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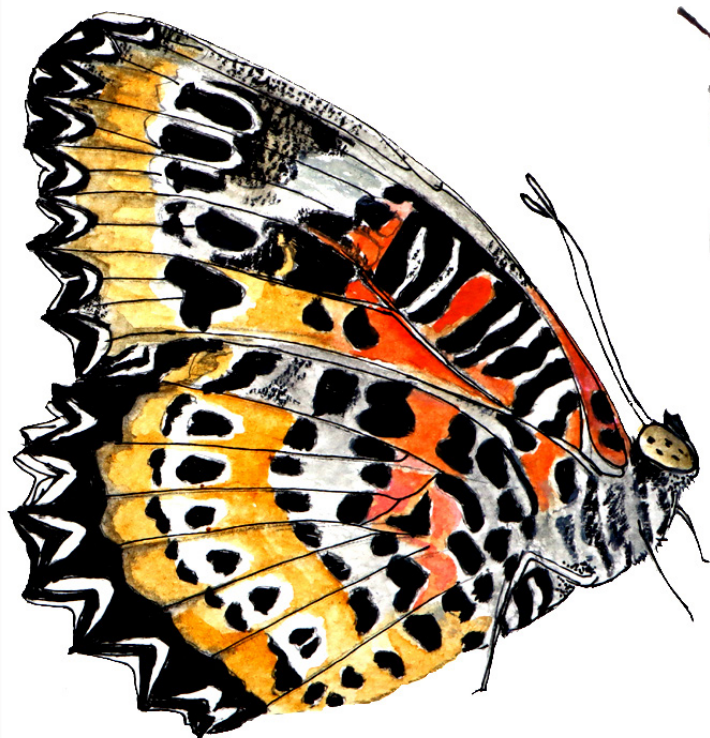
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Cover: Watercolour illustrations—Striped Tiger *Danaus genutia*, Common Silverline *Cigaritis vulcanus*, Tamil Lacewing *Cethosia mahratta*. © Mayur Nandikar.



Methods

During the regular birding trail to Bhalandeshwar Sacred Grove, while searching for Brown Wood-Owls *Strix leptogrammica*, Pravin observed a huge tree of *Myristica magnifica* Bedd. which led to him discovering the Myristica swamp. This finding was subsequently followed by visits to the swamp for further studies. The plants were identified using the book 'Trees of Sahyadri' a leaf-based field guide by Shrikant Ingaharikar and by consulting Dr. Navendu Page.

The area of the sacred grove and the area of the swamp were estimated within the sacred grove using Garmin GPS 72s by walking around the grove and swamp. All the trees in the swamp with a girth at breast height (GBH) of ≥ 30 cm by using a measuring tape, and height by using a Leica geosystem D1 distometer. For *Myristica magnifica*, an obligate swamp specialist, the height and girth of all individuals were recorded. For trees having less than 1.3 cm in height, their girth was visually estimated. Tree seedlings (GBH <10 cm) were enumerated from the sample plots to determine the regeneration status of tree species in the Myristica swamps. Additionally, a checklist was made for

other woody plant species to understand the species diversity and identify the associated species in the area. The checklist contains the list of species arranged alphabetically with their conservation status available on the International Union for Conservation of Nature (IUCN) website. Plants of the World Online (POWO) and The International Plant Names Index (IPNI) were used for nomenclature.

RESULTS

The Myristica swamp is located in Bhalandeshwar Sacred Grove at Kumbral Bagwadi (Image 1). The swamp is dominated by *Myristica magnifica*, which has prominent stilt roots (Image 1). The area of the grove and swamp is 8200 m² and 770 m², respectively. A total of 39 plant species were documented (Table 1, Images 3 & 4). Around 70 individuals of *Myristica magnifica* were recorded, out of which 19 individuals with a girth of ≥ 30 cm and 51 individuals with a girth of <30 cm. Given that 51 out of 70 individuals were <30 cm indicating regeneration of the *Myristica magnifica*. The size class plot for girth and height is given in Figures 1 & 2, respectively. The rank abundance curve shows

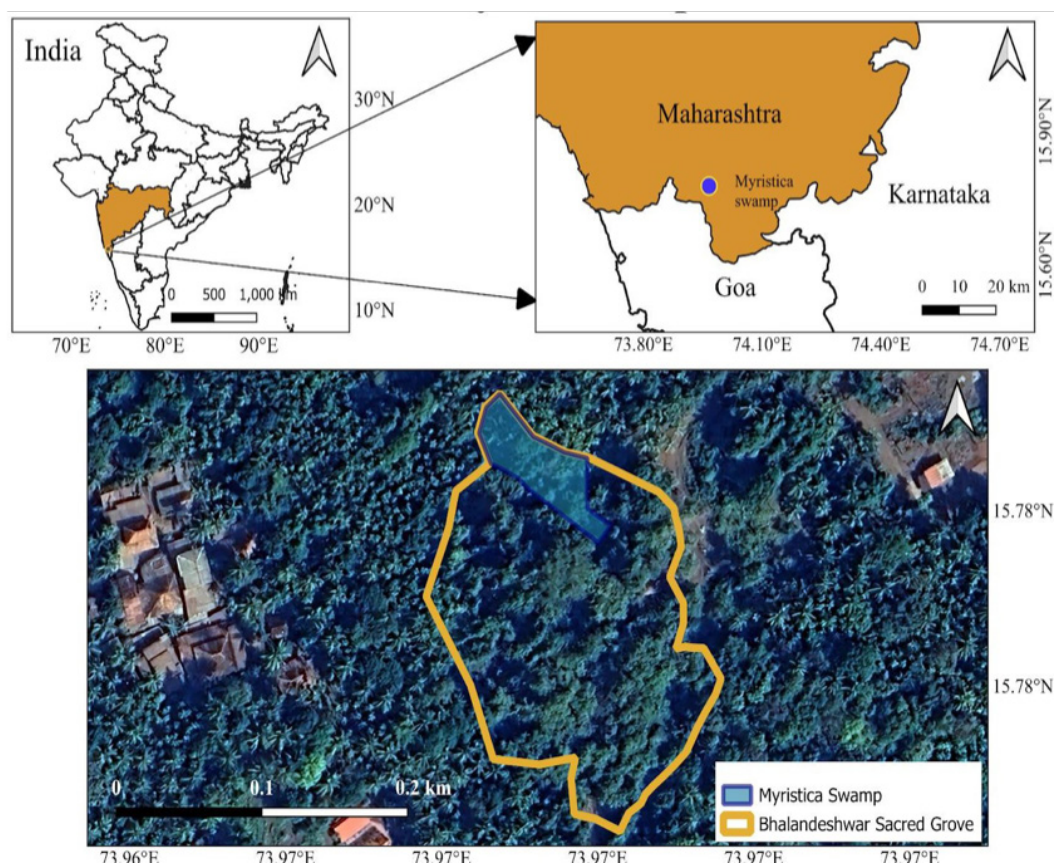


Image 1. Map showing the location of Bhalandeshwar Sacred Grove and the Myristica swamp as of 16 December 2023.

Table 1. Checklist of plants documented in the Myristica swamp of Bhalandeshwar.

	Species name	Family	Habit	IUCN Red List status
1	<i>Actephila excelsa</i> (Dalzell) Müll.Arg.	Phyllanthaceae	Small tree	Least Concern
2	<i>Allophylus cobbe</i> (L.) Forsyth f.	Sapindaceae	Liana	NA
3	<i>Anamirta cocculus</i> (L.) Wight & Arn.	Menispermaceae	Liana	NA
4	<i>Antidesma nigricans</i> Tul.	Phyllanthaceae	Shrub	NA
5	<i>Aporosa cardiosperma</i> (Gaertn.) Merr.	Phyllanthaceae	Tree	Vulnerable
6	<i>Artocarpus heterophyllus</i>	Moraceae	Tree	NA
7	<i>Artocarpus hirsutus</i> Lam.	Moraceae	Tree	Least Concern
8	<i>Bolbitis presiliana</i> (T.Moore) Ching.	Dryopteridaceae	Fern	Least Concern
9	<i>Bridelia retusa</i> (L.) A.Juss.	Phyllanthaceae	Tree	Least Concern
10	<i>Bridelia scandens</i> (Roxb.) Willd.	Phyllanthaceae	Scandent shrubs	Least Concern
11	<i>Calophyllum apetalum</i> Willd.	Calophyllaceae	Tree	Vulnerable
12	<i>Capparis</i> sp.	Capparaceae	Climber	NA
13	<i>Carallia brachiata</i> (Lour.) Merr.	Rhizophoraceae	Tree	Least Concern
14	<i>Caryota urens</i> L.	Arecaceae	Tree	Least Concern
15	<i>Chassalia curviflora</i> (Wall.) Thwaites	Rubiaceae	Shrub	NA
16	<i>Cleodendron</i> sp.	Lamiaceae	Shrub	NA
17	<i>Combretum</i> sp.	Combretaceae	Herb	NA
18	<i>Diospyros candolleana</i> Wight	Ebenaceae	Tree	Vulnerable
19	<i>Dracaena elliptica</i> Thunb. & Dalm.	Asparagaceae	Herb	Least Concern
20	<i>Entada rheedei</i> Spreng	Fabaceae	Liana	NA
21	<i>Ficus hispida</i> L.f.	Moraceae	Tree	Least Concern
22	<i>Ficus nervosa</i> Roth	Moraceae	Tree	Least Concern
23	<i>Flacourtia montana</i> J.Graham	Salicaceae	Tree	NA
24	<i>Garcinia indica</i> (Thouars) Choisy	Clusiaceae	Tree	Vulnerable
25	<i>Gymnosporia rothiana</i> (Walp.) M.A.Lawson	Celastraceae	Shrub	NA
26	<i>Holigarna arnottiana</i> Hook.f.	Anacardiaceae	Tree	Endemic
27	<i>Ipomoea campanulata</i> L.	Convolvulaceae	Climber	NA
28	<i>Ixora coccinea</i> L.	Rubiaceae	Shrub	NA
29	<i>Ixora nigricans</i> R.Br. ex Wight & Arn.	Rubiaceae	Small tree	NA
30	<i>Ixora brachiata</i> Rox.	Rubiaceae	Tree	NA
31	<i>Lagenandra toxicaria</i> Dalzell	Araceae	Herb	Least Concern
32	<i>Leea indica</i> (Burm.f.) Merr.	Vitaceae	Small tree	Least Concern
33	<i>Lophopetalum wightianum</i> Arn.	Celastraceae	Tree	Least Concern
34	<i>Macaranga peltata</i> (Roxb.) Müll.Arg.	Euphorbiaceae	Tree	NA
35	<i>Machilus glaucescens</i> (Nees) Wight	Lauraceae	Tree	NA
36	<i>Mimusops elengi</i> L.	Sapotaceae	Tree	LC
37	<i>Myristica magnifica</i> Bedd.	Myristicaceae	Tree	Endangered/ Endemic
38	<i>Nothopegia castaneifolia</i> (Roth) Ding Hou	Anacardiaceae	Tree	Critically Endangered
39	<i>Pandanus furcatus</i> Roxb.	Pandanaceae	Shrub	NA
40	<i>Pothos scandens</i> L.	Araceae	Climber	NA
41	<i>Premna coriacea</i> C.B.Clarke	Lamiaceae	Climber	NA
42	<i>Pterospermum acerifolium</i> (L.) Willd.	Malvaceae	Tree	Least Concern
43	<i>Sterculia guttata</i> Roxb.	Malvaceae	Tree	NA
44	<i>Tabernaemontana alternifolia</i> L.	Apocynaceae	Tree	NA
45	<i>Tetragium leucostaphyllum</i> (Dennst.) Alston	Vitaceae	Liana	NA
46	<i>Thottea siliquosa</i> E.S.S.Kumar, A.E.S.Khan & Binu	Aristolochiaceae	Shrub	NA

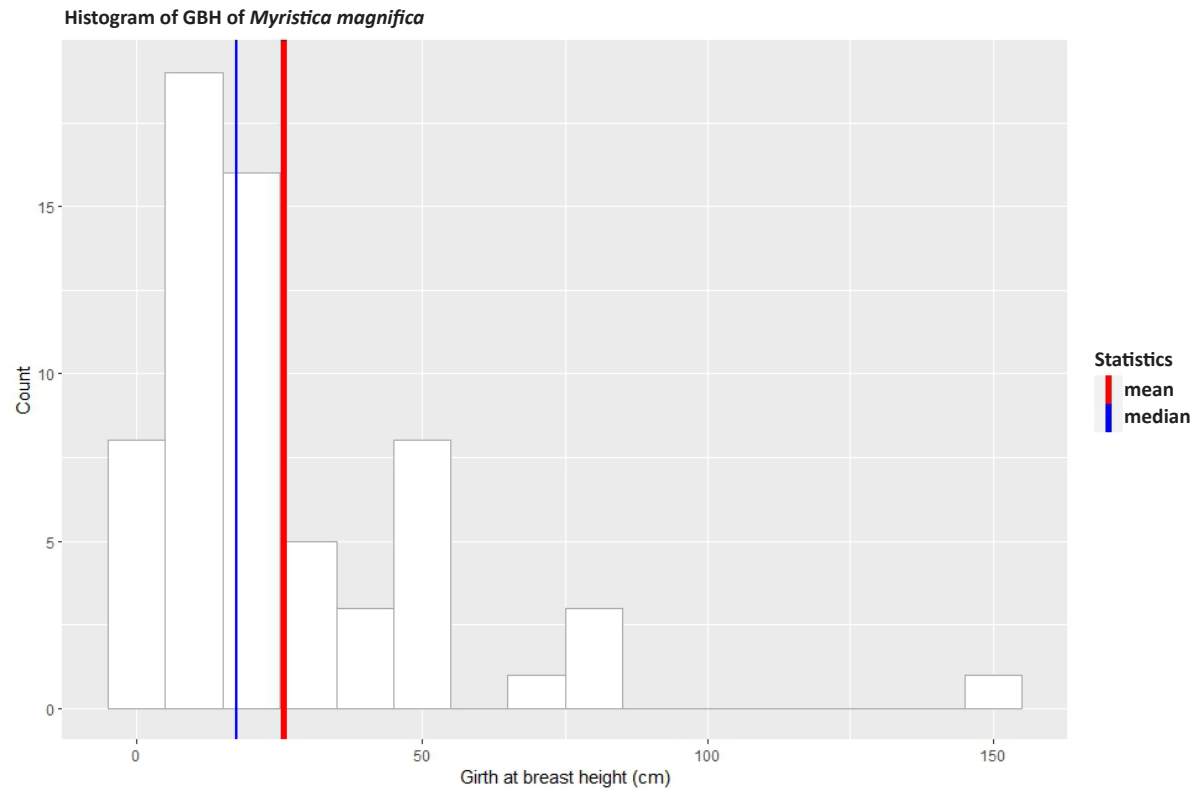


Figure 1. Histogram of girth at breast height of *Myristica magnifica* individuals that were >1.3 m in height.

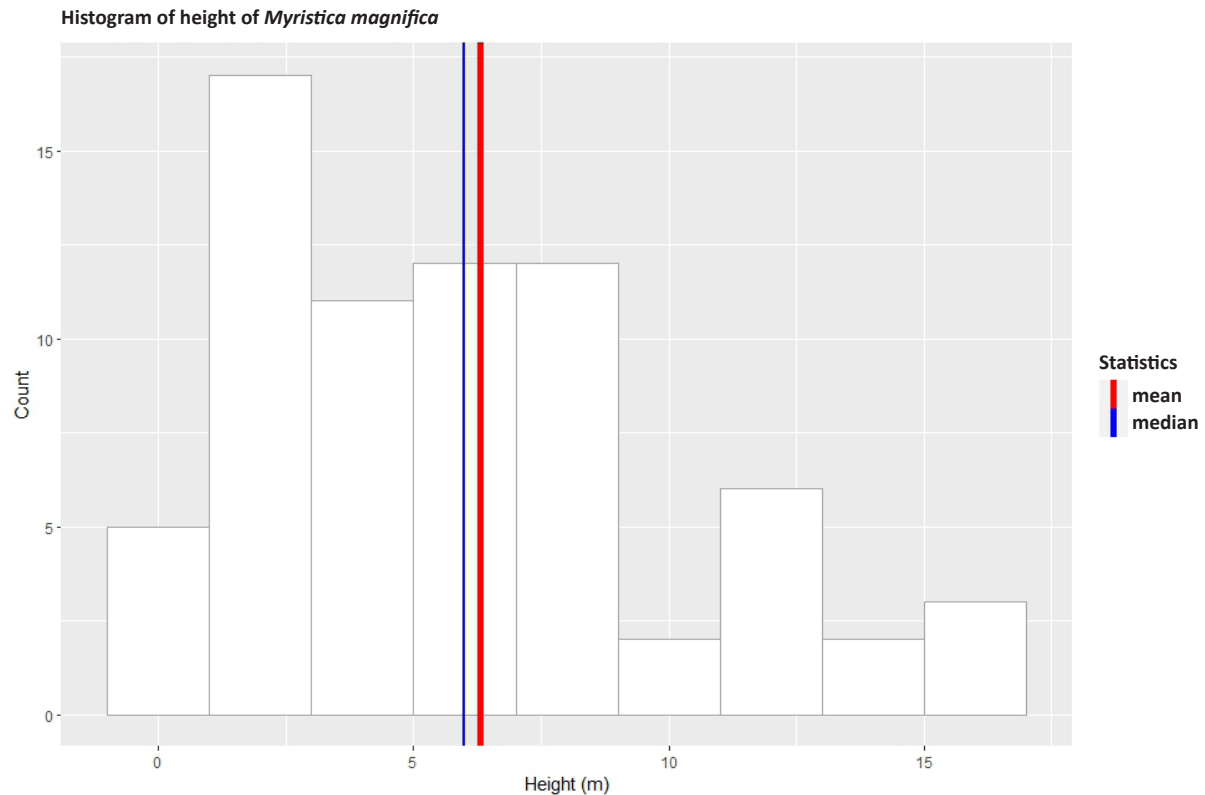


Figure 2. Histogram showing *Myristica magnifica* tree height distributions in the swamp. There is a greater representation of saplings indicating the regeneration of trees in the swamp.

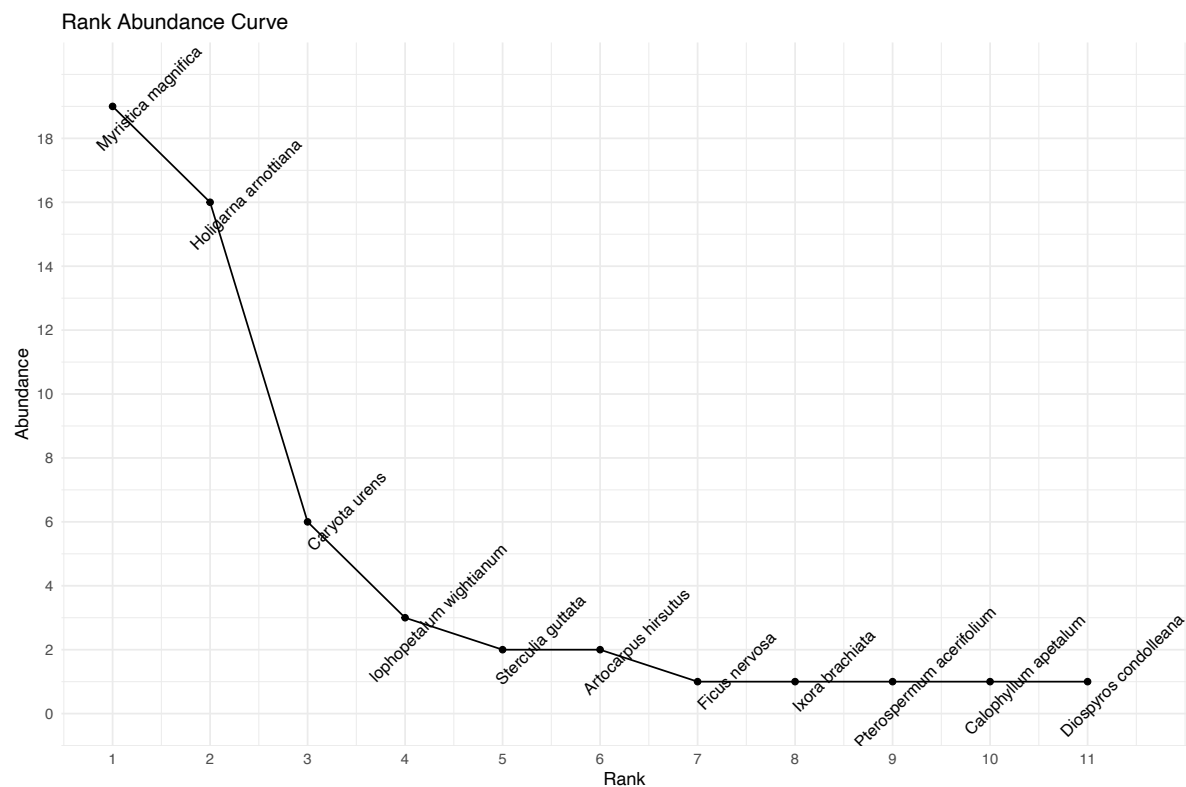


Figure 3. Rank abundance curve for all individual woody plant tree species in the *Myristica* swamp. Only those individuals with ≥ 30 cm girth at breast height were included in this plot.



Image 2. A—*Myristica magnifica* with undergrowth of fern, *Bolbitis presiliana*, and edge vegetation | B—Water inundation in the swamp and Stilt roots of *Myristica magnifica* | C—Source of water for the swamp | D—Idol being worshiped in the sacred grove. © Shital Desai.



Image 3. A—*Actephila excelsa* | B—*Allophylus cobbe* | C—*Anamirta cocculus* | D—*Antidesma nigricans* | E—*Aporosa cardiosperma* | F—*Artocarpus heterophyllus* | G—*Artocarpus hirsutus* | H—*Bolbitis presiliana* | I—*Bridelia retusa* | J—*Bridelia scandens* | K—*Calophyllum apetalum* | L—*Capparis* sp. | M—*Carallia brachiata* | N—*Caryota urens* | O—*Chassalia curviflora* | P—*Cleodendron* sp. | Q—*Combretum* sp. | R—*Diospyros candolleana* | S—*Dracaena elliptica* | T—*Entada rheedei* | U—*Ficus hispida* | V—*Ficus nervosa* | W—*Flacourtia montana* | X—*Garcinia indica*. © Shital Desai.

that the swamp species exhibit low species evenness, with *Myristica magnifica* being the dominant species in the swamp (Figure 3). The undergrowth in the swamp is dominated by the fern *Bolbitis presiliana* (T.Moore) Ching and *Pandanus furcatus* Roxb (Image 2).

DISCUSSION

The local communities worship the deity Bhalandeshwar, who is believed to be an avatar of Lord Shiva and they have been performing religious rituals since the 16th century. The local people practice the ritual of 'Kaul' to seek permission or answers to their



Image 4. A—*Gymnosporia rothiana* | B—*Holigarna arnottiana* | C—*Ipomoea campanulata* | D—*Ixora coccinea* | E—*Ixora nigricans* | F—*Ixora brachiata* | G—*Lagenandra toxicaria* | H—*Leea indica* | I—*Lophopetalum wightianum* | J—*Macaranga peltata* | K—*Machilus glaucescens* | L—*Mimusops elengi* | M—*Myristica magnifica* | N—*Nothopegia castaneifolia* | O—*Pandanus furcatus* | P—*Pothos scandens* | Q—*Premna coriacea* | R—*Pterospermum acerifolium* | S—*Sterculia guttata* | T—*Tabernaemontana alternifolia* | U—*Tetrastigma leucostaphylum* | V—*Thottea siliquosa*. © Shital Desai.

questions. During the temple renovation, they sought permission from the deity Bhalandeshwar to cut and use the tree of *Myristica* for construction. However, they did not receive a positive Kaul from the deity, and thus, the swamp was protected. The spring that emerges at the temple, serves as a source of drinking water for local people. The swamps offer various ecological services, like groundwater recharge, carbon sequestration,

natural barriers against floods, habitat, and food for many aquatic and aerial fauna. The fruits of *Myristica* are important food plants for threatened hornbills (Gopal et al. 2021). The occurrence and discovery of this second swamp in the northern Western Ghats of Maharashtra strongly point toward the possibility of more swamps in this region. Therefore, it is necessary to conduct a systematic survey to record the presence of marshes in

various regions. The preservation of this swamp has been motivated by religious values and is imperative to utilise its water resources for several decades sustainably.

REFERENCES

- Chandran, M.D.S., D.K. Mesta & M.B. Naik (1999).** *Myristica* swamps of Uttara Kannada district. *My Forest* 35(3): 217–222.
- Chandran, M.D.S., G.R. Rao, K.V. Gururaja & T.V. Ramachandra (2010).** Ecology of the Swampy Relic Forests of Kathalekan from Central Western Ghats, India. *Bioremediation, Biodiversity and Bioavailability* 4(1): 54–68.
- Dharmapalan, B. & A. Asokhan (2013).** *Myristica* swamps—evolutionary relics. *Science Reporter*, June 2013, 45–48 pp.
- Gadgil, M. & M.D.S. Chandran (1989).** Environmental Impact of Forest Based Industries on the Evergreen Forests of Uttara Kannada District. A Case Study (Final Report). Department of Ecology and Environment, Bangalore, 20 pp. <https://doi.org/10.13140/RG.2.2.11279.69281>
- Gopal, A., D. Mudappa, T.R.S. Raman & R. Naniwadekar (2021).** Seed fates of four rainforest tree species in the fragmented forests of Anamalais in the southern Western Ghats, India. *Acta Oecologica* 110: 103698. <https://doi.org/10.1016/j.actao.2020.103698>
- IPNI (2024).** International Plant Names Index. Published on the Internet <http://www.ipni.org>. The Royal Botanic Gardens, Kew, Harvard University Herbaria & Libraries and Australian National Herbarium. Accessed on 18 December 2023.
- IUCN (2024).** The IUCN Red List of Threatened Species. Version 2024-1. <https://www.iucnredlist.org>. Accessed on 05 January 2024.
- Moorthy, K.K. (1960).** *Myristica* swamps in the evergreen forests of Travancore. *Indian Forester* 86(5): 314–315.
- POWO (2024).** Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. <http://www.plantsoftheworldonline.org/>. Accessed on 18 December 2023.
- Santhakumaran, L.N., A. Singh & V.T. Thomas (1995).** Description of a sacred grove in Goa (India), with notes on the unusual aerial roots produced by its vegetation. *Wood* (Oct–Dec): 24–28.
- Sreedharan, G. & M. Indulkar (2018).** New distributional record of the northernmost *Myristica* swamp from the Western Ghats of Maharashtra. *Current Science* 115(8): 434–436.

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