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THE ASIATIC SPECIES OF PERSEA Mill. (Lauraceae)

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The name *Machilus* was created by Rumphius (Herb. Amboin. 3: 70, t. 40—42. 1743). The first post-Linnean description is of Desrousseaux *in* Lamarck, Encycl. 3: 668. 1791, who, however, failed to indicate a type species (a Rumphian species) and as *Machilus* Rumphius consists of 4 different species belonging to 3 different genera, *Machilus* Desrousseaux is not acceptable as it is confusing. The name *Machilus* was validated by Nees in 1831 (*in* Wallich, Pl. Asiat. rar. 2: 70). Nees included in his *Machilus* 4 species of which *M. odoratissimus* is provided with the synonym: "*Machilus quarta species minima* Rumphius, l.c. 70, t. 42 and we may accept this species as the type of the genus; of the second species (*M. macranthus*) the fruit (on which Nees had based the differential characters of *Machilus*) were unknown; the third species (*M. pedunculari*s) provided with the synonym: "*Machilus species tertia media* Rumph." (with an interrogation mark) was based on *Laurus pedunculari*s Wallich, which Nees referred in 1836 (Syst. Laur. 125) to *Persea* and in the same opus (p. 376) to *Haasia* Bl., where it actually belongs (*Dehaasia pedunculari*s), whereas Rumphius' *Machilus species tertia media* most likely represents *Dehaasia media* Bl. The fourth species (*M. incrassatus*), based on *Laurus incrassatus* Jack (Malay Miscell. 2(7): 33. 1820) was referred by Nees to *Persea* (Syst. Laur. 127. 1836) and at the same time to *Haasia* (l.c. 376); this species is now known as *Dehaasia incrassata* (Jack) Kosterm. The other species described by Rumphius under *Machilus* belong to *Litsea*.

Loureiro interpreted Rumphius' *Machilus quarta species minima* as being synonymous with *Laurus indica* L. (which is *Persea indica* (L.) Spr. from the Canary Isl.). Merrill (Interpretat. Rumph. Herb. Amboin. 234. 1917) rightly rejected this assumption and thought that Rumphius' plant might represent a species of *Phoebe* (Loureiro's species is probably *Persea odoratissima* Kosterm.) The fruit, as depicted in Rumphius' plate are, however, certainly those of a species of *Machilus*. It is however advisable not to typify *M. odoratissima* Nees by the Rumphian plant.

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Meissner (*in* DC., Prodr. 15(1): 39. 1864), Baillon (Hist. Plantes 2: 469. 1872) and Bentham (*in* Bentham & Hooker f., Gen. Pl. 3: 156. 1880) recognized the genus *Machilus*. Pax (*in* Engl. & Prantl, Nat. Pfl. fam. 3(2): 115. 1889) kept also *Machilus* separate from *Persea*, but included in his section *Alseodaphne* of *Persea* two species, which are now generally considered to belong to *Machilus* (*P. chinensis* (Champ.) Pax and *P. breviflora* (Benth.) Pax).

The genus *Machilus* is extremely close to *Persea* Mill. from which it was separated by Bentham (besides by its different geographical area) in the following way: *Machillus*: "perianth in the fruiting stage persistent, reflexed" and of *Persea*: "perianth in the fruiting stage either persistent, adpressed or subpatent, or deciduous".

This can hardly be accepted as a generic difference and consequently I suggested already in 1952 (*in* J. sci. Research Indonesia 1: 116) to combine both genera. Since then I had the opportunity to examine the greater part of the species of *Persea* and *Machilus*, which has strengthened my opinion that both belong together.

The nervation of the leaves is similar and it is even in sterile condition possible to distinguish *Persea* (*Machilus* included) from other genera by the peculiar pitting along the midrib on the upper leaf surface; this character is present also in *Phoebe*, the nearest relative of *Persea*. Nervation characters are important in some genera of Lauraceae and make it possible e.g. to distinguish *Endiandra* from *Beilschmiedia*.

Another important vegetative character is the presence or absence of bud scales, which makes it easy to recognize *Cryptocarya* (no bud scales) from other genera. *Persea* and *Machilus* have similar bud scales; their flowers show no differences at all and are similar to those of *Phoebe* (not to those of *Cinnamomum*, as suggested by Bentham; the latter has a concave receptaculum); the fruit are similar and characterized by the lack of a cup (also in *Phoebe*). The variable character, the fate of the perianth in the fruit, is in both genera the same; both in *Machilus* and in *Persea*, species are represented with a persistent (or more or less persistent) perianth, which may be patent or reflexed, or it may be deciduous altogether. The wood characters of both genera are the same.

I formerly included in *Persea*: *Caryodaphnopsis* Airy-Shaw, which differs from the other *Persea* species only by its opposite leaves, and this is a character, which is found almost in every other genus of Lauraceae; in *Litsea*, *Endiandra*, *Licaria*, *Aniba*, *Crytocarya*, etc. a certain percentage of the species have opposite (or sub-opposite) leaves.

In order to stabilize the nomenclature before revising the genus *Persea* (including *Machilus*), the necessary recombinations are presented here.

1. **Persea acuminatissima** (Hay.) Kosterm., *comb. nov.* (basionym: *Cinnamomum acuminatissimum* Hayata, Icon. Pl. Formos. 3: 157. 1913).

2. **Persea arisanensis** (Hay.) Kosterm., *comb. nov.* (basionym: *Machilus macrophylla,* var. *arisanensis* Hayata *in* J. College Sci. Tokyo 30: 243. 1911; *Machilus arisanensis* Hayata, Icon. Pl. Formos. 5: 160, f. 56-b et 57. 1915).

3. **Persea bombycina** (King *ex* Hk. f.) Kosterm., *comb. nov.* (basionym: *Machilus bombycina* King *ex* Hooker f., Fl. Brit. India 5: 861. 1890).

4. **Persea bonii** (Lec.) Kosterm., *comb. nov.* (basionym: *Machilus bonii* Lecomte *in* Nouv. Arch. Mus., 5e Sér. 5: 58 et 102. 1913).

5. **Persea bootanica** (Meissn.) Kosterm., *comb. nov.* (basionym: *Machilus bootanica* Meissner *in* DC., Prodr. 15(1): 42. 1864).

6. **Persea bournei** (Hemsley) Kosterm., *comb. nov.* (basionym: *Machilus bournei* Hemsley *in* J. Linn. Soc. 26: 373. 1891).

7. **Persea bracteata** (Lec.) Kosterm., *comb. nov.* (basionym: *Machilus bracteata* Lecomte *in* Nouv. Arch. Mus., 5e Sér. 5: 101. 1913).

8. Persea breviflora (Benth.) Pax *in* Engl. & Prantl, Nat. Pfl. Fam. 3(2): 115. 1889 (basionym: *Alseodaphne breviflora* Bentham).

9. **Persea cavaleriei** (Lév.) Kosterm., *comb. nov.* (basionym: *Lindera cavaleriei* Léveillé *in* Fedde, Repert 10: 371. 1912).

10. Persea chinensis (Champ. *ex* Benth.) Pax *in* Engl. & Prantl, Nat. Pfl. fam. 3(2): 115. 1889 (basionym: *Alseodaphne chinensis* Champion *ex* Bentham).

11. **Persea clarkeana** (King *ex* Hk. f.) Kosterm., *comb. nov.* (basionym: *Machilus clarkeana* King *ex* Hooker f., Fl. Brit. India 5: 137. 1886).

12. **Persea cochinchinensis** (Lec.) Kosterm., *comb. nov.* (basionym: *Machilus cochinchinensis* Lecomte *in* Nouv. Arch. Mus., 5e Sér. 5: 49 et 99. 1913).

13. **Persea curranii** (Merr.) Kosterm., *comb. nov.* (basionym: *Machilus curranii* Merrill *in* Philip. J. Sci. Bot. 5: 349. 1910).

14. **Persea decursinervis** (Chun) Kosterm., *comb. nov.* (basionym: *Machilus decursinervis* Chun *in* Acta Phytotax. Sinica 2(3): 170, t. 34. 1953).

15. **Persea dubia** (Das & Kanj.) Kosterm., *comb. nov.* (basionym: *Machilus dubia* Das & Kanjilal *in* Assam Forest Records 2: 11. 1937).

16. **Persea duthiei** (King *ex* Hk. f.) Kosterm., *comb. nov.* (basionym: *Machilus duthiei* King *ex* Hooker f., Fl. Brit. Ind. 5: 861. 1890).

17. **Persea fructifera** Kosterm., *nom. nov.* (base: *Machilus edulis* King *ex* Hooker f., Fl. Brit. India 5: 138. 1886); *Persea edulis* Rafinesque 1838 prevents the use of the specific epithet.

18. **Persea fruticosa** (Kurz) Kosterm., *comb. nov.* (basionym: *Machilus fruticosa* Kurz *in* J. Asiat. Soc. Bengal 42(2): 101. 1873).

19. **Persea gamblei** (King *ex* Hk. f.) Kosterm., *comb. nov.* (basionym: *Machilus gamblei* King *ex* Hooker f., Fl. Brit. India 5: 138. 1886 et 860. 1890).

20. **Persea globularia** Kosterm., *nom. nov.* (base: *Machilus globosa* Das *in* Assam Forest Records 2: 9, t. 10. 1937); *Persea globosa* (Lam.) Spr. 1825 prevents the use of the specific epithet.

21. **Persea gracillima** (Chun) Kosterm., *comb. nov.* (basionym: *Machilus gracillima* Chun *in* Acta Phytotaxon. Sinica 2(3): 171, t. 35. 1953).

22. **Persea grijsii** (Hance) Kosterm., *comb. nov.* (basionym: *Machilus grijsii* Hance *in* Ann. Sci. nat., Sér. 4, 18: 228. 1863).

23. **Persea hemsleyi** (Nakai) Kosterm., *comb. nov.* (basionym: *Machilus hemsleyi* Nakay *in* J. Jap. Bot. 16(3): 122. 1940).

24. **Persea ichangensis** (Rehder & Wilson) Kosterm., *comb. nov.* (basionym: *Machilus ichangensis* Rehder & Wilson *in* Sargent, Pl. Wilson. 2: 621. 1916).

25. **Persea japonica** (Sieb. & Zucc.) Kosterm., *comb. nov.* (basionym: *Machilus japonica* Siebold & Zuccarini *in* Muench. Abh. Bayr. Akad. Wiss. II Cl. IV, 3te Abth. 202. 1846; Fl. Jap. Fam. nat. 11: 78); *Persea japonica* Siebold *ex* Miquel (Ann. Mus. bot. Lugd. bat. 2: 195. 1867) is merely cited as a synonym of *Machillus thunbergii*.

26. **Persea kingii** (Hk. f.) Kosterm., *comb. nov.* (basionym: *Machilus kingii* Hooker f., Fl. Brit. India 5: 861. 1890).

27. **Persea konishii** (Hay.) Kosterm., *comb. nov.* (basionym: *Machilus konishii* Hayata *in* J. College Sci. Tokyo 30, Art. 1: 240. 1911).

28. **Persea kobu** (Maxim.) Kosterm., *comb. nov.* (basionym: *Machilus kobu* Maximowicz *in* Bull. Acad. Pétersbourg 31: 95. 1887).

29. **Persea kurzii** (King *ex* Hk. f.) Kosterm., *comb. nov.* (basionym: *Machilus kurzii* King *ex* Hooker f., Fl. India 5: 860. 1890).

30. **Persea leptophylla** (Hand. - Maz.) Kosterm., *comb. nov.* (basionym: *Machilus leptophyllus* Handel-Mazzetti, Symbol. Sin. 7: 252. 1931).

31. **Persea levinei** (Merr.) Kosterm., *comb. nov.* (basionym: *Machilus levinei* Merrill *in* Philip J. Sci. 15: 236. 1919).

32. **Persea liangkwangensis** (Chun) Kosterm., *comb. nov.* (basionym: *Machilus liangkwangensis* Chun *in* Acta Phytotax. Sinica 2(3): 165, t. 30. 1953).

33. **Persea listeri** (King *ex* Hk. f.) Kosterm., *comb. nov.* (basionym: *Machilus listeri* King *ex* Hooker f., Fl. Brit. India 5: 138. 1886).

34. **Persea longipedicellata** (Lec.) Kosterm., *comb. nov.* (basionym: *Machilus longipedicellata* Lecomte *in* Nouv. Arch. Mus., 5e Sér. 5: 101. 1913).

35. **Persea macrantha** (Nees) Kosterm., *comb. nov.* (basionym: *Machilus macrantha* Nees *in* Wallich, Pl. As. rar. 2: 70. 1831).

36. **Persea microcarpa** (Hemsley) Kosterm., *comb. nov.* (basionym: *Machilus microcarpa* Hemsley *in* J. Linn. Soc. 26: 376. 1891).

37. **Persea minutiflora** Kosterm., *nom. nov.* (base: *Machilus parviflora* Meissner *in* DC., Prodr. 15(1): 505. 1864); *Persea parviflora* Sprengel 1825 prevents the use of the specific epithet.

38. **Persea multinervia** (Liou Ho) Kosterm., *comb. nov.* (basionym: *Machilus multinervia* Liou Ho, Laur. Chine et Indoch. 56, f. 2. 1932).

39. **Persea obovatifolia** (Hay.) Kosterm., *comb. nov.* (basionym: *Cinnamomum obovatifolium* Hayata, Icon. Pl. Formos. 3: 161. 1913).

40. **Persea oculodracontis** (Chun) Kosterm., *comb. nov.* (basionym: *Machilus oculodracontis* Chun *in* Acta Phytotaxon. Sinica 2(3): 168, t. 33. 1953).

41. **Persea oreophila** (Hance) Kosterm., *comb. nov.* (basionym: *Machilus oreophila* Hance *in* Ann. Sci. nat., Sér. 4, 18: 227. 1863).

42. **Persea pauhoi** (Kan.) Kosterm., *comb. nov.* (basionym: *Machilus pauhoi* Kanehira *in* Trop. Woods 23: 8. 1930 et *in* Trans. Nat. Hist. Soc. Formosa 20: 388-91. 1930).

43. **Persea phoenicis** (Dunn) Kosterm., *comb. nov.* (basionym: *Machilus phoenicis* Dunn *in* Kew Bull. 1910: 297; *in* J. Linn. Soc. 39: 466. 1911).

44. **Persea pingii** (Cheng *ex* Yang) Kosterm., *comb. nov.* (basionym: *Machilus pingii* Cheng *ex* Yang *in* J. West China Border Res. Soc. 15, Ser. B.: 76, t. 6. 1945).

45. **Persea platycarpa** (Chun) Kosterm., *comb. nov.* (basionym: *Machilus platycarpa* Chun *in* Acta Phytotax. Sinica 2(3): 164, t. 29. 1953).

46. **Persea pseudokobu** (Koidz.) Kosterm., *comb. nov.* (basionym: *Machilus pseudokobu* Koidzumi *in* Bot. Mag. Tokyo 32: 255. 1918).

47. **Persea pseudolongifolia** (Hay.) Kosterm., *comb. nov.* (basionym: *Machilus pseudolongifolia* Hayata, Icon. Pl. Formos. 5: 160, f. 56-a. 1915).

48. **Persea rehderi** (Allen) Kosterm., *comb. nov.* (basionym: *Machilus rehderi* Allen *in* J. Arnold Arb. 17: 326. 1936).

49. **Persea robusta** (W.W. Sm.) Kosterm., *comb. nov.* (basionym: *Machilus robusta* W. W. Smith *in* Notes Bot. Garden Endinb. 13: 169. 1921.

50. **Persea salicina** (Hance) Kosterm., *comb. nov.* (basionym: *Machilus salicina* Hance *in* J. of Bot. 23: 327. 1885).

51. **Persea scortechinii** (Gamble) Kosterm., *comb. nov.* (basionym: *Machilus scortechinii* Gamble *in* Kew Bull. 1910: 226).

52. **Persea shawii** Kosterm., *nom. nov.* (base: *Machilus henryi* Hemsley *in* J. Linn. Soc. 26: 375. 1891); *Persea henryi* (Airy Shaw) Kosterm. 1952 prevents the use of the specific epithet.

53. **Persea shweliensis** (W.W. Sm.) Kosterm., *comb. nov.* (basionym: *Machilus shweliensis* W.W. Smith *in* Notes Bot. Gard. Edinb. 13: 170. 1921).

54. Persea thunbergii (Sieb. & Zucc.) Kosterm., Commun. For. Research Inst. Bogor 57: 35. 1957.

55. **Persea velutina** (Champ. *ex* Benth.) Kosterm., *comb. nov.* (basionym: *Machilus velutina* Champion *ex* Bentham in Hooker's Kew J. & Gard. Miscell. 5: 198. 1853).

56. **Persea villosa** (Roxb.) Kosterm., *comb. nov.* (basionym: *Laurus villosa* Roxburgh, Hort. Beng. 89. 1814; Fl. India 2: 310. 1832; Hooker f., Fl. Brit. India 5: 140. 1886).

57. **Persea viridis** (Hand.-Maz.) Kosterm., *comb. nov.* (basionym: *Machilus viridis* Handel-Mazzetti, Symbol. Sin. 7: 253. 1931).

58. **Persea wangchiana** (Chun) Kosterm., *comb. nov.* (basionym: *Machilus wangchiana* Chun *in* Acta Phytotaxon. Sinica 2(3): 166, t. 31. 1953).

59. **Persea yunnanensis** (Lec.) Kosterm., *comb. nov.* (basionym: *Machilus yunnanensis* Lecomte *in* Nouv. Arch. Mus., 5e Sér. 5: 100. 1913).