

Extended distribution of *Eria spicata* (Orchidaceae), a curious sympodial orchid from the Indian subcontinent^a

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Keywords/mots-clés : *Pinalia*, Himachal Pradesh, taxonomy/taxinomie, biogeography/biogéographie.

Abstract

Eria spicata (D.Don) H.R.E.Handel-Mazzetti, belonging to Section *Pinalia*, is reported for the first time from the state of Himachal Pradesh, India. The global distribution of the species is discussed. A detailed description coupled with illustration is provided to facilitate easy identification. An artificial key to the species belonging to Section *Pinalia* for India is also provided to show their relationship.

Résumé

Extension de la distribution géographique de *Eria spicata* (Orchidaceae), curieuse orchidée sympodiale du sous-continent indien – *Eria spicata* (D.Don) H.R.E.Handel-Mazzetti, de la section *Pinalia*, est pour la première fois enregistrée dans l'état de Himachal Pradesh, Inde. La distribution globale de l'espèce est discutée. Une description détaillée, associée à une illustration, en est donnée afin d'en faciliter l'identification. Une clé artificielle des espèces indiennes de la section est également proposée pour montrer leurs relations.

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Introduction

Eria J.Lindley is one of the large, polymorphous, sympodial, epidendroid genera of Orchidaceae, distributed mainly from tropical-Asia to the Indo-Pacific region. Considering the high amount of heterogeneity prevailing among its infrageneric taxa, the genus is divided into several sections. Section *Pinalia* J.Lindley is characterized by small flowers in dense or lax, cylindrical or globular heads; lip with side-lobes and keels; column-foot hollowed at its upper side, upward curved distally and firmly connected to the short claw at the base of lip, without a geniculate band or distinct joint.

Within India, the section is represented by 7 species, distributed mostly in the Himalayan region and North-East India, with one species [*Eria meghasaniensis* (S.Misra) S.Misra] extending south into peninsular India. *Eria spicata* (D.Don) H.R.E.Handel-Mazzetti, the most characteristic species of this section, is distributed widespread from the state Uttarakhand in the North-Western Himalaya, through Nepal, Bhutan, Eastern Himalaya, North-East India, China and Myanmar to Thailand [Seidenfaden (1982); Agrawala (2009)]. During a recent botanical tour to Himachal Pradesh, the species was found growing epiphytic on rock boulders at Neugalsari, Kinnaur district. The specimens were compared with earlier studied plants of the same species from other regions and found to be identical. Perusal of relevant literature [Collett (1902); Duthie (1906); Nair (1977); Vij *et al.* (1982); Seidenfaden & Arora (1982); Chowdhery & Wadhwa (1984); Deva & Naithani (1986); P.B. Singh *et al.* (1993, 1994); Ashwal & Mehrotra (1994); Chowdhery (1998); Dhaliwal & Sharma (1999); Singh & Rawat (2000); Pearce & Cribb (2002); Kaur & Sharma (2004); Singh & Sharma (2006); Lal & Rawat (2008); Pusalkar & Singh (2008)] revealed that this is the first report of its occurrence in this state. Thus the western limit of global distribution range of this species extends further from the state of Uttarakhand to the state of Himachal Pradesh. The detailed nomenclatural citation, synonymy, description coupled with illustration are provided here to facilitate easy identification. An artificial key to the species under Section *Pinalia* in India is also provided to show their relationships.

Citation and Synonymy

Eria spicata (D.Don) H.R.E.Handel-Mazzetti, *Symbolae Sinicae* 7: 1353 (1936); Pradhan, *Indian Orchids* 2: 365 (1979); Hara *et al.*, *Enumeration of Flowering Plants of Nepal*: 42 (1982); G.Seidenfaden in *Opera Botanica* 62: 126, f.78 (1982); S.K.Kataki, *Orchids of Meghalaya*: 92, pl.29(1a-1b) (1986); Deva & H.B.Naithani, *Orchid Flora of North-West Himalaya*: 287, f.163 (1986); R.C.Srivast in Hajra & D.M. Verma (eds.), *Flora of Sikkim* 1: 69 (1996); H.J.Chowdhery, *The Orchid Flora of Arunachal Pradesh*: 381, f.229 (1998); J.R.Press *et al.*, *Annotated Checklist of Flowering Plants of Nepal*: 216 (2000); T.M.Hynniewta *et al.*, *Orchids of Nagaland*: 181, f.60 (2000); N.Pearce & P.J.Cribb, *The Orchids of Bhutan*: 383, pl.19 (wrongly labeled as *Eria stricta*) (2002); W.J.Kress *et al.*, *Checklist of trees, shrubs, herbs and climbers of Myanmar*: 78 (2003); C.Sathish Kumar & P.C.Suresh Kumar, *Rheedea* 15(1): 39 (2005); Lucksom, *The Orchids of Sikkim and North-East Himalaya*: 559, f.342, pl.24 (2007). *Octomeria spicata* D.Don, *Prodromus Florae Nepalensis*: 31 (1825).

Eria convallarioides J.Lindley, *Genera and Species of Orchidaceous Plants*: 70 (1830); *Botanical Register* 27: t.62, misc. 58, no.121 (1841); *Journal of the Proceedings of the Linnean Society. Botany* 3: 53 (1858); J.D.Hooker, *Flora of British India* 5: 791 (1890); C.B.Grant, *Orchids of Burma (including Andaman Islands)*: 136 (1895); King & Pantling, *Annals of the Royal Botanic Garden Calcutta* 8: 118, t.161 (1898); Duthie, *Annals of the Royal Botanic Garden Calcutta* 9: 110 (1906); Kraenzlin, in Engler (ed.), *Das Pflanzenreich* IV-50 (2): 110 (1911); M.L.Banerji, *Orchids of Nepal*: 68 (1978).

Eria convallarioides var. *major* J.Lindley, *Botanical Register* 33: t.63 (1847).

Description

Epiphytic herbs, up to 39 cm high. Rhizomes condensed. Roots in cluster from the base of pseudobulbs, strongly wiry. Pseudobulbs closely stacked together, highly variable, 3-14 × 1-2.5 cm, narrow at base, somewhat clavate above, bilaterally compressed, with 3-5 internodes; internodes sometimes spindle-shaped, wrinkled or shallowly grooved on maturity; matured pseudobulbs devoid of sheaths at upper nodes, but basal internodes are covered with imbricate-distichous sheaths; new shoots develop at the base of matured pseudobulbs, cylindrical, at base covered with imbricate

sheaths, apical portion covered by the sheathing leaf-bases; sheaths ovate, entire, obtuse, 1-1.5 cm long; uppermost sheath is largest and non overlapping, and develops into a small leafy lamina. Leaves 3-7, highly variable, usually 5-17 × 1-2.7 cm, lowermost leaf is smallest, (in larger specimens leaves are up to 25 × 4.5 cm), sub-apical, narrowly elliptic-lanceolate to broadly elliptic-ovate, entire, acuminate, 9-11 veined, sessile or sometimes with narrow, channeled petiole, base sheathing. Racemes 1-3, up to 8 cm long, sub-apical, from the axil of the leaves, erect to arcuate, globose to ovate-cylindrical; peduncles 1.5-2 cm long, terete, erect, slightly curved at the apex, pubescent, at base covered with 2-3 ovate, membranous, imbricate sheaths, no sterile bract or sheath above; rachis longer, strongly arched horizontally, sometimes drooping, pubescent, densely many flowered. Floral bracts 4-9 × 2-4.5 mm, creamy yellow, strongly reflexed, ovate to ovate-lanceolate, entire, acuminate, 1-veined, sparsely pubescent outside. Flowers not fully opening, 7-12 mm long, 3.5-6 mm wide, creamy-white with yellow or pink-purple tinge at the apex of sepals and petals; mid-lobe of lip yellow; side-lobes white with purple tinge towards the apex; column apex and anther dark-purple. Pedicel and ovary 3-5 mm long, creamy-yellow, pubescent, ovary with prominent purple veins. Sepals ovate, entire, sub-acute to obtuse, 5-veined, sparsely pubescent at dorsal surface; dorsal sepal 4-5.5 × 2.5-3 mm, concave; lateral sepals 5-6 mm long, 4.5-5 mm broad at base, broadly-ovate, falcate, connate with the column-foot to form a broadly orbicular, rounded, shallowly emarginate mentum. Petals 3.5-5 × 1.5-2 mm, ovate-elliptic, slightly falcate, entire, sub-acute, 3-veined, glabrous. Lip 4-5 mm long, 4-5 mm broad through the side-lobes, fan-shaped, continuous with the column-foot without any separating line between them, 3-lobed; side-lobes ovate-falcate, rounded, much larger than mid-lobe; mid-lobe broader than long, quadrate, densely glandular-pubescent throughout, obtuse to truncate, mucronate to shortly apiculate. Column 1-2 mm long, erect, narrowly winged, white at base, dark-purple above; foot elongated, U-curved along with the base of lip, sparsely pubescent below; clinandrium cordate, with stelidia-like projections, deeply 2-grooved; rostellum beak-like, projecting forward; anther rounded, ca 0.5 × 1 mm, 2-lobed, each lobe 4-chambered;

pollinia 8, in 2 groups of 4, ca 0.5 mm long, yellow, clavate, united by their caudicles; stigmatic cavity obtriangular. Capsules 0.6-1.2 cm long, elliptic-oblong, almost sessile, 6-ridged. (Plate 1).

Flowering: July - September. Fruiting: October – December.

Distribution and ecology

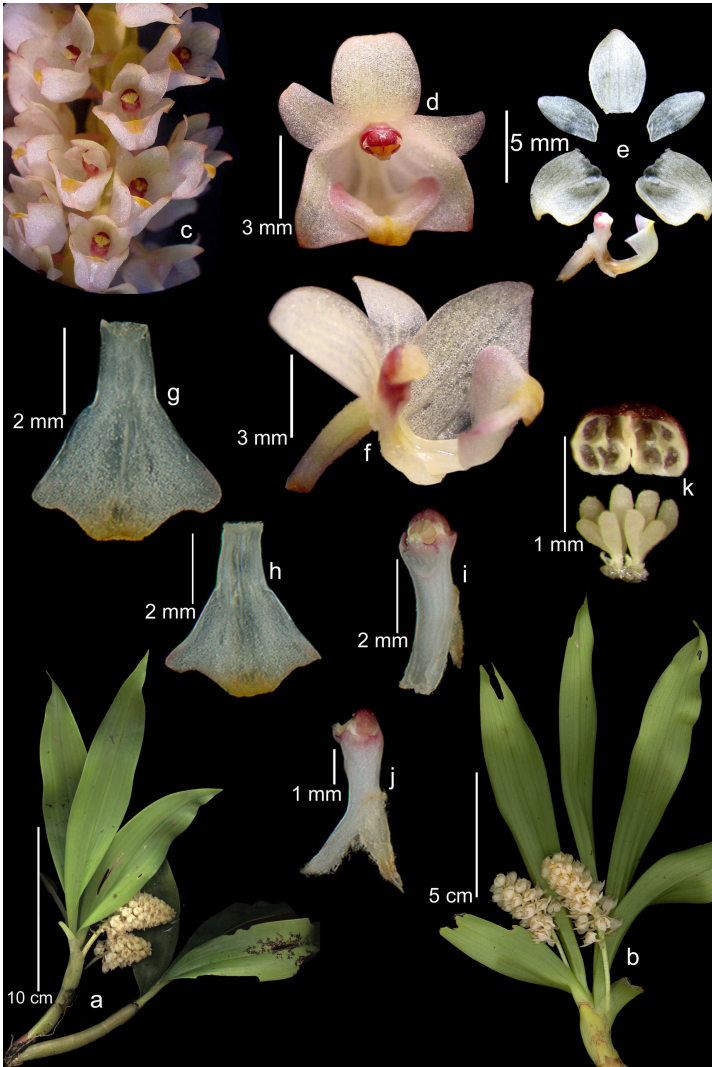
Ecology & habitat: epiphytic on tree trunks in tropical valleys and subtropical primary forests between 300-2800 m.

Host plants: *Alnus nepalensis* D.Don, *Duabanga grandiflora* (A.P. de Candolle) W.G.Walpers, *Quercus incana* Bartram, *Quercus serrata* Murray, *Toona ciliata* M.J.Roemer, *Engelhardtia* sp., *Euphorbia royleana* P.E.Boissier etc.

Distribution: INDIA: Himachal Pradesh, Uttarakhand, West Bengal, Sikkim, Assam, Arunachal Pradesh, Nagaland, Mizoram, Manipur, Meghalaya; NEPAL; BHUTAN; MYANMAR; CHINA; THAILAND.

Specimen examined:

Himachal Pradesh: Kinnaur district, Neugalsari, 25.07.2012, *Krishan Lal* 1728 (BSHC). **Uttarakhand:** Tehri district, Agrakhal, near Narendra Nagar, 1600m., 26.03.2007 (flowered on 25.07.2008), *D. K. Agrawala* 40107 (BSD). **West Bengal:** Darjeeling district, Lolleygaon, 28.04.2004, *D. K. Agrawala* 32672 (CAL); Neora Valley N. P., 22.07.2004, *D. K. Agrawala* 32683 (CAL). **Sikkim:** South district, Temi – Damthang (along the foot track), 1800m., 04.03.2005, *D. K. Agrawala* 32698 (CAL). **Assam:** North Lakhimpur district, Kokoi Reserve Forests, 22.11.1957, *G. Panigrahi* 11430 (ASSAM). **Arunachal Pradesh:** Lower Subansiri district, 26.08.1966, *A. R. K. Sastry s.n.* (ASSAM); West Kameng district, Bomdila – Selari 20th Km., 12.04.1973, *R. S. Rao* 53818 (ASSAM). **Manipur:** Lemokhong, near Imphal town, 14.04.1962, *J. G. Srivastava & party* 88907 (LWG). **Mizoram:** Lushai Hills, Sialsnk, 1500m., 15.01.1963, *D. B. Deb* 30798 (ASSAM). **Nagaland:** Naga Hills, Kohima, August 1886, *Dr. Prain's Collector* 45 (CAL); Naga Hills, *Dr. Prain's Collector* 62 (CAL). **Meghalaya:** Khasi Hills, Mairang, 16.07.1973, *T. M. Hynniewta* 53039 (ASSAM).



Pl. 1. *Eria spicata* (D.Don) H.R.E.Handel-Mazzetti

a). & b). Habit, c). Part of inflorescence, d). Flower, e). Pedicel, ovary, sepals, petals, lip, column & foot, f). Flower (one petal and lateral sepal removed), g). & h). Lip (flattened), i). column (front view), j). Column & foot (lateral view), k). Anther & pollinia. [Figures a to d and f to k – *D.K. Agrawala* 40107 (BSD); e – *D.K. Agrawala* 32672 (CAL)]. Figure c is not to scale.

Artificial key to the species under Section *Pinalia*, Genus *Eria* in India

- 1a. Inflorescence narrowly cylindrical, laxly flowered 2
- 1b. Inflorescence broadly ovoid to globose or sub-cylindrical, densely flowered 3
- 2a. Mid-lobe of lip bilobulate *E. occidentalis* G.Seidenfaden
- 2b. Mid-lobe of lip entire *E. bipunctata* J.Lindley
- 3a. Mid-lobe of lip bilobulate 4
- 3b. Mid-lobe of lip entire 5
- 4a. Globose inflorescence, less than 1 cm across; flowers minute; dorsal sepals up to 3 mm long; side-lobes of lip more basal in position, free apical part much longer than broad *E. pumila* J.Lindley
- 4b. Globose inflorescence, more than 3 cm across; flowers moderately sized; dorsal sepals more than 3 mm long; side-lobes of lip more near the start of mid-lobe, free apical part much broader than long
..... *E. meghasaniensis* (S.Misra) S.Misra
- 5a. Inflorescence small, globose, sub-sessile, subcapitate, 1-1.5 cm long; lateral sepals connate at base *E. connata* J.Joseph *et al.*
- 5b. Inflorescence large, broadly ovate to globose, with prominently elongated peduncle, raceme, 3.5-8 cm long; lateral sepals free at base 6
- 6a. Flowers uniformly white with dark yellow mid-lobe of lip; side-lobes of lip smaller, semicircular, placed near the middle, mid-lobe broadly orbicular *E. globulifera* G.Seidenfaden
- 6b. Flowers creamy-white with purple tinge at tip of sepals, petals, mentum and side-lobes of lip; mid-lobe light yellow; apical part of column and anther dark-purple; side-lobes of lip much larger, fan-shaped, occupying most part of the lip, mid-lobe sub-quadrata to broadly triangular
..... *E. spicata* (D.Don) H.R.E.Handel-Mazzetti

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Eria J.Lindley est l'un des genres d'Epidendroideae (Orchidaceae) sympodiaux, vastes, polymorphes ; il est présent principalement depuis l'Asie tropicale jusqu'à la région indo-pacifique. Du fait de la grande hétérogénéité de ses taxons infragénériques, il a été divisé en plusieurs sections. La section *Pinalia* J.Lindley est caractérisée par des fleurs petites, en boules denses ou lâches, cylindriques ou globulaires, un labelle doté de lobes latéraux et de carènes, un pied de colonne en creux sur sa face supérieure, courbé vers le haut en partie distale et fermement connecté au court onglet du labelle, sans bande géniculée ni joint net. En Inde, la section est représentée par sept espèces, principalement distribuées dans la région

himalayenne et le nord-est du pays, l'une d'elles, *Eria meghasaniensis* (S.Misra) S.Misra, s'étendant au sud dans l'Inde péninsulaire. *Eria spicata*, l'espèce la plus caractéristique de la section, est présent depuis l'état Uttarakhand, Himalaya nord-ouest, jusqu'en Thaïlande, en passant par le Népal, le Bhoutan, l'Himalaya oriental, le nord-est de l'Inde, la Chine et le Myanmar. Des spécimens ont été trouvés récemment dans le Himachal Pradesh, poussant en épiphyte sur des blocs rocheux à Neugalsari, district de Kinnaur. L'étude attentive de la littérature a montré que c'était la première découverte de l'espèce dans cet état. La limite occidentale de sa zone de répartition est ainsi repoussée de l'état d'Uttarakhand à celui de Himachal Pradesh. On propose dans cet article une description détaillée, une illustration et une clé artificielle d'identification des espèces indiennes de la section *Pinalia*.

Herbes épiphytes pouvant atteindre 40 cm de hauteur ; rhizomes courts ; racines en touffe à la base des pseudobulbes, très flexibles ; pseudobulbes resserrés, variables, 3-14 × 1-2,5 cm, étroits à la base, un peu claviformes au-dessus, comprimés latéralement, avec 3-5 entre-nœuds parfois fusiformes, ridés ou rainurés à la maturité ; pseudobulbes matures dépourvus de gaines aux nœuds supérieurs ; les pousses nouvelles, cylindriques, couvertes à la base de gaines imbriquées, et en partie apicale par les bases engainantes des feuilles, se développent à la base des pseudobulbes matures ; gaines ovales, entières, obtuses, longues de 1-1,5 cm, la supérieure, plus grande et ne chevauchant pas les autres, se développe en une petite feuille ; feuilles 3-7, variables, généralement 5-17 × 1-2,7 cm, l'inférieure plus petite, sub-apicales, étroitement elliptiques lancéolées à largement elliptiques ovales, entières, acuminées, à 9-11 veines, sessiles ou parfois avec un pétiole étroit et canaliculé, à base engainante ; racèmes 1-3, pouvant atteindre 8 cm de longueur, sub-apicaux, issus de l'axe des feuilles, dressés à arqués, globuleux à ovales cylindriques ; pédoncules longs de 1,5-2 cm, cylindriques, dressés, légèrement courbés à l'apex, pubescents, couverts à la base de 2-3 gaines ovales, membraneuses, imbriquées, sans bractée ou gaine stérile au-dessus ; rachis plus longs, fortement arqués horizontalement, pubescents densément multiflores ; bractées florales 4-9 × 2-4,5 mm, jaune crème, vivement réfléchies, ovales à ovales lancéolées, entières, acuminées, uni-veinées, peu pubescentes à l'extérieur ; fleurs ne s'ouvrant pas pleinement, 7-12 × 3,5-6 mm, blanc crème avec une nuance jaune ou rose pourpre à l'apex des sépales et des pétales, lobe médian du labelle jaune, lobes latéraux blancs avec une teinte pourpre vers l'apex, apex de la colonne et anthère pourpre foncé ; pédicelle et ovaire longs de 3,5 mm, jaune crème, pubescents, l'ovaire avec des veines proéminentes pourpres ; sépales ovales, entiers, sub-aigus à obtus, à 5 veines, peu pubescents sur la face dorsale, le dorsal 4-5,5 × 2,5-3 mm,

concave, les latéraux 5-6 × 4,5-5 mm, largement ovales, falciformes, connés avec le pied de la colonne pour former un menton largement orbiculaire, arrondi, émarginé; pétales ovales elliptiques, 3,5-5 × 1,5-2 mm, légèrement falciformes, entiers, sub-aigus, tri-veinés, glabres; labelle en forme d'éventail, 4-5 × 4-5 mm, trilobé, soudé de manière continue avec le pied de la colonne, lobes latéraux ovales falciformes, arrondis, beaucoup plus grands que le médian, lobe médian plus large que long, densément glandulaire pubescent, obtus à tronqué, mucroné à brièvement apiculé; colonne longue de 1-2 mm, droite, à 2 ailes étroites, pied allongé, courbé en U avec la base du labelle, peu pubescent au-dessous, clinandre cordé, avec des projections semblables à des *stelidia*, profondément bi-rainuré, rostellum en forme de bec, se projetant en avant, anthère arrondie, environ 0,5 × 1 mm, bilobée, chaque lobe à 4 chambres, pollinies 8, en 2 groupes de 4, environ 0,5 mm de longueur, jaunes, claviformes, unies par leurs caudicules, cavité stigmatique ob-triangulaire; capsules longues de 0,6-1,2 cm, elliptiques oblongues, presque sessiles, à 6 crêtes (planche 1).

Floraison en juillet-septembre, fructification en octobre-décembre.

Clé des espèces indiennes de la section *Pinalia*

- 1a. inflorescence étroitement cylindrique, à fleurs lâches.....2
- 1b. inflorescence largement ovoïde à globuleuse ou sub-cylindrique, densément fleurie.....3
- 2a. lobe médian du labelle bi-lobulé.....*E. occidentalis* G.Seidenfaden
- 2b. lobe médian entier.....*E. bipunctata* J.Lindley
- 3a. lobe médian bi-lobulé.....4
- 3b. lobe médian entier.....5
- 4a. inflorescence globuleuse, moins de 1 cm de diamètre, fleurs très petites, sépale dorsal jusqu'à 3 mm de longueur, lobes latéraux du labelle en position plus basale, partie apicale libre beaucoup plus longue que large.....*E. pumila* J.Lindley
- 4b. inflorescence globuleuse, plus de 3 cm de diamètre, fleurs de taille moyenne, sépale dorsal plus de 3 mm de longueur, lobes latéraux du labelle plus proches du début du lobe médian, partie apicale libre beaucoup plus large que longue.....
.....*E. meghasaniensis* (S.Misra) S.Misra
- 5a. inflorescence petite, globuleuse, sub-sessile, sub-capiteuse, longue de 1-1,5 cm, sépales latéraux connés à la base.....*E. connata* J.Joseph *et al.*
- 5b. inflorescence grande, largement ovale à globuleuse, avec un pédoncule nettement allongé, racème long de 3,5-8 cm, sépales latéraux libres à la base.....6

- 6a. fleurs uniformément blanches avec le lobe médian du labelle jaune foncé, lobes latéraux du labelle similaires, semi-circulaires, placés près du milieu, lobe médian largement orbiculaire.....*E. globulifera* G.Seidenfaden
- 6b. fleurs blanc crème avec une teinte pourpre au sommet des tépales, du menton et des lobes latéraux du labelle, lobe médian jaune pâle, partie apicale de la colonne et anthère pourpre foncé, lobes latéraux du labelle beaucoup plus grands, en éventail, occupant la majeure partie du labelle, lobe médian sub-carré à largement triangulaire.....*E. spicata* (D.Don) H.R.E.Handel-Mazzetti

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