臺灣女貞屬植物之系統分類

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摘　要

本報告以形態及少數生物的特徵對本省女貞屬（*Ligustrum*）植物進行系統性整理，共計有四種，各爲日本女貞（*Ligustrum japonicum* Thunb.）、卜萊斯女貞（*L. pricei* Hayata）、玉山女貞（*L. morrisonense* Kanehira & Sasaki）、及小實女貞（*L. microcarpum* Kanehira & Sasaki）。文中詳盡描述每種植物特徵及給予地理分佈、花期、參考之標本等資料，最後附簡短說明。

關鍵詞：系統分類、女貞屬、形態、生物特徵、生態、花期。

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The Systematics of *Ligustrum* (Oleaceae) of Taiwan

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[Summary]

In this report, based on some morphological and few biological characters, a systematic treatment is given to the species of the genus *Ligustrum* (Oleaceae) of Taiwan. Totally, four species, *L. japonicum* Thunb., *L. pricei* Hayata, *L. microcarpum* Kanehira & Sasaki, and *L. morrisonense* Kanehira & Sasaki, are recognized. For each species, a detailed description is provided; also included are geological distribution, ecology, phenology, citation of exsiccatae, and brief notification.

Key Words: Systematics, *Ligustrum*, morphology, biology, characters, ecology, phenology, species.

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一、緒　言

女貞屬（*Ligustrum*）爲木樨科（Oleaceae）植物之一屬，全世界約有四〇種(Willis, 1985)，分佈於暖溫帶，以及舊熱帶，主產亞洲東部。中國大陸約有二〇餘種（陳嵘，1937），日本有七種（Ohwi, 1965），其餘分散在馬來西亞、澳洲，經作者等整理後本省有四種，生長在3000m以下之地帶。

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由於本省本屬植物生長在不同的生育地上，生態習性上的差別，引發種內各族羣形態上的變異，使各學者在種的判識上有不同的結論，例如日本女貞可由海濱附近生長至2200m之山地，葉之大小及花序上絨毛疏密特徵在不同環境的選擇下有顯著的差別，過去之毛女貞(*L. japonicum* Thunb. *var. pubescens* Koidz) 即爲其花序上密佈絨毛而命名，本研究之目的在尋求本省本屬中穩定之形態特徵，以爲種類判識之需。同時，亦討論此等少數可用特徵之演化方向。

生育系統 (breeding system) 爲近代植物系統分類研究上一項重要工作。其結果不僅可資判斷種之變異範圍，亦藉以探討種間之親疏關係，筆者等亦調查本省本屬植物之生育系統，並以觀察所得解釋各種種內變異之緣由或種間隔離之機制。

二、前人研究

臺灣女貞屬植物之研究工作可追溯至 Henry (1986) 之臺灣植物名錄，記載有日本女貞及採自猴山 (Ape's Hill) 編號331之不知名種。此標本後來爲Rehder(1916) 定名臺灣女貞 (*L. formosanum*)，其後中間經過 Hayata (1915)、Mansfeld (1924)、Sasaki (1928)、Kanehira (1931)、Masamune (1936)、Shimizu and Kao (1962)、Li (1963、1978)，Liu and Liao (1977) 等研究，統計全部出現之學名有二〇個之多，大略而言，研究結果較爲完整者當推Kanehira and Sasaki (1931) 和 Li (1963)。茲將以往主要學名之變動列於表1，並列出筆者等之結果，以供參考比較。

三、屬之特徵

1.葉：單葉對生於枝條上，多數爲卵形，橢圓形，或卵狀橢圓形，少數爲披針形，如卜萊斯女貞，長度在0.8至8.0ｃm間，省產種類中，葉最大者屬小實女貞，長度在5至8ｃm間，最小者爲玉山女貞，在0.8至2.5ｃm間。

省產種類之葉柄一般較短，在0.3至1.8ｃm間，小實女貞者最長，由0.8至1.8ｃm，卜萊斯女貞和玉山女貞最短，0.1至0.3ｃm間。

葉脈通常5至8對，唯玉山女貞較少，有3或4對。

2.花序：根據 Benson (1979) 的定義，女貞屬植物之花序應爲圓錐狀聚繖花序 (Thyrse) 或密錐花序，但根據 Foster & Gifford (1974) 參照Troll (1964，未見) 的花序分類，名其爲 Thyrsoid type of polytelic synflorescences，作者等經過仔細考量結果，認爲單歧聚繖花序 (Simple dichasium) 爲本屬植物花序之最基本單位，連同花序軸頂端兩側之單花計算在內，小實女貞和日本女貞之花序有多達12對之側軸 (或側枝)，卜萊斯女貞花序具4對側軸，玉山女貞的花序最簡單，僅由1個單歧聚繖花序及1對單生花組成。

花序多數生長在當年生側枝之頂端，葉腋之側芽萌發後，先長出約2對較正常葉稍小的葉片，而後按序長出花軸、側枝、及花朵，每側軸之基部皆有小苞片。

花序上多少被有毛，量之多寡或許與生育地環境有關，以往，本屬植物常因毛之多寡區別種類，但 Mansfeld 在1924年認爲此特徵不足採信。

3.花：爲木樨科典型者，花萼基部連同合成筒狀，深淺因種而異，花萼裂片通常呈三角形，但有種類的裂片極 不明顯，如小實女貞和卜萊斯女貞之花萼。

花冠連合成筒狀，花冠筒的長度與花冠裂片的比例隨種而異，其比值以玉山女貞的4最大，卜萊斯女貞其次，爲2.6，小實女貞的0.5最小。

雄蕊有二，著生於花冠筒內側，花絲短，在1.5至2.5mm之間。

雌蕊單一，子房上位，兩室，胚珠倒生於各室之頂端，花柱單一，頂端膨大成柱頭；柱頭上有微小凸起。

目前瞭解，小實女貞的花是雌蕊先成熟，柱頭先伸出花外，花冠筒基部（子房之四周圍）分泌花蜜，吸引授粉媒介，進行異花授粉作用，雄蕊則在稍後挺出花冠筒，一段時間後，花藥開裂，避免自花授粉，作者等曾以醣度計(AO T／C Hand Refractometer）測定*L. sinense* Decone花蜜之醣度爲13 Brix（食品工業使用之醣度單位）。

另外所知，小果女貞之花柱長於花筒，卜萊斯女貞和玉山女貞的花柱短於花筒，此等性狀在種羣中頗爲穩定。但是，日本女貞則爲多型狀（Polymorphic）的花，其種羣中，不同的單株分別有長花柱、中間花柱及短花柱型花，此種花對於種內隔離機制的探討極有進一步研究的必要。

4.果實：本屬植物的果實爲核果，外有一層稍厚之果皮，內果皮稍硬，上有微小的網紋，網紋形狀在各種間無多大差異。果實的形狀可分爲二類，一類爲橢圓形，另一類爲球形，日本女貞和卜萊斯女貞的果型屬前者，小果女貞和玉山女貞屬後者。種子內有一層肉質胚乳，胚直立於胚乳中。

四、生態、分佈、與花期

本屬之植物多數生長在山區之林緣、稜脊、岩礫地或海濱一帶，在二次森林中亦可生長，因此本屬植物爲不耐陰者。

分佈之海拔範圍由海濱上至3000m之山地，跨本島之亞熱帶及暖溫帶之生態帶，4種之中，以玉山女貞之分佈最高，在海拔1200至3000m左右之山地，其次爲小實女貞，在2500m以下之地區，再者爲日本女貞，分佈在2200m以下之地帶，最低者爲卜萊斯女貞，在1500m以下。

開花時間，一般爲5月到6月，其中，只有卜萊斯女貞在3月到4月，果實在當年成熟。

五、形態或生物特性的演化意義

由於本省僅有4種女貞屬植物，佔全世界種類數不及十分之一，作者等無法進行屬以下各分類級的探討，僅取所得中有意義之特性予以討論，以提供往後處理女貞屬植物者有力之依據。

1.花序：一般而言，多數學者同意複式之花序代表一原始型，作者亦同意將由繁至簡之演化方向應用在女貞屬花序型上，亦即：日本女貞與小實女貞有十二側軸之花序型爲最原始，卜萊斯女貞有4側軸之花序型爲中間型，玉山女貞之1側軸或無側軸之花序型爲最進化（圖一之4、5、6）。

花序特徵大致可作爲屬內分組之用，可由日本之7種植物中，其花序之型式分類，與本省者相同之證據來支持此一說法。

2.花：由花冠筒之發生及長短因種而異之現象推測，可能爲各種植物與其授粉者相互作用(interaction)所得之結果，此一問題值得詳加研究。通常，一般學者認爲長花冠筒者代表進化之型式（但有不同的觀點），筆者等以此排列一演化方向（圖一之1、2、3）。配合花序之演化假說，認爲小一女貞爲省產本屬植物之最原始型，而玉山女貞爲最進化型，日本女貞之3種花柱花型（長花柱型、中間花柱型和短花柱型）或與其減少自花授粉可能性有關。但花型與花型間如何授粉有待研究。

3.花期：可分早、晚二期，早花期者僅卜萊斯女貞1種，在梅雨季之前（3—4月）開花，其餘三種均屬於晚花期者，在梅雨季後（5—6）月才開花，前者之花期性隔離機制、在在證明卜萊斯女貞爲一獨立種（good species）。

六、種之檢索表

1. Inflorescence a much reduced thyrse with 3–5 flowers in a cluster; leaves less than 3 cm long . . . . . 3. *L. morrisonense*
1. Inflorescence a paniculate thyrse with numerous flowers; leaves more than 3 cm long.
2. Inflorescence with 3–4 branches on the axis; corolla tubes more than 9 mm long; petioles 2–3 mm long . . . . . 4. *L. pricei*
2. Inflorescence with 10–13 branches on the axis; corolla tubes 3–7 mm long.
3. Corolla tubes 4.3–7 mm long; leavess coriaceous; fruits ellipsoid . . . . . 1. *L. japonicum*
3. Corolla tubes ca. 3 mm long; leaves chartaceous; fruits globose . . 2. *L. microcarpum*

七、分類處理

1. *Ligustrum japonicum* Thunb., Fl. Jap. 17. pl. 1. 1784; Mansfeld in Bot. Jahrb. **59**: Beibl. **132**: 51. 1924; Li in Li *et al.*, Fl. Taiwan **4**: 140. 1978. 日本女貞

   Ligustrum japonicum Thunb. var. *rotundifolium* Bl., Mus. Bot. Lugd. Bat. **1**: 311. 1851; Masamune, Short List Form. 169. 1936.

   L. japonicum Thunb. var. *pubescens* Koidz. in Bot. Mag. Tokyo **30**: 28. 1916; Kanehira, Form. Trees rev. ed. 615. f. 571. 1936.

   L. micranthum Zucc. var. *pubescens* Koidz. in Bot. Mag. Tokyo **30**: 82. 1916; Mori in Masamune, Short Fl. Form. 169. 1936.

   L. amamianum sensu Masamune in Trans. Nat. Hist. Soc. Form. **24**: 212. 1936, *non* Koidz.

   L. kanehirai Mori in J. Taihoku Soc. Agr. & For. **4**: 207. 1940.

   L. japonicum Thunb. var. *syaryotense* Masamune & Mori in J. Taihoku Soc. Agr. & For. 4: 205. 1940.

   An evergreen shrub or small tree, 3–5 m high; young branchlets minutely puberulous soon glabrous. Leaves thickly coriaceous, glabrous, oblong to ovate, 3.5–7.5 cm long, 1.8–3.8 cm broad, short-acuminate to acute or obtuse at the apex, acute to obtuse at the base, entire, the lateral veins 5–8 pairs, indistinct; petioles 0.4–0.8 cm long. Inflorescence a thyrse, terminal, subsessile, puberulous, 7–12 cm long, with ca. 12 branches; flowers numerous; pedicels 0.5–1.5 mm long; calyx ca. 1.8 mm long, the lobes triangular to round, distinct; corolla tubes 2–5 mm long, the lobes 1.5–3.0 mm long; stamens 2; filaments ca. 2.5 mm long; styles 2.8–3.5 mm long. Fruit ellipsoid, ca. 9 x 5 mm in size.

   Distributed in Mainland China, Korea, Japan, the Ryukyus, and Bonin islands.

   Ecology. At open site of the forests from low land to 2200 m in elevation.

   Phenology. May through June.

   Specimens examined. TAIPEI Co.: Shehliao, *Simada-Hidetaro 1216* (Type of *L. japonicum* Thunb. var. *syaryotense* Mori, TAI); Chu-tze-hu, *Lu 13154* (TAIF); Giran, *Kanehira s. n.* Dec. 1916 (Type of *L. kanehirai* Mori, TAIF); Ta-tung-shan, *Lu 16511* (TAIF); Keelung (Ho-ping-tao), *Lu 16399* (TAIF). TAOYUAN Co.: Chih-tuan, *Lu 16421* (TAIF). MIAOLI Co.: Ho-yen-shan, *Lu 4427* (TAIF). TAICHUNG Co.: Pi-lu-shih, *Lu s. n.* May 26, 1981 (TAIF). CHIAYI Co.: Fen-chih-hu, *Lu 14395* (TAIF). PINGTUNG Co.: Ta-han-lin-tao, *Lu 15006* (TAIF); Fengkang (Li-lung-shan), *Lu s. n.* (no date available) (TAIF). TAITUNG Co.: Tu-luang-shan, *Lu 5996* (TAIF). HUALIEN Co.: Shao-chin-suei, *Lu 14596* (TAIF); Ho-ping-lin-tao, *Lu 16305* (TAIF). ILAN Co.: Tai-ping-shan, *Lu s. n.* Mar. 22, 1985 (TAIF).

   Note. The authors agree Mansfeld's opinion (1924) to reduce *L. japonicum* Thunb. var. *pubescens* Koidz. of Taiwan, the Ryukyus and Japan to the synonymy of the species.

2. *Ligustrum microparpum* Kanehira & Sasaki in Trans. Nat. Hist. Soc. Form. **21**: 146. 1931; Li in Li *et al.*, Fl. Taiwan 4: 141. 1978. 小實女貞

   Ligustrum nokoense Masamune & Mori in J. Soc. Trop. Agr. 4: 191. 1932.

   L. shakaroense Kanehira Form. Tree rev. ed. 620. f. 576. 1936. *nom. nud.*

   L. microcarpum Kanehira & Sasaki var. *shakaroense* Shimizu & Kao in Acta Phytotax. Geobot. **20**: 67. 1962. *syn. nov.*

   L. matsudae Kanehira, Form. Tree rev. ed. 616. f. 57. 1936. *nom. nud.*

   L. matsudae Kanehira *ex* Shimizu & Kao

in Acta Phytotax. Geobot. **20**: 70. 1962. *syn. nov*.

A shrub or small tree, 3–7 m high; young branchlets somewhat puberulous. Leaves chartaceous, ovate-oblong to oblong, 3.5–8.0 long, 1.5–3.3 cm broad, obtuse-round to emarginate or sometimes acute at the apex, acute to obtuse at the base, entire, the lateral veins 6–8 pairs, indistinct; petioles 3–18 mm long. Inflorescence a thyrse, terminal, puberulous, 7–10 cm long, with ca. 12 branches; flowers numerous; pedicels 0.9–1.5 mm long; calyx broadly cupuliform, ca 1.0 mm long, glabrous, the lobes indistinct; corolla tubes ca. 1.1 mm long, the lobes ca. 2.0 mm long; stamens 2, the filaments 1.8–2.2 mm long; style ca. 1.6 mm long. Fruit globose, ca. 6.5 x 6 mm in size.

Endemic to this island.

Ecology. At the open sites of forests and the bare rocky sites from low land to 2,500 m in elevation.

Phenology. May through June.

Specimens examined. TAIPEI Co.: Ping-lin, *Ohwi s. n.* June, 1933 (Type of *L. shakaroense* Kanehira, TAI); Pi-hu, *Lu 16260* (TAIF). HSINCHU Co.: Kuan-wu, *Lu 13432* (TAIF). TAICHUNG Co.: Pi-lu-shih, *Lu 5710* (TAIF); Li-shan, *Lu 13377* (TAIF). NANTOU Co.: Nan-tou, *Matuda s. n.* Aug. 11, 1919 (Type of *L. microcarpum* Kanehira & Sasaki, TAIF); Nen-kao-shan, *Kudo & Mori 2139* (Type of *L. nokoense* Masamune & Mori, TAI); Tan-ta, *Lu 15190* (TAIF). CHIAYI Co.: A-li-shan to Ta-ta-chia, *Lu 14756* (TAIF). PING-TUNG Co.: Heng-chung Peninsula, *Matuda 719* (Type of *L. matsudae* Kanehira ex Shimizu & Kao, TAIF); Ta-han-lin-tao, *Lu 15006* (TAIF); Suang-liu, *Lu 12298* (TAIF); Lin-pa-la-pa-la-shan, *Lu 13570* (TAIF). HUALIEN Co.: San-chan, *Lu 16331* (TAIF); Lan-shan, *Lu 13046* (TAIF). ILAN Co.: Shih-yuan-ya-kou, *Lu 16258* (TAIF).

Note. *L. shakaroense* was first described in English by Kanehira in 1936. In 1962, basing on the pubescent petioles and vein axils, Shimizu and Kao redescribed the species in latin, and treated it as a variety of *L. microcarpum*. Since the pubescence varies quantitatively and intraspecifically, the authors reduce the variety rank to its specific status.

L. matudae Kanehira & Sasaki was recognized as a distinct species by many authors since it has larger leaves with longer petioles than those of other knwon species of Taiwan. In the examination of many specimens of *L. microcarpum*, the authors learned that some intermediates of the two species exist. Therefore, the authors treat *L. microcarpum* and *L. matudae* as conspecies.

3. *Ligustrum morrisonense* Kanehira & Sasaki in Trans. Nat. Hist. Soc. Form. **21**: 147. 1931; Kanehira, Form. Tree rev. ed. 618. 1936; Li in Li *et al.*, Fl. Taiwan **4**: 143. 1978. 玉山女貞

A small shrub, sometimes prostrate, young branchlets pubescent. Leaves thinly coriaceous, subsessile, ovate to oblong, 0.8–2.5 cm long, 0.4–1.1 cm broad, obtuse-round to emarginate or sometimes acute at the apex, obtuse-round to acute at the base, entire, the lateral veins 3–4 pairs, indistinct; petioles 1–3 mm long. Inflorescence a much reduced thyrse, sessile, terminal, pubescent; flowers 2–5 in a cluster; pedicels 0.5–1 mm long; calyx 2.0 mm long, slightly pubescent, the lobes triangular, distinct; corolla tubes ca. 8 mm long, 4-lobed, the lobes ca. 2 mm long; stamens 2, the filaments ca. 1.4 mm long, the style ca. 1.4 mm long. Fruit globose, 3.5 x 3.0 mm in size.

Endemic to this island.

Ecology. At the open sites of forest or bare rocky sites of 1,200 to 3,000 m of mountain area in this island.

Phenology. May through June.

Specimens examined. NANTOU Co.: Hsin-ren-kang (near Ho-huan-shan, at 2,490 m), *Lu 14985* (TAIF). CHIAYI Co.: Yu-shan (Niitakayama-Tataka, at 9,000 ft), *Kanehira & Sasaki s. n.* Feb., 1918 (TAIF), *Kawakami & Mori s. n.* Oct. 1906 (TAIF); Pai-yung to Tataka, *Lu 14763* (TAIF); Tataka, *Lu 13500* (TAIF). HUALIEN Co.: Lan-shan, *Lu 13049* (TAIF); Lu-shuei, *Lu 15954* (TAIF); Nan-hu-ta-shan, *Sasaki s. n.* July, 1922 (TAIF). ILAN Co.: Shih-yuan-ya-kou, *Lu s. n.* Jun. 3, 1980 (TAIF).

Note. The authors agree with Kanehira's opinion (1936) which indicated that this species is closely related to *L. delavayanum* Hariot of the Mainland China, but differs in having different inflorescence.

However, *L. morrisonense* is a distinct species of the genus *Ligustrum* of Taiwan

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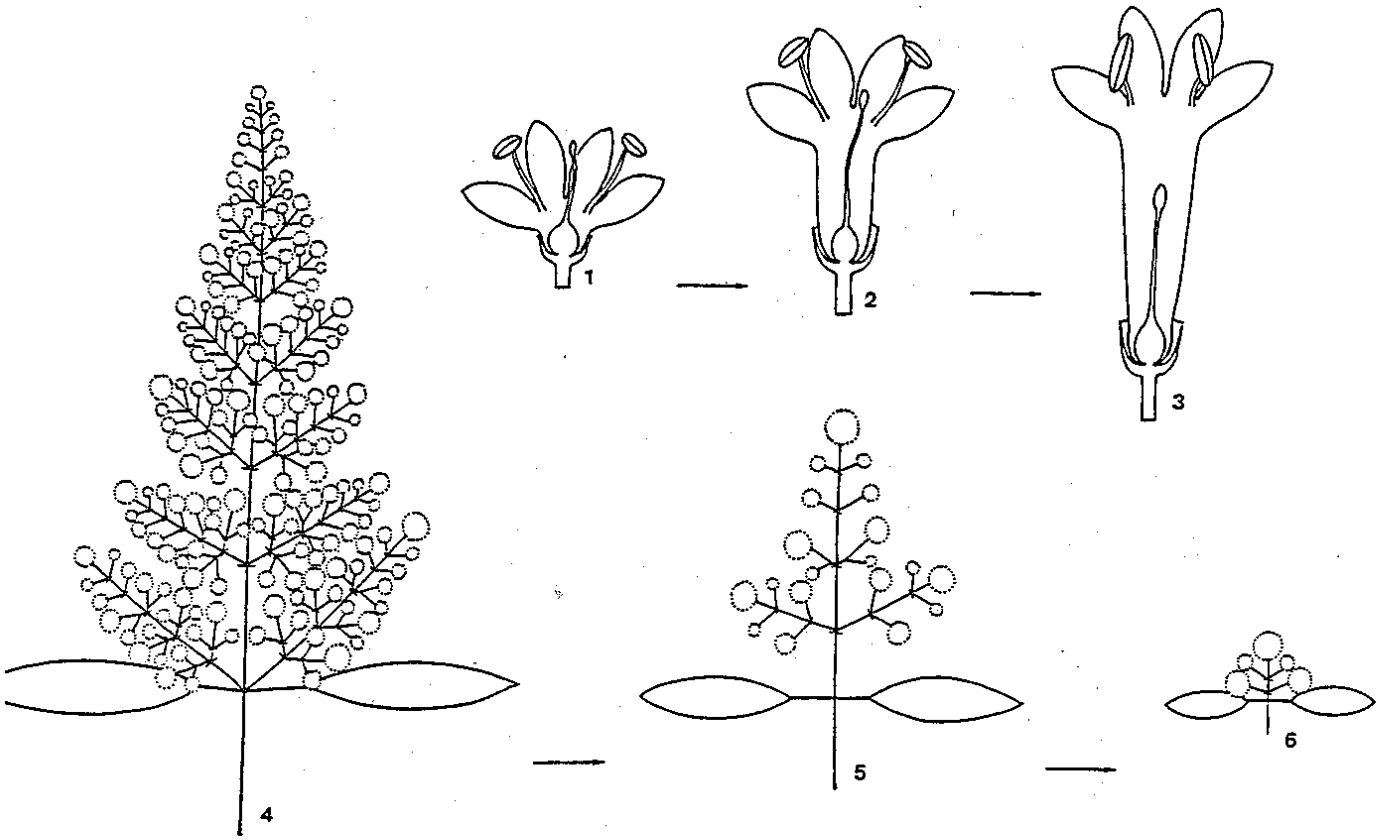

Figure 1. The proposed evolution of the inflorescence and florwer types of *Ligustrum*.

because of its much reduced inflorescence as well as small leaves less than 2.5 cm in length.

L. ibota Sieb. & Zucc., an endemic species of Japan, was listed as a native species of Taiwan in Sasaki's publication (1928). Since no other reports concering the species were currently available to us, we assume that *L. ibota* was misidentified as *L. morrisonense* by Sasaki due to their similar inflorescences. However, further study is needed to support this assumption.

4. *Ligustrum pricei* Hayata, Ic. Pl. Form. **5**: 123. f. 43. 1915; Kanehira, Form. Tree rev. ed. 619. 1936; Li in Li *et al.*, Fl. Taiwan **4**: 143. 1978. 卜萊斯女貞

   Ligustrum formosanum Rehder in Sargent, Pl. Wilson. **2**: 608. 1916.

   L. seisuiense Shimizu & Kao in Acta Phytotax. Geobot. **20**: 67. 1962. *syn. nov.*

   L. japonocum Thunb. var. *pricei* (Hayata) Liu & Liao in Quart. J. Taiwan Mus. **31**: 292. 1978. *syn. nov.*

A shrub or small tree, 2–4 m high; young branchlets slender, somewhat pubescent. Leaves thinly coriaceous, subsessile, oblong to lanceolate or rhomboid-ovate, 3.5–7.0 cm long, 1.5–3.0 cm broad, acuminate to acute at the apex, obtuse or acute at the base, entire, the lateral veins 6–8 pairs, indistinct; petioles short, 2–3 mm long. Inflorescence a thyrse, terminal, 2–3 cm long, pedunculate, with 4–5 branches, slightly pubescent; peduncles 2–3 cm long; flowers numerous; pedicels 1.0–5.5 mm long; calyx glabrous, ca. 2.1 mm long, the lobes distinct; corolla tubes ca. 6.5 mm long, the lobes ca. 2.5 mm long; stamens 2, the filaments ca. 1.5 mm long, the style 4–7 mm long. Fruit oblong, ca. 7 x 4 mm in size.

Endemic to this island.

Ecology. In the broad-leaved forest, ravine, or open site of forest below 1,800 m in elevation.

Phenology. March through April.

Specimens examined. NANTOU Co.: Horisha (currently Pu-li), *Price s. n.* 1912 (Type of *L. pricei* Hayata, TAIF); Chiou-fen-er-shan, *Lu 18704* (TAIF). TAINAN Co.: Yu-chin, *You & Liao s. n.* (no detail information). HUALIEN Co.: Shao-chin-shuei, *Lu 14602* (TAIF); Sha-fu-shih-lin-tao, *Lu 14473* (TAIF); Chin-shuei-shan, *Shimizu & Kao 11721* (Type of *L. seisuiense* Shimizu & Kao, TAI); Hsin-kang-shan, *Lu 19392* (TAIF).

Note. This species was only known from the type collections gathered by Price at Horisha since described by Hayata in 1915. To collect more materials for study, the authors made several field trips at the type locality indicated in Price's guidance (1982). In 1986, some materials with flowering buds of *Ligustrum* near Horisha were collected. They were then examined as *L. pricei* because their characters appeared fully agree Hayata's original description. The species is quite understood since then.

In 1962, Shimizu and Kao described a new species *L. seisuiense* for few collections made at Ching-shuei-shan. According to them, the species was characterized by the short inflorescence and the narrow and long leaves with caudate apex. However, the authors found that the variation of the key characteristics of the species at the locality follows that of *L. pricei*. Thus, the authors regard the two species as being conspecific.

In 1978, Liu and Liao treated *L. pricei* as a variety of *L. japonicum* Thunb. Since the two species are distinctly different in the length of inflorescence, the branches of the inflorescence, the texture of leaves, the length of petioles, and the phenology, the authors regard *L. pricei* representing a distinct species.

誌　謝

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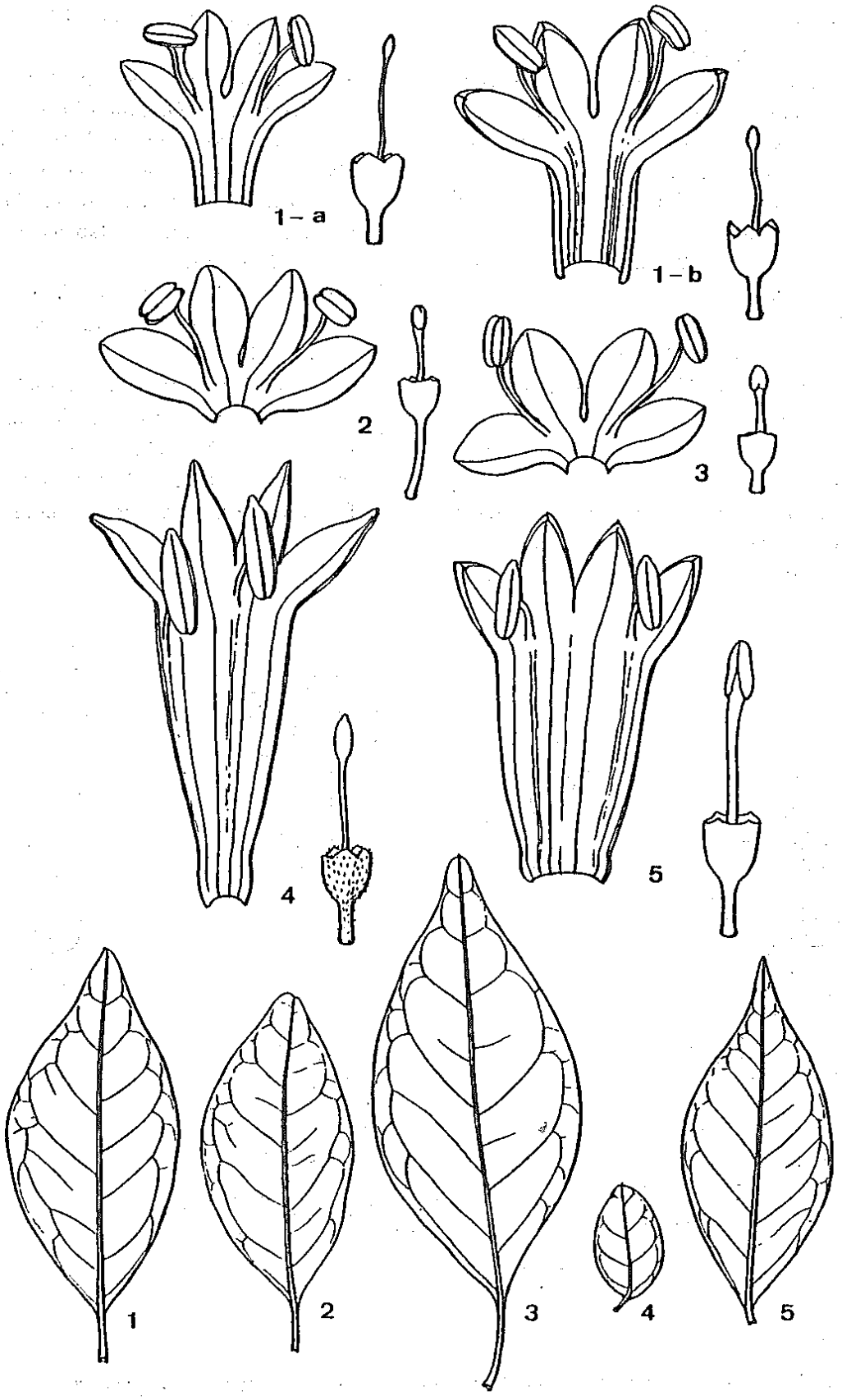

Figure 2. The morphology of flowers and leaves of *Ligustrum*. 1. a & b, *L. japonicum*; 2 & 3. *L. microcarpum*; 4. *L. morrisoniense*; 5. *L. pricei*.

Table 1. The evolutionary history of the scientific names of *Ligustrum* in Taiwan.

	Henry (1896)	Hayata (1915)	Rehder (1916)	Sasaki (1928)	Kanehira (1931)	Masamune and Mori (1932)	Masamune (1936)	Kanehira (1936)	Mori (1940)	Suzuki and Kao (1962)	Li (1963)	Liao (1978) and (1981)	Authors
L. japonicum	+										+	+	+
var. *pubescens*								+				+	
var. *ovalifolium*				+									
var. *rotundifolium*							+						
var. *syaryotense*									+ (var. nov.)				
var. *pricei*												+ (stat. nov.)	
L. amamianum							+						
L. formosanum			+ (sp. nov.)	+			+	+					
L. pricei		+ (sp. nov.)		+			+	+		+	+		+
L. ibota				+									
L. microparpium					+ (sp. nov.)		+	+		+	+	+	+
var. *shakaroense*										+ (var. nov.)			
L. morrisonense					+ (sp. nov.)		+	+		+	+	+	+
L. nokoense						+ (sp. nov.)	+						
L. micranthum													
var. *pubescens*							+						
L. matudae								+ (nom. nud.)		+ (sp. leg.)	+	+	
L. shakaroense								+ (nom. nud.)				+ (stat. nov.)	
L. kanehirai									+ (sp. nov.)				
L. seisuiense										+ (sp. nov.)	+	+	

Fig. 1. The proposed evolution of the inflorescence and flower types of *Ligustrum*.

Fig. 2. The morphology of flowers and leaves of *Ligustrum*. 1. a & b, *L. japonicum*; 2 & 3. *L. microcarpum*; 4. *L. morrisoniense*; 5. *L. pricei*.

Fig. 1. Diospyros rhombifolia Hemsl. 1. flowering branch; 2–4. male inflorescences; 5. flower; 6–7. longitudinal section of flower; 8. stamens; 9. female flower; 10. longitudinal section of flower; 11. pistile; 12. cross section of ovary; 13. bract; 14. fruit.

Fig. 2. Leaf Morphology of *Diospyros* spp. 1. *D. ferrea*; 2. *D. vaccinioides*; 3. *D. oldhamii*; 4. *D. rhombifolia*; 5. *D. maritima*; 6. *D. maritima*; 7. *D. discolor*; 8. *D. morrisiana*; 9. *D. erientha*; 10. *D. japonica*.

Fig. 3. Inflorescences and Fruits of *Diospyros*. 1. *D. ferrea*; 2. *D. vaccinioides*; 3. *D. oldhamii*; 4. *D. rhombifolia*; 5. *D. maritima*; 6. *D. maritima*; 7. *D. discolor*; 8. *D. morrisiana*; 9. *D. erientha*; 10. *D. japonica*.