madhabkunda Eco-Park, Bangladesh Tea Research Institute (BTRI) Campus in Moulvi Bazar; Rema-Kalenga Wildlife Sanctuary and Satchari National Park in Habiganj; Jaflong, Tamabil, Sripur, Jaintapur, Tilagarh forest beat in Sylhet district and Sadar of Sunamganj district. Eleven different sites in four districts of greater Sylhet region were visited to study the diversity and ecology of orchids.

Collection of specimens

Orchid specimens with detailed information were collected both in the flowering and non-flowering stage from the study area through eight field trips each consisting of 4 to 5 days in early monsoon (March to May), monsoon (June to July), late monsoon (August to October) and winter (November to February).

Herbarium and literature survey

Both living and herbarium specimens were examined and studied carefully at the Herbarium of Chittagong University (HCU). Herbarium specimens of orchids collected in the present study were studied and matched with herbarium specimens available at DACB, DUSH, HBFRI, HBCSIR, and HCU. Local orchid experts were consulted to identify some specimens and to confirm some critical specimens. In order to compare the description, nomenclature and geographical distribution and uses, Roxburgh (1814, 1832) Hooker (1890a, b), Prain (1903), Heinig (1925), Bruhl (1926), Sinclair (1956), Abraham and Vatsala (1981), Joseph (1987) and Huda (2000) were consulted.

Abundance status was measured based on observation, availability of the species in the field, herbarium specimen preserved at DACB, DUSH, HCU and HBFRI and literature survey following Misra (2000) and Rao (1998). Categories for Abundance status based on their availability are mentioned as Specimen deficient (no collection or herbarium specimen is available in any herbarium of Bangladesh), Rare (only one herbarium specimen found but no further collection made after record), Scarce (one or two herbarium specimens available and collected once or twice after record), Occasional (few herbarium specimens available and collected from one or few localities from other parts of Bangladesh also), and Common (usually occur in the different areas of greater Sylhet and other parts of Bangladesh).

Taxonomic enumeration to the species

The present study identified 75 species belonging to 49 genera of Orchidaceae in the greater Sylhet region. Enumeration is presented below alphabetically. An asterisk (*) at the beginning of the species name indicates its occurrence from the greater Sylhet region only, on the other hand, another asterisk (*) used at the end of synonym in the enumeration to indicate that it is the first recorded name, if applicable. Flowering time (Fl.) of the species is presented numerically from 1 to 12 for January to December, respectively. Categories of Abundance status follows the flowering time.

1. **Acampe papillosa** (Lindl.) Lindl., *Fol. Orchid.* 2 (1853). *Saccolabium papillosum* Lindl. (1841); *Gastrochilus papillosus* (Lindl.) O. Kuntze (1891). Reported by its synonym from Chittagong and the Sundarbans by Prain (1903). Epiphytic. *Fl.*: 8–9. Common. *Distribution*: India

and Bangladesh (Chittagong, Cox's Bazar, Bandarban, Rangamati, Khagrachari and greater Sylhet). *Specimen examined*: Habiganj: Rema-Kalenga; 25.02.2007, M. Islam 01 (HCU).

2. ***Acanthephippium sylhetense** Lindl., Gen. Sp. Orchid. Pl.: 177 (1833). Reported from Sylhet by Hooker (1890a). Terrestrial. *Fl.*: 4–5. Specimen deficient. *Distribution*: China, Fiji Island, India and Bangladesh (Sylhet).

3. **Aerides crispa** Lindl., Gen. Sp. Orchid. : 239 (1833). *Aerides lindleyana* Wight, *Ic.* t. 1677. (1851). Reported by Ahmed *et al.* (1989). Epiphytic. *Fl.*: 3–5. Rare. *Distribution*: Southern India to Myanmar, Bangladesh (Chittagong and Sylhet). *Specimen examined*: Sylhet: Lama Bazar; 21.3.1988, M. Ahmed 122 (HCU).

4. **Aerides multiflorum** Roxb., Pl. Cor. 3: 68, t. 271 (1820). *Aerides affine* Lindl. (1833); *Aerides multiflora* var. *dactyloides* Mokter *et al.* (1989). Roxburgh (1832) reported from Sylhet. Epiphytic. *Fl.*: 5–6. Occasional. *Distribution*: India, Malaysia, Philippines, Thailand and Bangladesh (Cox's Bazar, Rangamati and Sylhet). *Specimen examined*: Sylhet: Lama Bazar (Near college road); 21.03. 1986, M. Ahmed, 97 (HCU).

5. **Aerides odoratum** Lour., Fl. Cochinch. 2: 525 (1790). *Aerides cornutum* Roxb. (1832). Reported by its synonym from Dhaka by Roxburgh (1832). Epiphytic. *Fl.*: 5–6. Common. *Distribution*: China, India, Malaysia, Myanmar, Nepal and Bangladesh (distributed in most of the areas of south-east part of Bangladesh and greater part of Sylhet). *Specimens examined*: Sylhet: Jainta bazar; 10.10.81; Moyeen 70 (HCU); Lawachara; 27. 02. 07, M. Islam and M. K. Huda 11 (HCU).

6. ***Aerides suavissima** Lindl. N. Journ. Hort. Soc. Iv. : 263 (1858). Hooker, f. (1890b) reported from Sylhet. Epiphytic. *Fl.*: 5–6. Rare. *Distribution*: Malaysia, Myanmar and Bangladesh (Sylhet). *Specimen examined*: Sylhet: Tamabil; 23.03.86, M. Ahmed 130 (HCU).

7. **Agrostophyllum khasianum** Griff. Calcutta J. Nat. Hist. 4: 376, t. 19. (1844). *Appendicula hasseltii* Wight. (1851). Reported from Sylhet by Ahmed *et al.* (1989a). Epiphytic. *Fl.*: 4-5. Scarce. *Distribution*: India and Bangladesh (Cox' Bazar and Sylhet). *Specimen examined*: Sunamganj: Bagan bari, Sadar; 25.4.1986, M. Ahmed 116 (HCU).

8. ***Anaectochilus roxburghii** (Wall.) Lindl., Gen. Sp. Orchid. Pl.: 499 (1840). *Chrysobaphus roxburghii* Wall. (1826); *Anaectochilus yungianus* Hu (1971); *Zeuxine roxburghii* (Lindl.) Hiroe (1971). Lindley (1830–40) reported it from Sylhet. Terrestrial. *Fl.*: 4–6. Specimen deficient. *Distribution*: Bhutan, China, India, Laos, Thailand, Vietnam and Bangladesh (Sylhet).

9. **Arundina graminifolia** (D. Don) Hochr. in Bull. New York Bot. Gard. 6: 270 (1910). *Blettia graminifolia* D. Don (1825); *Limodorum graminifolia* Buch.-Ham. ex D. Don (1825); *Arundina bambusifolia* Lindl. (1830); *Cymbidium bambusifolium* Roxb. (1832). Reported from Chittagong by Roxburgh (1814, 1832). Terrestrial. *Fl.*: 12–3. Occasional. *Distribution*: China, India, Malaysia, Myanmar, Philippines, Sri Lanka and Bangladesh (Bandarban, Chittagong, Cox's Bazar, Khagrachari, Rangamati and Sylhet). *Specimen examined*: Dhaka: 07.09. 46, S. K. Sen (DUSH).

10. **Brachycorythis helferi** (Rchb. f.) Summerh. in Kew Bull. 1955: 235 (1955). *Gymnadenia helferi* Rchb. f. (1872); *Habenaria helferi* (Rchb. f.) Hook. f. (1890b). Terrestrial. *Fl.*: 8–9. Scarce. *Distribution*: India, Myanmar and Bangladesh (Bandarban and Sylhet). Uddin *et al.* (2000) reported it from Habiganj. *Specimen examined*: Bandarban: Chimbuk hills, 08. 09. 99, M.A. Rahman *et al.* 5744c (HCU).

11. **Bulbophyllum lilacinum** Ridl. in J. Linn. Soc. 32: 276 (1896). Epiphytic. *Fl.*: 10–11. Common. *Distribution*: India, Malaya Peninsula and Bangladesh throughout Cox's Bazar district (Khan and Halim, 1987) and Sylhet. *Specimen examined*: Sylhet: Tamabil, 12. 06. 07, M. Islam 02 (HCU).
12. ***Calanthe densiflora** Lindl., Gen. Sp. Orchid. Pl.: 250 (1833). *Alimorchis densiflora* (Lindl.) Kuntze (1891); *Calanthe kazuoi* Yamamoto (1930). Reported from Sylhet by Lindley (1830–40). Terrestrial. *Fl.*: 10–12. Specimen deficient. *Distribution*: Bhutan, China, India, Japan, Nepal, Vietnam and Bangladesh (Sylhet).
13. ***Calanthe puberula** Lindl., Gen. Sp. Orchid. Pl.: 252 (1833). *Alismorchis puberula* (Lindl.) Kuntze (1891); *Calanthe amoena* Smith (1921); *C. lepida* Smith (1921). Lindley (1830–40) reported from Sylhet. Terrestrial. *Fl.*: 10–12. Specimen deficient. *Distribution*: Bhutan, China, India, Myanmar, Taiwan, Vietnam and Bangladesh (Sylhet).
14. **Cephalantheropsis gracilis** (Lindl.) S. Y. Hu. in Quart. J. Taiwan Mus. 25 (3–4): 213 (1972). *Calanthe gracilis** Lindl. (1833). Terrestrial. *Fl.*: 10. Rare. *Distribution*: India and Bangladesh (Bandarban and Sylhet). Lindley (1830–40) reported from Sylhet by synonym. *Specimen examined*: Bandarban: Teracha mukh; 09. 09. 99, M. A. Rahman *et al.* 5787a (HCU).
15. **Cleisostoma subulatum** Blume, Bijdr. : 363 (1825). *Sarcanthus secundus** Griff. (1851); *Sarcanthus subulatus* (Blume) Rchb. f. (1857); *Saccolabium secundum* (Griff.) Ridl. (1907). Reported by its synonym from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 8. Rare. *Distribution*: Bhutan, Cambodia, India, Malaysia, Myanmar, Philippines, Thailand and Bangladesh (Chittagong and Sylhet) No specimen examined.
16. **Coelogyne cristata** Lindl., Coll. Bot. : t. 33 (1821). *Cymbidium speciosissimum* Don (1825). Hooker (1890b) reported it from Sylhet. Epiphytic. *Fl.*: 3–4. Rare. *Distribution*: Bhutan, India, Nepal and Bangladesh (Cox's Bazar and Sylhet).
17. ***Coelogyne punctulata** Lindl., Coll. Bot.: sub t. 33 (1821). *Cymbidium nitidum** *sensu* Roxb. (1814). *Coelogyne ocellata* Lindl. (1830); *C. goweri* Rchb. f. (1869); *C. nitida sensu* (Roxb.) Hook. f. (1890b). Reported by its synonym from Sylhet by Roxburgh (1832). Epiphytic. *Fl.*: 3–4. Specimen deficient. *Distribution*: Bhutan, India, Myanmar, China, Nepal and Bangladesh (Sylhet).
18. **Cymbidium aloifolium** (L.) Sw. in Nov. Act. Soc. Upsal. 6: 73 (1799). *Epidendrum aloifolium* L. (1753); *Epidendrum pendulum* Roxb. (1795); *Cymbidium bicolor* Lindl. (1833); *Cymbidium erectum* Wight (1851). Reported from Chittagong by Heinig (1925). Epiphytic. *Fl.*: 4–6. Common. *Distribution*: India, Myanmar to Java, Sri Lanka and Bangladesh (Commonly distributed in Chittagong, Chittagong Hill Tracts, Sylhet and Cox's Bazar). *Specimen examined*: Habiganj: Rema-Kalenga National Forest, 25. 02. 07, M. Islam 03 (HCU).
19. **Dendrobium amoenum** Wall in Lindl., Gen. Sp. Orchid. Pl.: 78 (1830). *Dendrobium egertoniae* Lindl. (1847); *D. mesochlorum* Lindl. (1847); *D. amoena* (Wall. *ex* Lindl.) Kuntze (1891). Hooker (1890b) reported it from Sylhet. Epiphytic. *Fl.*: 6. Rare. *Distribution*: India, Myanmar and Bangladesh (Sylhet). *Specimen examined*: Sylhet: Haripur, 08.07.1981, Moyeen 57 (HCU).
20. **Dendrobium aphyllum** (Roxb.) C.E.C. Fischer in Gamble, Fl. Pres. Madras 3: 1416 (1928). *Limodorum aphyllum* Roxb. (1795); *Dendrobium pierardi** Roxb. *ex* Hook. (1822); *D. aphyllum* var. *cucullatum* (Hook. f.) Sarkar (1984). Roxburgh (1832) reported it from Chittagong by synonym. Epiphytic. *Fl.*: 4–5. Common. *Distribution*: India, Myanmar and Bangladesh

(Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet). *Specimen examined*: Sylhet: Jaintapur; 12. 06. 07, M. Islam and M. K. Huda 12 (HCU).

21. ***Dendrobium chryseum** Rolfe in Gard. Chron. Ser. 3, 3: 233 (1888). *Dendrobium clavatum* Wall. ex Lindl. (1852); *Callista clavata* (Wall. ex Lindl.) Kuntze (1891); *Dendrobium tibeticum* Schltr. (1921); *D. clavatum* var. *aurantiacum* (Rchb. f.) Tang & Wang (1951). Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 6. Specimen deficient. *Distribution*: Bhutan, China, India, Myanmar, Nepal, Thailand, Vietnam and Bangladesh (Sylhet).

22. **Dendrobium fimbriatum** Hook., Exot. Fl. : t. 71 (1823). *Dendrobium paxtonii* Paxt. (1839); *D. fimbriatum* var. *oculatum* Hook. f. (1890b); *Callista oculata* (Hook.) Kuntze (1891). Reported from Chittagong by Prain (1903). Epiphytic. *Fl.*: 3–5. Rare. *Distribution*: India and Bangladesh (Chittagong Hill tracts, Cox's Bazar and Sylhet). *Specimen examined*: Sylhet: Jaintapur, 23.03.86, M. Ahmed 1000 (HCU).

23. **Dendrobium formosum** Roxb. ex Lindl. in Wall., Pl. Asiat. Rar. 1: 34, t. 29 (1830). *Dendrobium formosum* Roxb. (1814); *D. infundibulum sensu* Rchb. f. (1887); *Callista formosa* (Roxb. ex Lindl.) Kuntze (1891). Reported from Sylhet by Roxburgh (1832). Epiphytic. *Fl.*: 5. Rare. *Distribution*: Bhutan, India, Nepal and Bangladesh (Chittagong, Cox's Bazar and Sylhet). *Specimens examined*: Cox's Bazar: Ukhia, 07.05.84, D.K. Das and M.K. Alam 5015 (HBFRI); Ukhia, 08.08.81; Moyeen 63 (HCU). Sylhet: Tamabil, 19.05.1983, Mia 909 (DACB).

24. **Dendrobium lindleyi** Steud., Nomencl. Bot. ed. 2: 490 (1840). *Dendrobium aggregatum** Roxb. (1814); *Callista aggregata* (Roxb.) Kuntze (1891). Reported by its synonym from Cox's Bazar by Sinclair (1956) and from Sylhet by Uddin *et al.* (2002). Epiphytic. *Fl.*: 3–5. Occasional. *Distribution*: Bhutan, China, India, Laos, Myanmar, Thailand, Vietnam and Bangladesh (Chittagong Hill Tracts, Cox's Bazar and Sylhet). *Specimen examined*: Rangamati: Sitapahar, Kaptai, 08.01.95, Mezanul Hoque 7344 (HBFRI).

25. ***Dendrobium macrostachyum** Lindl., Gen. Sp. Orchid. Pl. : 78 (1830). *Dendrobium gamblei* King & Pantl. (1897). Reported from Sylhet by Hossain (2002). Epiphytic. *Fl.*: 5–6. Rare. *Distribution*: India, Sri Lanka and Bangladesh (Sylhet). *Specimen examined*: Sylhet: Near Forest School. 22.03.96, Ahmed 96 (HCU).

26. **Dendrobium moschatum** (Buch-Ham) Sw. in Schltr. Neim. J. Bot. 1: 943 (1805). *Dendrobium calceolaria* Carey ex Hook. f. (1825-26); *Epidendrum moschatum* Buch-Ham. (1800). Reported from Chittagong by Prain (1903). Epiphytic. *Fl.*: 5–7. Rare. *Distribution*: India and Bangladesh (Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet). *Specimen examined*: Sylhet: New Forest School; 13.03.56, M. S. Khan Collection number: not available (DUSH).

27. **Dendrobium parishii** Rchb. f. in Bot. Zeit. 21(31): 237 (1863). *Callista parishii* (Rchb. f.) Kuntze (1891). Epiphytic. *Fl.*: 3–5. Scarce. *Distribution*: India, Malaysia, Myanmar, Thailand and Bangladesh (Bandarban, Rangamati and Sylhet). *Specimens examined*: Rangamati: Naniarchar, 26.09.1998, M. K. Huda & S. B. Uddin 469 (HCU); Sylhet: Jaflong; 23.02.1986, M. Ahmed *sn* (HCU).

28. ***Dendrobium pulchellum** Roxb ex Lindl., Gen. Sp. Orchid. Pl.: 82 (1830). *Dendrobium pulchellum* Roxb. (1814); *D. dalhausianum* Wall. (1844); *Callista pulchella* (Roxb. ex Lindl.) Kuntze (1861). Reported from Sylhet by Roxburgh (1814, 1832). Epiphytic. *Fl.*: 2–4. Specimen deficient. *Distribution*: Bhutan, India and Bangladesh (Sylhet).

29. ***Dendrobium ruckeri** Lindl. in Bot. Reg. 29: t. 60, misc. 25, no. 38 (1843). *Dendrobium ramosum** sensu Lindl., Gen. & Sp. Orchid Pl : 82 (1830). Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: not known. Specimen deficient. *Distribution*: India and Bangladesh (Sylhet).
30. **Didymoplexis pallens** Griff., Calcutta J. Nat. Hist. 4: 383, t. 17 (1844). *Leucorchis sylvatica* Bl. (1849); *Arethusa ecristata* Griff. (1851); *Apetelon minutum* Wight (1852); *Gastrodia pallens* (Griff.) F. Mueller (1870); *Didymoplexis brevipes* Ohwi. (1937). Reported from Bengal by Hooker (1890b). Saprophytic. *Fl.*: 4–5. Scarce. *Distribution*: Afghanistan, Australia, Bhutan, India, Japan, Malaysia to Philippines, New Guinea, Thailand, and Bangladesh (Comilla, Dhaka, Gazipur, Panchagarh and Sylhet by Khanam *et al.*, 2001).
31. **Eria pubescens** (Hook. f.) Lindl. in Edw., Bot. Reg. 11: t. 904 (1825). *Dendrobium pubescens* Hook. f. (1890b); *Eria flava** Lindl. (1830). Reported by its synonym from Cox's Bazar by Ahmed *et al.* (1989b). Epiphytic. *Fl.*: 2–4. Scarce. *Distribution*: India and Bangladesh (Chittagong and Sylhet). *Specimens examined*: Sylhet: Jaflong, 22.03.1989, M. Ahmed and Pasha 135 (HCU); Tamabil, 12. 06. 07, M. Islam and M. K. Huda, 04 (HCU).
32. ***Erythrodes humilis** (Bl.) J. J. Smith, Bull. Dep. Agric. Indes Neerl. 13: 11 (1907). *Physurus humilis* Bl., Orch. Archip. Ind. 96: t. 27, f. 2 (1859); *Physurus blumei** Lindl. (1840). Reported by its synonym from Sylhet by Lindley (1830 - 40). Terrestrial. *Fl.*: 1–3. Specimen deficient. *Distribution*: Borneo, India, Java, Sri Lanka and Bangladesh (Sylhet).
33. **Gastrochilus calceolaris** (Buch-Ham. ex J. E. Smith) D. Don, Prodr. Fl. Nepal.: 32 (1852). *Aerides calceolaris* Buch.-Ham. ex J. E. Smith (1819); *Epidendrum calceolare* Buch.-Ham. (1825); *Sarcochilus nepalensis* Spreng. (1826); *Saccolabium calceolare** (Buch.-Ham. ex J. E. Smith) Lindl. (1833); *Aerides leopardium* Wall. ex Lindl. (1838); *A. leopardorum* Wall. (1890). Reported by its synonym from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 3–5. Specimen deficient. *Distribution*: Bhutan, China, India, Myanmar, Nepal, Thailand, Vietnam to Malaysia and Bangladesh (Cox's Bazar and Sylhet).
34. ***Gastrochilus inconspicuus** (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 661 (1891). *Saccolabium inconspicuus* Hook. f. (1890b); *Cymbidium inconspicuus* Wall. ex Hook. f. (1895); *Luisia inconspicua* Hook. f. (1898). Reported from Sylhet by Ahmed and Pasha (1998a). Epiphytic. *Fl.*: 6–7. Rare. *Distribution*: Bhutan, India, Nepal and Bangladesh (Sylhet). *Specimen examined*: Sylhet, 05.06.81, M. Ahmed *sn* (HCU).
35. **Geodorum densiflorum** (Lam.) Schltr. in Fedde, Repert. 4: 259 (1929). *Limodorum densiflorum* Lam. (1792); *Geodorum dilatatum** R. Br. (1813); *Geodorum purpureum* R. Br. (1813); *Limodorum candidum* Roxb. (1814). Reported by its synonym from Sylhet by Roxburgh (1814, 1832). Terrestrial. *Fl.*: 4. Occasional. *Distribution*: Australia, Bhutan, China, Fiji, India, Malaysia, Myanmar, New Guinea, Samoa, Solomon Island, Sri Lanka, Tonga and Bangladesh (Chittagong, Chittagong Hill tracts, Gazipur, Mymensingh, Tangail and Sylhet). *Specimens examined*: Rangamati: Kaptai, 30.08.99, M.A. Rahman *et al.* 5365 (HCU).
36. **Goodyera procera** (Wall. ex Ker-Gawl.) Hook. f., Exot. Fl. 1(3): t. 39 (1823). *Neottia procera* Wall. ex Ker-Gawl. (1822); *Goodyera carnea* A. Rich. (1841); *Epipactis procera* (Ker-Gawl.) Eaton (1908). Reported from Sylhet by Lindley (1830) Terrestrial. *Fl.*: 3–5. Occasional. *Distribution*: Bhutan, China, India, Japan, Malaysia, Myanmar, Sri Lanka, Taiwan, Philippines and Bangladesh (Chittagong, Cox's Bazar and Sylhet). *Specimen examined*: Bandarban: Ali Kadam; 30.05.98, M.A. Rahman *et al.* 2882b (HCU).

37. **Habenaria digitata** Lindl. Gen. Sp. Orchid. Pl.: 307 (1835). *Habenaria trinervia* Wight (1851); *H. graveolens* Duthie (1906). Hooker (1890b) reported it from Sylhet. Terrestrial. *Fl.*: 8–11. Specimen deficient. *Distribution*: India, Myanmar and Bangladesh (Chittagong and Sylhet).
38. **Hetaeria affinis** (Griff.) Seidenf. in Oasis, Suppl. 2: 9 (2001). *Goodyera affinis* Griff. (1851); *Cerochilus rubens* Lindl. (1854); *Rhamphidia rubens* (Lindl.) Lindl. (1857); *Hetaeria rubens** (Lindl.) Benth. ex Hook. f. (1890). Reported by its synonym from Chittagong by Bruhl (1926). Terrestrial. *Fl.*: 3–4. Scarce. *Distribution*: Bhutan, China, India, Myanmar, Thailand, Vietnam and Bangladesh (Chittagong, Mymensingh and Sylhet). *Specimen examined*: Moulvi Bazar: Lawachara, 27. 02. 07, M. Islam 05 (HCU).
39. **Luisia filiformis** Hook. f., Fl. Brit. India 6(1): 23 (1890). *Luisia grovesi* Hook. f. (1890); *L. volurcris* sensu King & Pantl. (1898); *L. gamblei* Durand (1906). Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 3–4. Scarce. *Distribution*: Bhutan, India, Laos, Thailand, Vietnam and Bangladesh (Cox's Bazar and Sylhet). *Specimen examined*: Sylhet: Jaintapur, 12. 06. 07, M. Islam 13 (HCU).
40. **Luisia trichorhiza** (Hook. f.) Bl. Rumphia 4: 50 (1849). *Vanda trichorhiza* Hook. f. (1825); *Cymbidium triste sensu* Lindl. (1833). Reported from Sylhet by Ahmed and Pasha (1998b). Epiphytic. *Fl.*: 3–5. Occasional. *Distribution*: Bhutan, India, Myanmar, Thailand and Bangladesh (Chittagong, Cox's Bazar and Sylhet). *Specimens examined*: Sylhet: Lama Bazar; 24.03.86, M. Ahmed 102 (HCU); Cox's Bazar: Whykong Reserve Forest; 10.09.99, M.K. Huda *et al.* 5834 (HCU).
41. **Luisia volurcris** Lindl., Fol. Orchid. 1 (1852). Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 3–4. Rare. *Distribution*: India, Sikkim and Bangladesh (Chittagong and Sylhet).
42. **Malaxis acuminata** D. Don, Prodr. Fl. Nepal. : 29 (1825). *Microstylis wallichii* Lindl. (1830); *M. biloba* Lindl.(1829); *Malaxis biloba* (Lindl.) Ames (1908); *Malaxis wallichii* (Lindl.) Deb (1962). Reported from Sylhet by Lindley (1830–40). Terrestrial. *Fl.*: 7–9. Rare. *Distribution*: Bhutan, Cambodia, India, Java, Malaysia, Myanmar, Nepal, Philippines, Sumatra, Thailand, Vietnam and Bangladesh (Sylhet and Rangamati). *Specimen examined*: Rangamati: Kaptai, 27.06.98, M.A. Rahman *et al.* 3229 (HCU).
43. ***Malaxis biaurita** Lindl., Gen. Sp. Orchid. : 20 (1830). Report from Sylhet by Lindley (1830–40). Terrestrial. *Fl.*: 7–10. Specimen deficient. *Distribution*: India and Bangladesh (Sylhet).
44. **Micropera rostrata** (Roxb.) Balakr. in J. Bombay Nat. Hist. Soc. 67 (1): 66 (1970). *Aerides rostrata** Roxb. (1814); *Camarotis purpurea* Lindl. (1832); *Micropera pallida sensu* Lindl. (1833); *Camarotis pallida* (Lindl.) Lindl. (1859); *C. rostrata* (Roxb.) Roxb. (1864); *Sarcochilus purpureus* (Lindl.) Benth. ex Hook. f. (1890); *Micropera purpurea* (Lindl.) Pradhan (1979). Reported by synonym by Roxburgh (1814, 1832) from Chittagong and Sylhet. Epiphytic. *Fl.*: 5–6. Occasional. *Distribution*: India, Malaysia, Myanmar, Thailand and Bangladesh (Chittagong, Chittagong Hill Tracts and Sylhet).
45. ***Nervilia juliana** (Roxb.) Schltr. In Bot. Jahrb. Syst. 45: 402 (1911). *Arethusa juliana* Roxb. (1814); *Epipactis juliana* Roxb. (1832); *Pogonia juliana* (Roxb.) Lindl. (1832). Reported from Sylhet by Jayaweera (1981). Terrestrial. *Fl.*: Not known. Specimen deficient. *Distribution*: India, Sri Lanka and Bangladesh (Sylhet).
46. ***Oberonia mannii** Hook. f. Ic. Pl. : t. 2003 (1890). Reported from Sylhet by Hooker (1890a). Epiphytic. *Fl.*: Not known. Specimen deficient. *Distribution*: India and Bangladesh (Sylhet).

47. **Oberonia mucronata** (D. Don.) Ormerod & Seidenfaden in Seidenfaden, Contrib. Orch. Flora Thailand XIII: 20 (1997). *Stelis mucronata* D. Don. (1825); *Cymbidium iridifolium** Roxb. (1832); *Oberonia iridifolia* Lindl., (1830); *Malaxis iridifolia* (Roxb.) Rchb. f. (1861); *Oberonia denticulata* var. *iridifolia* (Roxb.) S. Misra (1989). Reported by its synonym from Sylhet by Roxburgh (1814, 1832). Epiphytic. *Fl.*: 8–9. Occasional. *Distribution*: Bhutan, China, India, Indonesia, Malaysia, Nepal, Philippines and Bangladesh (Chittagong and Sylhet). *Specimens examined*: Sylhet: Lathitila Rain Forest, 29.11.83, M. K. Alam 4742 (HBFRI); Lama Bazar, 21.03.86, M. Ahmed 103 (HCU); Madhabkunda Eco Park, 26.02.07, M. Islam 06 (HCU).
48. **Oberonia rufilabris** Lindl., Sert. Orch. : t. 8 A (1838). *Malaxis rufilabris* (Lindl.) Rchb. f. (1861). Reported from Sylhet by Hooker (1890a) and from Cox's Bazar by Huda (2000). Epiphytic. *Fl.*: 8–9. Scarce. *Distribution*: Bhutan, Cambodia, India, Malaysia, Myanmar, Nepal, Thailand, Vietnam and Bangladesh (Cox's Bazar and Sylhet). *Specimen examined*: Cox's Bazar: Panerchara Tulabagan; 30.01.99, M.K. Huda *et al.* 5315 (HCU).
49. **Oberonia wallichii** Hook. f. Fl. Brit. India. 6: 681 (1890). *Oberonia iridifolia* Wall. Cat. 1948/2 in part. Reported from Sylhet by Hooker (1890a). Epiphytic. *Fl.*: Not known. Specimen deficient. *Distribution*: India and Bangladesh (Cox's Bazar and Sylhet).
50. ***Paphiopedilum insigne** (Wall. ex Lindl.) Pfitz., in Engler, Bot. Jahrb. 19: 41 (1894). *Cypripedium insigne* Wall. ex Lindl. (1840). Reported from Sylhet by Lindley (1830-1840). Terrestrial. *Fl.*: 10–3. Specimen deficient. *Distribution*: Bhutan, India and Bangladesh (Sylhet).
51. ***Paphiopedilum venustum** (Wall.) Pfitzer ex Stein, Orchid.- Buch: 489 (1892). *Cypripedium venustum* Wall. (1820); *Cypripedium pardinum* Rchb. f. (1869). Reported from Sylhet by Lindley (1830-1840). Terrestrial. *Fl.*: 3–5. Specimen deficient. *Distribution*: Bhutan, India and Bangladesh (Sylhet).
52. **Papilionanthe teres** (Roxb.) Schltr. in Orchis 9: 78 (1915). *Dendrobium teres* Roxb. (1832); *Vanda teres** (Roxb.) Lindl. (1833). Reported by its synonym from Chittagong by Roxburgh (1814, 1832). Epiphytic. *Fl.*: 3–4. Occasional. *Distribution*: Bhutan, China, India, Myanmar, Nepal, Thailand, Vietnam and Bangladesh (Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet). *Specimens examined*: Rangamati: Kaptai, 23.05.83, M. N. Islam *sn* (HBFRI); Cox's Bazar: Sylhet: Madhabkunda, 16.06.07; M. Islam, 10 (HCU).
53. **Pelatantheria insectifera** (Rchb. f.) Ridl. in J. Linn. Soc. 32: 373 (1896). *Sarcanthus insectifer* Rchb. f. (1857). Reported from Chittagong by Hooker (1890b). Epiphytic. *Fl.*: 9–12. Scarce. *Distribution*: Bhutan, India, Myanmar, Nepal, Thailand and Bangladesh (Cox's Bazar and Sylhet). *Specimen examined*: Habiganj: Rema-Kalenga, 25.02.07, M. Islam 07(HCU).
54. **Peristylus goodyeroides** (D. Don.) Lindl., Gen. Sp. Orchid. : 299 (1835). *Habenaria goodyeroides** D. Don (1825). Reported by its synonym from Sylhet by Hooker (1890b). Terrestrial. *Fl.*: 5–7. Occasional. *Distribution*: China, India, Indonesia, Malaysia, Philippines and Bangladesh (Chittagong, Rangamati and Sylhet). *Specimen examined*: Rangamati: Khajachara, 26.07.97, M.A. Rahman *et al.* 1579 (HCU).
55. **Phaius tancarvilleae** (Banks ex L "Herit) Blume, Mus. Bot. 2: 177 (1856). *Limodorum tancarvilleae* Banks in L "Herit. (1789); *Bletitia tancarvilleae* Ait (1813); *Phajus veratrifolius* Wall ex Lindl. (1831); *Phaius wallichii** Lindl (1831); *Phaius blumei* var. *assamica* Rchb. f. (1882). Reported by its synonym from Sylhet by Hooker (1890b). Terrestrial. *Fl.*: 2–3. Scarce. *Distribution*: Australia, Bhutan, China, India, Indonesia, Malaysia, Myanmar, New Guinea, Pacific Islands, Sri Lanka, and Bangladesh (Runcitia Forest, Gazni and Sylhet).

56. ***Phalaenopsis taenialis** (Lindl.) E.A. Christenson & Pradhan in Selbyana 9: 168 (1986). *Aerides taeniale* Lindl. (1833); *Doritis taenialis* (Lindl.) Hook. f. (1890); *Kingiella taenialis* (Lindl.) Rolfe (1917); *Kingidium taenialis** (Lindl.) P.F. Hunt (1970). Reported by its synonym from Sylhet by Ahmed *et al.* (1992). Epiphytic. *Fl.*: 5. Rare. *Distribution*: Bhutan, China, India, Nepal and Bangladesh (Sylhet). *Specimen examined*: Sylhet: Jainta Bazar, 24.03.86, M. Ahmed *sn* (HCU).
57. **Pholidota imbricata** Hook. f., exot. Fl. 2: t. 138 (1825). *Cymbidium imbricatum** Roxb. (1832); *Coelogyne imbricata* (Roxb.) Rchb. f. (1861); *Pholidota asamica* Regel. (1890); *Pholidota pallida sensu* Holtum (1964). Reported by its synonym from Chittagong and Sylhet by Roxburgh (1814, 1832). Epiphytic. *Fl.*: 6–7. Occasional. *Distribution*: Australia, China, India, Laos, Malaysia, Myanmar, Nepal, Nicobar Island, New Guinea, Pacific Islands, Sri Lanka, Thailand and Bangladesh (Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet). *Specimen examined*: Cox's Bazar: Whykong Reserve Forest, 11.09.99, M.K. Huda *et al.* 5848 (HCU).
58. ***Podochilus khasianus** Hook. f., Fl. Brit. India 6: 81 (1890). *Podochilus chinensis* Schltr. (1924). Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 3–5. Specimen deficient. *Distribution*: Bhutan, China, India and Bangladesh (Sylhet).
59. **Pomatocalpa decipiens** (Lindl.) J. J. Smith, Natuurk. Tijdschr. Ned. Indie 72: 33 (1912). *Cleisostoma decipiens* Lindl. (1844); *Saccolabium decipiens* (Lindl.) Alston (1931). Reported from Habiganj by Uddin *et al.* (1999). Epiphytic. *Fl.*: 3. Scarce. *Distribution*: Sri Lanka and Bangladesh (Sylhet). *Specimen examined*: Habiganj: Chunarughat, Rema Kalenga Wild life Sanctuary, Kalega beat, Habiganj: 18.03.99 (DACB and DUSH).
60. **Rhynchostylis retusa** (L.) Blume, Bijdr. : 286, t. 49 (1825). *Epidendrum retusum* L. (1753); *Aerides guttatum** Roxb. (1832); *Saccolabium rheedii* Wight (1851); *Saccolabium guttatum* Lindl. (1833); *Saccolabium berkeleyi* Rchb. f. (1883). Reported by its synonym from Dhaka by Roxburgh (1814, 1832). Epiphytic. *Fl.*: 5–7. Common. *Distribution*: Bhutan, India, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka and Bangladesh (throughout Bangladesh). *Specimen examined*: Sylhet: Shreepur, 12. 06. 07, M. Islam 08 (HCU).
61. **Robiquetia spathulata** (Bl.) J. J. Sm. in Nat. Tijdschr. Ned. Ind. 72: 114 (1912). *Cleisostoma spathulatum* Bl. (1825); *Saccolabium densiflorum* Lindl. (1832); *Cleisostoma spicatum* Lindl. (1847). Reported from Sylhet by Seidenfaden (1988). Epiphytic. *Fl.*: 5–7. Scarce. *Distribution*: China, India, Indo-china, Indonesia, Malaysia, Myanmar, Singapore, Thailand and Bangladesh (Cox's Bazar and Sylhet).
62. **Robiquetia succisa** (Lindl.) Seid. & Garay in Bot. Tidsskr. 67: 119 (1972). *Sarcanthus succisus* Lindl. (1826); *Oecoclades paniculata* Lindl.(1833); *Saccolabium parvulum* Lindl. (1859); *S. buccosum** Rchb. f. (1871); *Robiquetia paniculata* (Lindl.) J. J. Smith (1912); *Sarcanthus henryi* Schltr. (1919). Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 6–7. Scarce. *Distribution*: Bhutan, Cambodia, China, India, Laos, Myanmar, Thailand, Vietnam and Bangladesh (Chittagong, Chittagong Hill Tracts and Sylhet).
63. **Saccolabiopsis pusilla** (Lindl.) Seidenf. & Garay in Bot. Tidsskr. 67: 118, f. 33 (1972). *Saccolabium pusillum* Lindl. (1858); *Saccolabium pumilio** Rchb. f. (1890). Reported by its synonym from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 4–6. Scarce. *Distribution*: Bhutan, India, Myanmar and Bangladesh (Rangamati and Sylhet). *Specimen examined*: Chittagong: Gondamara, Dhoplachari, Chandanaish, 24.07.99, M.K. Huda *et al.* 5152 (HCU).

64. ***Saccolabium cephalotes** Hook. f., Fl. Brit. India 5: 63 (1890). *Acampe cephalotes* Lindl. Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: Not known. Specimen deficient. *Distribution*: India and Bangladesh (Sylhet).
65. ***Schoenorchis gemmata** (Lindl.) J. J. Smith in Natuurk. Tijdschr. Ned.-Indie. 72: 100 (1912). *Saccolabium gemmata* Lindl. (1838); *S. gemmatum** (Lindl.) Hook. f. (1890); *Cleisostoma gemmatum* (Lindl.) King & Pantl. (1898). Reported by its synonym from Jyantia (Sylhet) by Hooker (1890b). Epiphytic. *Fl.*: 5–6. Specimen deficient. *Distribution*: Bhutan, Cambodia, China, India, Laos, Myanmar, Thailand, Vietnam and Bangladesh (Sylhet).
66. **Smitinandia micrantha** (Lindl.) Holttum in Gard. Bull. Singapore, 25: 106 (1969). *Saccolabium micranthum** Lindl. (1833); *Cleisostoma micranthum* (Lindl.) King & Pantl. (1898). Reported by its synonym from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 7–9. Scarce. *Distribution*: Bhutan, India, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam and Bangladesh (Cox's Bazar and Sylhet).
67. ***Spathoglottis pubescens** Lindl., Gen. Sp. Orchid. : 120 (1831). *Spathoglottis pubescens* var. *parviflora* (Lindl.) Hook. f. (1890). Collected from East Bengal by Griffith, CAL- 5194 (Huda *et al.*, 1999) and reported from Sylhet by Lindley (1830 - 40). Terrestrial. *Fl.*: 6–9. Specimen deficient. *Distribution*: Bhutan, China, India, Myanmar and Bangladesh (Sylhet).
68. **Staurochilus ramosus** (Lindl.) Seidenf., in Opera Bot. 95: 95 (1988). *Saccolabium ramosum* Lindl. (1833); *Aerides ramosum* Wall. (1833); *Cleisostoma ramosum** (Lindl.) Hook. f. (1890); *Gastrochilus ramosus* (Lindl.) Kuntze (1891); *Sarcanthus ramosus* (Lindl.) J. J. Smith (1912); *Pomatocalpa ramosum* (Lindl.) Summerh. (1948). Reported by its synonym from Sundarbans by Hooker (1888–90) and from Cox's Bazar by Seidenfaden (1988). Epiphytic. *Fl.*: 5. Common. *Distribution*: Bhutan, India, Myanmar, Thailand and Bangladesh (Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet). *Specimen examined*: Habiganj: Rema-Kalenga, 25. 02. 07, M. Islam 09 (HCU).
69. ***Tainia latifolia** (Lindl.) Rchb. f. in Bonplandia 5: 54 (1857). *Ania latifolia* Lindl. (1831); *Mitopetalum latifolium* (Lindl.) Bl. (1856); *Eulophia hastata* Lindl. (1859); *Tainia hastata* (Lindl.) Hooker (1890); *T. khasiana* Hook. f. (1890). Reported from Sylhet by Hook. f. (1890a). Terrestrial. *Fl.*: 9–11. Specimen deficient. *Distribution*: Bhutan, China, India, Laos, Myanmar, Thailand, Vietnam and Bangladesh (Sylhet).
70. ***Tropidia angulosa** (Lindl.) Bl., Coll. Orchid. : 122 (1859). *Decasinea angulosa* Wall. (1832); *Cnemidia angulosa* Lindl. (1840); *Govindova nervosa* Wight (1853); *Tropidia govindovii* Bl. (1858). Reported from Sylhet by Hooker (1890b). Terrestrial. *Fl.*: 8–11. Rare. *Distribution*: Bhutan, China, India, Malaysia, Myanmar, Sumatra, Thailand, and Bangladesh (Sylhet).
71. **Tropidia curculigoides** Lindl., Gen. Sp. Orchid. Pl. : 497 (1840). *Tropidia squamata* Bl. (1859); *T. assamica* Bl. (1858); *T. graminea* Bl. (1859); *T. formosana* Rolfe (1895). Report from Sylhet by Hooker (1890b). Terrestrial. *Fl.*: 9–12. Occasional. *Distribution*: Bhutan, China, India, Malaysia, Myanmar and Bangladesh (Cox's Bazar and Sylhet). *Specimen examined*: Rangamati: Kaptai, Sitapahar, 03.09.99, M.A. Rahman *et al.* 5591 (HCU).
72. ***Vanda crisata** Lindl., Gen. Sp. Orchid. Pl. : 216 (1833). *Aerides cristatum* Wall. (1832); *Trudelia cristata* (Lindl.) Senghas (1988). Reported from Sylhet by Hooker (1890b). Epiphytic. *Fl.*: 5. Rare. *Distribution*: Bhutan, India, Nepal and Bangladesh (Sylhet).

73. **Vanilla parishii** Rehb. f., *Otia Bot. Hamb.* : 39 (1878). Reported from Rangamati by Prain (1903). Hemi-epiphytic. *Fl.*: Not known. Scarce. *Distribution*: India, Myanmar and Bangladesh (Chittagong, Cox's Bazar and Sylhet).

74. ***Zeuxine flava** (Wall. ex Lindl.) Trimen, *Syst. Cat. Fl. Pl.* : 90 (1885). *Etaeria flava* Lindl. (1832); *Monochilus flavum* Wall. ex Lindl. (1840). Reported from Sylhet by Seidenfaden (1978). Terrestrial. *Fl.*: 5. Rare. *Distribution*: Bhutan, India, Nepal, Thailand and Bangladesh (Sylhet). *Specimen examined*: Sylhet: Tamabil; 11.03.56, M. S. Khan (DUSH).

75. **Zeuxine nervosa** (Wall. ex Lindl.) Bentham ex C.B. Clarke in *J. Linn. Soc., Bot.* 25: 73 (1889). *Monochilus nervosum* Wall. ex Lindl. (1840); *Haplochilus nervosum* (Wall. ex Lindl.) D. Dietrich (1852). Reported from Comilla and Sylhet by Hooker (1890b). Terrestrial. *Fl.*: 3–4. Scarce. *Distribution*: Bhutan, China, India, Philippines, Taiwan, and Bangladesh (Comilla, Mymensingh and Sylhet). *Specimen examined*: Mymensingh; 04.03.77, M. Rahman (DACB).

Discussion

A total of 75 orchid species were recorded from greater Sylhet, out of which 48 species are epiphytic, 25 species are terrestrial, one is saprophytic (*Didymoplexis pallens* Griff.) and another one is hemiepiphytic (*Vanilla parishii* Rehb. f.). Based on literature and the present field work, 26 species were found to occur in Sylhet region only. Thirty-seven out of 49 genera are monotypic indicating a narrower diversity of the family in the studied region. Herbarium specimens of 53 orchid species are available in different herbaria of Bangladesh, namely DACB, DUSH, HCU, HBFRI and HBCSIR. Only 17 orchid species were found in the present survey and are housed at HCU. 22 orchid species were not found in the last 50 years from greater Sylhet region or other parts of Bangladesh.

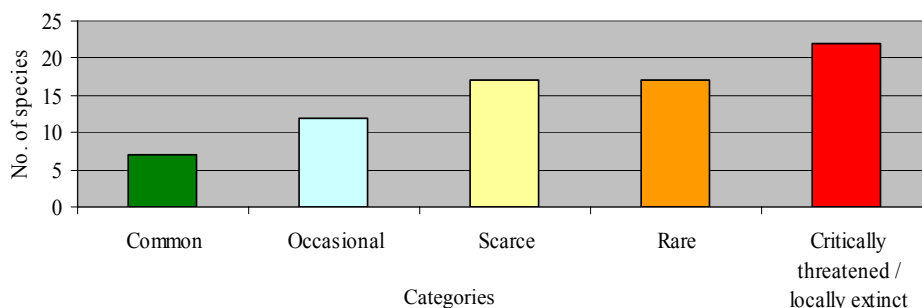


Fig. 1. Abundance status of the orchid species distributed in Sylhet.

Orchids are under great threats to their existence in the natural habitats due to biotic pressures, like illegal felling of large host trees, clearing off forest floor, forest fire and collection of horticultural valuable orchid species. Abundance status based on the availability of different orchid species in the natural habitat of the studied area and previous reports is presented in Fig. 1. It indicates that 30% orchid species in the Sylhet region have no data of their present occurrence and probably locally extinct from this area or critically threatened. So, both *in-situ* and *ex-situ* conservation measures along with public awareness programmes need to be undertaken.

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