



A revision of genus *Actinodaphne* Nees (Lauraceae) in the Indo-Burmese region

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Abstract

A taxonomic revision of the genus *Actinodaphne* Nees in the Indo-Burmese region is presented including Sri Lanka, India, Nepal, Bhutan, Bangladesh and Myanmar. Twenty eight species (two species having two varieties each) are recognized and treated with field images (of six species), key to the species, nomenclature, synonymy, typifications, descriptions, vernacular names, uses, if any, flowering and fruiting periods, habitats and citation of selected specimens examined. *Actinodaphne salicina* Meisn. and *A. shendurunii* Robi & Udayan are reduced to synonyms of *A. elegans* Thwaites and *A. lanata* Meisn. respectively. In addition, *A. obovata* (Nees) Blume var. *wattii* Kanjilal *et al.* is merged under the typical variety. Lectotypes have been designated for the names *A. obovata* var. *obovata*, *A. obovata* var. *wattii* and *A. sikkimensis* Meisn. The name *A. salicina* has been epitypified. Occurrence of *A. elegans* in India is recorded for the first time.

Keywords: Taxonomy; lectotypification; epitypification; new synonym; Indian subcontinent.

Introduction

The genus *Actinodaphne* was established by Nees (1831) with a single species, *A. pruinosa* Nees from Malaysia. In the subsequent year, Nees (1832) added two more species, *A. concolor* Nees and *A. angustifolia* (Blume) Nees and later he (Nees 1836) treated 12 species including two dubious species. Meissner (1864), in his monograph, recognized 46 species. The genus is at present known to be represented by about 100 Indo-Malesian and eastern Asian species (Werff 2001, Mabberley 2017). Kostermans (1952) published a historical review of Lauraceae and later he (Kostermans 1957) presented a classification of the family and placed *Actinodaphne* under the tribe Cinnamomeae Baill., subtribe Cinnamomineae Kosterm. According to Werff (2001), the genus is best recognized by the whorled leaves and the perulate terminal buds.

Hooker (1886) revised *Actinodaphne* in erstwhile British India and accepted 24 species. Long (1984) treated 4 species in Bhutan while Kostermans (1995) revised the genus in Sri Lanka and

recognized 9 species. Werff (2001) published an annotated key to the genera of Lauraceae in the Flora Malesiana region. Ara *et al.* (2007) enumerated two species of *Actinodaphne* in Bangladesh while Puhua & Werff (2008) presented systematic revision of the genus in China and treated 17 species. Tanaros *et al.* (2010) published an account of *Actinodaphne* in Thailand and recognized 10 species. As regards Nepal, Pendry (2017) reported the occurrence of 4 species. Recent publications on Indian *Actinodaphne* include Chakrabarty & Diwakar (2011), Udayan & Robi (2012), Robi & Udayan (2013, 2016), Robi *et al.* (2017), Selvakumar *et al.* (2019) and Chakrabarty *et al.* (2010, 2021a, 2021b).

Species of *Actinodaphne* are shrubs or trees, 2–30 m high. The plants occur in varied habitats such as evergreen to semievergreen forests (Sri Lanka, peninsular India, Bangladesh, Myanmar), shola forests (peninsular India), dry forests or primary forests (northeast India), tropical to subtropical forests (East Himalayas) and in inland forests (Andaman and Nicobar

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Islands). They are occurring between 100–2500 m altitudes in Sri Lanka, between 100–2500 m in peninsular India, at 1200–2100 m altitudes on the Himalayas and between 200–1500 m in the northeast India, Bangladesh and Myanmar.

High degree of endemism may be noticed among the species occurring in the Indo-Burmese region. Eight species are endemic to Sri Lanka whereas 9 species are endemic to peninsular India. Further, *A. reticulata* is endemic to Meghalaya, India while *A. andamanica* is restricted to the Andaman Islands. Myanmar contains two endemic species, *A. concolor* and *A. mansonii*. The remaining 7 species exhibit somewhat wider distribution. *Actinodaphne elegans* occurs in peninsular India and Sri Lanka while *A. longipes* is distributed from East Himalayas, northeast India to Bangladesh. The species *A. sikkimensis* is found on the East Himalayas (Sikkim, Nepal and Bhutan) and also extends to Myanmar. The most widespread species is *A. angustifolia*, occurring in India, Bangladesh, Myanmar, Thailand and Indonesia (Java and Sumatra), followed by *A. sesquipetalis* which is occurring in Myanmar, Thailand, Cambodia, Malaysia and Borneo. *Actinodaphne obovata* has been reported from India, Nepal, Bhutan, Bangladesh, Myanmar, China and Vietnam whereas *A. procera* is known from Myanmar, Nicobar Islands and Indonesia (Java and Sumatra).

The characters of leaves, nature of pubescence, inflorescence type and the features of the fruits are among the important diagnostic characters in *Actinodaphne*.

It is hoped that the present revision will clarify most of the confusions so far encountered in the taxonomy of *Actinodaphne* in the study area and will be helpful in identifying the taxa accurately.

Materials and Methods

The present revision is based on the study of herbarium specimens and literature. The following herbaria were consulted (including digital images): AMD, ASSAM, BM, BO, BR, BSI, CAL, E, FR, G, GH, K, L, LE, MEL, MH, MPU, NY, PBL, RHT, U and US.

The descriptions were prepared on the basis of dried materials except for the flowers which were expanded by soaking in water for dissection and then measured under microscope.

The systematic treatment contains generic nomenclature, citation of type and description. Key to the species is then presented. Detailed nomenclature, typifications and descriptions are provided for each species. The homotypic synonyms are clubbed together. The vernacular names and uses, if any, flowering and fruiting periods and distribution of each taxon treated are indicated. Selected specimens examined during the course of the present revision are also cited.

Systematic treatment

Actinodaphne Nees in Wall., Pl. Asiat. Rar. 2: 68. 1831; 3: 31. 1832 & Syst. Laur. 27, 586, 590. 1836; Meisn. in DC., Prodr. 15(1): 210. 1864; Hook.f., Fl. Brit. India. 5: 147. 1886; Kanjilal *et al.*, Fl. Assam 4: 76. 1940; T.Cooke, Fl. Bombay 2: 537. 1908; Backer & Bakh.f., Fl. Java 1: 124. 1963; Ridl., Fl. Malay Penins. 3: 107. 1924; D.G. Long in Grierson & D.G. Long, Fl. Bhutan 1(2): 280. 1984; Kochummen in Whitmore, Tree Fl. Malaya 4: 102. 1989; Kosterm. in Dassan. *et al.*, Rev. Handb. Fl. Ceylon 9: 134. 1995; Werff in Blumea 46(1): 125. 2001; Puhua & Werff in Raven *et al.*, Fl. China 7: 161. 2008; Tanaros *et al.* in Thai J. Bot. 2(1): 8. 2010.

Type: Actinodaphne pruinosa Nees.

Dioecious trees with simple indumentum; terminal bud perulate with imbricate scales, rarely covered with subfoliaceous scales (*A. sesquipetalis*); clusters of scars present on the older twigs immediately above the whorls of leaves; branchlets terete. *Leaves* simple, verticillate (or subverticillate) at ends of branchlets and at nodes or rarely opposite, entire, often glaucous beneath, penninerved or occasionally weakly to strongly trinerved at base; lateral nerves brochidodromous; petioles usually sulcate or channeled above. *Inflorescences* axillary and extra-axillary (on internodes), cymose, paniculate, fasciculate (condensed panicles), umbellate or pseudo-umbellate, subtended by alternate caducous bracts (clusters of bract scars present at the very base), when paniculate, the

flowers arranged along the secondary axes of the inflorescences in racemes or umbels. *Flowers* unisexual, trimerous; perianth tube short, subcampanulate; tepals 6, equal; stamens 9 in 3 whorls (the third whorl with basal glands), exerted, reduced to strap-like staminodes in female flowers; anthers 4-locular, upper pair

introrse, lower lateral or sub-introrse; ovary in male flowers reduced to stalk with distinct stigma, in female flowers with well-developed style and lobed, prominent stigma. *Fruits* drupaceous, of various shapes, seated on a flat, discoid, concave or cupular persistent perianth tube (cupule) with entire, thin margin, occasionally with persistent to subsistent tepals.

Key to the species

1a.	Terminal buds covered with subfoliaceous scales; persistent perianth subtending the fruits tubercled	23. <i>A. sesquipedalis</i>
	Terminal buds perulate with imbricate scales; persistent perianth subtending the fruits smooth	2
2a.	Inflorescences (either male or female or both) with an appreciable axis (racemiform or thyrsiform)	3
b.	Inflorescences (either male or female or both) without such axis (fasciculate or umbellate)	9
3a.	Leaves strongly to weakly trinerved at base, in the latter case the first pair of lateral nerves longer than the subsequent pairs	4
b.	Leaves penninerved	5
4a.	Leaves 8–24 × 2.5–7 cm; female inflorescences umbellate; fruits subglobose or often oblong-ellipsoid, 8–9 mm in diameter	13. <i>A. lanceolata</i>, <i>p.p.</i>
b.	Leaves 16–60 × 6–34 cm; female inflorescences thyrsiform or racemiform; fruits ellipsoid-oblong, 2.5–3 cm long, 1.5–1.8 cm in diameter	20. <i>A. obovata</i>
5a.	Leaves verticillate as well as closely alternate to subopposite	6
b.	Leaves strictly verticillate	7
6a.	Leaves glabrous beneath; petioles 1.5–4 cm long; fruits <i>ca</i> 2 cm in diameter	21. <i>A. procera</i>
b.	Leaves densely hirsute to tomentellous beneath; petioles 0.7–2 cm long; fruits 7–10 mm in diameter	28. <i>A. wightiana</i>
7a.	Mature leaves glabrous beneath; fruits oblong-ellipsoid, 9–12 mm long, 7–8 mm in diameter	16. <i>A. madraspatana</i>, <i>p.p.</i>
b.	Mature leaves tomentellous beneath; fruits subglobose, 8–10 mm in diameter	8
8a.	Leaves 3-verticillate, usually obovate; petiole 1.5–4 cm long; female inflorescences condensed panicles of umbels	3. <i>A. andamanica</i>
b.	Leaves 4–8-verticillate, usually narrowly oblong-elliptic to lanceolate-elliptic, petiole 1–1.5 cm long; female inflorescences subumbellate to racemiform	5. <i>A. bourdillonii</i>
9a.	Leaves glabrous beneath	10
b.	Leaves variously pubescent to tomentose beneath	21
10a.	Leaves strongly to weakly trinerved at base, in the latter case the first pair of lateral nerves longer than the subsequent pairs	11
b.	Leaves penninerved	12
11a.	Young shoots glabrous; fruits ellipsoid	2. <i>A. ambigua</i>
b.	Young shoots tomentose; fruits subglobose	11.2. <i>A. glauca</i> var. <i>subtriplinervis</i>
12a.	Leaves obovate, 8–9 cm broad	17. <i>A. mansonii</i>

b.	Leaves of various shapes but not obovate, 1–6 cm broad	13
13a.	Leaves rounded, obtuse to subacute at apex	14
b.	Leaves apiculate to acuminate or caudate at apex	16
14a.	Leaves stiffly coriaceous, often rolling downwards along margins	11. <i>A. glauca</i>
b.	Leaves thinly coriaceous, not rolling downwards along margins	15
15a.	Leaves linear-lanceolate to oblong-lanceolate; lateral nerves 10–15 pairs; areolation of minor nervules usually prominent on both surfaces; persistent perianth subtending the fruits entire	26. <i>A. stenophylla</i>
b.	Leaves oblong-elliptic to lanceolate-oblong; lateral nerves 6–12 pairs; areolation of minor nervules obscure on both surfaces; persistent perianth subtending the fruits undulate to divided	7.2. <i>A. campanulata</i> var. <i>obtusa</i>
16a.	Persistent perianth subtending the fruits discoid, 1–1.5 mm high, 2–3 mm in diameter, entire, sometimes reflexed or deflexed	24. <i>A. sikkimensis</i>
b.	Persistent perianth subtending the fruits cupular, 3–6 mm high, 5–12 mm in diameter, entire to undulate	17
17a.	Terminal buds sparsely puberulous to glabrous; young shoots glabrous; fruiting pedicels 10–30 mm long	15. <i>A. longipes</i>
b.	Terminal buds villous to tomentose; young shoots tomentellous; fruiting pedicels 5–15 mm long	18
18a.	Minor venation of leaves forming prominent fine reticulum on both surfaces; fruiting pedicels <i>ca</i> 15 mm long or longer	22. <i>A. reticulata</i>
b.	Minor venation of leaves obscure or faint on both surfaces; fruiting pedicels 5–10 mm long	19
19a.	Leaves 2.5–6 cm broad, strongly glaucous beneath; fruits oblong-ellipsoid	16. <i>A. madraspatana</i> , <i>p.p.</i>
b.	Leaves 1–3 cm broad; not or sometimes glaucous beneath; fruits subglobose or occasionally ellipsoid	20
20a.	Young shoots orange-brown sericeous to tomentose; lateral nerves of leaves 10–16 pairs; persistent perianth subtending the fruits entire	10. <i>A. elegans</i>
b.	Young shoots tawny tomentellous to brown puberulous; lateral nerves of leaves 6–12 pairs; persistent perianth subtending the fruits undulate to divided	7. <i>A. campanulata</i>
21a.	Leaves 3–8 cm long	22
b.	Leaves 6–28 cm long	23
22a.	Leaves broadly to narrowly cuneate at base, rounded to obtuse or occasionally subacute at apex, lateral nerves 4–6 pairs on grooved surface; petioles 5–10 mm long	18. <i>A. molochina</i>
b.	Leaves acute or sometimes obtuse to rounded at base, subacute, apiculate or shortly and bluntly to acutely acuminate at apex, lateral nerves 6–9 pairs on flat surface; petioles 3–5 mm long	19. <i>A. moonii</i>
23a.	Perianth subtending the fruits bearing persistent to semipersistent tepals	12. <i>A. lanata</i>
b.	Perianth subtending the fruits entire, devoid of tepals	24
24a.	Leaves strongly to weakly trinerved at base, in the latter case the first pair of lateral nerves longer than the subsequent pairs	25
b.	Leaves penninerved	29
25a.	Leaves broadly elliptic-obovate to suborbicular or occasionally cuneate-obovate, usually folding downward along margins when dry, stiffly coriaceous; petioles 3–6 cm long	25. <i>A. speciosa</i> , <i>p.p.</i>
b.	Leaves ovate, elliptic, oblong to lanceolate, not folding downwards along margins when dry, chartaceous to thinly coriaceous; petioles 1–3 cm long	26

26a.	Lateral primary veins of leaves ascending to 70–80 % way up the lamina; lateral nerves 3–4 pairs above the basal	1. <i>A. albifrons</i>
b.	Lateral primary veins of leaves ascending to 60 % way up the lamina; lateral nerves 4–10 pairs above the basal	27
27a.	Acumen of leaves 0.5–1 cm long; petioles 0.7–1 cm long; persistent perianth subtending the fruits <i>ca</i> 3 mm high, <i>ca</i> 5 mm in diameter	6. <i>A. bourneae</i>
b.	Acumen of leaves 1–4 cm long; petioles 1–3 cm long; persistent perianth subtending the fruits 4–7 mm high, 6–10 mm in diameter	28
28a.	Leaves verticillate to opposite; lateral nerves 4–6 pairs; tertiary nerves percurrent, mostly unbranched, slightly sunken above; fruiting pedicels 3–5 mm long	8. <i>A. candolleana</i> , <i>p.p.</i>
b.	Leaves strictly verticillate; lateral nerves 6–10 pairs; tertiary nerves scalariform to laxly reticulated, usually branched, not sunken above; fruiting pedicels 10–20 mm long	13. <i>A. lanceolata</i> , <i>p.p.</i>
29a.	Persistent perianth subtending the fruits discoid, 1–2 mm high, often reflexed or deflexed	4. <i>A. angustifolia</i>
b.	Persistent perianth subtending the fruits concave to cupular, 3–5 mm high	30
30a.	Leaves predominantly elliptic to oblong or ovate	31
b.	Leaves predominantly obovate, obovate-elliptic to obovate-oblong or suborbicular	32
31a.	Leaves acute to cuneate-attenuate at base; lateral nerves 8–14 pairs; tertiary nerves obscure to faint above; fruits 8–10 mm in diameter; fruiting pedicels 6–10 mm long	27. <i>A. tadulingamii</i>
b.	Leaves acute, obtuse to rounded at base; lateral nerves 4–6 pairs; tertiary nerves prominent and slightly sunken above; fruits 6–7 mm in diameter; fruiting pedicels 3–5 mm long	8. <i>A. candolleana</i> , <i>p.p.</i>
32a.	Leaves often folding downwards on drying; lateral and tertiary nerves immersed on grooves on the upper surface; petioles 3–6 cm long; fruits ovoid	25. <i>A. speciosa</i> , <i>p.p.</i>
b.	Leaves not folding downwards on drying; lateral and tertiary nerved not immersed on grooves on the upper surface; petioles 1–2.5 cm long; fruits globose to subglobose	33
33a.	Leaves slightly decurrent into petioles at the extreme base, acuminate to acuminate at apex, not glaucescent beneath; fruiting pedicels 3–7 mm long	9. <i>A. concolor</i>
b.	Leaves not decurrent into petioles at the extreme base; obtuse to subacute or acuminate at apex, often glaucescent beneath; fruiting pedicels 8–12 mm long	14. <i>A. lawsonii</i>

Enumeration of taxa

1. *Actinodaphne albifrons* Kosterm. in Ceylon J. Sci. (Biol. Sci.) 9(2): 53. 1971 & in Dassan. *et al.*, Rev. Handb. Fl. Ceylon 9: 143, f. 13. 1995.

Type: Sri Lanka, Ratnapura Dist., Rassagalle, Above Balangoda, 19 May 1969, *Kostermans* 23575 (holotype BO, herb. reg. no. BO23575, image!; isotypes L, herb. reg. nos. L.1779380, L.1779381, images!).

Trees, 4–10 m high; young shoots white or brownish-lanate; branchlets blackish or brownish, terete, 3–5 mm thick, initially tawny-tomentell-

ous, finally glabrous or glabrescent; Leaves 3–5-verticillate, oblong (or narrowly so) to oblong-elliptic or sometimes ovate-lanceolate, 7–26 × 3–8 cm, acute to subacute or sometimes obtuse at base, entire, acuminate (acumen 10–30 mm long, acute) at apex, stiffly chartaceous to thinly coriaceous, glabrous above, white or greyish puberulous or tomentellous on major nerves or rarely glabrescent (*Kostermans* 25391) beneath, brown to greenish-brown above when dry, pale brown and usually glaucous or glaucescent (not always) beneath, prominently 3-nerved at base;

midrib slightly incised above, raised beneath; lateral primary veins slender, ascending to 70–80 % way up the lamina; lateral nerve slender, 3–4 pairs above the basal, prominent and slightly incised above, raised beneath; tertiary nerves faint above, prominent beneath, percurrent to scalariform; nervules obscure (fine reticulations rarely prominent above); petioles 10–25 mm long, 1.8–3 mm thick, tawny-tomentellous, puberulous to glabrescent. *Male*: inflorescences fasciculate-umbellate, few-flowered. *Flowers*: pedicels ca 2 mm long, pilose outside; calyx tube ca 1 mm long; tepals broadly ovate-triangular, ca 2 × 1.2 mm, pilose outside; stamens 3–4 mm long; anthers ca 1.5 mm long. *Female*: inflorescences umbellate, 2–5-flowered. *Flowers*: pedicels 2–3 mm long; tepals as in male; ovary subglobose, ca 1.5 mm in diam., glabrous; style thick; stigma 3-lobed. *Fruits* subglobose and 6–8 mm in diam. (*Kostermans* 25391), ellipsoid-subglobose (ca 7 × 6 mm) or ellipsoid to ovoid-ellipsoid (ca 10 × 6 mm); persistent perianth discoid or shallowly cupular, 2–4 mm high, 5–6 mm in diam.; fruiting pedicels 5–9 mm long, 1–1.8 mm thick.

Flowering & fruiting: May – November.

Habitat: Locally common in evergreen forests and dry ridge forests between 100–800 m altitudes.

Distribution: Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Ratnapura Dist.: Rassagalle, Above Balangoda, 18 May 1969, *Kostermans* 23554 A (L herb. reg. nos. L.1779367, L.1779-368); *ibid.*, 18 May 1969, *Kostermans* 23560 (L herb. reg. no. L.1779366); *ibid.*, 20 May 1969, *Kostermans* 23590 (L herb. reg. no. L.1779364). Nandagala-Oya forest, 22 June 1976, *Waas* 1686 (L herb. reg. no. L.1779-360). Galle Dist.: Hinidunkanda, 2 Sept. 1974, *Jayasuriya, Kostermans & Bandaranayake* 1811 (L herb. reg. no. L.1779361). Hinidum-kande (Haycook), Near Hiniduma, 2 Sept. 1974, *Kostermans* 25507 (L herb. reg. no. L. 1779377). Hiniduma forest reserve, 7 May 1973, *Kostermans* 24734 (CAL). Kaneliya forest, Near Hiniduma, 11 Aug. 1974, *Kostermans* 25391 (L herb. reg. nos. L.1779379, L.1779378); *ibid.*, Aug. 1974, *Kostermans & Jayasuriya* 2363 (L herb. reg. no. L.1779375).

Notes: The fruits are variable.

2. *Actinodaphne ambigua* (Meisn.) Hook.f., Fl. Brit. India 5: 153. 1886; Trimen, Handb. Fl. Ceylon 3: 447. 1895, *p.p.* (*excl. syn. Litsea zeylanica* var. β *Thwaites et var. venosa* Meisn.); *Kosterm.* in *Dassan. et al.*, Rev. Handb. Fl. Ceylon 9: 138, f. 12. 1995. – *Litsea ambigua* Meisn. in DC., Prodr. 15(1): 226. 1864, *p.p.*; Trimen, Syst. Cat. Fl. Pl. Ceylon 76. 1885.

Type (lectotype, designated by *Kostermans* 1995: 138): Sri Lanka, *Thwaites* CP 2280 (PDA – *n.v.*; isolectotypes BM000951000, BM000951001, K000793023, images!).

= *Litsea ambigua* Meisn. var. *lanceolata* Meisn. in DC., Prodr. 15(1): 227. 1864; Hook.f., Fl. Brit. India 5: 154. 1886, *in obs.*

Type (lectotype, designated by *Kostermans* 1995 : 138): Sri Lanka, *Thwaites* CP 72 (PDA – *n.v.*; isolectotypes BO herb. reg. no. BO126-2584, image!, CAL herb. acc. no. 385934 – without barcode!, CAL herb. acc. no. 387968 – without barcode!, K000793022, MEL2388585, images!).

= *Actinodaphne pisifera* Hook.f., Fl. Brit. India 5: 151. 1886; Trimen, Handb. Fl. Ceylon 3: 447. 1895.

Type (lectotype, designated by *Kostermans* 1995 : 140): Sri Lanka, *Thwaites* CP 2536 (PDA – *n.v.*; isolectotypes BM000950999, BO herb. reg. no. BO1263846, K000793011, images!).

Actinodaphne glauca auct. non *Nees*, 1836: *Thwaites*, Enum. Pl. Zeyl. 256. 1861, *p.p.*, *quoad* specimens CP 2536; Meisn. in DC., Prodr. 15(1): 213. 1864, *p.p.*

Trees, 3–6 m high (shrubs, ca 1.5 m high – *Huber* 657); young shoots glabrous; branchlets black or greyish or reddish-brown, terete, 2–5 mm thick, glabrous. *Leaves* 3–7-verticillate, elliptic to narrowly oblong-elliptic or broadly elliptic, broadly ovate-elliptic to suborbicular, 5.5–10 (–13) × 1.5–5 (–7) cm, acute to subacute or sometimes rounded to obtuse or cuneate at base, tapering and slightly decurrent into petioles at the extreme base, often curling downwards along margins, rounded, obtuse to subacute at apex, stiffly coriaceous, glabrous, greenish-brown, brown or blackish above when dry, paler (brown) and often glaucous beneath, usually weakly (often strongly) trinerved at base; lateral nerves 4–7 (–9) pairs (above the basal), slender, prominent and slightly incised above,

conspicuous beneath; tertiary nerves inconspicuous, scalariform; nervules obscure; petioles 5–15 mm long, 1.2–3 mm thick, glabrous. *Male*: inflorescences fasciculate. *Flowers*: rusty-tomentellous outside; pedicels ca 3 mm long; tepals triangular-oblong, ca 2 × 1 mm; stamens ca 4 mm long; anthers ca 1 mm long. *Female* inflorescences and flowers not seen. *Infructescences* umbellate, with 3–5 fruits, on short pulvini. *Fruits* ellipsoid (rarely subglobose), 7–10 mm long, 4.5–7 mm in diam.; persistent perianth concave to shortly cupular, 2–4 mm high, 3–5 mm in diam.; fruiting pedicels 5–10 mm long, 1–2 mm thick.

Flowering & fruiting: August – May.

Habitat: Common in montane zone, in evergreen forests, often on steep slope in mossy elfin forest with a heavy undergrowth of bamboo between 1100–2400 m altitudes.

Distribution: Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Without precise locality and date, Gardner 733 (K000793021), Thwaites CP 3155 (K000793020). Nuwara Eliya Dist.: Horton Plains, Along road from Ohaya to Far Inn, 18 Nov. 1977, Huber 657 (L, herb. reg. no. L.1779-330). Hakgalle jungle, 18 May 1971, Kostermans 24512 (L, herb. reg. no. L.1779858). Ramboda Dist., Above Frotoft Estate, 21 June 1973, Kostermans 25095 A (L, herb. reg. no. L.1779-331). Thotulagalle Estate above Haputale, 18 Apr. 1969, Kostermans 23213 (L, herb. reg. no. L.1779334). Ratnapura Dist., Trail to Gongala, 28 Aug. 1984, Jayasuriya, Balasubramaniam & Greller 2896 (CAL).

Notes: Very close to *A. glauca* but distinct in the complete glabrescence (including young parts), usually trinerved leaves and the ellipsoid fruits.

3. *Actinodaphne andamanica* M.Gangop. in Bangladesh J. Pl. Taxon. 15(2): 89, Plate 1. 2008. –*Actinodaphne sesquipedalis* Hook.f. & Thomson ex Meisn. subsp. *andamanica* (M.Gangop.) Chakrab., Diwakar & Lakra in J. Econ. Taxon. Bot. 34: 588. 2010.

Type: India, Andaman and Nicobar Islands, South Andaman Island, Dhani reef creek, 29 June 1890, King's collector s.n. (holotype CAL-0000021639!).

Actinodaphne sesquipedalis sensu S.P. Mathew & Lakshmin. in J. Bombay Nat. Hist. Soc. 89(2): 272. 1992, non Hook.f. & Thomson ex Meisn., 1864.

Trees, 8–10 m high; branchlets greyish, fulvous or tawny or rufous tomentellous, 3–9 mm thick. *Leaves* 3-verticillate, obovate, cuneate-obovate to elliptic, 21–40 × 8–15 cm, cuneate or acute to subacute at base, acuminate (acumen 20–40 mm long, acute) at apex, coriaceous, puberulous to glabrous above, brown tomentellous (mainly on nerves) beneath, greenish or blackish (and often glossy) above when dry, paler and often glaucescent beneath, penninerved; midrib flat to slightly incised above, raised beneath; lateral nerves stout, 8–10 pairs, prominent above, raised beneath; tertiary nerves somewhat prominent above, raised beneath, closely parallel, percurrent; nervules inconspicuous above, faint beneath, reticulate; petioles 15–40 mm long, 3–3.5 mm thick, tawny tomentellous. *Male*: inflorescences and flowers not seen. *Female*: inflorescences condensed panicles of umbels, up to 2.5 cm long, tomentellous; peduncle up to 5 mm long. *Flowers*: pedicels 3–4 mm long; tepals ovate to ovate-lanceolate, 3–3.5 × 2–2.5 mm, glabrous outside, sericeous inside; ovary ovoid-oblong, ca 0.8 mm long, sparsely puberulous towards apex, style ca 0.5 mm long, curved; stigma capitate. *Fruits* globose, 8–10 mm in diam., glabrous; persistent perianth cupular, 3–4 mm high, ca 10 mm in diam., entire; fruiting pedicels 9–11 mm long, 1–2 mm thick.

Flowering & fruiting: May – July.

Habitat: Rare in inland forests at low altitudes.

Distribution: India (Andaman Islands) – endemic.

Specimens examined:

INDIA. Andaman & Nicobar Islands: South Andaman Island, Shoal Bay, 16 May 1990, S.P. Mathew 20503 (PBL). Namunagar, 28 June 1890, King's collector s.n. (CAL0000033384!, CAL0000033385! – paratypes).

4. *Actinodaphne angustifolia* (Blume) Nees in Wall., Pl. Asiat. Rar. 3: 31. 1832 & Syst. Laur. 594. 1836; Wight, Icon. Pl. Ind. Orient. 5(2): 15, t. 1841. 1852; Miq., Fl. Ned. Ind. 1(1): 967. 1858; Meisn. in DC., Prodr. 15(1): 214. 1864; Bedd., Fl.

Sylv. S. India t. 295. figs. 10, 11. 1873; Hook.f., Fl. Brit. India 5: 152. 1886; Rama Rao, Fl. Pl. Travancore 344. 1914; Haines, Bot. Bihar Orissa 5: 792. 1924, *p.p.*, *excl. syn.* *A. hookeri*; Kanjilal *et al.*, Fl. Assam 4: 76. 1940; Backer & Backh.f., Fl. Java 1: 125. 1964; D.G. Long in Grierson & D.G. Long, Fl. Bhutan 1(2): 280. 1984; C.J. Saldanha & S.R. Ramesh in C.J. Saldanha, Fl. Karnataka 1: 56. 1984; Ara *et al.* in Bangladesh J. Plant Taxon. 14(2): 148. 2007; Tanaros *et al.* in Thai J. Bot. 2(1): 11. 2010; Av. Bhattacharjee & A.A. Ansari in Lakshmin. *et al.*, Fl. West Bengal 4: 432. 2019; Chakrab. *et al.* in Phytotaxa 508(1): 61. 2021. – *Litsea angustifolia* Blume, Bijdr. Fl. Ned. Ind. 566. 1826; Kurz, Forest Fl. Burma 2: 305. 1877. – *Tetranthera angustifolia* (Blume) Nees in Wall., Pl. Asiat. Rar. 2: 65. 1831. – *Actinodaphne areolata* Blume, Mus. Bot. 1: 344. 1851, *nom. superfl.* & *illeg.* – *Iozoste* (“*Jozoste*”) *angustifolia* (Blume) Kuntze, Revis. Gen. Pl. 2: 570. 1891.

– *Actinodaphne gullavara* M.R. Almeida, Fl. Maharashtra 4A: 251. 2003, *nom. superfl.* & *illeg.* Type (lectotype, designated by Chakrabarty *et al.* 2021a: 61): Indonesia, Java, Without precise locality and date, *Blume s.n.* (L0035443, image!). Additional original material: Indonesia, Java, *Blume s.n.* (L0035440, L0035441, L0035442, images!). Epitype (designated by Chakrabarty *et al.* 2021a: 61): Indonesia, Java, Jawa Barat, Preanger, Sanggrawa, 28 June 1890, *Koorders 3349 β* (L0927081, image!).

= *Actinodaphne angustifolia* (Blume) Nees var. *latior* Nees in Wall., Pl. Asiat. Rar. 3: 31. 1832.

Type (lectotype, designated by Chakrabarty *et al.* 2021a: 61): Myanmar, Moulmein, 26 Jan. 1827, *Wallich 2559 D* (K001116443, image!; isolectotype G00694222, image!). Additional syntypes: Myanmar, Tavoy, 22 May 1827, *Gomez in Wallich 2559 D* (CAL0000021643!, CAL00000-21645!, G00694224, K001116444, images!). Myanmar, Near Syrian, Pegu, 1826, *Wallich 2559 D* (BM000888205, G00694216, K001116440, images!).

= *Actinodaphne heterophylla* Blume, Mus. Bot. 1: 342. 1851; Meisn. in DC., Prodr. 15(1): 214. 1864. – *Iozoste* (“*Jozoste*”) *heterophylla* (Blume) Kuntze, Revis. Gen. Pl. 2: 570. 1891.

Type (lectotype, designated by Chakrabarty *et al.* 2021a: 61): Indonesia, Sumatra, Without precise locality and date, *Collector not indicated s.n.* (L0035461, image!; isolectotypes L0035457,

L0035459, images! – fruiting specimens). Additional original material: Indonesia, Sumatra, without precise locality and date, *collector not indicated s.n.* (L0035458, L0035460, images! – flowering specimens). Indonesia, Sumatra, without precise locality and date, *Korthals s.n.* (AMD herb. reg. no. AMD.86567, K000793063, L0035462, L0035463, L0927085, images! – fruiting specimens).

= *Actinodaphne heterophylla* Blume var. *elliptica* Blume Mus. Bot. 1: 342. 1851.

Type (lectotype, designated by Chakrabarty *et al.* 2021a: 61): Indonesia, Sumatra, Without precise locality and date, *Collector not indicated s.n.* (L0035464, image!; isolectotype L0035465, image!). Additional original material: Indonesia, Sumatra, *Korthals s.n.* (U herb. reg. no. U.1401429, image!).

Tetranthera caduca Buch.-Ham. in Wall. [Numer. List No. 2559 A. 1830, *nom. nud.*]. – [K00111-6441, image!].

Laurus gullavara Buch.-Ham. in Wall. [Numer. List No. 2559 B. 1830, *nom. nud.*]. – [K001116442, image!].

Shrubs or trees, 2–15 m high; bark greyish with white patches; young shoots fulvous or rusty villous or tomentose; branchlets blackish to brownish, terete, 3–6 mm thick, initially tawny or rusty tomentose or greyish villous, glabrous in age. *Leaves* 3–6-verticillate, narrow obovate to elliptic-obovate, cuneate-obovate to oblanceolate or obovate-elliptic to oblong-elliptic (or narrowly so) or sometimes oblong-lanceolate, 10–28 × 3–8 cm, acute to cuneate at base, apiculate to acuminate (acumen 5–30 mm long, acute) at apex, chartaceous to thinly coriaceous, greyish or rusty tomentellous or fulvous villous on major nerves to glabrous above, tawny or rusty tomentellous or fulvous villous on major nerves to glabrescent beneath, greenish, greenish-brown, brown or often dark brown or coppery or reddish brown above when dry, paler or coppery and often (not always) glaucous or glaucescent beneath, penninerved; midrib flat or slightly raised above, raised beneath; lateral nerves slender, 6–10 pairs, ascending, flat or often slightly incised above, raised beneath; tertiary nerves closely percurrent (to scalariform), obscure to faint (occasionally prominent) above, obscure to somewhat pro-

minent beneath; petiole 8–25 mm long, 1–3 mm thick, greyish or tawny or rusty tomentellous or villous to glabrous. *Male*: inflorescences fasciculate-glomerate, many-flowered, often shortly pedunculate. *Flowers*: pedicels 2–3 mm long, tomentellous; tepals ovate-oblong, *ca* 2.5 × 2 mm, puberulous outside; stamens 2.5–3.5 mm long; anthers 0.8–1.2 mm long. *Female*: inflorescences umbellate, 3–10-flowered, often pedunculate (peduncle 2–5 mm long) (rarely racemiform with *ca* 10 mm long main axis with flowers solitary or 2–3 at nodes; occasionally 3–5 short peduncles arising from a single node, each terminated by 2–3 flowers). *Flowers*: pedicels 3–5 mm long, 0.5–0.8 mm thick, tomentellous; calyx tube *ca* 2 × 3 mm; tepals triangular-oblong, *ca* 2 × 1 mm; ovary sub-globose, *ca* 2 mm in diam.; style *ca* 1 mm long. *Fruits* subglobose, 8–10 mm in diam.; persistent perianth discoid or concave, 1–2 mm high, 4–6 mm in diam.; fruiting pedicels 3–10 mm long, 0.8–1 mm thick.

Flowering & fruiting: July – January (fruits once noted to be bluish black).

Local names: Assamese: *Petarichawa*; Burmese: *Nalingyo*; *Taung bamarr*; Kuki: *Nabhar*; Mikir: *Lobong-kron*; Naga: *Mechchhim-ching*. Odiya: *Jharjhampa*; *Tengeda*; *Sabalia*.

Uses: Wood used for house posts in Myanmar.

Habitat: Common in primary or dry forests up to 1000 m altitude.

Distribution: India, Bangladesh, Myanmar, Thailand and Indonesia (Java and Sumatra).

Specimens examined:

BANGLADESH. Rangamati Dist., Chittagong hill tracts, 1887, *King's collector* 513 (CAL).

INDIA. Peninsula Indiae Orientalis, *Wight* Kew Distrib. No. 2537 (L herb. reg. no. L.1779349).

Assam: Sibsagar Dist., Sibsagar, *Petari doa*, 1888–1891, *Peal* 159, 305, 335, 352, 353 (CAL).

Meghalaya: Garo Hills Dist., Garo hills, New bridle path, Dec. 1885, *Mann s.n.* (CAL).

Odisha: Khurda Dist., Khurda, Feb. 1881, *Gamble* 9292 (CAL).

Tripura: Tlangsang, 26 Jan. 1962, *Deb* 27167 (ASSAM, CAL).

West Bengal: Jalpaiguri Dist., Duars, 1896, *Haines* 518 (CAL).

MYANMAR. Pegu, Rangoon, without date, *Scott s.n.* (L herb. reg. no. L.1779347). Moulme-

in, Papun, Jan. 1912, *Meebold* 17020 (L herb. reg. no. L.1779351). Insein Dist., Myaukhlaing Reserve, 22 July 1948, *Po Khant* 569 (CAL). Papun, 1912, *Meebold* 17019, 17020 (CAL). Tavoy Dist., Linba bhaung, 26 Aug. 1925, *Ba Pe* 819 (CAL).

5. *Actinodaphne bourdillonii* Gamble in Bull. Misc. Inform. Kew 1925: 129. 1925 & Fl. Madras, Pt. 7: 1231. 1925; V. Chandras. in A.N. Henry *et al.*, Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; M. Mohanan & A.N. Henry, Fl. Thiruvanthapuram 389. 1994; C.J. Saldanha & S.R. Ramesh in C.J. Saldanha, Fl. Karnataka 1: 56. 1984; N. Mohanan & Sivad., Fl. Agasthyamala 562. 2002; Robi & Udayan in *Telopea* 19: 173. 2016.

Fig. 1 A–B.

Type (lectotype, designated by Robi & Udayan 2016: 183): India, Kerala, Travancore, 1890, *Bourdillon* 504 (K000793026, image!; isolectotypes CAL0000021616!, MH00002473!). Additional syntypes: India, Kerala, Idukki Dist., Peermade, Feb. 1887, *Bourdillon* 37 (K000793025, image!). India, Kerala, Travancore, Feb. 1887, *Bourdillon* 19 (MH00002477!). Karnataka, Dakshina Kannada Dist., South Kanara *Beddome s.n.* (MH00002474!). Tamil Nadu, Coimbatore Dist., Iyerpadi, Anamalai hills, 25 Apr. 1903, *Barber* 5469 (MH00002475!, MH00002476!). Lord Hobrat's road, Nilgiris, 2000 m alt., June 1883, *Gamble* 11800 – *n.v.*

Trees, 8–15 m high; GBH 15–20 cm; young shoots fulvous, tawny or orange-brown villous; branchlets brown, greyish or blackish, terete, 3–8 mm thick, rufous, brown or fulvous tomentose or tomentellous, finally scattered puberulous to glabrescent. *Leaves* 4–8-verticillate to subverticillate, narrowly oblong-elliptic, narrowly elliptic, or lanceolate-elliptic or sometimes narrowly obovate-elliptic, 12–30 × 3.5–7 cm, acute (occasionally subacute) or subcuneate at base, acuminate (acumen 10–40 mm long, usually acute) at apex, chartaceous to thinly coriaceous, tomentellous on midrib to glabrescent above, brown villous or fulvous tomentellous on major nerves beneath, scattered pilose elsewhere, brown or greenish-brown or blackish or often reddish brown or dark brown above when dry, paler and greenish, brown, coppery and occasionally glaucescent beneath, penninerved; midrib flat or slightly incised above except at base, raised beneath; lateral

nerves stout, 8–12 pairs, more or less straight to slightly arching, flat or sometimes slightly incised above, raised beneath; tertiary nerves percurrent to scalariform, more or less prominent or faint or sometimes obscure above, faint to prominent beneath; nervules inconspicuous above and beneath; petioles 10–15 mm long, 1.5–3 mm thick, brownish-tomentellous. *Male*: inflorescences fasciculate-racemi-form, many-flowered (15–30 or more); peduncle or rachis 5–20 mm long, slender. *Flowers*: pedicels 3–4 mm long, tomentellous; tepals ovate-triangular, 2–2.5 × 1–1.3 mm, tomentellous outside; stamens 4–5 mm long; anthers 1–1.5 mm long. *Female*: inflorescences usually pedunculate and subumbellate (peduncle 4–15 mm long, stout, often absent or slightly pulvinate) or flowers arranged singly on racemiform branches/peduncles (10–20 mm long), 6–12-flowered; axis and pedicels tawny tomentellous. *Flowers*: pedicels 8–10 mm long, 1–1.5 mm thick; tepals 2–3 × 1–1.5 mm; ovary ovoid, *ca* 1.5 mm long; style *ca* 2.5 mm long. *Fruits* sub-globose, 8–10 mm in diam.; persistent perianth cupular, 3–5 mm high, 6–10 mm in diam., entire, sparsely pubescent to glabrous; fruiting pedicels 7–15 mm long, 1–1.5 mm thick, tomentellous.

Flowering & fruiting: December – August (fruits noted to be bright red).

Habitat: Common in evergreen forests and shoals, often in Cardamon plantations, between 1000–2500 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

INDIA. Kerala: Travancore, 1890, *Bourdillon s.n.* (CAL, herb. acc. no. 386017); *ibid.*, *Bourdillon* 32 (CAL). Idukki Dist., Devicolam to Bodi road, 24 Mar. 1980, *Ramamuthy* 66350 (CAL, MH). Vandanmedu, 28 Sept. 1981, *C.N. Mohanan & Ramanujam* 72063 (CAL, MH). Road Thekadi to Devicolam, 16 June 1976, *Kostermans* 26136 (L herb. reg. nos. L.1784190, L.1784236). Kottayam Dist., Devicolam, Lockkert gap, 20 Apr. 1964, *Sebastine* 18332 (MH). Devicolam, 28 Jan. 1964, *Sebastine* 18494 (MH). **Tamil Nadu**: Kannayakumari Dist., Upper Kodayar, Way to valve house, 7 Aug. 1977, *Henry* 49636 (CAL, MH). Tirunelveli Dist., Natinkal, 13 Feb. 1913, *Hooper*

& *Ramaswamy* 38560 (CAL). Valayar, Eastern slope, 12 July 1976, *Bhargavan* 47463 (CAL, MH). Walaiyar cardamom estate, 12 July 1976, *Kostermans* 26303 (L herb. acc. no. L.1784187). Tirunelveli Dist., Eastern slopes of Valayar, 12 July 1976, *Bhargavan* 47463 (MH).

6. Actinodaphne bourneae Gamble in Bull. Misc. Inform. Kew 1925: 128. 1925 & Fl. Madras, Pt. 7: 1231. 1925; Fyson, Fl. S. Indian Hill Sta. 1: 505. 1932; V. Chandras. in A.N. Henry *et al.*, Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; K.M. Matthew, III. Fl. Palni Hills t. 605. 1996 & Fl. Palni Hills 2: 1065. 1999; Selvakumar *et al.* in Trop. Pl. Res. 6: 15. 2019.

Type: India, Tamil Nadu, Dindygul Dist., Pulney Hills, Kodaikanal shola, 26 June 1897, *Bourne* 517 (holotype K000793027, image!).

Trees, 5–10 m high; young shoots fulvous tomentose; branchlets greyish, terete, 4–5 mm thick, fulvous-tomentose, glabrescent in age. Leaves 4–6-verticillate, elliptic to narrowly oblong-elliptic, 8.5–18 × 2.5–6 cm, acute at base, shortly and acutely acuminate at apex (acumen up to 10 mm long); stiffly chartaceous, fulvous-tomentellous on major nerves above and beneath, greenish-brown above when dry, pale brown beneath (not glaucous), weakly triner-ved at base (first pair of lateral nerves usually longer than the subsequent pairs); lateral nerves 6–8 pairs (above the basal), pro-minent above, raised beneath; tertiary nerves faint above, inconspicuous beneath, percurrent to laxly scalariform; nervules obscure; petioles 7–10 mm long, 2–3 mm thick. *Male*: inflorescences umbellate, few-flowered. *Flowers*: pedicels *ca* 5 mm long, *ca* 2 mm thick, tomentellous; tepals ovate, *ca* 3 × 1.5 mm, tomentellous outside; stamens 4–5 mm long; anthers 1–1.3 mm long. *Female*: inflorescences umbellate, few-flowered. *Flowers*: pedicels *ca* 6 mm long; tepals ovate-oblong, *ca* 3 × 2 mm, tomentellous outside; ovary ovoid, *ca* 1.5 mm long; style *ca* 2 mm long. *Fruits* subglobose, *ca* 8 mm in diam.; persistent perianth cupular, *ca* 3 mm high, *ca* 5 mm in diam.; fruiting pedicels 5–6 mm long.

Flowering & fruiting: June – November.

Habitat: Rare in shola forests at 1600 – 2200 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

INDIA. Tamil Nadu: Dindygul Dist: Kodai-kanal, Gundar shola, 10 July 1986, Matthew & Rajendran 45825 (CAL, RHT). Mahilkundram shola, way to Berijam, 23 May 1987, Matthew & Charles 49702 (CAL, RHT).

7. Actinodaphne campanulata Hook.f., Fl. Brit. India 5: 148. 1886; Gamble, Fl. Madras, Pt. 7: 1230. 1925; C.N. Mohanan, Fl. Quilon Dist. 343. 1984; V. Chandras. in A.N. Henry *et al.*, Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; Robi & Udayan in Telopea 19: 174. 2016.

Type (lectotype, designated by Robi & Udayan 2016: 174): India, Tamil Nadu, Tirunelveli Dist., Tinnevely, *Beddome* 200 (K000778983, image!; isolectotypes CAL0000021634!, CAL0000025632!, MH00002470!).

Shrubs or trees, 2–10 m high; terminal buds tawny tomentellous to brown puberulous, soon glabrous; branchlets greyish, brown, dark brown or black, terete, 2–6 mm thick, initially tawny puberulous, soon glabrous. *Leaves* 3–6-verticillate, oblong-elliptic (usually narrowly) to lanceolate-oblong or occasionally oblanceolate, 4–12.5 × 1.5–3 cm, acute at base, acute to shortly acuminate (acumen 5–15 mm long) or sometimes subacute to obtuse (var. *obtusa*) at apex, thinly coriaceous, glabrous, greenish, brown, coppery-brown to dark brown or blackish above when dry, coppery-brown to dark brown and sometimes glaucous beneath, penninerved; midrib more or less flat or slightly immersed above, raised beneath; lateral nerves slender, 6–12 pairs, obscure to somewhat prominent above, faint to prominent beneath; tertiary nerves obscure or rarely somewhat prominent above, inconspicuous beneath, laxly reticulate to scalariform; nervules obscure; petioles 3–15 mm long, 1–2 mm thick, glabrous. *Male:* inflorescences and flowers not seen. *Female:* inflorescences umbellate, 2–5-flowered, often shortly pedunculate (peduncle up to 4 mm long). *Flowers:* pedicels 4–6 mm long, tawny-tomentellous to glabrous; tepals ovate-triangular to ovate-oblong, ca 2 × 1.2 mm; ovary ovoid, ca 1.5 mm long; style ca 2.5 mm long, 3-fid at apex, with peltate stigma. *Fruits* ellipsoid to ovoid-subglobose or subglobose, 7–

10 mm long, 6–8 mm in diam.; persistent perianth cupular, 4–5 mm high, 6–7 mm in diam., entire, undulate to divided; fruiting pedicels 5–10 mm long, 0.8–1 mm thick.

Key to the varieties

1a.	Leaves often acute to shortly acuminate at apex; lateral nerves 6–8 (–12) pairs 7.1. var. campanulata
b.	Leaves usually obtuse at apex; lateral nerves 8–12 pairs 7.2. var. obtusa

7.1. var. campanulata

Flowering & fruiting: November – March.

Habitat: Scarce in shola forests between 1200–1800 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined: **INDIA. Kerala:** Idukki Dist., Maddalam kothi, Near Elatheri, 15 Dec. 1981, C.N. Mohanan 72807 (CAL, MH). **Tamil Nadu:** Kanyakumari Dist., Mahendragiri peak, Panagudi, 8 Feb. 1972, B.D. Sharma 40039 (MH). Upper Kodayay, Way to Oothu, 8 Aug. 1977, Henry 49665 (CAL, MH). Tirunelveli Dist., Naterikal, 13 Feb. 1913, Hooper & Ramaswamy 38575 (CAL). Way to Natterikkal, 26 Sept. 1916, Gamble 13382 (MH).

7.2. var. obtusa Gamble, Fl. Madras, Pt. 7: 1230. 1925; M. Mohanan *et al.* in Bull. Bot. Surv. India 22: 106. 1982; V. Chandras. in A.N. Henry *et al.*, Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; M. Mohanan & A.N. Henry, Fl. Thiruvanthapuram 389. 1994; Robi & Udayan in Telopea 19: 175. 2016.

Type (lectotype, designated by Mohanan *et al.* 1982: 106): India, Kerala, Trivardrum Dist., Travancore, Chemunji, 4 Apr. 1895, Bourdillon 543 (MH00002471!; isolectotypes CAL0000033762!, CAL0000033763!, K000778984, K000778985, K000778986, images!).

Flowering & fruiting: November – May.

Habitat: Scarce in shola forests between 900–1500 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

INDIA. Kerala: Trivandrum Dist., Chemunji, 16 May 1896, *Bourdillon* 869 (CAL); *ibid.*, 8 Mar. 1979, *M. Mohanan* 61723 (CAL, MH).

Notes: Robi & Udayan (2016), unaware of the publication of Mohanan *et al.* (1982), designated a new lectotype based on a duplicate at K which is superfluous.

8. *Actinodaphne candolleana* Meisn. in DC., *Prodr.* 15(1): 219. 1864; Hook.f., *Fl. Brit. India* 5: 153. 1886; Trimen, *Handb. Fl. Ceylon* 3: 448. 1895; Kosterm. in Dassan. *et al.*, *Rev. Handb. Fl. Ceylon* 9: 137. 1995. – *Actinodaphne speciosa* Nees var. *candolleana* (Meisn.) Hook.f., *Fl. Brit. India* 5: 153. 1886; Trimen, *Handb. Fl. Ceylon* 3: 448. 1895.

Type (lectotype, designated by Kostermans 1997: 137): Sri Lanka, *Thwaites* CP 3371 (PDA – *n.v.*; isoelectotypes BR0000005176168, image!, CAL0000021595!, FR0031108, G00390146, G00390150, G00694264, K000793017, MEL2386449, images!, MH00003058!, fragm. NY00354768, image!).

Tree 4–8 m high; young shoots rusty-villous; branchlets greyish, brown or blackish, terete, 3–7 mm thick, rusty to tawny tomentellous. *Leaves* 3–5-verticillate, sometimes opposite, ovate, elliptic, oblong-elliptic or sometimes broadly elliptic, 8–28 × 4–11 cm, acute, obtuse to rounded at base, acuminate (acumen 1–4 cm long, acute) at apex, thinly coriaceous, rusty to tawny tomentellous (evanescently) on major nerves above, tomentellous beneath mainly on nerves, glossy and brown or greenish-brown above when dry, paler beneath, penninerved or often 3-nerved at base (with lateral primary veins of same thickness and equal to or longer than the subsequent pairs); midrib prominent above and beneath;

lateral nerves 4–6 pairs, arcuate, prominent above in impressed grooves, raised beneath; tertiary nerves prominent, slightly sunken above, raised beneath, percurrent; nervules often prominent above and beneath; petioles 10–30 mm long, 2–3 mm thick, rusty or tawny-tomentellous. *Male:* inflorescences and flowers not seen. *Female:* inflorescences solitary or 2–3-together. *Flowers:* pedicels 3–5 mm long, tomentellous; tepals suborbicular, ca 3 × 3 mm, tomentellous outside. *Fruits* solitary or 2–3-together, subglobose, 6–7 mm in diam., pointed at apex; persistent perianth cupular, 4–5 mm high, 7–8 mm in diam.; fruiting pedicel 3–5 mm long, tomentellous.

Flowering & fruiting: April – June.

Habitat: In lower montane and hill evergreen forests, often along rivulet, between 200–900 m altitudes.

Distribution: Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Kaneliya forest, near Hiniduma, 9 June 1973, *Kostermans* 24989B (L herb. reg. no. L.1779670). Knuckles, Madulkelle area, 12 June 1973, *Kostermans* 25042 (L herb. reg. no. L.1779665). Near Kandy, Nileembe Hauntane ridge, 25 Apr. 1969, *Kostermans* 23283 (L herb. reg. no. L.1779692).

Notes: Closely allied to *A. speciosa*, but the leaves acuminate at apex and not folding downwards and the fruits are subglobose rather than ovoid.

9. *Actinodaphne concolor* Nees in Wall., *Pl. Asiat. Rar.* 3: 31. 1832 & *Syst. Laur.* 593. 1836; Meisn. in DC., *Prodr.* 15(1): 213. 1864; Hook.f., 5: 148. 1886. – *Iozoste* ('*Jozoste*') *concolor* Kuntze, *Revis. Gen. Pl.* 2: 570. 1891. – *Litsea concolor* (Nees) Kurz, *Prelim. Rep. Forest Pegu, App. A.*: cii. 1875 & *Forest Fl. Burma* 2: 304. 1877.

Type: Myanmar, Tavoy, 2 Aug. 1827, *Gomez* in *Wallich* 6346 (holotype K001123636, image!).

= *Actinodaphne concolor* Nees var. *fagifolia* Meisn. in DC., Prodr. 15(1): 213. 1864.

Type: Myanmar, Tavoy, 1827, Wallich 347 [1605] (holotype G00694298, image!; isotype fragm. NY00354770, image!).

Shrubs or trees, 3–12 m high; young shoots ochraceous or fulvous villous; branchlets greyish, blackish or dark brown, terete, 2.5–5 mm thick, rusty or tawny tomentellous when young, glabrous or glabrescent in age. Leaves 3–6-verticillate, cuneate-obovate, obovate-oblong, obovate-elliptic, oblong-elliptic (to narrowly so) or sometimes broadly elliptic to suborbicular, 12–25 × 3–10 cm, acute to cuneate or cuneate-attenuate at base, usually slightly decurrent into petioles, apiculate to acuminate at apex (acumen 5–15 mm long, acute), thinly coriaceous, glabrous above, evanescently rusty/tawny tomentellous on major nerves (finally glabrous) beneath, brown, dark brown or blackish above when dry, pale brownish, brown or dark brown or blackish beneath (“concolor” but not always), not glaucous, penninerved; midrib flat, slightly immersed or slightly raised above, raised beneath; lateral nerves somewhat stout, 5–8 pairs, usually incised/immersed or occasionally flat above, raised beneath; tertiary nerves obscure or rarely seen sunken above, obscure to prominent beneath, closely percurrent; nervules inconspicuous above, obscure or faint beneath; petioles 10–20 (–25) mm long, 1–2 mm thick, evanescently rusty or tawny tomentellous. *Male*: inflorescences fasciculate, up to 7-flowered; pedicels *ca* 1 mm long; tepals triangular-oblong, *ca* 2 × 1 mm, tomentellous outside; stamens *ca* 3 mm long; anthers *ca* 1.5 mm long. *Female*: inflorescences and flowers not seen. *Fruits* few (3–5) in umbels (peduncle absent), globose to subglobose, 7–10 mm long, 8–12 mm in diam.; persistent perianth concave to cupular, 3–5 mm high, 5–10 mm in diam., entire; fruiting pedicels 3–7 mm long, 1.2–2.5 mm thick.

Flowering & fruiting: August – April.

Habitat: Common in interior forests on hill slopes and ridges from sea level, between 200–700 m altitudes.

Distribution: Myanmar – endemic.

Specimens examined:

MYANMAR. Tavoy Dist.: SW headwaters of the Heinze Chaung, 12 Feb. 1919, Russell 115 (CAL). Heinze No. 1 camp, 14 Apr. 1921, Russell 2006 (CAL). Valley of the Kying Pyu chaung, 24 Jan. 1919, Gage 18 (CAL). East of Paungdaw power station, Aug. 1961, Keenan, Aung & Rule 828 (E00901494). By the Paungdaw river south of power station, August 1961, Keenan, Aung & Rule 980 (E00901495). 2.5 miles east of Paungdaw power station, Aug. 1961, Keenan, Aung & Rule 1019 (E00901496). Mergui, Cinchona camp, Kyin chung, 22 Mar. 1924, Calder *s.n.* (CAL). Tenasserim, Lepahe Chaung, 12 Feb. 1931, K. Biswas 989 (CAL).

10. *Actinodaphne elegans* Thwaites, Enum. Pl. Zeyl. 256. 1861; Meisn. in DC., Prodr. 15(1): 212. 1864; Trimén, Syst. Cat. Fl. Pl. Ceylon 75. 1885; Hook.f., Fl. Brit. India 5: 150. 1886; Trimén, Handb. Fl. Ceylon 3: 446. 1895; Kosterm. in Dassan. *et al.*, Rev. Handb. Fl. Ceylon 9: 141. 1995. – *Iozoste* (“*Jozoste*”) *elegans* (Thwaites) Kuntze, Revis. Gen. Pl. 2: 570. 1891. **Fig. 2 C–D.** *Type* (lectotype, designated by Kostermans 1995: 141): Sri Lanka, Thwaites CP 2277, *p.p.* (PDA – *n.v.*; isolectotypes BM000950997, BR000-0005117482, images!, CAL0000021636!, CAL-0000021637!, CAL0000021638! FR0036290, G00-390136, G00390138, GH00041111, K00079-3008, K000793009, K000793010, LE00012663, MEL-2384407, images!, MH00003057!, MPU0-18780, NY00354772, fragm. NY00354773, NY00354774, US00099303, images!).

= *Actinodaphne salicina* Meisn. in DC., Prodr. 15(1): 212. 1864; Hook.f., Fl. Brit. India 5: 148. 1886; Rama Rao, Fl. Pl. Travancore 343. 1914; Gamble, Fl. Madras, Pt. 7: 1230. 1925; Fyson, Fl.

S. Indian Hill Sta. 1: 505. 1932; V. Chandras. in A.N. Henry *et al.*, Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; Robi & Udayan in *Telopea* 19: 181. 2016. – *Iozoste* (“*Jozoste*”) *salicina* Kuntze, Revis. Gen. Pl. 2: 570. 1891, **syn. nov.**

Type: (lectotype, designated by Robi & Udayan 2016: 181): India, Without precise locality, *Wight* 41 (NY00354778, image!). **Epitype** (designated here): India, Peninsula Indiae Orientalis, without precise locality and date, *Wight* Kew Distrib. No. 2535 (CAL0000021633!; isoepitype K000778982, image!).

? = *Actinodaphne salicina* var. *abbreviata* Meisn. in DC., Prodr. 15(1): 212. 1864.

Type: India, Tamil Nadu, Nilgiri hills, *Wight* – not traceable.

Trees, 3–10 (–20) m high; young shoots orange-brown sericeous; branchlets greyish, brown to dark brown, terete, 2–7 mm thick. *Leaves* 3–7-verticillate, narrowly oblong-elliptic, oblong-lanceolate, or elliptic-lanceolate to lanceolate, 5–16 × 1–3 cm, acute or cuneate at base, apiculate to acuminate (acumen 5–30 mm long, acute) at apex, stiffly chartaceous to thinly coriaceous, glabrous, brown above when dry, paler and sometimes glaucous beneath; penninerved; lateral nerves slender, faint, 10–16 pairs; tertiary nerves more or less prominent or sometimes faint above, obscure beneath, scalariform to laxly reticulate; nervules occasionally seen forming fine reticulum above, inconspicuous beneath; petioles 10–14 mm long, 1.5–2 mm thick, glabrous. *Male*: inflorescences fasciculate, few to many-flowered. *Flowers*: pedicels *ca* 3 mm long; tepals broadly triangular-ovate, tawny-tomentellous outside; stamens *ca* 3 mm long. *Female*: inflorescences umbellate, few-flowered. *Flowers*: pedicels 4–6 mm long, *ca* 1 mm thick; tepals broadly triangular-ovate, *ca* 3 × 2 mm, tomentellous outside; ovary subglobose, *ca* 1.5 mm in diam.; style *ca* 2 mm long. *Fruits* subglobose, *ca* 10 mm in diam.; persistent perianth cupular, 3–4 mm high, 5–7 mm in

diam.; fruiting pedicels 6–10 mm long, 1–1.5 mm high.

Flowering & fruiting: April – February.

Habitat: Rare in peninsular India in evergreen forests up to 100 m altitude; common in Sri Lanka in wet evergreen forests, often in ravine along river, between 200–1500 m altitudes.

Distribution: Peninsular India and Sri Lanka.

Specimens examined:

INDIA. Kerala: Palakkad Dist., Sulent valley RF, Poovancholai, 7 Mar. 1984, N.C. Nair 81117 (CAL, MH). **SRI LANKA**. Knuckles, Madul-kelle area, 12 June 1973, *Kostermans* 25051 (L herb. reg. no. L.1779616). Road Laxapana to Naskelia, 11 May 1971, *Kostermans* 24059 (L herb. reg. no. L.1779618). Dara Oya, Two miles east of Loolekondia, Gannewa Korale, 30 Oct. 1978, *Fosberg* 58163 (L herb. reg. no. L.1779647). Sriharaja forest, 3 Feb. 1979, *Kostermans* 27350 (L herb. reg. no. L.1779646); *ibid.*, 2 Feb. 1979, *Kostermans* 27268 (L herb. reg. no. L.1779645). Kandy Dist., Road to Dolosbagi, Nov. 1978, *Kostermans* 27171 (L herb. reg. no. L.1779642); Maskeliya, 19 Apr. 1972, *Jayasuriya, Dassanayake & Balasubramanium* MJ 752 (L herb. reg. no. L.1779614).

Note: *Actinodaphne salicina* was originally described on the basis of sterile material, considered to be a rare endemic confined to Tamil Nadu and Kerala, India (Hooker 1886, Rama Rao 1914, Gamble 1925, Fyson 1932, Chandrasekaran 1987, Robi & Udayan 2016). Hooker (1886) added the description of the unknown fruits: “fruit globose seated on the enlarged 6-lobed perianth tube” and compared it with *A. stenophylla* of Sri Lanka. The present studies revealed that the characters of *A. salicina* are same as those of the Ceylonese endemic *A. elegans* and therefore the former is merged herein with the latter. This also extends the range distribution of *A. elegans* from Sri Lanka

to India. The lectotype of *A. salicina* designated by Robi & Udayan (2016) is a sterile specimen which prompted us to designate here an epitype of the name bearing fruits. It may be mentioned here that Hooker's (1886) observation on fruiting calyx was based on immature material bearing deciduous sepals in addition to the persistent perianth tube.

11. *Actinodaphne glauca* Nees, Syst. Laur. 509. 1836; Thwaites, Enum. Pl. Zeyl. 256. 1861; Meisn. in DC., Prodr. 15(1): 213. 1864; Trimen, Syst. Cat. Fl. Pl. Ceylon 75. 1885; Hook.f., Fl. Brit. India 5: 151. 1886; Trimen, Handb. Fl. Ceylon 3: 446. 117. 1895; Kosterm. in Dassan. *et al.*, Rev. Handb. Fl. Ceylon 9: 142. 1995. – *Actinodaphne glauca* var. *walkeri* Meisn. in DC., Prodr. 15(1): 213. 1864.

Type: (lectotype, designated by Kostermans 1995: 142): Sri Lanka, Thwaites CP 3518 (PDA – *n.v.*; isoelectotypes BM000950998, BR000000517-5512, images!, CAL0000021600!, CAL0000021601!, CAL0000021603!, FR0031106, G00390140, G00390141, MEL2386422, NY00354775, images!).

Trees, 3–10 m high; young shoots rusty or rufous-tomentose, glabrous later on; branchlets greyish to black, terete, 2–8 mm thick, rusty-tomentellous, soon glabrous. *Leaves* 4–8-verticillate, oblong to oblong-elliptic or sometimes broadly obovate-elliptic to oblanceolate (suborbicular in var. *subtriplinervis*), 6–9 × 2–5 cm, rounded, cuneate, obtuse or acute at base, often rolling downwards along margins, rounded or occasionally obtuse to subacute at apex, stiffly coriaceous, initially rusty-tomentellous beneath, soon glabrous, greenish, brown to blackish-brown above when dry, pale brown and often glaucous beneath, penninerved; midrib prominent, lateral nerves slender, 5–10 pairs (rarely weakly trinerved at base), prominent (occasionally on slightly incised surface or immersed) above, raised beneath; tertiary nerves scalariform to laxly reticulate, prominent or some-

times inconspicuous above and beneath; nerves finely reticulate above and beneath (at least under lens) or occasionally obscure; petioles 8–20 mm long, 1.5–3 mm thick, initially rusty-tomentellous, soon glabrous. *Male:* inflorescences fasciculate. *Flowers:* pedicels *ca* 3 mm long; sepals triangular-oblong, *ca* 2 × 1 mm, rusty-tomentellous out-side; stamens *ca* 4 mm long; anthers *ca* 1 mm long. *Female:* inflorescences umbellate, 3–10-flowered. *Flowers:* pedicels 3–5 mm long, tomentellous; tepals triangular-ovate, *ca* 2 × 1–1.2 mm, minutely rusty-tomentellous outside; ovary subglobose, *ca* 1.5 mm in diam.; style *ca* 2.5 mm long. *Fruits* subglobose, 7–10 mm in diam.; persistent perianth concvte to cupular, 2–3 mm high, 4–6 mm in diam.; fruiting pedicels 5–8 mm long, 1–1.2 mm thick.

Key to the varieties

1a.	Leaves oblong-elliptic or broadly obovate-elliptic to oblanceolate, usually penninerved 11.1. var. glauca
b.	Leaves suborbicular, trinerved at base 11.2. var. subtriplinervis

11.1. var. *glauca*

Flowering & fruiting: March – November.

Habitat: Common in dense wet forests or montane forests between 1900–2300 m altitudes. *Distribution:* Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Kandy Dist., Above Frotost Estate, Nov. 1978, Kostermans 27082 (L herb. reg. no. L.1779582). Nuwara Eliya Dist.: Horton Plains, road to World's end, 10 Apr. 1969, Kostermans 23068 (L herb. acc. no. L.1779857). Horton Plains forest reserve, 17 Nov. 1977, Huber 651 (L herb. reg. no. L.1779581). Horton Plains, Near Far Inn, 8 Apr. 1969, Kostermans 23061 (L herb. reg. no. L.1779863). Base of Adams Peak rock, Trail from Moray Estate, 12 Sept. 1979, Kostermans 27813 (L herb. reg. no. L.1779880). Base of Adams Peak, 25 May 1971,

Kostermans 24269 (L herb. reg. no. L.1779875). Hakgala Botanical Garden (cult.), 21 Aug. 1985, *Jayasuriya & Wijesundara* 3362 (CAL). Slopes of Mt. Pidurutalagale, 25 Oct. 1974, *Davidse & Sumithraarachchi* 8064 (CAL).

11.2. var. *subtriplinervis* (Meisn.) Kosterm. in Dassan. et al., Rev. Handb. Fl. Ceylon 9: 143. 1995. – *Actinodaphne molochina* Nees var. *subtriplinervis* Meisn. in DC., Prodr. 15(1): 211. 1864 (p.p., excl. *Gardner* 733 et *Thwaites* 2536) – *Litsea orbicularis* Thwaites, Enum. Pl. Zeyl. 258. 1861. – *Actinodaphne ambigua* (Meisn.) Hook.f. var. *orbicularis* (Thwaites) Trimen, Handb. Fl. Ceylon 3: 447. 1895.

Type (lectotype, designated by Kostermans 1995: 143): Sri Lanka, *Thwaites* CP 2699 (PDA – n.v.; isolectotype BO, herb. reg. no. BO-0116031, image!).

Flowering: October – November.

Habitat: On steep slope in mossy elfin forest with a heavy undergrowth of bamboo at about 1200 m altitude.

Distribution: Sri Lanka – endemic.

Specimen examined:

Known from the type collections only.

12. *Actinodaphne lanata* Meisn. in DC., Prodr. 15(1): 219. 1864; Hook.f., Fl. Brit. India 5: 149. 1886; Gamble, Fl. Madras, Pt. 7: 1230. 1925; Rama Rao, Fl. Pl. Travancore 343. 1914; Brandis, Indian Trees 534. 1921; V. Chandras. in A.N. Henry et al., Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; Jayakumar & K.K.N. Nair in J. Econ. Taxon. Bot. 29(1): 153. 2005; Robi et al. in Bangladesh J. Pl. Taxon. 24(1): 120. 2017.

Type (lectotype, designated by Robi et al. 2017: 120): India, Peninsular Indiae Orientalis, *Wight* Kew Distrib. No. 2538 (K000778989, image!). Additional syntypes: India, Tamil Nadu, Nilgiri Dist., Nilgiris, *Gardner s.n.* (K000778987, K000-778988, images!). India, Tamil Nadu, Nilgiri Dist., Nilgiris, *Wight s.n.* (MH00007709!).

= *Actinodaphne shendurunii* Robi & Udayan in Int. J. Pl. Anim. & Environm. Sci. 3(3): 185. 2013, **syn. nov.**

Type: India, Kerala, Kollam Dist., Kallar, ca 850 m, 21 Jan. 2010, *Robi & Udayan* 6547 (holotype CAL – not traceable; isotypes CALI, CMPR, KFRI – n.v., MH00001709!).

Notes: We have been clarified by the authorities of CAL that the holotype of *A. shendurunii* indicated in the protologue was not received.

Trees, 5–8 m high; young shoots fulvous or rufous tomentose to lanate; branchlets greyish or blackish or dark brown, terete, 2–5 mm thick, evanescently tawny, fulvous or greyish tomentellous or densely pilose. *Leaves* 3–8-verticillate, narrowly oblong-elliptic to lanceolate-oblong or sometimes lanceolate, 6–14 × 1.5–3 cm, acute to cuneate at base, acuminate to caudate at apex (acumen or cauda 10–30 mm long, acute), stiffly chartaceous or thinly coriaceous, glabrous above, tawny, fulvous or greyish appressed tomentellous on major nerves (especially on midrib) to glabrescent beneath (lanate on both surfaces when young), dark brown, reddish brown or blackish brown or pale brownish above when dry, pale brown, coppery-brown to dark brown and glaucescent beneath, penninerved; midrib slightly incised above, raised beneath; lateral nerves slender, 6–12 pairs, arching, faint or obscure above, prominent to inconspicuous beneath; nervules inconspicuous; petioles 7–15 mm long, 0.8–2 mm thick, tomentellous to glabrous. *Male*: inflorescences and flowers not seen. *Female*: inflorescences and flowers not seen. *Infructescences* umbellate, with 3–5 fruits together on short brachyblasts. *Fruits* subglobose, 6–9 mm in diam. (also ovoid and ca 10 × 7 mm); persistent perianth cupular, 5–6 × 8–10 mm, with persistent or semipersistent calyx segments (ovate-triangular), scattered puberulous outside; fruiting pedicels 5–7 mm long, ca 1.2 mm thick, fulvous tomentellous.

Fruiting: October – December.

Habitat: Rare in shola forests between 1300–2200 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

INDIA. Tamil Nadu: Nilgiri Dist., Sispara ghat, Nov. 1883, *Gamble* 13367, 13429 (CAL); *ibid.*, May 1884, *Gamble* 14425 (CAL); *ibid.*, May 1889, *Gamble* 20585 (MH). Tirunelveli Dist., South Tinnevely, 1873, *Beddome s.n.* (CAL).

Notes: *Actinodaphne shendurunii* was described from Kerala, India and it was differentiated from the Malesian species *A. pruinosa* Nees.

The authors possibly overlooked the Indian endemic *A. lanata* which would have been the closest match! Study of the protologues and the original materials of *A. shendurinii* and *A. lanata* revealed that they are conspecific. Therefore, the former is combined herewith under the latter.

13. *Actinodaphne lanceolata* Dalzell & A. Gibson, Bombay Fl. 312. 1861; Chakrab. et al. in Phytotaxa 508(1): 66. 2021. **Fig. 1 C-D.**

Type (lectotype, designated by Chakrabarty et al. 2021b: 66): India, Maharashtra, Without precise locality and date, *Collector not indicated* [Herb. Dalzell] s.n. (CAL0000047870!). Additional original material: India, Maharashtra, Satara Dist., Mahabaleshwar, Without date, *Collector not indicated* [Herb. Dalzell] 59 (fragm. CAL000-0047874!). India, Maharashtra, Without precise locality and date, *Collector not indicated* [Herb. Dalzell] s.n. (CAL0000008845!, CAL0000047869!, CAL0000047871!, CAL0000047872!, CAL00000-47873!, K000778994, image!)

=*Actinodaphne hookeri* Meisn. in DC., Prodr. 15(1): 218. 1864 (excl. var. *longifolia*); Hook.f., Fl. Brit. India 5: 149. 1886; T.Cooke, Fl. Bombay 2: 537. 1906; Talbot, For. Fl. Bombay 2: 391. 1911; C.J. Saldanha & S.R. Ramesh in C.J. Saldanha, Fl. Karnataka 1: 58. 1984; Robi & Udayan in Telopea 19: 176. 2016. - *Iozoste* ["*Jozoste*"] *hookeri* Kuntze, Revis. Gen. Pl. 2: 569. 1891.

Type (lectotype, designated by Robi & Udayan 2016: 176): India, Maharashtra, Concan, *Law* s.n. (K000778992, image!; isolectotypes G0069-4230, K000778993, L herb. reg. no. L.1779346, images!).

= *Actinodaphne hookeri* Meisn. var. *glabrata* Meisn. in DC., Prodr. 15(1): 218. 1864.

Type (lectotype, designated by Robi & Udayan 2016: 176): India, Maharashtra, Concan, *Law* s.n. (K000778995, image!; isolectotypes CAL-0000021623!, K000778996, image!).

Actinodaphne angustifolia sensu Londhe in N.P. Singh et al., Fl. Maharashtra 2: 823. 2001, non (Blume) Nees, 1832.

Shrubs or trees, 3–10 m high; young shoots fulvous, brown, tawny or rusty villous; branchlets greyish, yellowish, blackish or brown to dark brown, terete, 3–8 mm thick, initially brown, fulvous or tawny tomentose to rusty villous, soon glabrous. *Leaves* 3–6-verticillate, ovate,

ovate-elliptic, ovate-oblong, ovate-lanceolate, oblong-lanceolate to lanceolate 8–24 × 2.5–7 cm, acute, obtuse to rounded at base, acuminate (acumen 1–4 cm long, acute) at apex, thinly coriaceous, fulvous or rusty-tomentellous on midrib above but soon glabrous, evanescently rusty-tomentellous on major nerves beneath, greenish-brown, brown, dark brown or blackish above when dry, paler and usually glaucous beneath, penninerved or weakly trinerved at base; midrib flat to slightly incised above, raised beneath; lateral nerves 6–10 pairs (basal pair opposite to subopposite, mostly slightly longer than the subsequent pairs), faint, flat or slightly incised above, raised beneath; tertiary nerves obscure or sometimes somewhat prominent above, faint beneath, scalariform to laxly reticulate; petioles 10–30 mm long, 1–3 mm thick, initially fulvous or rusty tomentellous, soon glabrous. *Male*: inflorescences fasciculate-thyriform (up to 2 cm long when thyriform with flowers arranged in pairs or 3-together), dense-flowered. *Flowers*: pedicels 3–5 mm long, 0.5–0.7 mm thick, brown tomentellous; tepals ovate-triangular, triangular-oblong to oblong, 3–5 × 1.5–2.5 mm, tomentellous outside; stamens ca 5 mm long; anthers 0.8–1 mm long. *Female*: inflorescences umbellate, often pedunculate, 3–10-flowered. *Flowers*: pedicels 5–13 mm long, 1–1.5 mm thick; tepals triangular-ovate or broadly so, 2–3 × 1.2–2.5 mm; ovary subglobose, ca 2 mm in diam. *Fruits* subglobose, 8–9 mm in diam., sometimes oblong to oblong-ellipsoid, ca 9 × 7 mm; peduncle 3–5 mm long; persistent perianth cupular, 5–7 mm high, 6–10 mm in diam.; fruiting pedicel 10–20 mm long, 1.5–2 mm thick, fulvous tomentellous.

Flowering & fruiting: November – May.

Local names: Hindi: *Pisa*; Kannada: *Galavaara*, *Tudgensu*; Marathi: *Pisa*; *Pisara*; Tamil: *Tali*.

Uses: Oil from fruits used in manufacture of soap.

Habitat: Common in evergreen forests on hill slopes, often on red gravelly soil between 500–1300 m altitudes.

Distribution: India (Karnataka and Maharashtra) – endemic.

Specimens examined:

INDIA. Karnataka: Uttara Kannada Dist., Devimone ghat, 18 May 1896, *Talbot* 3697 (CAL). **Maharashtra:** Malabar, Concan, etc., *Stocks & Law s.n.* (CAL0000021641). Pune Dist.: Sakarpathar, 25 Dec. 1962, *R.S. Rao* 85247 (BSI, CAL); *ibid.*, 24 Apr. 1964, *B.V. Reddi* 97717 (BSI, CAL). Sakarpathar road to Ambavne, Above INS Shivaji, 1 Dec. 1963, *B.V. Reddi* 68328 (BSI, CAL); *ibid.*, 8 Mar. 1962, *B.V. Reddi* 77721 (BSI, CAL). Tiskari to Varpa, Ambavne, 30 Jan. 1964, *B.V. Reddi* 95812 (BSI, CAL). Satara Dist., Mahabaleshwar, Oct. 1881, *Brandis s.n.* (CAL); *ibid.*, 27 Apr. 1957, *Puri* 16729 (BSI, CAL). Raigad Dist., Matheran, Feb. 1892, *No collector s.n.* (CAL, herb. acc. no. 385762); *ibid.*, 14 May 1957, *Puri* 14034 (BSI, CAL); *ibid.*, 14 May 1957, *Puri* 12896 (BSI, CAL). Thane Dist., Sadiya ghat top forest and Takarada range, 12 Apr. 1968, *Billore* 113989 (BSI, CAL).

Notes: Specimens with penninerved leaves (e.g. CAL0000047869, CAL0000008845) may deserve distinct varietal status on this character pending examination of further gatherings.

14. Actinodaphne lawsonii Gamble in Bull. Misc. Inform. Kew 1925: 129. 1925 & Fl. Madras, Pt. 7: 1231. 1925; V.Chandras. in A.N. Henry et al., Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; Jayakumar & Nair in J. Econ. Taxon. Bot. 29 (1): 153. 2005; Udayan & Robi in Indian Forester 138(7): 663. 2012; Robi & Udayan in Telopea 19: 178. 2016.

Type (lectotype, designated by Robi & Udayan 2016: 178): India, Tamil Nadu, Nilgiri Dist., South-East Wynaad, 1884, *Lawson s.n.* (K000-793029, image!). Additional syntype: India, Tamil Nadu, Nilgiri Dist., Connoor, 19 Mar. 1870, *C.B. Clarke* 11079 (K000793028, image!).

Trees, 6–18 m high; young shoots ochraceous to brown villous to tomentose; branchlets brown or blackish, terete, 4–6 mm thick, densely ochraceous, brown or tawny pilose to tomentellous, glabrescent in age. *Leaves* 4–8-verticillate, obovate, obovate-elliptic to obovate-oblong or often narrowly oblong-elliptic to elliptic, 10–19 × 3–8 cm, (immature leaves 20–30 × 5.5–10 cm with 10–12 pairs of lateral nerves and up to 25 mm long petiole), cuneate at base, obtuse to subac-

ute or apiculate at apex, chartaceous to thinly coriaceous, brown, dark brown or blackish above when dry, pale brown or coppery and often glaucescent beneath, scattered ochraceous, brown or tawny pilose on major nerves above, densely pilose on major nerves beneath and evanescently scattered pilose elsewhere, penninerved; midrib flat to slightly raised above, raised beneath; lateral nerves stout, 6–9 pairs, straight to slightly curved, prominent above, raised beneath, ascending, slightly arching, often bifurcating, tertiary nerves somewhat prominent above, inconspicuous beneath (not at right angles), percurrent to laxly scalariform; nervules somewhat prominent to obscure above, inconspicuous beneath, reticulate (not finely); petioles 10–15 mm long, 2–3 mm thick, densely brown or tawny or rufous pilose. *Male:* inflorescences fasciculate. *Flowers:* pedicels 3–4 mm long, fulvous tomentellous; tepals ovate-oblong, ca 3 × 2 mm; stamens ca 4 mm long. *Female:* inflorescences subumbellate on pulvini (pulvini up to 3 mm long) or peduncle (up to 4 mm long), 6–8-flowered. *Flowers:* pedicels 7–10 mm long, 1–1.5 mm thick, tomentellous; tepals broadly ovate, ca 3 × 1.5–1.8 mm, tomentellous outside; ovary subglobose, ca 1.2 mm in diam.; style ca 1.5 mm long. *Fruits* subglobose, ca 8 mm in diam.; persistent perianth cupular, ca 4 mm high, ca 6 mm in diam., entire; fruiting pedicels 8–12 mm long, 1–1.5 mm thick, tomentellous.

Flowering & fruiting: January – May.

Habitat: Scarce in evergreen and shola forests between 1500–2000 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

INDIA. Tamil Nadu: Nilgiri District, Gudalur – Naduvattam road, 21 Jan. 1961, *Shetty* 11979 (CAL, MH); Naduvattam, 25 Dec. 1861, *T. Anderson s.n.* (CAL); *ibid.*, 20 May 1971, *Ellis* 38494 (MH); *ibid.*, 28 Nov. 1971, *Rathakrishnan* 39060 (MH); *ibid.*, 26 Oct. 1974, *Vajravelu* 46063 (MH). Without precise locality and date, *T. Anderson s.n.* (CAL). Cinchona plantation, 24 Feb. 1978, *Ansari* 1007 (CAL).

Notes: Udayan & Robi (2012) recorded the species for Karnataka.

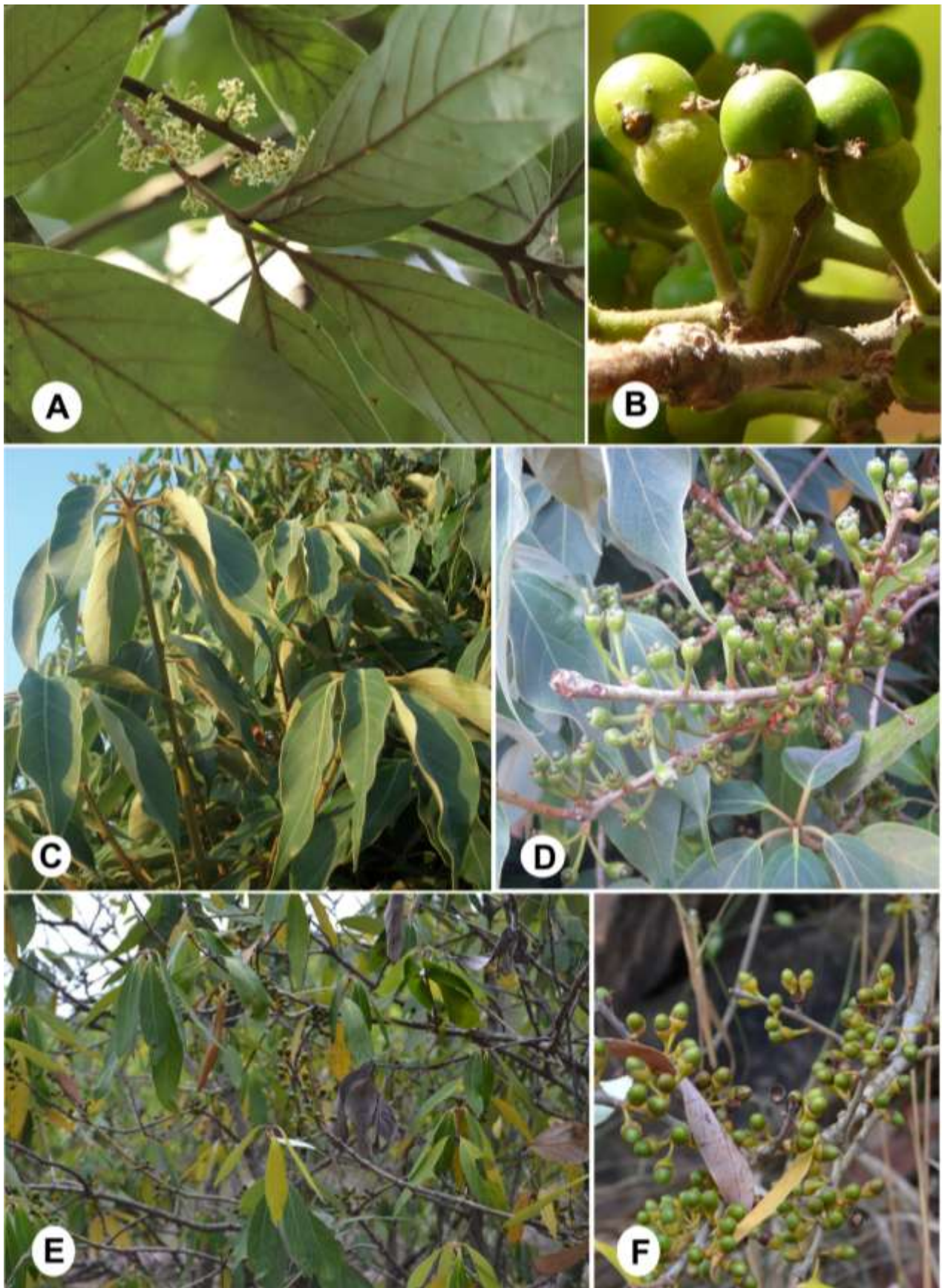


Figure 1. Field images of *Actinodaphne* species.
A-B. *A. bourdillonii*; C-D. *A. lanceolata*; E-F. *A. madraspatana*.

15. *Actinodaphne longipes* Kosterm. in Reinwardtia 9(1): 98. 1974; D.G. Long in Grierson & D.G.Long, Fl. Bhutan 1(2): 281. 1984.

- *Actinodaphne reticulata* Meisn. var. *glabra* Meisn. DC., Prodr. 15(1): 212. 1864; C.K.Allen in Ann. Missouri Bot. Gard. 25: 412. 1938.

Type: Bangladesh, East Bengal, J.S. Smith s.n. (holotype K - n.v.). India, Nagaland, Naga hills, Paona, 2 Sept. 1935, *Bor* 6276 (paratype K000793024, image!). India, West Bengal, Darjeeling Dist., Dilpa, 26 Oct. 1903, *Osmaston* s.n. (paratypes CAL herb. acc. nos. 385686!, 385690!).

Actinodaphne reticulata sensu Av. Bhattacharjee & A.A. Ansari in Lakshmin. *et al.*, Fl. West Bengal 4: 433. 2019, *non* Meisn. 1864.

Trees, 7–12 m high; terminal buds puberulous; young shoots glabrous; branchlets greyish to blackish or dark brown, glabrous, 2–5 mm thick. *Leaves* 4–6-verticillate, often alternate to subopposite below, lanceolate-oblong to narrowly oblong, 6.5–16 × 1.5–3.5 cm, acute to cuneate at base, apiculate to acuminate (acumen 5–15 mm long, acute), glabrous, thinly coriaceous, greenish or blackish above when dry, paler beneath, not glaucous, penninerved; midrib flat above, raised beneath; lateral nerves slender, 8–12 pairs, faint to prominent above and beneath; tertiary nerves inconspicuous to faint above, obscure beneath, laxly reticulate; nervules obscure or faint above, obscure beneath, finely reticulate-scrobiculate (according to protologue); petioles 5–10 mm long, 0.8–1.5 mm thick, glabrous. *Male*: inflorescences fasciculate, *ca* 10-flowered. *Flowers*: pedicels *ca* 3 mm long, glabrous; tepals triangular-oblong, *ca* 2 × 1.2 mm, glabrous; stamens 4–4.5 mm long; anthers *ca* 2 mm long. *Female*: Inflorescences and flowers not seen. *Infructescences* umbellate, with 3–5 fruits (per umbel) on a short brachyblast. *Fruits* subglobose and *ca* 10 mm in diam. or oblong and 10–12 mm long, *ca* 8 mm in diam.; persistent perianth cupular, 4–5 mm high, 8–12 mm in diam., entire, glabrous; fruiting pedicels 10–30 mm long, 1–2 mm thick, glabrous.

Flowering & fruiting: February – September.

Habitat: Common in West Bengal but rare elsewhere in tropical to subtropical forests or

primary forests between 1200–2100 m altitudes.

Distribution: India and Bangladesh.

Specimens examined:

INDIA. Meghalaya: Khasi hills, Mwodaw, 9 Nov. 1871, C.B. Clarke 15289 C (CAL). **Nagaland**: Naga hills, Harikanni, Dec. 1907, *Meebold* 6949 (CAL). **West Bengal**: Darjeeling Dist.: Darjeeling, Mar. 1918, *No collector* s.n. (CAL). Tonglu, 15 Nov. 1902, *Osmaston* 30 (CAL). Manibhanjan, 10 May 1916, *Cave* s.n. (CAL). Kurseong, July 1915, *Modder* 43 D (CAL). Batasi, sine date, S.K. Mukherjee 12 (CAL).

Notes: Very close to *A. reticulata* but differing in being glabrous and the minor venation of leaves mostly inconspicuous. There is only one collection from Khasi hills collected by Clarke which is glabrous and the minor venation inconspicuous.

16. *Actinodaphne madraspatana* Bedd. ex Hook.f., Fl. Brit. India 5: 149. 1886; Gamble, Fl. Madras, Pt. 7: 1231. 1925; V.Chandras. in A.N. Henry *et al.*, Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; Pullaiah & Moulavi, Fl. Andhra Pradesh 2: 823. 1997; Robi & Udayan in Telopea 19: 179. 2016. - *Iozoste* (“*Jozoste*”) *longifolia* Kuntze, Revis. Gen. Pl. 2: 570. 1891. **Fig. 1 E-F.**

Type (lectotype, designated by Robi & Udayan 2016: 179): India, Andhra Pradesh, Cuddapah Dist., Cuddapah, Feb. 1872, *Beddome* 259 (K000-778990, image!).

= *Actinodaphne hookeri* Meisn. var. *longifolia* Meisn. in DC., Prodr. 15(1): 219.1864.

Type (lectotype, designated by Robi & Udayan 2016: 179): India, Peninsula Indiae Orientalis, *Wight* Kew Distrib. No. 2537 (K000778991, image!; isolectotypes CAL0000021624!, P0195-4955, image!).

Shrubs or trees, 2–4 m high; young shoots brown or rusty tomentose; branchlets greyish to brownish or blackish, terete, 3–6 mm thick, initially brown or rusty tomentellous, soon glabrous. *Leaves* 4–8-verticillate, lanceolate-oblong, lanceolate-elliptic to lanceolate or sometimes narrowly oblong-elliptic, 11–25 (–29) × 2.5–6 (–8) cm, acute at base, apiculate to acuminate (acumen 8–20 mm long, acute) at apex, thinly coriaceous, glabrous above, rusty tomentellous on major nerves to soon glabrous beneath;

green to greenish-brown above when dry, glaucous beneath, penninerved; midrib flat or slightly raised above, raised beneath; lateral nerves slender, 8–12 pairs, more or less prominent and flat above, conspicuous and raised beneath; tertiary nerves inconspicuous to faint above, obscure beneath, percurrent to scalariform; nervules obscure; petioles 8–15 mm long, 1.5–3 mm thick, glabrous. *Male*: inflorescences fasciculate or sometimes racemiform (1–1.6 cm long with flowers solitary along rachis), dense-flowered. *Flowers*: pedicels *ca* 3 mm long; tepals ovate-triangular, *ca* 2 × 1.3 mm; stamens *ca* 3 mm long; anthers *ca* 1 mm long. *Female*: inflorescences solitary or umbellate and 2–5-flowered; peduncle absent or up to 3 mm long. *Flowers*: pedicels 3–5 mm long, rusty tomentellous; tepals ovate-oblong, 2–2.5 × 1–1.3 mm, rusty tomentellous outside; ovary subglobose, *ca* 1.5 mm in diam.; style *ca* 2.5 mm long. *Fruits* oblong-ellipsoid, 9–12 mm long, 7–8 mm in diam.; persistent perianth 4–5 mm high, 6–8 mm in diam., undulate to entire, glabrous; fruiting pedicels 5–10 mm long, 0.7–1 mm thick, glabrous.

Flowering & fruiting: January – June.

Habitat: Common in Andhra Pradesh but scarce in Tamil Nadu in semievergreen forests between 600–1100 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

INDIA. Andhra Pradesh: Chittoor Dist.: Tirumalai, 17 June 1969, *Subba Rao* 31904 (MH). Near Eethakayala Mandapam, 31 Dec. 1975, *Subba Rao* 46910 (CAL, MH). Talakona RF, 25 Mar. 1986, *Ranga Charyulu* 421 (CAL, MH). Cuddapah Dist.: Seshachalam hills, 24 Mar. 1921, *C.E.C. Fischer* 4628 (CAL, MH). Cudappah, Noglibetta, 1 Aug. 1889, *Gamble* 21331 (MH). **Tamil Nadu**: Chinglepattu Dist., Kambakkam hill, 7 Feb. 1922, *C.E.C. Fischer* 4717 (CAL); *ibid.*, 8 Feb 1922, *C.E.C. Fischer* 4718 (CAL).

17. *Actinodaphne mansonii* M.Gangop. in Bangladesh J. Pl. Taxon. 15(2): 91, Plate 2. 2008. *Type*: Myanmar, Tenasserim, Saung Oh, sine date, *Manson* 101 (holotype CAL0000021621!).

Stature unknown; terminal buds perulate, silky pilose; branchlets blackish, terete, up to 5 mm thick, glabrous. Leaves 4-verticillate, obovate, 21–25 × 8–9 cm, cuneate-attenuate at base, subacute at apex, coriaceous, glabrous, blackish above when dry, pale brownish beneath, not glaucous, penninerved; midrib raised above and beneath; lateral nerves stout, 8–10 pairs, raised above and beneath; tertiary nerves more or less prominent above, raised beneath, percurrent; nervules inconspicuous above, faint beneath, reticulate; petioles 20–22 mm long, 2.5–3 mm thick, glabrous. *Flowers*: not seen. *Infructescences* umbellate, with few fruits, shortly pedunculate, silky puberulous. *Fruits* not seen; persistent perianth cupular, 2.5–3.5 mm long, 7–8 mm in diam., entire, glabrous; fruiting pedicels *ca* 10 mm long, *ca* 1.5 mm thick, shortly pilose.

Flowering & fruiting: Period unknown.

Local name: Burmese: *Kyese shor*.

Habitat: No data available.

Distribution: Myanmar – endemic.

Specimen examined:

Known from the type collection only.

Note: A poorly known species, described on the basis of imperfect material. It was said to be allied to *A. concolor*, differing “in having glabrous nature, leaves with strongly incurved margin and acute apex, raised lateral nerves on upper surface and long stalked fruits.”

18. *Actinodaphne molochina* Nees, Syst. Laur. 636. 1836; Wight, Icon. Pl. Ind. Orient. 5(2): 15, t. 1843. 1852 (as *melochina*); Thwaites, Enum. Pl. Zeyl. 257. 1861; Meisn. in DC., Prodr. 15(1): 211. 1864 (*excl. vars.*); Trimen, Syst. Cat. Fl. Pl. Ceylon 75. 1885; Hook.f., Fl. Brit. India 5: 150. 1886 (*excl. var.*); Trimen, Handb. Fl. Ceylon 3: 445. 1895 (*excl. var.*); Kosterm. in Dassan. *et al.*, Rev. Handb. Fl. Ceylon 9: 136. 1995.

Type: (lectotype, designated by Kostermans 1995: 136): Sri Lanka, *Thwaites* CP 2273 (PDA – *n.v.*; isolectotypes BM000950994 – left hand side specimen, BR0000005175840, images!, CAL00-00021611!, CAL0000021612!, CAL0000021613!, CAL0000021614!, G00390135, G00390137, G006-

94252, G-DC-without barcode, GH00041107, K000778998, K000779000, MEL-2386429, images!).

Actinodaphne molochina Nees var. *glabrescens* Meisn. in DC., Prodr. 15(1): 211. 1864, *p.p.*, *tantum quoad specimina* Gardner 738.

Small trees; branchlets greyish or dark brown, 3–5 mm thick, rusty-tomentellous, glabrescent in age. *Leaves* 3–7-verticillate, ovate, elliptic, broadly oblong-elliptic to suborbicular or broadly obovate-elliptic, 4–8 × 2–5.5 cm, broadly to narrowly cuneate at base, slightly incurved along margins, rounded to obtuse or occasionally subacute at apex, coriaceous, glabrous above, rusty-tomentellous beneath on major nerves, sublanate-tomentellous elsewhere, brown to dark brown or blackish above when dry, brown beneath, not glaucous, penninerved; lateral nerves 4–6 pairs, prominent above on grooved surface, raised beneath; tertiary nerves inconspicuous to faint above, somewhat prominent beneath, percurrent to scalariform; nervules inconspicuous or often faint beneath; petioles 5–10 mm long, 2–3 mm thick, rusty-tomentellous. *Male*: inflorescences clustered. *Flowers*: rusty-tomentellous; pedicels *ca* 5 mm long, *ca* 1 mm thick; tepals triangular, *ca* 2 × 1 mm; stamens *ca* 3.5 mm long; anthers *ca* 1.5 mm long. *Female*: inflorescences umbellate, few-flowered. *Flowers*: pedicels 3–4 mm long, tomentellous; tepals broadly ovate, *ca* 2 × 1 mm, tomentellous outside; ovary subglobose, *ca* 1.5 mm in diam.; style *ca* 2 mm long. *Fruits* (slightly immature ones seen): subglobose, *ca* 5 mm in diam.; persistent perianth concave, *ca* 2 mm high, *ca* 4 mm in diam.; fruiting pedicels *ca* 5 mm long, *ca* 1.2 mm thick.

Flowering & fruiting: May – June.

Habitat: Rare at about 1800 m altitude.

Distribution: Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Without locality and date, G. Thomson *s.n.* (CAL, GH00041108, K000778997); *ibid.*, Walker 221 (K000793001); *ibid.*, Gardner 738 (G00694288). Peveru talagala, 1 June 1923, *Stomps s.n.* (AMD herb. reg. no. AMD.86572).

Notes: The specimen at G-DC (G00390135) bears

very prominent finely areolate minor venation on the upper surface of the leaves.

19. *Actinodaphne moonii* Thwaites, Enum. Pl. Zeyl. 256. 1861; Kosterm. in Dassan *et al.*, Rev. Handb. Fl. Ceylon 9: 136. 1995. – *Actinodaphne molochina* Nees var. *glabrescens* Meisn. in DC., Prodr. 15(1): 211. 1864. – *Actinodaphne molochina* Nees var. *moonii* (Thwaites) Hook.f., Fl. Brit. India 5: 150. 1886; Trimen, Handb. Fl. Ceylon 3: 445. 1895.

Type: (lectotype, designated by Kostermans 1995: 136): Sri Lanka, Central Province, Moon in Thwaites C.P. 74, *p.p.* (PDA – *n.v.*; isolectotypes BR0000005176175, image!, CAL0000021615!, FR0036291, G00390134, G-DC – without barcode, K000778999, MEL2386430, images!).

Shrubs (often bushy) or trees, 1–4 m high; young shoots fulvous or ferruginous tomentose to villous, branchlets greyish or black, terete, 2–7 mm thick, greyish (discoloured), rusty or rufous tomentellous, glabrescent in age. *Leaves* 5–8-verticillate, elliptic to oblong-elliptic (or narrowly so) or occasionally ovate, 3–8 × 1–3 cm, acute or sometimes obtuse to rounded at base, subacute, apiculate or shortly and bluntly to acutely acuminate at apex, thinly to stiffly coriaceous, glabrous or pubescent on midrib above, minutely and scattered greyish pilose or tomentellous on midrib to glabrescent beneath; blackish, brown or coppery-brown above when dry, pale brown and sometimes glaucous beneath, penninerved; lateral nerves slender to stout, 6–9 pairs, faint to prominent above, prominent beneath; tertiary nerves scalariform, mostly branched, prominent or obscure; nervules forming conspicuous areolation above and beneath or minor nervation obscure (when the leaves stiffly coriaceous); petioles 3–5 mm long, 1–2 mm thick, greyish (discoloured) or rufous tomentellous. *Male*: inflorescences few-flowered, umbellate-fasciculate. *Flowers*: subsessile; tepals ovate, 2–3 mm long; anthers *ca* 1.5 mm long. *Female flowers*: umbellate and few-together or solitary, subsessile; tepals broadly ovate, *ca* 1.5 × 1 mm; ovary subglobose, *ca* 1 mm in diam.; style *ca* 1.5 mm long. *Fruits* subglobose, *ca* 6 mm in diam.; persistent perianth flat or concave, 2–3 mm in diam. bearing subpersistent tepals; fruiting pedicels *ca* 2 mm long, stout.

Flowering & fruiting: August – September.

Habitat: Common in forests of the upper montane zone between 1300–2000 m altitudes.

Distribution: Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Without locality, Moon 305 (K000-793003). *ibid.*, Mac Kenzie s.n. (K000-793002). Nuwara Eliya Dist.: Horton Plains, 8 Apr. 1969, Kostermans 23071 (L herb. acc. no. L.1790216). Road Luxapwapana to Naskeliya, 18 Aug. 1974, Kostermans 25407 (L herb. acc. no. L.1790219).

Notes: *Actinodaphne molochina* Nees var. *glabrescens* Meisn. was not superfluous when described because there was no mention of any specimen in the protologue of *A. molochina*. Later, Kostermans lectotypified the variety with that of the species whereby it became a homotypic synonym. Having seen only flower buds, the description of the flowers and fruits have been adopted after Kostermans (1995).

20. *Actinodaphne obovata* (Nees) Blume, Mus. Bot. 1: 342. 1851; Hook.f., Fl. Brit. India 5: 153. 1886; C.K.Allen in Ann. Missouri Bot. Gard. 25: 404. 1938; D.G. Long in Grierson & D.G. Long, Fl. Bhutan 1(2): 280. 1984; Puhua & Werff in Fl. China 7: 162. 2008; Av. Bhattacharjee & A.A. Ansari in Lakshmin. et al., Fl. West Bengal 4: 432. 2019. – *Tetradenia obovata* Nees in Wall., Pl. Asiat. Rar. 2: 64. 1831. – *Litsea obovata* (Nees) Nees, Syst. Laur. 636. 1836. – *Iozoste* (“*Jozoste*”) *obovata* (Nees) Kuntze, Revis. Gen. Pl. 2: 570. 1891.

Fig. 2 A–B.

Type (lectotype, designated here): Bangladesh, Sylhet, without date, Buchanan-Hamilton in Wallich 2562 B (K001116450, image!). Additional syntypes: Bangladesh, Sylhet, de Silva in Wallich 2562 A (K001116449, fragm. L0035479, images!). Bangladesh, Sylhet, Wallich 2562 (BM000888419, G00390149, G-DC – without barcode, images!). = *Actinodaphne obovata* (Nees) Blume var. *wattii* King ex Kanjilal et al., Fl. Assam 4: 78. 1940, **syn. nov.**

Type (lectotype, designated here): India, Manipur, Descent from Khongui, 9 Apr. 1882, Watt 6331 (CAL0000021647!; isolectotype CAL-0000021648!).

Shrubs or trees, 2–20 m high; bark greyish-brown, exfoliating in thin papery flakes; young

shoots tawny-tomentose or rusty or fulvous velutinous; branchlets brown, greyish to black, terete, 3–10 mm thick, initially tomentellous, glabrous later on. Leaves 3–7-verticillate, broadly obovate to oblong-elliptic or sometimes ovate, 16–60 × 6–34 cm, acute to subacute to obtuse or occasionally rounded at base, apiculate to acuminate at apex (acumen 10–20 mm long, acute), thinly coriaceous (chartaceous when young), scattered tawny or rufous puberulous on the major nerves to glabrous and glossy above, tomentellous on major nerves to subglabrous beneath (with puberulous midrib), greenish-brown, brown, dark brown or blackish above when dry, greenish to pale brownish or coppery or blackish and often glaucous or glaucescent beneath, weakly to prominently trinerved at base (first pair of lateral nerves usually longer than the subsequent pairs); midrib flat above, raised beneath; lateral nerves 5–6 pairs (excluding basal), prominent above and beneath, straight to arching; tertiary nerves faint above, faint to very prominent (often raised) beneath, percurrent to scalariform; petioles 20–70 mm long, 1.5–5 mm thick, initially tawny tomentellous (when young), glabrous when mature. *Male:* inflorescence compound umbels or thyriform with each branch ending into an umbel (up to 3 cm long). *Flowers:* ca 10 mm in diam.; pedicels 2–5 mm long, ca 0.6 mm thick, brown tomentellous outside; tepals ovate-oblong to triangular-oblong, 3–4 × 2–2.3 mm, tomentellous outside; stamens 4–5 mm long; anthers ca 2 mm long. *Female:* inflorescences thyriform, (up to 3.5 cm long) or racemiform (up to 3.5 cm long), often pedunculate (peduncle 3–5 mm long), occasionally simple pedunculate umbels (with ca 5 mm long stout peduncle). *Flowers:* pedicels 3–8 mm long, 0.8–1 mm thick, rufous tomentellous; calyx tube ca 1 mm long; tepals ovate-oblong, 2–2.5 × ca 2 mm; ovary ovoid or subglobose, ca 1.5 mm long; style ca 2 mm long. *Infructescences* up to 5 cm long. *Fruits* ellipsoid-oblong, 2.5–3 cm long, 1.5–1.8 cm in diam; persistent perianth concave-cupular, 3–4 mm high, 8–15 mm in diam., entire; fruiting pedicels 8–10 mm long, 1.5–2 mm thick.

Flowering & fruiting: March – October.

Local names: Assamese: *Pati-honda*, *Petarichowa*, *Petari soa*, *Pajihuta*; Khasi: *Dieng-la-sata*, *Dieng-sala-bung-kron*; Garo: *Bolring-ranjak*.

Habitat: Fairly common in semi-evergreen or primary forests between 300–1600 m altitudes.

Distribution: India, Nepal, Bhutan, Bangladesh, Myanmar, China and Vietnam.

Specimens examined:

BANGLADESH. East Bengal, *Griffith* Kew Distrib. No. 4327/1 (U herb. reg. no. U.1401-413). **INDIA. Assam:** Darrang Dist., Aka hills, Mar. 1890, *Badal Khan* (*King's collector*) 157 (CAL). Kamrup Dist., Without locality, Mar. 1878, *Mann* 793 (CAL). Sibsagar Dist., Nagira, 18–19 Mar. 1895, *Watt* 10363 (CAL). Sibsagar, n.d., *Peal* 78, 121, 146, 155 (CAL). **Manipur:** Dzukou valley, 800 ft., 31 Mar. 1897, *Watt* 10327 (CAL). Descent from Khongam, 9 Apr. 1882, *Watt* 6331 (CAL). **Meghalaya:** Khasi hills Dist., Khasi hills, *J.D. Hooker & T. Thomson s.n.* (CAL). Cherrapunjee, 12 May 1952, *Rup Chand* 5327 (L herb. reg. no. L.1790055). Nungpo, 2 Apr. 1886, *Clarke* 43272 B (CAL). **Mizoram:** Lushai hills, Hmuntha, 6 Apr. 1951, *Rup Chand* 4484 (L herb. reg. no. L.1790054). **Nagaland:** Naga hills, Jabocka, June 1899, *Prain's collector* 638 (CAL). **Sikkim:** Without locality, 1–2000 ft., no date, *J.D. Hooker s.n.* (CAL); *ibid.*, 1893, *Haines* 5 (CAL); *ibid.*, n.d., *King s.n.* (CAL). Rongpo, 2 May 1876, *King s.n.* (CAL). **Tripura:** Teliamura, 21 Feb. 1960, *Deb* 2277 (CAL). **West Bengal:** Alipurduar Dist., Buxa National Park, Rajabhatkhawa range, 12 Mar. 2011, *Krishna* 50545 (CAL). Darjeeling Dist., Munsong, 17 Mar. 1909, *Kari* 629 (CAL). Rieng valley, Apr. 1878, *Lister s.n.* (CAL). Jalpaiguri Dist., Gorumara National Park, Tower range, 22 Sept. 2008, *Ranjan & Anant Kumar* 44617 (CAL).

Notes: *Actinodaphne obovata* was originally described from Sylhet in Bangladesh based on two collections by F. de Silva and Buchanan-Hamilton, listed in the Wallich's Catalogue (Wallich 1830) as 2562 A and 2562 B respectively. Specimens bearing the Wallich's number 2562 are available at BM, G-DC (two sheets), K (two sheets) and L. Of these the sheets at K are further specified with the numbers A and B while the others are simply marked with the number 2562. Therefore, the

specimens at K can be considered for lectotype designation and the specimen 2562 B (barcode K001116450, digital image!) is slightly better than the other specimen (barcode K001116449, digital image!) bearing inflorescences with somewhat mature male flowers which has been selected here as the lectotype. Allen (1938) mentioned: "*N. Wallich* 2562 (isotype of *Tetranthera obovata*, Kew, see footnote p. 370)." However, citation of type as "isotype" does not qualify the name to be effectively lectotypified (N.J. Turland, *pers. comm.*). The variety, *A. obovata* var. *wattii* Kanjilal et al. was described for a variant with larger leaves which, however, is connected to the typical variety through ample intergradations. Of the two specimens of the original material, the sheet CAL0000021647 bears flowers and therefore designated here as the lectotype of the name.

A closely related fully glabrous species, *A. menghaiensis* J.Li also occurs in China (Yunnan). A specimen, *Cuong* 359 from Vietnam (L043552) possibly represents a hitherto undescribed species, differing from *A. obovata* by the penninerved leaves with globose fruits.

21. Actinodaphne procera Nees, Syst. Laur. 605. 1836; Miquel, Fl. Ned. Ind. 1(1): 966. 1858; Meisn. in DC., Prodr. 15(1): 216. 1864; Vasudeva Rao in J. Econ. Taxon. Bot. 8: 141. 1986; B.K. Sinha, Fl. Great Nicobar Isl. 364. 1999; Pandey & Diwakar in J. Econ. Taxon. Bot. 32: 450. 2008; Jayanthi, Fl. Campbell Bay Natl. Park 248. 2017; Chakrab. et al. in Nelumbo 63(1): 115. 2021. – *Litsea pruinosa* Blume, Bijdr. Fl. Ned. Ind. 560. 1826, non *Actinodaphne pruinosa* Nees, 1831. – *Iozoste* ["*Jozoste*"] *procera* (Nees) Kuntze, Revis. Gen. Pl. 2: 570. 1891.

Type: (lectotype, designated by Chakrabarty et al. 2021: 115): Indonesia, Java, without precise locality and date, *Blume s.n.* (L0035485: image!; isolectotype L0035482, L0035483, L0035484, L0035486, images!). Additional original material: Indonesia, Java, without precise locality and date, *Blume s.n.* (L0926959, U herb. reg. no. U.1401436, images!).

= *Litsea leiophylla* Kurz in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42: 103. 1873 & Forest Fl. Burma 2: 305. 1877. – *Actinodaphne leiophylla* (Kurz) Hook.f., Fl. Brit. India 5: 154. 1886 (sphlam.

"*leiantha*"). – *Iozoste* ["*Jozoste*"] *leiophylla* (Kurz) Kuntze, Revis. Gen. Pl. 2: 570. 1891 (as *leiantha*).

Type: (lectotype, designated by Chakrabarty *et al.* 2021: 115): Myanmar, Tenasserim [and Andamans] *Helper* Kew Distrib. No. 4330 (CAL0000021625!; isolectotype K000793018, image!).

= *Actinodaphne nicobarica* M.Gangop. in Bangladesh J. Pl. Taxon. 15(2): 93. 2008.

Type: India, Andaman & Nicobar Islands, Great Nicobar Island, 34 km on East-West Road, 22 July 1976, *Balakrishnan* 3939 (holotype CAL0000021622!; isotype CAL0000021630!). *Actinodaphne angustifolia* (Blume) Nees var. *latior auct non* Nees, 1832: Chakrab. *et al.* in Ramakrishna *et al.*, Recent Trends Biodivers. Andaman & Nicobar Isl. 180. 2010; Chakrab. & Diwakar in Indian J. Forest. 34(2): 216. 2011.

Trees, 12–30 m high; young shoots fulvous tomentose; branchlets blackish or dark brown, terete, 2–7 mm thick, glabrous. *Leaves* 6–8-verticillate or closely alternate to subopposite, narrowly elliptic, narrowly oblong-elliptic to lanceolate-elliptic or occasionally ovate-lanceolate, 15–30 × 5–9 cm, acute, subacute or cuneate at base, apiculate to acuminate at apex (acumen up to 25 mm long), thinly coriaceous, glabrous, greenish, coppery or dark brown above when dry, coppery or pale greenish and glaucous or glaucescent beneath; midrib slightly impressed above, raised beneath; lateral nerves slender, 8–10 (–12) pairs, ascending, arcuate, slightly impressed above, raised beneath; tertiary nerves obscure above, faint to somewhat prominent beneath, closely scalariform; nervules inconspicuous above and beneath; petioles 15–40 mm long, 1.5–2.5 mm thick, glabrous. *Male*: inflorescences racemiform, 15–30 mm long. *Flowers*: pedicels *ca* 3 mm long; tepals ovate-oblong to suborbicular, *ca* 3 × 2–2.5 mm, brown puberulous outside; stamens 2.5–3.5 mm long; anthers *ca* 1 mm long. *Female*: inflorescences and flowers not seen. *Infructescences* racemiform, up to 3 cm long. *Fruits* 3–5 in umbels along the rachis, depressed-subglobose, *ca* 10 mm long, *ca* 20 mm in diam.; persistent perianth concave-cupular, 3–4 mm high, *ca* 10 mm in diam.; fruiting pedicels 5–7 mm long, *ca* 2 mm thick.

Flowering & fruiting: April – September (fruits red when ripe).

Habitat: Scarce in inland hill forests on clayey loam up to 200 m altitude.

Distribution: India (Great Nicobar Island), Myanmar, Indonesia (Java and Sumatra).

Specimens examined:

INDIA. Andaman & Nicobar Islands: Great Nicobar Island: Laful forest, 19 May 1981, *Dwivedi* 8546 (CAL, PBL); *ibid.*, 3 June 1981, *Hore* 8712 (CAL, PBL). Between Chingenh and Pygmalion Point, 29 June 1981, *Hore* 8854 (PBL).

22. *Actinodaphne reticulata* Meisn. in DC., Prodr. 15(1): 212. 1864; Hook.f., Fl. Brit. India 5: 147. 1886; C.K. Allen in Ann. Missouri Bot. Gard. 25: 412. 1938; Kanjilal *et al.*, Fl. Assam 4: 77. 1940. – *Iozoste* ("Jozoste") *reticulata* Kuntze, Revis. Gen. Pl. 2: 570. 1891.

Type (lectotype, designated by Allen 1938: 412): India, Meghalaya, Khasi hills, Munklow, Oct. 1820, *J.D. Hooker & T.Thomson s.n.* (K000778977, image!). Additional syntypes: India, Meghalaya, Khasi hills, Munklow, 13 Jul. 1850, *J.D. Hooker & T.Thomson* 1700 (K000778978, image!). India, Meghalaya, Khasi hills, without locality and date, *J.D. Hooker & T.Thomson s.n.* (G00390139, G00694257, G-DC – without barcode, L0035492, images!, MH00002481!).

Notes: Allen (1938) stated: "*Herb. Hooker f.* (type, Kew)." One sheet at K (barcode K000778977, image!) bears annotation by him.

Small tree (Kanjilal *et al.*, 1940); young shoots brown-tomentellous; branchlets brown or blackish, terete, 2–5 mm thick, scattered brownish puberulous, glabrescent in age. *Leaves* 4–8-verticillate, oblong-lanceolate to narrow oblong, 8–19 × 2–4.5 cm, cuneate, acute to acute-subattenuate at base, acuminate (acumen 5–20 mm long, acute) at apex, thinly coriaceous, glabrous above, puberulous on midrib to glabrous beneath, brown, greenish-brown or blackish above when dry, paler and rarely glaucescent beneath, penninerved; midrib flat or slightly incised above, raised beneath; lateral nerves slender, 12–16 (or more) pairs, prominent above and beneath; tertiary nerves prominent above and beneath, laxly reticulate; nervules forming prominent fine reticulum above and beneath; petioles 5–12 mm long, 0.8–1.2 (–2) mm thick, scattered brownish puberulous, glabrescent in

age. *Male*: inflorescences fasciculate. *Flowers*: only buds seen, puberulous. *Female*: inflorescences and flowers not seen. *Infructescences* umbellate, with few fruits (*ca* 3). *Fruits* ovoid-ellipsoid to broadly ellipsoid, 12–14 mm long, 7–10 mm in diam.; persistent perianth cupular, 5–6 mm high, 7–10 mm in diam., entire; fruiting pedicels *ca* 15 mm long, 1–1.2 mm thick.

Flowering and fruiting: June – July.

Habitat: Rare in primary forests between 1200–1500 m altitudes.

Distribution: India (Meghalaya) – endemic.

Specimen examined:

INDIA. Meghalaya: Khasi hills Dist., Cherrapunjee, 21 July 1952, *Rup Chand* 6183 (L herb. reg. no. L.1790333).

Notes: Best treated as a rare species restricted to the Khasi hills of Meghalaya and closely related to *A. longipes*, differing in the puberulous parts and the prominent fine reticulum of minor nervation of the leaves.

23. *Actinodaphne sesquipedalis* Hook.f. & Thomson ex Meisn. in DC., Prodr. 15(1): 216. 1864; Hook.f., Fl. Brit. India 5: 151. 1886; C.K. Allen in Ann. Missouri Bot. Gard. 25: 409. 1938 – *Iozoste* (“*Jozonste*”) *sesquipedalis* (Hook.f. & Thomson ex Meisn.) Kuntze, Revis. Gen. Pl. 2: 570. 1891.

Type (lectotype, designated by Allen 1938: 409): Myanmar, Mergui, sine date, *Griffith s.n.* (fragm. K000793034 – left hand side specimen, image!; isolectotypes CAL0000021627!, G00694-238, NY00354779, images!).

Myristica sesquipedalis Wall. [Numer. List. No. 6809. 1822, *nom. nud.*].

Litsea macrophylla sensu Kurz, Forest Fl. Burma 2: 305. 1877, *non* Blume 1825.

Trees, 5–10 m high; terminal buds covered with subfoliaceous scales; branchlets brown, greyish or black, terete, 4–14 mm thick, fulvous or tawny tomentose to villous. *Leaves* 5–8-verticillate, cuneate-obovate, cuneate-oblongate, oblong-oblongate or narrowly oblong-elliptic, 18–60 × 5–20 cm, acute, cuneate to cuneate-attenuate at base, often decurrent into petioles, apiculate to acuminate (acumen 5–10 mm long, acute) at apex, coriaceous, glabrous above,

scattered tawny pubescent beneath (especially on major nerves), glabrescent in age, pale greenish above when dry, brown and often glaucescent beneath, penninerved; midrib flat or slightly raised to sunken above, raised beneath; lateral nerves slender, 12–22 pairs, prominent above and beneath; tertiary nerves obscure, prominent above, faint to prominent beneath, percurrent to scalariform or sometimes laxly reticulate; nervules prominent above, inconspicuous or sometimes prominent beneath, reticulate; petioles 15–30 mm long, 2–4 mm thick, fulvous or tawny tomentose to villous. *Male*: inflorescences and flowers not seen. *Female*: inflorescences pseudo-umbellate, few-flowered. *Flowers*: pedicels 5–7 mm long, tomentellous; tepals ovate, *ca* 3 × 2 mm; ovary ovoid, *ca* 1 mm long; style *ca* 0.5 mm long; stigma peltate. *Fruits* globose to subglobose, 2–2.5 cm in diam.; persistent perianth concave, 3–10 mm high, 7–15 mm in diam., undulate (angled), tubercled outside; fruiting pedicels 5–10 mm long, 1–2 mm thick, tomentellous.

Flowering & fruiting: Period not know (February – April in other areas).

Habitat: In evergreen forests.

Distribution: Myanmar, Thailand, Cambodia, Malaysia and Borneo.

Specimens examined:

MYANMAR. without locality and date, *Griffith* Kew Distrib. No. 4326 (CAL0000021626!, U herb. reg. no. U.1401393).

Notes: Allen (1938) cited the type as: “MERGUI: W. Griffith (type, Kew)”. Now, the particular sheet at K bears two specimens. The left hand side specimen is a single leaf and the right hand side specimen bears a twig with two leaves. The material bears a locality written in pen at the top left: “Mergui, Griffith” while Wallich’s collection number 6809 from Penang is written at the bottom left hand side.

24. *Actinodaphne sikkimensis* Meisn. in DC., Prodr. 15(1): 213. 1864; Hook.f., Fl. Brit. India 5: 147. 1886; Kanjilal *et al.*, Fl. Assam 4: 77. 1940; D.G. Long in Grierson & D.G. Long, Fl. Bhutan 1(2): 281. 1984; Av. Bhattacharjee & A.A. Ansari in Lakshmin. *et al.*, Fl. West Bengal 4: 433. 2019.

– *Iozoste* (“*Jozoste*”) *sikkimensis* (Meisn.) Kuntze, Revis. Gen. Pl. 2: 570. 1891.

Fig. 2 E-F.

Type (lectotype, designated here): India, Sikkim, without precise locality and date, J.D. Hooker s.n. (G00694249, image!). Additional syntypes: India, Sikkim, Mainamchu, Dec. 1827, J.D. Hooker s.n. (K000778980, image!). India, Sikkim, Mainamchoo Mt., Dec. 1848, J.D. Hooker s.n. (K000778979, image!).

Shrubs or trees, 3–6 m high; young shoots pubescent; branchlets brown, greyish or blackish, terete, 2–5 mm thick, initially brownish pubescent, soon glabrous. Leaves 3–6-verticillate, oblong-lanceolate or often narrow oblong-elliptic, 6–16 × 1.5–4 cm, acute to cuneate or often cuneate-attenuate at base, acuminate or caudate (acumen or cauda 5–25 mm long, acute), chartaceous (mostly) to thinly coriaceous, glabrous, pale green, greenish-brown, brown to dark brown or blackish above when dry, paler and greenish, brown or coppery beneath, not glaucous, penninerved; midrib flat above, raised beneath; lateral nerves slender, 8–12 pairs, prominent or sometimes faint above, prominent or occasionally faint beneath; tertiary nerves obscure to faint above, mostly obscure or sometimes somewhat prominent beneath, scalariform; nervules inconspicuous; petioles 5–10 mm long, 0.8–1 mm thick. *Male*: inflorescences fasciculate (10–25-flowered). *Flowers*: pedicels ca 3 mm long, fulvous tomentellous; tepals oblong-elliptic, ca 3 × 1.2 mm, tomentellous outside; stamens 5–6 mm long; anthers oblong, ca 2 mm long. *Female*: inflorescences umbellate, few-flowered (3–5). *Flowers*: pedicels 3–4 mm long, tomentellous; tepals triangular-oblong to oblong-elliptic, ca 3 × 1.2 mm; ovary ovoid, ca 1 mm long; style ca 1.5 mm long; stigma peltate. *Fruits* oblong-ellipsoid, obovoid to oblanceolate, 10–18 mm long, 7–10 mm in diam.; persistent perianth discoid, 1–1.5 mm high, 2–3 mm in diam., entire, sometimes reflexed or deflexed; fruiting pedicels 7–10 mm long, 0.8–1 mm thick.

Flowering and fruiting: December – June.

Local names: Nepali: *Phirphiri*, *Rudilo*, *Sik Siki*, *Phurke Sissi*.

Habitat: Common in tropical to subtropical forests or primary evergreen forests between 1300–2100 m altitudes.

Distribution: India, Nepal, Bhutan and Myanmar.

Specimens examined:

BHUTAN. Sarbhang division, Shamkhara to Maore, 27 Dec. 1963, *Sen Gupta* 1085 (CAL).

INDIA. Manipur: Ching so, 15 Jan. 1882, *Watt* 5904 c (CAL). **Sikkim:** without locality, 25 Nov. 1877, *King* s.n. (CAL); *ibid.*, 1874, *King* s.n. (CAL)

herb. acc. nos. 385703, 385694). Yoksam to Bakkim, 18 May 1960, *Hara et al.* 6638 (CAL).

Sang, 20 May 1967, *N.C. Mazumder & R.M. Dutta* 437 (CAL). Mundi jhora, 27 June 1876,

Dungbu [*King's collector*] s.n. (CAL). **West Bengal:** Darjeeling Dist.: Dumsong, Dec. 1879,

Gamble 7608 (CAL); *ibid.*, Dec. 1879, *Gamble* 7525 (CAL), *ibid.*, Dec. 1879, *Gamble* 7586 (CAL);

ibid., Mar. 1875, *Gamble* 607 [2936 A] (CAL); *ibid.*, 15 Nov. 1875, *Gamble* 252 B (CAL).

Kalimpong Dist: Labha, 7 Apr. 1908, *Rhomoo* 163 (CAL). Munsong, 20 Apr. 1909, *Kari* 1093 (CAL).

ibid., 23 Nov. 1980, *W.G. Craib* 244 (CAL). **NEPAL.** without locality and date, *no collector* s.n. (CAL).

Kopchathali (Phulchoki), 17 Nov. 1967, *No collector* 8185 (CAL). **MYANMAR.** Kachin hills, Jan. 1898, *Mokim* s.n. (CAL).

Notes: In the protologue of *A. sikkimensis*, Meissner (1864) mentioned: “v. s. sine fr. in hb. DC. et Hook.” Thus, he had examined specimens at G-DC and K. Of these, there is one specimen at G-DC and two at K of which the best specimen bearing open male flower is designated here as the lectotype of the name. Report of the occurrence of the species in Thailand by *Tanaros et al.* (2010) appears to be erroneous because they mentioned that the persistent perianth tubes subtending the fruits are 7–8 mm in diameter while the typical *A. sikkimensis* bears perianth tubes which are much smaller (1–1.5 mm high, 2–3 mm in diameter).

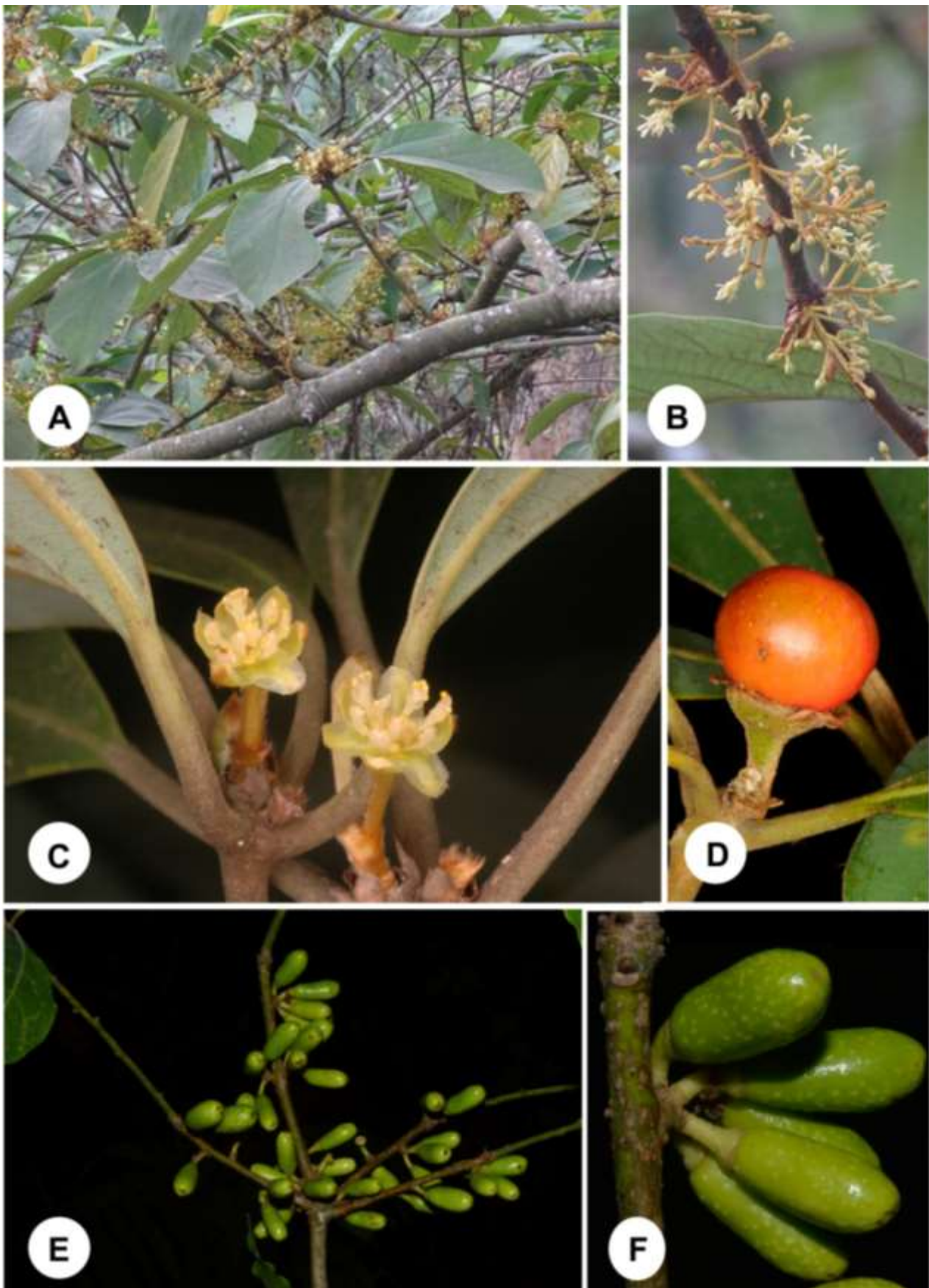


Figure 2. Further field images of *Actinodaphne* species.
A–B. *A. obovata*; C–D. *A. elegans*; E–F. *A. sikkimensis*.

25. *Actinodaphne speciosa* Nees, Syst. Laur. 602. 1836; Wight, Icon. Pl. Ind. Orient. 5(2): 15, t. 1842. 1852; Thwaites, Enum. Pl. Zeyl. 257. 1861 (*excl.* var. β); Meisn. in DC., Prodr. 15(1): 219. 1864; Hook.f., Fl. Brit. India 5: 153. 1886 (*excl.* var. *candolleana*); Trimen, Handb. Fl. Ceylon 3: 448. 1895 (*excl.* var. *candolleana*); Kosterm. in Dassan. *et al.*, Rev. Handb. Fl. Ceylon 9: 135. 1995. – *Iozoste* (“*Jozoste*”) *speciosa* (Nees) Kuntze, Revis. Gen. Pl. 2: 570. 191.

Type (lectotype, designated by Kostermans 1995: 135): Sri Lanka, *Gardner s.n.* in CP 674 (PDA, – *n.v.*; isolectotypes BR0000005175529, BR0000005176212, images!, CAL herb. acc. nos. 385880!, 385882!, 385883!, 385884! – without barcodes, FR0031107, G00390144, G00390145, G00694204, K000793015, MEL2386450, MEL238-6451, fragm. NY00354807, images!). Additional original material: Sri Lanka, *Herb. Wight s.n.* (E00386462, image!).

Tree, 4–9 (–20) m high; terminal buds rufous or fulvous villous; branchlets brown to black, terete, 5–10 mm thick, rusty or rufous tomentose. *Leaves* 3–5-verticillate, broadly elliptic-obovate to suborbicular or occasionally cuneate - obovate, 12–25 × 7–13 cm, acute, obtuse to rounded or occasionally cuneate at base, usually/often folding downward along margins when dry, obtuse to apiculate or acuminate (acumen up to 10 mm long, acute) at apex, stiffly coriaceous, glossy above, tawny tomentellous on midrib and major nerves above, rusty or rufous tomentellous beneath (especially on nerves), brown above when dry, paler and brown or coppery and often strongly glaucous beneath, penninerved to trinerved at base; midrib raised above and beneath; lateral nerves stout (first pair often much longer than the subsequent pairs), 4–6 pairs (including basal), ascending, straight to slightly curved, prominent and sunken (on grooves) above, raised beneath; tertiary nerves faint to prominent and sunken (on grooves) above, prominent beneath, closely parallel, percurrent; nervules inconspicuous above, faint beneath; petioles 3–6 cm long, 3–5 mm thick, rufous tomentellous. *Male*: inflorescences fasciculate. *Flowers*: pedicels 3–4 mm long, tomentellous; tepals broadly ovate, *ca* 2.5 × 1.8 mm, tomentellous outside; stamens *ca* 3 mm long; anthers *ca* 1 mm long. *Female*: inflores-

cences umbellate, 5–10-flowered. *Flowers*: pedicels 5–7 mm long; tepals oblong, *ca* 4 × 2 mm, brown tomentellous outside; ovary ovoid, *ca* 2 mm long; style *ca* 2 mm long. *Fruits* ovoid, 8–10 mm long, 6–8 mm thick; persistent perianth cupular, 4–5 mm high, 8–10 mm in diam., entire; fruiting pedicels 8–12 mm long, *ca* 1.5 mm thick.

Flowering & fruiting: April – September.

Habitat: Common in mountain rain forests between 1500–2500 m altitudes.

Distribution: Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Without locality and date, *Walker s.n.* (CAL), *Gardner s.n.* (CAL). Adisham forest, near Haputale, 9 May 1969, *Kostermans* 23419 A (L herb. reg. no. L.1790287). Tothulagalle Estate above Haputale, 7 May 1969, *Kostermans* 23371 (L herb. reg. no. L.1790309). Kandy Dist., Slopes of Adam’s peak, 21 Nov. 1974, *Davidse & Sumithraarachchi* 8621 (CAL). Nuwaraeliya Dist., Hakgala strict natural reserve, 21 Aug. 1985, *Jayasuriya & Wijesundara* 3360 (CAL).

26. *Actinodaphne stenophylla* Thwaites, Enum. Pl. Zeyl. 256. 1861; Meisn. in DC., Prodr. 15(1): 212. 1864; Trimen, Syst. Cat. Fl. Pl. Ceylon 75. 1885; Hook.f., Fl. Brit. India 5: 150. 1886; Trimen, Handb. Fl. Ceylon 3: 446. 1895; Kosterm. in Dassan. *et al.*, Rev. Handb. Fl. Ceylon 9: 140. 1995. – *Iozoste* (“*Jozoste*”) *stenophylla* (Thwaites) Kuntze, Revis. Gen. Pl. 2: 570. 1981.

Type (lectotype, designated by Kostermans 1995 : 140): Sri Lanka, *Thwaites* CP 304 (PDA – *n.v.*; isolectotypes BM000950995, BM000950996, BR0000005175857, images!, CAL0000021654!, CAL0000021655!, CAL0000021656!, CAL00000-21657!, CAL0000021658!, FR0031109, G00368-717, G00390142, G-DC – without barcode, K000793005, K000793006, K000793007, MEL238-6452, NY00354782, fragm. NY00354783, images!). Additional syntype: Sri Lanka, *Thwaites* CP 2491 (K000793004, image!).

= *Actinodaphne thwaitesii* Meisn., in DC., Prodr. 15(1): 212. 1864.

Type (lectotype, designated by Kostermans 1995: 141): Sri Lanka, *Thwaites* CP 2277, *p.p.* (PDA – *n.v.*). Additional syntypes: Sri Lanka, *Thwaites* CP 304 – as cited above.

Shrubs or trees, 1.5–12 m high; young shoots fulvous or tawny villous, glabrous in age; branchlets brown to blackish, terete, glabrous, 3–7 mm thick. *Leaves* 3–8-verticillate, linear-lanceolate, lanceolate-oblong or occasionally narrowly oblong-elliptic, 5–14 × 1.5–2.5 (–4) cm, acute at base, obtuse to subacute or rarely apiculate at apex, thinly coriaceous, glabrous, brown or blackish above when dry, paler and often glaucescent beneath, penninerved; midrib raised above and beneath; lateral nerves (8–) 10–15 pairs, slender, prominent; tertiary nerves faint above, inconspicuous or sometimes faint beneath, scalariform, branched; areolation of minor nervules often visible above and beneath (as seen under lens); petioles 6–12 mm long, 2–2.5 mm thick, glabrous. *Male*: inflorescences fasciculate, on short peduncles, few-flowered. *Flowers*: pedicels 4–5 mm long, *ca* 1 mm thick, tawny tomentellous; tube short; tepals broadly ovate to ovate-triangular, *ca* 2 × 1.3 mm, apiculate, tawny tomentellous outside; stamens *ca* 4 mm long; anthers oblong, *ca* 2 mm long. *Female*: inflorescences umbellate, 3–8-flowered, pulvinate or shortly pedunculate. *Flower*: pedicels 5–8 mm long, *ca* 1 mm thick; tepals triangular-oblong, *ca* 2 × 1 mm; ovary subglobose, *ca* 1.5 mm in diam.; style simple, *ca* 2 mm long. *Fruits* subglobose, 8–10 mm in diam.; persistent perianth concave, 2–3 mm high, 5–6 mm in diam., entire; fruiting pedicels 5–10 mm long.

Flowering & fruiting: April – November.

Local name: Sinhalese: *Naike daula*, *Nika daule*.

Habitat: Common in wet evergreen forests, often along roadsides, between 600–1200 m altitudes.

Distribution: Sri Lanka – endemic.

Specimens examined:

SRI LANKA. Hagele forest above Belikulyona, 21 May 1969, *Kostermans* 23617 (L herb. reg. no. L.1790240). Badulla Dist., Erabedde, Keppetipola, 27 Apr. 1972, *Jayasuriya & Cramer* MJ 770 (L herb. reg. no. L.1790230). Kandy Dist.: Hunsigiriya, 6 June 1971, *Kostermans* 24421 (L herb. reg. no. L.1790273). Lorawatta, Between Bandarawela and Welimada, 13 Nov. 1968, *Wirawan* 742 (L herb. reg. no. L.1790245).

Notes: The name *A. thwaitesii* is not a superfluous name of *A. stenophylla* though one of the cited type specimens i.e. CP 303 in the protologue of *A. thwaitesii* was later corrected to CP 304 by Trimen (1885) which is also the type of *A. thwaitesii* because when described, the collection number of the latter differed from that of the former.

27. *Actinodaphne tadulingamii* Gamble in Bull. Misc. Inform. Kew 1925: 130. 1925 & Fl. Madras, Pt. 7: 1231. 1925; V.S. Ramach. & V.J. Nair, Fl. Cannanore Dist. 392. 1988; Vajr., Fl. Palghat Dist. 402. 1990; Pandura. & V.J. Nair in J. Econ. Taxon. Bot. 17: 173. 1993; N. Mohanan & Sivad., Fl. Agasthyamala 564. 2002; Robi & Udayan in Telopea 19: 182. 2016.

Type (lectotype, designated by Robi & Udayan 2016: 182): India, Tamil Nadu, Tirunelveli Dist., Mundanthurai to Kanikkatti, 17 Mar. 1917, *Tadulingam* 14640 (K000793032, image!; isolectotypes MH00002478!, MH00002479!). Additional syntypes: India, Tamil Nadu, Coimbatore Dist., Anamalai Hills, sine date, *Beddome s.n.* (K000793031, K000793033, images!). India, Kerala, Travancore, Murchison Estate, 1 Dec. 1893, *Lawson s.n.* (CAL0000021649!, MH0000-2480!). India, Karnataka, Canara, sine date, *Stocks s.n.* (K000793030, image!).

Trees, 5–10 m high; young shoots rufous to fulvous villous; branchlets greyish, brownish or blackish, 2.5–4 mm thick, terete, evanescently fulvous to tawny or sometimes rufous villous to tomentose. *Leaves* 4–5-verticillate, elliptic to oblong-elliptic (often narrowly so), 11–26 × 3–8 cm, acute to cuneate or cuneate-attenuate at base, acuminate (acumen 10–25 mm long, acute) at apex, stiffly chartaceous, glabrous above (except midrib at base), fulvous villous to tomentellous on major nerves beneath, brown to greenish-brown or blackish or often dark brown above when dry, paler or often coppery beneath, not glaucous, penninerved; midrib slightly raised to flat above, raised beneath; lateral nerves 8–14 pairs, arcuate, flat and somewhat prominent above, raised beneath; tertiary nerves obscure to faint above, faint to prominent beneath, percurrent to scalariform, petioles 10–22 mm long, 1.5–3 mm thick, fulvous to tawny villous to tomentose. *Male*: inflorescences epedunculate, 4–10-flowered.

Flowers: pedicels 3–5 mm long, tomentellous; calyx ca 5 mm long; tepals ovate-oblong, ca 4 × 2 mm, tomentellous outside; stamens ca 4 mm long; anthers 1.5–2 mm long. *Female*: inflorescences umbellate, 3–6-flowered. *Flowers*: pedicels 5–8 mm long; tepals triangular-oblong, ca 3 × 1.5 mm, tawny tomentellous outside; ovary ovoid, ca 1.5 mm long; style ca 2 mm long. *Fruits* subglobose, 8–10 mm in diam.; persistent perianth cupular, 4–5 mm high, 6–10 mm in diam.; fruiting pedicels 6–10 mm long, 1–1.2 mm thick.

Flowering & fruiting: November – June.

Habitat: Rare in evergreen forests between 700–1500 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

India. Karnataka: Canara, Stocks s.n. (K000793-030). **Kerala**: Cannanore Dist., Chandanathode, 6 Dec. 1967, Ellis 29508 (MH). Idukki Dist., Meenmutty – Kulanravu, 23 Dec. 1893, Pandurangan 66450 (CAL, MH). Palakkad Dist., Silent valley RF, 22 Dec. 1969, Vajravelu 33261 (MH); *ibid.*, Kumattanthode, 22 June 1980, V.J. Nair 67237 (CAL, MH). Panthenthode, 7 Apr. 1978, N.C. Nair 56642 (CAL, MH); *ibid.*, 10 Apr. 1978, N.C. Nair 56719 (CAL, MH).

28. *Actinodaphne wightiana* (Kuntze) Noltie, Regnum Veg. 145: 495. 2005. – *Iozoste* (“*Jozoste*”) *wightiana* Kuntze, Revis. Gen. Pl. 2: 570 1891. – *Actinodaphne hirsuta* Hook.f., Fl. Brit. India 5: 152. 1886; Bourd., For. Trees Travancore 304. 1908; Rama Rao, Fl. Pl. Travancore 344. 1914; Gamble, Fl. Madras, Pt. 7: 1231. 1925, *nom. illeg.*, *non* Blume, 1856. – *Actinodaphne malabarica* N.P. Balakr. in J. Bombay Nat. Hist. Soc. 63: 329. 1967, *nom. superfl.*; Gandhi in C.J. Saldanha and Nicolson, Fl. Hassan Dist. 45. 1976; V. Chandras. in A.N. Henry et al., Fl. Tamil Nadu, Ser. I, Analysis 2: 206. 1987; V.S. Ramach. & V.J. Nair, Fl. Cannanore Dist. 392. 1988; Vajr., Fl. Palghat Dist. 402. 1990; M. Mohanan & A.N. Henry, Fl. Thiruvanthapuram 389. 1994; K.M. Matthew, Ill. Fl. Palni Hills t. 605. 1996 & Fl. Palni Hills 2: 1065. 1999.

Type: India, Kerala, Quilon, Oct. 1835, Wight Kew Distrib. No. 2489 (holotype K000793013, image!; isotype L.1790204, image!).

Notes: the isotype bears the field number 2455. *Actinodaphne hookeri sensu* Bedd., Fl. Sylv. t. 296. 1873, p.p., *non* Meisn., 1864.

Trees, 3–15 (–25) m high; young shoots ochraceous, tawny or rusty villous or velutinous; branchlets brown, dark brown to black or greysih, terete, 2–6 mm thick, densely brown to rusty hirsute to tomentose, glabrescent in age. Leaves 3–5-verticillate or opposite to subopposite or alternate, oblong-elliptic or narrowly so to lanceolate-oblong, 9–23 (–26) × 2.5–6 (–7) cm, acute to cuneate at base, apiculate to acuminate (acumen 5–15 (–25) mm long, acute) at apex, thinly coriaceous, tomentellous on midrib to glabrous above, densely brown to rusty hirtellous to tomentellous (especially on major nerves) beneath, greenish-brown, brown to dark brown or reddish-brown or blackish above when dry, pale brown or coppery and occasionally glaucescent beneath (mostly not glaucous), penninerved; midrib flat to slightly raised above, raised beneath; lateral nerves slender 8–14 pairs, ascending, arcuate, prominent or sometimes faint above, raised beneath; tertiary nerves obscure, faint to prominent above, obscure to somewhat prominent beneath, mostly closely percurrent; petioles 7–20 mm long, 1–2 mm thick, densely brown to rusty hirtellous to tomentellous, glabrescent in age. *Male*: inflorescences variable, fasciculate, else racemiform with flowers along 1–3 cm long rusty or tawny tomentellous rachis. *Flowers*: pedicels 2.5–6 mm long, pilose; tube short; tepals broadly ovate-triangular to ovate-oblong, 2.5–3 × 1.3–1.6 mm; stamens 3.5–4 mm long; anthers 1–1.5 mm long. *Female*: inflorescences variable, racemiform with 7–20 mm long rachis and flowers along the rachis and forming 3–5-flowered umbels at the summit; often pedunculate (peduncle 3–7 mm long) and umbellate (umbels 3–5-flowered); sometimes peduncle lacking and flowers on short pulvini. *Flowers*: pedicels 5–10 mm long, 0.5–1 mm thick; tepals ovate-triangular, 2–2.5 × 1.2–1.5 mm; ovary ovoid, ca 1 mm long; style ca 2 mm long. *Fruits* subglobose, often slightly depressed, 7–10 mm in diam.; persistent perianth concave, 2–4 mm high, 5–7 mm in diam.; fruiting pedicels 5–10 mm long, 0.6–1 mm thick.

Flowering & fruiting: July – April.

Local name: Malayalam: *Thali*.

Habitat: The commonest species in the area (Kerala) in semievergreen to evergreen forests between 150–1800 m altitudes.

Distribution: Peninsular India – endemic.

Specimens examined:

INDIA. Karnataka. Kodagu Dist., Marcara – Bhagamandala, 12 Oct. 1978, *Ramesh & Prakash* KFP 3300 (CAL). Uttara Kannada Dist., Devimone ghat, Oct. 1919, *Sedgwick & Bell* 903 (CAL); without locality and date, *Talbot* 261 (BSI, CAL). **Kerala.** Travancore, without locality and date, *Bourdillon s.n.* (CAL). Cannanore Dist., Tirunalli RF, 6 Mar. 1979, *Ramachandran* 62148 (CAL, MH). Idukki Dist., Meenmutty, 27 Sept. 1981, *C.N. Mohanan & Ramanujam* 72117 (CAL, MH); *ibid.*, 20 Feb. 1983, *C.N. Mohanan* 76284 (CAL, MH). Kollam Dist., Punalur, 21 Jul. 1903, *Bourdillon* 1412 (CAL). Kottayam Dist., Thek-kadi, 27 Jan. 1965, *Vivekananthan* 23033 (MH). Palakkad Dist., Karapara Dam – submerged area, 27 Dec. 1980, *N.C. Nair* 69842 (CAL, MH). Quilon Dist., Hakapuzha, 22 Dec. 1978, *C.N. Mohanan* 59604 (CAL, MH). Thiruvanthapuram Dist., Kottur RF, 20 Feb. 1979, *M. Mohanan* 59349 (CAL, MH). Way to Ponmudi from Kallar, 20 Aug. 1980, *M. Mohanan* 69256 (CAL, MH). **Tamil Nadu.** Kanyakumari Dist., Maramalai, 19 Mar. 1979, *Henry* 60772 (CAL, MH). Balmore to Ranni, 28 July 1977, *Henry* 49437 (CAL, MH). Ramanathapuram Dist., Sethur hills, Near Naduthottam, 11 Mar. 1981, *Srinivasan* 68045 (CAL, MH).

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