

FIVE ENDEMIC ORCHIDS FROM THE SIMILIPAL FOREST OF ODISHA, INDIA

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Abstract

The present paper describes the five endemic orchids reported periodically from the Similipal Forest in Odisha with updated nomenclature. Morphological descriptions along with scientific diagrams and a key to these species is provided.

Introduction

ON THE Northern district of Mayurbhanj in the state of Odisha, lies Similipal, a compact mass of hill forest which is very rich in flora and fauna. Its subtropical location, physiography (hill ranges 600-1100 m), moderately high rainfall (2,249 mm in 124 rain days) has adored the hills with thick forests of tropical moist deciduous, semi-evergreen and evergreen type. More importantly, its geology is unique in the sense that water retention capacity of the subsoil is very high. This has given birth to numerous perennial water courses, small and big, and keeps the atmosphere always moist. The average relative humidity is 75% to 91% (mean 83%) at 0600 hrs and 81%-93% (mean 87%) at 1800 hrs. Such a situation favours growth of arboreal plants like orchids. Orchidaceae is a highly evolved group of flowering plants that is still under active state of speciation. Similipal formed a congenial niche for such a procedure to take place. This event must have taken hundreds of years. Massive deforestation for timber exploitation here over a long period of time in the past has left the forest with poverty of vegetation. Drastic change in the vegetation (supporting orchids) within the past 50 years is markedly visible today. What we see today in the orchid population is only the remnants of the flora of a by gone era, although Similipal has today the credit of being a National Park, a Tiger Reserve, and a Biosphere Reserve. Five endemic species of orchids have been reported from such a small geographical area, out of the 12 numbers known from the Odisha state. Occurrence of these endemic species has been reported periodically; two of these being published (2007 and 2022) in books. It was hence felt to put these reports in one place. Morphological descriptions supported with scientific illustrations of the important components are provided along with a key to the species. The bibliography at the end provides details of the publication.

Artificial Key to the Species

- 1a. Plants terrestrial, perennating through underground root-stem tuberoids; leaves with translucent margins; inflorescence terminal; perianth never opening *Odisha cleistantha* ssp. *cleistantha*
- 1b. Plants epiphytic, sympodially connected leafy shoots arise every year from a creeping and rooting base; leaves not margined; inflorescence lateral; perianth opening
 - 2a. Plants without distinct leafy stem; leaves folded along middle, compressed, with sharp edges, ensiform, fleshy, sessile, overlap at base; inflorescence born from axil of uppermost leaf; flowers minute..... *Oberonia similipalensis*
 - 2b. Plants with distinctly leafy, usually variously swollen stems; leaves normal; inflorescence from leaf opposed or subterminal on stem; flowers small or medium-sized
 - 3a. Stems drooping, uniformly slender, sturdy, polished, leafy on the distal half of the stem; inflorescence 1-few leaf-opposed fascicles of 1-3 yellow-ochre flowers with maroon on lip *Dendrobium prasannae*
 - 3b. Stem erect, pseudobulbous; leaves on top of the stem, inflorescence shorter than the leaves; this and the flowers otherwise
 - 4a. Pseudobulbs proximate, clavate-fusiform, compressed, 2-3 noded; leaves 2-4, sessile; inflorescence subterminal, 1-3 per plant, raceme with 10-15 very small flowers *Eria meghasaniensis*

- 4b. Pseudobulbs distant, obliquely ovoid, base covered with stiff sheath-fibers; leaf single, coriaceous, petioled; inflorescence basal, sub umbellate, with erect or decurved medium-sized flowers.....*Cirrhopetalum panigrahianum*

Morphological Descriptions

Odisha cleistantha ssp. *cleistantha* S. Misra (Fig. 1)

Nelumbo 61(2): 12. 2019; Misra, Orch. India- Handb.: 520. 2019; Misra, Similipal: For. Hund. Orch.: 126. 2022. *Odisha cleistantha* S. Misra, Orch. India Glimp.: 252.2007. Orch. Odisha: 238 (excl. figs f₁, f₂, l₃ and description of lip in part). *Habenaria pelorioides* auct. non Par. & Rchb.f.; Misra, Untamed Orissa: 26. 2000; Orch. Orissa: 231. 2004.

Scattered *herbs*, 30-70 cm high; *root-stem* tuberoid narrow-elliptic; *leaves* 3-4, spiral, elliptic-lanceolate with translucent margins; *inflorescence* erect, 20-40 cm tall, spicate, with 5-10 spirally ascending flowers. *Flowers* green, 10-15 mm long, perianth not opening. *Sepals* and *petals* subequal, oblong-lanceolate, acuminate, margins glandular hairy. *Lip* erect, distal two-third enclosed by margins of lateral sepals, 3-lobed; lateral lobes smaller, ovate-lanceolate, sub-acute; midlobe lanceolate, acute, spurred; spur shortly squarish, with a broad rounded apex, compressed. *Column* erect; stigma lobes 2, basally joined at bottom of column,

curved in; rostellum erect, oblong, apex bent in, expanded, 3-lobed, lateral lobes not connected to anther lobes. *Anther* erect and confluent with the column, 2-loculed, each locule longitudinally two-chambered, without basal projections; auricles short and slender, hooked; *pollinaria* two, each with an oblong pollinium and a minute basal caudicle; viscidia absent.

Flowering

October

Habitat

In moist deciduous open forest floors, between 360-1400 m, under partly shaded situation, with loamy soil.

Occurrence

Similipal: Bamanghaty, Barehipani, Gudugudia, Kabataghari; scarce. Elsewhere: Gajapati, Kandhamal, Kendujhar, and Koraput districts.

Note: The structure of its anther and rostellum are very characteristic separating it from allied genera like *Habenaria* etc.

Oberonia similipalensis S. Misra (Fig. 2)

Nelumbo 62: 1-4. 2021; Misra, Similipal: For. Hund. Orch.: 182. 2022. *Oberonia gammiei* auct. non King & Pantl. 1897; Misra, Plant Sc. Res. 11(2): 82. 1989a; Misra, J. Orchid Soc. India 3(1-2): 66. 1989b; Misra, J. Orchid Soc. India 8(1-2): 30. 1994; Misra, J. Orchid Soc. India 9(1-2): 26, 27, 28. 1995; Misra, Similipal: Natu. Hab. Uniq. Biod: 85. 1997; Misra, In: Biod. Cons.: Prob. Prosp.: 93. 1998; Misra, Untamed Orissa: 22, 24, 29. 2000; Misra, Orch. Orissa-Handb.: 248. 2014; Misra & al., J. Orchid Soc. India 18(1-2): 118. 2004. *Oberonia verticillata* auct. non Wight; Misra, In: Proc. Natio. Conf. Bios. Res. Similipal, Orissa: 176. 1986.

Pendulous epiphytes in small, tufts, 90-130 mm long. *Leaves* 4-5, unequally narrowly ensiform, subulate, sub-falcate, 80-120 × 3-5 mm. *Inflorescence* spiciform, longer than the leaves, in dense whorls. *Flowers* non-resupinate, ca. 1.7 × 1.7 mm, greenish yellow. *Sepals* subequal, reflexed; dorsal ovate, rounded; laterals obliquely ovate-lanceolate, rounded, concave. *Petals* widely spreading, elliptic-oblong, rounded. *Lips* spreading at right angles to the ovary, sessile, broadest at base, apex minutely obtuse, margin irregularly lacinate progressively from base upwards, sparingly gland-dotted. *Column* globular, clinandrium cupular. *Anther* terminal, orbicular-quadrate; *pollinia* 4 cohering in hemi-ovoid pairs.

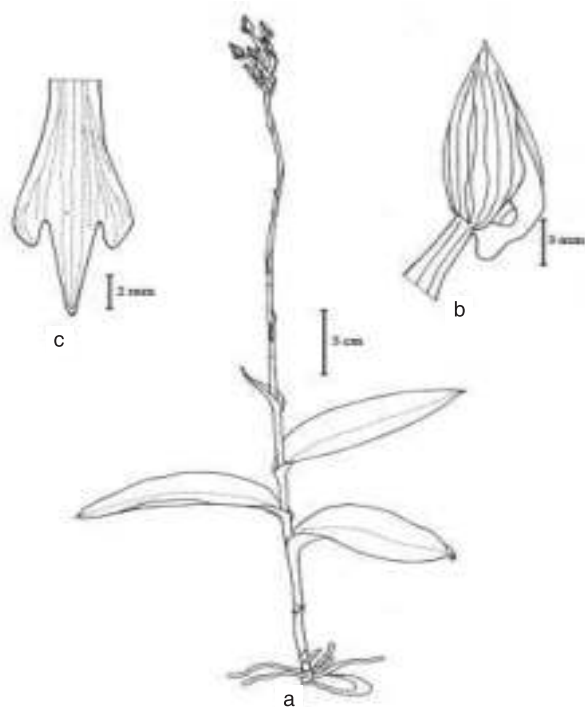


Fig. 1. a-c. *Odisha cleistantha* ssp. *cleistantha*: a, Habit; b, Flower; c, Lip.

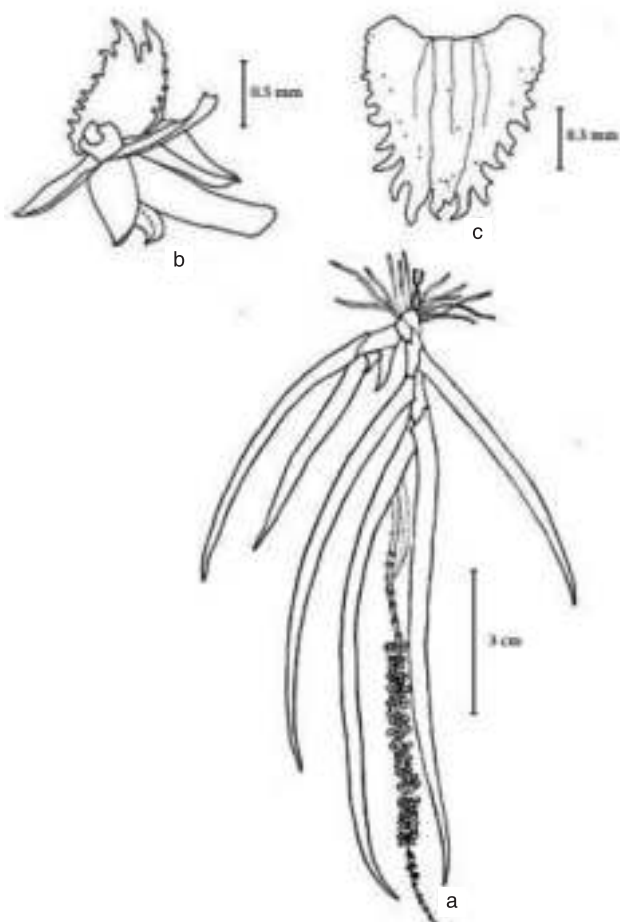


Fig. 2. a-c. *Oberonia similipalensis*: a, Habit; b, Flower; c, Lip.

Flowering

August

Habitat

In evergreen to semi-evergreen vegetation at 600-1100 m, moist valleys preferring edges of water courses; on moss-covered slender branches of trees at low heights, under dense shade.

Occurrence

Similipal: Bada Makabadi, Baniapada, Bhanjabasa, Chakunda nala, Jenabila, Khairiburu, Matughara, Meghasani, Tarinibila, U. Barhakamuda, Udiabasa; scarce.

Note: The undivided broad lip with lacinate margin is characteristic; the apical pair of laciniae gives the impression as though the lip is deeply emarginate.

Dendrobium prasannae S. Misra (Fig. 3)

Similipal: For. Hundr. Orch.: 66, 208, 209. 2022.
Dendrobium haemoglossum ssp. *nayakii* S. Misra, J.

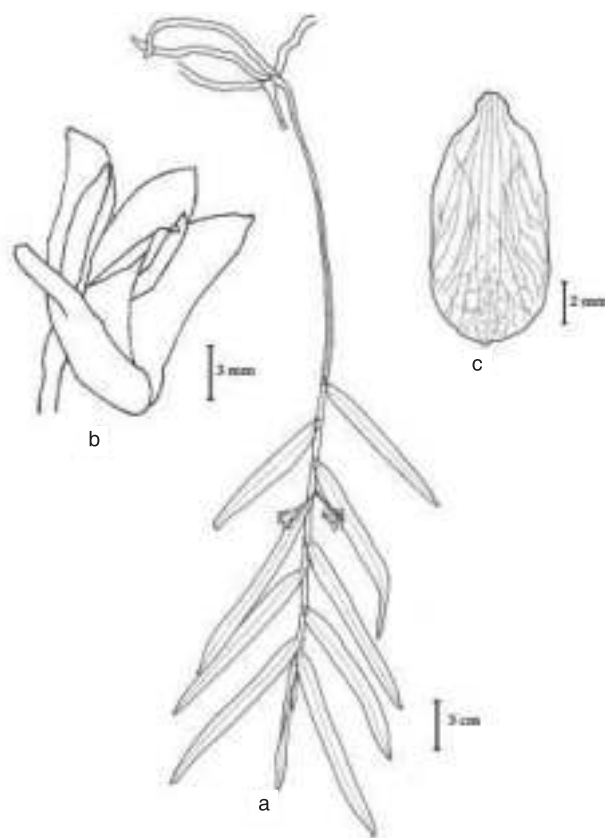


Fig. 3. a-c. *Dendrobium prasannae*: a, Habit; b, Flower; c, Lip.

Orchid Soc. India 35: 141. 2021. *Dendrobium cathcarti* auct. non Hook.f.1888; Misra, Proc. Natio. Conf. Bios. Res. Similipal Orissa: 171.1986; Misra, Plant Sc. Res. 11(2): 76.1989a, Misra, J. Orchid Soc. India 3(1,2): 65.1989b; Misra, J. Orchid Soc. India 8: 28.1994; Misra, Similipal. Natu. Hab. Unique Biod.: 80.1997; Misra, Untam. Orissa: 28. 2000; Misra, Orch. Orissa: 413.2004; Misra, Orch. Odisha: Handb.: 280-281. 2014; Misra & al, J. Orchid Soc. India 18 (1-2):118. 2004.

Pendulous epiphytes, 35-120 cm long, sometimes forming huge tufts; roots thick and vermiform; stem uniformly thick to 3-4 mm. Leaves distichous, linear-lanceolate, 100-150 × 10-15 mm, sessile, strongly unequally bifid at apex. Inflorescence short fascicles of usually a pair of drooping flowers. Flowers yellow-ochre, 10-15 mm across. Dorsal sepal oblong-lanceolate; laterals obliquely lanceolate, adnate at base to form a stout, curved mentum. Petals erect, oblong-lanceolate, acute. Lip simple entire, elliptic-oblong rounded, apex with an obtuse mucro, base abruptly narrowed to a short claw, margin on basal half rolled in, apex deflexed, with two large oblong maroon blotches within on the lateral edges. Column pale yellow, erect, apical edge irregularly dentate; foot ca. 6 mm long, concave. Stigma ovate-lunar with a pair of knobs at base. Anther ovate, cream-coloured; pollinia obliquely

oblong, waxy-yellow. *Capsules* clavate to ellipsoid, ca. 12 × 5 mm.

Flowering

March-April, sometimes in May-June or September

Habitat

In evergreen forest, between 800-1000 m, in moist and shady localities.

Occurrence

Similipal: Bada Makabadi, Baniapada, Bhanjabasa, Dhanagoji, Jamuna gada, Meghasani, Nekedanecha, Sarua, Tarinibila, U. Barhakamuda; occasional.

Note: This is a distinct species different from the allied *D. salaccense* (Bl.) Lindl. by its lip, which is gently narrowed to base, apex retuse; with a medial long narrow keel; the stem is erect.

Eria meghasaniensis (S. Misra) S. Misra (Fig. 4)

J. Orchid Soc. India 3(1, 2): 69, 66.1989a; Misra, Plant Sc. Res. 11(2): 78.1989b; Misra, J. Orchid Soc. India 8 (1-2): 26 & 30, 1994; Misra, Similipal: Natur. Hab.

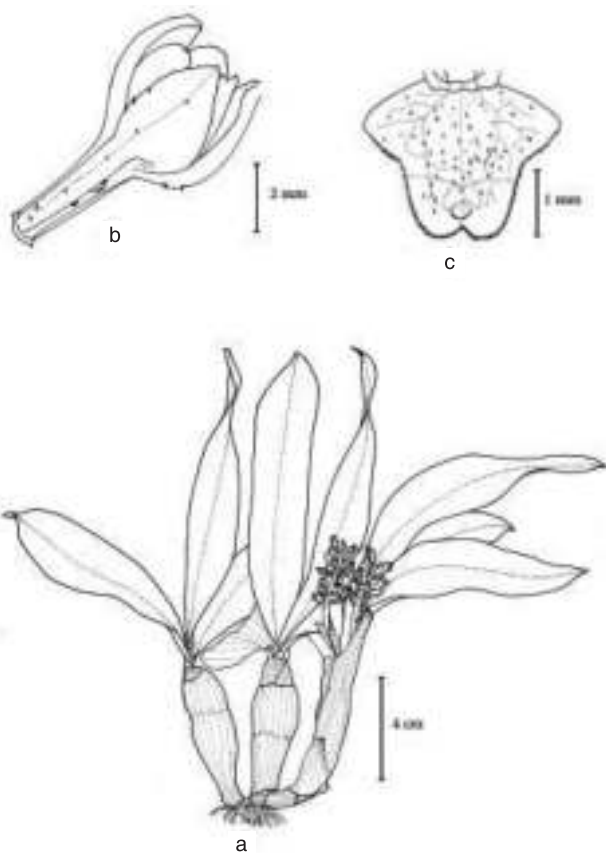


Fig. 4. a-c. *Eria meghasaniensis*: a, Habit; b, Flower; c, Lip.

Unique Biod.:81.1997; Misra, In: Biod. Cons.: Prob. Prosp.92,93.1998; Misra, Untam. Orissa: 22, 29.2000; Misra, Orch. Orissa: 398. 2004; Misra, Orch. India-Glimp.: 55, 103, 123, 298. 2007; Misra, Orch. Odisha - Handb.: 274-275. 2014; Misra, Orch. India-Handb.: 508.2019; Misra, Similipal: For. Hund. Orch.: 204.2022. *Eria bilobulata* Seidenf. ssp. *meghasaniensis* S. Misra, J. Orchid Soc. India 2(1-2): 49-53.1988; Misra, J. Orchid Soc. India 3(1-2): 69.1989.

Small tufted epiphytes, 12-16 mm tall, *leaves* elliptic-lanceolate, acuminate, 75-135 × 15-30 mm, narrowed below to an articulating sheathing base. *Inflorescence* from behind the leaf base, ca.105 mm long. *Flowers* ca. 5 mm long; *perianth* not wide-opening, unequal, mucronate, sparingly dotted with linear glands. *Sepals* off-white; dorsal ovate-truncate, apical edge narrowly involute; laterals obliquely ovate-lanceolate. *Petals* white, oblong-ovate, mildly oblique. *Lip* erect, included in the lateral sepals, sessile, 3-lobed, margin serrulate with round-tipped glands (but for the outer edges of the side lobes); *hypochile* pale-yellow, with large ovate-triangular, erect side lobes; *epichile* bright yellow, scabrous, ovate, truncate, shortly bilobulate, with rounded tips and an orbicular warted patch. Sometimes two additional crescent-shaped patches exist slightly above the notch of the lobules. *Column* erect; foot short, incurved. *Stigma* deep-seated, V-shaped. *Anther* broader than long, distinctly 2-loculed, each 4-chambered; *pollinia* 8, pear-shaped, yellow with an obscure brownish *viscidium*. *Capsules* ellipsoid, ca. 10 × 4 mm, caducous; *seeds* oblong, with a golden-brown hair-like testa.

Note: The small lip with minutely hairy margin, an orbicular warted patch between the lobules of the midlobe and a column without stylids are characteristic of this species- the only endemic *Eria* species of peninsular India.

Cirrhopetalum panigrahianum (S. Misra) S. Misra (Fig. 5)

J. Orchid Soc. India 11(1,2): 54.1997; Misra, In: Biod. Cons.: Prob. Pros.: 92.1998; Misra, In: Untam. Orissa: 28. 2000; Misra, Orch. Orissa:457. 2004; Misra, Orch. India -Glimp.: 287.2007; Orch. Odisha-Handb.: 306. 2014; Misra, Orch. India-Handb.: 497. 2019; Misra, Similipal: For. Hundr. Orch.:228; Misra, S., S. Panda & S.S. Jena, J. Econ. Tax. Bot.43(1-4): 2.2019. *Bulbophyllum panigrahianum* S. Misra, Nord. J. Bot. 6: 25, fig.1.1986; Misra, J. Orissa Bot. Soc. 9(1): 33.1987; Misra, Plant Sc. Res.11(2): 75.1989a; Misra, J. Orchid Soc. India 3(1, 2): 65.1989b; Misra, J. Orchid Soc. India: 8:29.1994; Misra, J. Orchid Soc. India 9(1,2): 28.1995;

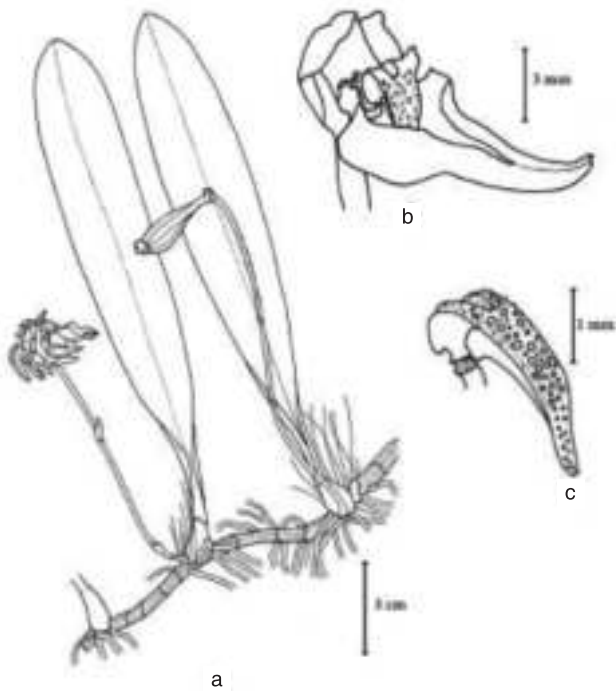


Fig. 5. a-c. *Cirrhopetalum panigrahanum*: a, Habit; b, Flower; c, Lip.

Misra, J. Orch. Soc. India 11 (1,2): 54. 1997. Misra, Similipal: Natur. Hab. Uniq. Biod.: 79.1997.

Pseudobulbous epiphytes; *rhizome* ca. 3 mm thick, internodes 6-8 mm long. *Pseudobulbs* 2-5 cm apart, slightly obliquely ovoid, 5-10 × 6-10 mm. *Leaf* thickly coriaceous, oblong to oblong-lanceolate, apex minutely notched. *Inflorescence* from base of pseudobulb; peduncle erect or arcuate, slender, brown, 7.5-11 cm long, thickened on fruiting; rachis suberect or decurved, 5-7 mm long with 4-10 flowers. *Flowers* 10-12 mm long, waxy-white with maroon flushing. *Sepals* unequal; dorsal hooded over column, cymbiform, ovate-lanceolate, mucronate. *Petals* erect, obliquely ovate-lanceolate, mucronate, distal one-third constricted. *Lip* narrowly ligulose, decurved from base, reflexed at the distal one-third; upper face dotted with rounded papillae throughout except the median W-shaped shallow depression on the proximal quarter, sparingly puberulent; lower face glabrous, with a prominent ridge gradually reduced towards tip. *Column* with vertical wings; clinandrium cup-shaped; stielidia ca. 0.75 mm long; foot hooked upward; *stigma* narrowly triangular; *rostellum* minute, broadly triangular. *Anther* with a distinct bilobed front edge and a broad sinus; *pollinia*, globose-ovoid, compressed, light yellow. *Capsules* ellipsoid, ca. 10 × 5 mm.

Flowering

June

Habitat

In moist valleys of tropical evergreen forests, on edge of perennial water courses, under shade, epiphytic or lithophytic at low heights.

Occurrence

Similipal: Bhuduka; very rare. Kendujhar district: Rebana forest at Gola, Rimbeda and Kendughata; rare.

References

- King, G. and R. Pantling. 1897. Some new Indo-Malayan Orchids, *J. Asiat. Soc. Bengal*, **66**(2): 578.
- King, G. and R. Pantling. 1898. The Orchids of Sikkim-Himalaya. *Ann. Roy. Bot. Gard. Calcutta*, **8**: 1-342.
- Misra, S. 1986. Orchidaceous flora of the Similipal hills in Orissa. In: *Proc. Natio. Conf. Bios. Res. Similipal, Orissa*. Orissa Environmental Society, Bhubaneswar, India.
- Misra, S. 1987. Additions to the Orchidaceous Flora of Orissa-III. *J. Orissa Bot. Soc.*, **9**(1): 32-37.
- Misra, S. 1988. A new subspecies of *Eria* from the Similipal hills of Orissa, India. *J. Orchid Soc. India*, **2**(1-2): 49-53.
- Misra, S. 1989a. An enumeration of the orchids of Similipal hills in Orissa. *Plant Sc. Res.*, **11**(2): 73-85.
- Misra, S. 1989b. Orchid flora of Orissa. *J. Orchid Soc. India*, **3**(1-2): 61-72.
- Misra, S. 1994. Phenology of the flowering of the Orissa orchids. *J. Orchid Soc. India*, **8**(1-2): 25-33.
- Misra, S. 1995. Ecology of the Orissa orchids. *J. Orchid Soc. India*, **9**(1-2): 23-28.
- Misra, S. 1997a. Orchids of the Similipal forest. In: *Similipal: Natural. Hab. Uniq. Biod.* (ed. P.C. Tripathy and S. N. Patro) pp. 73-91. Orissa Environmental Society, Bhubaneswar, India.
- Misra, S. 1997b. *Bulbophyllum* and allied genera in Orissa: Taxonomic review. *J. Orchid Soc. India*, **11**(1-2): 51-59.
- Misra, S. 1998. Biodiversity of the Orissa orchids and its conservation. In: *Biodiversity Conservation: Problems and Prospects* (ed. H. K. Patra) pp. 91-100. Orissa Environmental Society, Bhubaneswar, India.
- Misra, S. 2000. The Orchids. In: *Untamed Orissa: A Journey into the Wilds of Orissa* (ed. Anonymous) pp. 15-38. Wild Orissa, Bhubaneswar, India.
- Misra, S. 2004. *Orchids of Orissa*. Bishen Singh Mahendra Pal Singh, Dehradun, India.
- Misra, S. 2014. *Orchids of Odisha: A Handbook*. Bishen Singh Mahendra Pal Singh, Dehradun, India.
- Misra, S. 2019a. *Orchids of India- A Handbook*. Bishen Singh Mahendra Pal Singh, Dehradun, India.
- Misra, S. 2019b. Notes on an endemic genus *Odisha* S. Misra (Orchidaceae) and its two subspecies from Odisha, India. *Nelumbo*, **61**(2): 10-13.

Misra, S. 2021. *Dendrobium* Sw.- Section *Grastidium* (Bl.) J.J. Sm. in India, and a new subspecies of *Dendrobium haemoglossum* from the Similipal forest in Odisha. *J. Orchid Soc. India*, **35**: 91-93.

Misra, S. 2022. *Similipal: The Forest of Hundred Orchids*. Wildlife Organization, Forest and Environment Department, Government of Odisha, Bhubaneswar, India.

Misra, S., S. P. Panda, and D. Sahu. 2004. Orchid flora of Similipal, Orissa, India: Some observations. *J. Orchid Soc. India*, **18**(1-2): 117-21.

Wight, R. 1850. *Icones Plantarum Indiae Orientalis*. J. B. Pharoah, Madras, India.