

THE GENUS AESCHYNOMENE IN MALAYSIA
(LEGUMINOSAE - PAPILIONATAE)

by

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SUMMARY

Seven species are found to occur in Malaysia, only *Ae. aspera* presumably being native there. Key, synonymy, descriptions, and particulars are given, besides indexes to collections and names.

Some twenty or more species of *Aeschynomene* have been attributed to Malaysia, or "Ind. Or." When the specimens are examined, however, and the synonymy recognized, it appears that the number should be reduced to seven. One species, *Ae. aspera*, presumably is native to the area; *Ae. elaphroxylon* and *Ae. uniflora* are African species; *Ae. americana*, *Ae. elegans*, *Ae. indica*, and *Ae. villosa* are all believed to be natives of America.

The writer is grateful to the curators of the following herbaria for making available the material for this study. The abbreviations of herbarium names used below and in the citation of specimens are those of Lanjouw and Stafleu (Index Herbariorum, 1, ed. 2. 1954).

A Arnold Arboretum Herbarium, Harvard University, Cambridge, Mass.
BO Herbarium Bogoriense, Bogor, Java.

GH Gray Herbarium, Harvard University, Cambridge, Mass.

K The Herbarium, Royal Botanic Gardens, Kew, Surrey.

L Rijksherbarium, Leyden.

MO Missouri Botanical Garden, St. Louis, Mo.

NY New York Botanical Garden, New York, N.Y.

UC Herbarium of the University of California, Berkeley, Calif.

US United States National Herbarium, Washington, D.C.

A e s c h y n o m e n e L.

Aeschynomene L., Sp. PL 713. 1753; Gen. PL ed. 5. 319. 1754.—*Gajati* Rumph. ex Adans., Fam. 2: 328. 1763.—*Mantodda* Adans., Fam. 2: 508. 1763.—*Rochea* Scop., Introd. 296. 1777, non DC. 1810, nee Salisb. 1812.—*Herminiera* Guill. & Perr. in Guill.,

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Perr. & Rich., Fl. Sénégal. 1: 201. 1832.—*Patagoniwm* E. Mey., Comm. Pl. Afr. Austr. 1: 123. 1835, non Schrank. 1808.—*Macromiscus* Turcz., Bull. Soc. Nat. Mosc. 19: 507. 1846.—*Rueppelia* A. Rich., Tent. Fl. Abyss. 1: 203, t.37. 1847.—*Aedemone* Kotschy, Oesterr. bot. Zeitschr. 8: 115. 1858.—*Ctenodon* Baill., Adansonia 9: 236. 1870.—*Secula* Small, Fl. Miami 90, 200. 1913.—*Climacorachis* Hemsl. & Rose, Contr. U.S. Nat. Herb. 8: 43. 1903.

Erect or decumbent herbs, shrubs or small trees; leaves pinnately compound, 5—about 100-foliolate; stipules peltate, appendiculate below the point of attachment or attached at the base and not appendiculate; inflorescences racemose, sometimes paniculate, terminal or axillary, with few or many flowers; calyx and corolla 5-merous; petals yellowish to red or purplish; stamens 10, monadelphous or diadelphous 5:5, fruit a loment (1—)2—18-articulate; seeds small, reniform, light brown to black, smooth sublustrous, the hilum circular.

TYPE SPECIES.—*Aeschynomene aspera* L.

DISTRIBUTION.—Chiefly in the tropics, with some extension into warm temperate areas, in America, Africa, Asia, Australia, and the Pacific Islands.

ECOLOGY.—Some species are hydrophytes, occurring in marshes, mud holes, paddy fields, and along streams; others are more xeric, found in dry waste places, pine barrens, oak woods, caatinga and savanna, or on rocky hillsides and sandy beaches. A few species are cultivated as ornamentals; many are weedy. Some species are widespread; several are known only from the type collections.

USES.—Pith of hydric species such as *Ae. aspera*, *Ae. indica*, etc., used as cork substitute for floats, helmets, insect boxes, etc. and for stropping knives and razors. Some African species used as native medicine. In Java and the United States *Ae. indica*, *Ae. elegans* and others have been tested for green manure but with only moderate success. The larger-flowered species, especially *Ae. elaphroxylon* have been planted as ornamentals.

KEY TO SPECIES AND VARIETIES

1. Stipules peltate, appendiculate below the point of attachment; calyx bilabiate.
2. Leaflets 2—several-costate, somewhat falcate.
3. Ovary and fruit glabrous or nearly so. . . . *la. Ae. americana* var. *americana*.
3. Ovary and fruit puberulent to villous or hispid.
4. Flowers 6—8 mm long; leaflets mostly more than 5 mm long; mature fruit reticulate-veiny near the margins, usually muricate at the center of the articles. . . . *lb. Ae. americana* var. *glandulosa*.
4. Flowers commonly 3—5 mm long; leaflets about 5 mm long or less; surface of fruit lacking conspicuous venation or murication. . . . 2. *Ae. villosa*.
2. Leaflets 1-costate, elliptic, oblong, or obovate.
5. Plants conspicuously thorny; flowers 25—45 mm long; fruit strongly curved or spirally contorted. . . . 3. *Ae. elaphroxylon*.

5. Plants glabrous to hispid but not thorny; flowers less than 20 mm long; fruit straight or but slightly curved.
- G. Flowers 15—20 mm long¹, the petals commonly pubescent on the outer face, the calyx about 9 mm long; fruit mostly 8—10 cm long with both margins essentially straight, the stipe 15—20 mm long, the articles quadrate, about 10 mm long and 7—8 mm wide. 4. *Ae. aspera*
6. Flowers 6—12 mm long, the petals glabrous, the calyx about 4—8 mm long; fruit 2—6 cm long, with one margin straight the other crenate, the stipe 4—10 mm long, the articles subquadrate, about 3—6 mm in diameter.
7. Fruit with stipe recurved, the articles usually rugose at maturity, especially at the center over the seeds, the general profile rounded; calyx with one lip bifid, the other trifid; inflorescences 1—several-flowered, with bracts and bracteoles present; leaflets commonly entire, rarely ciliate-denticulate 5. *Ae. indica*
7. Fruit with stipe straight, ascending, the articles finely verrucose at maturity, raised over the seeds with sharp demarcation of margins, the general profile angular; calyx with lips essentially entire; inflorescences 1- or 2-flowered, apparently without bracts except for the pair of bracteoles immediately subtending the calyx; leaflets commonly ciliate or ciliate-denticulate, sometimes entire. 6. *Ae. uniflora*
1. Stipules attached at the base, not peltate or appendiculate; calyx campanulate with 5 subequal lobes 7. *Ae. elegans*

1. AESCHYNOMENE AMERICANA L.

Aeschynomene americana Linn., Sp. Pl. 713. 1753.*

Herb, sometimes suffrutescent, the stem to about 2 m high, erect or decumbent, glandular-hispid to subglabrous; stipules peltate-appendiculate, glabrous or somewhat hispid at the point of attachment, striate, usually ciliate, (5—)10—25 mm long, 1—4 mm wide, the upper portion attenuate, 2 or 3 times as long as the lower acute or erose portion; leaves 2—7 cm long, 20—60-foliolate; leaflets glabrous, somewhat falcate, 4—15 mm long, 1—2 mm wide, ciliate, at least along one margin, 2—several-costate; inflorescences few-flowered, about as long as the subtending leaves or longer, the axes sometimes flexuous, hispidulous; bracts cordate, acuminate or sometimes truncate-flabelliform, about 2—4 mm long, 2—3 mm wide, glabrous, ciliate; bracteoles linear to linear-ovate, 2—4 mm long, 1—1.5 mm wide, acute to acuminate, glabrous, serrate-ciliate; flowers 5—10 mm long; calyx bilabiate, 3—6 mm long, glabrous to hispidulous, the vexillar lip 2-dentate, the carinal 3-dentate; petals yellowish to tan, usually with red or purple stripes, glabrous, clawed, the standard spatulate with the blade suborbiculate to broadly obcordate, 5—10 mm wide and 4—8 mm long, often ciliate at the apex, the wing blades obliquely oblong, 5—8 mm long, 2 mm wide, entire or with a few cilia at the apex, the keel blades 4—6 mm long, 2.5—3.5 mm wide at the maximum; stamens about 5—8 mm long; fruit about 2.5—3 cm long, 3—9-articulate, the articles 2.5—5 mm wide, 3—6 mm

* Full synonymy under the varieties.

long, glabrous to puberulent, sometimes with glandular hairs on the surface or along the margins, often verrucose when fully mature, the margins thickened, the venation prominent along the margins; seeds 2—3 mm long, 15—20 mm wide, dark brown.

1a. var. AMERICANA

Aeschynomene americana L., Sp. PL 713. 1753.—*Hippocrepis mimosula* Noroña, Verh. Bat. Genootsch. 5: 78. 1790 (cited by Miquel as *Hypocrepis*), *nomen nudum*.—? *Ae. mexicana* Biroli ex Colla, Herb. Pedem. 2: 195. 1834.—*Ae. mimosula* Blume ex Miq., Fl. Ind. Bat. 1: 276. 1855, *nomen in synonym*.—*Ae. javanica* Miq. var. (*j. luxurians* Miq., Fl. Ind. Bat. 1: 276. 1855.—*Ae. americana* L. var. *depila* Millsp., Field Mus. Publ. Bot. 1: 363. 1898.—*Ae. tricholoma* Standl. & Steyerl., Field Mus. Publ. Bot. 23: 10. 1943.

The typical variety is characterized by fruits that are glabrous or that have only a slight tendency toward development of puberulence or glandular hairs on the surface of the articles or along the margins. The bracts are cordate. The flowers commonly are 6—8 mm long.

TYPE LOCALITY.—Jamaica, B.W.I. Type collected by Sloane.

DISTRIBUTION.—Chiefly in Caribbean and adjacent areas; in West to East Java and the Philippine Islands (Bohol, Luzon) apparently introduced from America. Except one collection by Blume (?) all have been made in this century.

LOCAL NAME.—"Asem-aseman", Bandjaran, Java, fide Beumée.

Examination of apparently authentic specimens at Leyden annotated as *Aeschynomene mimosula* Bl. by Blume and *Ae. javanica* var. *luxurians* Miq. by Miquel indicates that those names, as well as *Hippocrepis mimosula* on which the former was based, should be placed in synonymy with typical *Ae. americana*.

1b. var. GLANDULOSA (Poir.) Rudd

Aeschynomene americana L. var. *glandulosa* (Poir.) Rudd, Contr. U.S. Nat. Herb. 32: 26. 1955.—*Ae. glandulosa* Poir. in Lam., Encyc. Suppl. 4: 76. 1816, *von de Wild*. 1904. — *Ae. guayaquilensis* G. Don, Gen. Syst. Gard. Bot. 2: 284. 1832.

This differs from the typical variety in that there is greater glandular activity; the fruits are puberulent and/or beset with glandular hairs. The stipules commonly are hispid at the point of attachment. As in the typical variety, the bracts are cordate and the flowers about 6—8 mm long.

TYPE LOCALITY.—Puerto Rico, "dans les savannes". Type collected by Ledru.

DISTRIBUTION.—Widespread in tropical and subtropical America, usually in wet or moist places, sometimes on dry hills, at elevations up to about 1400 m. In Malaysia seen only from West to East Java, and one specimen

from SW. Celebes. Except a collection by Blume (?) and one by Junghuhn, all collections date from this century. In Malaysia presumably introduced.

LOCAL NAMES.—"Anjang", Java, fide Junghuhn; "katenan", fide Clason.

Separation of this variety from the typical is of dubious value. We do not know if the increased glandular pubescence is due to differences in physiological activity, or in genetic relationship with *Ae. villosa*.

Young material of *Ae. villosa* and of glandular *Ae. americana* are almost impossible to distinguish. A scarcely adequate specimen at Leiden that I have annotated as *Ae. americana* var. *glandulosa* was apparently taken by Miquel and Blume to be the same as my concept of *Ae. villosa*. In what appears to be Miquel's hand is the name *Aeschynomene pudica* Zoll. and in Blume's, *Ae. pseudoviscosa* Bl. On the basis of other specimens, I believe, however, that those names as well as *Ae. javanica*, should be synonyms of *Ae. villosa* Poir.

2. AESCHYNOMENE VILLOSA Poir.

Aeschynomene villosa Poiret in Lam., Encyc. Suppl. 4: 76. 1816.

Herb with stem to about 1 m long, prostrate to weakly erect, hispid; stipules peltate-appendiculate, usually hispid, especially at the point of attachment, striate; ciliate, (5—)10—15 mm wide, the upper portion attenuate, slightly longer to twice as long as the truncate-erose lower portion; leaves about 2—7 cm long, 20—50-foliolate; leaflets glabrous, somewhat falcate, 2—several-costate, 3—15 mm long, 1—3 mm wide, ciliate along one margin; inflorescences about 3—10-flowered, the peduncles and pedicels hispid like the stem, the bracts cordate, acuminate, 1.5—6 mm long, 1—2 mm wide, ciliate, the bracteoles ovate-lanceolate, acute to acuminate, 1—4 mm long, 0.5—1 mm wide, ciliate; flowers 3—9 mm long; calyx bilabiate, 2—4 mm long, hispid, the vexillar lip 2-dentate, the carinal 3-dentate; petals yellow to purplish, glabrous, clawed, the standard commonly about 5 mm long, the claw 1—2 mm long, the blade suborbiculate, 4—5 mm in diameter, emarginate, entire; wings about as long as the standard, the blades obliquely oblong, 1—2 mm wide; keel about 4—5 mm long, the claws 1—1.5 mm long, the blades 3—4 mm long, 1—2 mm wide, sometimes ciliate along the free margin; stamens 4—5 mm long; fruit commonly 1—2 cm long, 3—7-seeded, the articulations distinct or sometimes lacking, the articles 2.5—3(—4) mm in diameter, villous-hispid, the tuberculate bases of the hairs often dark, in contrast to the otherwise straw-colored or light brown fruits, the venation inconspicuous, the margins often breaking away from the **body** of the articles; seeds 2—2.5 mm long, 1.5—2 mm wide, blackish.

2a. var. VILLOSA

Aeschynomene villosa, Poiret in Lam., Encyc. Suppl. 4: 76. 1816.—? *Ae. hirta* Lag., Nov. Gen. et Spec. 22. 1816, non Lam. 1797.—? *Ae. hirsuta* DC, Prodr. 2: 322. 1825.—*Ae. timoriana* Span, in Linnaea 15: 193. 1841, as synonym (*nomen nudum*)

erroneously referred to *Ae. patula* Poir.—*Ae. decumbens* Zipp. ex Span. *I.e.* as synonym (*nomen nudum*) erroneously referred to *Ae. patula* Poir.—*Ae. pudica* Zoll., Nat. en Geneesk. Arch. 3: 55. 1846, non F. G. Dietr. 1802.—*Ae. javanica* Miq., Pl. Ind. Bat. 1: 275. 1855.—*Ae. pseudoviscosa* Blume ex Miq., Fl. Ind. Bat. 1: 276. 1855, *nomen in synon.*—*Ae. glvndulosa* Bello, Ap. 1: 259. 1881, non Poir. 1816.—*Ae. americana* L. var. *villosa* (Poir.) Urb., Symb. Ant. 4: 288. 1905.—*Cassia tenuicaulis* M. E. Jones, Extracts from Contr. West. Bot. 18: 40. 1933.—*Ae. meridana* Pittier, Bol. Téen. Minist. Agric. & Cria Serv. Bot. Caracas 5: 40. 1944, without Latin diagnosis.

All of the Malaysian material of *Ae. villosa* appears to be referable to the typical variety; stems about 2—6 dm high, usually decumbent; leaflets 4—5 mm long, 1—1.5 mm wide, mostly 3-costate; inflorescences open, sometimes paniculate, usually few-flowered, longer than the leaves; flowers commonly 3—5 mm long; fruits with distinct articulations or rarely lacking an occasional septum.

TYPE LOCALITY.—Savannas, Puerto Rico. Type collected by Ledru.

DISTRIBUTION.—Southern Arizona to northern South America and the Antilles, at elevations up to about 2250 m, usually in dry areas, pine and oak woods, pastures, and sometimes in wet places. In Java, Timor, New Guinea, and Australia apparently as an introduced weed. The collections are rather few, in Java already collected by Horsfield and Zollinger, and in Timor by Zippelius and Spanoghe.

Examination of Zippelius and Spanoghe collections from Timor, which presumably are "types" of *Ae. decumbens* Zipp. and *Ae. timoriana* Span., show those two species to be the same as *Ae. villosa* Poir., Miquel, apparently on the basis of description only, erroneously referred *Ae. decumbens* and *Ae. timoriana* to *Ae. patula* Poir. (miss-cited in part as Pers. rather than Poir.).

The name *Ae. javanica* was published by Miquel to replace *Ae. pudica* Zoll., a later homonym of *Ae. pudica* F. G. Dietr.

3. AESCHYNOMENE ELAPHROXYLON (Guill. & Perr.) Taub.

Aeschynomene elaphroxylon (Guil. & Perr.) Taubert in Engl. & Prantl, Nat. Pflanzenf. III, 3: 319, / 12U A-C. 1894.—*Herminiera elaphroxylon* Guill. & Perr. in Guill., Perr. & Rich., Fl. Sénégal. 1: 201, tab. 51. 1832.—*Aedemone mirabilis* Kotschy, Oester. bot. Zeitschr. 8: 116. 1858.— ? *Aedemone excelsa* Kotschy, *I.e.* [As *H. exeelsa* Kotschy by Baker in Oliver, Fl. Trop. Afr. 2: 145. 1871].— ? *Aedemone humilis* Kotschy, *I.e.* [As *H. humilis* Kotschy by Baker, *I.e.*].—*Ae. tchadica* Chev., Etud. Fl. Afr. Centr. Fr. 1: 85. 1913, *nomen*.

Shrub or small tree, 2—8 m tall, the trunk and stems hispid and also armed with thorns about 2—10 mm long; densely pubescent on the outer face, unilaterally stipules/appendiculate below the point of attachment, the upper portion deltoid-ovate, acute, 7—13 mm long, 3—5 mm wide, the

appendage erose, 2—4 mm in diam.; leaves 4—16 cm long, 20—40-foliolate, the rachis pubescent and spiny; leaflets oblong-elliptic, 5—30 mm long, 4—10 mm wide, entire, retuse or emarginate, mucronulate, the base rounded, 1-costate, the secondary veins usually blackish on the lower surface, the upper surface glabrous, the lower coarsely pubescent; inflorescences axillary, racemose, usually 2—4-flowered, the axes hispid like the stems, the bracts and bracteoles ovate, acute, about 5—15 mm long, 3—10 mm wide, pubescent on the outer face; flowers about 3—4.5 cm long, calyx bilabiate, 20—25 mm long, hispid-pubescent, the lips essentially entire, or briefly 2- and 3-dentate; petals orange-yellow, somewhat pubescent, the standard about 30—40 mm long, spatulate, emarginate, 30—40 mm broad, the upper portion usually pubescent on the upper face, the wings slightly longer than the standard, the claw about 5 mm long, the blade oblique, 35—40 mm long and 15—20 mm wide, glabrous, the keel petals slightly shorter than the standard, the claws about 5 mm long, the blades falcate, oblique, about 25—30 mm long and 10—15 mm wide, pubescent on the outer face, laciniate at the union of the two petals; stamens 28—40 mm long; fruit 6—17-articulate, glandular hispid, spirally contorted, short-stipitate, the articles trapezoidal, about 7—9 mm wide, 5—10 mm long; seeds black, about 5 mm long and 3 mm wide.

TYPE LOCALITY.—Senegambia, Africa. Type collected by Perrottet.

DISTRIBUTION.—Tropical Africa and Madagascar, usually in shallow water. Cultivated as ornamental in Java (Bogor) and South America.

LOCAL NAME.—"Ambach" or "ambatsch", Africa.

4. AESCHYNOMENE ASPERA L.

Aeschynomene aspera Linné, Sp. Pl. 713. 1753, non Muhl. ex Willd. in *synon.*, *nee* sensu Wall. Cat. 5666. 1831-1832.—*Ae. lagenaria* Lour., Fl. Conchinch. 2: 446. 1790.—*Ae. aquatiea* Roxb., *nomen in synonym.* Steud., ed. 2, 1: 31. 1840.—*Heclisarum lagenarium* Roxb., Flor. Ind. 3: 365. 1832.—*Ae. indica j] aspera* Hassk. ex Miquel, Fl. Ind. Bat. 1: 275. 1855, in *synon.*

Robust herb, sometimes suffrutescent, the stems commonly erect, 1—2 m high; stipules appendiculate, about 20 mm long, the portion above the point of attachment attenuate, about 15 mm long, 2 mm wide, ciliate to ciliate-denticulate, otherwise glabrous, the lower portion below the point of attachment truncate-erose, about 5 mm long, 2 mm wide; leaves 8—17 cm long, 60— about 100-foliolate, the petiole and rachis glabrous to sparsely hispidulous; leaflets linear-oblong, 5—10 mm long, subequal, those near the base and apex shorter than those at the center, about 1.5 mm wide, 1-costate, the midrib and some secondary veins blackish, the apex subacute, mucronulate, the base asymmetrical, the margin entire to ciliate; inflorescences axillary, racemose, 1—few-flowered; peduncles and pedicels hispid; bracts cordate, about 3—5 mm long, 1.5—3 mm broad, the apex acute to acuminate, ciliate, otherwise glabrous to hispid, the hairs, yellowish, the bracts becoming more hispid towards the flower, the bracteoles ovate, rounded to

acute, hispid, about 2 mm broad, 4—5 mm long; flowers 15—20 mm long; calyx hispid, bilabiate, 6—8 mm long, the vexillar lip retuse, the carinal lip with three acute lobes about 2 mm long; petals yellow, pubescent in part, clawed, the standard broadly spatulate, about 10—15 mm long and 8 mm broad, essentially glabrous, the wings 8—10 mm long, 3 mm broad, glabrous or nearly so, the keel petals 15—20 mm long, 6 mm broad, hispidulous on the outer face; stamens about 15 mm long; fruit 4—7-articulate, compressed to 1.5—2 mm thick, glabrous to moderately hispid, dark brown at maturity, straight or but slightly curved, one margin entire, the other crenate, the stipe 10—15 mm long, the basal article aborted, tapering to the stipe, the apical article also aborted, tapering to the usually persistent style, the other articles subquadrate, 10 mm long, 7—8 mm wide, papillose to verrucose at margin and at the center over the seeds, otherwise smooth; seeds reniform, black, 7 mm long, 4—5 mm wide, 1.5 mm thick.

TYPE LOCALITY.—Ceylon. Type collected by P. Hermann?

DISTRIBUTION.—Eastern India, Ceylon, Burma, Siam, Assam, Cochinchina, Malay Peninsula (one collection by Griffith), and Java (exclusively in the vicinity of Djakarta, already collected in 1870).

LOCAL NAME.—"Sola pith plant".

5. AESCHYNOMENE INDICA L.

Aeschynomene indica Linne', Sp. Pl. 713. 1753.—*Ae. piimila* L., Sp. Pl. ed. 2, 1061. 1763.—*Hedysarum alpinum* Lour., Fl. Cochinch. 451. 1790, ed. Willd. 551. 1793, non L. 1753 [fide Merrill].—*H. virginieum* Lour., Fl. Cochinch. 451. 1790, ed. Willd. 551. 1793, non L. 1753 [fide Merrill].—*Ae. diffuse*/, Klein ex Willd., Sp. Pl. 3: 1164. 1803.—*Ae. indica* var. *ji* ? *punctata* Pers., Synop. Pl. 2: 317. 1807.—*Ae. viscidula* Roxb. ex Willd., Enum. Pl. Hort. Berol. 2: 776. 1809., non Michx. 1803.—*H. neli-tali* Roxb., Hort. Beng 57. 1814.—*Ae. glaberrima* Poir. in Lam., Encyc. Suppl. 4: 76: 1816.—*Ae. aspera sensu* Wall., Cat. 5666. 1831-32, non L. 1753.—*Ae. macropoda* DC, Prodr. 2: 320. 1825.—*Ae. subviscosa* DC, Prodr. 2: 321. 1825.—*Ae. roxburghii* Spreng., Syst. 3: 322. 1826.—*Ae. quadrata* Schum., Schum. Beskr. Guin. PL 356. 1829.—*Ae. punctata* Steud., Nom. ed. 1: 17. 1821, nomen.—*Ae. montana* Span., Linnaea 15: 192. 1841.—*A. el cachemiriana* Cambess., Jacquem, Voy. Bot. 40. 1844; as *kashmiriana* Baker in Hook, f., Fl. Brit. India. 1879.—*Ae. indica* var. *fi* Miq., Fl. Ind. Bat. 1: 274. 1855, based on *Ae. pumila* L.—*Ae. indica* var. *y viseosa* Miq., Fl. Ind. Bat. 1: 274. 1855, based on *Ae. subviscosa* DC.—*Ae. oligantha* Welw. ex Baker in Oliver, Fl. Trop. Afr. 2: 146. 1871.

Herb, sometimes suffrutescent, with erect stems, about 1—2.5 m high, glabrous to moderately hispid; stipules peltate-appendiculate, 10—15 mm long, 2—3 mm wide, glabrous, entire, sometimes ciliate, often hyaline-margined, the upper portion acuminate, the part below the point of insertion obtuse, usually notched or erose; leaves about 5—10 cm long, 50—70-foliate, the petiole and rachis sparsely hispidulous; leaflets elliptic-oblong, 2—10 mm long, 1—2.5 mm wide, entire or rarely ciliate-denticulate, glabrous, 1-costate; inflorescences axillary, racemose, few-flowered, the peduncles and pedicels glabrous to hispidulous, the bracts about 5 mm long, 1—2

mm wide, ovate, acuminate, subentire to serrate-laciniate, the bracteoles lanceolate-ovate, acute, 2—4 mm long and 1 mm wide, subentire; flowers 7—10 mm long; calyx glabrous, bilabiate, 4—6 mm long, the vexillar lip 2-dentate, the carinal lip 3-dentate; petals yellow to purplish, glabrous, the standard 7—10 mm long, the claw 1—2 mm long, the blade elliptic, about 7—9 mm long, 4—7 mm wide, entire or sparsely ciliate, emarginate, the wings 6—8 mm long, the claw 1—2 mm long, the blade 4—6 mm long, 1.2—3 mm wide, rarely ciliate, the keel petals about 7—9 mm long, the claw 1—2 mm long, the blade 6—7 mm long, 2—3 mm wide, entire; stamens 6—8 mm long; fruit 3—4 cm long, 5—10(—12) articulate, the upper edge essentially straight, the lower crenate, the stipe recurved, 4—10 mm long, the articles subquadrate, 5—6 mm long, 4—6 mm wide, glabrous or sparsely hispid, glabrescent, sometimes muriate, dark brown when fully mature; seeds 3—4 mm long, 2—3 mm wide, dark brown.

TYPE LOCALITY.—"India". Collector not known.

DISTRIBUTION.—South-east United States, presumably native; introduced widely in tropical and warm temperate Old World, especially in rice fields of Asia, Pacific Islands, Africa, in Malaysia represented in North to South Sumatra, Malay Peninsula (Perils, Pahang, Wellesley, Singapore), West to East Java, Madura, Kangean, Bali, Timor, SE. Borneo, South Celebes, the Philippines (Luzon, Mindoro, Polillo, Panay, Mindanao), and West to East New Guinea.

LOCAL NAMES.—"Gaga busan", Sunda, fide Hasskarl; "limlim", Java, fide Backer; "mati mati", Sumatra, fide Posthumus; "riampoem", Borneo, fide Endert; "tjampah tjampah", Celebes, fide Rachmat.

The list of synonymy for this species is lengthly, the names, with one exception (*Ae. glaberrima*), having been based on Old World collections, some made more than 200 years ago. In spite of this it appears that *Ae. indica* is native to America, and was introduced in the Old World. The Old World collections are remarkably uniform, whether from Java, Africa, or China. In America, however, *Ae. indica* is but one member of a complex of ten or so closely related species which, except for *Ae. indica* seem to be confined to the western hemisphere.

One exception to the uniformity of *Ae. indica* is the collection made in New Guinea by Versteeg (No. 1921). The specimens correspond to *Ae. indica* except for extreme glandular development, including glandular-denticulate leaflet margins. I have seen no other collections exactly like it, but I do not believe that it warrants taxonomic recognition.

6. AESCHYNOMENE UNIFLORA E. Mey.

Aeschynomene uniflora E. Mey., Comm. PL Afr. Austr. 1: 123. 1835.—*Aeschynomene trachyloba* Miq., Fl. Ind. Bat. 1: 276. 1855.—*Aeschynomene papulosa* Welw. ex Baker in Oliver, Fl. Trop. Afr. 2: 146. 1871.

Suffrutescent herb about 0.5—2 m high, the stems erect, hispidulous with glandular hairs, usually glabrescent toward the base; stipules appendiculate, 3—10 mm long, 1—2 mm wide, glabrous, the margins hyaline, ciliate, the upper portion acute or acuminate, about 2 or 3 times as long as the lower, truncate-erose portion; leaves 2—8 cm long, about 20—50-foliolate, the axis hispidulous like the stem; leaflets 3—14 mm long, 1—2.5 mm wide, usually ciliate, sometimes entire, glabrous, the apex rounded to acute, 1-costate, the veins usually dark reddish; inflorescences axillary, 1 or 2-flowered, the pedicels hispidulous; bracts apparently lacking or indistinguishable from stipules except the pair of bracteoles immediately subtending the calyx, which are narrowly ovate, acute, ciliate, 4 mm long and 1.5 mm wide; flowers 6—10 mm long; calyx bilabiate, 6—9 mm long, the lips essentially entire, hispidulous; petals yellow to somewhat purplish, glabrous, the standard 6—9 mm long, spatulate-obovate, emarginate, 4—5 mm wide, the wings obliquely obovate, 4—6 mm long, 1.5—3 mm wide, the keel petals 6—10 mm long, 2—3 mm wide; stamens 6—10 mm long; fruit 4—7(—9)-articulate, the upper edge essentially straight, the lower crenate, the stipe straight, ascending, 5—10 mm long, glabrous at the base, hispidulous toward the first article, the articles subquadrate, about 4 mm in diameter, hispidulous, finely verrucose at maturity, raised over the seeds with sharp demarcation of margins, the general profile angular, dark brown when fully mature; seeds 3 mm long and 2 mm wide, dark reddish-brown.

TYPE LOCALITY.—South Africa. Type collected by Drège.

DISTRIBUTION.—Tropical Africa, Madagascar, Comores, and the Mascareignes. In Java apparently as an introduction, but unsuccessful, as there are only two collections from the 19th century, viz Gondang Legi, *Zollinger 2365* (BO); Soerakarta, *Horsfield L. 5* (GH, K, isotypes of *Ae. trachyloba*).

Through the courtesy of Dr. G. Taylor at Kew, the type of *Ae. trachyloba* was compared with material of *Ae. uniflora* and the two species found to be conspecific.

7. AESCHYNOMENE ELEGANS Schl. & Cham.

Aeschynomene elegans Schl. & Cham., *Linnaea* 5: 583. 1830.—*Ae. tecta* Vog., *Linnaea* 12: 87. 1838.—*Ae. falcata* Vog. var. *plurijuga* Benth. in Mart., *Fl. Bras.* 15: 68. 1859.—*Ae. falcata* Vog. var. *elegans* (Schl. & Cham.) O. Kuntze, *Rev. Gen.* 1: 158. 1891.—*Ae. falcata* Vog. var. *elegans* (Schl. & Cham.) O. Kuntze forma *glabrior* O. Kuntze, *Rev. Gen.* 1: 158. 1891.—*Ae. arenicola* Brandeg., *Univ. Calif. Publ. Bot.* 10: 408. 1924.

Decumbent herb, the stems to about 1 m long, pubescent and also glandular-hispidulous; stipules attached at the base, not appendiculate, 4—7 mm long, about 1 mm wide at the base, lanceolate, acuminate, ciliate, subglabrous to sparsely hispidulous; leaves (7—)10—18-foliolate, the axis 1—5 mm long; leaflets obovate to subelliptic, about 8—15 mm long, 4—9 mm wide, obtuse, mucronate, entire, the upper surface sparsely pubescent to glabrous, the lower moderately pubescent; inflorescences commonly 2—7-

flowered, longer than the subtending leaves, the pedicels and peduncles with indument like the stem, the bracts and bracteoles 0.5—1.5 mm long, 0.5—1 mm wide, ovate, acute, ciliate, flowers about 7 mm long; calyx 2—3 mm long, subglabrous, ciliolate; petals yellow to purplish; standard about 7 mm long, the claw 1 mm long the blade elliptical-orbulate, about 6 mm long, 4—6 mm wide, entire, pubescent on the outer face; wings about 6 mm long, the claw 1 mm long, the blade about 5 mm long and 2 mm wide; keel about as long as the standard, the blades 1.5—2 mm wide; stamens about 6 mm long; fruit submoniliform, curved or straight, 5—9-(commonly 6—8-) articulate, the stipe (5—)10—15 mm long, glabrous or somewhat hispidulous, the articles obliquely suborbiculate, 2—2.5 mm in diameter, crisp-pubescent, often slightly glabrescent, the margins often separating from the body of the article; seeds about 1.8—2 mm long, 1—1.5 mm wide, dark brown.

TYPE LOCALITY.—Hacienda de la Laguna, Jalapa, Vera Cruz, Mexico. Type collected by Schiede and Deppe.

DISTRIBUTION.—Widespread in tropical America, Mexico to Argentina. In Java as introduction for green manure, only known from two collections in the Botanic Gardens, Bogor, and the Experimental Garden at Pasuruan.

According to the previous determinations of the above cited specimens, the material was introduced as *Ae. brasiliana* and *Ae. falcata*. There is no question, however, of its identity with *Ae. elegans*.

EXCLUDED SPECIES

1. *Aeschynomene aspera* Noronha [Noronha], Verh. Bat. Gen. 5, Art. 4: 5. 1790, non L. 1763 = *Sesbania grandiflora* (L.) Pers. ? (= *Agati grandiflora* Desv., fide Miquel).
2. *Aeschynomene atropurpurea* Span. Linnaea 15: 192. 1841 = *Ormocarpum* sp. on basis of examination of a sheet at Leiden, presumably the type of *Ae. atropurpurea*.
3. *Aeschynomene laevis* Noronã [Noronha], Verh. Bat. Gen. 5, Art. 4: 6. 1790, nomen nudum.
4. *Aeschynomene violacea* Noronã [Noronha], Verh. Bat. Gen. 5. Art. 4: 5. 1790, nomen nudum.

INDEX TO COLLECTORS AND NUMBERS

The specimens examined have been referred to by the number of the taxon accepted in this paper, as follows:

- 1a = *Ae. americana* L. var. *americana*
- 1b = *Ae. americana* L. var. *glandulosa* (Poir.) Rudd
- 2 = *Ae. villosa* Poir.
- 3 = *Ae. elaphroxylon* (Guill. & Perr.) Taub.
- 4 = *Ae. aspera* L.
- 5 = *Ae. indica* L.

6 = *Ae. uniflora* E. Mey.

7 = *Ae. elegans* Schl. & Cam.

All collections have been cited by collectors' names, not by series, but if they make part of series, the initials of the series have been added to the number, for example Ramos B(ur.) S(cience) 1423.

Author's names preceded by "van", "de", etc. have been entered under the name proper, for example den Berger under Berger.

- Backer s.n.*, Jan. 1904 (L): 5; *s.n.*, in 1911 (BO): 3; *s.n.*, in 1916 (BO): 3; *s.n.*, in 1916 (BO): 7; *s.n.*, in 1924 (L): 7; 543 (BO): 5; 982 (BO): 5; 1138 (BO): 5; H21 (BO): 5; 2137 (BO): 5; 2164 (BO): 5; 2592 (BO): 2; 3514 (BO): 1b; 3887 (BO): 1b; U01 (BO): 5; 4720 (BO): 1a; 4738 (BO): 5; 5023 (BO): 5; 5901 (BO): 5; 6894 (BO): 5; 6912 (BO): 5; 6924 (BO): 5; 6657 (BO): 5; 7313 (BO): 5; 7419 (BO): 5; 7707 (BO, L): 5; 7S07 (BO): 5; 8006 (BO): 1b; SOOS (BO): 1b; 8277 (BO): 5; 8426 (BO): 1a; ii797 (BO): 5; 13019 (BO): 5; 13078 (BO): 2; Z5207 (BO): 5; 15451 (BO): 5; 15526 (BO): 1b; Jf63jT7 (BO, L): 5; i-jSS7 (BO): 1a; 18254 (BO): 5; 15319 (BO): 5; i\$ \$n (BO): 5; 1S604 (BO): 5; iPii6 (BO, L): 5; 19729 (BO, L): 5; 20217 (BO, L): 5; 20327 (BO): 5; 21452 (BO): 5; 23339 (BO): 5; 244S1 (BO): 5; 256.42 (BO): 5; 26457 (BO): 4; 20S75 (BO): 5; 27497 (BO): 5; 27660 (BO): 5; 30063 (BO, L): 1b; 501S3 (BO, L): 5; 30555 (BO): 5; 30368 (BO): 1b; 31302 (BO): 4; 315.46 (BO): 5; 35236 (BO): 1b; 32S06 (BO): 5; 32898 (BO): 5; 32901 (BO): 5; 32005 (BO): 5; 32908 (BO): 5; 32911 (BO): 5; 32914 (BO): 5; 34475 (BO): 4; 34476 (BO): 4; 34477 (BO): 4; 3447S (BO): 4; 34479 (BO): 4; 36734 (L): 1b; 37122 (L): 5.
- Bakhuizen van den Brink f.* 421 (BO): 5; 1095 (BO, L): 5; 1658 (BO, L): 1b; 3042 (BO): 2.
- den Berger s.n.*, 21 Dec. 1916 (BO): 5.
- Beumée* 1981 (BO): 1a; 2376 (BO): 1a; 4147 (BO): 1a; 4200 (BO): 1a; 5179 (BO): 1a.
- Blume ? s.n.* (L): 1a; ? *s.n.* (L): 1b; *s.n.* (L): 4; *s.n.* (L): 5.
- Boden-Kloss 14534* (BO, K, UC): 5.
- Boerlage s.n.*, Oct.-Nov. 1888 (BO, L): 5.
- Brass 6052* (BO, NY, US): 5; 6299 (BO, L): 5.
- Brinkman 704* (BO, GH, L): 1b.
- B-iinnemeyër 11401* (BO, L): 5.
- Bijhouwer 12* (BO): 5.
- Carr 11890* (K, L): 2.
- Clason K 54* (BO): 1b.
- Cuning 646* (L, MO): 5; 1370 (L): 5.
- Coert 42* (L): 5; 336 (L): 5.
- Corner 29903* (BO): 5.
- Dizon 10* (US): 5; 24 (US): 1a.
- Docters van Leeuwen 33* (BO): 5; 123 (BO): 1b; 3768 (BO): 5.
- Dorgelo 176* (L): 1b; 784 (L): 5.
- Edeling s.n.*, Aug. 1863 (BO): 5.
- Endert 1502* (BO): 5.
- Floyd 5549* (BO, L): 5.
- van der Gaag 79* (L): 1b.
- Griffith 1615* (K): 4.
- Hallier-* 74 (BO): 5; D315 (BO): 7; D316 (BO): 2; 4356 (L): 5.
- van Harreveld 11* (BO): 1b.
- Hcmken 17* (BO): 5.
- den Hoed 3014* (L): 1a.
- Hollrung 694* (BO): 5.
- Holstvoogd 156* (BO, L): 1b.
- Horsfield L. 3* (GH): 2; L. 4 (K): 5; L. 5 (GH, K): 6.
- Houwing 523* (L): 1b; 917 (L): 5; 972 (L): 1b.

Iboet 220 (BO, L) : 5.

Jungkuhn s.n. (L) : 5; 13 (L) : 1b.

Janowsky 461 (BO, L) : 5.

Karsten 18 (L) : 1b.

Kievits 64 (L) : 5.

Kjellberg 1298 (BO): 5; 1982 (BO): 5;
U06 (BO) : 1b.

Koch 1928 (BO) : 5.

Koorders 42 (BO): 5; 179 (BO): 5; 547
(BO, L): 5; 793 (BO): 5; 2022 (BO):
5; 2133 (BO): 5.

Kwwtee 5Z06 (NY) : 5.

Leenart 55 (BO) : 1a.

Lörzing 431 (BO) : 5; 3364 (BO) : 5; 3492
(BO) : 5; 7707 (BO) : 5.

Mabesa & Catalan FB 26928 (UC) : 5.

raw der Meer 949 (BO) : 5.

Mendoza 1502 (= P2VH IS50.9) (L, US) :
5.

Men-ill, Sp. Blanc. 762 (BO, L, MO, NY,
US) : 5; WO (US, NY) : 5; 4235 (L,
NY, US) • 5.

Monod de Froideville 98 (BO, L) : 5; 355
(L) : 1b.

Mo[^]ej/ 700 (K) : 5.

Noerkas (Exp. van Vuuren) 25 (BO, L) :
5; 40 (BO, L) : 5.

Polak 1 (BO) : 5.

Popta 47 (BO) : 5; 286 (L) : 1a; 7371165
(L) : 1b.

Posthumus 1048 (BO, L) : 5.

w < der P#7 43 (BO) : 1b; 162 (BO) : 5.

Rachmat (Exp. van Vuuren) JZØ (BO, L) :
5.

Ramos BS 1423 (BO, NY, US) : 5; BS
27613 (BO) : 5; FB 39716 (UC) : 5.

fiamos & Convocar BS 83371 (NY) : 5.

Reinwardt 471 (BO) : 5.

Ridley 8009 (K) : 5; 15122 (K) : 5.

Robinson BS 9024 (BO, L) : 5.

Rogerson 1066 (US) : 5.

Rijkevorsel 29 (BO) : 5.

Rijkebilisch s.n. (BO) : 1b.

Samios 6353 (US) : 1a.

Schimper 10 (L) : 5.

Schlechter 18096 (NY) : 5.

Sinclair, 4 Dec. 1949 (BO, L) : 5.

van Slooten 730 (BO) : 5; 2052 (BO) : 1a;
2460 (BO) : 1a.

Spanoghe s.n. (L) : 2; s.w. (L) : 5.

van Steenis 3 (L) : 5; -Z75S (BO) : 5; -Z796
(BO) : 1b; 3760 (BO) : 5; 7513 (BO) : 5;
7706 (BO) : 5; 10495 (BO) : 5.

raZeow PiVH 33698 (US) : 5.

Teijsmann s.n. (L) : 5; s.w., in 1869 (L) :
5; HB 11941 (BO, L) : 5.

Ulteé 23 (BO) : 5.

Versteeg 1921 (BO, L) : 5.

de Visser Smits s.n., June 1915 (BO) : 5.

de Voogd 481 (BO) : 5; 817 (A) : 1b.

Vorderman s.n. (BO) : 4; s.n., about 1886
(BO) : 5.

Waitz s.n. (L) : 5.

van Welsem 402 (BO) : 5; 403 (BO) : 4.

Wenzel 3460 (BO, MO, UC) : 5.

Wester 18621 (NY) : 5.

PFisse 5S (BO, L) : 1b; 141 (BO) : 5; 211
(BO) : 5; 377 (BO) : 1a.

Womersley NGF 3715 (BO, L) : 5.

Zipelius 75 (L) : 2.

Zollinger 407 (L) : 5; 2365 (BO) : 6; 2754
(BO) : 2; 3S57 (L) : 5.

INDEX TO SCIENTIFIC NAMES

The names have been referred to by the number of the taxa distinguished in this paper; the excluded names have been referred to that category. Synonyms have been printed in *italics*.

- Aedemone excelsa* Kotschy: 3; *humilis* Kotschy: 3; *mirabilis* Kotschy: 3.
- Aeschynomene americana* L.: 1; var. *americana*: 1a; var. *depila* Millsp.: 1a; var. *glandulosa* (Poir.) Rudd: 1b; var. *villosa* (Poir.) Urb.: 2a; *aquatica* Roxb.: 4; *arenicola* Brandeg.: 7; *aspera* L.: 4; *aspera* Noroiia: excluded; *aspera sensu* Wall.: 5; *atropurpurea* Span.: excluded; *cachemiriana* Cambess.: 5; *decumbens* Zipp. ex Span.: 2a; *diffusa* Klein ex Willd.: 5; *elaphroxylon* Guill. & Perr.) Taub.: 3; *elegans* Schl. & Cam.: 7; *falcata* Vog. var. *elegans* (Schl. & Cam.) O. Kuntze: 7; f. *glabrior* O. Kuntze: 7; var. *plurijuga* Benth.: 7; *glaberrima* Poir.: 5; *glandulosa* Bello: 2a; *glandulosa* Poir.: 1b; *guayaquilensis* G. Don: 1b; *hirsuta* DC: 2a; *hirta* Lag.: 2a; *indica* L.: 5; var. β Miq.: 5; var. γ *aspera* Hassk. ex Miq.: 4; var. *ff*? *punctata* Pers.: 5; var. *y viscosa* Miq.: 5; *javanica* Miq.: 2a; var. *ji luxurians* Miq.: 1a; *laevis* Noroiia: excluded; *lagenaria* Lour.: 4; *macropoda* DC: 5; *meridana* Pittier: 2a; *mexicana* Biroli ex Colla: 1a; *mimosula* Bl. ex Miq.: 1a; *montana* Span.: 5; *oligantha* Welw. ex Baker: 5; *papulosa* Welw. ex Baker: 6; *pseudoviscosa* Bl. ex Miq.: 2a; *pubica* Zoll.: 2a; *pumila* L.: 5; *punctata* Steud.: 5; *quadrats*. Schum.: 5; *roxburghii* Spreng.: 5; *subviscosa* DC: 5; *tchadica* Chev.: 3; *tecta* Vog.: 7; *timoriana* Span.: 2a; *trachyloba* Miq.: 6; *tricholoma* Standl. & Steyerl.: 1a; *uniflora* E. Mey.: 6; *villosa* Poir.: 2; var. *villosa*: 2a; *viscidula* Roxb. ex Willd.: 5.
- Cassia tenuicaulis* M. E. Jones: 2a.
- Hedysarum alpinum* Lour.: 5; *lagenarium* Roxb.: 4; *neli-tali* Roxb.: 5; *violacea* Noroiia: excluded; *virginicum* Lour.: 5.
- Herminiera elaphroxylon* Guill. & Perr.: 3.
- Hippocrepis mimosula* Norofia: 1a.