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NOTE

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AN EXTENDED DISTRIBUTION RECORD OF WESTERN GHATS SPECIES *LITSEA OLEOIDES* (MEISSN.) HOOK.F. (LAURACEAE) FROM MATHERAN, MAHARASHTRA, INDIA

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In the course of floristic explorations in the hill station, Matheran, in Raigad District of Maharashtra, we collected an interesting specimen of a *Litsea* species. After critical examination and comparing our specimens with all available collections in various herbaria including Kew, the specimen was identified to be *Litsea oleoides* (Meissn.) Hook.f., an endemic species of wet evergreen forests in southern India, hitherto not reported from Maharashtra.

Litsea oleoides

(Meissn.) Hook.f., Fl. Brit. India 5: 175. 1886; Gamble, Fl. Pres. Madras 2: 1236. 1925; V. Chandras. in A.N. Henry et al., Fl. Tamil Nadu 2: 211. 1987; Matthew, K.M. Illustrations on the Flora of the Palni Hills, southern India. 616. 1996; Sasidh., Biodiv. Doc. Kerala - Fl. Pl. 399. 2004; Udayan et al. Indian Forester 130 (5): 551–564. 2004; Bhuinya et al., Bangladesh J. Plant Taxon. 17(2): 183–191. 2010; Rajeev Kumar Singh et al. Bangladesh Journal of Plant Taxonomy 22(2): 77–81. 2015. *Tetranthera oleoides* Meissn. Prodr. 15(1): 195 1864.

Specimen examined: Phytocare Herbarium, Piramal Enterprises Limited, 20130725(1), 29.vi.2013, Maharashtra, Raigad, Matheran (in fruit), 750m, coll. Gurumurthi Hegde & Radha Veach.

Other specimens: The Herbarium at Center for Ecological Sciences (CES), Indian Institute of Science Bengaluru JCB 0291, 15.iii.2015, Karnataka,

Kemmannugundi, Bababudengiri, Muthodi, Bhadra forest 13.530°N & 75.785°E, 1,375m, coll. Srinivas S.G & Y.L Krishnamurthy; Royal Botanic Gardens, Kew (KEW) K000357533, (date unknown) iv.1846, Kerala, Sispara (as Chispaurey) s.d., R. Wight.

Medium to large canopy trees 10–30 m tall, girth up to 3.82m; young bark smooth, lenticellate, green, turning greyish-brown or grey; older trunks buttressed with the bark exfoliating in longitudinal patches; branchlets green or yellowish-green, glabrous or glabrescent. Leaves sub-opposite to alternate; blade elliptic or elliptic-oblong or oblong (when young), up to 12–26 x 7–14 cm, apex short and bluntly acuminate, base cuneate, margin entire, sub-coriaceous, glabrous on both surfaces, dark green above, much paler and whitish beneath; new foliage pinkish-red turning to copper; petiole 1.5–3 cm long, glabrous; midrib shallowly sunken or flattened above, raised beneath, secondary veins 12–15 pairs, slightly prominent above, raised beneath, curving or curving

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Competing interests: The authors declare no competing interests.

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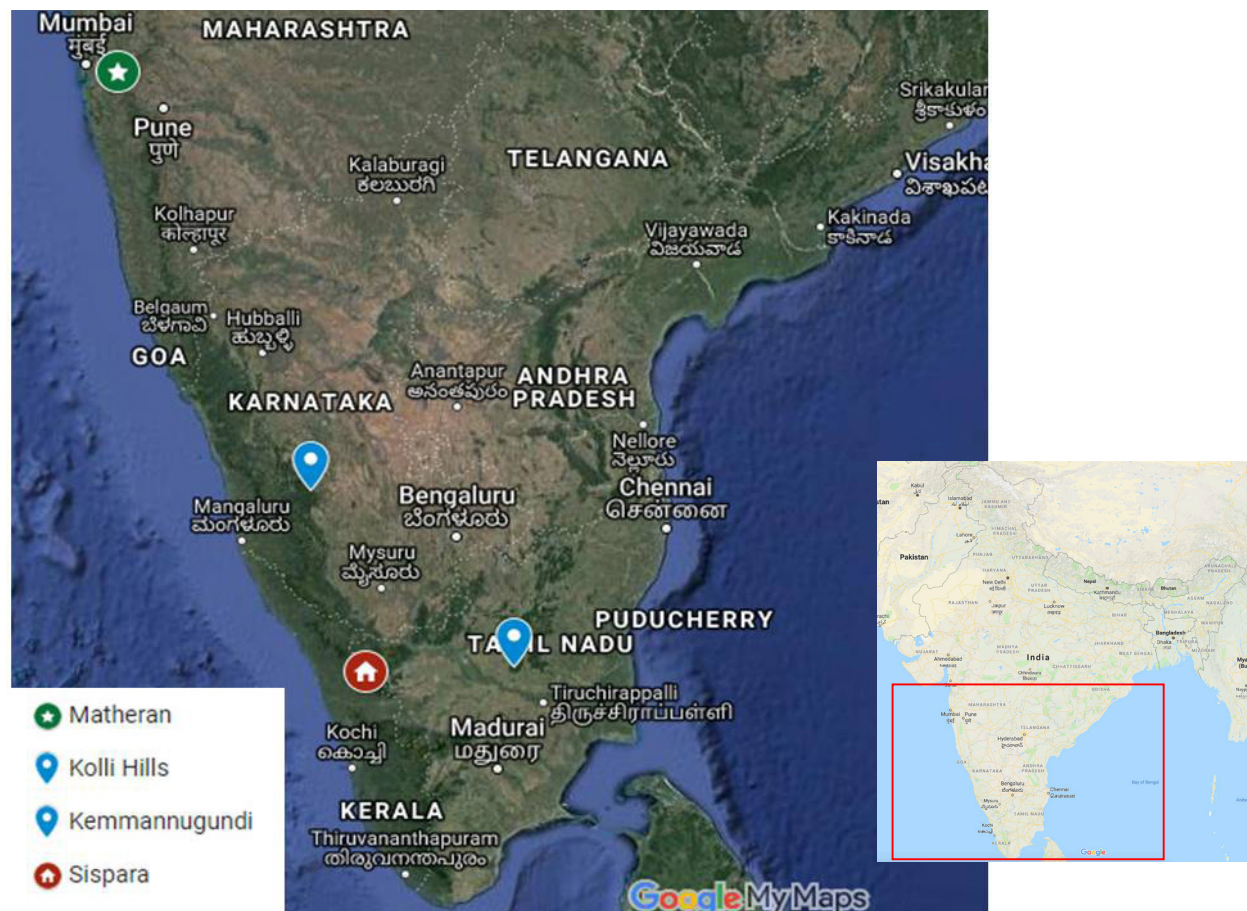


Figure 1. *Litsea oleoides* (Meissn.) Hook.f. - Map of distribution in India. Imagery © 2017 Data SIO, NOAA, U.S. Navy, NGA, GEBCO, Landsat / Copernicus, Map data ©2017 Google

and looping near margin, tertiary veins reticulate, indistinct on both surfaces; prominent leaf galls on lower epidermis bursting stellately. Inflorescences on umbel-bearing reduced branchlets with the appearance of racemes of umbels, in axils of leaves or along branchlets, racemes of umbels 2–4 cm long; umbels 0.5–1 cm in diam.; peduncles 0.6–1.2 cm long, glabrous; bracts 4, decussate, sub-orbicular, broadly ovate, concave, 3.5–7 by 3–5 mm, membranous, with veins, two outer ones glabrescent, two inner ones glabrous. Male flowers 3–6 in each umbel; tepals 5, ovate-lanceolate, 3–3.5 by 2–3 mm, membranous, pubescent inside; pedicels 1–2 mm long, glabrous; stamens 8–11, unequal; anthers 1.5–2 mm long; filaments 1.5–2 mm long, villous, 2 glands at base or some without glands; pistillode 1–1.5 mm long, glabrous. Female flowers not seen. Fruits globose, 1.2–1.6 cm in diam., appressed at the top, pale green with faint white dots, turning dark cherry-pink and later dark red when ripe, glabrous, glossy; enlarged perianth tube obconical, glabrous; fruiting pedicels 0.3–0.7 cm long,

glabrous; infructescence stalks 0.3–1 cm long, glabrous.

Flowering: September–October. Fruiting: April–June.

Phenology: Tight buds appear in early August and remain almost unchanged in appearance for a whole month. The buds are swollen by mid-September and single flowers bloom randomly all over the tree. By early October half of the total buds are open and within a week the tree is in full bloom. Flowering terminates by late October, and if heavy rains do not persist dried flowers remain on the tree until January. Green juvenile fruits are formed in the first week of March. They mature slowly and remain green faintly speckled with white through April. By early May the fruits ripen to pink and fall. Meanwhile many immature fruits are knocked down by impatient monkeys. Large numbers of Bonnet Macaque *Macaca radiata* collect ripe fruits, eat the fleshy portion and discard the seeds, thus assisting in their dispersal. Though frugivory by birds is common in the Lauraceous tree species, we did not observe birds feeding on the fruit. Lack of ornithochory may be the

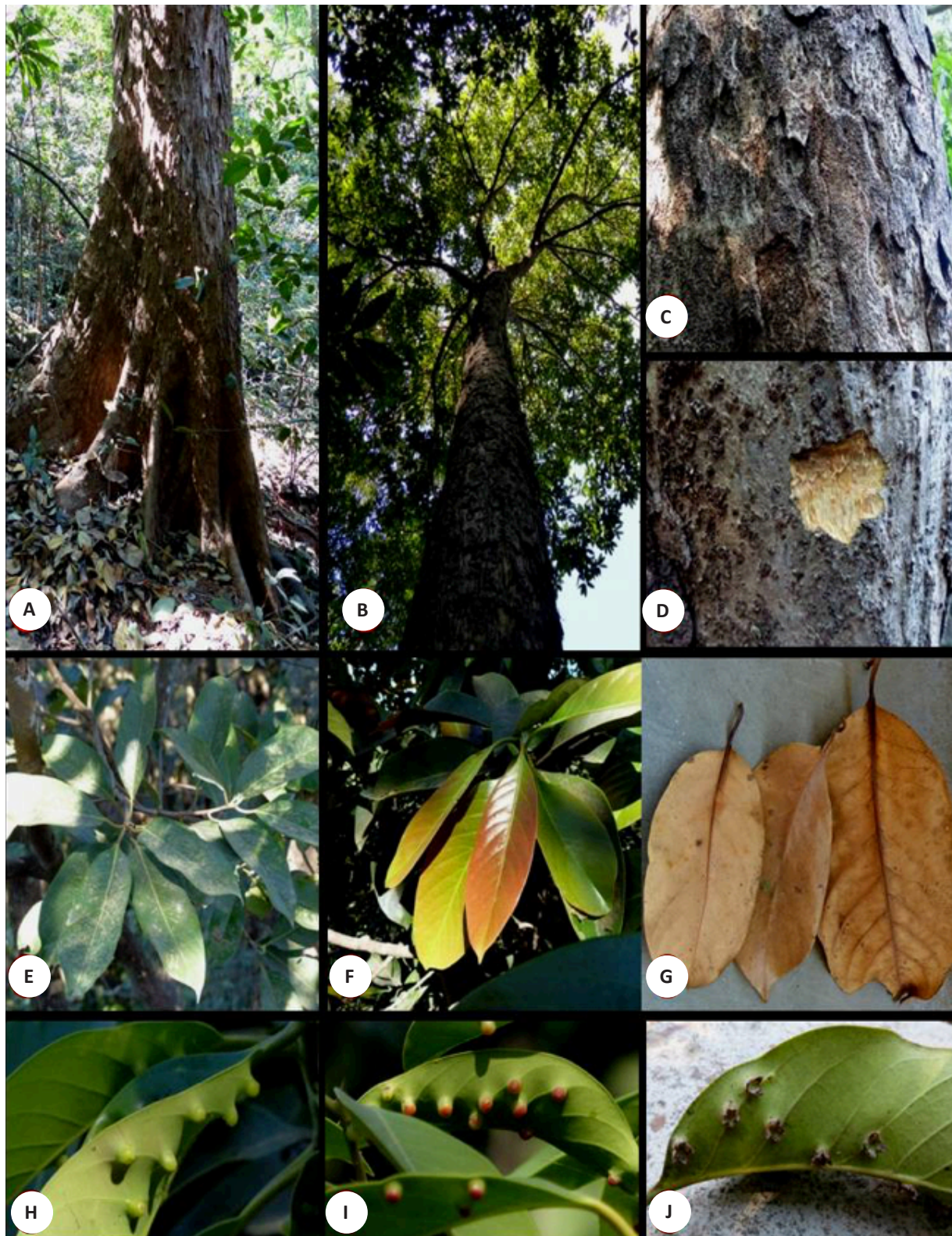


Image 1. *Litsea oleoides* (Meissn.) Hook.f. (A–J): A - Bole; B - Canopy; C - Bark; D - Blaze; E - Leaves; F - Young leaves with copper tinge; G - Fallen dried leaves; H–J - Galls on lower epidermis of leaves (H - younger stage, I - intermediate stage, J - older galls burst open)

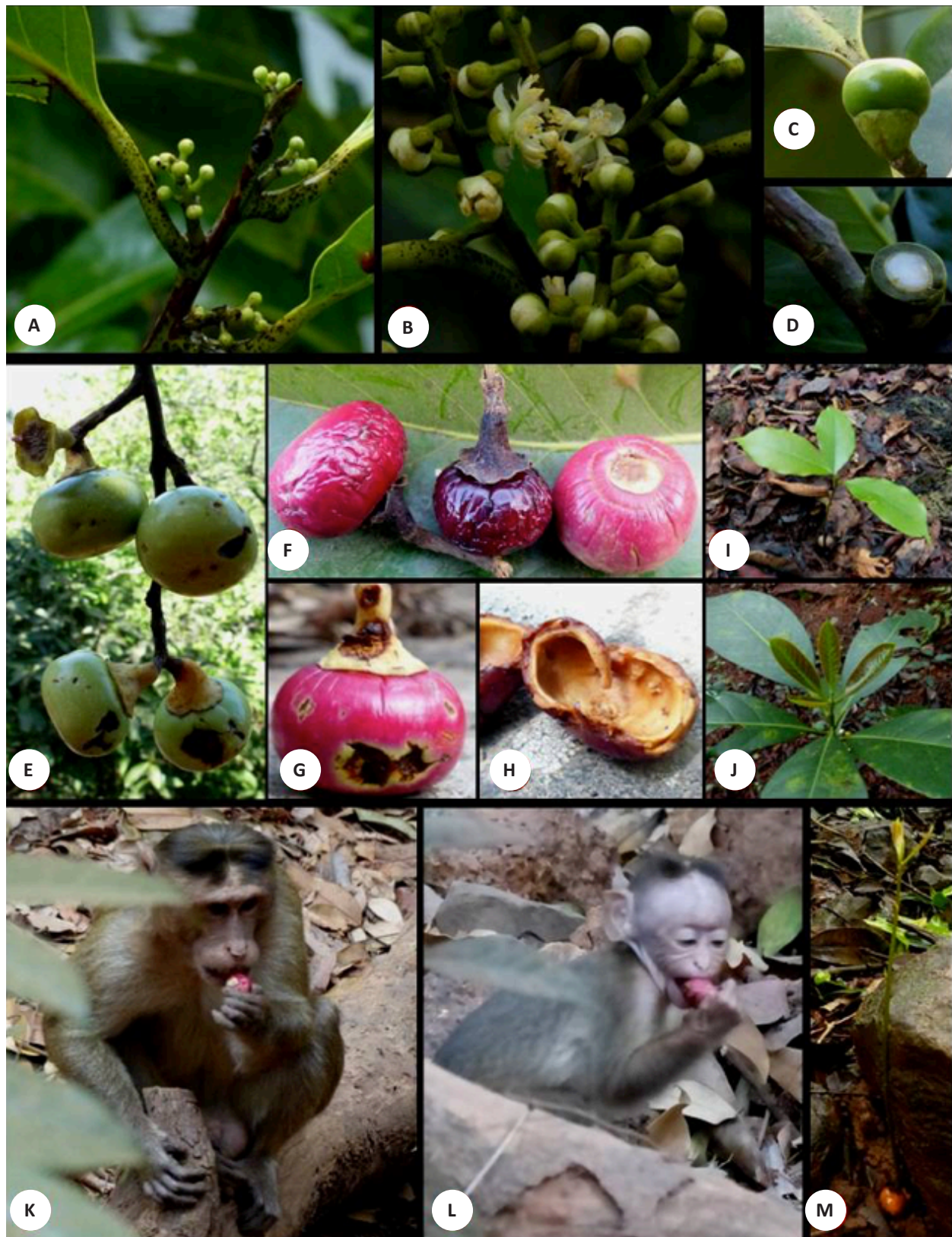


Image 2. *Litsea oleoides* (Meissn.) Hook.f. A&B: Flowers. A - buds, B - open flowers; C-H - Fruits (C - tender fruit, D - tender fruit cut transversely, E - just before maturity, F - different stages of maturity, G - Scars of frugivory, H - Epicarp); I & J - Saplings (I - 3-leaf stage, J - Two year old seedling); K & L - Frugivory by *Macaca radiata*; M - Fresh seedling.

cause for the present discontinuous distribution of this species. Seeds germinate beneath the parent trees. Seedlings at the 2-leaf and 4-leaf stages were observed in August. Of all 10 individual mature trees located in the slopes harbouring evergreen forest we saw an abundance of saplings ranging from 6–8 m tall with girths of 10–30 cm. The leaves of the saplings are much larger than those of the canopy trees. Though the tree is recorded as having opposite leaves in some locations, lower altitude plants have alternate leaves (Jose Robi pers. comm. 13 March 2014). The abundance of smaller seedlings in the vicinity of the parent trees indicates a good regeneration of the taxon locally.

Distributional notes: The tree is a known endemic to Kerala, Tamil Nadu (Nayar et al. 2006) and Karnataka (Udayan et al. 2004) states of southern India. Its northernmost distribution recorded to date is Kemmanagundi in Karnataka (Srinivas & Krishnamurthy 2016). The present collection site, Matheran, in the northern Western Ghats of Maharashtra is about 700 km further north. Matheran's elevation is about 759 m making it a new lower elevation record for *Litsea oleoides*. It is usually found in wet evergreen forests of 800–1300 m range.

Matheran is an isolated forested plateau west of the Ghats escarpment. It shelters a pocket of evergreen forest which has become isolated in the geological past leading to the present extremely discontinued distribution of the species. While the top of hill is a large lateritic plateau, deep ravines around it are covered by relatively small patches of evergreen forest of the type *Memecylon-Syzigium-Actinodaphne* (Puri et al. 1983). This forest type is quite unlike others in which *Litsea oleoides* commonly occurs. It is a common canopy tree or emergent in the type *Cullenia exarillata* - *Mesua ferrea* - *Palaquium ellipticum* (Pascal et al. 2004).

In Matheran, the population of *Litsea oleoides* is found

in conjunction with other evergreen species including *Diospyros sylvatica* Roxb., *Beilschmiedia dalzellii* (Meisn.) Kosterm., *Cryptocarya wightiana* Thwaites, *Ficus nervosa* B. Heyne ex Roth, *Garcinia talbotii* Raizada ex Santapau, *Mangifera indica* L., *Persea macrantha* (Nees) Kosterm., *Sageraea laurina* Dalzell and *Syzygium* spp. The ground layer of the forest includes *Ancistrocladus heyneanus* Wall. ex J. Graham, *Mallotus resinosa* (Blanco) Merr. and *Dimorphocalyx glabellus* var. *lawianus* (Hook. f.) Chakrab. & N.P. Balakr.

All the mature individuals of *Litsea oleoides* existing at Matheran are of a great height, making detailed observation difficult. This may be a reason why the presence of the species has been unrecorded until now. With the present collection of *Litsea oleoides*, Matheran is the northernmost distribution limit for this species. Also, the presence of this southern evergreen endemic confirms the remnant legacy of an evergreen flora of Matheran.

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