

Three new records of orchid species for the Flora of Arunachal Pradesh, India

J. Tsering

Orchid Research Centre, Tipi, Bhalukpong 790 114, Arunachal Pradesh, India

Corresponding Email: jamserng@gmail.com

Abstract

Three species of orchids viz. *Liparis acuminata* Hook.f., *Oreorchis foliosa* (Lindl.) Lindl. and *Platanthera juncea* (King & Pantl.) Kraenzl. are reported here as additions to the Orchid Flora of Arunachal Pradesh. These species have been found in Tawang and West Kameng districts of the state. Morphological description, photographs of habit and floral parts are provided for easy identity of these species.

Keywords: Eastern Himalaya, *Liparis acuminata*, *Oreorchis foliosa*, *Platanthera juncea*.

INTRODUCTION

Arunachal Pradesh, located in the Eastern Himalayan region in India has the highest species diversity of orchid among the Indian states (Rao, 2010). Out of about 1350 orchid species known from India, more than 600 species are found in Arunachal Pradesh alone (Rao 2010, Singh *et al.*, 2019). These orchids are mostly distributed in tropical to subtropical areas. Diversity of orchids in temperate area is much less and only countable number of orchids are found in sub-alpine to alpine areas.

During a floristic survey in Tawang and West Kameng Districts of Arunachal Pradesh in the year 2023, many interesting orchids were observed and collected. The detailed characterization and identification of these species revealed that three species have not been reported earlier from the state. These are *Liparis acuminata* Hook.f., *Oreorchis foliosa* (Lindl.) Lindl. and *Platanthera juncea* (King & Pantl.) Kraenzl. (Figure 1–4).

Liparis acuminata is a rarely found species reported so far only from Meghalaya in India and two other countries (Cambodia and Vietnam), *Oreorchis foliosa* is more commonly distributed with its existence in Manipur, Himachal Pradesh, Sikkim and Uttarakhand in India and several other countries, whereas *Platanthera juncea* is

known only from Sikkim and Darjeeling in India (Averyanov & Averyanova, 2023; Hooker, 1890; Pridgeon *et al.*, 2005; Rao & Singh, 2015; Swami, 2016; Singh *et al.*, 2019). Morphological description along with photographs of habit and dissected floral parts are provided to facilitate identification of the species.

The genus *Liparis* Rich. is cosmopolitan in distribution and consists of around 432 species (POWO, 2023). Most of the *Liparis* species are epiphytes or terrestrial in habit whereas, some are found as lithophytes. *Oreorchis* Lindl. has currently 19 accepted species distributed from Himalayas to Eastern China, extending north to Korea and Japan. *Platanthera* Rich. is distributed in the temperate to alpine regions and high elevation tropics of Macronesia, North Africa, Eurasia, North and Central America and Cuba. It is one of the largest terrestrial genera of the tribe Orchidaceae, represented by 169 species (Chase, 2015; Prasad, 2023; POWO, 2023).

TAXONOMIC ACCOUNT

Liparis acuminata Hook.f., Fl. Brit. India 5: 696. 1890; L. Averyano & L. Averyanova, Upd. Checklist Orch. Vietnam 2013; C.S. Rao & S.K. Singh, Wild Orch. Meghalaya, Pic. Guide 140. 2015; S.K. Singh *et al.*, Orch. India, Pic. Guide 338. 2019. *Leptorkis*

acuminata (Hook.f.) Kuntze., Revis. Gen. Pl. 2: 671. 1891.

Morphological description: Plants 15–25 cm tall including inflorescence. Stem cylindrical, stout, fleshy, enclosed by sheaths. Leaves 4–5; not articulate, apex acuminate; blade 15–25 × 6–10 cm, base contracted into petiole. Inflorescence up to 25 cm long, erect; rachis subdensely 3–12 or more flowered; floral bracts minute, ovate, green, ca. 3.4 mm. Flowers large, greenish yellow, not resupinate; pedicel and ovary ca. 1.5 cm. Sepals spreading, margin revolute, apex acute; dorsal sepals linear-oblong, 14–16 × 1.5–2 mm; lateral sepals linear-oblong to narrowly elliptic, 11–13 × 2–2.6 mm. Petals filiform, ca. 1.1–1.3 cm; lip reflexed near middle, obovate, ca. 0.9–1.2 × 0.7–1 cm when spread, base contracted into a short 2-tubercled neck, apical margin denticulate. Column slender, arcuate, ca. 8 mm, wings very small. Pollinia 4, grouped into two, subovoid, bilaterally flattened, yellowish-orange; viscidium small, not clearly visible. Capsule ellipsoid, pale green, 3 prominent ridges.

Flowering: July (Arunachal Pradesh).

Habitat: Found growing terrestrially in cool, shady places under dense forest cover in close association with *Zeuxine agyokuana* and *Z. goodyeroides* at an elevation range of 1500–1520 m.

Population: Only 16 mature plants were observed in the collection locality.

Specimens examined: INDIA, Arunachal Pradesh, West Kameng, Tenga Reserve Forest, Saiddle, 27°8'10"N, 92°33'56"E, 1520 m, 05 July 2023, *J. Tsering* 50222 (Orchid Herbarium Tipi, designated as OHT!).

Global distribution: INDIA (Arunachal Pradesh: reported here, Meghalaya), CAMBODIA AND VIETNAM.

Oreorchis foliosa (Lindl.) Lindl. J. Proc. Linn. Soc., Bot. 3: 27. 1858; N.R. Pearce & P.J. Cribb, Orch. Bhutan 240. 2002; S.K. Singh et al., Orch. India, Pic. Guide 338. 2019. *Corallorhiza foliosa* Lindl., Gen. Sp. Orchid. Pl.: 535. 1840. *Kitigorhis foliosa* (Lindl.) Maek., Wild Orchids Japan Colour: 469. 1971.

Morphological description: Plants 10–36 cm tall including inflorescence. Pseudobulbs ovoid or subellipsoid, 1–1.5 in diam., 2–3-noded, forming a chain of pseudobulbs connected by a short rhizome, fibrous roots at base of each pseudobulb; pseudobulb attached with a multiple branched coralloid rhizome. Leaf single, narrowly elliptic-lanceolate, plicate, 10–17 × 1.5–2.5 cm, tapering at base into a petiole-like stalk 2–3 cm, apex acute to acuminate. Inflorescence up to 36 cm tall, with 2–3 tubular sheaths below middle; rachis upto 8.5 cm, laxly 4–10-flowered; floral bracts ovate-lanceolate, 3–3.3 mm long. Flowers dark yellow with 6–8 brown stripes, lip white with burgundy colour stripes and spots, side lobes with 3–5 brown stripes; pedicel and ovary 6–7 mm. Sepals 7–8 × 1–1.8 mm, apex acute; lateral sepals narrowly obovate, falcate; dorsal sepal narrowly oblanceolate. Petals narrowly oblanceolate, falcate, 6–7 × ca. 2 mm, apex acute; lip obovate-oblong or broadly oblong, 6–8 × 4–5 mm, hypochile reflexed, 3-lobed at middle; lateral lobes ovate, much smaller than mid lobe; mid-lobe subquadrate to suborbicular, ca. 4 × 4 mm, margin undulate, apex bifurcate; disk without lamellae or calli. Column slightly arcuate, 6–7 mm, base thickened into spur, spur ca. 1 mm. Capsule ca. 2 cm × 7 mm.



Figure 1: **a.** *Liparis acuminata* Hook.f.; **b.** *Platanthera juncea* (King & Pantl.) Kraenzl.; **c.** *Oreorchis foliosa* (Lindl.) Lindl.

Flowering: June–July.

Habitat: Found growing terrestrially in cold, wet places, under the shades of *Abies* tree grove in temperate coniferous to subalpine forest at an elevation range of 3420–3620 m.

Population: Around 200 mature individuals were observed at Tawang and only 3 individuals at West Kameng in Arunachal Pradesh.

Specimens examined: INDIA, Arunachal Pradesh, West Kameng, Baisakhi, 27°28'15"N, 92°6'57"E, 3420 m, 30 June 2023, *J. Tsering 50201* (Orchid Herbarium Tipi, designated as OHT!); INDIA, Arunachal Pradesh, Tawang, Nyingmey Phu, 27°37'7"N, 91°51'48"E, 3610 m, 30 June 2023, *J. Tsering 50202* (Orchid Herbarium Tipi, designated as OHT!).

Global distribution: INDIA (Arunachal Pradesh: reported here, Manipur, Himachal Pradesh, Sikkim and Uttarakhand), BHUTAN, CHINA, MYANMAR AND NEPAL.

Platanthera juncea (King & Pantl.) Kraenzl., *Orchid. Gen. Sp.* 1: 942. 1901. N. Swami, *Terrestrial Orchids.* 2016. *Habenaria juncea* King & Pantl., *J. Asiatic Soc. Bengal*, Pt. 2, Nat. Hist. 65: 132. 1896.

Morphological description: Plants slender, 15–25 cm tall. Tuberoles oblong-cylindric, 3–5 × 0.3–0.5 cm. Stem with 1 or 2 tubular sheaths at base, 1-leaved. Leaf subbasal, oblong to oblong-elliptic, 5–7 × 0.7–2 cm, apex subacute. Inflorescence 7–20 cm; peduncle cylindric, slender, with 1–2 linear-lanceolate sterile bracts, bract 7–15 mm; rachis 2–10 cm, laxly 5–10 or more flowered; floral bracts lanceolate, ca. 6 × 1.8 mm, almost as long as to slightly exceeding ovary, apex subacute. Flowers pale green; ovary and pedicel 5–7 ×

1.3–1.6 mm. Sepals ovate-lanceolate, weakly spreading, apex subobtusate; dorsal sepal 1.5–2 × 0.8–1 mm; lateral sepals, 1.5–2.1 × 0.8–0.9 mm. Petals ovate-lanceolate, 1.5–2 × 0.9–1.1 mm, apex subobtusate; lip ovate-lanceolate, 2–2.5 × 0.9–1 mm, ecallose, entire, apex subacute; spur pendulous, slightly curving forward, cylindric-clavate, ca. 2 mm, much shorter than ovary, apex obtuse. Column ca. 1–1.2 mm; pollinarium 1.2 mm long, pollinium white, caudicles very short; viscidia brownish yellow, 0.8 mm.

Flowering: July–August.

Habitat: Found growing terrestrially on grassland and moss-covered wet slopes at an elevation range of 2800–3400 m.

Population: Small population comprising about 50–100 plants were observed in two different locations.

Specimens examined: INDIA, Arunachal Pradesh, Tawang, Mirba, 27°32'7"N, 91°57'9"E, 2850 m, 24 July 2023, *J. Tsering 50241* (Orchid Herbarium Tipi, designated as OHT!); INDIA, Arunachal Pradesh, Tawang, in between Mirba and Bhagajang, 27°32'16"N, 91°58'44"E, 3400 m, 19 August 2023, *J. Tsering 50273* (Orchid Herbarium Tipi, designated as OHT!).

Global distribution: INDIA (Arunachal Pradesh: reported here, Sikkim, West Bengal).

Note: *Platanthera juncea* (King & Pantl.) Kraenzl. has been reported in many literatures as synonym of *P. nematocaulon* (Hook.f.) Kraenzl., however Swami (2016) in his book ‘Terrestrial Orchids’ presented colour photographs of these two species which clearly depicts these as two different species.

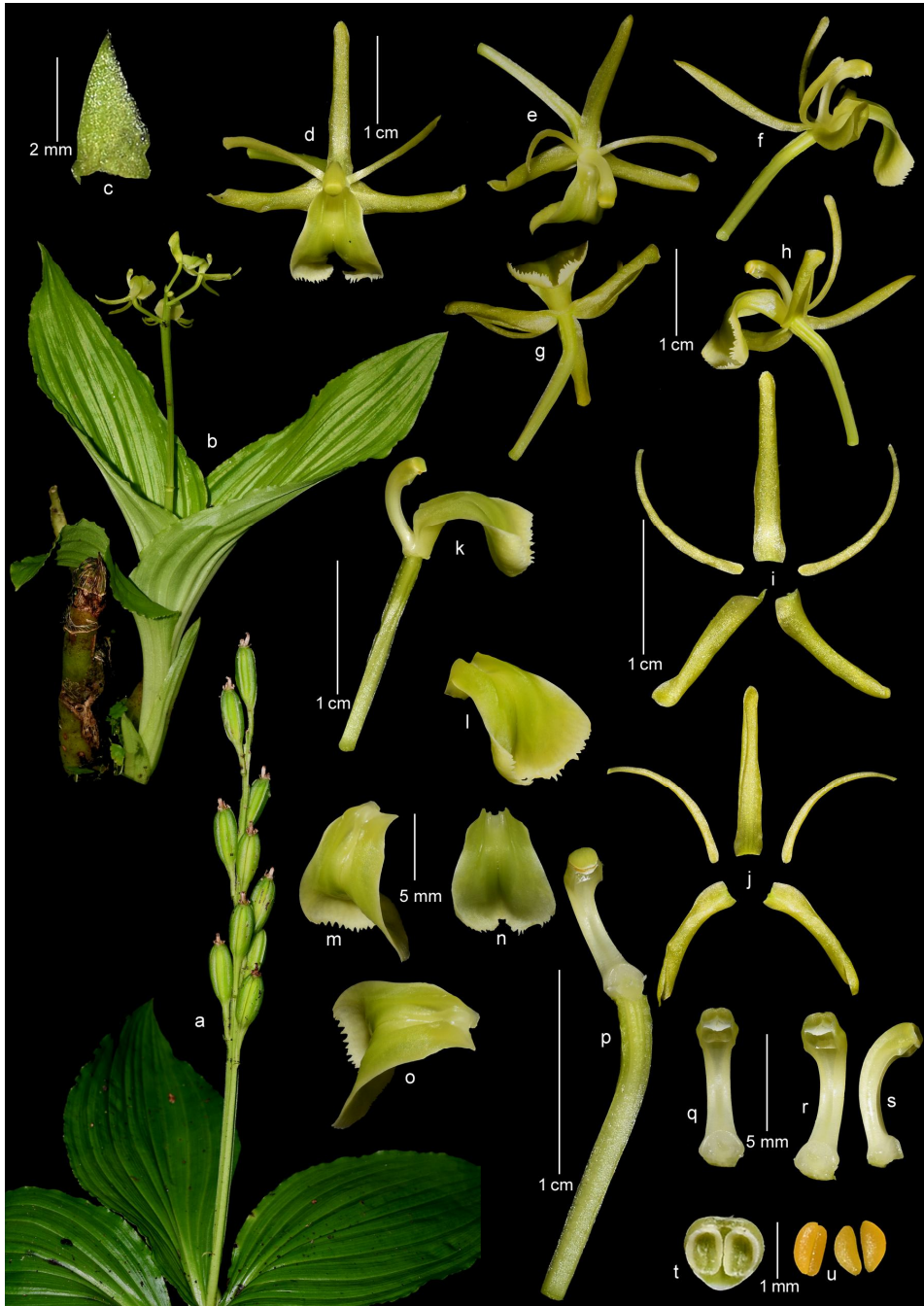


Figure 2: *Liparis acuminata* Hook.f.: **a–b.** Habit; **c.** Bract; **d–h.** Flower; **i.** Sepals and petals (adaxial); **j.** Sepals and petals (abaxial); **k.** Lip and column with attached peduncle and ovary; **l–o.** Lip; **p.** Column with attached peduncle and ovary; **q–s.** Column; **t.** Anther cap; **u.** Pollinaria.



Figure 3: *Oreorchis foliosa* (Lindl.) Lindl.: a. Habit; b. Coralloid rhizome attached with pseudobulb; c. Bract; d-h. Flower; i. Sepals and petals; j. Lip and column with attached peduncle and ovary; k-m. Petal; n-p. Column with attached peduncle and ovary; q. Column head; r. Pollinaria; s. Capsule.



Figure 4: *Platanthera juncea* (King & Pantl.) Kraenzl.: **a–b.** Habit; **c.** Inflorescence; **d.** Bract; **e–j.** Flower; **k.** Sepals and petals; **l.** Lip, spur and column with attached peduncle and ovary; **m–n.** Column and spur with attached peduncle and ovary petal; **o.** Column with attached spur; **p.** Lip; **q.** Pollinaria.

ACKNOWLEDGEMENTS

The author is thankful to the Director, State Forest Research Institute, Itanagar and the Principal Chief Conservator of Forests & Head of the Forest Force, Department of Environment, Forest and Climate Change, Government of Arunachal Pradesh for providing the research facilities.

REFERENCES

- Averyanov, L.V., Averyanova, A.L., 2023.** Updated Checklist of The Orchids of Vietnam. Vietnam National University Publishing House, Hanoi.
- Chase, M.M., Cameron, K.M., Freudenstein, J.V., Pridgeon, A.M., Salazar, G., Van Den Berg, C., Schuiteman, A., 2015.** An updated classification of Orchidaceae. Botanical Journal of the Linnean Society. 177, 151–174.
- Hooker J.D., 1890.** Flora of British India, Volume 5. L.Reeve & Co., London, pp. 21.
- Swami, N., 2016.** Terrestrial Orchids. Naresh Swami, India.
- POWO (2023).** Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://www.plantsoftheworldonline.org/> (Cited: 9 October 2023).
- Prasad, K., 2023.** The genus *Platanthera* (Orchidaceae) in India with two new species. Rheedeia. 33(2), 31-52.
- Pridgeon, A.M., Cribb, P.J., Chase, M.W., Rasmussen, F.N., 2005.** Genera orchidacearum, Volume 4: Epidendroideae (Part 1). Oxford University Press, Oxford.
- Rao A.N. 2010.** Orchid flora of Arunachal Pradesh – an update. Bulletin of Arunachal Forest Research. 26(1&2), 82–110.
- Rao, S., Singh, S.K., 2015.** Wild Orchids of Meghalaya, Pictorial Guide. Meghalaya Biodiversity Board, Shillong.
- Singh, S.K., Agrawala, D.K., Jalal, J.S., Dash, S.S., Mao, A.A., Singh, P., 2019.** Orchids of India, A Pictorial Guide. Botanical Survey of India.