

A Picture Guide for the Flora of Bidoup-Nui Ba National Park I: Mt. Langbian



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A new name is validly published in this publication:

Actinodaphne rehderiana (C.K.Allen) Kosterm. ex Yahara, *comb. nov.* ... 56

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Preface

We are delighted to publish this book, “A Picture Guide for the Flora of Bidoup-Nui Ba National Park I: Mt. Langbian”. To enrich our knowledge of the flora of Bidoup-Nui Ba National Park, seven botanical surveys were conducted in the protected area in 2012–2018. Among these surveys, this book focusing on the flora of Mt. Langbian was resulted from our four recent surveys carried out in March, June, September and December 2018.

This is our sixth picture guide for the flora of Southeast Asia: Vols. 1–4 for Cambodia, and Vol. 5 for Java, Indonesia. As for the flora of Vietnam, this is the first volume and our collaboration between Kyushu University, Japan, Dalat University and Bidoup-Nui Ba National Park, Vietnam, are really fruitful. All the above volumes are freely available on the website of *Picture Guides of Forest Trees* (<https://sites.google.com/site/pictureguides/>) under a Creative Commons Attribution Non Commercial (CC-BY-NC). We hope these books are useful for people who are interested in the flora of Southeast Asia and its conservation.

16 February 2019

Ai Nagahama
Shuichiro Tagane
Tetsukazu Yahara

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Introduction

Bidoup-Nui Ba National Park, Lam Dong Province, southern Vietnam, established in 2004, covers ca. 70,038.45 ha (Bidoup-Nui Ba National Park 2019) of Langbian Plateau consisted of the two highest peaks, Bidoup (alt. 2287 m) and Langbian (formerly Nui Ba; alt. 2167 m). The area is famous for its high species diversity, and 91% of NP are forests, which are mainly composed of primeval forest with many different plant species (Phong et al. 2015). It is known that the national park harbors 1933 species of vascular plants (Bidoup-Nui Ba National Park 2016) including 62 threatened species (Ban et al. 2007, IUCN 2012), and 29 endemic species (Bidoup-Nui Ba National Park 2016, Tagane et al. 2017).

Mt. Langbian (N12°02'47", E108°25'25") is located ca. 12 km apart from the center of Dalat City, and the foot of mountain is open to tourists. In the mountain, three forest types are observed from the entrance of the trail (alt. 1855 m) to the summit of Mt. Langbian (alt. 2167 m): pine forest, lower montane evergreen forest dominated by Fagaceae, and montane evergreen forest (dense cloud forest) around the summit dominated mainly by Lauraceae and Elaeocarpaceae. These forests are home to many interesting plant species and have been surveyed by botanists since 1910s. The following species were described based on specimens collected from Mt. Langbian and its vicinity: *Arundinaria schmidiana* A.Camus (1953), *Begonia langbianensis* Baker f. (1921), *Cephalostachyum langbianense* A.Chev. & A.Camus (1921), *Cryptophragmium langbianense* Benoist (1934), *Dankia langbianensis* Gagnep. (1939), *Dendrobium dalatense* Gagnep. (1930), *Dendrobium langbianense* Gagnep. (1930), *Diospyros hayatae* Lecomte (1928), *Impatiens langbianensis* Tardieu (1944), *Lasianthus chevalieri* Pitard (1924), *Lasianthus dalatensis* Wernham (1921), *Lasianthus saprosmoides* Pitard (1924), *Mahonia klossii* Baker f. (1921), *Melastoma klossii* Baker f. (1921), *Memecylon langbianense* Guill. (1921), *Oberonia langbianensis* Gagnep. (1930), *Procris langbianensis* Gagnep. (1928), *Psychotria langbianensis* Wernham (1921), *Quercus langbianensis* Hickel & A.Camus (1921), *Saccolabium klossii* Ridl. (1921), *Saprosma gracile* Pitard (1924), *Scutellaria langbianensis* Wernham (1921), *Strobilanthes evrardii* Benoist (1934), and *Strobilanthes saltiensis* S.Moore (1921). Even recently, *Arisaema langbianense* Van et al. (2016), *Billolivia noanii* Luu et al. (2018), *B. trucii* Luu et al. (2018), *Camellia ligustrina* Orel et al. (2014), *Lasianthus elevatineurus* H.Zhu (2002) and *Schizostachyum langbianense* Tien et al. (2016) were described, indicating that the flora of Bidoup-Nui Ba National Park are still not well-understood.

In addition, plant species vary within and between forests in their phenological behaviors, such as leafing, flowering, and fruiting, which may be influenced by fluctuation of rainfalls caused by rainy and dry seasons (annual rainfall 1951 mm; Fick & Hijmans 2017) rather than temperature but there are no reliable information on the species phenology at present. It is important to accurately know the diversity and phenological behaviors of plant species to develop a conservation planning for the better management of the national park.

To document the plant species diversity in Mt. Langbian and the phenology of each species, we conducted four field surveys using a standardized method with a belt-transect in March 2018 and a semi-permanent plot in June, September, and December in 2018. This book was edited based on the results from these field surveys.

Methods

We recorded the flora of Mt. Langbian based on a belt-transect of 100 m × 5 m and a semi-permanent plot of 50 m × 30 m. In addition, we made general collections along the trail to the summit of Mt. Langbian. A belt-transect was placed in the lower montane forest at alt. 1905 m on March 2018, and a semi-permanent rectangular plot of 50 m × 30 m was placed near the belt-transect site, at alt. 1920 m, on June 2018 (see Map in page 8). In the transect survey, we recorded all the vascular plant species including trees, shrubs, herbs, climbers and epiphytes, took photographs, and collected leaf pieces for DNA analysis and voucher specimens. In the semi-permanent plot, we tagged all the trees 4 m or taller and measured their height and girth. To elucidate phenological events in Mt. Langbian, we visited the plot on 26–27 June, 8 October and 21 December in 2018 and recorded leafing, flowering, and fruiting events for 20 dominant tree species (Table A). In each species, one individual was observed on 26–27 June 2018, and 3–6 individuals were observed on 8 October and 21 December.

Through the survey, we collected basically at least three sets of voucher specimens. These are deposited in Dalat University (DLU), the herbarium of Bidoup-Nui Ba National Park (at present temporary kept at DLU), Kyushu University (FU), and partly in Kagoshima University Museum (KAG).

Table A. The list of 20 dominant species in semi-permanent plot in Mt. Langbian.

Family	Species
Araliaceae	<i>Macropanax schmidii</i> C.B.Shang
Cornaceae	<i>Mastixia euonymoides</i> Prain
Elaeocarpus	<i>Elaeocarpus</i> sp. 2
Euphorbiaceae	<i>Claoxylon langbianense</i> Nagah. & Tagane <i>Ostodes paniculata</i> Blume
Fagaceae	<i>Quercus braianensis</i> A.Camus
Juglandaceae	<i>Engelhardia serrata</i> Blume
Lauraceae	<i>Beilshmiedia langbianensis</i> Yahara <i>Litsea laeta</i> (Wall.) Benth. & Hook.f.
Magnoliaceae	<i>Magnolia duclouxii</i> (Finet & Gagnep.) Hu <i>Magnolia langbianensis</i> Yahara
Rosaceae	<i>Prunus arborea</i> (King) Kalkman var. <i>stipulacea</i> (King) Kalkman <i>Prunus wallichii</i> Steud.
Rutaceae	<i>Melicope pteleifolia</i> (Champ. ex Benth.) T.Hartley
Sapindaceae	<i>Acer erythranthum</i> Gagnep. <i>Acer flabellatum</i> Rehder <i>Acer laurinum</i> Hassk.
Symplocaceae	<i>Symplocos annamensis</i> Noot. <i>Symplocos hayatae</i> Guillaumin
Theaceae	<i>Schima crenata</i> Korth.

Results

Through our survey, a total of 477 voucher specimens were collected with their photographs and silica-dried leaf pieces for DNA analysis. Based on taxonomic and molecular phylogenetic studies using these materials, we here illustrate 117 species of 43 families using photographs. Those 117 species include all the tree species in the plot and some additional species for which we collected flowers or fruits. Among 117 species, 19 species of 7 families are undescribed. For these 19 species, we used unpublished names with “*ined.*” which will be published elsewhere. However, a new combination, *Actinodaphne rehderiana* (C.K.Allen) Kosterm. ex Yahara, is validated here (in page 56).

Phenological observation

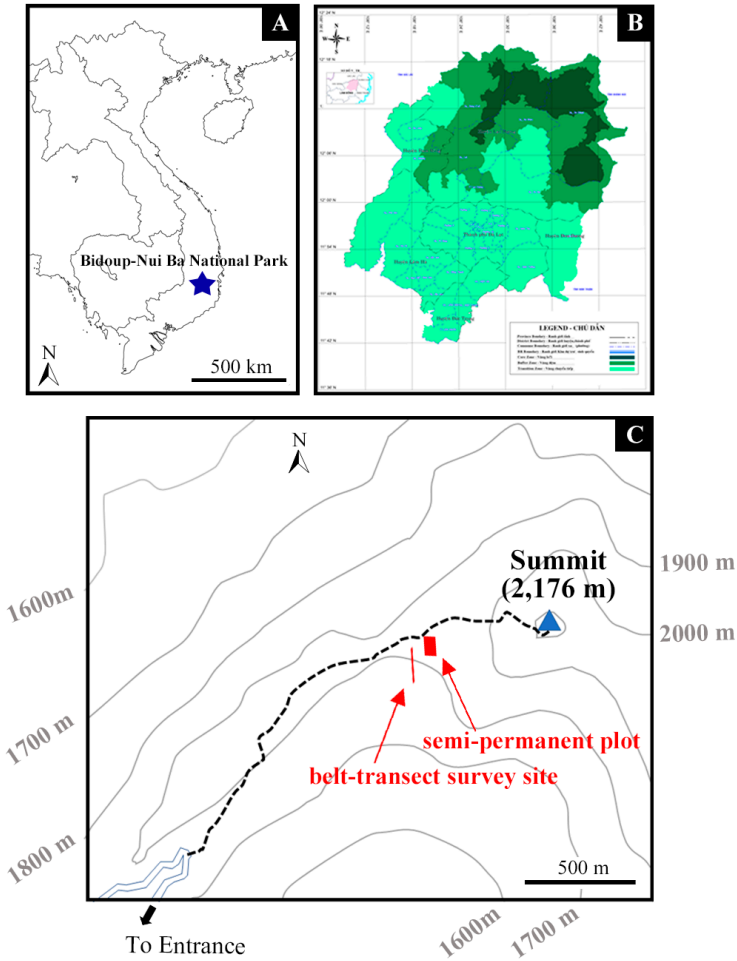
In the semi-permanent plots, we could observe at least one phenological event, i.e. leafing, flowering and fruiting, for 16 species (FIG. A in page 9 and Table A), whereas we observed neither of these events for four species; *Macropanax schmidii* C.B.Shang, *Quercus braianensis* A.Camus, *Symplocos hayatae* Noot., and *Schima crenata* Korth. Through the belt-transect survey and general collecting, we could record the phenological events of additional 54 species which are shown in FIG. B (in page 10).

Summarizing our results in 2018, many species in the semi-permanent plot produced new leaves and flowers from March to May (FIG. A). On the other hand, fruiting events did not concentrate in a particular season.

Table B. The number of species that showed the leafing, flowering or fruiting event in March, June, September or December. We recorded the events in the semi-permanent plots in June, September and December, and in or near the belt-transect in March.

Period	March	June	September	December
Leafing	12	1	0	1
Flowering	4	1	0	2
Fruiting	2	3	2	2

Map



MAP. Localities of Bidoup-Nui Ba National Park and Mt. Langbian. A, The location of Bidoup-Nui Ba National Park in Vietnam; B, Zoning of the national park and its vicinities, core zone (dark green), buffer zone (green) and transition zone (light green); C, study sites in Mt. Langbian.

Here, we show the leafing, flowering, and fruiting event of each species using a 12×3 matrix below. Twelve cells in a row show twelve months, from January (left) to December (right). Three cells in a column show three phenological events; LF: leafing, FL: flowering, and FR: fruiting. A leafing event is shown by green (■), a flowering event by yellow (■) and a fruiting event by red (■).

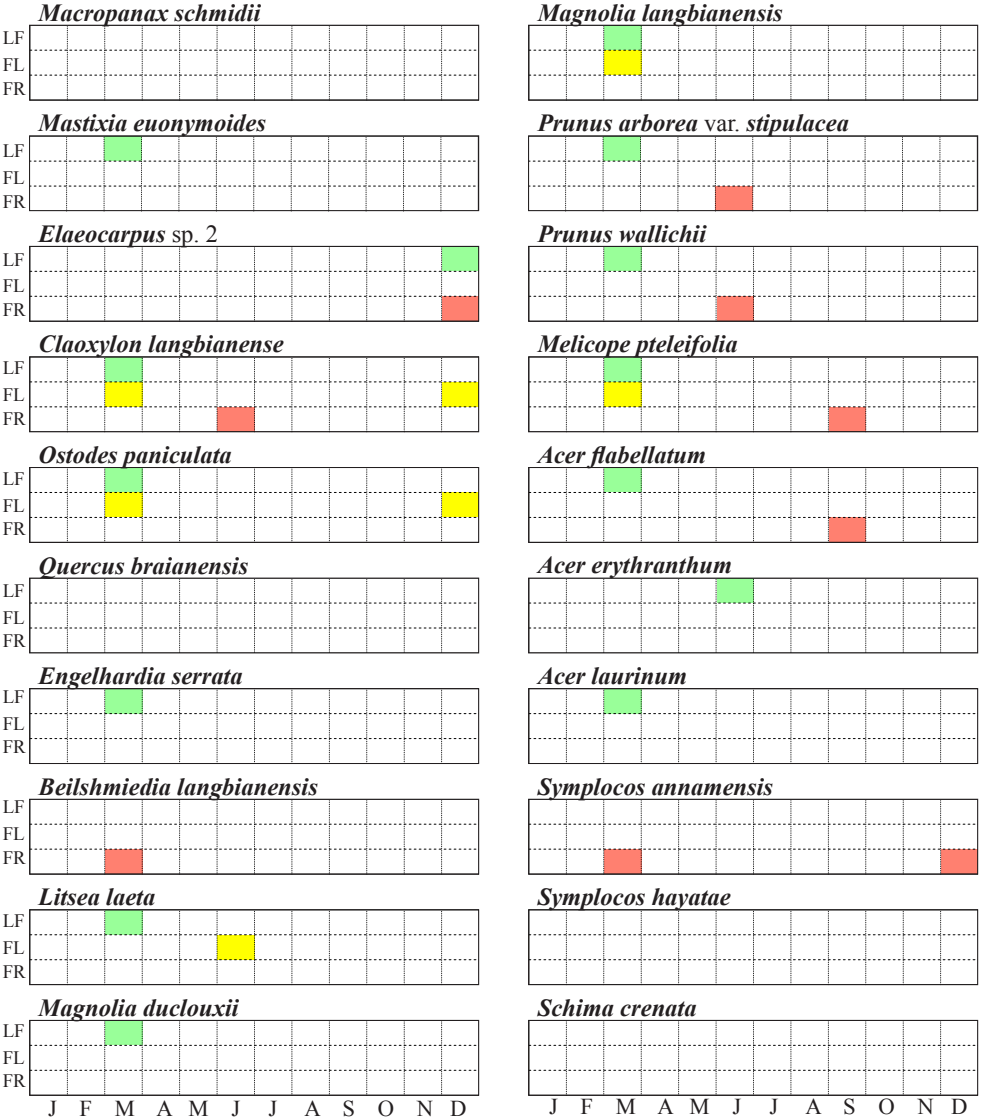


FIG. A. Phenology of 20 dominant species in Mt. Langbian.

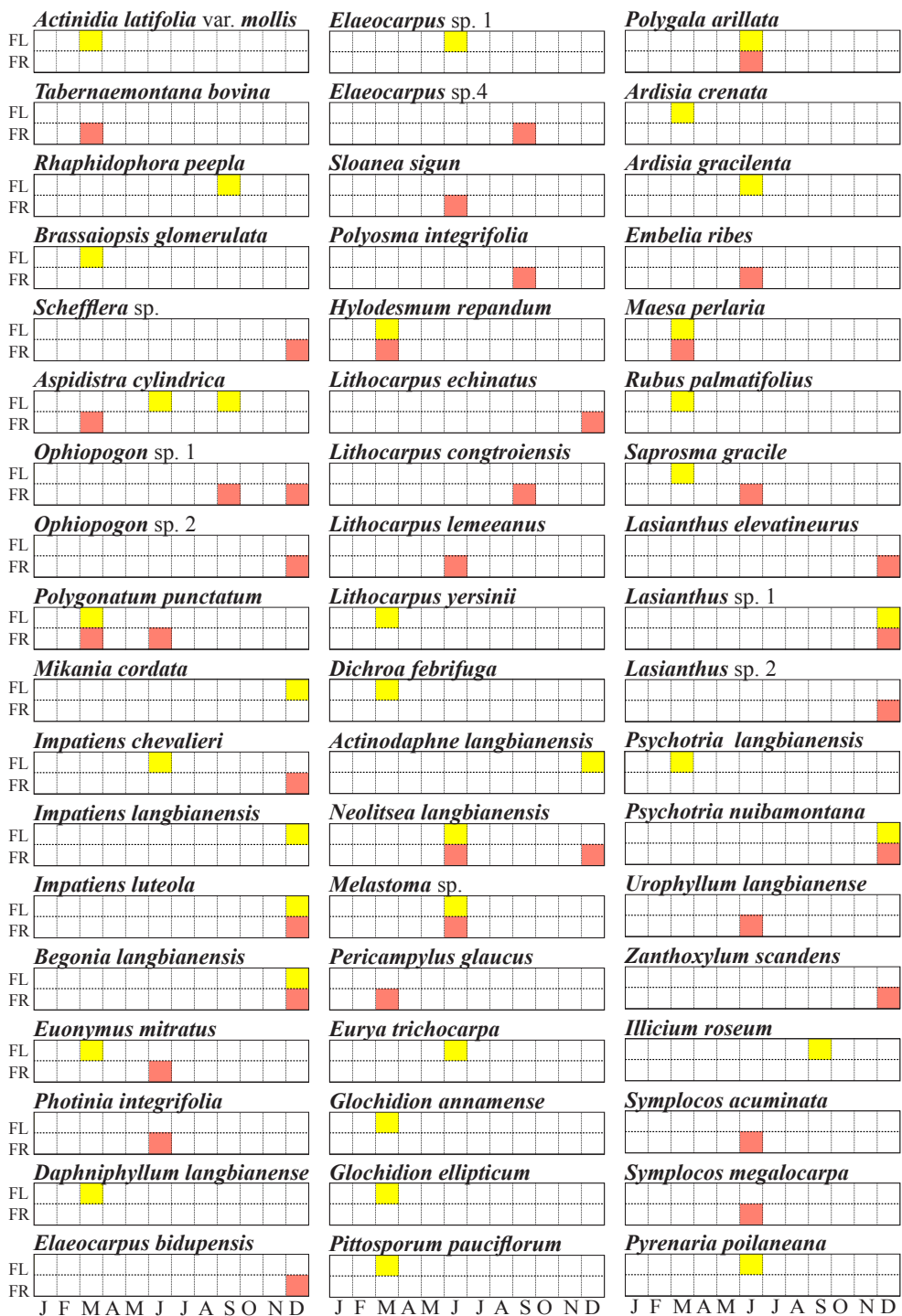


FIG. B. Phenology of other species.

How to Use This Book

1 **Family name:** following the latest internationally accepted classification (APG IV) (Angiosperm Phylogeny Group 2016). 2 **Scientific name:** genus name, epithet and name(s) of author(s). 3 **Literature:** reference in which the scientific name was validly published. 4 **Vietnamese name:** vernacular names in Vietnam, prepared by Ngoc Van Nguyen and Truong Quang Cuong. 5 **Specimen numbers:** our voucher specimen number collected in the survey. 6 **Photographs:** photos taken in our field surveys. 7 **Map of trees in the semi-permanent plot/Close-up specimen image:** For plot trees, individuals of a particular species are shown by solid circles on a map of the plot. Circle size shows a size class of diameter; small, less than 10 cm; medium, 10 cm or more, less than 30 cm; large, 30 cm or more. The right side of the map shows north and upper side of the slope. For non-plot trees or herbs, close-up image(s) of leaves or other organs of the species are shown. 8 **Photograph of specimen:** a scanned image of a voucher specimen. 9 **Note:** a short description of the characteristic of a species illustrated, differences from similar species, and observations on habitats, distribution and abundance.

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Apocynaceae

Urceola micrantha (Wall. ex G.Don) D.J.Middleton

Local name: Can Châu, Mắc Sang

Specimens: V7906, V7932, V8973.

Novon 4(2): 151 (1994).

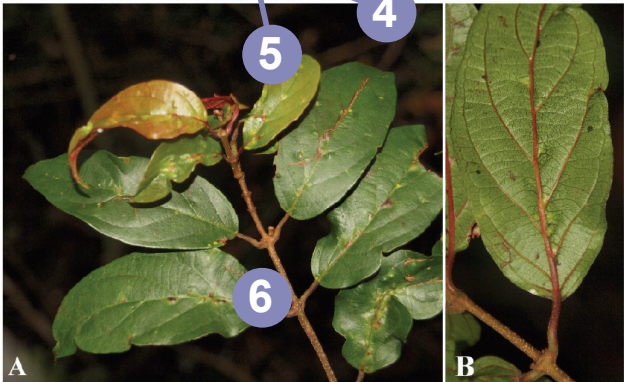
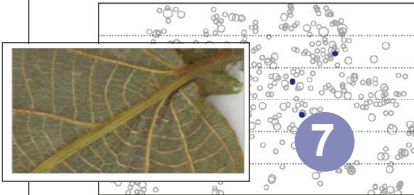



FIG. 4. *Urceola micrantha*. A: leafy branch, B: portion of lower leaf surface. A & B from V8973, Jun. 2018.



No. of individuals: 4. Height: up to 12 m tall. DBH: 2.1–3.0 (ave. 2.7) cm.

Urceola micrantha is a woody climber, widely distributed from India to SE Asia, extending to China and Japan (Ryukyu Islands).



Specimen: V8973.

Actinidia latifolia (Gardner & Champ.) Merr. var. *mollis* (Dunn) Hand.-Mazz.

■ **Local name:** Dương Đào lá rộng

Symb. Sin. 7: 391 (1931).

■ **Specimens:** V8098 [fl. bud], V8124 [fl.].

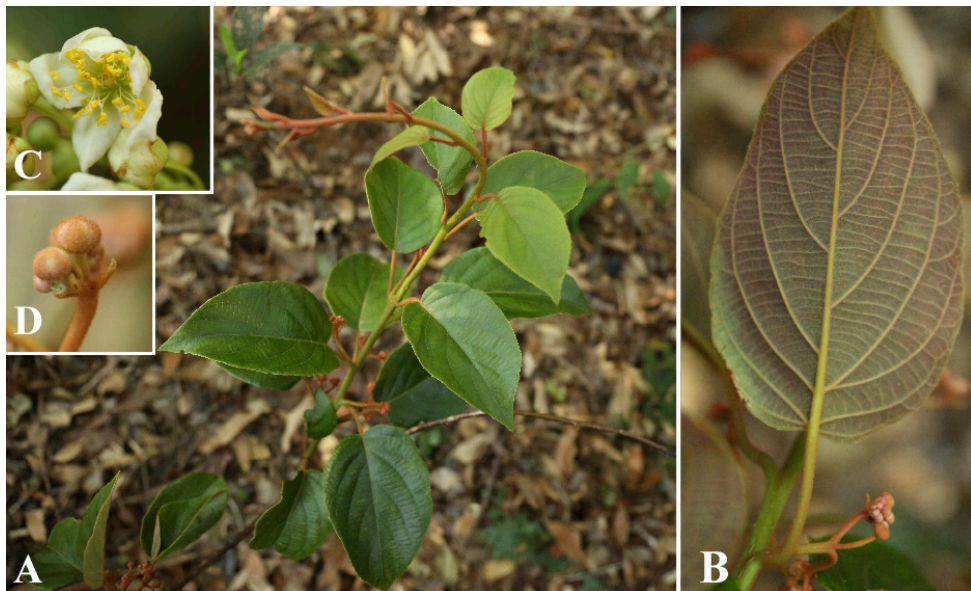


FIG. 1. *Actinidia latifolia* var. *mollis*. A: branch with flower buds, B: lower leaf surface, C: flower, D: flower buds. A–C from V8098, Mar. 2018; D from V8124, Mar. 2018.



Lower surface of leaves covered with brown stellate hairs.

We found this climber at the edge of evergreen forest in Mt. Langbian. This variety is distinguished from var. *latifolia* by its densely stellate tomentose lower leaf surface, rachis of inflorescences and sepals (Li et al. 2007)



Specimen: V8098.

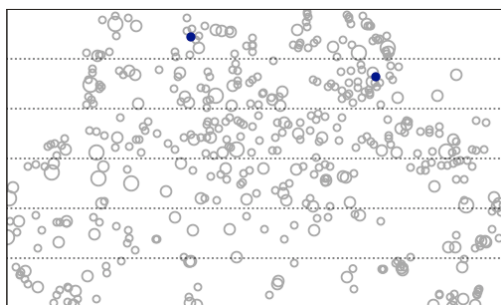
Anodendron sp.

■ Local name: Tóc thẳng

■ Specimens: V7998, V9009.



FIG. 2. *Anodendron*. A: leafy branch, B: lower leaf surface. A & B from V9009, Jun. 2018.



No. of individuals: 2. Height: up to 12 m tall.

DBH: 4.3–4.8 (avg. 4.5) cm.

This species is possibly *Anodendron punctatum* Tsiang, known from Cambodia, China (type) and Thailand, in having 12–13 pairs of secondary veins and punctate lower leaf surface. We need to examine fertile materials to confirm its taxonomic identity.



Specimen: V7998.

Tabernaemontana bovina Lour.

■ Local name: Lài Trâu

Fl. Cochinch. 1: 118 (1790).

■ Specimens: V7942 [fr.].



FIG. 3. *Tabernaemontana bovina*. A: leafy branch, B: portion of lower leaf surface, C: shoot apex, D: fruit, E: latex from cut branch. A–E from V7942, Mar. 2018.



A twig and the lower surface of a leaf; both are glabrous.

Tabernaemontana bovina is found in southern China, Laos, Myanmar, Thailand and Vietnam in a wide variety of habitats to 2000 m altitude (Middleton 2014).



Specimen: V7942.

Urceola micrantha (Wall. ex G.Don) D.J.Middleton

■ **Local name:** Can Châu, Mặc Sang

Novon 4(2): 151 (1994).

■ **Specimens:** V7906, V7932, V8973.

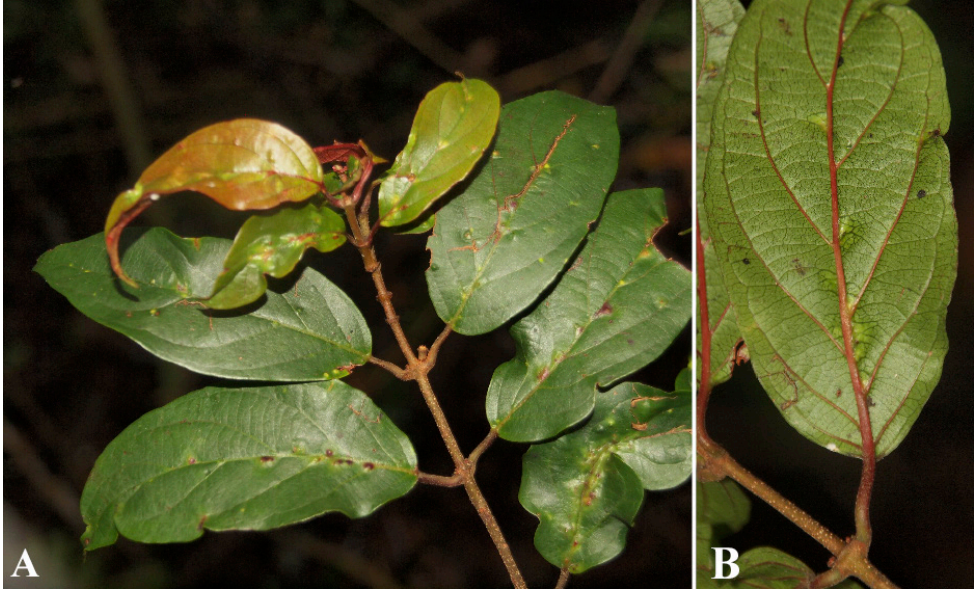
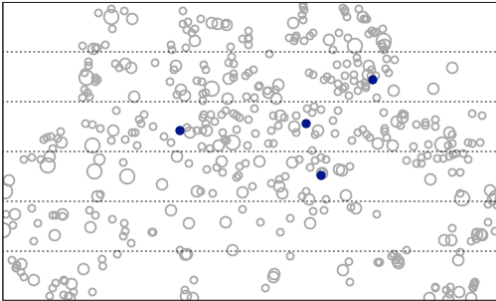


FIG. 4. *Urceola micrantha*. A: leafy branch, B: portion of lower leaf surface. A & B from V8973, Jun. 2018.



No. of individuals: 4. **Height:** up to 12 m tall.
DBH: 2.1–3.0 (avg. 2.7) cm.

Urceola micrantha is a woody climber, widely distributed from India to SE Asia, extending to China and Japan (Ryukyu Islands).



Specimen: V8973.

Rhaphidophora peepla (Roxb.) Schott

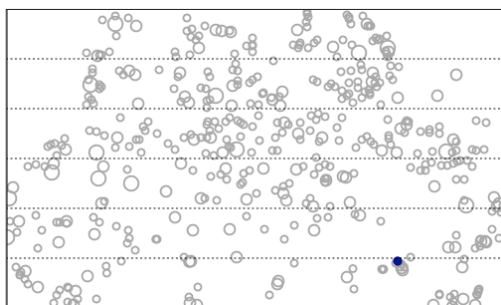
■ **Local name:** Trâm Đài

Bonplandia 5: 45 (1857).

■ **Specimens:** V8000, V8004, V9503 [fl.].

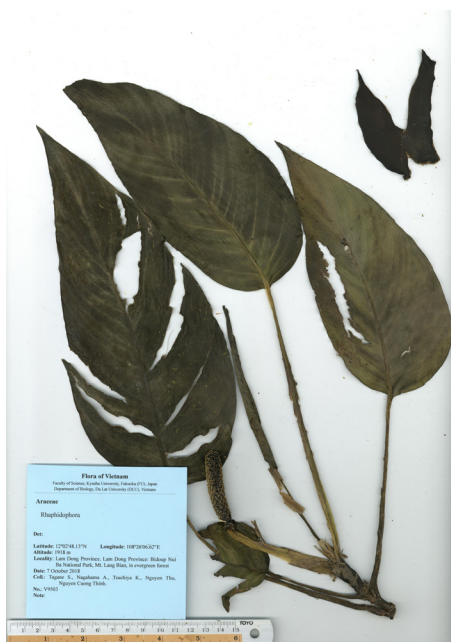


FIG. 5. *Rhaphidophora peepla*. A: flowering branch, B: portion of lower leaf surface, C: male inflorescence. A–C from V9503, Sept. 2018.



No. of individuals: 1. **Height:** 10 m tall.
DBH: 1.6 cm.

Rhaphidophora peepla is a climber occasional on a tree. The species is widely distributed from the northern part of South Asia to continental Southeast Asia.



Specimen: V9503.

***Brassaiopsis glomerulata* (Blume) Regel**

■ **Local name:** Mô cộng ngắn

Gartenflora: 275 (1863).

■ **Specimens:** *V8116* [fl. bud], *V9027* [fl. finished].

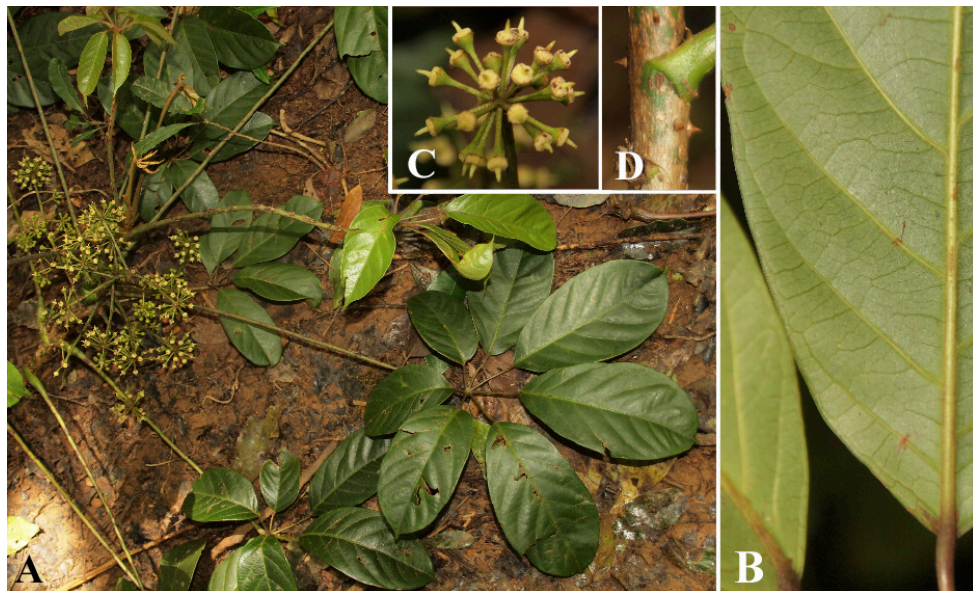


FIG. 6. *Brassaiopsis glomerulata*. A: branch with young fruits, B: portion of lower leaf surface, C: young fruits, D: stem with prickles. A–D from *V9027*, Jun. 2018.



Branch top densely covered with ferruginous hairs.

Brassaiopsis glomerulata is a tree characterized by prickly twigs, palmately compound leaves with 5–9 leaflets. Although it does not occur in the plot, it is locally common along the trail to the summit of Mt. Langbian. The species is widely distributed from India to China and Indochina, and also in Indonesia.



Specimen: *V9027*.

Macropanax schmidii C.B.Shang

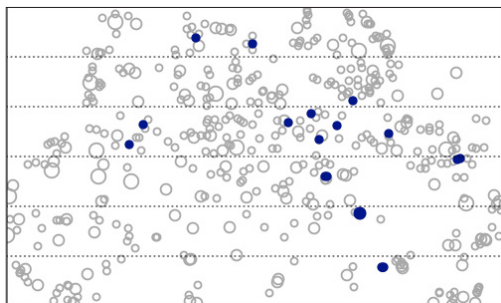
■ **Local name:** Chăn chim schmid

Bull. Mus. Natl. Hist. Nat., B, Adansonia Ser. 4, 5(1): 50 (1983).

■ **Specimens:** V7900, V8956.



FIG. 7. *Macropanax schmidii*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V8956, Jun. 2018.



No. of individuals: 18. **Height:** up to 7 m tall.

DBH: 1.8–20.4 (avg. 4.4) cm.

Macropanax schmidii is a tree up to 7 m tall, rather common in the plot, but we have not seen its flowers and fruits yet. It is recognized by its 3–5 leaflets.



Specimen: V8956.

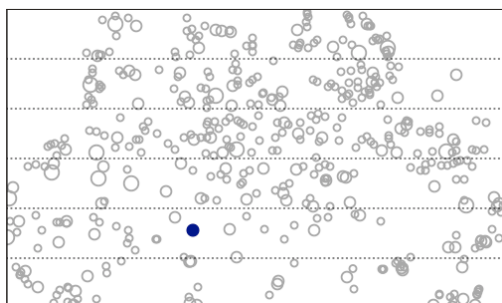
***Schefflera* sp.**

■ **Local name:** Chân chim

■ **Specimens:** *V9496*, *V9584* [fr.].



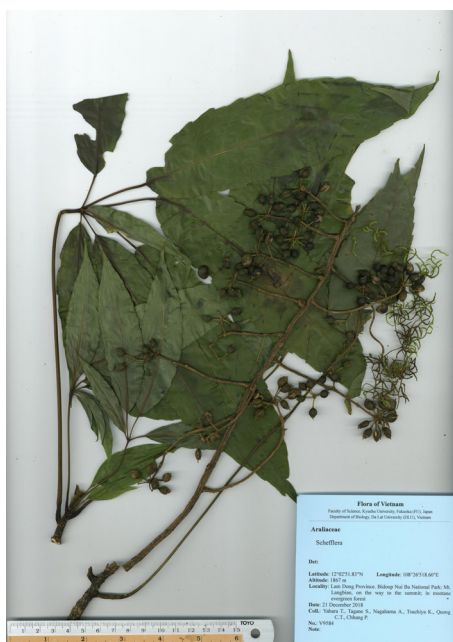
FIG. 8. *Schefflera* sp. A: leafy branch, B: portion of lower leaf surface, C: branch surface, D: infructescence. A–C from *V9496*, Sept. 2018; D from *V9584*, Dec. 2018.



No. of individuals: 1. **Height:** 8 m tall.

DBH: 12.7 cm.

Only a single sterile individual was recorded in the plot but we collected a fruiting specimen outside the plot. So far, we have not found any described species identical with this species.



Specimen: *V9584*.

Aspidistra cylindrica Vislobokov & Nuraliev

■ **Local name:** Tỏi rừng

Syst. Bot. 41(1): 160 (2016).

■ **Specimens:** V7961 [fr.], V9022 [fl. & fr.].

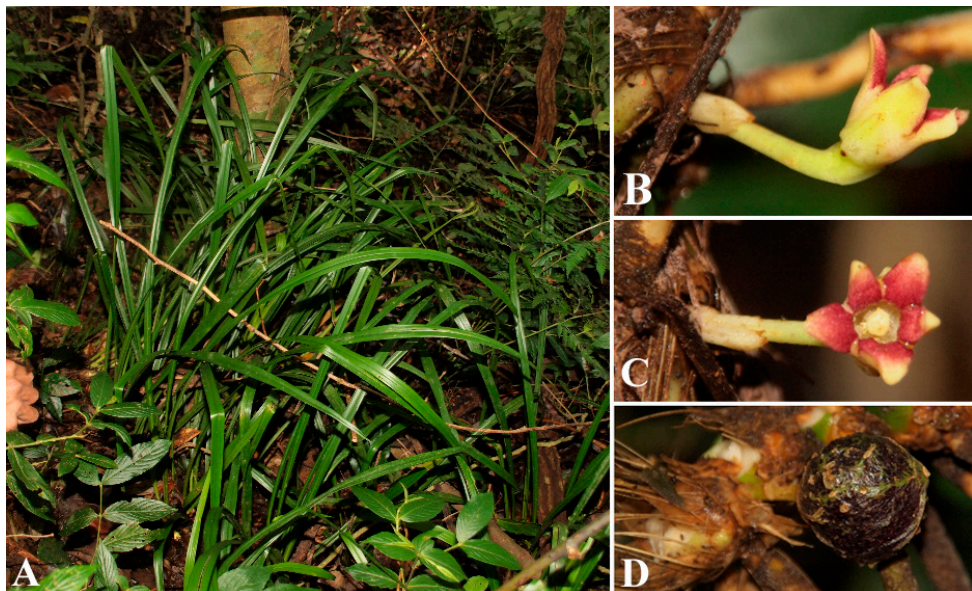


FIG. 9. *Aspidistra cylindrica*. A: habit, B & C: flowers, D: fruit. A–D from V9022, Jun. 2018.



A rhizome and petioles.

This is a perennial herb, ca. 40 cm tall, scattered in the understory of lower montane forest in Mt. Langbian. Flowers and fruits were found in June.



Specimen: V9022.

Ophiopogon dracaenoides Hook.

■ **Local name:** Xà Thảo

Fl. Brit. India [J. D. Hooker] 6(18): 268 (1892).

■ **Specimens:** V9504 [fr.], V9574 [fr.].

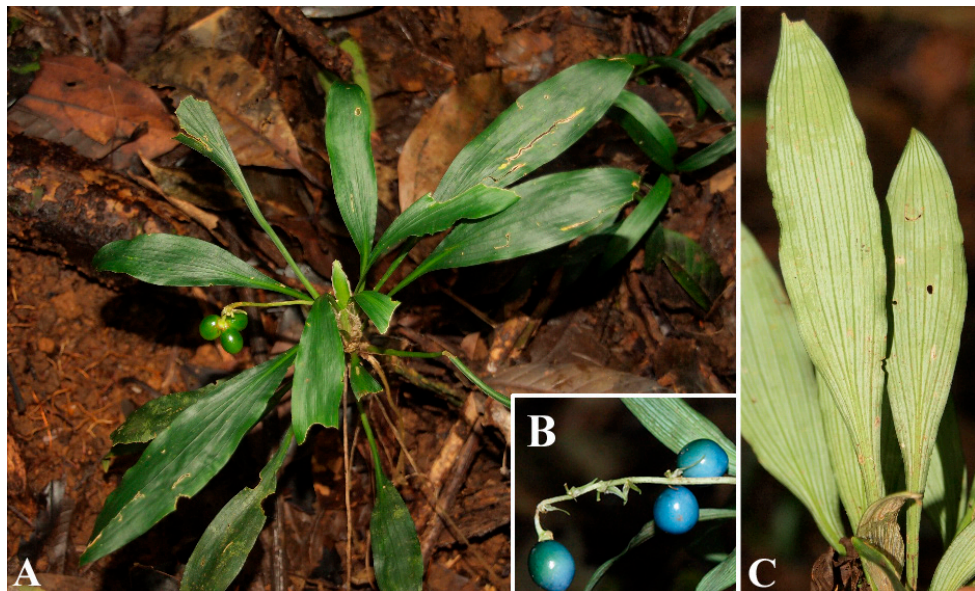
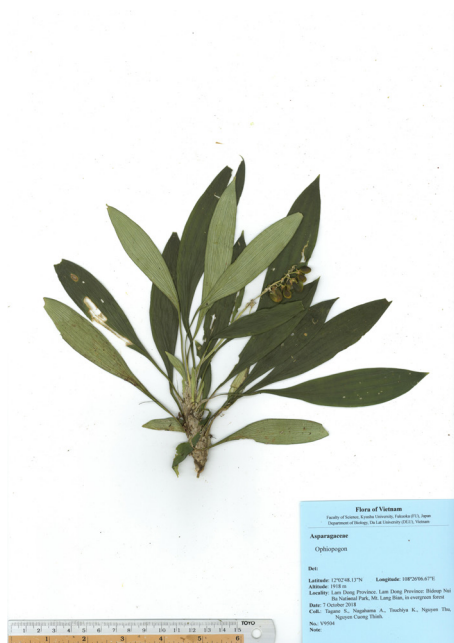


FIG. 10. *Ophiopogon dracaenoides*. A: habit, B: seeds, C: lower leaf surface. A–C from V9574, Dec. 2018.



An infructescence.

This is a small herb, occasional in the understory of evergreen forest in the plot. It is similar to *Ophiopogon peliosanthifolius* L.Rodr. but differs in erect stem and smaller plant size.



Specimen: V9504.

Ophiopogon sp.

■ Local name: Xà Thảo

■ Specimens: V9575 [fr.].



FIG. 11. *Ophiopogon* sp. A: habit, B: seeds, C: lower leaf surface. A–C from V9575, Dec. 2018.



An infructescence.

This is a perennial herb, ca. 30 cm tall, scattered in the understory of lower montane forest in Mt. Langbian. This may be a form of *Ophiopogon longifolius* Decne.



Specimen: V9575.

Polygonatum punctatum Royle

■ Local name: Đa đầu dóm

Ill. Bot. Himal. Mts. [Royle]: 380 (1839).

■ Specimens: V8144 [fl. & fr.], V9031 [fr.].

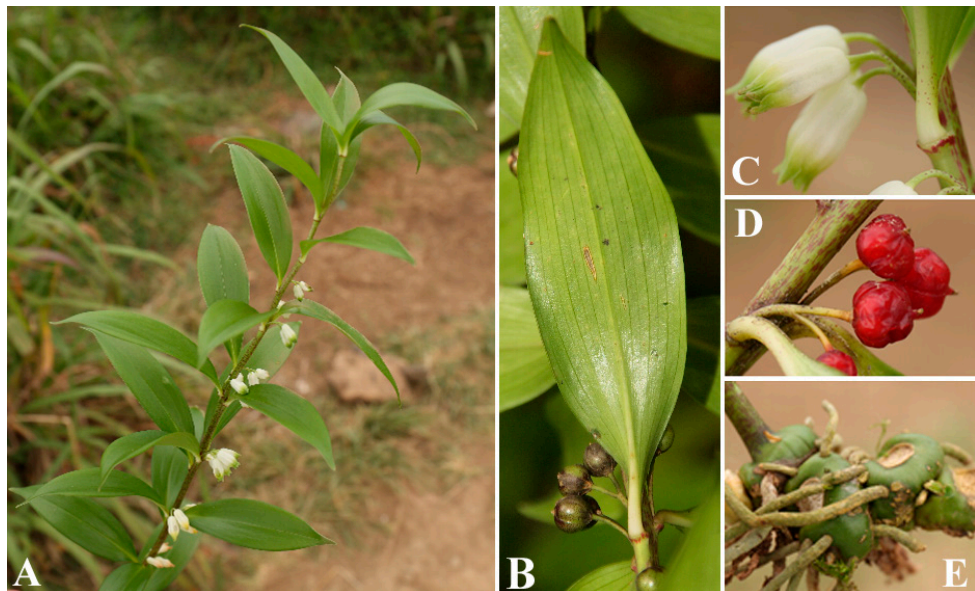


FIG. 12. *Polygonatum punctatum*. A: habit, B: lower leaf surface, C: flowers, D: fruits, E: rhizome. A, C–E from V8144, Mar. 2018; B from V9031, Jun. 2018.



An infructescence.

Polygonatum punctatum is an epiphytic plant occasional on tree trunk. It is one of the Himalayan elements, widely distributed in higher elevations of NE India, Nepal, Sikkim, Bhutan, Myanmar, China, Thailand and Vietnam.



Specimen: V8144.

Mikania cordata (Burm.f.) B.L.Rob.

■ Local name: Mỹ đăng

Contr. Gray Herb. 104: 65 (1934).

■ Specimens: V9588 [fl. bud].

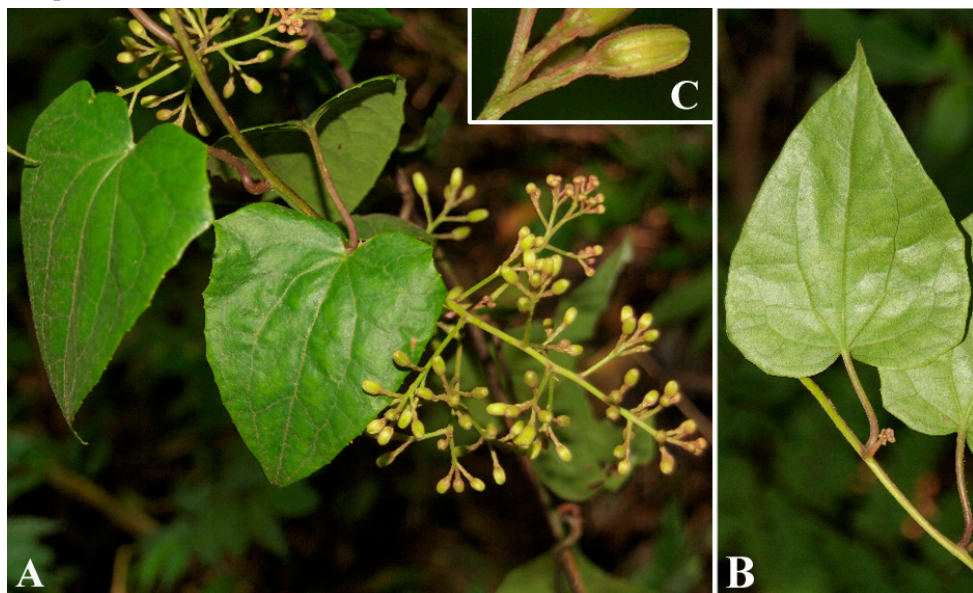


FIG. 13. *Mikania cordata*. A: branch with flower buds, B: lower leaf surface, C: flower bud. A–C from V9588, Dec. 2018.



Heads and hairy peduncles.

This is a climber, scattered in forest gaps and margins in Mt. Langbian. The species is widely distributed throughout SE Asia.



Specimen: V9588.

Impatiens chevalieri Tardieu

■ **Local name:** Móc tai hồng

■ **Specimens:** V9032 [fl.], V9580 [fl. & fr.].

Notul. Syst. (Paris) 11: 181 (1944).

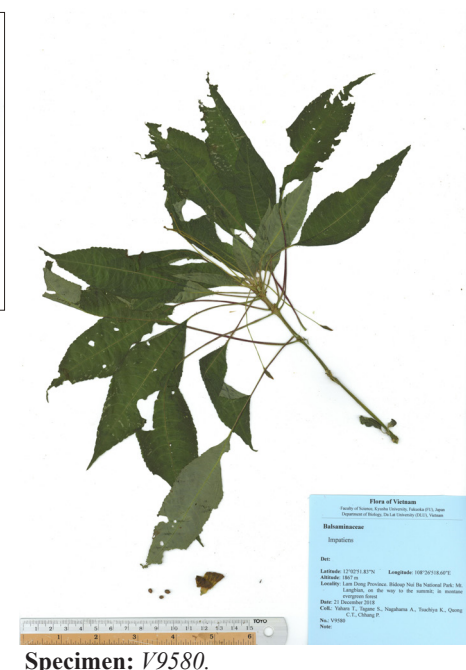


FIG. 14. *Impatiens chevalieri*. A: habit, B: portion of lower leaf surface, C: fruits. A–C from V9032, Jun. 2018.



Seeds (left) and a dehiscent capsule (right).

This species is the most common among the three species of *Impatiens* in Mt. Langbian. Flowers are observed from June to December.



Specimen: V9580.

Impatiens langbianensis Tardieu

■ Local name: Móc tai Langbian

Notul. Syst. (Paris) 11: 174 (1944).

■ Specimens: V9579 [fl.].

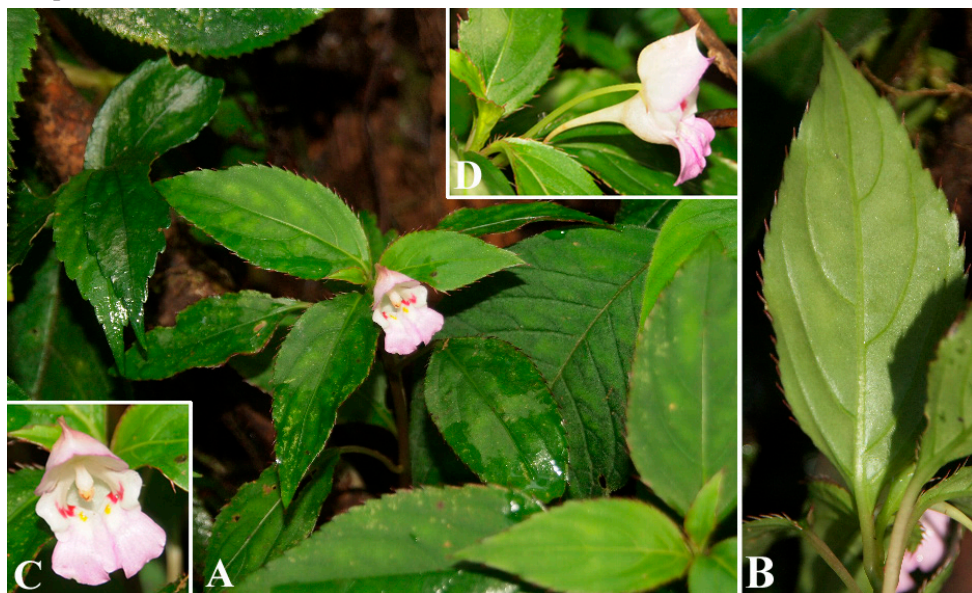


FIG. 15. *Impatiens langbianensis*. A: flowering plant, B: lower leaf surface, C & D: front and side view of flower, respectively. A–D from V9579, Dec. 2018.



Leaves with long extended tooth.

This is a herb occasional in the understory of montane evergreen forest in Mt. Langbian. Mt. Langbian is the type locality of this species (Type-Eberhardt P.A. 1721, P).



Specimen: V9579.

Impatiens luteola Tardieu

■ Local name: Móc tai vàng

Notul. Syst. (Paris) 11: 175 (1944).

■ Specimens: V9593 [fl.].



FIG. 16. *Impatiens luteola*. A: habit, B: flowers, C: fruits. A–C from V9593, Dec. 2018.



Crenate leaf margin; the upper end of each teeth is shortly projected.

This yellow flowered *Impatiens* is found in the understory of montane evergreen forest at altitude 2062 m, near the summit of Mt. Langbian.

Flora of Vietnam
 Institute of Botany, Vietnam Academy of Science and Technology (VIBST)
 Department of Botany, Ho Chi Minh City, Vietnam

Balsaminaceae
Impatiens

Det:
 Latitude: 12°02'N 107° Longitude: 108°30'22"E
 Altitude: 2062 m
 Locality: Cao Bang Province, Bàng Nai National Park,
 Cao Bang, Ho Chi Minh City, Vietnam (elevation: 2062 m)
 Date: 11 December 2018
 Coll.: Tardieu, L., Nguyen, L., Nguyen, A., Thanh, K., Quang
 C.T., Chhang P.
 No.: V9593
 Note:



Specimen: V9593.

Begonia langbianensis Baker f.

■ **Local name:** Thu Hải đường Langbian

J. Nat. Hist. Soc. Siam 4: 133 (1921).

■ **Specimens:** *V9601* [fl. & fr.].

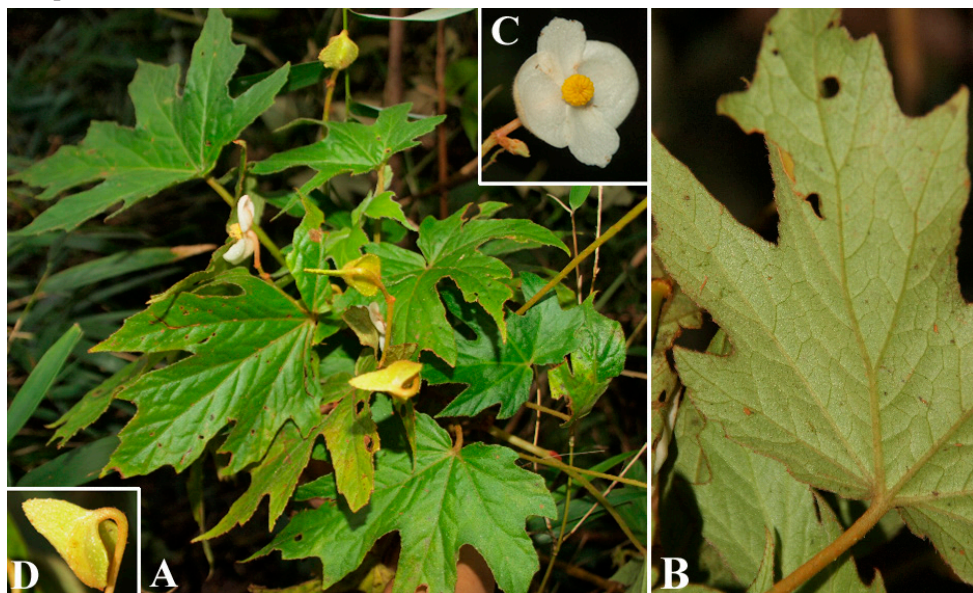


FIG. 17. *Begonia langbianensis*. A: habit, B: portion of lower leaf surface, C: male flower, D: fruit. A–D from *V9601*, Dec. 2018.



A light red pink stipule.

This species is commonly found along the trail to the summit of Mt. Langbian. The type specimen (C.B. Kloss s.n., BM) was collected in Langbian Peaks in 1918, just a hundred years ago.



Specimen: *V9601*.

Euonymus mitratus Pierre

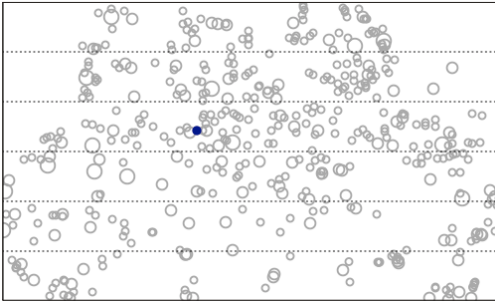
■ **Local name:** Chân danh nón

Fl. Forest. Cochinch.: sub t. 308 (1894).

■ **Specimens:** V7928 [fl. bud], V7984, V9006 [young fr.].



FIG. 18. *Euonymus mitratus*. A: leafy branch, B: lower leaf surface, C: young inflorescence. A–C from V7928, Mar. 2018.



No. of individuals: 1. **Height:** 3 m tall.

DBH: 2.2 cm.

Individuals of Langbian plots have thicker leaves and more faintly visible tertiary veins than types (Cambodia, *Pierre 897*, P). It might be a different species.



Specimen: V7928.

Sarcandra glabra (Thunb.) Nakai

■ Local name: Sỏi nhẵn

Fl. Sylv. Kor. 18: 17 (1930).

■ Specimens: V7067.



FIG. 19. *Sarcandra glabra*. A: leafy branch, B: lower leaf surface. A & B from V7967, Mar. 2018.



Leaf apex (lower surface).

This is a shrub, ca. 0.8 m tall, common in evergreen forest of Indochina.



Specimen: V7967.

Mastixia euonymoides Prain

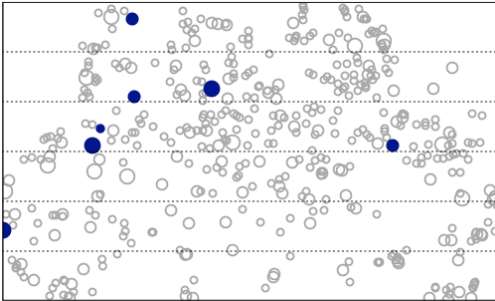
■ **Local name:** Búi

J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 67: 295 (1898).

■ **Specimens:** V7897, V8104, V8994, V9490.



FIG. 20. *Mastixia euonymoides*. A: leafy branch, B: lower leaf surface, C: apical bud on branch. A–C from V8104, Mar. 2018.



No. of individuals: 7. **Height:** up to 27 m tall.

DBH: 7.2–84.1 (avg. 32.7) cm.

Mastixia euonymoides has been known from NE India, Myanmar and Thailand. Our record is new to the flora of Vietnam, extending its eastern limit.



Specimen: V8994.

Daphniphyllum langbianense Yahara, *ined.*

■ **Local name:** Vai Langbian

■ **Specimens:** *V8014*, *V8022* [female fl.], DGR(*V7749*).

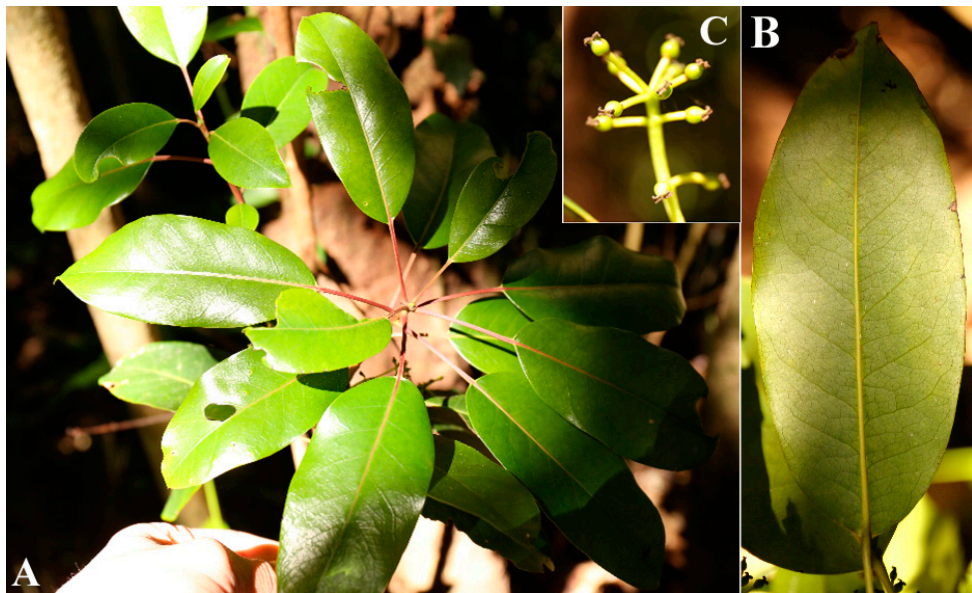
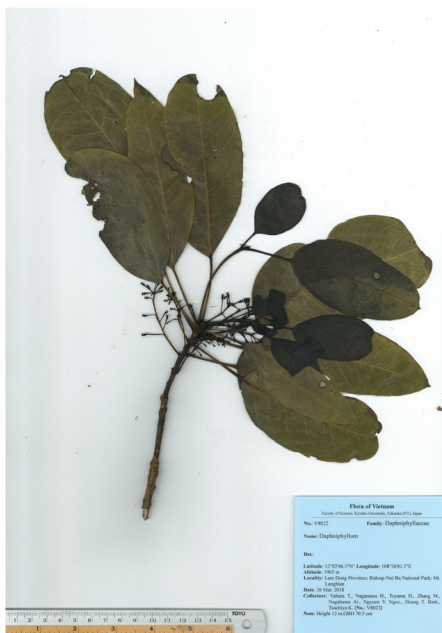


FIG. 21. *Daphniphyllum langbianense*. A: leafy branch, B: lower leaf surface, C: female flowers. A–C from V8022, Mar. 2018.



Finely reticulate tertiary veins on the lower surface of a leaf.

This species is similar to *D. oldhamii* in female flowers with caducous calyx, but different in reticulodromous venation (lateral veins reticulated near the margin, vs. lateral veins anastomosing with each other, forming a loop in *D. oldhamii*). Endemic to Mt. Langbian and its vicinity.



Specimen: *V8022*.

***Daphniphyllum* sp.**

■ **Local name:** Vai

■ **Specimens:** *V8951*.

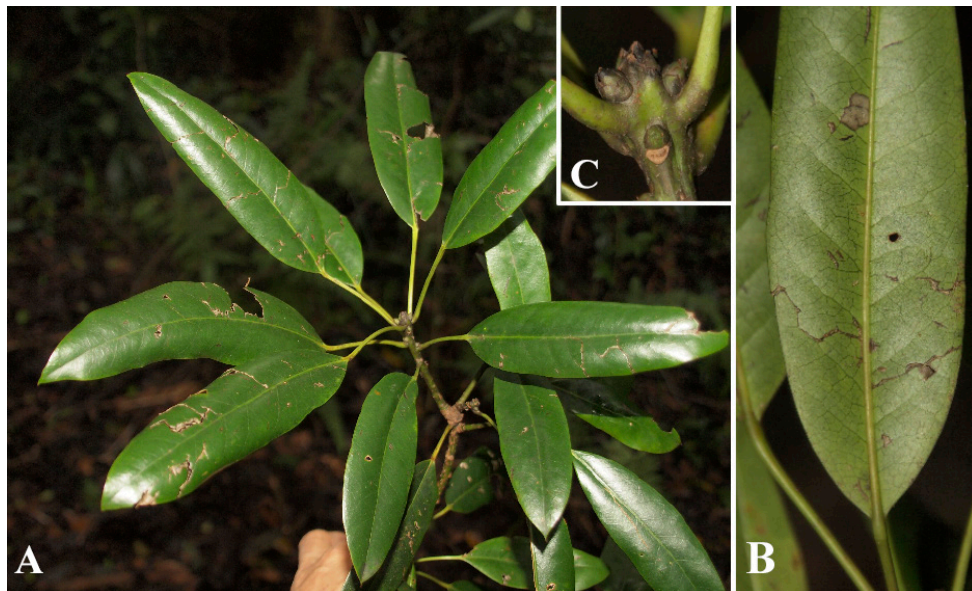
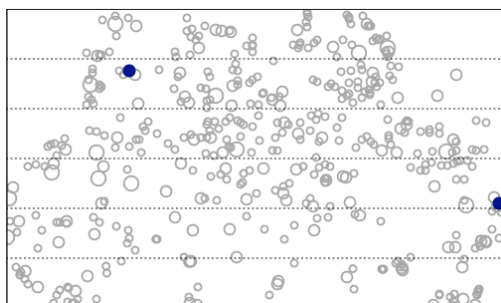


FIG. 22. *Daphniphyllum* sp. A: leafy branch, B: portion of lower leaf surface, C: shoot apex. A–C from *V8951*, Mar. 2018.



No. of individuals: 2. **Height:** up to 11 m tall.

DBH: 10.4–17.2 (avg. 13.8) cm.

This species is similar to *D. langbianense* in having reticulodromous venation but leaves are longer and thicker. Fertile collections are needed to identify this species.



Specimen: *V8951*.

Elaeocarpus bidupensis Gagnep.

■ **Local name:** Côm Bidoup

Notul. Syst. (Paris) 11: 2 (1943).

■ **Specimens:** V9021, V9595 [fr.].

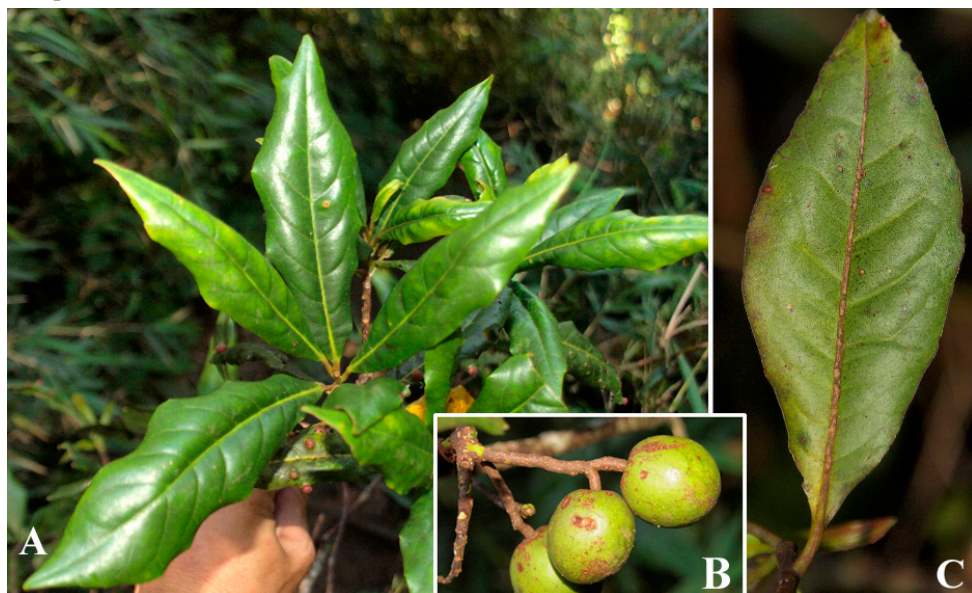
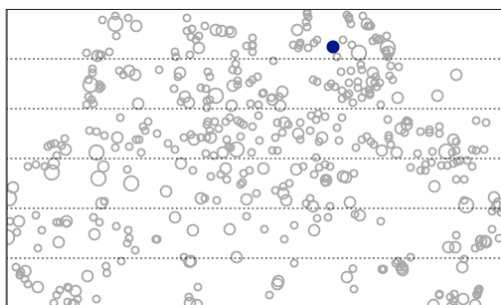


FIG. 23. *Elaeocarpus bidupensis*. A: leafy branch, B: fruits, C: lower leaf surface. A–C from V9595, Dec. 2018.



No. of individuals: 1. **Height:** 12 m tall.
DBH: 13.5 cm.

Only two individuals were found in our survey. One is sapling inside the plot and another is fruiting in the forest just below the summit of Mt. Langbian.



Specimen: V9595.

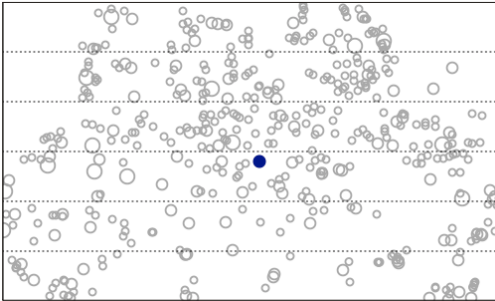
***Elaeocarpus* sp. 1**

■ **Local name:** Côm

■ **Specimens:** V7904, V8021, V8979 [fl. Bud].



FIG. 24. *Elaeocarpus* sp. 1. A: leafy branch, B: lower leaf surface, C: young inflorescence. A & B from V7904, Mar. 2018; C from V8979, Jun. 2018.



No. of individuals: 1. **Height:** 12 m tall.
DBH: 27.2 cm.

This species is similar to *Elaeocarpus* sp. 2 but distinct in lacking domatia on abaxial side of lamina and having young twigs densely covered with short whitish hairs (vs. glabrous).



Specimen: V7904.

Elaeocarpus sp. 2

■ Local name: Côm

■ Specimens: V8995, V9596 [fr.].

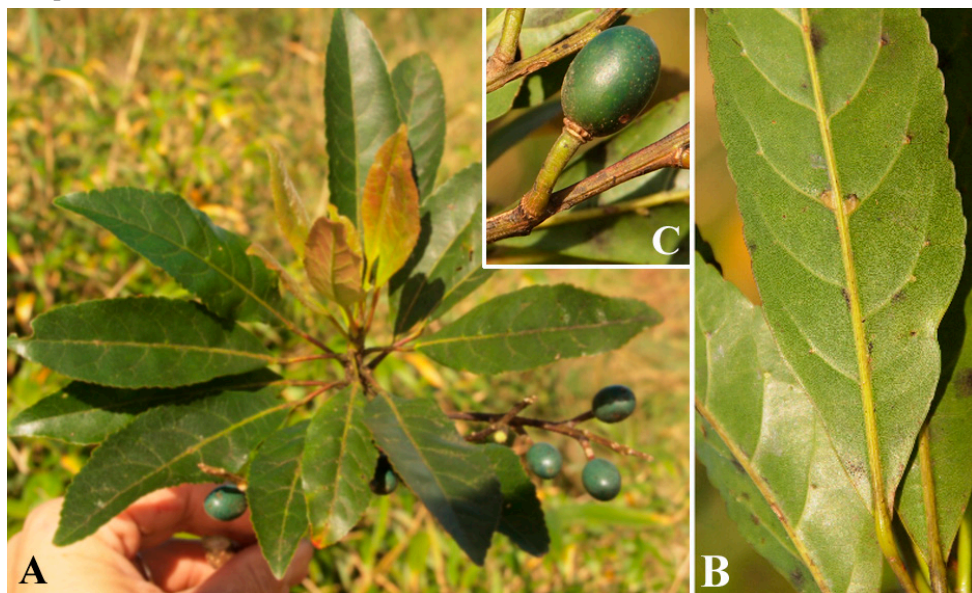
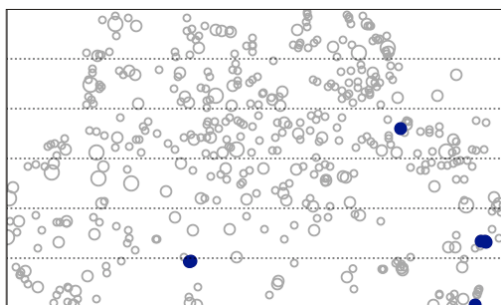


FIG. 25. *Elaeocarpus* sp. 2. A: fruiting branch, B: portion of lower leaf surface, C: fruit. A–C from V8995, Jun. 2018.



No. of individuals: 7. Height: up to 12 m tall.

DBH: 14.2–26.0 (avg. 18.9) cm.

This species is apparently similar to *E. medioglaber* but differs in tertiary veins invisible (vs. finely reticulate and distinct abaxially in *E. medioglaber*), presence of domatia in the abaxial vein axils of lamina (vs. absent) and pubescent ovary (vs. glabrous).



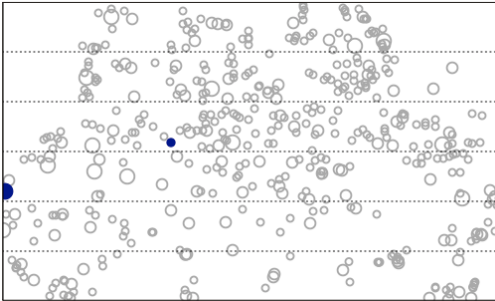
Specimen: V9596.

***Elaeocarpus* sp. 3**

- **Local name:** Côm
- **Specimens:** V8020, V8987.

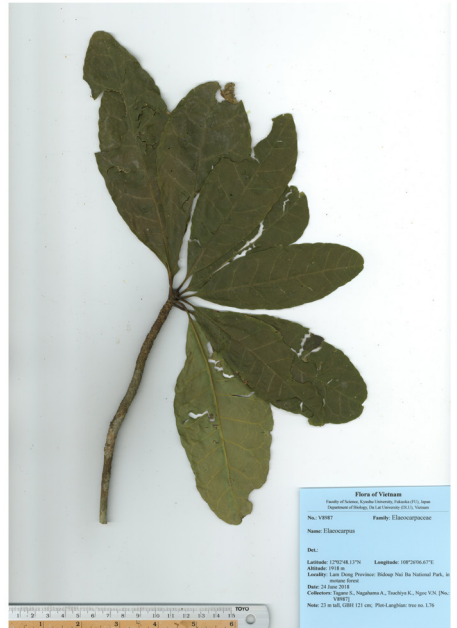


FIG. 26. *Elaeocarpus* sp. 3. A: leafy branch, B: portion of lower leaf surface. A & B from V8987, Jun. 2018.



No. of individuals: 2. **Height:** up to 23 m tall.
DBH: 9.2–38.5 (avg. 23.9) cm.

Two individuals were recorded in the plot. We need to examine flowers and fruits to identify this species identify.



Specimen: V8987.

Elaeocarpus sp. 4

■ Local name: Côm

■ Specimens: V7980, CT(V9469 [fr.]).

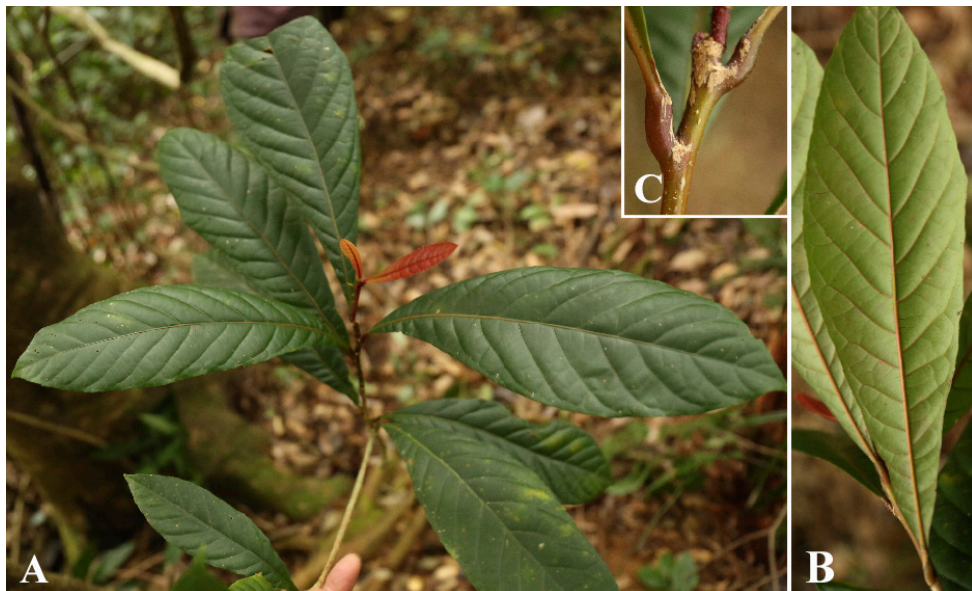
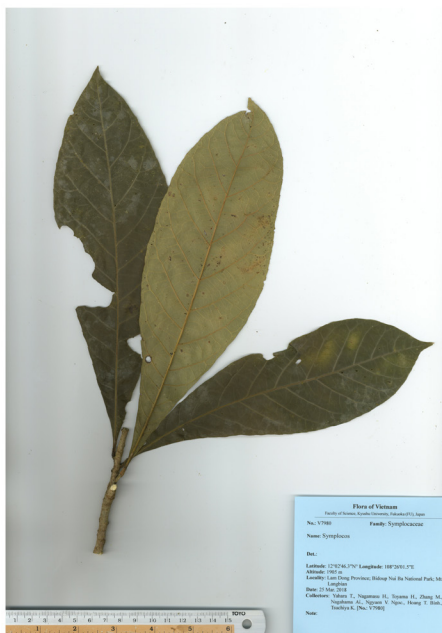


FIG. 27. *Elaeocarpus* sp. 4. A: leafy branch, B: portion of lower leaf surface, C: petioles. A–C from V7980, Mar. 2018.



Leaf apex (lower surface).

This species is very similar to *Elaeocarpus* sp. 3 but differs in having lustrous leaves and finely reticulated and prominent tertiary veins on both surfaces when dry (vs. dull grayish green and tertiary veins obscure adaxially in *E.* sp. 3).



Specimen: V7980.

***Sloanea sigun* (Blume) K.Schum.**

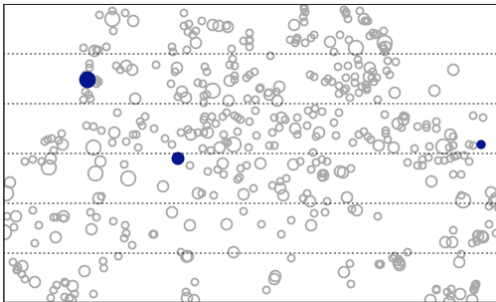
■ **Local name:** Sô loan

Nat. Pflanzenfam. 3 (6): 5 (1890).

■ **Specimens:** V7988, V8063, V8984, V8989, V9017 [fr.].



FIG. 28. *Sloanea sigun*. A: leafy branch, B: portion of lower leaf surface, C: fruit. A from V8989; B from V8984; C from V9017, Jun. 2018.



No. of individuals: 3. **Height:** up to 15 m tall.

DBH: 4.8–51.9 (avg. 22.3) cm.

This species is common in valley forest in Bidoup-Núi Ba NP. As in *Elaeocarpus*, petioles are swollen at both ends, but *Sloanea* is easily distinguished by broader leaf blade and minutely serrate leaf margin (seemingly entire).



Specimen: V8989.

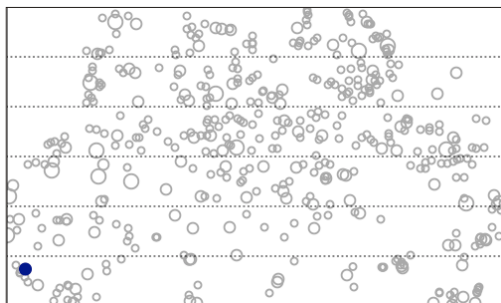
■ **Local name:** Đa hương trái dài

■ **Specimens:** *V7891*, *V9497* [fr.].

Bijdr. Fl. Ned. Ind. 13: 659 (1826).



FIG. 29. *Polyosma integrifolia*. A: leafy branch, B: lower leaf surface, C: fruit. A & B from V7891, Mar. 2018; C from V9497, Sept. 2018.



In Bidoup-Nui Ba NP, a similar species, *Polyosma dolichocarpa* Merr., but *P. dolichocarpa* is distinguished by entire leaf margin and more dense hairs on twigs and abaxial side of lamina.



Claoxylon langbianense Nagah. & Tagane, *ined.*

■ **Local name:** Lộc mại Langbian

■ **Specimens:** V7909 [fl.], V8120 [fl. & fr.], V8963, V9026 [fr.], V9502 [fr.], V9585 [male fl.], V9586 [fr.].

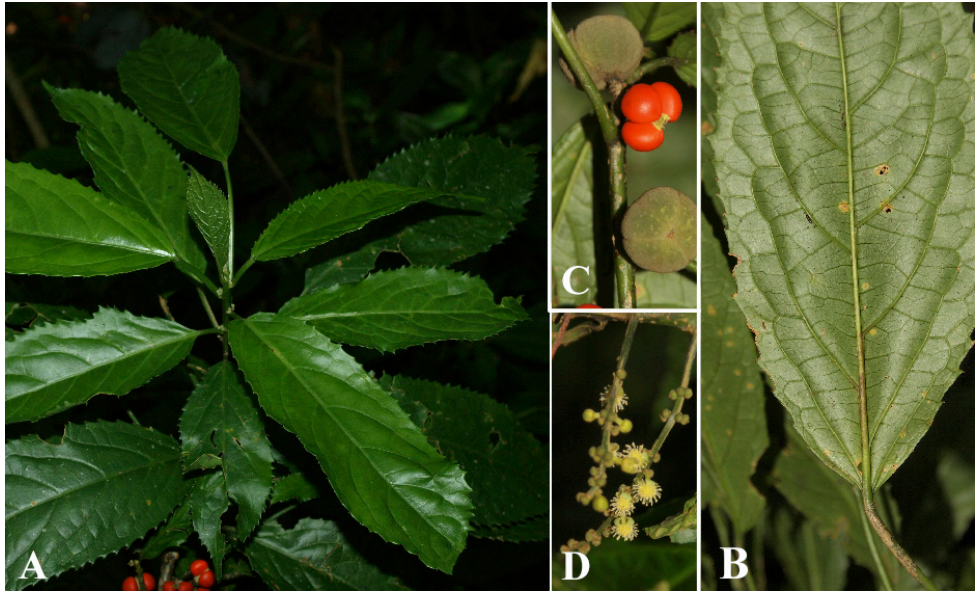
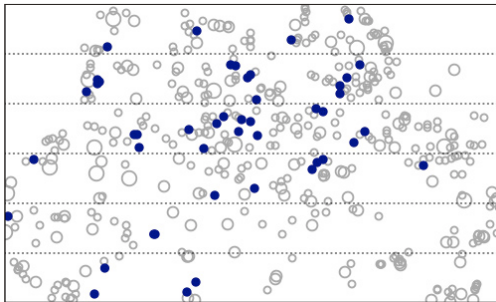


FIG. 30. *Claoxylon langbianense*. A: fruiting branch, B: portion of lower leaf surface, C: fruit and seeds, the latter covered with red aril, D: male inflorescence. A–C from V9586, Dec. 2018; D from V9585, Dec. 2018.



No. of individuals: 46. **Height:** up to 8 m tall.

DBH: 1.4–4.6 (avg. 2.6) cm.

This is one of the most abundant trees in the plot. It is similar to *Claoxylon longifolium*, but differs in having lateral veins anastomosing with each other, forming distinct loops apart from the margin (vs. ascending to margin).



Specimen: V9026.

Ostodes paniculata Blume

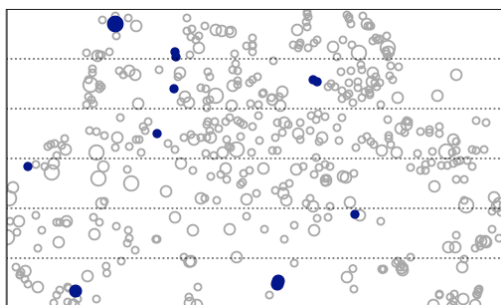
■ **Local name:** Gỗ tằm chùm tụ tán

Bijdr. Fl. Ned. Ind. 12: 620 (1826).

■ **Specimens:** *V7914*, *V8128* [male fl.], *V8137* [fr.], *V8988*, *V9589* [fl.].



FIG. 31. *Ostodes paniculata*. A: branch with male flowers, B: portion of lower leaf surface, C: male flower, D: fruit. A–C from *V8128*, Mar. 2018; D from *V8137*, Mar. 2018.



No. of individuals: 12. **Height:** up to 12 m tall.
DBH: 2.1–30.3 (avg. 11.2) cm.

This species is a tree attaining to 12 m, common in the montane evergreen forest in Bidoup-Nui Ba NP. It is widely distributed from India to Indochina and southern China, extending to Indonesia. The plant is known to be dioecious, having male and female individuals.



Specimen: *V8128*.

Hylodesmum repandum (Vahl) H.Ohashi & R.R.Mill

■ Local name: Unknown

Edinburgh J. Bot. 57(2): 185 (2000).

■ Specimens: V8138 [fl.].

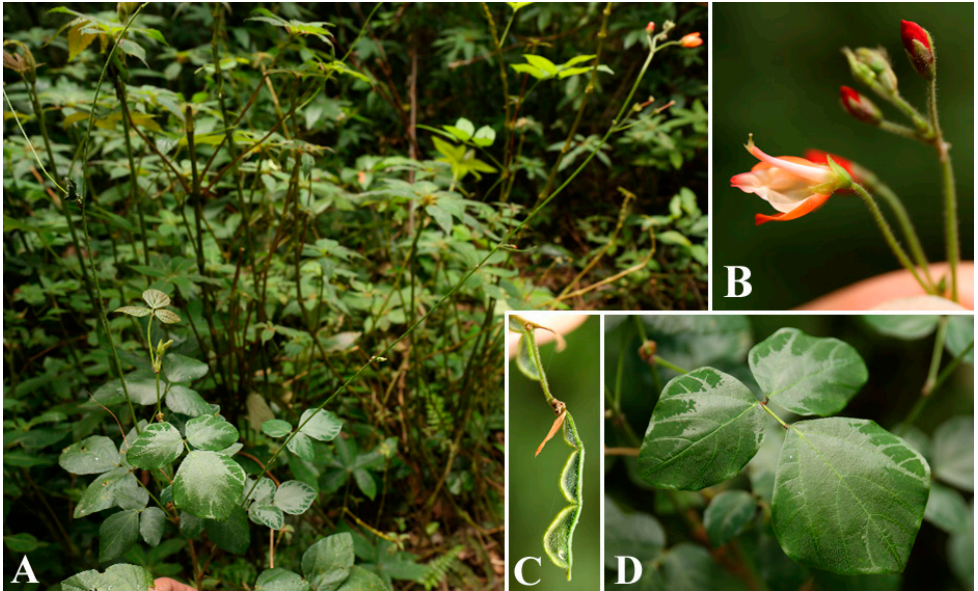
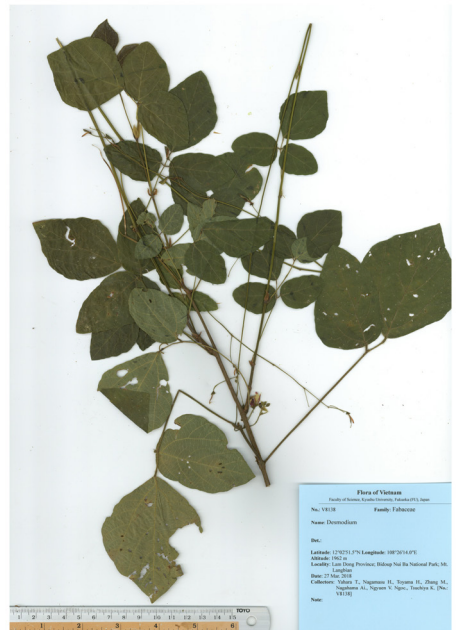


FIG. 32. *Hylodesmum repandum*. A: habit, B: flowers, C: fruit, D: upper leaf surface. A–D from V8138, Mar. 2018.



A pair of stipules.

This is a small shrub, ca. 50 cm tall in the understory of lower montane evergreen forest in Mt. Langbian. The species is widely distributed from India to SE Asia, extending New Guinea.



Specimen: V8138.

J. Bot. 1: 182, footnote (1863).

■ **Specimens:** *V7985*.



FIG. 33. *Castanopsis acuminatissima*. A: leafy branch, B: lower leaf surface, C: petiole. A–C from V7985, Mar. 2018.



Leaf base (upper surface); a midvein is sunken.

This is a polymorphic species widely distributed from China to Indonesia. In Biduop Nui Ba National Park, this species is common in evergreen forests from 1500 m to 1900 m. This species is distinct in pale golden-brown color of lower leaf surface and cupule wall sparsely covered with simple, short spines.



Specimen: *V7985*.

Lithocarpus echinatus Ngoc, Tagane, & Yahara, *ined.*

■ **Local name:** Dẻ cầu mang gai

■ **Specimens:** V8967, V9572 [fr.].

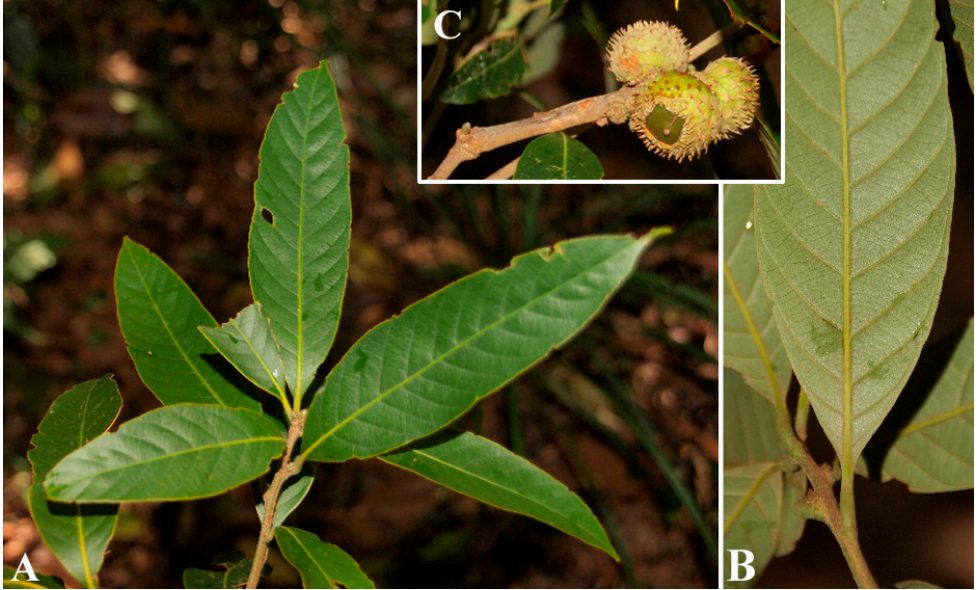
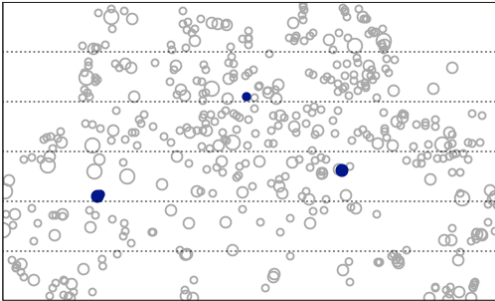


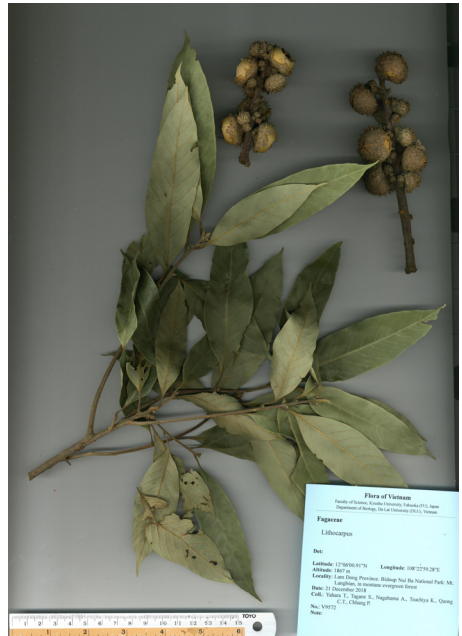
FIG. 34. *Lithocarpus echinatus*. A: leafy branch, B: portion of lower leaf surface, C: fruits. A–C from V9572, Dec. 2018.



No. of individuals: 4. **Height:** up to 11 m tall.

DBH: 2.6–20.5 (avg. 10.3) cm.

This species is similar to *L. echinophorus* and *L. fenestratus* in that cupule completely covers the nut before maturation but the top of cupule wall is irregularly opened when the nut is matured. The tip of the scales extends long and is spine-like (vs. not spine-like in *L. fenestratus*) and spine-like tip is erect (vs. recurved in *L. echinophorus*). Endemic to Mt. Langbian, collected at 1900 m.



Specimen: V9572.

Lithocarpus lemeeanus A.Camus

■ **Local name:** Dê Lemé

Bull. Soc. Bot. France 90: 84 (1943).

■ **Specimens:** V8152 [female fl.], V9038 [young fr.], V9598 [mature fr.].

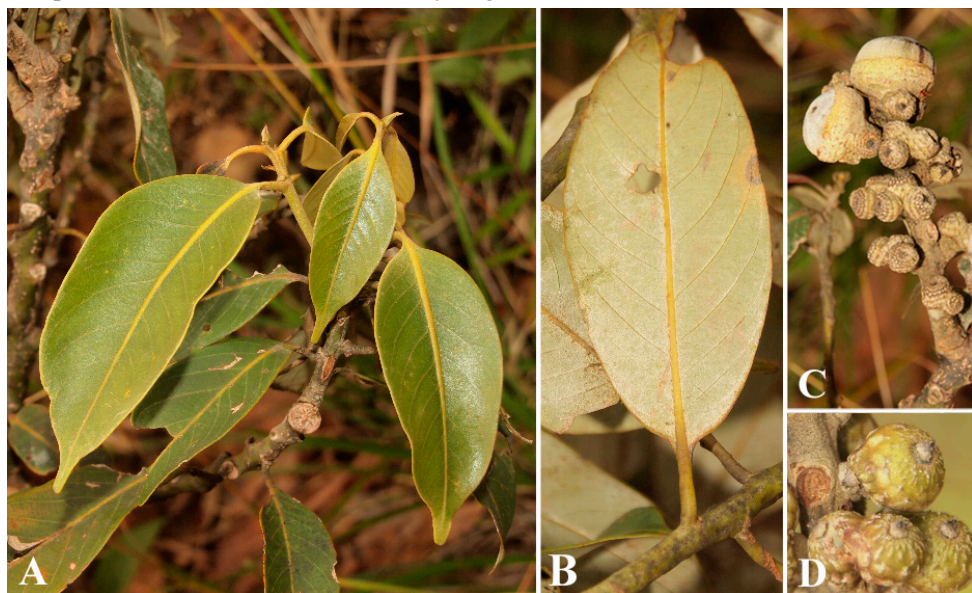


FIG. 35. *Lithocarpus lemeeanus*. A: leafy branch, B: lower leaf surface, C: infructescence, D: young fruits. A–C from V9598, Dec. 2018; D from V9038, Jun. 2018.



Leaf base (upper surface); a midvein is raised and tertiary veins are invisible.

This species is characterized by having elliptic leaves relatively small, thick, glabrous, caudate-acuminate at apex, and obtuse or rounded at base. The nut is covered completely with cupule in the first year but only the basal 1/2–1/3 of the nut is covered when matured. Cupule wall has imbricated and appressed scales. Endemic to Bidoup-Nui Ba NP, occurring above 1900 m.



Specimen: V9038.

Lithocarpus congtrioensis Ngoc, Tagane, & Yahara, *ined.*

■ **Local name:** Dẻ đá Công trời

■ **Specimens:** V9492, CT(V9102 [fr.], V9470[fr.]).

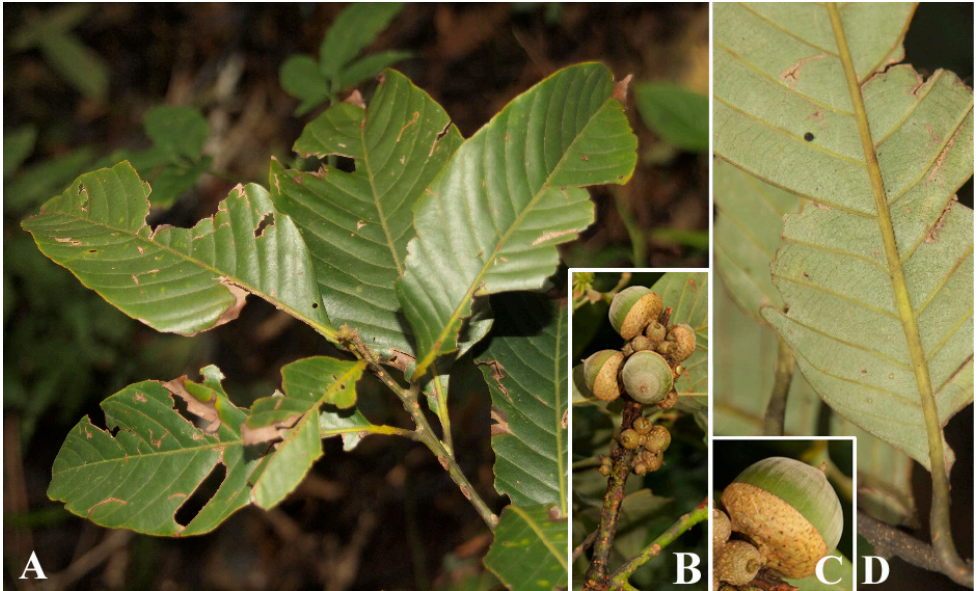
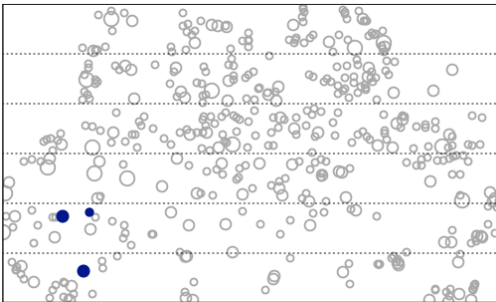


FIG. 36. *Lithocarpus congtrioensis*. A: leafy branch, B: infructescence, C: fruits, D: portion of lower leaf surface. A & D from V9492, Sept. 2018; B & C from V9470, Sept. 2018.



No. of individuals: 3. **Height:** up to 12 m tall.

DBH: 8.7–17.9 (avg. 14.4) cm.

This species is similar to *L. licentii* in having glabrous, elliptic leaves with more than 15 pairs of lateral veins, cupule covering more than 1/2 of the nut, and imbricated and appressed scales. This species is distinct from *L. licentii* in nuts silky hairy when young, flat at base, scales free at the tip (vs. fused), and slightly glaucous lower leaf surface with distinct scalariform tertiary veins. Endemic to Mt. Langbian and its vicinity.



Specimen: V9492.

Lithocarpus yersinii A. Camus

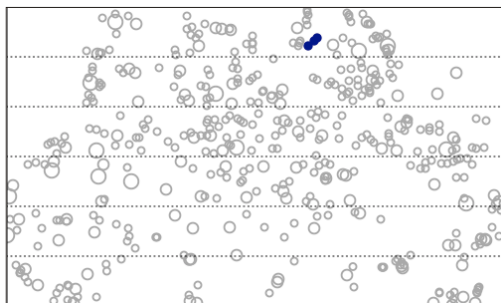
■ **Local name:** Dẻ dẻ Yersin

Bull. Mus. Natl. Hist. Nat. 2, 6: 93 (1934).

■ **Specimens:** V8013 [fl.], V9020.



FIG. 37. *Lithocarpus yersinii*. A: flowering branch, B: lower leaf surface, C: male flowers. A & C from V8013, Mar. 2018; B from V9020, Jun. 2018.



No. of individuals: 3. **Height:** up to 9.5 m tall.
DBH: 2.1–7.5 (avg. 5.1) cm.

This species is similar to *L. hancei* and *L. jacksonianus* in having elliptic to lanceolate, glabrous leaves with dark green above and green below. This species is distinguished from them by thicker leaves lustrous below, tertiary veins indistinct (vs. raised below), and nuts solitary (vs. three nuts clustered). This species is endemic to Bidoup-Nui Ba NP and Hon Ba Nature Reserve.



Specimen: V8013.

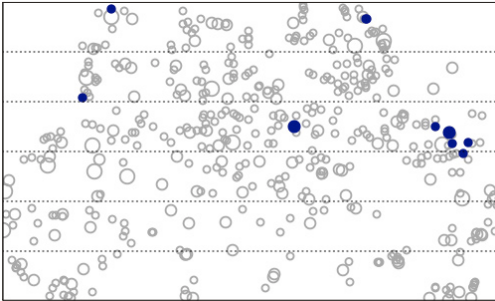
Quercus braianensis A.Camus

■ **Local name:** Sỏi Braian Les Chenes, Monogr. Gen. Quercus, Atlas 2. Expl. Pl. (Encycl. Econ. Sylv. 7.): 120 (1935)

■ **Specimens:** V8955.

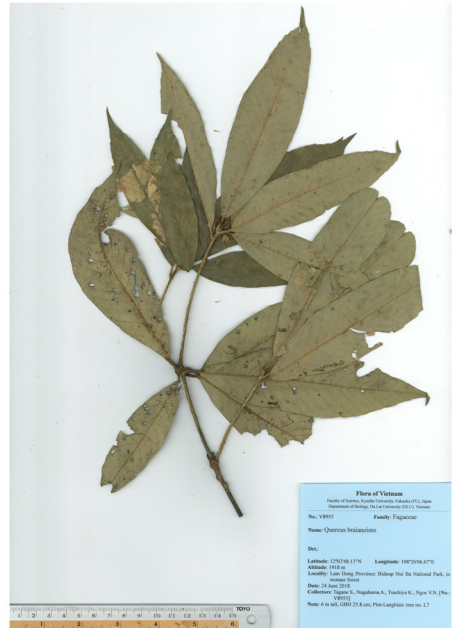


FIG. 38. *Quercus braianensis*. A: leafy branch, B: portion of lower leaf surface. A & B from V8955, Jun. 2018.



No. of individuals: 10. **Height:** up to 10 m tall.
DBH: 2.5–17.4 (avg. 6.3) cm.

This species is similar to *Q. poilanei* in having white-brownish tomentum on the lower leaf surface, petioles and young branchlets. This species is distinguished from *Q. poilanei* by narrower lanceolate leaves (vs. elliptic), hemispherical, hairy nuts with flat base (vs. globose, glabrous nuts with narrowed base), and short hairy cupule (vs. wooly hairy). This species is known from Mt. Braian (type locality) and Bidoup-Nui Ba NP.



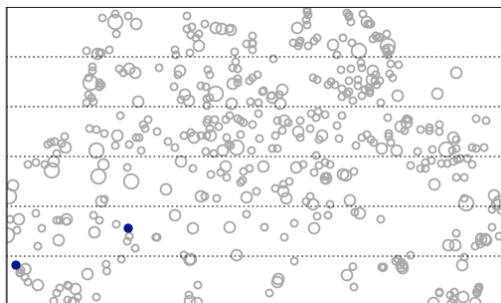
Specimen: V8955.

Ann. Sci. Nat., Bot. Ser. 10(3): 382 (1921).

■ **Specimens:** *V7898*, *V8094*, *V9495*.



FIG. 39. *Quercus langbianensis*. A: leafy branch, B: densely brown tomentose young branch, C: portion of lower leaf surface. A–C from *V8094*, Mar. 2018.



No. of individuals: 2. **Height:** up to 4 m tall.
DBH: avg. 2.6 cm.

This species is similar to *Q. baolamensis* in leaves of mature trees distinctly serrate in the upper 1/2 to 1/3 of margin, cupule cup-shaped, enclosing 1/3 of nut, bract margin nearly entire, and nuts ellipsoid and hairy, but is distinguished in obovoid to ellipsoid nuts (vs. ovoid-ellipsoid) with convex scar (vs. flat scar). While leaves of mature trees are wider, serrate and glabrous, leaves of young trees are narrower, entire and often hairy. Endemic to Mt. Langbian.



Specimen: *V8094*.

Distylium annamicum (Gagnep.) Airy Shaw

■ Local name: Lưỡnng thư Trung bộ

Kew Bull. 17(2): 264 (1963).

■ Specimens: V8981.

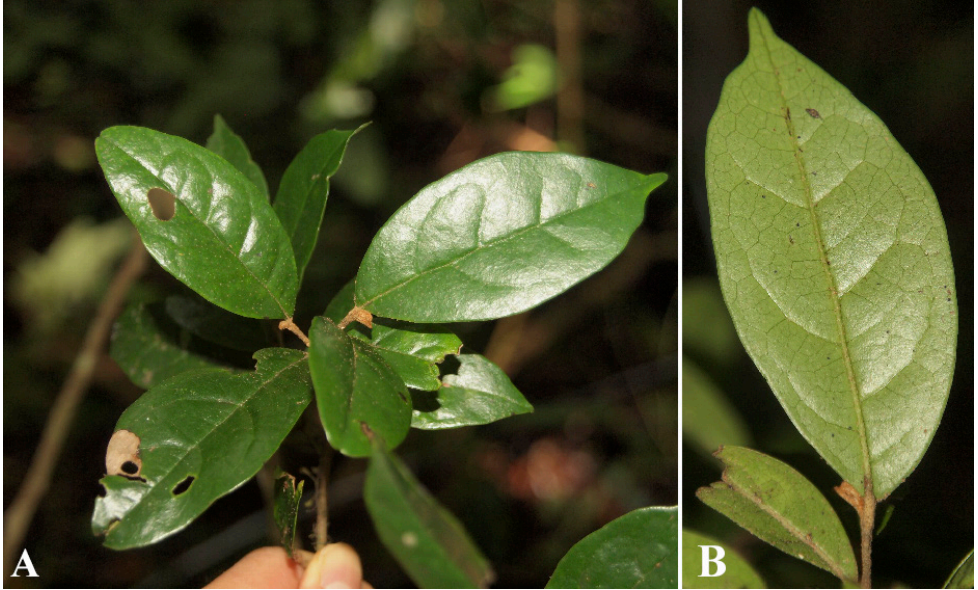
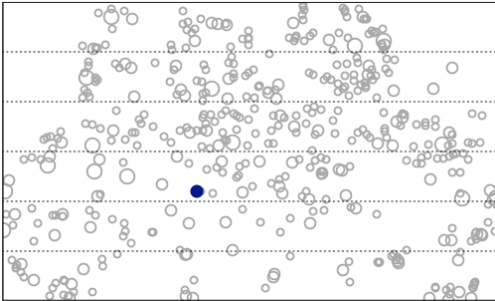


FIG. 40. *Distylium annamicum*. A: leafy branch, B: lower leaf surface. A & B from V8981, Jun. 2018.



No. of individuals: 1. Height: 12 m tall.

DBH: 18.9 cm.

This species is similar to *D. pingpiense* in young branchlets and petioles tomentose, leaves elliptic-lanceolate, hairy along veins below, and reticulate tertiary veins prominent below. This species is distinguished from *D. pingpiense* by obtuse leaf apex (vs. caudate-acuminate). Endemic to Lamdong Province.



Specimen: V8981.

Dichroa febrifuga Lour.

■ **Local name:** Thường sơn

Fl. Cochinch. 1: 301 (1790).

■ **Specimens:** V8135 [fl.].

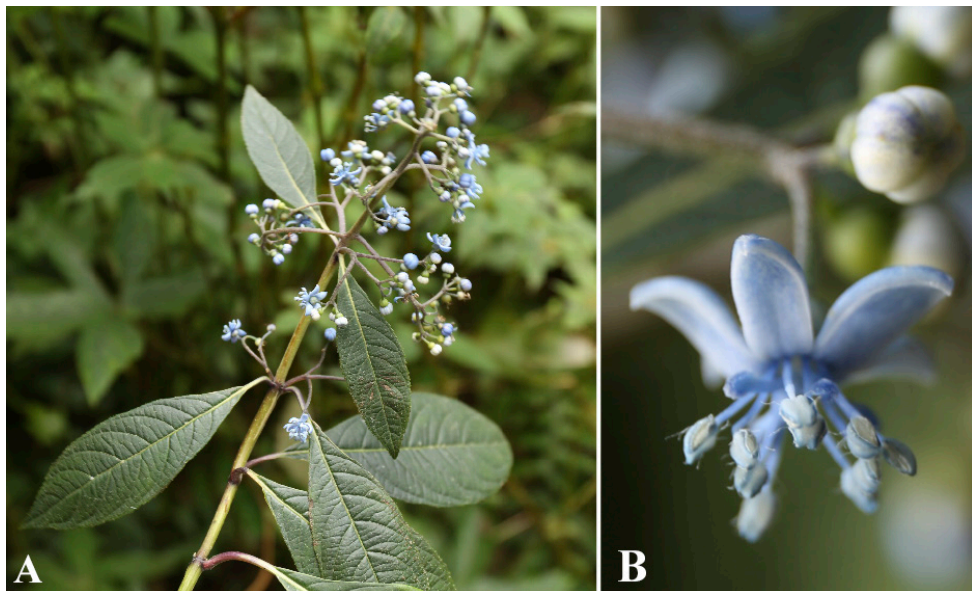


FIG. 41. *Dichroa febrifuga*. A: flowering branch, B: flower. A & B from V8135, Mar. 2018.



Leaf apex (lower surface).

Dichloa febrifuga is common along streams in understory or at edge of evergreen forest. It is easily recognized by its shrubby habit and blue flowers.



Specimen: V8135.

Engelhardia serrata Blume

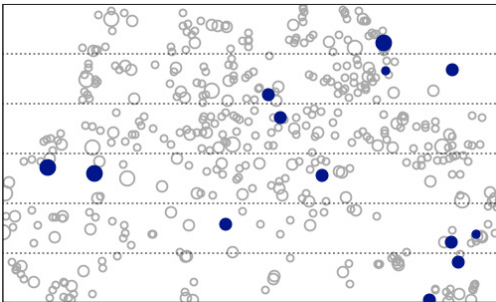
■ Local name: Chẹo răng

Fl. Javae 2: 14, tab.: 4 (1829).

■ Specimens: V7949, V7954, V8970.



FIG. 42. *Engelhardia serrata*. A: leafy branch, B: lower leaf surface, C: shoot apex. A & B from V7949, Mar. 2018; C from V8970, Jun. 2018.



No. of individuals: 13. **Height:** up to 25 m tall.

DBH: 3.7–60.5 (avg. 24.1) cm.

This species is characterized by its pinnate compound leaves with 8–12 oblong leaflets.



Specimen: V7954.

Gomphostemma sp.

■ Local name: Đinh hùng

■ Specimens: V8011.

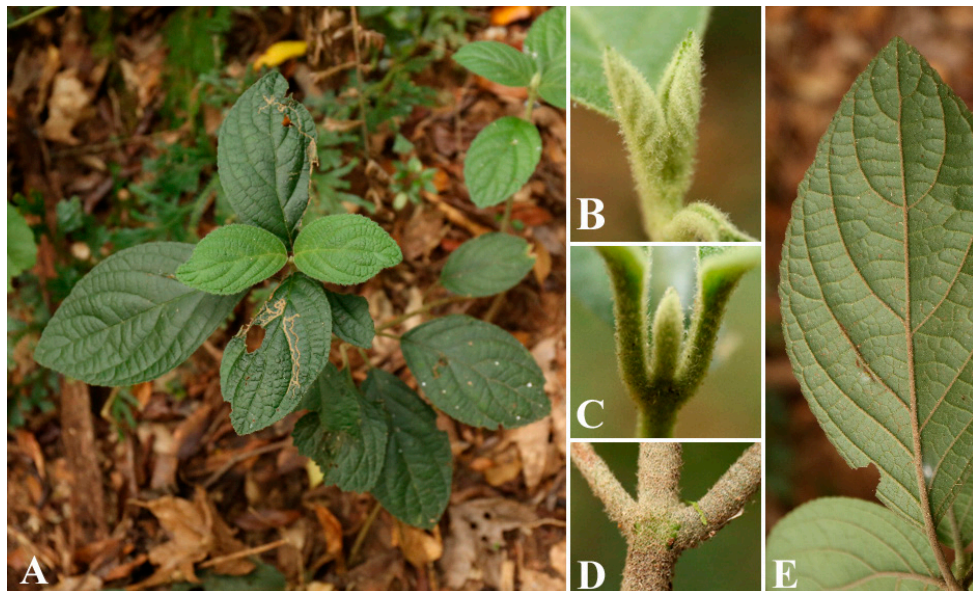
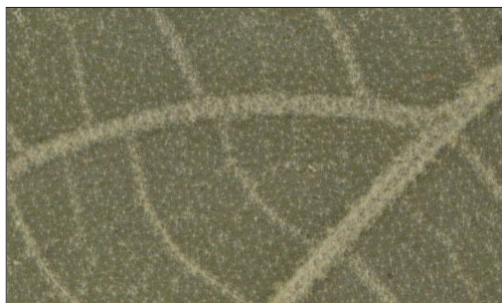


FIG. 43. *Gomphostemma* sp. A: habit, B: young leaves, C: shoot apex, D: base of petiole, E: lower leaf surface. A–E from V8011, Mar. 2018.



Lower leaf surface densely covered with whitish hairs.

Small shrub, 30 cm tall, rare in the plot.



Specimen: V8011.

Actinodaphne langbianensis Yahara & Tagane, *ined.*

■ **Local name:** Bộp Langbian

■ **Specimens:** V7895, V8040, V8960, V9599 [male fl.].

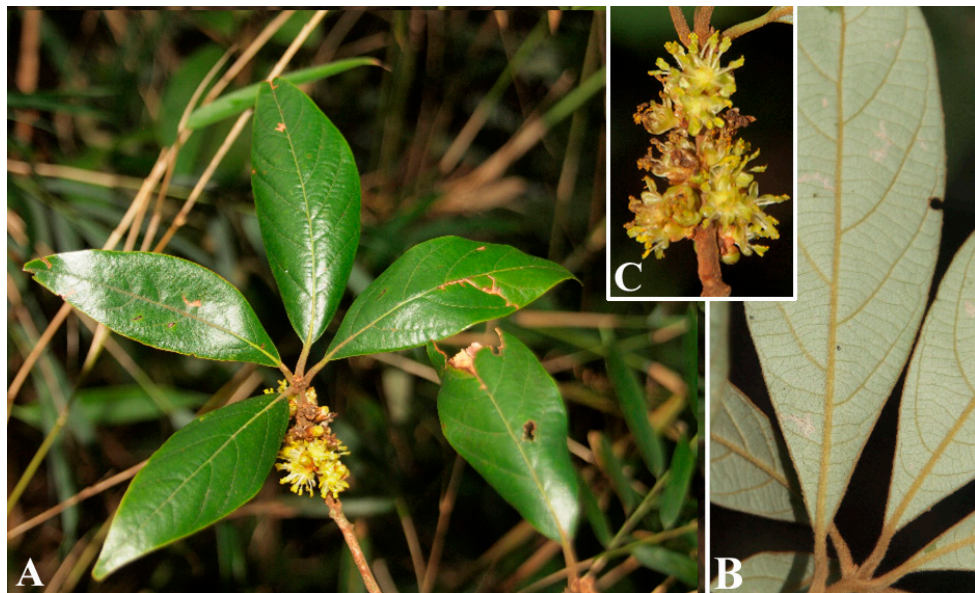
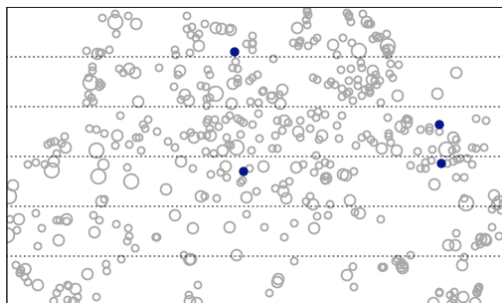


FIG. 44. *Actinodaphne langbianensis*. A: leafy branch, B: portion of lower leaf surface, C: flowers. A–C from V8960, Jun. 2018.



No. of individuals: 4. **Height:** up to 9 m tall.
DBH: 3.0–8.8 (avg. 5.9) cm.

This species is similar to *A. pilosa* (Lour.) Merr. described from Vietnam in having relatively smaller leaves densely pubescent beneath. While *A. pilosa* has obovate leaves, this species has lanceolate leaves. This is endemic to Mt. Langbian and its vicinity.



Specimen: V9599.

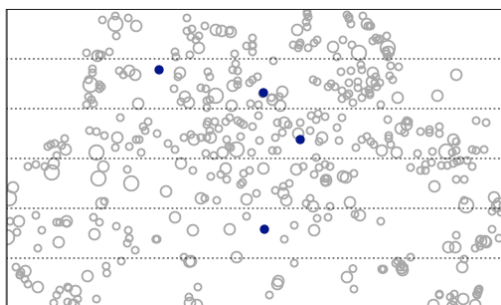
Actinodaphne rehderiana (C.K.Allen) Kosterm. ex Yahara, *comb. nov.*

■ **Local name:** Bộp Rehder Basionym: *Litsea rehderiana* C.K.Allen, Ann. Missouri Bot. Gard. 25: 381 (1938).

■ **Specimens:** *V8095*, *V9001*.



FIG. 45. *Actinodaphne rehderiana*. A: leafy branch, B: portion of lower leaf surface, C: shoot apex. A–C from *V8095*, Mar. 2018.



No. of individuals: 4. **Height:** up to 6.5 m tall.
DBH: 2.0–4.3 (avg. 3.4) cm.

This species is distinct in its large elliptic leaves and hemispherical buds crowded at the shoot apex. This species is described from Mt. Braian of Lamdong Province, and is widely distributed in Bidoup-Nui Ba NP from 1500 m to 1900 m.



Specimen: *V9001*.

Alseodaphne bidoupensis Yahara, *ined.*

■ Local name: Vàng trắng Bidoup

■ Specimens: V8993, V9501.

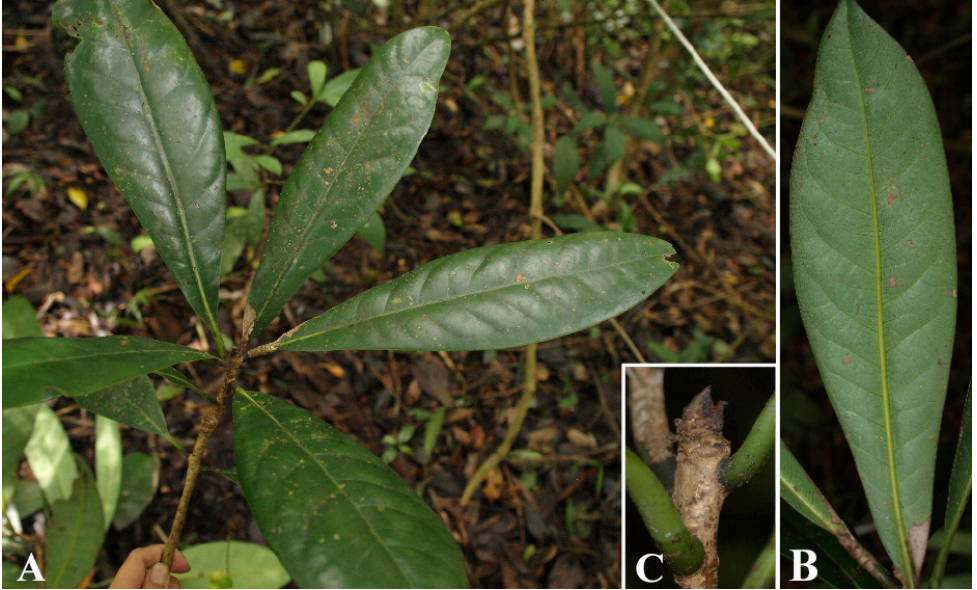
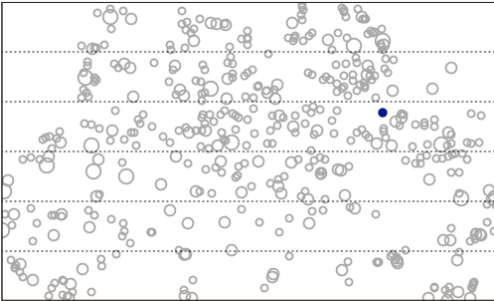


FIG. 46. *Alseodaphne bidoupensis*. A: leafy branch, B: portion of lower leaf surface, C: branch surface & shoot apex. A–C from V8993, Jun. 2018.



No. of individuals: 1. Height: 3.2 m tall.
DBH: 2.9 cm.

This species is similar to *A. rugosa* Merr. & Chun endemic to Hainan Island in having robust branchlets, but distinguished from it in whitish-brown and smooth branchlet surface (vs. dark-brown and *rugosa*). This is endemic to Mt. Langbian and its vicinity.



Specimen: V8993.

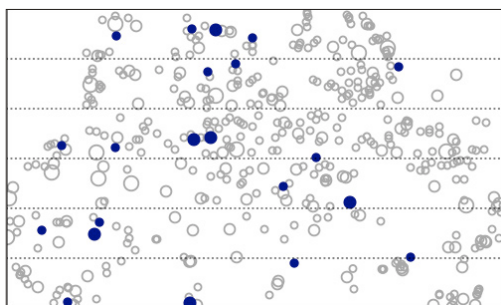
Beilshmiedia langbianensis Yahara, *ined.*

■ **Local name:** Chập chọc Langbian

■ **Specimens:** V7952 [fr.], V8024, V8069, V8971.



FIG. 47. *Beilshmiedia langbianensis*. A: leafy branch, B: lower leaf surface, C: fruits. A–C from V7952, Mar. 2018.



No. of individuals: 21. **Height:** up to 15 m tall.
DBH: 2.2–26.1 (avg. 8.5) cm.

This species is similar to *B. lumutensis* Gamble in having opposite, glabrous and elliptic leaves and lanceolate terminal buds, but distinguished from it in smaller, narrower and thicker leaves with veinlets not distinctly raised (vs. distinctly raised). This is endemic to Mt. Langbian.



Specimen: V7952.

Beilshmiedia nuibamontana Yahara, *ined.*

■ Local name: Chập chợ Núi Bà

■ Specimens: V8026, V9014.

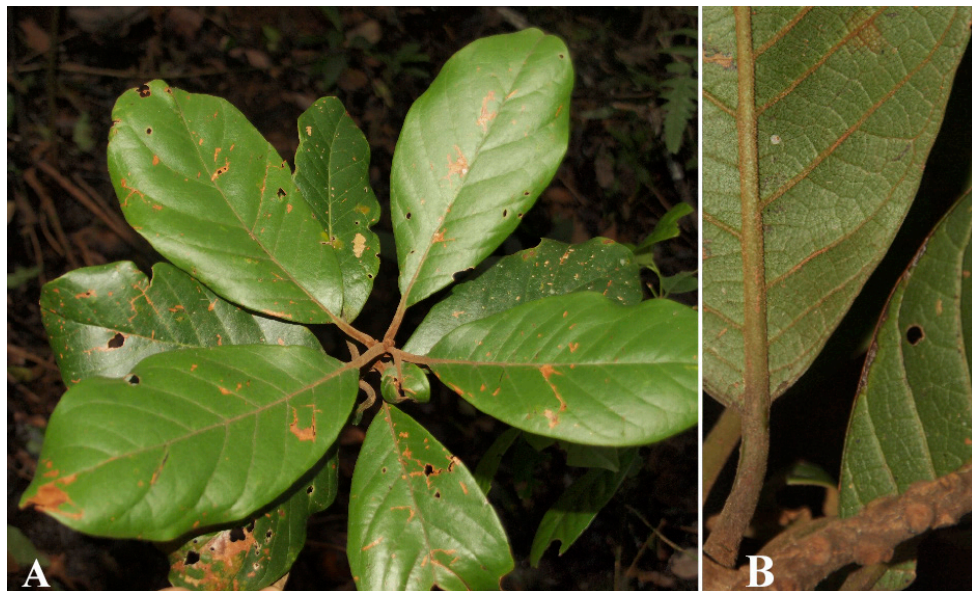
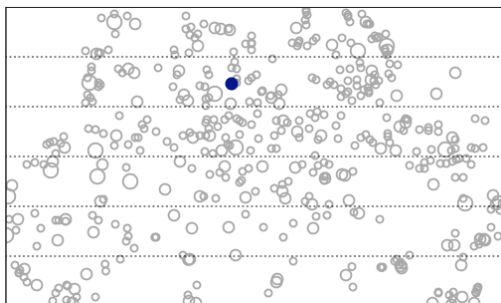


FIG. 48. *Beilshmiedia nuibamontana*. A: leafy branch, B: lower leaf surface. A & B from V9014, Jun. 2018.



No. of individuals: 1. Height: 9.5 m tall.
DBH: 14.3 cm.

This species is similar to *B. vidalii* Kosterm. described from Bach Ma in central Vietnam, but distinct from it in having reticulate tertiary veins (vs. scalariform). This is endemic to Mt. Langbian and its vicinity.



Specimen: V9014.

Lindera bidoupensis Yahara, *ined.*

■ **Local name:** Liên dân Bidoup

■ **Specimens:** V8958.

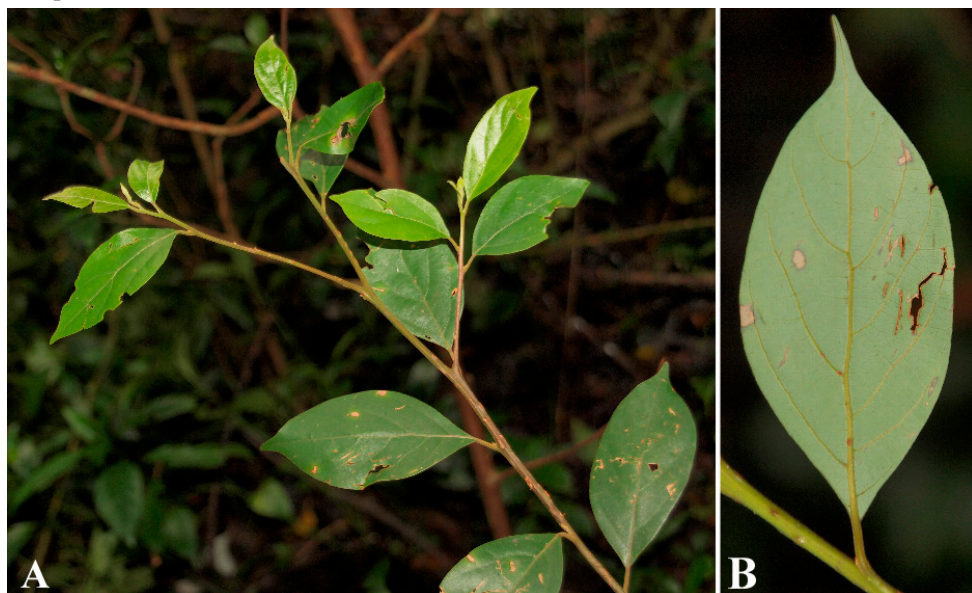
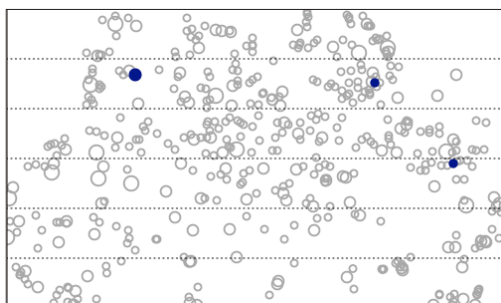


FIG. 49. *Lindera bidoupensis*. A: leafy branch, B: lower leaf surface. A & B from V8958, Mar. 2018.



No. of individuals: 3. **Height:** up to 7.5 m tall.
DBH: 1.8–11.3 (avg. 5.1) cm.

Among species of *Lindera* with pinninerved leaves, this species is similar to *L. balansae* in having scalariform tertiary veins and yellowish brown hairs on young branchlets, petioles and lower surface of leaves, but distinct in having many umbels on a spike (vs. solitary or paired umbels in *L. balansae*).



Specimen: V8958.

Litsea brochidodroma Yahara, ined.

■ Local name: Unknown

■ Specimens: V8103, V8961.

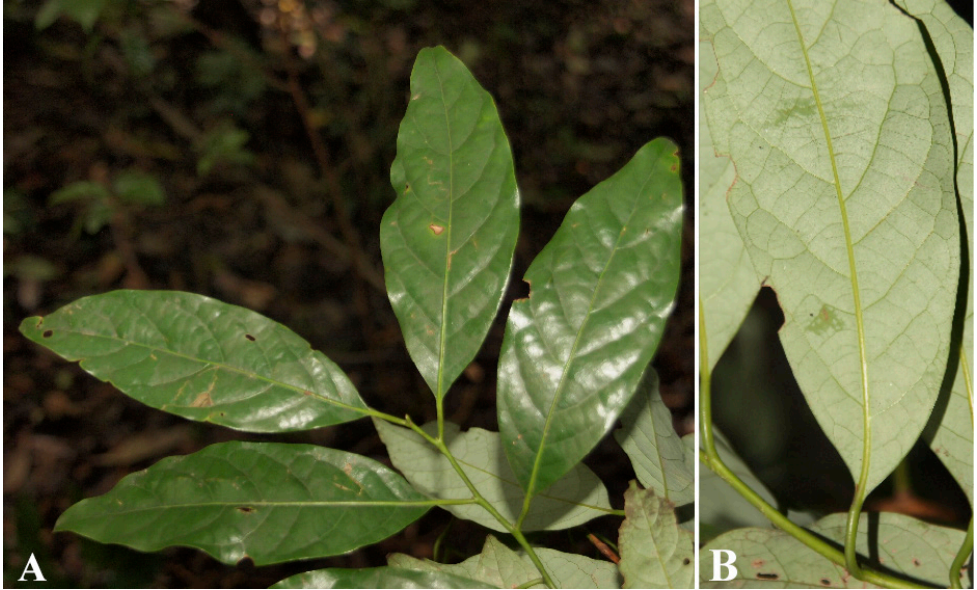
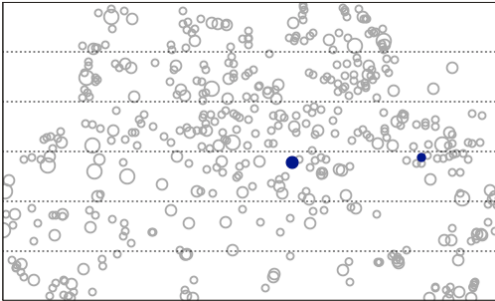


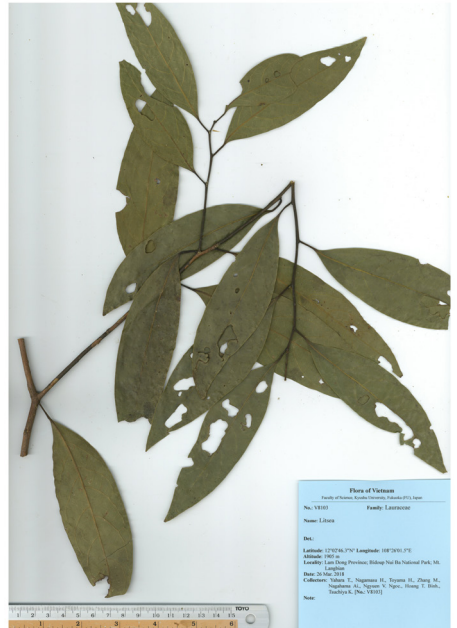
FIG. 50. *Litsea brochidodroma*. A: leafy branch, B: lower leaf surface. A & B from V8961, Mar. 2018.



No. of individuals: 2. **Height:** up to 8 m tall.

DBH: 7.5–11.4 (avg. 9.4) cm.

While our specimens are sterile, we place this species under *Litsea* based on unpublished molecular phylogenetic evidence. This species is characterized by brochidodromous venation; lateral veins are anastomosed with each other, forming a loop. This venation is often found in *Cryptocarya* but quite rare in *Litsea* and *Lindera*. This species is endemic to Mt. Langbian.



Specimen: V8103.

Litsea laeta (Wall.) Benth. & Hook.f.

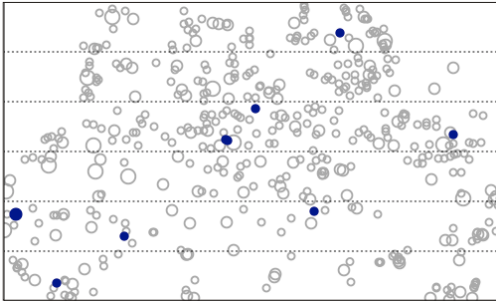
■ **Local name:** Bôi lòi

Fl. Brit. India 5: 169 (1886).

■ **Specimens:** V7951, V8006, V8019 [fl. bud], V8091 [fl. bud], V8990, V9003 [fl. bud], V9029 [fl.].



FIG. 51. *Litsea laeta*. A: leafy branch, B: lower leaf surface, C: male flowers, D: perianth of male flower. A & B from V8990, Jun. 2018; C & D from V9029, Jun. 2018.



No. of individuals: 9. **Height:** up to 11 m tall.
DBH: 2.1–20.1 (avg. 6.2) cm.

This species is characterized by lanceolate, chartaceous, and glabrous leaves glaucous beneath, with 6–8 pairs of lateral veins and indistinct tertiary veins. This species is common in Bidoup-Nui Ba NP, from 1500 m to 1900 m. This species is distributed from Himalaya to northern Thailand and disjunctively in southern Vietnam.



Specimen: V9029.

Machilus bidoupensis Yahara, *ined.*

■ Local name: Kháo Bidoup

■ Specimens: V8986.

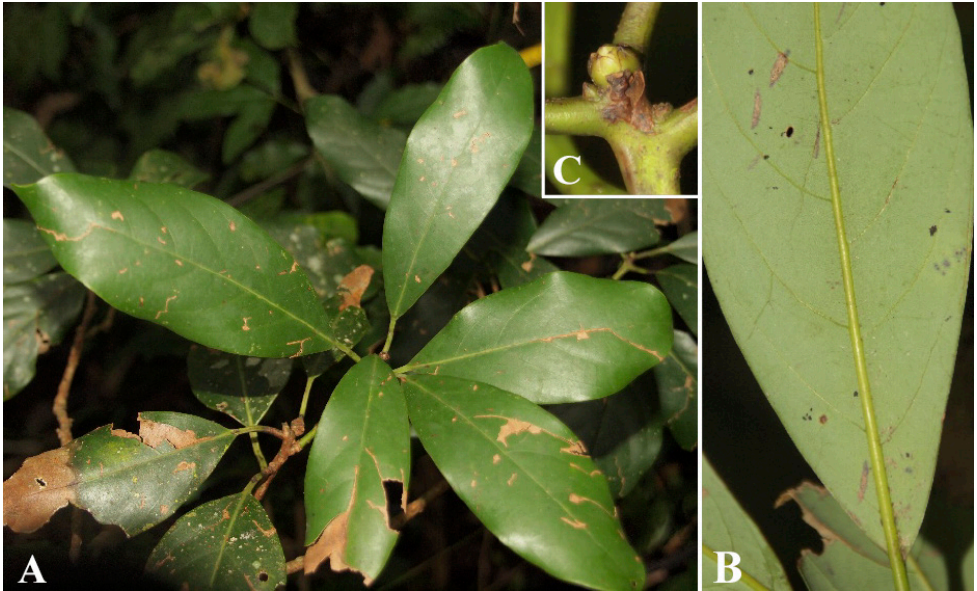
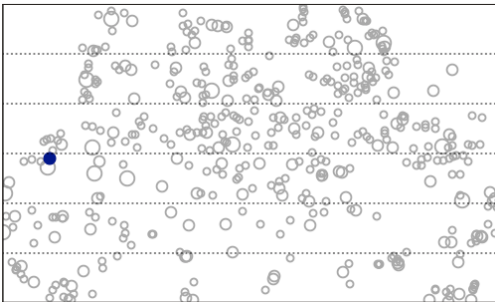
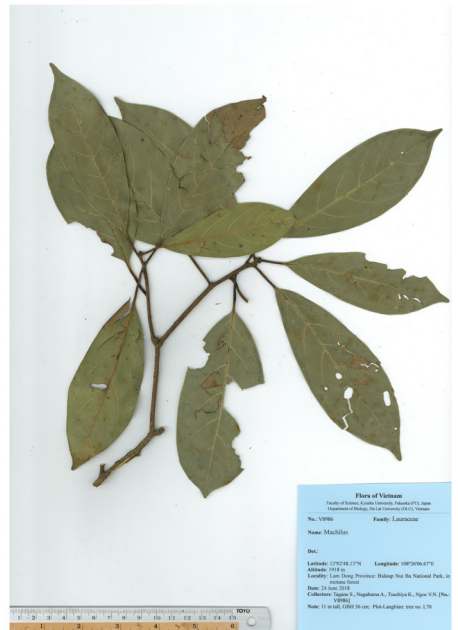


FIG. 52. *Machilus bidoupensis*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V8986, Jun. 2018.



No. of individuals: 1. **Height:** 11 m tall.
DBH: 11.5 cm.

This species is similar to *M. bokorensis* of Mt. Bokor, Cambodia in having scaly terminal buds, almost glabrous branchlets, and lanceolate leaves clustered on the top of branchlets, but different from it in smaller terminal buds. This species has larger leaves than *M. langbianensis*. This species is found widely in Bidoup-Nui Ba NP, from 1500 m to 1900 m.



Specimen: V8986.

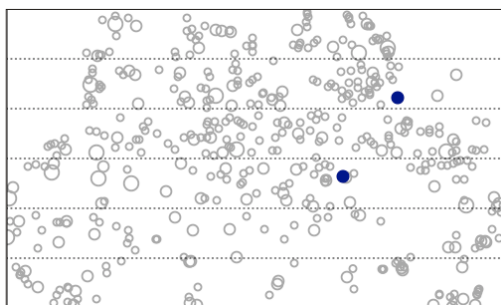
Machilus langbianensis Yahara, *ined.*

■ **Local name:** Kháo Langbian

■ **Specimens:** V7999, V8025, V8065, V8090, V8966.



FIG. 53. *Machilus langbianensis*. A: leafy branch, B: shoot apex, C: lower leaf surface. A & B from V8025, Jun. 2018.



No. of individuals: 2. **Height:** up to 11 m tall.
DBH: 16.2–22.0 (avg. 19.1) cm.

This species is distinguished from *M. bidoupensis* in its smaller leaves and larger terminal buds. *Machilus bidoupensis* and *M. langbianensis* are placed at different positions on an unpublished molecular phylogenetic tree. *Machilus langbianensis* is common in Mt. Langbian but rare in the eastern part of Bidoup-Nui Ba NP.



Specimen: V8966.

Machilus myrsinifolia Yahara, *ined.*

■ Local name: Khảo cơm nguội

■ Specimens: V8058, V9000.

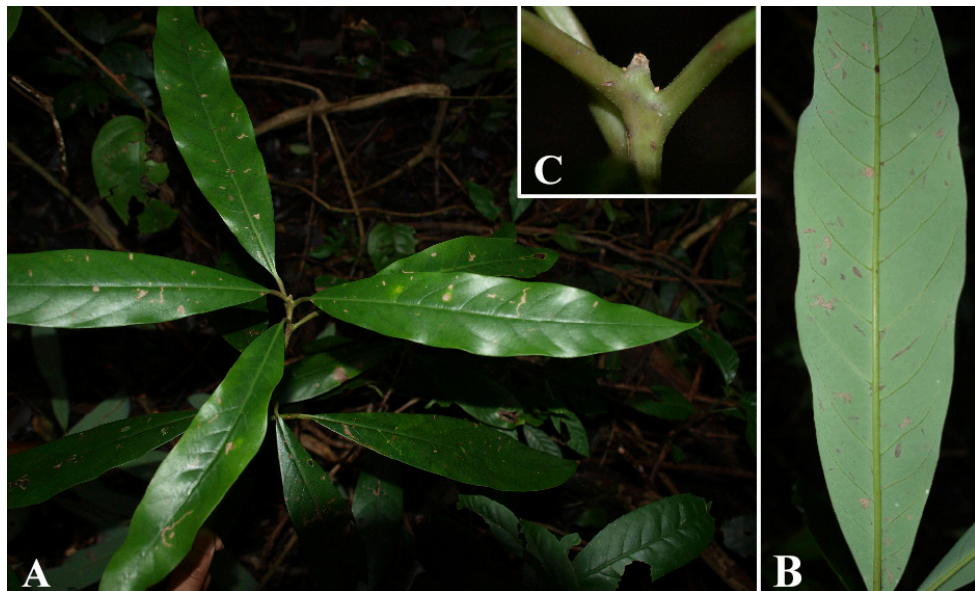
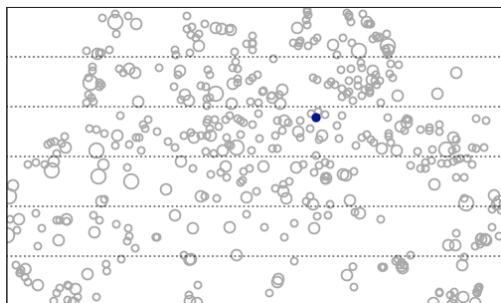
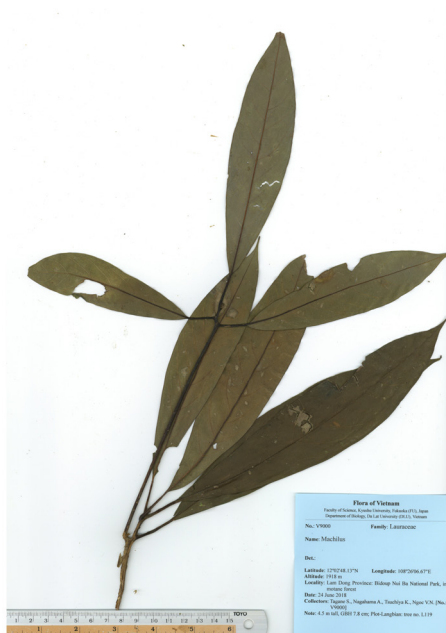


FIG. 54. *Machilus myrsinifolia*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V9000, Jun. 2018.



No. of individuals: 1. Height: 4.5 m tall.
DBH: 2.5 cm.

This species is distinct in its linear-lanceolate leaves and almost naked terminal buds. This species is distributed widely from 1500 m to 1900 m in Bidoup-Nui Ba NP and also in the top area of Hon Ba Nature Reserve, at about 1500 m above the sea level.



Specimen: V9000.

Neolitsea langbianensis Yahara & Tagane, *ined.*

■ **Local name:** Tân bời lời Langbian

■ **Specimens:** *V8978*, *V9028* [young fl. bud & fr.], *V9037*, *V9592* [fr.].

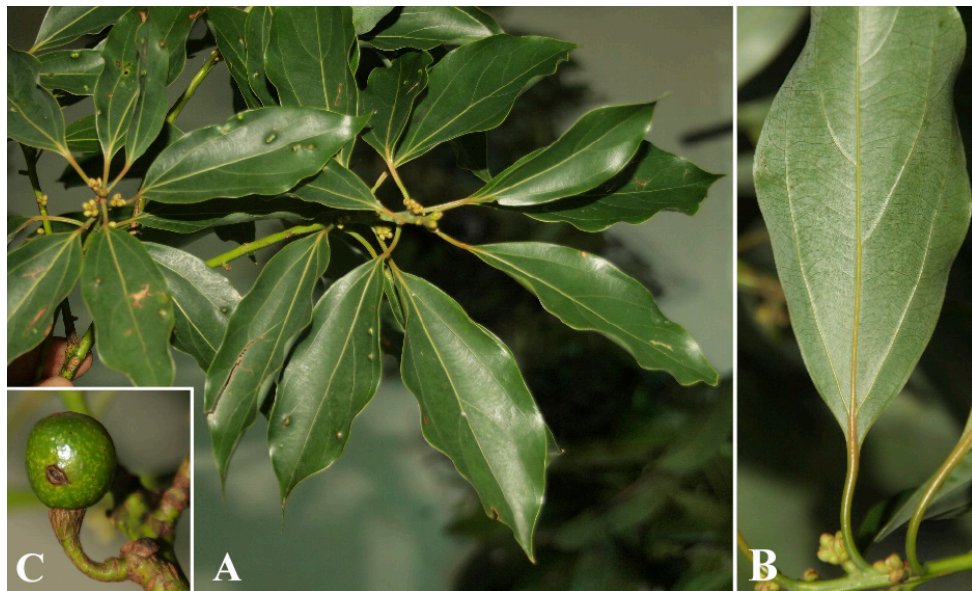
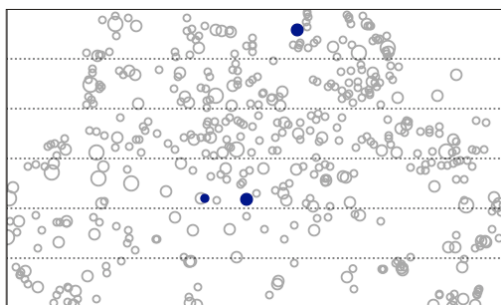


FIG. 55. *Neolitsea langbianensis*. A: leafy branch, B: lower leaf surface, C: fruit. A–C from *V9037*, Jun. 2018.



No. of individuals: 3. **Height:** up to 12 m tall.

DBH: 4.9–19.9 (avg. 12.4) cm.

This species is similar to *N. polycarpa* H.Liu in having elliptic to oblong-elliptic leaves with long petioles, triplinerved veins, and additional 2–3 pairs of lateral veins, but distinct from it in having globose fruits and dense scalariform tertiary veins raised on the lower surface of leaves. This species is distributed widely from 1500 m to 1900 m in Bidoup-Nui Ba NP and endemic to this area.



Specimen: *V9028*.

Neolitsea tomentosa H.W.Li

■ **Local name:** Tân bời lồi qui

Philipp. J. Sci. 13(3): 138–139 (1918).

■ **Specimens:** V9494.

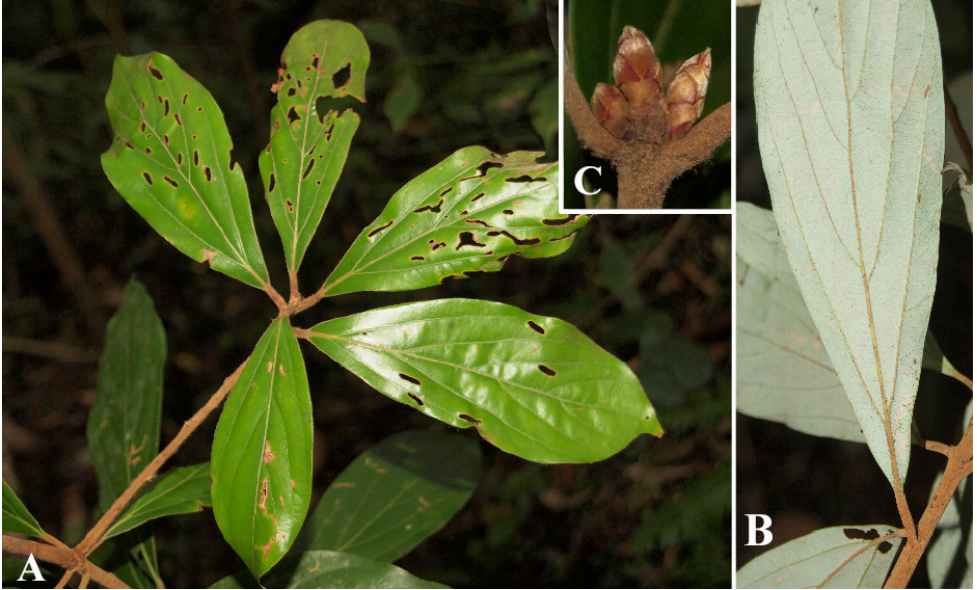
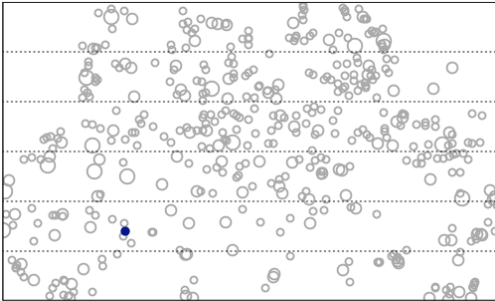


FIG. 56. *Neolitsea tomentosa*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V9494, Sept. 2018.



No. of individuals: 1. **Height:** 4.5 m tall.

DBH: 2.9 cm.

This species is characterized by oblong-oblancoate leaves with caudate-acuminate apex and dense tomentum on branchlets, petioles, and lower surface of leaves. This species is described from SE Yunnan and Mt. Langbian is the second locality. While *N. tomentosa* in Yunnan is described to have yellow-brownish tomentum, the specimen of Mt. Langbian has bright brown tomentum.



Specimen: V9494.

Magnolia braianensis Gagnep.

■ **Local name:** Dà hớp Braian

Acta Phytotax. Sin. 16(4): 41 (1978).

■ **Specimens:** V8097, V9012.

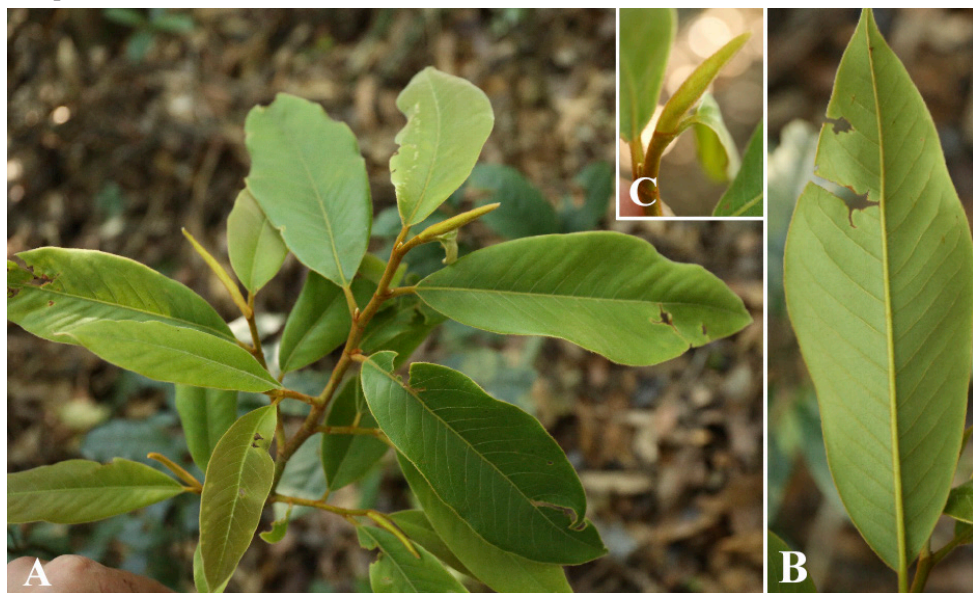
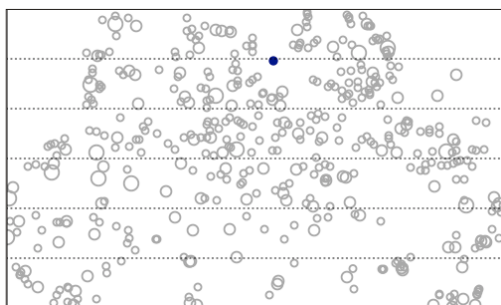


FIG. 57. *Magnolia braianensis*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V8097, Jun. 2018.



No. of individuals: 1. **Height:** 5.5 m tall.
DBH: 4.0 cm.

Magnolia braianensis is occasional in hill evergreen forest to lower montane forest in the national park.



Specimen: V9012.

Magnolia duclouxii (Finet & Gagnep.) Hu

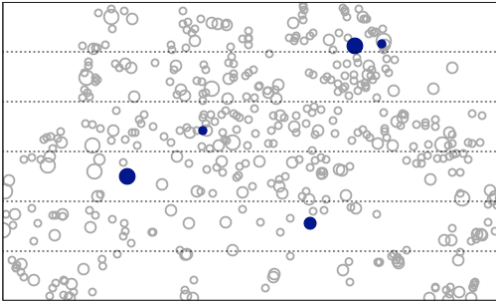
■ **Local name:** Dà hợp Ducloux

Icon. Pl. Sin. 2: 18 (1929).

■ **Specimens:** V7893, V8052, V8985.



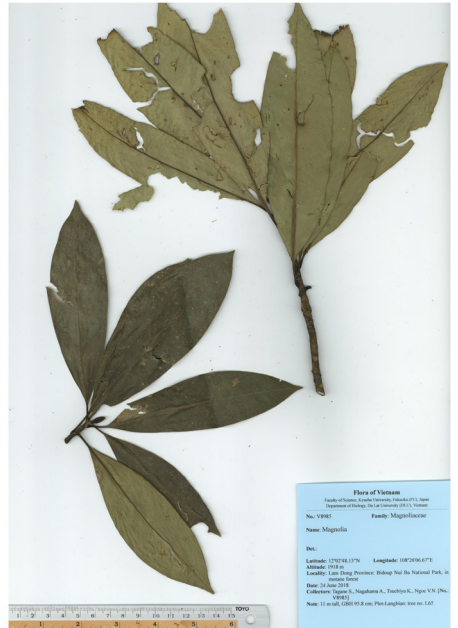
FIG. 58. *Magnolia duclouxii*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V8052, Mar. 2018.



No. of individuals: 5. **Height:** up to 16 m tall.

DBH: 2.1–43.0 (avg. 21.3) cm.

Magnolia duclouxii is commonly found in hill evergreen forest to lower montane evergreen forest in the national park. It is easily distinguished from the other two *Magnolia* species of Mt. Langbian by its glabrous leaves and twigs.



Specimen: V8985.

Magnolia langbianensis Yahara, *ined.*

■ **Local name:** Dạ hợp Langbian

■ **Specimens:** V8146 [fl.], V8991.

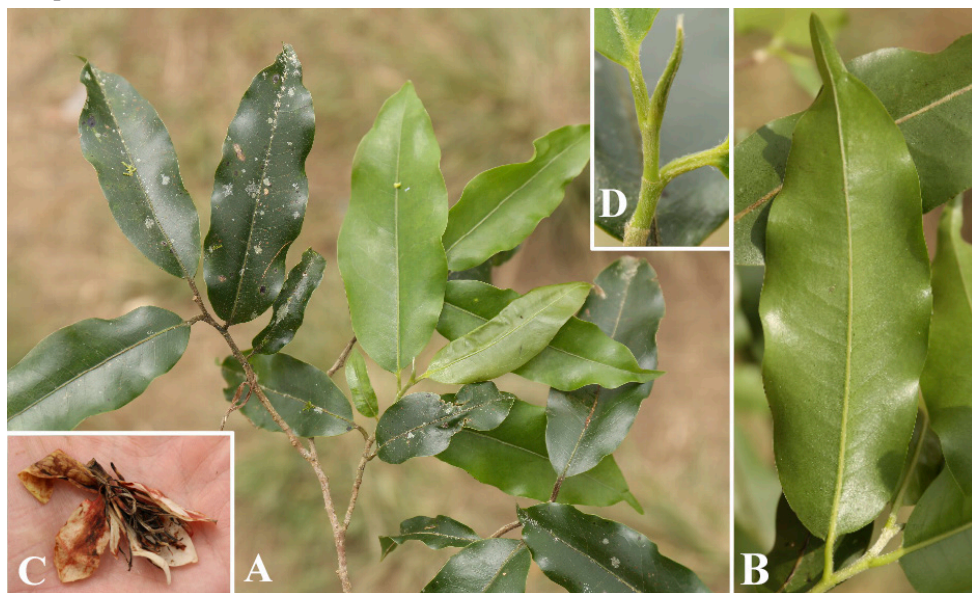
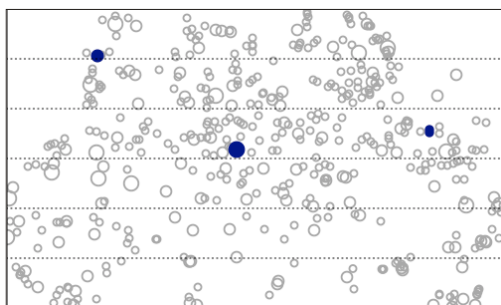


FIG. 59. *Magnolia langbianensis*. A: leafy branch, B: lower leaf surface, C: dropped flower, D: new leaves. A–D from V8146, Mar. 2018.



No. of individuals: 4. **Height:** up to 18 m tall.
DBH: 3.2–66.3 (avg. 2) cm.

We collected this species within and nearby the plot of Mt. Langbian and also along the trail to the summit. The species is similar to *Magnolia eriostepta* in its long whitish silky hairs on bud and young leaves, but leaves are lanceolate and glabrescent beneath (vs. elliptic and densely hairy beneath). We collected white flowers fallen on the ground.



Specimen: V8146.

***Melastoma* sp.**

■ **Local name:** Muôi

■ **Specimens:** V8023, V9002, V9015 [fl. & young fr.].

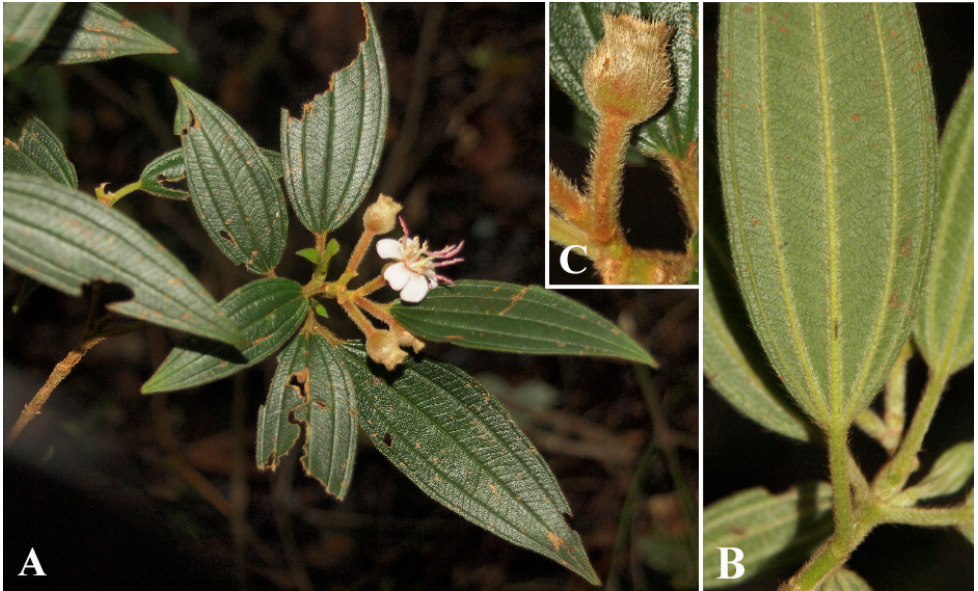
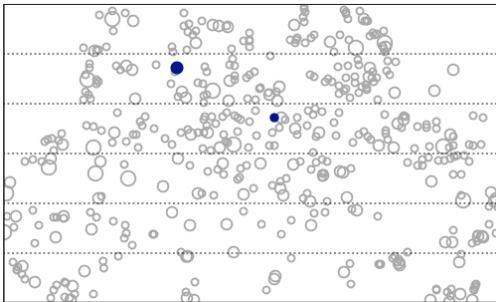


FIG. 60. *Melastoma* sp. A: flowering branch, B: lower leaf surface, C: young fruits. A–C from V9015, Jun. 2018.



No. of individuals: 2. **Height:** up to 8 m tall.

DBH: 4.1–17.7 (avg. 10.9) cm.

This species might be a form of *Melastoma klossii* Baker f. that was described from Dalat in 1921. However, our collection V9015 has smaller flowers compared with the original description of *M. klossii*. We need to examine the type specimen of *M. klossii* to identify V9015.



Specimen: V9015.

Dysoxylum cyrtobotryum Miq.

■ **Local name:** Huỳnh đàn Nam bộ

Fl. Ned. Ind., Eerste Bijv. 3: 504 (1861).

■ **Specimens:** V7991.

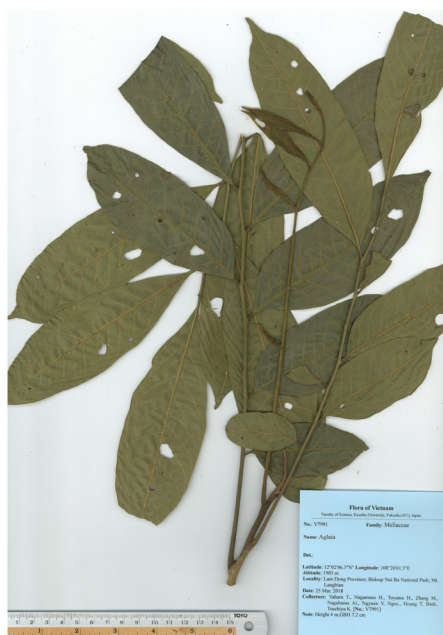


FIG. 61. *Dysoxylum cyrtobotryum*. A: leafy branch, B: shoot apex, C: lower surface of leaflet. A–C from V7991, Mar. 2018.



Leaf apex (lower surface).

Only one individual was found outside the plot. This species is widely distributed in Indochina and Malaysia.



Specimen: V7991.

Toona ciliata M.Roem.

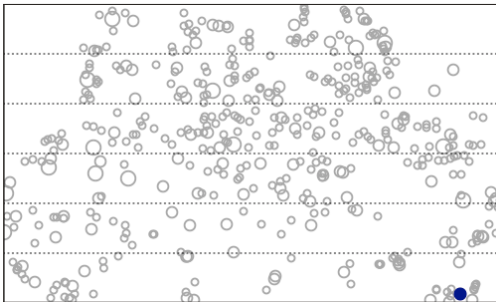
■ Local name: Hương xuân

■ Specimens: V9498, V9605.

Fam. Nat. Syn. Monogr. 1: 139 (1846).



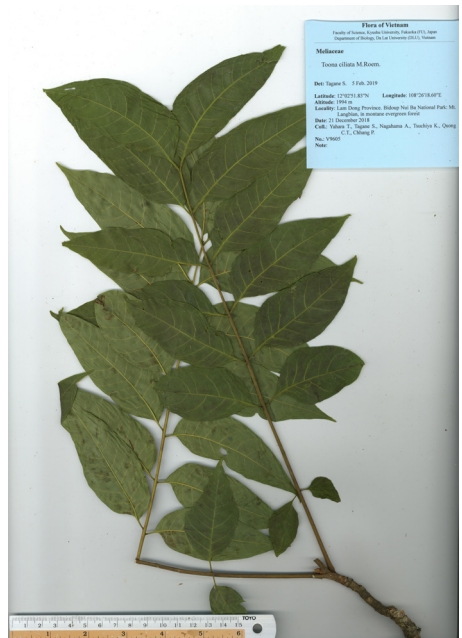
FIG. 62. *Toona ciliata*. A: leafy branch, B: lower surface of leaflet, C: shoot apex. A–C from V9498, Mar. 2018.



No. of individuals: 1. Height: 9 m tall.

DBH: 17.7 cm.

Toona ciliata is the most widely distributed species in the genus and it occurs throughout SE Asia. In Bidoup-Nui Ba NP, it is not rare and can be seen in various forest types including hill evergreen forest to montane evergreen forest.



Specimen: V9605.

Pericampylus glaucus (Lam.) Merr.

■ **Local name:** Dây Châu đảo

Interpr. Herb. Amboin.: 219 (1917).

■ **Specimens:** V7911, V8122 [fl. Bud & fr.].

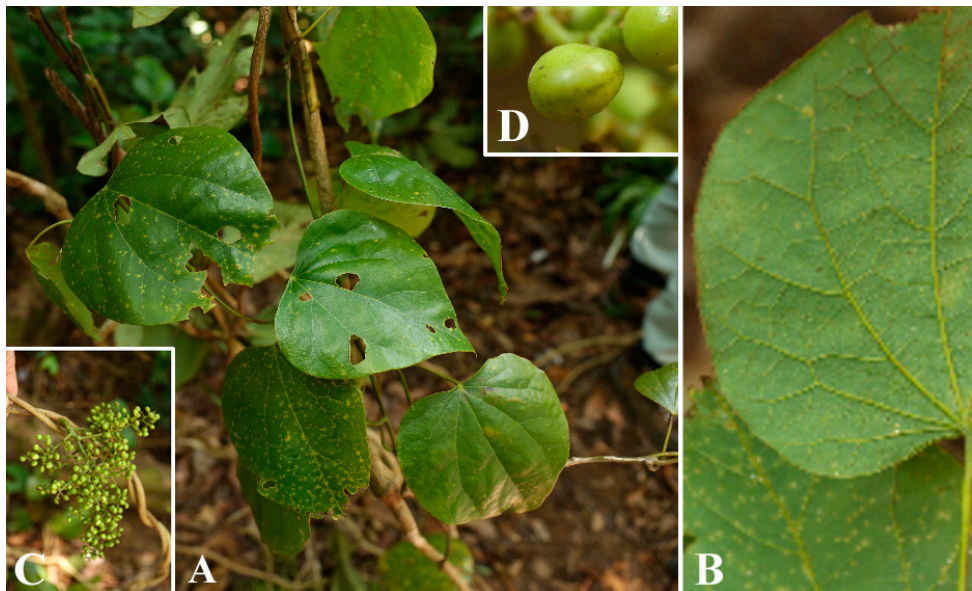


FIG. 63. *Pericampylus glaucus*. A: leafy branch, B: portion of lower leaf surface, C: young inflorescence, D: fruit. A–D from V8122, Mar. 2018.



Leaf base (upper surface).

This species is a woody vine widely distributed from China to Malaysia, and also in India. This species is characterized by triangular-ovate leaves, palmately 3–5 veined, tomentose below, obtuse to rounded at apex, and subtruncate to cordate at base. This species was collected at 1900 m of Mt. Langbian.



Specimen: V8122.

Apodytes dimidiata E.Mey. ex Arn.

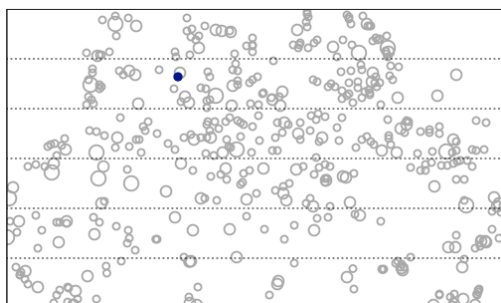
■ Local name: Sài long

J. Bot. [Hooker] 3: 155 (1840).

■ Specimens: V8100, V9016.



FIG. 64. *Apodytes dimidiata*. A: leafy branch, B: portion of lower leaf surface. A & B from V9016, Jun. 2018.



No. of individuals: 1. **Height:** 4 m tall.
DBH: 3.7 cm.

This is a small tree. Only one individual was recorded in the plot. The species is widely distributed from Africa to throughout SE Asia. The leaves are blackish when dry.



Specimen: V9016.

Syzygium cochinchinense (Gagnep.) Merr. & L.M.Perry

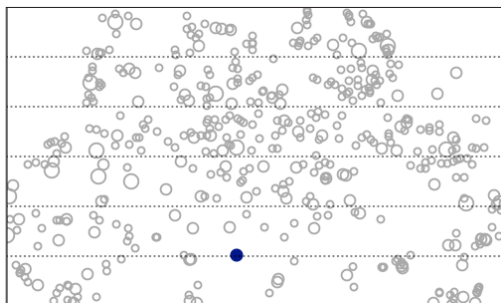
■ **Local name:** Trâm Nam bộ

J. Arnold Arbor. 19: 107 (1938).

■ **Specimens:** V9493.



FIG. 65. *Syzygium cochinchinense*. A: leafy branch, B: lower leaf surface. A & B from V9493, Sept. 2018.



No. of individuals: 1. **Height:** 8 m tall.

DBH: 11.3 cm.

This species is distinct in having oblong–lanceolate leaves undulate along margin and whitish gray branchlets. This species is often reduced to *S. ripicola* (Craib) Merr. & L.M.Perry, but *S. ripicola* is distinguished by its narrower leaves with finely reticulate tertiary veins. While *S. ripicola* grows in river banks, *S. cochinchinense* grows in montane forest.



Specimen: V9493.

Syzygium sp.

■ Local name: Trâm

■ Specimens: V8977.

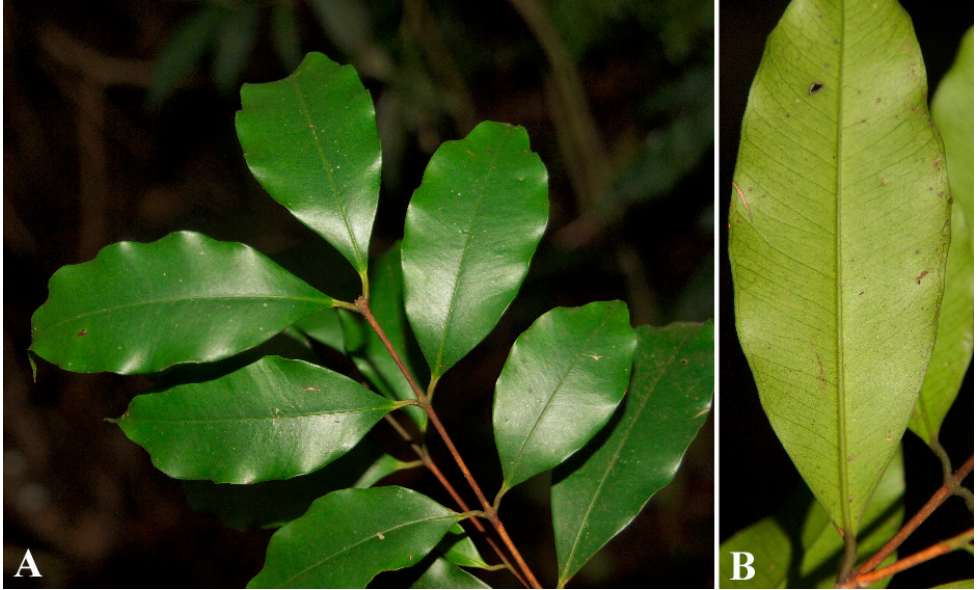
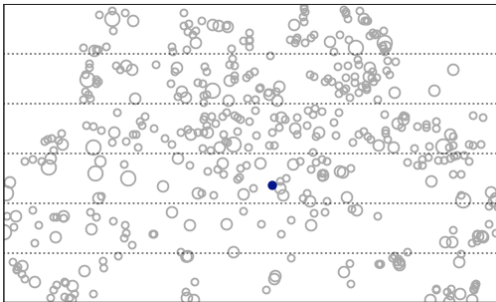


FIG. 66. *Syzygium* sp. A: leafy branch, B: lower leaf surface. A & B from V8977, Jun. 2018.



No. of individuals: 1. Height: 8 m tall.

DBH: 9.3 cm.

This species is similar to *Syzygium levinei* (Merr.) Merr. & L.M.Perry in having elliptic leaves caudate-acuminate at apex, cuneate at base, but differs in larger leaves and reddish brown branchlets (vs. whitish in *S. levinei*).



Specimen: V8977.

Eurya cf. *nitida* Korth.

■ Local name: Chè cầu

■ Specimens: V7945.



FIG. 67. *Eurya* cf. *nitida*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V7945, Mar. 2018.



Leaf apex (lower surface).

We found only one tree outside the plot. It is characterized by its smooth terminal buds and young shoots, and glossy oblong leaves.



Specimen: V7945.

Eurya trichocarpa Korth.

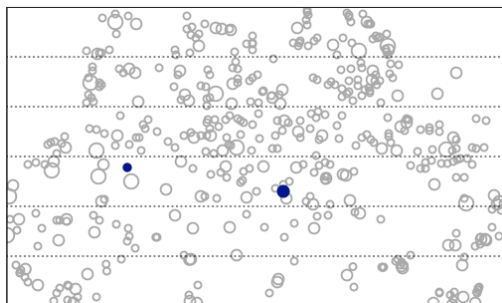
■ **Local name:** Linh trái có lông

Verh. Nat. Gesch. Ned. Bezitt., Bot.: 114 (1842).

■ **Specimens:** V8127, V8976, V9040 [fl. bud].



FIG. 68. *Eurya trichocarpa*. A: leafy branch, B: lower leaf surface. A & B from V9040, Jun. 2018.



No. of individuals: 2. **Height:** up to 9 m tall.

DBH: 6.1–15.9 (avg. 11.0) cm.

Eurya trichocarpa is small tree to 10 m tall. It is distinguished from *Eurya acuminata*, a common species in southeastern Asia, and *E. cf. nitida* found in the plot, by its hairy terminal buds, young shoots, ovary and fruits.



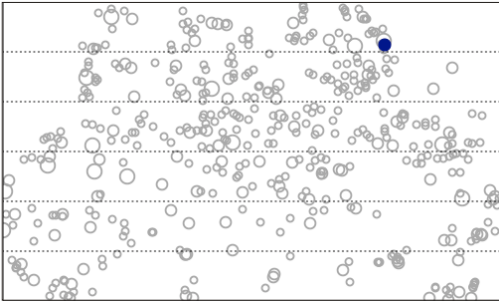
Specimen: V9040.

Ternstroemia sp.

- Local name: Unknown
- Specimens: V9018.



FIG. 69. *Ternstroemia* sp. A: leafy branch, B: lower leaf surface. A & B from V9018, Jun. 2018.



No. of individuals: 1. Height: 9 m tall.
DBH: 12.6 cm.

In Bidoup-Nui Ba NP, there are at least two species of *Ternstroemia*. One species (*T. gymnanthera*) flowers in March and has thicker and obovate leaves. Another species (*T. sp.*) flowers in June and has thinner, lanceolate, and undulate leaves. Further studies are needed to identify this species.



Specimen: V9018.

Glochidion annamense Champ. ex Benth.

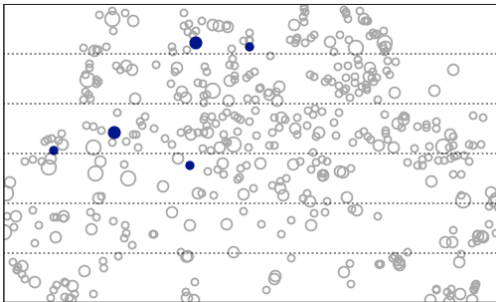
■ **Local name:** Bọt ếch

Fl. Indo-Chine [P.H. Lecomte et al.] 5: 627 (1927).

■ **Specimens:** V7944, V7956 [fl. bud], V8983, V9007.



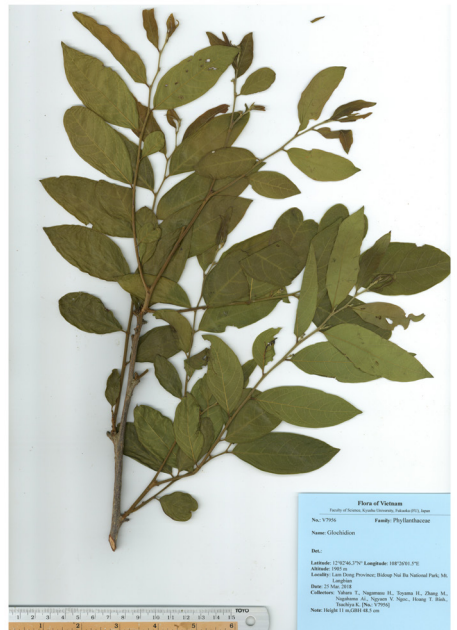
FIG. 70. *Glochidion annamense*. A: branch with male flowers, B: lower leaf surface, C: flower buds. A–C from V7956, Mar. 2018.



No. of individuals: 5. **Height:** up to 9.5 m tall.

DBH: 4.3–14.3 (avg. 9.5) cm.

This is a tree common in gaps or at the edge of the evergreen forest in Bidoup-Nui Ba NP. *Glochidion annamense* is sometimes treated as a synonym of *G. eriocarpum* Champ. ex Benth. but we consider the two are distinct species from each other.



Specimen: V7956.

Glochidion ellipticum Wight

■ Local name: Bọt ếch bầu dục

Fl. Brit. India 5: 319 (1887).

■ Specimens: V7993, V7996 [fl.].

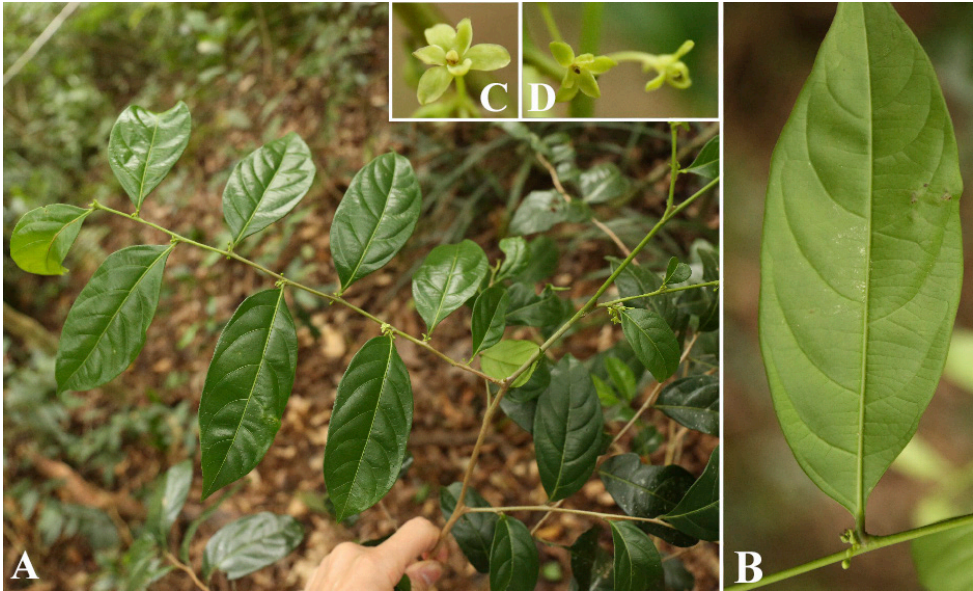


FIG. 71. *Glochidion ellipticum*. A: branch with flowers, B: lower leaf surface, C & D: front and side views of flowers, respectively. A–D from V7996, Mar. 2018.



Leaf apex (lower surface).

This is a tree common in and around the plot. It is easily distinguishable from *G. annamense* by its glabrous twigs and leaves.



Specimen: V7996.

Pittosporum pauciflorum Hook. & Arn.

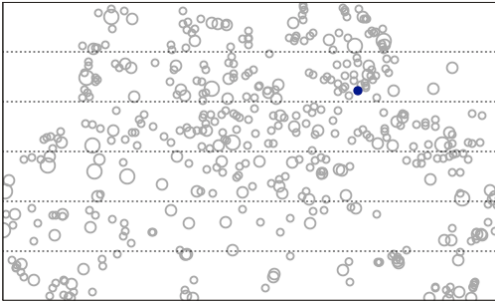
■ **Local name:** Hắc châu ít hoa

Bot. Beechey Voy.: 168, t. 32 (1833).

■ **Specimens:** V7890 [fl.], V7908 [fl.], V9010.



FIG. 72. *Pittosporum pauciflorum*. A: flowering branch, B: flower & flower buds, C: lower leaf surface. A–C from V7890, Mar. 2018.



No. of individuals: 1. **Height:** 3 m tall.

DBH: 1.8 cm.

This is an evergreen shrub or small bushy tree up to 4.5 m tall, scattered at edge of evergreen forest. The leaves are crowded in pseudo-whorls near the end of twigs.



Specimen: V7908.

Podocarpus neriifolius D. Don

■ Local name: Thông tre

■ Specimens: V7992.

Descr. Pinus [Lambert] 2: 21 (1824).



FIG. 73. *Podocarpus neriifolius*. A: leafy branch, B: shoot apex, C: portion of lower leaf surface. A–C from V7992, Mar. 2018.



Leaf apex (lower surface).

This species is widely distributed in SE Asia, extending to Papua New Guinea and Pacific Islands. In Bidoup-Nui Ba, it is occasional in hill evergreen up to montane forest.



Specimen: V7992.

***Polygala arillata* Buch.-Ham. ex D. Don**

■ **Local name:** Kích ngũ mồng

Prodr. Fl. Nepal.: 199 (1825).

■ **Specimens:** V8066 [fl. bud], V9025 [fl. & fr.].

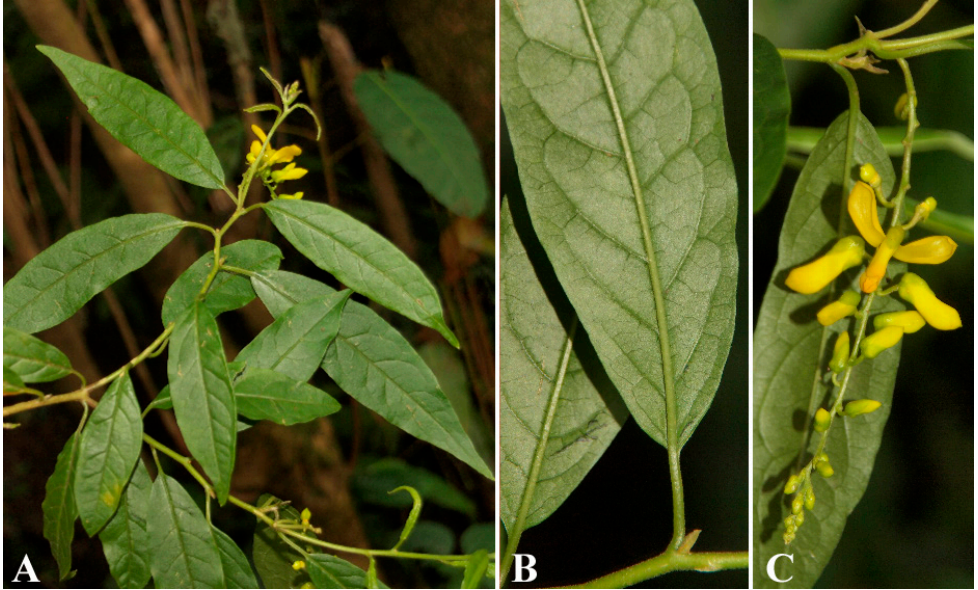


FIG. 74. *Polygala arillata*. A: flowering branch, B: lower leaf surface, C: inflorescence. A–C from V9025, Jun. 2018.



A reniform fruit containing 2 seeds.

This is a shrub up to 3 m, occasional in forest margin. In Mt. Langbian, we found this species along the summit trail. It is widely distributed in continental SE Asia and China.



Specimen: V9025.

Ardisia crenata Sims

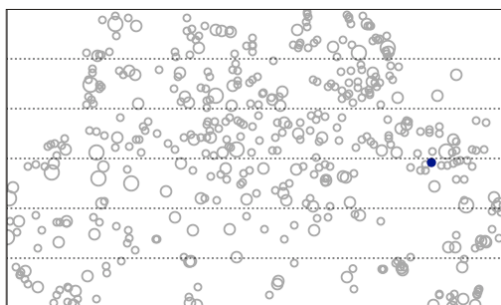
■ **Local name:** Com ngội răng

Bot. Mag. 45: t. 1950 (1817).

■ **Specimens:** V7913, V8047 [fl.], V8962.



FIG. 75. *Ardisia crenata*. A: leafy branch, B: lower leaf surface, C: flower & flower buds. A & B from V8962, Jun. 2018; C from V8047, Mar. 2018.



No. of individuals: 1. **Height:** 3 m tall.

DBH: 1.8 cm.

This species is similar to *Ardisia maculosa* Mez var. *panctatilimba* C.M.Hu but leaves are thinner and secondary veins are not so prominent on lower surface.



Specimen: V8047.

Ardisia evrardii Pit.

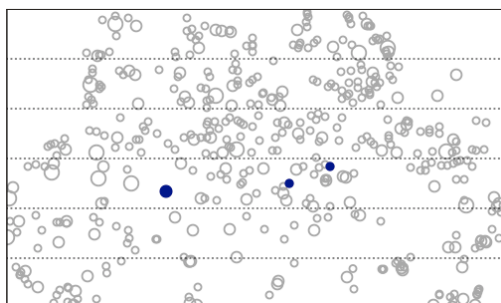
■ **Local name:** Cơm nguội Evrard

■ **Specimens:** V7920, V8969.

Fl. Indo-Chine [P.H. Lecomte et al.] 3: 825 (1930).



FIG. 76. *Ardisia evrardii*. A: leafy branch, B: portion of lower leaf surface. A & B from V8969, Jun. 2018.



No. of individuals: 3. **Height:** up to 6 m tall.

DBH: 1.8–11.8 (avg. 5.3) cm.

Ardisia evrardii is endemic to Bidoup-Nui Ba NP and its vicinity, at 1500–2000 m, in Lam Dong Province (Hu & Vidal 2004).



Specimen: V8969.

Ardisia ravida C.M.Hu & J.E.Vidal

■ **Local name:** Com ngội ravida

J. Trop. Subtrop. Bot. 5(1): 9 (1997).

■ **Specimens:** V7918, V8051, V8950.

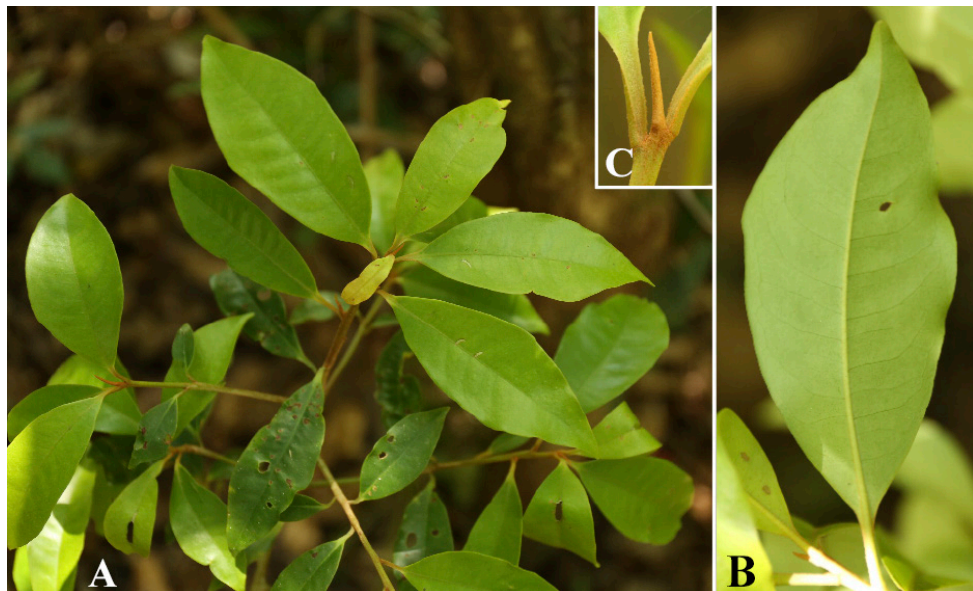
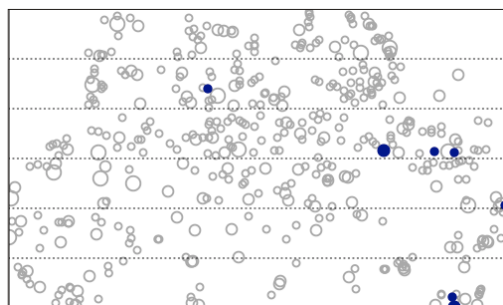


FIG. 77. *Ardisia ravida*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V8051, Mar. 2018.



No. of individuals: 7. **Height:** up to 10 m tall.

DBH: 2.1–14.6 (avg. 9.1) cm.

Ardisia ravida is a medium tree, often more than 15 m tall. It is widely observed in the national park and one of the dominant trees in the dense evergreen forest.



Specimen: V8950.

Ardisia gracilenta C.M.Hu & J.E.Vidal

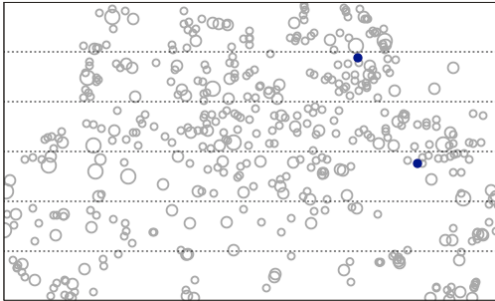
■ **Local name:** Com nguội chân mảnh

J. Trop. Subtrop. Bot. 4(4): 11 (1996).

■ **Specimens:** V7983 [fl. bud], V7995, V8964 [fl. bud].



FIG. 78. *Ardisia gracilenta*. A: branch with flower bud, B: lower leaf surface, C: flower bud. A–C from V8964, Jun. 2018.



No. of individuals: 2. **Height:** up to 4 m tall.
DBH: 1.9–3.1 (avg. 2.5) cm.

Ardisia gracilenta is a small tree somewhat common in montane forest in the national park. It is characterized by its small narrowly elliptic to elliptic-oblong leaves and slender 1–2 flowered inflorescences.



Specimen: V8964.

Primulaceae

Embelia parviflora Wall. ex A.DC.

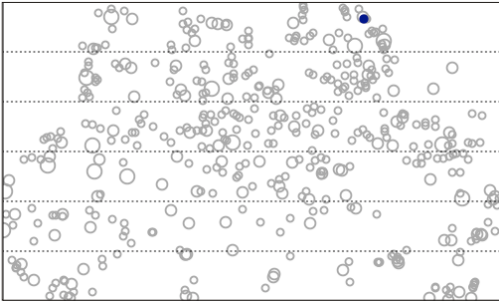
Local name: Rè

Trans. Linn. Soc. London 17(1): 130 (1834).

Specimens: V7941.



FIG. 79. *Embelia parviflora*. A: leafy branch, B: lower leaf surface. A & B from V7941, Mar. 2018.



No. of individuals: 1. Height: 15 m tall.
DBH: 4.6 cm.

Embelia parviflora is a climber common and widely occurs in various forests usually in higher elevations in SE Asia.



Specimen: V7941.

Embelia ribes Burm.f.

■ **Local name:** Rè dai

Fl. Ind. (N. L. Burman): 62, t. 23 (1768).

■ **Specimens:** V8009, CT(V9188 [fr.]).



FIG. 80. *Embelia ribes*. A: young leaves, B: branch with fruits, C: lower leaf surface, D: fruit. A & C from V8009, Mar. 2018; B & D from V9188, Sept. 2018.



Leaf apex (lower surface).

Embelia ribes is a woody climber, occasional at forest margin and gaps.



Specimen: V8009.

Maesa perlaria (Lour.) Merr.

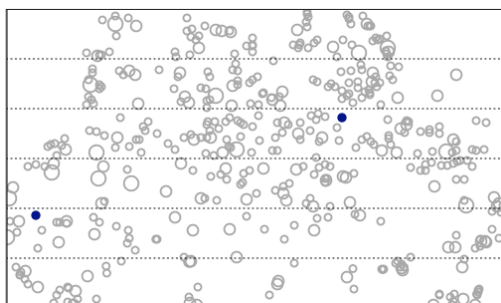
■ **Local name:** Đon nem

Trans. Amer. Philos. Soc., n.s., 24(2): 298 (1935).

■ **Specimens:** V7902 [fl. & fr.], V8999.



FIG. 81. *Maesa perlaria*. A: flowering branch, B: lower leaf surface, C: flowers, D: drupaceous fruits. A–D from V7902, Mar. 2018.



No. of individuals: 2. **Height:** up to 6 m tall.

DBH: 2.5–3.5 (avg. 3.0) cm.

This is a shrubby tree up to 6 m tall, commonly and widely found in forest margin in Bidoup-Nui Ba National Park.



Specimen: V7902.

Photinia integrifolia Lindl.

■ Local name: Dư

■ Specimens: V8997 [young fr.].

Trans. Linn. Soc. London 13(1): 103, t. 10 (1821).

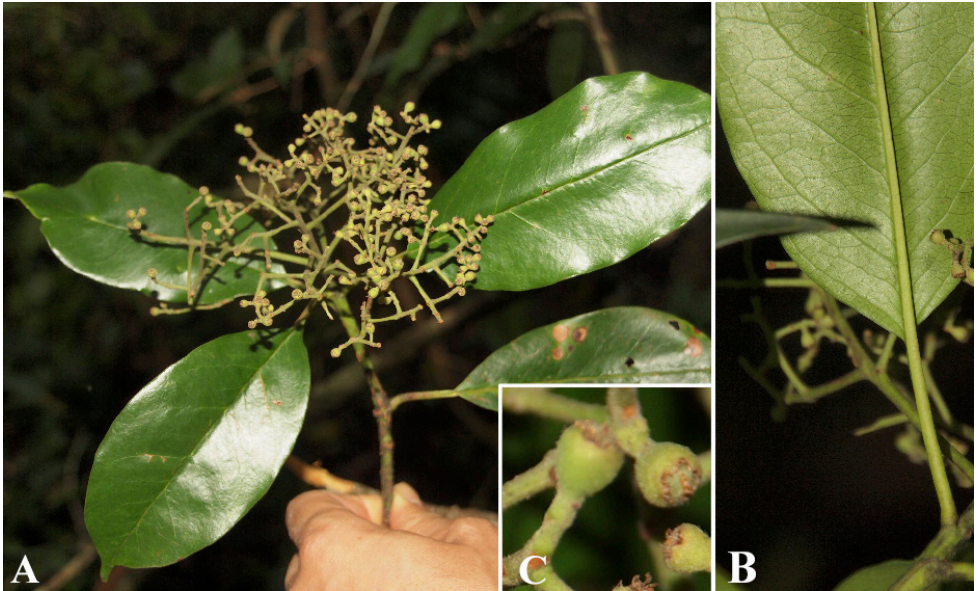
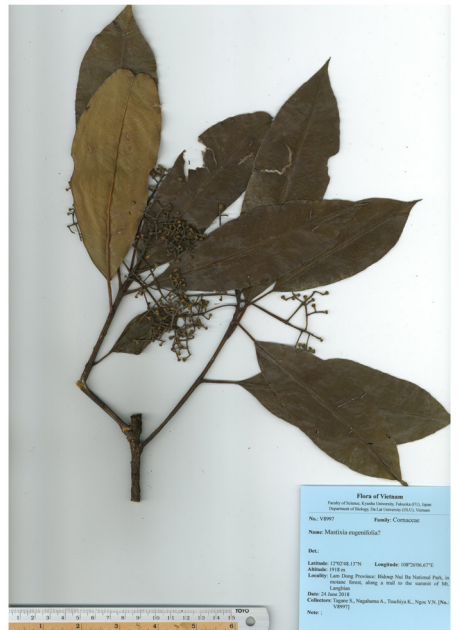


FIG. 82. *Photinia integrifolia*. A: branch with young fruit, B: lower leaf surface, C: young fruits. A–C from V8997, Jun. 2018.



Leaf base (lower surface).

Photinia integrifolia is one of the Himalayan elements and occurs in evergreen forest at high elevations from Bhutan in the west to Vietnam in the east. The species is easily distinguished from the other species of the genus in Vietnam by its evergreen habit, entire, coriaceous leaves which are glabrous on both surfaces.



Specimen: V8997.

Prunus arborea (King) Kalkman var. *stipulacea* (King) Kalkman

■ **Local name:** Vàng nương đại mộc

Blumea 13: 98 (1965).

■ **Specimens:** V7962, V8953, V9023 [fr.].

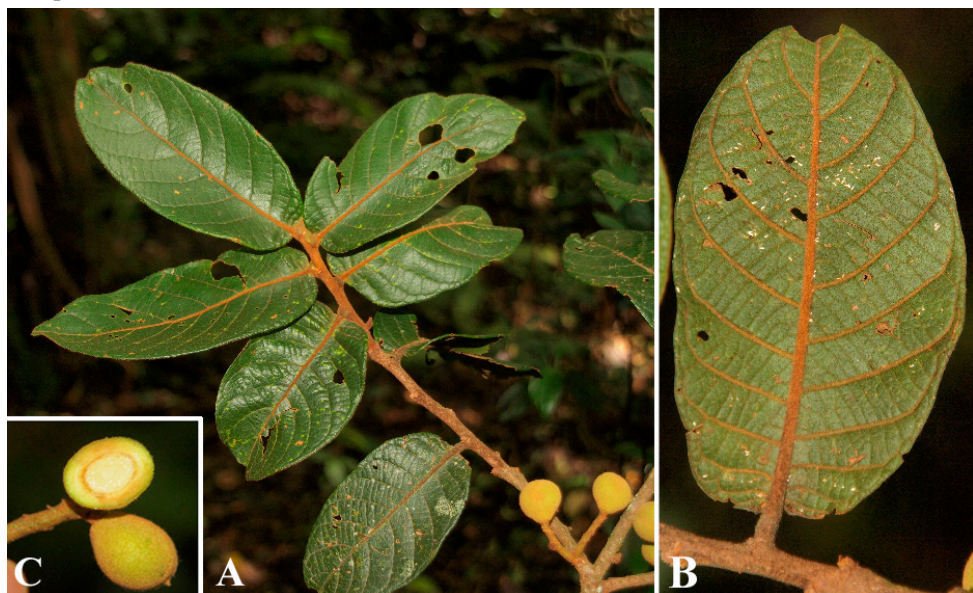
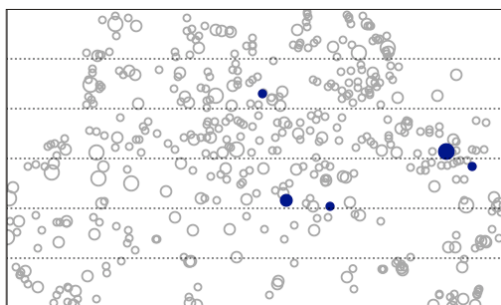


FIG. 83. *Prunus arborea* var. *stipulacea*. A: fruiting branch, B: lower leaf surface, C: fruits (upper: transverse section of fruit). A–C from V9023, Jun. 2018.



No. of individuals: 5. **Height:** up to 13 m tall.
DBH: 2.4–35.7 (avg. 15.0) cm.

This species is common in lower montane evergreen forest in Bidoup-Nui Ba NP. The species is characterized by its leaves brown velvety hairy on both surfaces when young, and with pair of glands near base of leaf blade.



Specimen: V9023.

Prunus wallichii Steud.

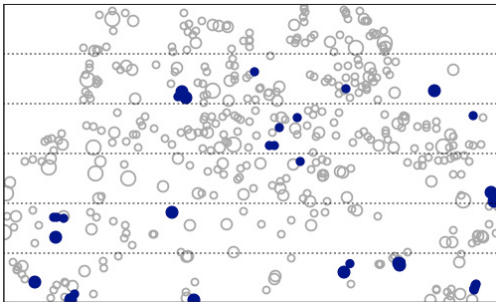
■ **Local name:** Vàng nương Wallich

Nomencl. Bot. [Steudel], ed. 2, 2: 404 (1840).

■ **Specimens:** V7907, V8952 [fr.], V8996 [fr.].



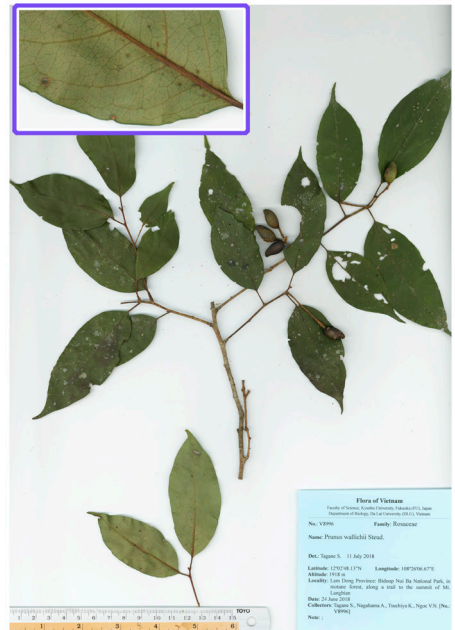
FIG. 84. *Prunus wallichii*. A: leafy branch, B: lower leaf surface, C: fruiting branch. A–C from V8996, Jun. 2018.



No. of individuals: 34. **Height:** up to 10 m tall.

DBH: 1.4–20.2 (avg. 9.2) cm.

Prunus wallichii is a medium size tree, attaining up to 15 m, common in humid evergreen forests, especially along streams, in Bidoup-Nui Ba NP. This species has glabrous leaves and more than 2 small glands on lower leaf surface which are parallel with a midvein.



Specimen: V8996.

Rubus blepharoneurus Cardot

■ **Local name:** Dùm gân râu

Notul. Syst. (Paris) 3: 298 (1917).

■ **Specimens:** V7990.

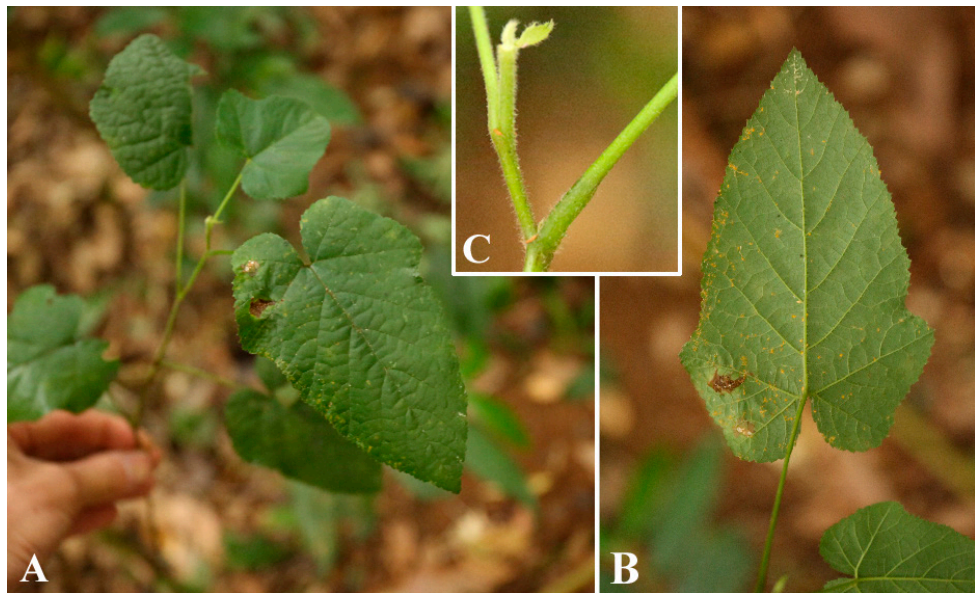


FIG. 86. *Rubus blepharoneurus*. A: leafy branch, B: lower leaf surface, C: young leaf. A–C from V7990, Mar. 2018.



Leaf apex (lower surface).

We found only one sapling of this species.



Specimen: V7990.

Lasianthus elevatineurus H.Zhu

■ Local name: Xú hương

Blumea 47(2): 395 (2002).

■ Specimens: V7922, V9600 [fr.].

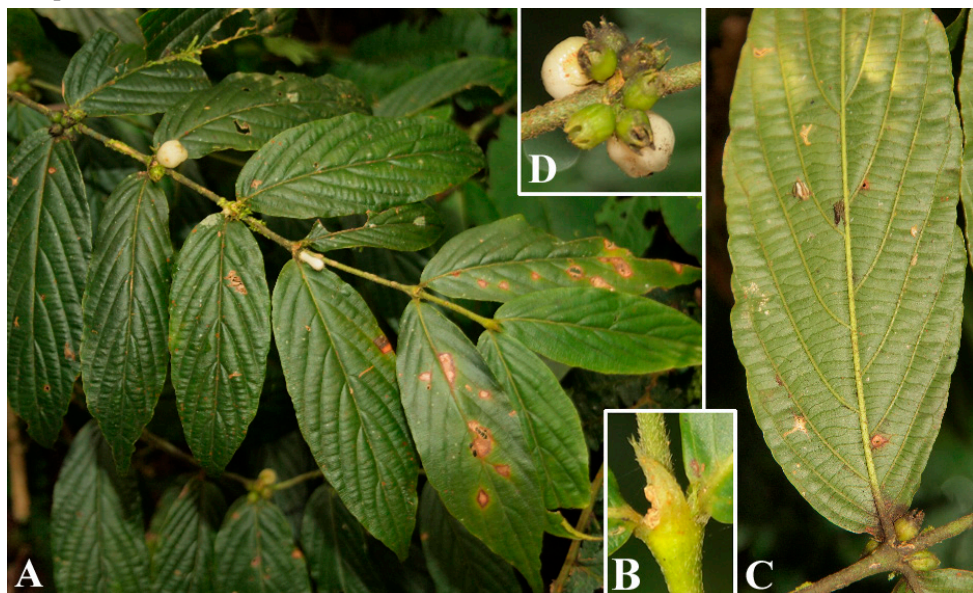


FIG. 87. *Lasianthus elevatineurus*. A: branch with flower and fruits, B: stipule, C: portion of lower leaf surface, D: fruits. A–D from V9600, Dec. 2018.



Flowers in axillary fascicles.

Lasianthus elevatineurus is a shrub, up to 1.5 m tall, occasional in lower montane evergreen forest in the national park, at 1600–2200 m. It is characterized by its venation elevated abaxially, and long, ca. 3 mm long, and hirsute calyx lobes.



Specimen: V9600.

Lasianthus sp. 1

■ Local name: Xú hương

■ Specimens: V7923, V9594 [fl. & fr.].

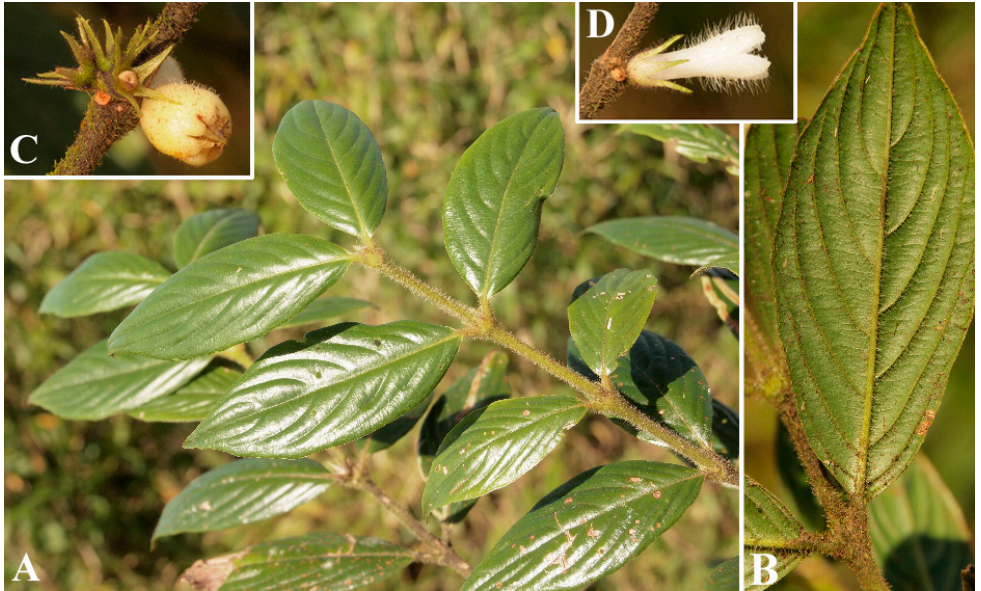
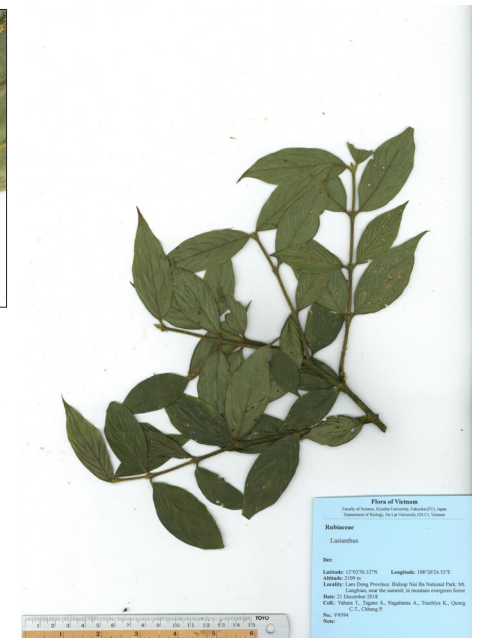


FIG. 88. *Lasianthus* sp. 1. A: leafy branch, B: lower leaf surface, C: fruit, D: flower. A–D from V9594, Dec. 2018.



Leaf apex (lower surface).

This is a shrub, up to 1 m tall, characterized by its branches, petiole and lower leaf surface densely strigose or villous. It is similar to *Lasianthus hispidulus* (Drake) Pit., but differs in having thicker leaves, secondary veins running more narrowly from midveins, and narrowly triangular calyx lobes (vs. broadly triangular).



Specimen: V9594.

Lasianthus sp. 2

■ **Local name:** Xú hương

■ **Specimens:** V9005, V9570 [fr.].

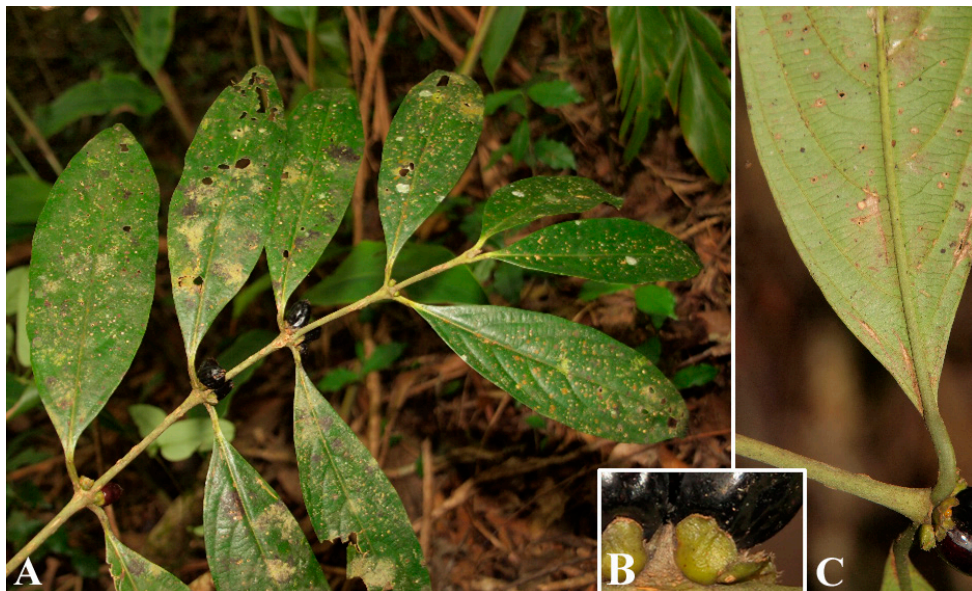
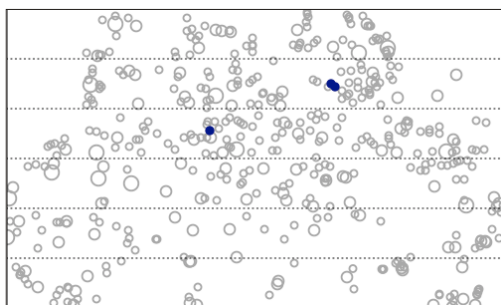


FIG. 89. *Lasianthus* sp. 2. A: fruiting branch, B: base of fruits showing green large bracts, C: lower leaf surface. A–C from V9570, Dec. 2018.



No. of individuals: 3. **Height:** up to 4 m tall.
DBH: 1.9–4.1 (avg. 2.6) cm.

This species is similar to *L. bidoupensis* V.S.Dang & Naiki in having broadly ovate bracts to 8 mm long, but differs in having narrower leaves and blackish fruits (vs. deep red in *L. bidoupensis*).



Specimen: V9570.

Paederia sp.

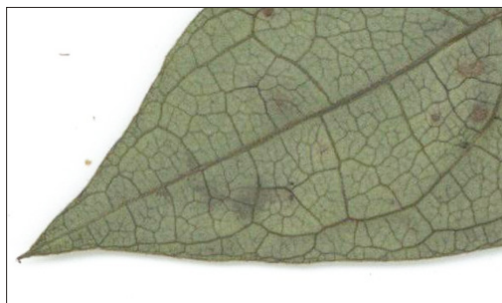
■ Local name: Unknown

■ Specimens: V9499.



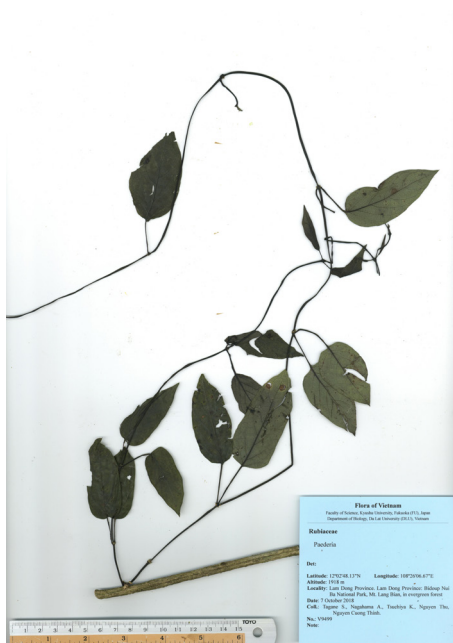
A

FIG. 90. *Paederia* sp. A: leaves showing adaxial (upper) and abaxial (below) sides. A from V9499, Sept. 2018.



Leaf apex (lower surface).

This is a woody climber, rare in and around the plot. We need fertile specimens to identify this species.



Specimen: V9499.

Psychotria langbianensis Wernham

■ **Local name:** Lầu Langbian

J. Nat. Hist. Soc. Siam 4: 137 (1921)

■ **Specimens:** V8107[fl], V9004.

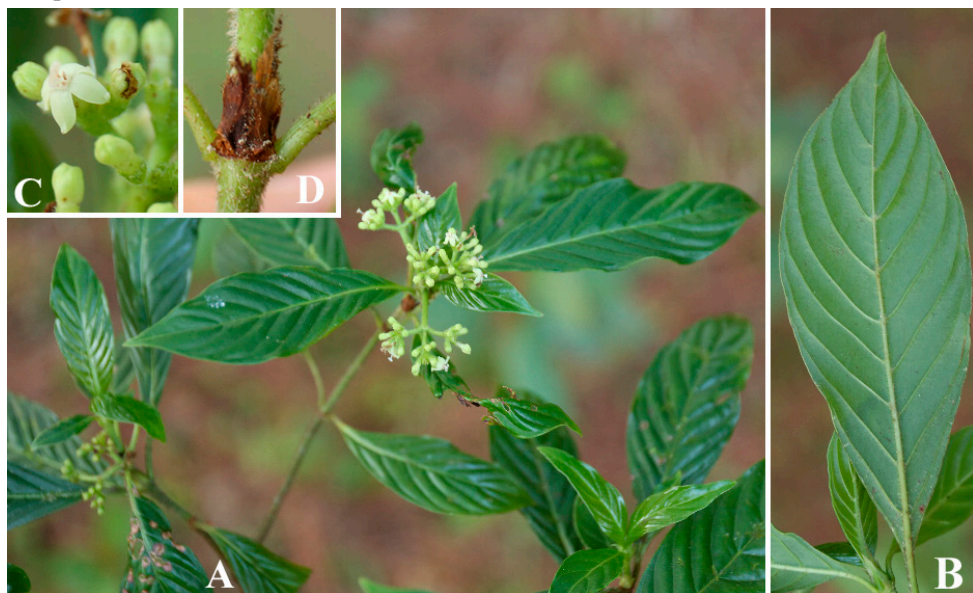
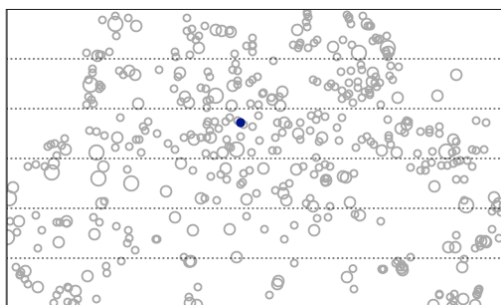


FIG. 91. *Psychotria langbianensis*. A: flowering branch, B: lower leaf surface, C: flower, D: stipule. A–D from V8107, Mar. 2018.



No. of individuals: 1. **Height:** 4 m tall.
DBH: 3.8 cm.

This is a shrub usually lower than 4 m; thus, only one individual was recorded as a plot tree. The type material was collected from Langbian (type *C. Boden Kloss s.n.*, BM).



Specimen: V9004.

Psychotria nuibamontana Yahara & Tagane, *ined.*

■ Local name: Lầu

■ Specimens: V9573 [fr.], V9590 [fl. bud & fr.], V9711 [fl.].

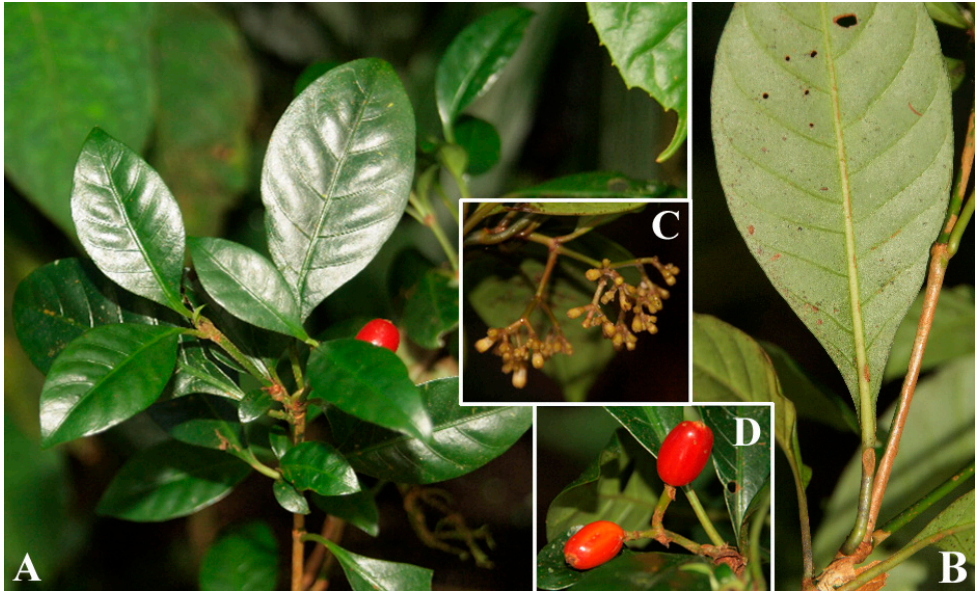
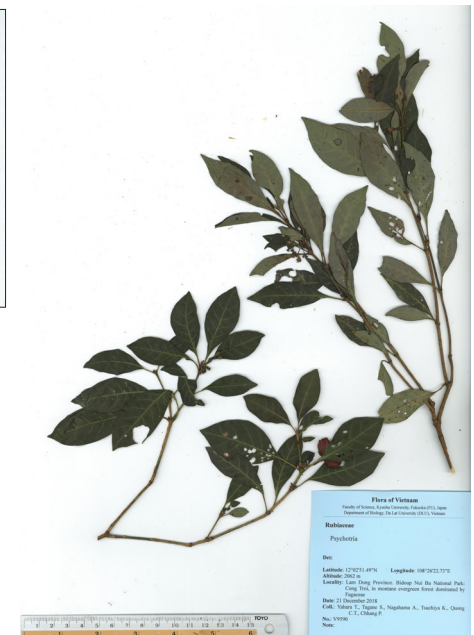


FIG. 92. *Psychotria nuibamontana*. A: fruiting branch, B: lower leaf surface, C: inflorescence, D: fruits. A, B, & D from V9590, Dec. 2018; C from V9711, Dec. 2018.



Inflorescence cymose.

This species is a small shrub, up to 1 m, scattered in the evergreen forest of Mt. Langbian. It is characterized by its pendulous inflorescences.



Specimen: V9590.

Saprosma gracile Pit.

■ **Local name:** Hoại hương mãnh

Fl. Indo-Chine [P.H. Lecomte et al.] 3: 402 (1924).

■ **Specimens:** V7912 [fl. bud], V9008 [fr.], V9569 [fr.].



FIG. 93. *Saprosma gracile*. A: fruiting branch, B: lower leaf surface. A & B from V9008, Jun. 2018.



Flowers on compound cymes.

Saprosma gracile is a shrub, up to 1.5 m tall, widely occurs in understory of evergreen forest in the national park.



Specimen: V7912.

Tarennoidea wallichii (Hook.f.) Tirveng. & Sastre

■ **Local name:** Găng Wallich

Mauritius Inst. Bull. 8(4): 90 (1979).

■ **Specimens:** V7955.



FIG. 94. *Tarennoidea wallichii*. A: leafy branch, B: lower leaf surface, C: stipule. A–C from V7955, Mar. 2018.



Leaf apex (lower surface).

We found only one individual outside the plot.
The species is easily distinct by its brown terete
twigs and opposite glabrous leaves.



Specimen: V7955.

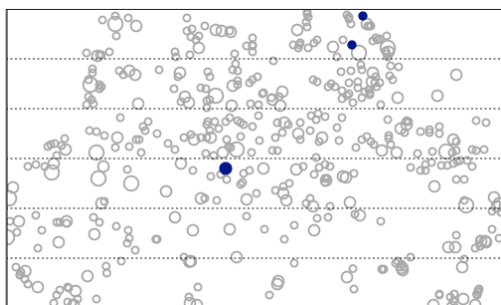
Urophyllum bidoupense Yahara, *ined.*

■ **Local name:** Vĩ điệp Bidoup

■ **Specimens:** V7930, V8982.



FIG. 95. *Urophyllum bidoupense*. A: leafy branch, B: portion of lower leaf surface. A & B from V8982, Jun. 2018.



No. of individuals: 3. **Height:** up to 7 m tall.

DBH: 7.8–11.9 (avg. 9.6) cm.

This is a small tree, up to 7 m, scattered in lower montane forest in the national park. This species is identical with *Poilane 18661* (P, image!), collected from Mt. Langbian, 1500–1800m, but we could not find any name described so far for this species.



Specimen: V8982.

Urophyllum langbianense Yahara & Tagane, ined.

■ **Local name:** Vĩ điệp Langbian

■ **Specimens:** V9035 [young fr.], V9591 [fr.].

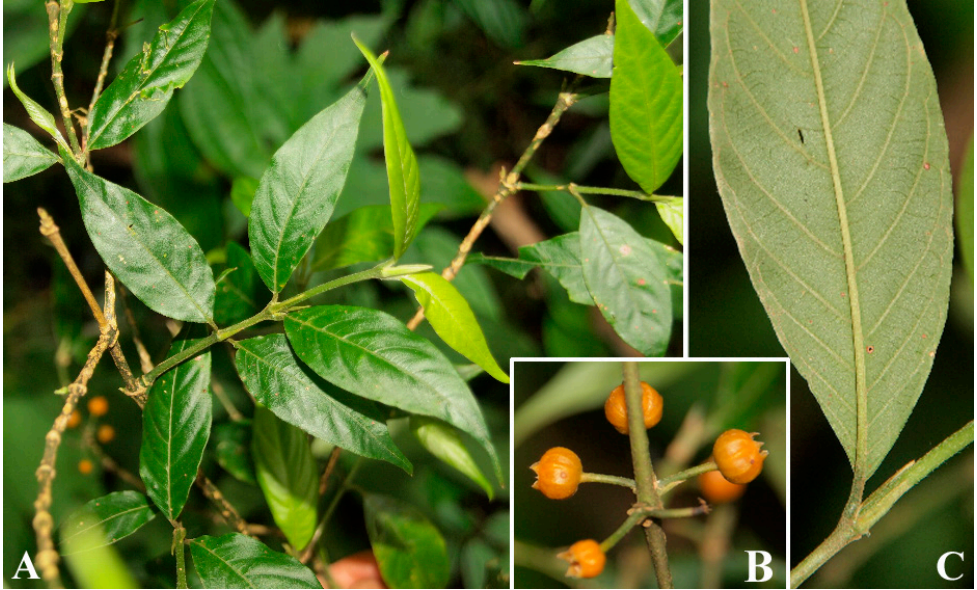


FIG. 96. *Urophyllum langbianense*. A: fruiting branch, B: fruits, C: portion of lower leaf surface. A–C from V9591, Dec. 2018.



The upper part of a shoot covered with white and appressed hairs.

This is a shrub, up to 1.5 m tall, and distinguished from *U. bidoupense* by its smaller leaves and fruits, whitish hairy on young twigs and lower leaf surface. We found this species only along the summit trail of Mt. Langbian, whereas *U. bidoupensis* is widely found in the national park. It vegetatively resembles *Urophyllum parviflorum* Wall., but is distinguished by longer rachis and pedicels in inflorescence.



Specimen: V9035.

Wendlandia formosana Cowan subsp. *breviflora* F.C.How

■ **Local name:** Huân lang

Sunyatsenia 7: 38 (1948).

■ **Specimens:** V7903.



FIG. 97. *Wendlandia formosana* subsp. *breviflora*. A: leafy branch, B: lower leaf surface, C: shoot apex showing stipules and new leaves coming appear. A–C from V7903, Mar. 2018.



Leaf apex (lower surface).

This species is a tree widely distributed from Japan, China to Vietnam. Subspecies *breviflora* distributed from China to Vietnam is distinguished from subsp. *formosana* distributed in Japan and Taiwan, in having more lateral veins (7–10 pairs vs. 5–9 pairs) more closely set, prominent beneath, and smaller flowers.



Specimen: V7903.

Melicope pteleifolia (Champ. ex Benth.) T.G.Hartley

■ **Local name:** Dầu dẫu, Ba chạc

Fl. Taiwan (ed. 2) 3: 521 (1993).

■ **Specimens:** V7896 [fl. bud], V8992, NG272 [fr.].

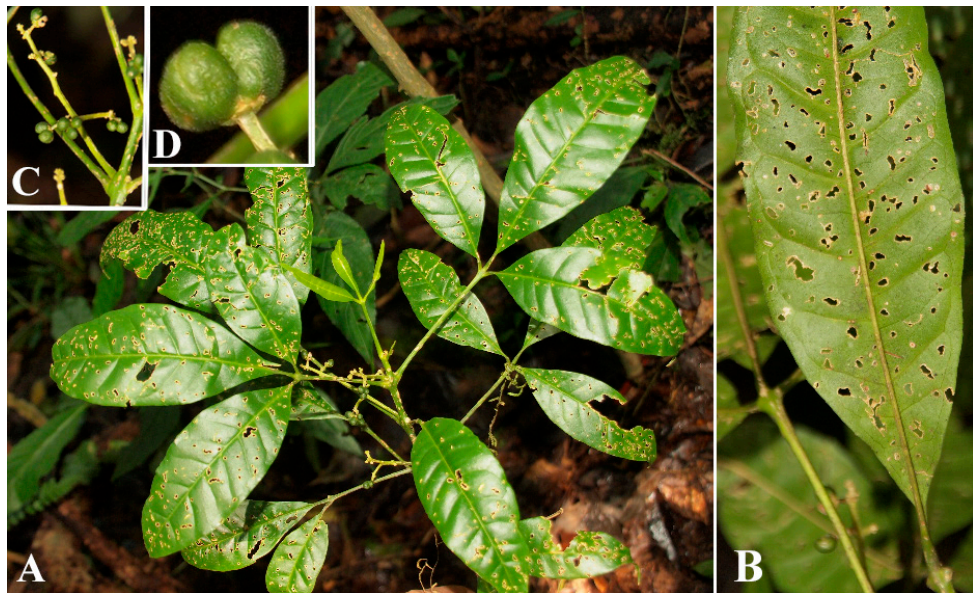
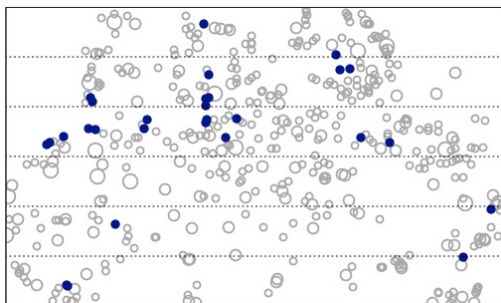


FIG. 98. *Melicope pteleifolia*. A: fruiting branch, B: lower leaf surface, C: infructescence, D: fruit. A–D from NG272, Jun. 2018.



No. of individuals: 28. **Height:** up to 6 m tall.

DBH: 1.4–6.7 (avg. 3.1) cm.

Melicope pteleifolia is a shrub, up to 6 m tall, common in the plot, gaps and at edge of evergreen forest. It is easily distinct from the other species in the plot by opposite and trifoliate leaves and axial flowers. The plant is dioecious, i.e. male and female flowers are born in different tree.



Specimen: V7896.

Zanthoxylum nitidum DC.

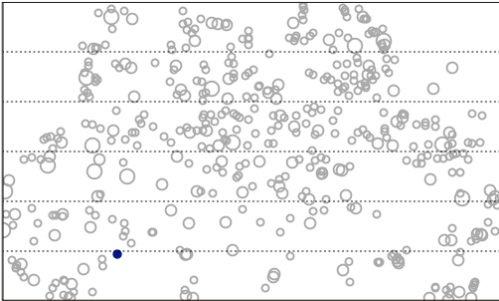
Local name: Sên, Xuyên tiêu, Hoàng liệt

Specimens: V7950.

Prodr. [A. P. de Candolle] 1: 727 (1824).



FIG. 99. *Zanthoxylum nitidum*. A: leafy branch, B: stem with prickles, C: lower leaf surface. A–C from V7950, Mar. 2018.



No. of individuals: 1. Height: 10 m tall.
DBH: 3.0 cm.

This is a woody climber, widely distributed from India, throughout SE Asia, to Australia and Pacific Islands.



Specimen: V7950.

Zanthoxylum scandens Blume

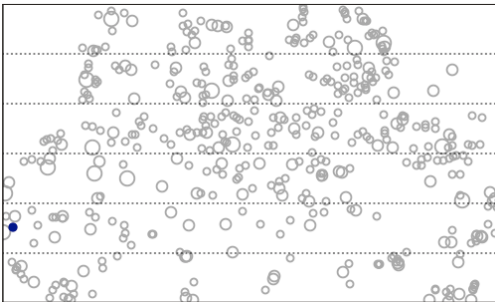
■ **Local name:** Hoàng mộc leo

Bijdr. Fl. Ned. Ind. 5: 249 (1825).

■ **Specimens:** V9576 [fr.].



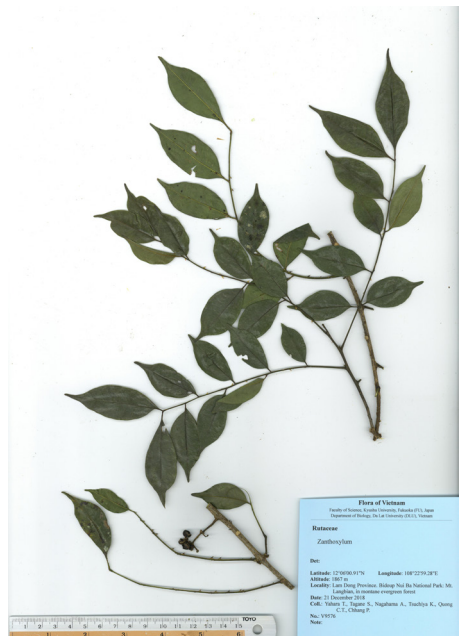
FIG. 100. *Zanthoxylum scandens*. A: leafy branch, B: fruits, C: lower leaf surface. A–C from V9576, Dec. 2018.



No. of individuals: 1. **Height:** 10 m tall.

DBH: 3.8 cm.

This is a woody climber. Only one individual was found in the plot and fruiting in December. It is easily distinguished from *Z. nitidum* by smaller and entire leaves.



Specimen: V9576.

Xylosma longifolia Clos

■ **Local name:** Mộc hương lá dài

■ **Specimens:** V8974.

Ann. Sci. Nat., Bot. ser. 4, 8: 230 (1857).

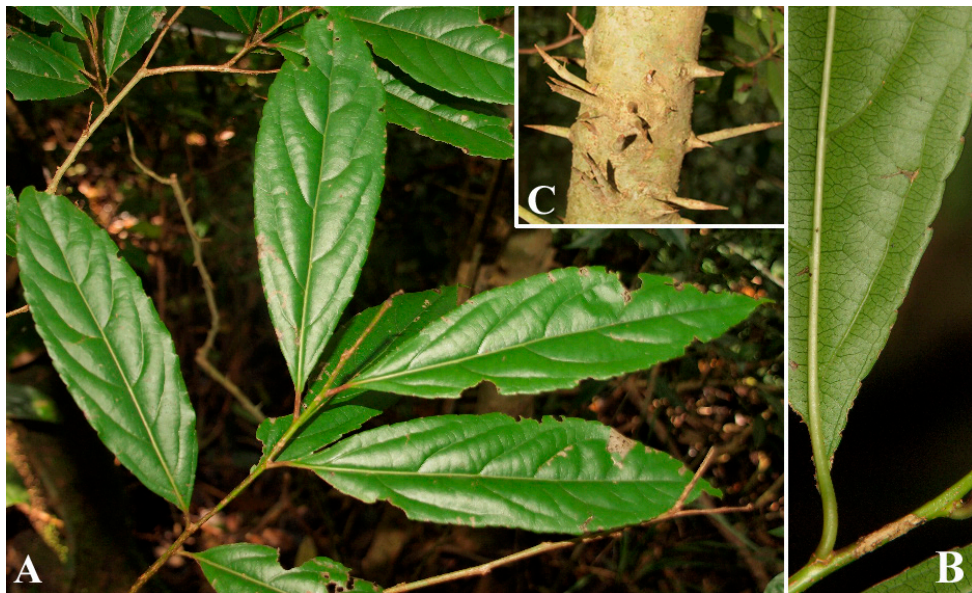
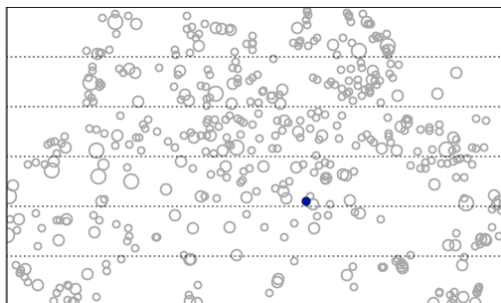


FIG. 101. *Xylosma longifolia*. A: leafy branch, B: lower leaf surface, C: trunk with spines. A–C from V8974, Jun. 2018.



No. of individuals: 1. **Height:** 7 m tall.
DBH: 8.0 cm.

Xylosma longifolia occurs widely in hill evergreen forest in Bidoup-Núi Ba NP but rare in Mt. Langbian.



Specimen: V8974.

Acer erythranthum Gagnep.

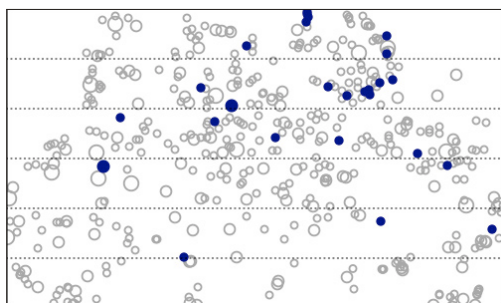
■ **Local name:** Phong hoa đỏ

Notul. Syst. (Paris) 13: 193 (1948).

■ **Specimens:** V7959, V8965.



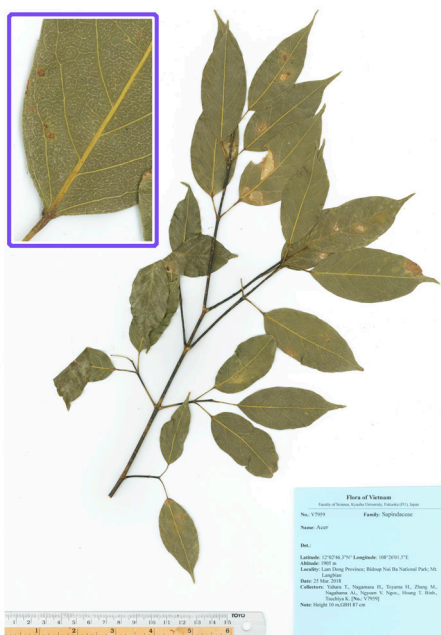
FIG. 102. *Acer erythranthum*. A: leafy branch, B: lower leaf surface. A & B from V8965, Jun. 2018.



No. of individuals: 26. **Height:** up to 14 m tall.

DBH: 1.6–15.7 (avg. 4.6) cm.

Acer erythranthum is a deciduous tree, common in the plot as well as humid hill evergreen forest to lower montane evergreen forest throughout the national park.



Specimen: V7959.

Acer flabellatum Rehder

■ **Local name:** Phong lá quạt

Trees & Shrubs [Sargent] 1(4): 161 (1905).

■ **Specimens:** V7953, V8123, V8975, V9107 [fr.].

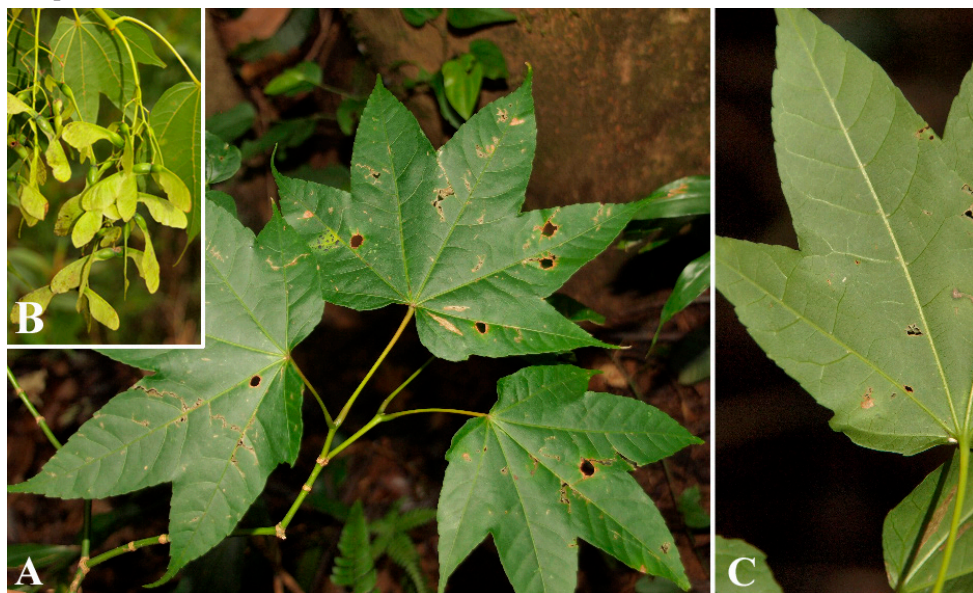
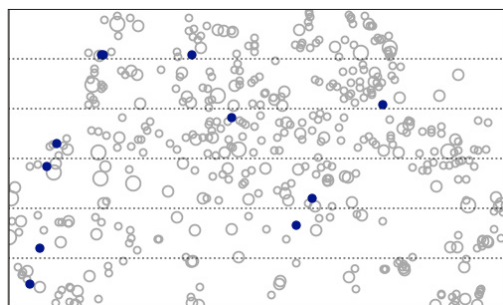
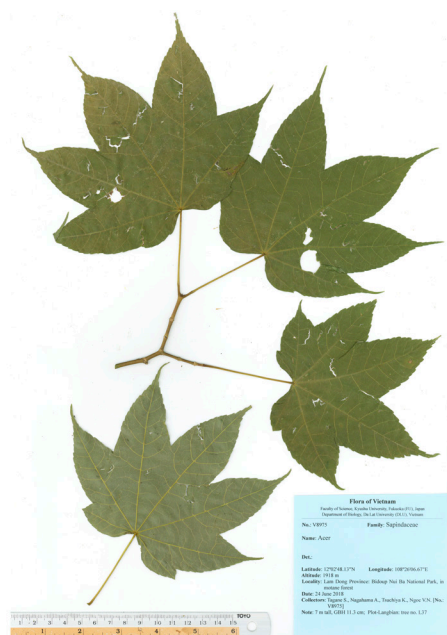


FIG. 103. *Acer flabellatum*. A: leafy branch, B: fruits, C: portion of lower leaf surface. A & C from V8975, Jun. 2018; B from V9107, Dec. 2018.



No. of individuals: 11. **Height:** up to 7 m tall.
DBH: 2.1–4.5 (avg. 3.0) cm.

Acer flabellatum is a deciduous tree, usually occurs sympatrically with *A. erythranthum*.



Specimen: V8975.

Acer laurinum Hassk.

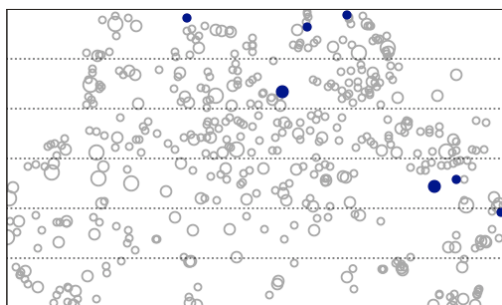
■ **Local name:** Phong lá quế

■ **Specimens:** V8096, V8957.

Tijdschr. Natuurl. Gesch. Physiol. 10: 138 (1843).



FIG. 104. *Acer laurinum*. A: leafy branch, B: lower leaf surface. A & B from V8957, Jun. 2018.



No. of individuals: 7. **Height:** up to 13 m tall.

DBH: 3.1–17.7 (avg. 5.1) cm.

This is an evergreen tree, common in the plot. It is identical with *Acer decandrum* Merr. (type Hainan) but now this name is a synonym of *A. laurinum*.



Specimen: V8957.

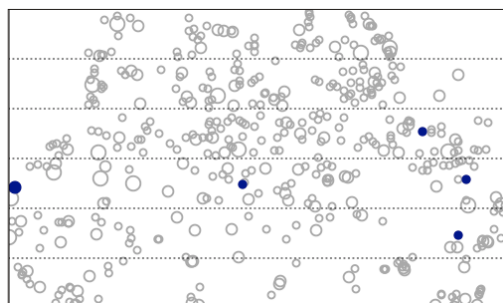
Illicium roseum Yahara, *ined.*

■ **Local name:** Đại hồi

■ **Specimens:** V8959, V9266 [fl.].



FIG. 105. *Illicium roseum*. A: branch with flower buds, B: lower leaf surface, C & D: side and front views of flower, respectively. A–D from V9266, Sept. 2018.



No. of individuals: 5. **Height:** up to 11 m tall.
DBH: 2.1–14.2 (avg. 6.2) cm.

This species is similar to *I. henryi* widely distributed in China in having pink tepals, 3–5 cm long pedicels, and less than 10 carpels. This species is distinct from *I. henryi* in cup-shaped flowers with erect tepals (vs. widely open flowers with spreading or ascending tepals). This species is distributed commonly from 1600 m to 1900 m in Bidoup-Nui Ba NP.



Specimen: V8959.

***Kadsura coccinea* (Lem.) A.C.Sm.**

■ **Local name:** Dây Xum xê, Ngũ vị tử nam

Sargentia 7: 166 (1947).

■ **Specimens:** V9500, CT(V9545 [fl. Bud]).

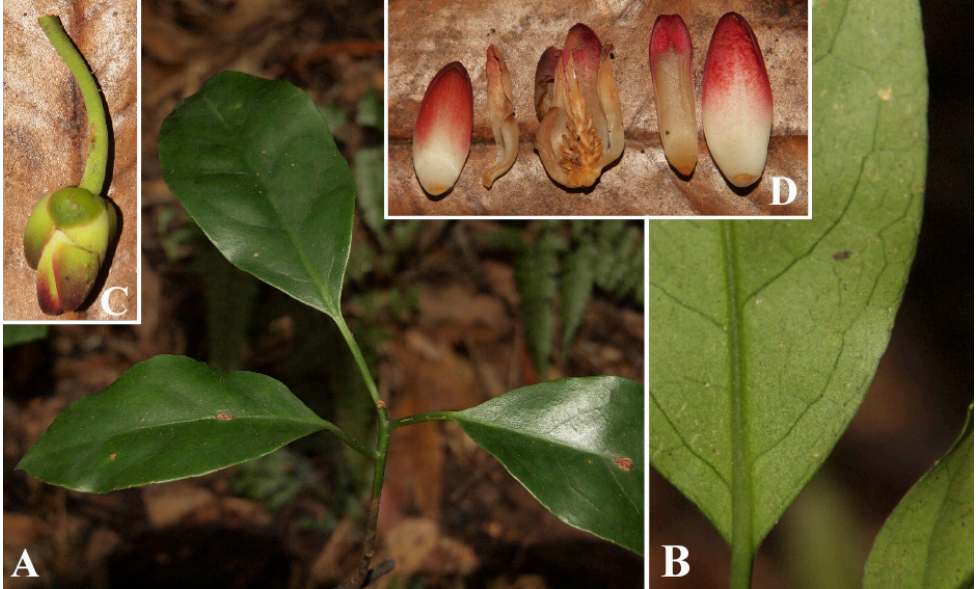
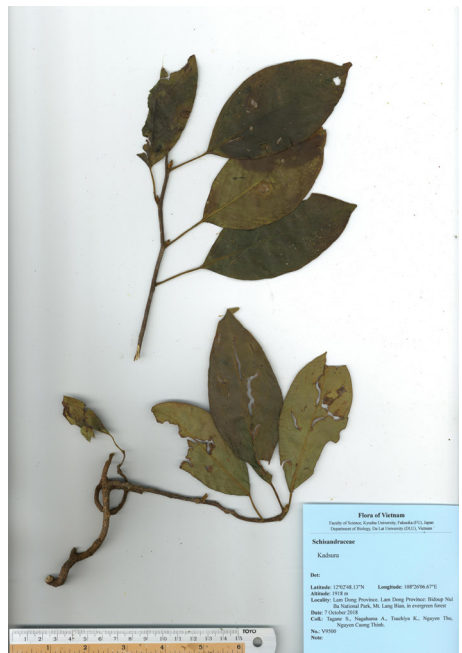


FIG. 106. *Kadsura coccinea*. A: leafy branch, B: portion of lower leaf surface, C: flower bud, D: sepal. A–D from V9545, Dec. 2018.



The upper part of a branch.

This is a vine distributed widely in southern China and also in Myanmar, northern Thailand and Vietnam. Fruits are edible. While many species of *Kadsura* have stamens tightly aggregated into a compact subglobose head with connate filaments, this species has stamens with free filaments, arranged on an elongated receptacle.



Specimen: V9500.

Kadsura heteroclinia (Roxb.) Craib

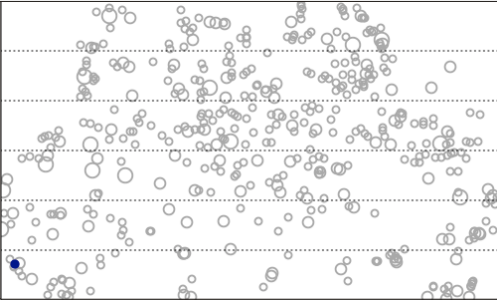
Local name: Xum xê tap

Fl. Siam. 1: 28 (1925).

Specimens: V8039.



FIG. 107. *Kadsura heteroclinia*. A: leafy branch, B: lower leaf surface, C: branch surface. A–C from V8039, Mar. 2018.



No. of individuals: 1. Height: 12 m tall.
DBH: 4.5 cm.

This species is distinguished from *K. coccinea* by chartaceous leaves with lateral veins indistinct beneath (vs. distinct in *K. coccinea*), creamy yellow tepals and stamens tightly aggregated into a compact subglobose head with connate filaments. This species was collected at 1900 m of Mt. Langbian.



Specimen: V8039.

Kadsura verrucosa (Gagnep.) A.C.Sm.

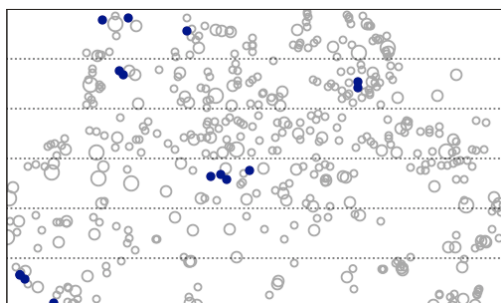
■ **Local name:** Phân hùng có mủ

Sargentia 7: 195 (1947).

■ **Specimens:** V7958, V8980.



FIG. 108. *Kadsura verrucosa*. A: leafy branch, B: portion of lower leaf surface. A & B from V8980, Jun. 2018.



No. of individuals: 15. **Height:** up to 15 m tall.
DBH: 2.2–6.1 (avg. 3.8) cm.

Kadsura verrucosa is a woody climber, not rare in montane evergreen forest in Bidoup-Nui Ba NP. It is characterized by relatively large leaves and lenticellate twig.



Specimen: V8980.

Symplocos acuminata (Blume) Miq.

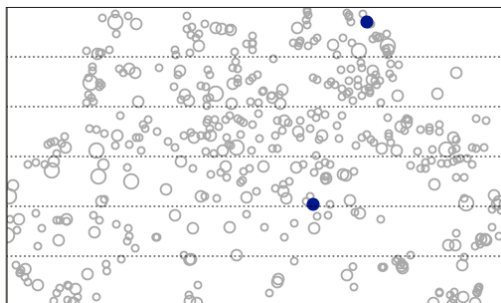
■ **Local name:** Dung lá nhọn

Fl. Ned. Ind. 1(2): 467 (1859).

■ **Specimens:** V7943, V8972, V9019, V9036 [fr.].



FIG. 109. *Symplocos acuminata*. A: fruting branch, B: lower leaf surface, C: fruit. A–C from V9036, Jun. 2018.



No. of individuals: 2. **Height:** up to 10 m tall.

DBH: 12.0–20.2 (avg. 16.1) cm.

This is a common tree in Bidoup-Nui Ba NP. It shows wide variation in its leaf shape and texture but easily recognized by its green glabrous twigs and leaves, relatively long inflorescence up to 6 cm long and globose fruits.



Specimen: V9036.

Symplocos annamensis Noot.

■ **Local name:** Dung Trung bộ

Leiden Bot. Ser. 1: 125 (1975).

■ **Specimens:** V7899 [young fr.], V9606 [young fr.].

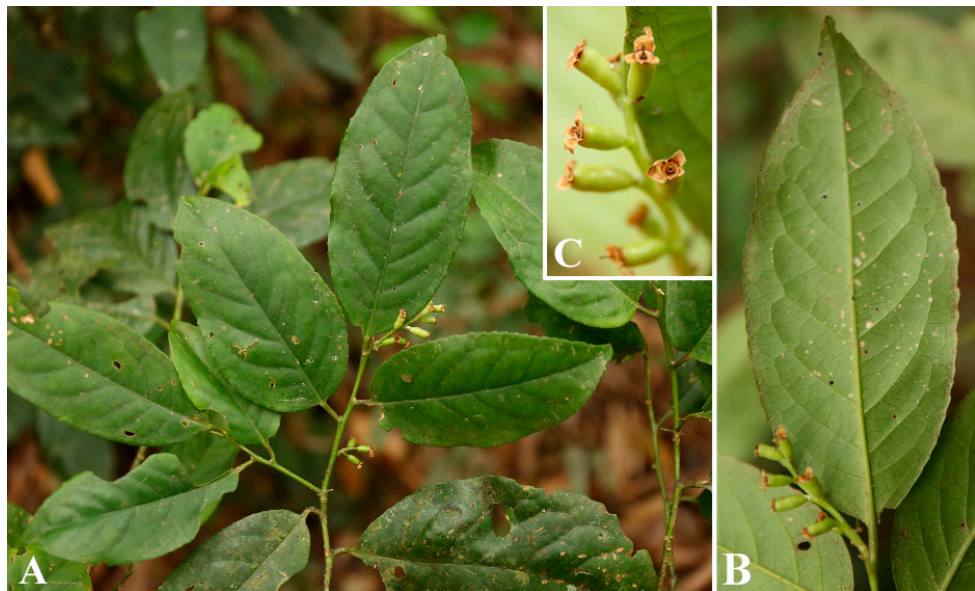
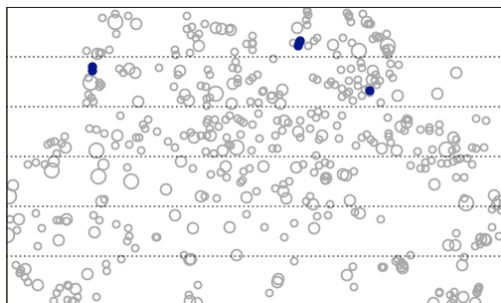


FIG. 110. *Symplocos annamensis*. A: branch with young fruits, B: lower leaf surface, C: young fruits with persistent calyx lobes. A–C from V7899, Mar. 2018.



No. of individuals: 6. **Height:** up to 6.5 m tall.
DBH: 2.4–6.5 (avg. 3.9) cm.

This is a small tree, up to 6.5 m tall, occasional in the plot. It is similar to *S. acuminata* in having green glabrous twigs and leaves, but distinguished by its thinner leaves, shorter inflorescences, cylindrical fruits (vs. globose), and with persistent and enlarged calyx lobes on the top of fruits.



Specimen: V7899.

Symplocos hayatae Guillaumin

■ **Local name:** Dung Haya

Bull. Soc. Bot. France 79: 172 (1932).

■ **Specimens:** V7894, V9013.

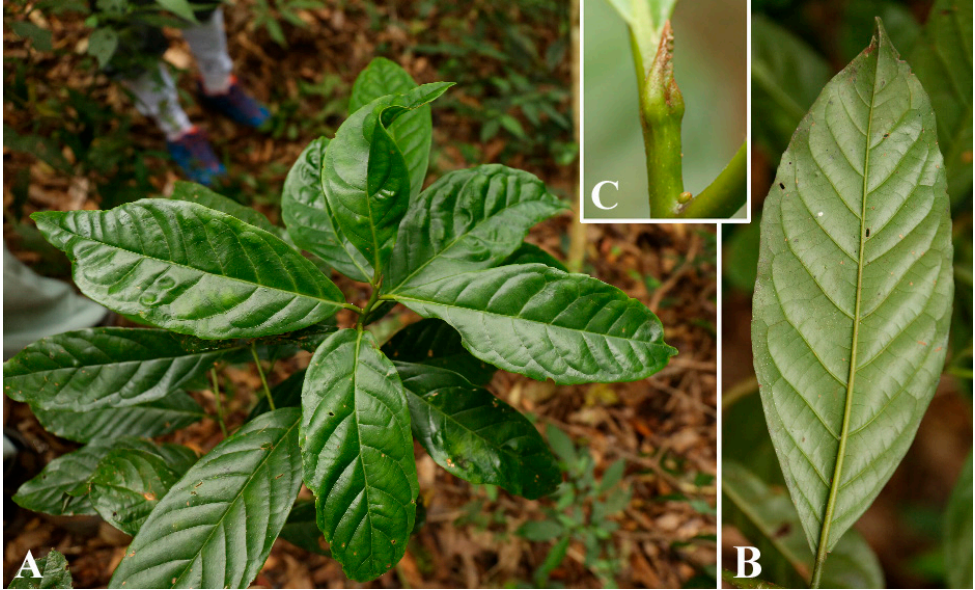
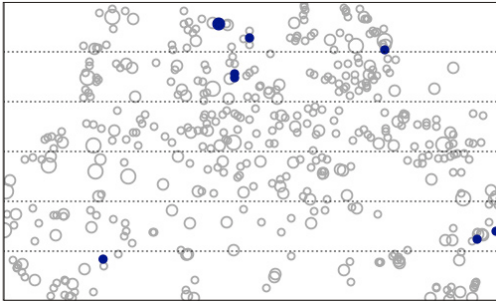


FIG. 111. *Symplocos hayatae*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V7894, Mar. 2018.



No. of individuals: 8. **Height:** up to 9.5 m tall.
DBH: 2.4–17.0 (avg. 5.9) cm.

This is a tree, common in lower evergreen forest in the plot and throughout Bidoup-Nui Ba NP. Nootboom & Vidal (1977) treated this species as *Symplocos glomerata* subsp. *congesta* var. *poilanei* (Guillaumin) Noot., but we consider it is a distinct species.



Specimen: V7894.

Symplocos megalocarpa H.R.Fletcher

■ Local name: Dung trái to

■ Specimens: V9041 [fr.].

Bull. Misc. Inform. Kew 1937: 507 (1937).



FIG. 112. *Symplocos megalocarpa*. A: leafy branch, B: portion of lower leaf surface, C: fruit. A–C from V9041, Jun. 2018.



Leaf base (lower surface).

Only one fruiting individual was found outside the plot. We identified this species as *Symplocos megalocarpa* in its large leaves and fruits, petiole less than 2 cm long, and venation reticulated and distinct on both surfaces.



Specimen: V9041.

Novon 23(3): 310 (2014).

Figure 1 consists of three panels labeled A, B, and C. Panel A shows a branch of *Camellia japonica* with several green, serrated leaves. Panel B is a close-up of a single leaf, showing its serrated margin and prominent venation. Panel C is a close-up of a white flower with yellow stamens.

DBH: 2.1–13.4 (avg. 6.5) cm.

Flora of Vietnam
Faculty of Science, Kien Giang University, Rongkhai (1), An Giang
Department of Biology, Da Lat University (131), Vietnam

No. 12004

Family: Theaceae

Name: Camellia

Det:

Latitude: 17°24'N, 107°N Longitude: 108°30'N, 107°E
Altitude: 1015 m
Locality: Lam Dong Province: Honkay Hill (the National Park, Honkay Hill)
Date: 14 June 2018
Collector: Tugayev, S., Nagehama, A., Tsuchiya, K., Nguyen V.N. (Vietnam)
Note: 7 m tall, DBH 20.0 cm; Fls. Light-yellow; tree size 1.21

124

Pyrenaria poilaneana Gagnep.

■ **Local name:** Thạch châu poilane

Notul. Syst. (Paris) 10: 122 (1942).

■ **Specimens:** V7940, V8998, V9024 [fl.].

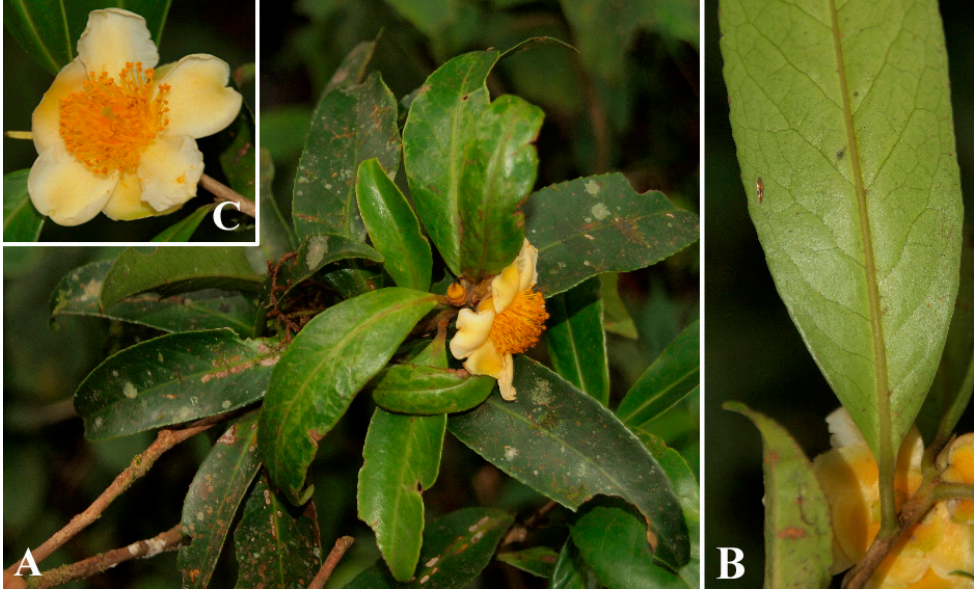
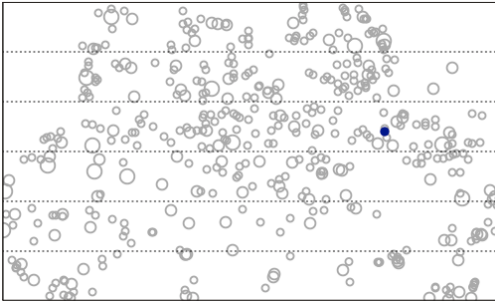


FIG. 114. *Pyrenaria poilaneana*. A: flowering branch, B: lower leaf surface, C: flower. A–C from V9024, Jun. 2018.



No. of individuals: 1. **Height:** 6 m tall.

DBH: 3.3 cm.

This is a medium size tree, scattered in and around the plot. In September, one tree outside plot was in full bloom and many flowers were dropped on the ground.



Specimen: V9024.

Schima crenata Korth.

■ **Local name:** Chò xót

Verh. Nat. Gesch. Ned. Bezitt., Bot.: 143 (1842).

■ **Specimens:** V7892, V8954.

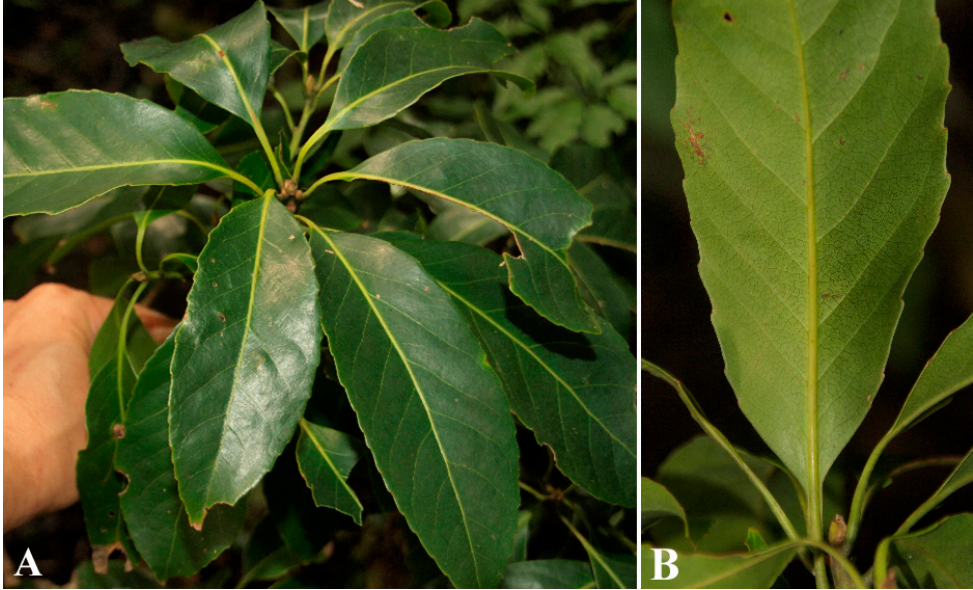
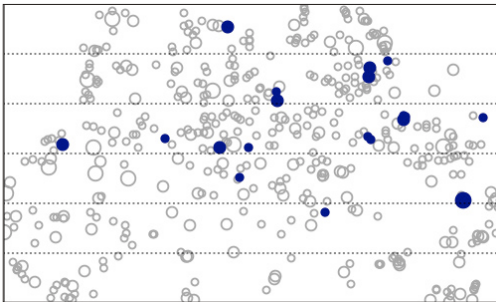


FIG. 115. *Schima crenata*. A: leafy branch, B: lower leaf surface. A & B from V8954, Jun. 2018.



No. of individuals: 20. **Height:** up to 22 m tall.
DBH: 2.0–73.7 (avg. 12.4) cm.

Schima crenata is a tree widely distributed in continental SE Asia.



Specimen: V8954.

Tetrastigma annamense Gagnep.

■ **Local name:** Tứ thư Trung bộ

Bull. Soc. Bot. France 91: 32 (1944).

■ **Specimens:** *V8037*, *V8089*, *V9011*.

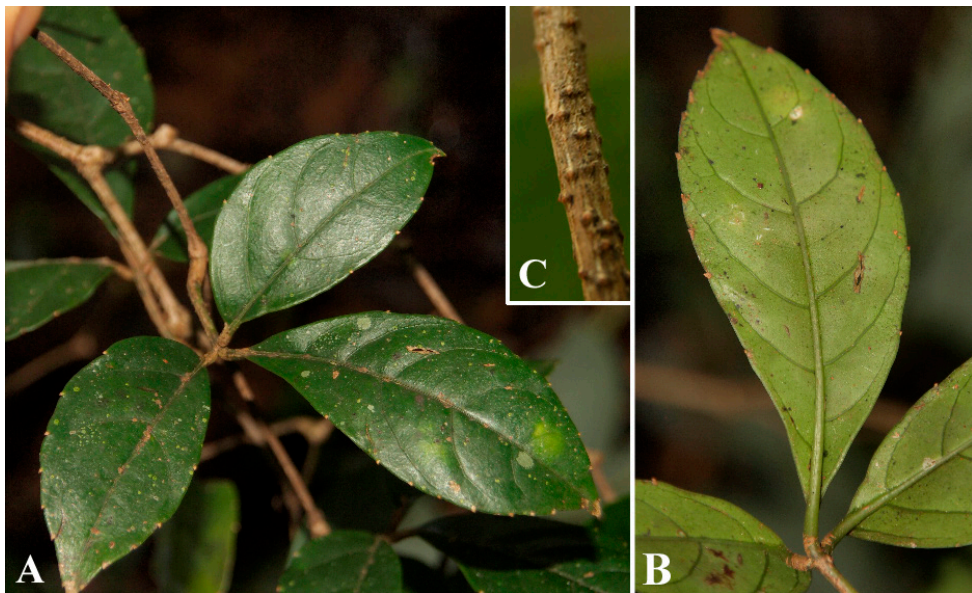
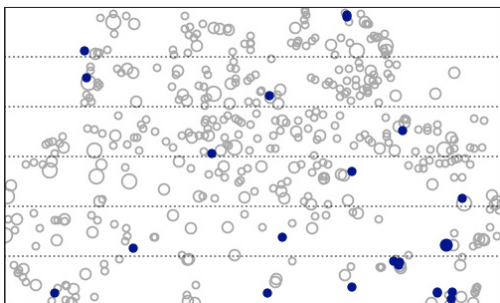


FIG. 116. *Tetrastigma annamense*. A: leafy branch, B: lower leaf surface, C: stem with prickles. A & B from *V9011*, Jun. 2018; C from *V8089*, Mar. 2018.



No. of individuals: 22. **Height:** up to 25 m tall.
DBH: 1.3–19.4 (avg. 4.1) cm.

The type of *Tetrastigma annamense* (20 April 1919, *Chevalier 40378*, P) was collected from “massif du Langbian Dran, 1000–1200 m alt.”



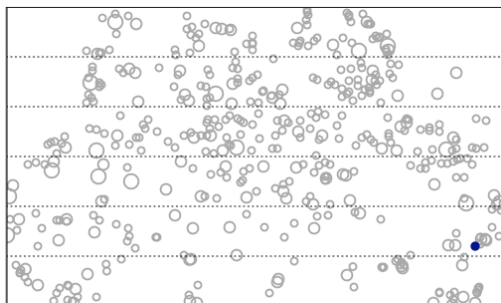
Specimen: *V8037*.

Bull. Soc. Bot. France 111: 34 (1944).

■ **Specimens:** *V7905*.



FIG. 117. *Tetrastigma laoticum*. A: leafy branch, B: lower leaf surface, C: shoot apex. A–C from V7905, Mar. 2018.



No. of individuals: 1. **Height:** 8 m tall.

DBH: 1.3 cm.

This species is similar to *Tetrastigma lanceolarium* in having five palmate leaflets but distinguished from *T. lanceolatum* in its lax infructescence.



Specimen: *V7905*.

Field Photos



The belt-transect survey site, 25 Mar. 2018.



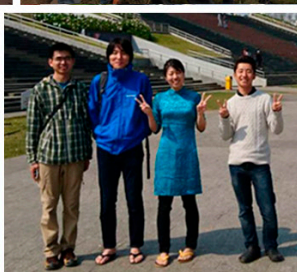
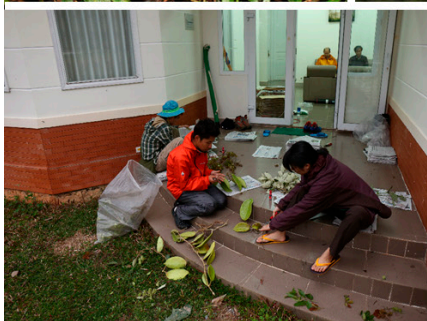
The semi-permanent plot, 24 Jun. 2018



View from the summit of Mt. Langbian



Dalat City viewing from the summit of Mt. Langbian



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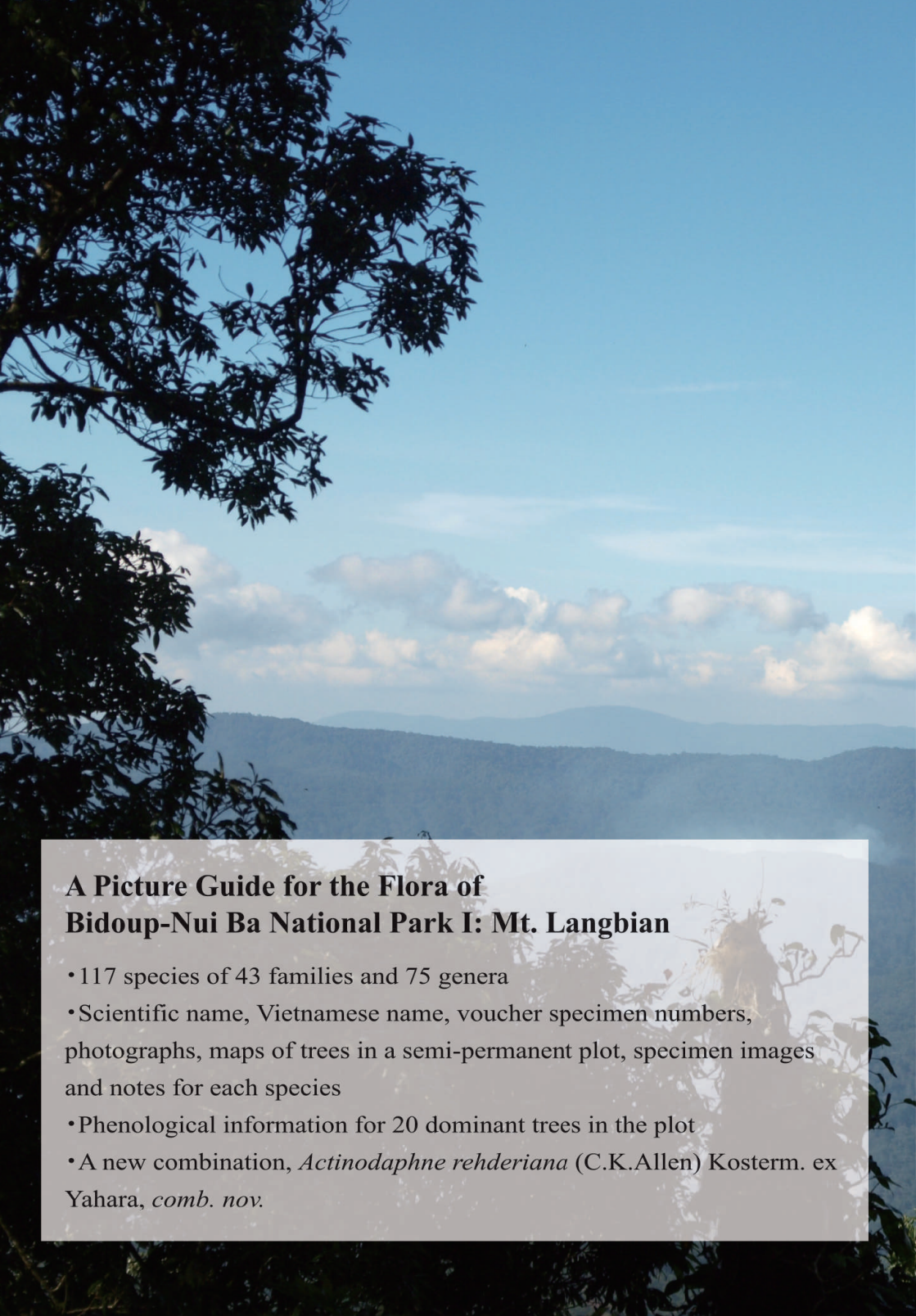
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A Picture Guide for the Flora of Bidoup-Nui Ba National Park I: Mt. Langbian

- 117 species of 43 families and 75 genera
- Scientific name, Vietnamese name, voucher specimen numbers, photographs, maps of trees in a semi-permanent plot, specimen images and notes for each species
- Phenological information for 20 dominant trees in the plot
- A new combination, *Actinodaphne rehderiana* (C.K.Allen) Kosterm. ex Yahara, *comb. nov.*