

## Notes on the genus *Piper* L. (Piperaceae) in Thailand

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ABSTRACT. *Piper caninum* Blume, *P. muricatum* Blume, *P. magnibaccum* C.DC., *P. ramipilum* C.DC., and *P. ridleyi* C. DC. are newly recorded for Thailand. These species are described and illustrated with line drawings and photographs. *P. magnibaccum* is lectotypified.

*Piper* is the largest genus in the family Piperaceae with approximately 1,000 species (Tebbs, 1993). The distribution is mainly in the New World and in the Old World especially in Malaysia (Yuncker, 1958). Nineteen species have been enumerated in Thailand (The Forest Herbarium, 2001). The genus can be easily recognized on gross morphological characters, but it is difficult to identify to species. The genus is characterized by being either monoecious or dioecious, with leaves that are simple, alternate and entire. The inflorescences are spikes or catkins with dense or sparse flowers on the rachis. The flowers are unisexual or bisexual, very small, without sepal and petal and floral bracts are different in shape. The ovary has one locule and the fruit is a drupe.

During revisionary work on the genus in Thailand the following new records have been found. In addition *P. magnibaccum* is lectotypified.

Prof. Dr. P. Chantarantthai and I are working on the account of the family Piperaceae for the Flora of Thailand.

***Piper caninum*** Blume, Verh. Nat. Batav. Gen. 11: 214. 1826; Hook., Fl. Br. Ind. 5: 82. 1887; Ridl., Fl. Mal. Pen. 3: 38. 1924; Henderson, Mal. Wild Flow. 6(3): 422. 1951; Backer & Bakh.f., Fl. Java 1: 171. 1963. Type: Indonesia, Java. Figs. 1 & 4 A–D.

Woody climber, dioecious, glabrous, puberulous or pilose; node swollen with adventitious roots. *Leaves* chartaceous, elliptic, elliptic-oblong, ovate or cordate, symmetric or asymmetric, 3–15.5 by 2.5–5 cm, apex acuminate, base rounded, cuneate or cordate,

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margin glabrous, lower surface glabrous, puberulous or pilose, venation pinnipalmately 2-nerved, glabrous or puberulous; petioles 0.7–1.8 cm long, glabrous or puberulous; stipules lanceolate, glabrous, puberulous or pilose. *Inflorescence* terminal, petioles opposed, catkin, erect, cylindrical, white; rachis hairy, with dense flowers; floral bract peltate, 2 mm diam., margin ciliate, stalk 0.5–0.6 mm long; peduncles puberulous or pilose. *Male inflorescence* 0.5–2.5 by 0.1–0.2 cm; peduncles 0.5–2.5 cm long. *Male flower*: stamens 3; filament ca. 0.8 mm long; anther ca. 0.8 mm long with 2 valves and longitudinal theca. *Female inflorescence* 0.6–1.2 by 0.1–0.2 cm; peduncles 3–6 mm long. *Female flower*: ovary elliptic, stigma star-shaped, 3–4-lobed, hairy. *Infructescences* 2–3 by 1 cm wide, erect, cylindrical; peduncles 0.7–2 cm long. *Fruit* ± globose, 3–4 mm diam. with stipe 3–5 mm long; sparse on rachis, ripening red, with persistent stigma.

Thailand.—PENINSULAR: Chumphon [*Khantchai* 1145 (BKF); *Jaray* 81 (BK); *Put* 1570 (BK)]; Ranong [*A.F.G. Kerr* 11747 (BK), 16732 (BK), 16854 (BK)] Surat Thani [Khao Sok, *V. Chamchumroon* 866 (BKF); *A.F.G. Kerr* 12567 (BK), 13312 (BK); *C. Suwanphakdee* 113 (Kasetsart University Herbarium), 114 (DMSC)]; Phangnga [*A.F.G. Kerr* 17155 (BK), 18347 (BK)]; Krabi [*A.F.G. Kerr* 18561 (BK)]; Nakhon Si Thammarat [Khao Luang, *B. Hansen & T. Smitinand* 11855 (BKF); *H. Koyama et al.* T-34049 (BKF); *J.F. Maxwell* 87-216 (BKF); *Ploenchit* 148 (BKF); *Snan* 531 (BKF), 973 (BKF); *T. Shimizu et al.* T-28978 (BKF); *T. Smitinand* 1001 (BKF); *C. Suwanphakdee* 55 (BK), 137 (BK), 139 (BKF)]; Phatthalung [*A.F.G. Kerr* 15321 (BK)]; Trang [Khao Chong, *Ch. Charoenphol et al.* 3506 (BKF); *C. Chermisrivattana & K. Larsen* 1649 (BKF); *J.F. Maxwell* 75-771 (BK), 75-801 (BK); *D.J. Middleton et al.* 322 (BKF); *Rabil* 244 (BK); *P. Sangkhachand* 1580 (BKF), 1827 (BK); *T. Shimizu et al.* T-27467 (BKF); *C. Suwanphakdee* 104 (BKF); *Vacharapong* 152 (BK)] Satun [*A.F.G. Kerr* 14544 (BK)]; Songkhla [Ton Nga Chang, *A.F.G. Kerr* 13663 (BK); *J.F. Maxwell* 84-424 (BKF), 84-482 (BKF), 85-20 (BKF), 85-1085 (BKF, CMU), 86-31 (BKF, CMU), 87-216 (BKF, CMU); *R. Pooma et al.* 1941 (BKF); *C. Suwanphakdee* 111 (KKU)]; Ko Hong, Hat Yai, *P. Siriruga* 1241 (AAU)]; Pattani [*A.F.G. Kerr* 7640 (BK)]; Yala [Bala Hala, *C. Suwanphakdee* 142 (DMSC)].

Distribution.—India, Peninsular Malaysia, Singapore.

Vernacular.—Prik nok (พริกนรก) (Trang).

Ecology.—In evergreen or hill evergreen forest, by stream or waterfall. Flowering and Fruiting - all year round.

Note.—The species has variable in shape and size of leaves, but the distinguishing features of *P. caninum* one the erect inflorescence and stipitate ovary.

**Piper magnibaccum** C.DC., Rec. Bot. Surv. Ind. 6(5): 301. 1912; Ridl., Fl. Mal. Pen. 3: 46. 1924. Type: Malaysia, Selangor, Samangko, *Ridley* 15569 (not located); Perak, Larut, *King's collector* 6369 (not located); Maxwell's Hill, *Wray* 4239 (not located); *Curtis* 2046 (SING!); *Thaipang*, *Ridley* 2963 (not located), *Ridley* 5480 (lectotype SING!; designated here).

Woody climber, dioecious, glabrous; stem fleshy with 7 wings; node with adventitious roots. *Leave* coriaceous, fleshy, chartaceous when dry, elliptic or elliptic-ovate, asymmetric, 11–20 by 11–20 cm, apex acute, base cuneate, margin glabrous; venation palmately 3–4-nerved, glabrous; petioles 1.5–4.5 cm long, with 7 wings; stipules lanceolate-

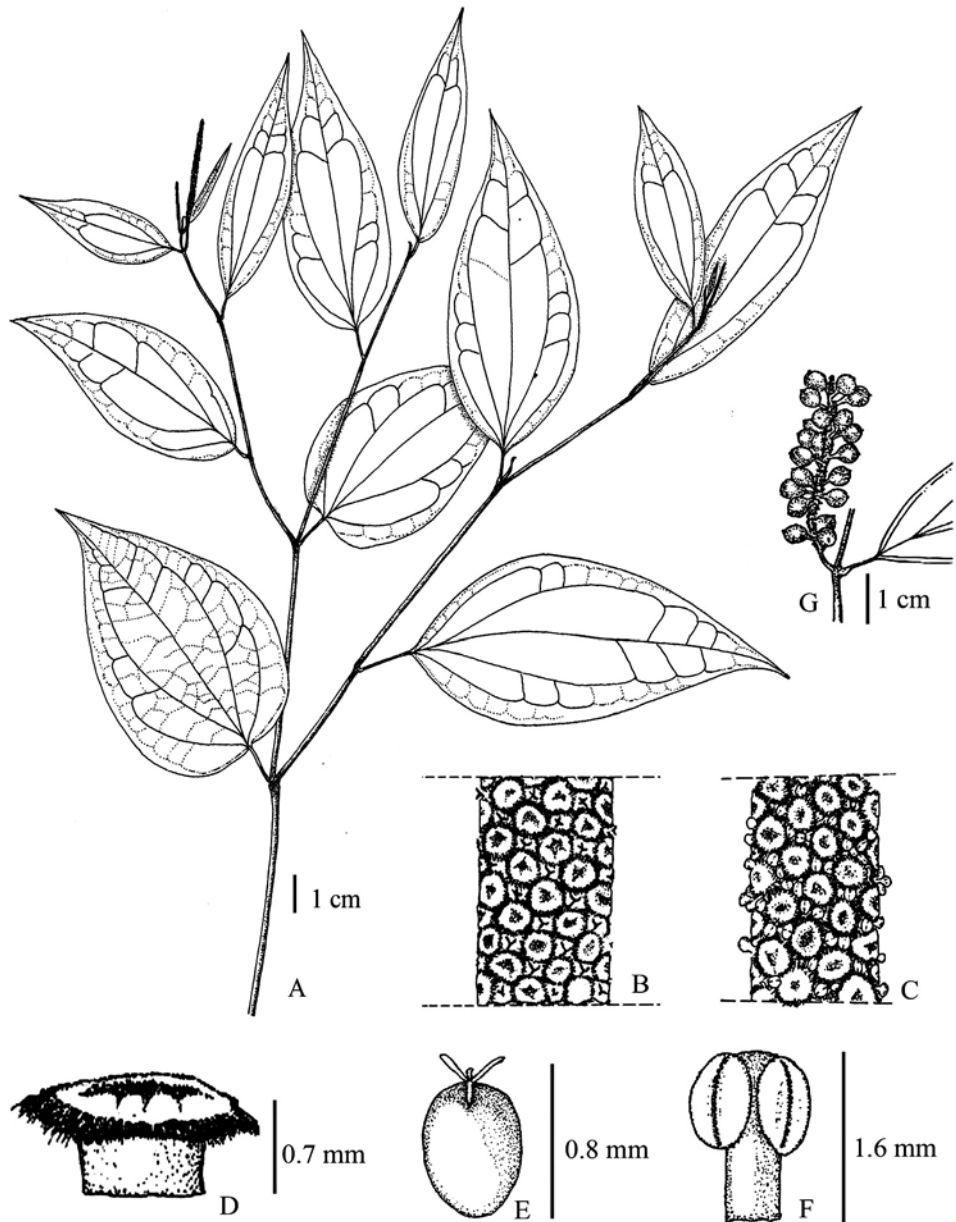


Figure 1. *Piper caninum* Blume: A. flowering branch; B. a portion of female inflorescence; C. a portion of male inflorescence; D. floral bracts; E. ovary; F. stamen; G. infructescence. Drawn by L. Loekhachon and C. Suwanphakdee.

oblong, glabrous. *Inflorescence* terminal, petiole opposed, catkin, pendulous, cylindric, green, rachis hairy, with dense flowers; floral bract ovate, 1–2 mm diam., peduncles 2–4 cm long. *Male inflorescence* unknown. *Female inflorescence* 2–20 by 0.2–0.3 cm, peduncles 2–5 cm long. *Female flower*: ovary elliptic, stigma star-shaped, 3–5-lobed, hairy. *Infructescences* 16–25 cm long, pendulous, cylindric; peduncles 3–5 cm long. *Fruit* ± globose or elliptic, ca. 0.5 cm diam., sparse on rachis, with pointed and curved apex; bract persistent.

Thailand.—PENINSULAR: Nakhon Si Thammarat [Khao Luang, *C. Suwanphakdee* 140 (DMSC); *C.F. van Beusekom* & *C. Phengkklai* 831 (BKF)]; Yala [*C. Niyomdham* 5332 (BKF)].

Distribution.—Peninsular Malaysia.

Ecology.—In evergreen forest, by stream. Fruiting March–April.

Note.—The species is characterized by the 7-winged stem and petiole. Two collections at SING, *H.N. Ridley* 5480 & *C. Curtis* 2046 are mentioned in the original description. The first collection is chosen as lectotype because it is the better preserved of the two specimens.

***Piper muricatum*** Blume, Verh. Batav. Nat. Gen. 11: 219. 1826; Ridl., Fl. Mal. Pen. 3: 32. 1924; Backer & Bakh.f., Fl. Java. 1: 169. 1963. Type: Indonesia, Java.

Shrub 1–2 m high, dioecious, stem scabrous or hirsute, terminal branch with velutinous hairs; node swollen. *Leaves* chartaceous, ovate or rhomboids, asymmetric, 19–25 by 10–12 cm, apex acute or acuminate, base oblique, rounded or cordate, margin hairy, scabrous, strigose or hirsute on both surfaces; venation pinnately 4–5-nerved, scabrous, strigose or hirsute on both surfaces; petioles 0.5–1.2 cm long, scabrous; stipules lanceolate with velutinous hairs. *Inflorescence* terminal or in the upper axis, petiole opposed, catkin, erect, cylindric, rachis hairy, with dense flowers, floral bract peltate or rounded, 1–2 mm diam., with a short stalk or sessile. *Male Inflorescence* unknown. *Female Inflorescence* ca. 7.5 cm long, peduncles 0.8–2 cm long, scabrous. *Female flower*: ovary more or less globose, stigma star-shaped, 3–5-lobed, hairy, *Infructescences* 7.5 by 1.5 cm, erect, cylindric; peduncles ca. 1.5 cm long. *Fruit* ± globose, 3–4 mm diam., sparse on rachis; stipe 5–6 mm long, ripening fruit yellow, turning red when mature.

Thailand.—PENINSULAR: Narathiwat [*C.S.S.* 276 (BKF); *Supee et al.* 45678 (AAU, BKF)]; *S.S. Larsen et al.* 4628 (BKF)].

Distribution.—Peninsular Malaysia.

Ecology.—Along trail to waterfall in evergreen forest. Flowering & fruiting May–June.

Note.—The species has fruit shorter than stipe.

***Piper ramipilum*** C.DC., Rec. Bot. Surv. Ind. 6(1): 3. 1912; Ridl., Fl. Mal. Pen. 3: 39. 1924. Type: Malaysia, Penang, Gunong Bulang, *Kunstler* 270 (not located); Balik, Palau, *Curtis* 792 (SING!), *Kunstler* 1481 (not located), *Deschamps s.n.* (not located); Perak, Gunong Keledang, *Ridley* 9582 (not located), Larut, *King's collector* 3574 (not located); Johore, Bukit Saya, *Ridley* 11022 (not located). Figs. 2 & 4 E–H.

Woody climber, dioecious, with ramulose hairs when young, glabrescent, terminal branch with dense ramulose hairs, node swollen with adventitious roots. *Leaves* lamina chartaceous or slightly coriaceous, elliptic-oblong, elliptic or cordate, asymmetric, 9.5–13 by 2–2.5 cm, apex acuminate, acute or caudate, base oblique or cordate, margin glabrous, lower surface with ramulose hairs, venation pinnately 2–3-nerved, petioles 4–8 mm long, ramulose; stipules lanceolate or lanceolate-oblong, with ramulose hairs. *Inflorescence* terminal or in upper axis, petiole opposed, catkin, pendulous, cylindrical white to green, rachis glabrous, with dense flowers; floral bract rounded, ca. 1 mm diam. *Male Inflorescence* 9–12 by 0.1–0.3 cm; peduncles 1–2 cm long, with ramulose hairs. *Male flower*: filament ca. 0.2 mm long, anther oblong, row of stamens alternately with row of floral bracts. *Female inflorescence* 6–8 by 0.1–0.2 cm; peduncles 1.2–1.5 cm long, with ramulose hairs. *Female flower*: ovary more or less globose, connate at base, stigma star-shaped, 3–4-lobed, hairy. *Infructescences* 6–13.5 by 0.3 cm, pendulous, cylindrical; peduncles 2.5–4 cm long, with ramulose hairs. *Fruit* globose, 1–2 mm diam., dense and connate at base to the middle part of infructescence, ripening fruit red, stigma and floral bract persistent.

Thailand.—PENINSULAR: Nakhon Si Thammarat [Khao Luang, *T. Smitinand* 781 (BKF); *C. Suwanphakdee* 136 (BK, BKF, DMSC, KKU)]; Trang [Khao Chong, *C. Bunnab* 469 (BKF)]; *P. Sangkhachand* 1997 (BKF); *C. Suwanphakdee* 105 (BK, BKF)]; Songkhla [Ton Nga Chang, *C. Suwanphakdee* 110 (DMSC, KKU)].

Distribution.— Peninsular Malaysia.

Vernacular.—Prik khao (พริกขาว) (Nakhon Si Thammarat).

Ecology.—In shaded or open area by stream in evergreen forest. Flowering March. Fruiting June.

Note.—All parts of *P. ramipilum* are characterized by ramulose hairs except on the rachis and fruit.

**Piper ridleyi** C.DC., Rec. Bot. Surv. Ind. 10: 19. 1919; Ridl., Fl. Mal. Pen. 3: 33. 1924. Type: Malaysia, Selangor, Suiting Peras, *Ridley* 7609 (SING!); Perak, Maxwell's Hill, *Curtis* 2047 (not located), *Waterloo* 2697 (not located), *Kunstler* 10784, Gunong Batu Patek, *Wray* 428 (not located). Fig. 3.

Shrub 1–2 m high, dioecious, terminal branch woolly, node swollen. *Leaves* lamina chartaceous, elliptic or more or less rounded, asymmetric, 19–25 by 12–15 cm, apex acuminate, base oblique or cordate, margin hairy, scabrous on both surfaces, venation pinnately 3–5-nerved, scabrous; petioles 0.4–1.5 cm long, more dense woolly or pilose than lamina; stipules lanceolate, woolly. *Inflorescence* terminal or in upper axis, petiole opposed, catkin, erect, cylindrical, rachis hairy with dense flowers. *Male Inflorescence* unknown. *Female Inflorescence* ca. 7.5 cm long; peduncles 0.5–2 cm long, woolly. *Female flower*: ovary ovate, stigma star-shaped, 3–5-lobed, hairy, floral bract peltate or rounded, ca. 1 mm diam., with short stalk or sessile. *Infructescence* 7.5 by 1.5 cm, erect, cylindrical; peduncles ca. 1.5 cm long, pilose or woolly. *Fruit* ±globose, 4–5 mm diam., sparse on rachis, stipe 2–3 cm long.

Thailand.—PENINSULAR: Yala [Betong, *A.F.G. Kerr* 7443 (BK); *M.C. Lakshnakara* 820 (BK)], Narathiwat [*K. Larsen & S.S. Larsen* 32890 (BKF); *C. Niyomdham & P. Puudjaa* 4978 (BKF); *C.S.S.* 210 (BKF); *C. Suwanphakdee* 144 (BKF, DMSC)].

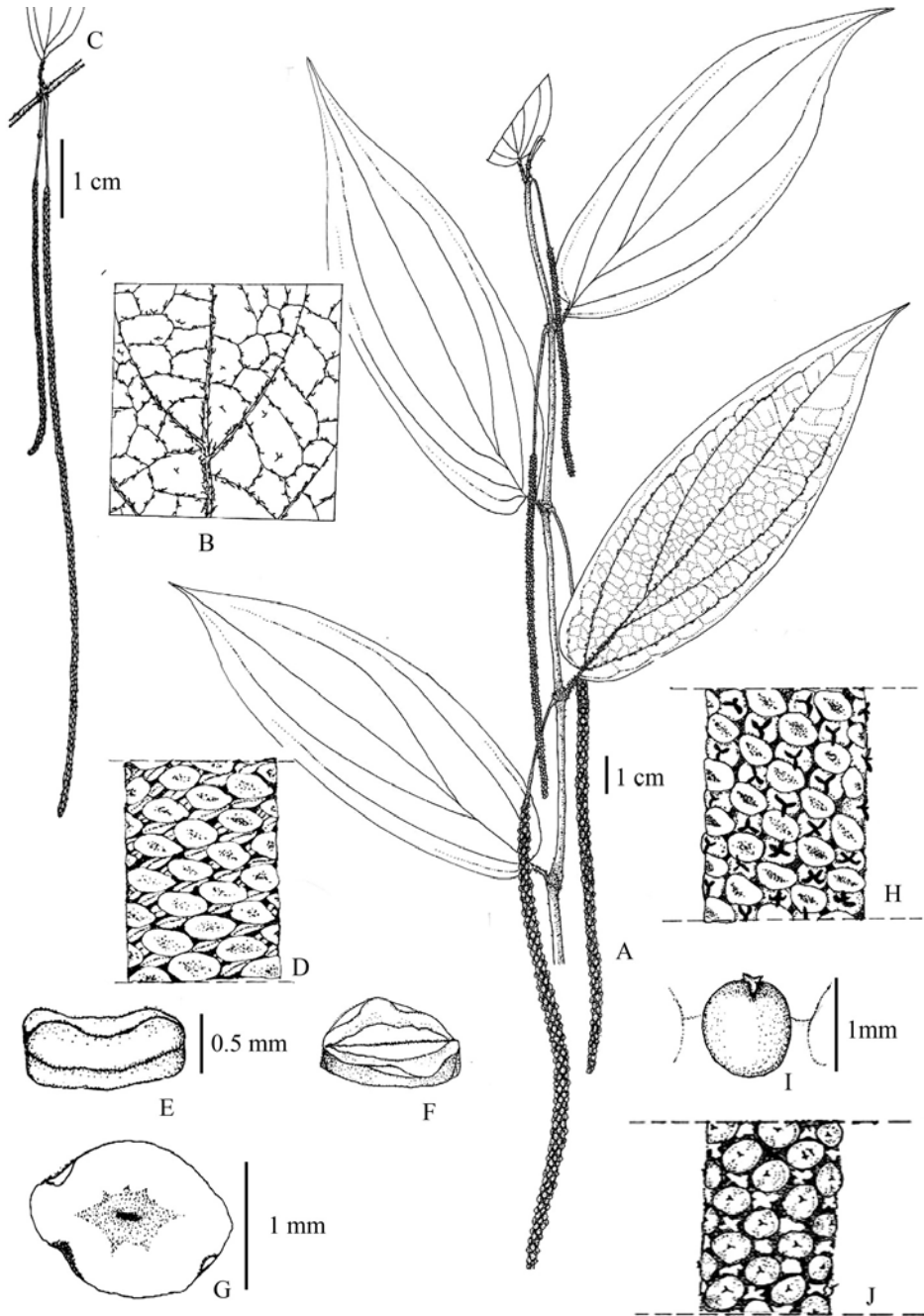


Figure 2. *Piper ramipilum* C.DC.: A. branch with infructescences; B. ramulose hairs on lower leaf surface; C. male inflorescences; D. a portion of male inflorescence; E. mature stamen (size view); F. dehiscent stamen (size view); G. floral bracts; H. a portion of female inflorescence; I. ovary; J. a portion of infructescence. Drawn by L. Loekhachon and C. Suwanphakdee.

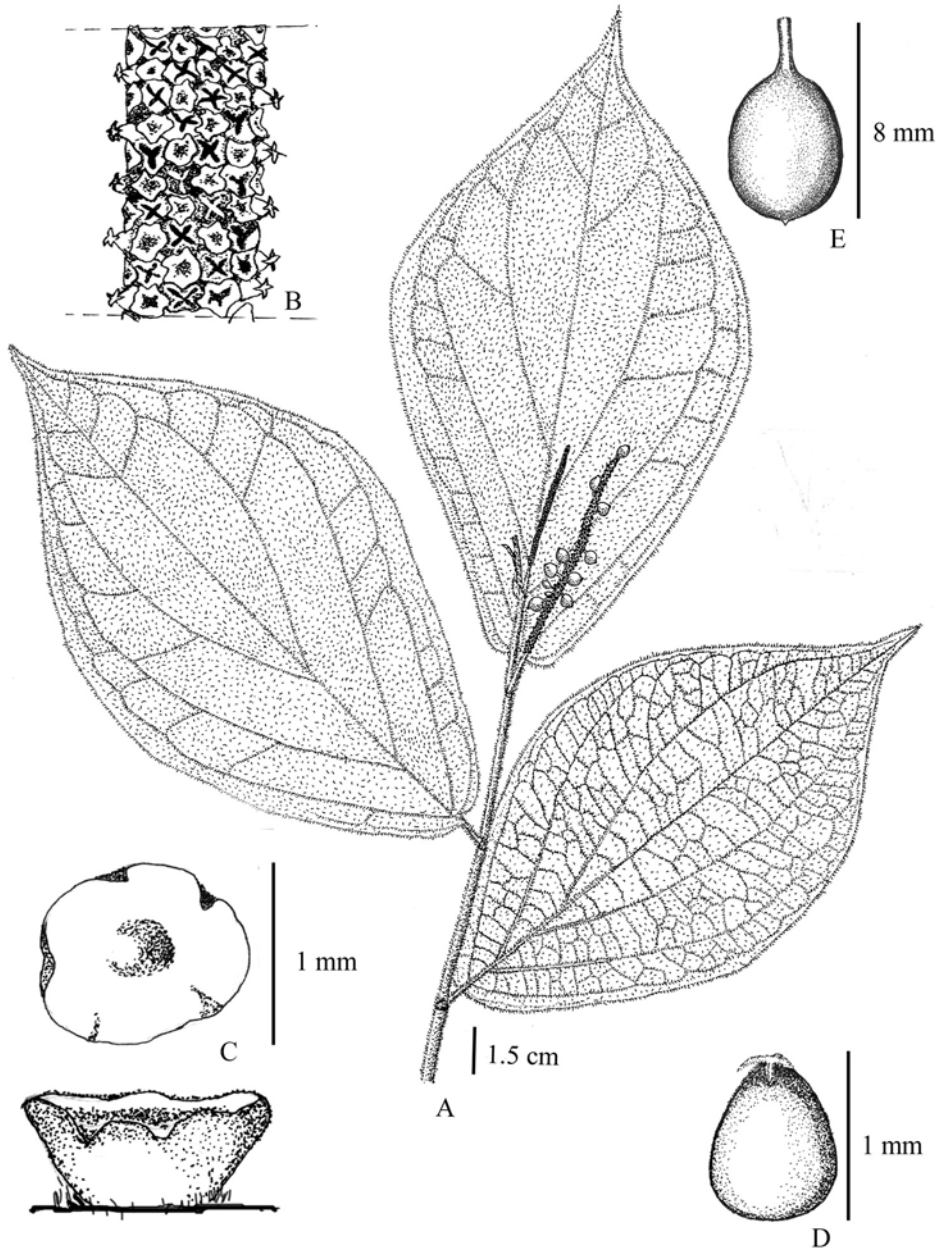


Figure 3. *Piper ridleyi* C.DC.: A. branch with infructescence; B. a portion of female inflorescence; C. floral bract (upper: top view, lower size view); D. ovary; E. fruit. Drawn by L. Loekhachon and C. Suwanphakdee.

Distribution.—Peninsular Malaysia.

Ecology.— In evergreen forest or open area near waterfall. Flowering & Fruiting June-July.

Note.—Two specimens from BK, *A.F.G. Kerr* 7443 and *M.C. Lakshnakara* 820 were determined by Wilson (1972) as *P. muricatum*. *P. ridleyi* is closely related to *P. muricatum* but differs in the fruit which is longer than the stipe.

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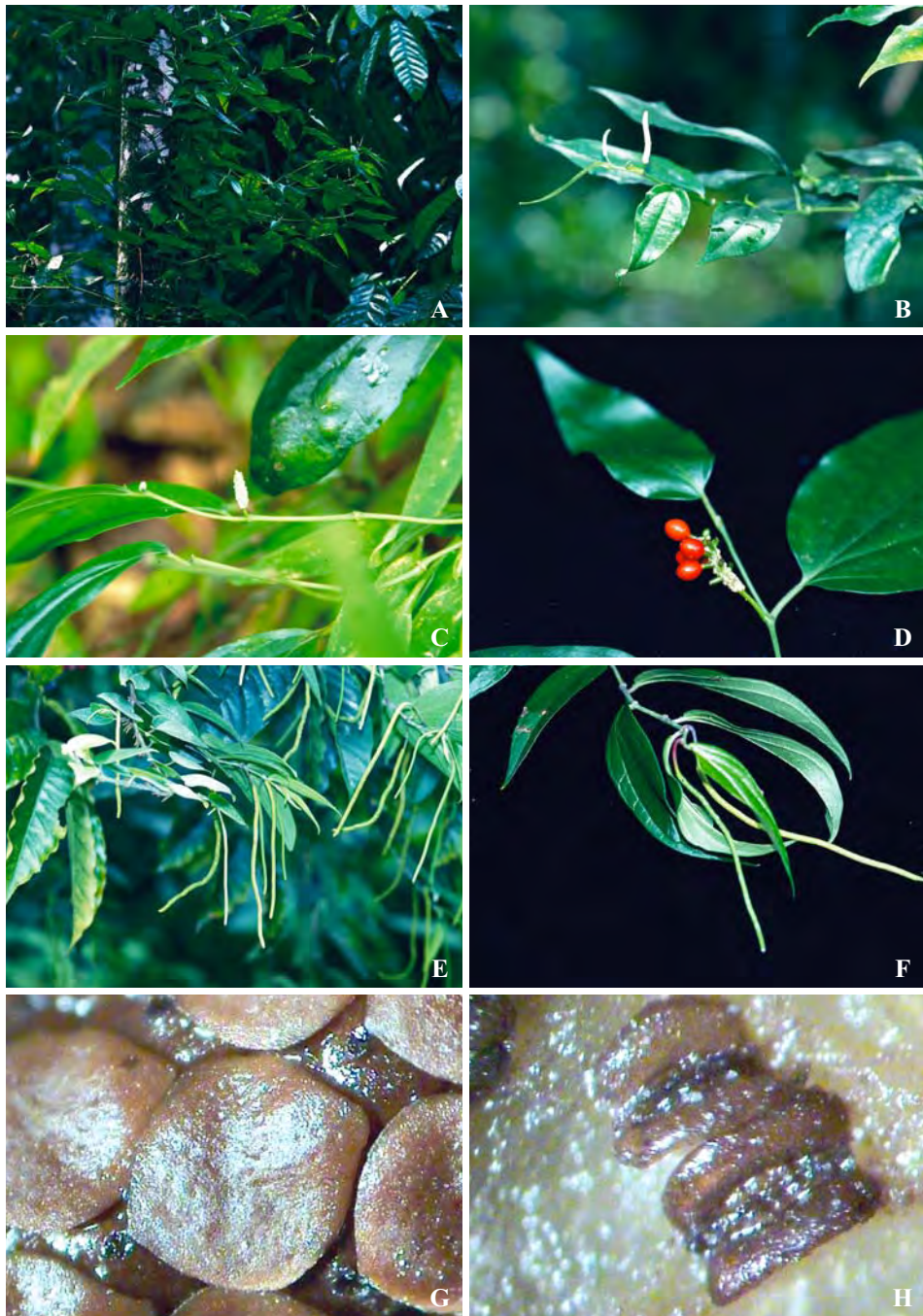


Figure 4. *Piper caninum* Blume: A. habit; B. male inflorescences; C. female inflorescence; D. infructescence. *P. ramipilum* C.DC.: E. habit & infructescences; F. male inflorescences; G. floral bracts; H. stamens (top view). Photographed by C. Suwanphakdee.