

Lectotypification of two *Musa* sections (Musaceae)

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The present work is part of a continuing study to revise the old names in *Musa* and aims to clarify the taxonomy in the sections *Rhodochlamys* and *Callimusa*. Lectotypes are designated here for *Musa* sect. *Callimusa* and *M.* sect. *Rhodochlamys*. These sections were first erected without the indication of a type species.

Various botanists have classified wild bananas into various sections or subgenera. Linnaeus, in ‘Species Plantarum’ (1753), was the first to apply the binomial nomenclature to bananas. He then established the modern botanical nomenclature. Sagot (1887) and Baker (1893) recognized three subgenera in the genus *Musa*: *M.* subgen. *Physocaulis*, *M.* subgen. *Eumusa* and *M.* subgen. *Rhodochlamys*. Cheesman (1947) developed a clear and coherent classification system for the genus. His original grouping of the species in the genus *Musa* into four sections proved to be very useful and it has, therefore, been widely accepted. However, he stated that “the groups have deliberately been called sections rather than subgenera in an attempt to avoid the implication that they are of equal rank”. He further pointed out that this work “may stimulate investigation of a genus that is difficult to collect and study, but sufficiently interesting and important in both economic and its more strictly botanical aspects to repay the investigators”. In Cheesman’s classification the genus was divided into four sections: *Australimusa* with a chromosome number of $2n = 20$, *Callimusa* $2n = 20$, *Musa* (*Eumusa*) $2n = 22$ and *Rhodochlamys* $2n = 22$ (Cheesman 1947, 1948a, 1948b, 1949a, 1949b, 1950a, 1950b, Shepherd 1959, 1999, Champion 1967, Simmonds and Weatherup 1990, Häkkinen and Sharrock 2002, Häkkinen 2004a, 2005b, 2007, Häkkinen et al. 2007, Häkkinen and Väre 2008c). Argent (1976) added one more section *Ingentimusa* $2n = 14$, comprised of the single species *Musa ingens* Simmonds. However, Cheesman have not typified the sections *Callimusa* and *Rhodochlamys* in his taxonomic works. These sectional names are formally typified here.

Musa sect. *Callimusa* Cheesman (1947, p. 112)

Lectotype (designated here): *Musa coccinea* Andrews (1797, plate 47).

The species of *Musa* sect. *Callimusa* occur on the Asian continent from southern China to northern Vietnam, Peninsular Malaysia, Sumatra and Borneo. This section consists of 22 species viz *M. azizii* Häkkinen (2005a), *M. barioensis* Häkkinen (2006a), *M. bauensis* Häkkinen and Meekiong (2005a), *M. beccarii* N. W. Simmonds (Simmonds 1960, Häkkinen et al. 2005), *M. borneensis* Becc. (Beccari 1902, Häkkinen and Meekiong 2005b), *M. campestris* Becc. (Beccari 1902, Häkkinen 2003b, 2004a, 2004b), *M. coccinea* Andrews (1797), *M. exotica* Valmayor (2001), *M. gracilis* Holttum (Cheesman 1950a), *M. hirta* Becc. (Beccari 1902, Häkkinen 2004b), *M. lawitiensis* Nasution & Supard. (Nasution and Supardiyono 1998, Häkkinen 2006b), *M. lokok* Geri and Ng (2005), *M. lutea* Valmayor et al. (2004), *M. monticola* Argent (2000), *M. muluensis* M. Hotta (1967), *M. paracoccinea* A. Z. Liu et al. (2002), *M. sakaiana* Meekiong et al. (2005), *M. salaccensis* Zoll. ex Backer (1924), *M. tuberculata* M. Hotta (1967), *M. violascens* Ridl. (1893), *M. viridis* Valmayor et al. (2004) and *M. voonii* Häkkinen (2004a).

Musa sect. *Rhodochlamys* (Baker) Cheesman (1947, p. 110)

Basionym: *Musa* subg. *Rhodochlamys* Baker (1893, p. 205).

Lectotype (designated here): *Musa ornata* Roxb. (1824, p. 488).

The species of *Musa* sect. *Rhodochlamys* occur on the Asian continent from Tibet to Cambodia including western Yunnan. This section consists of 12 species viz *Musa aurantiaca* Baker (Baker 1893, Häkkinen and Väre 2008a), *Musa chunii* Häkkinen (2009), *Musa dasycarpa* Kurz (Kurz 1867, Häkkinen and Väre 2008b), *Musa laterita* Cheesman (Cheesman 1949b, Häkkinen 2001), *Musa mannii* Baker (Baker 1892, Hooker 1893, Häkkinen

2007), *Musa ornata* Roxb. (Roxburgh 1824, Häkkinen and Väre 2008c), *Musa rosea* Baker (Baker 1893, Häkkinen 2006c), *Musa rubinea* Häkkinen and Teo (2008), *Musa rubra* Kurz (Kurz 1867, Hooker 1895, Häkkinen 2003a), *Musa sanguinea* Hook. f. (Hooker 1872, Häkkinen 2007), *Musa siamensis* Häkkinen and Wallace (2007) and *M. zaifui* Häkkinen and Wang (2008).

Conclusions

The taxonomy of *Musa*, including *M. sect. Callimusa* and *M. sect. Rhodochlamys*, has been very obscure throughout its history despite several attempts of clarification. Much of the diversity in the four *Musa* sections is found in the areas of continental Asia that have been and continue to be difficult and sometimes even dangerous to travel and work in. There are still new Musaceae species awaiting description or clarification observed in those areas by the present author.

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References

- Andrews, H. C. 1797. Musaceae. – Bot. Repos. 1: 343, plate 47.
- Argent, G. C. G. 1976. The wild bananas of Papua New Guinea. – Notes R. Bot. Gard. Edinburgh 35: 77–114.
- Argent, G. C. G. 2000. Two interesting wild *Musa* species (Musaceae) from Sabah, Malaysia. – Gard. Bull. Sing. 52: 77–114.
- Backer, C. A. 1924. Musaceae. – Flora van Java Alf. 3: 13–141.
- Baker, J. G. 1892. Scitamineae. – In: Hooker, J. D. (ed.), Flora Brit. India Vol. 6. J. D. Hooker, pp. 225–264.
- Baker, J. G. 1893. A synopsis of the genera and species of *Museae*. – Ann. Bot. Oxford 7: 189–229.
- Beccari, O. 1902. Nota sui banani selvatici di Borneo. Nelle foreste di Borneo. – Tipografia di Salvatore Landi, Firenze, pp. 611–624.
- Champion, J. 1967. Notes et documents sur les bananiers et leur culture. Tome 1, Botanique et Génétique des Bananiers. – Inst. Française de Recherches Fruitières Outre-Mer (IFAC). SETCO.
- Cheesman, E. E. 1947. Classification of the bananas. II. The genus *Musa* L. – Kew Bull. 2: 106–117.
- Cheesman, E. E. 1948a. Classification of the bananas. III. Critical notes on species. – Kew Bull. 3: 11–28, 145–157.
- Cheesman, E. E. 1948b. Classification of the bananas. III. Critical notes on species. – Kew Bull. 3: 323–328.
- Cheesman, E. E. 1949a. Classification of the bananas. III. Critical notes on species. – Kew Bull. 4: 23–28, 133–137, 265–272.
- Cheesman, E. E. 1949b. Classification of the bananas. III. Critical notes on species. – Kew Bull. 4: 445–452.
- Cheesman, E. E. 1950a. Classification of the bananas. III. Critical notes on species. – Kew Bull. 5: 27–31.
- Cheesman, E. E. 1950b. Classification of the bananas. III. Critical notes on species. – Kew Bull. 5: 151–155.
- Geri, C. and Ng, F. S. P. 2005. *Musa lokok* (Musaceae), a new species of banana from Bario, Borneo. – Gard. Bull. Sing. 57: 279–283.
- Hooker, J. D. 1872. *Musa sanguinea*. – Bot. Mag. 98, Table 5975.
- Hooker, J. D. 1893. *Musa mannii*. – Bot. Mag. 119, Table 7311.
- Hooker, J. D. 1895. *Musa rubra*. – Bot. Mag. 121, Table 7451.
- Hotta, M. 1967. Notes on the wild bananas of Borneo. – J. Japan. Bot. 42: 344–352.
- Häkkinen, M. 2001. *Musa laterita*: an ornamental banana. – Fruit Gard. USA 33: 6–7.
- Häkkinen, M. 2003a. Taxonomic history and identity of *Musa rubra* Wall. ex Kurz. – Philipp. Agricult. Sci. 86: 92–98.
- Häkkinen, M. 2003b. *Musa campestris* Beccari varieties in northern Borneo. – Philipp. Agricult. Sci. 86: 424–435.
- Häkkinen, M. 2004a. *Musa voonii*, a new *Musa* species from northern Borneo and discussion of the section *Callimusa* in Borneo. – Acta Phytotax. Geobot. 55: 79–88.
- Häkkinen, M. 2004b. *Musa campestris* Becc. (Musaceae) varieties in northern Borneo. – Folia Malaysiana 5: 81–100.
- Häkkinen, M. 2005a. *Musa azizii*, a new *Musa* species (Musaceae) from northern Borneo. – Acta Phytotax. Geobot. 56: 27–31.
- Häkkinen, M. 2005b. Ornamental bananas: notes on the section *Rhodochlamys* (Musaceae). – Folia Malaysiana 6: 49–72.
- Häkkinen, M. 2006a. *Musa barioensis*, a new *Musa* species (Musaceae) from northern Borneo. – Acta Phytotax. Geobot. 57: 55–60.
- Häkkinen, M. 2006b. *Musa lawitiensis* Nasution & Supard. (Musaceae) and its intraspecific taxa in Borneo. – Adansonia 28: 55–65.
- Häkkinen, M. 2006c. A taxonomic revision of *Musa rosea* (Musaceae) in southeast Asia. – Novon 16: 492–496.
- Häkkinen, M. 2007. Ornamental bananas: focus on *Rhodochlamys*. – Chron. Horticult. 47: 7–12.
- Häkkinen, M. 2009. *Musa chunii*, a new *Musa* species (Musaceae) from Yunnan China and taxonomic identity of *Musa rubra*. – J. Syst. Evol. 47: 87–91.
- Häkkinen, M. and Sharrock, S. 2002. Diversity in the genus *Musa* – focus on *Rhodochlamys*. – Inst. for the Improvement of Banana and Plantain, Ann. Rep. 2001, pp. 16–23.
- Häkkinen, M. and Meekiong, K. 2005a. A new species of *Musa* from Borneo. – Syst. Biodiv. 2: 169–173.
- Häkkinen, M. and Meekiong, K. 2005b. *Musa borneensis* Becc. (Musaceae) and its intraspecific taxa in Borneo. – Acta Phytotax. Geobot. 56: 213–230.
- Häkkinen, M. and Wallace, R. 2007. *Musa siamensis*, a new *Musa* species (Musaceae) from southeast Asia. – Folia Malaysiana 8: 61–70.
- Häkkinen, M. and Väre, H. 2008a. A taxonomic revision of *Musa aurantiaca* (Musaceae) in southeast Asia. – J. Syst. Evol. 46: 89–92.
- Häkkinen, M. and Väre, H. 2008b. Taxonomic history and identity of *Musa dasycarpa*, *M. velutina* and *M. assamica* (Musaceae). – J. Syst. Evol. 46: 230–235.
- Häkkinen, M. and Väre, H. 2008c. Typification and check-list of *Musa* names (Musaceae) with nomenclatural notes. – Adansonia 30: 63–112.
- Häkkinen, M. and Teo, C. H. 2008. *Musa rubinea*, a new *Musa* species (Musaceae) from Yunnan, China. – Folia Malaysiana 9: 23–33.
- Häkkinen, M. and Wang, H. 2008. *Musa zaifui*, a new species (Musaceae) from Yunnan, China. – Nord. J. Bot. 26: 42–46.
- Häkkinen, M. et al. 2005. *Musa beccarii* Simmonds (Musaceae) varieties in Sabah, northern Borneo. – Acta Phytotax. Geobot. 56: 137–142.
- Häkkinen, M. et al. 2007. The detection and analysis of genetic variation and paternity in *Musa* section *Rhodochlamys* (Musaceae). – Folia Malaysiana 8: 71–86.
- Kurz, S. 1867. Note on the plantains of the Indian archipelago. – J. Agricult. Soc. Ind. 14: 295–301.
- Linnaeus, C. 1753. Species Plantarum – Laurentii Salvii, Stockholmiae.

- Liu, A. Z. et al. 2002. Taxonomic notes on wild bananas (*Musa*) from China. – Bot. Bull. Acad. Sin. 43: 77–81.
- Meekiong, K. et al. 2005. A new banana: *Musa sakaiana* (Musaceae) from Sarawak, Malaysia. – Folia Malaysiana 6: 131–138.
- Nasution, R. E and Supardiyono, A. 1998. New species: *Musa lawitiensis*. – Bull. Kebun Raya Ind. 8: 128–130.
- Ridley, H. N. 1893. *Musa violascens*. – Trans. Linn. Soc. Ser. 2, 3: 384.
- Roxburgh, W. 1824. Flora Ind. Carey, W. and Wallich, N. (eds), Description of Indian Plants. Mission Press, Calcutta.
- Sagot, P. 1887. Sur le Genre Bananier. – Bull. Soc. Bot. France 34: 328–330.
- Shepherd, K. 1959. Two new basic chromosome numbers in Musaceae. – Nature 183: 1539.
- Shepherd, K. 1999. Cytogenetics of the genus *Musa*. – Int. Network for the Improvement of Banana and Plantain, Montpellier, France.
- Simmonds, N. W. 1960. Notes on banana taxonomy. – Kew Bull. 4: 198–212.
- Simmonds, N. W. and Weatherup, S. T. C. 1990. Numerical taxonomy of the wild bananas. – New Phytol. Lond. 115: 567–571.
- Valmayor, R. V. 2001. Classification and characterization of *Musa exotica*, *M. alinsanya* and *M. acuminata* ssp. *errans*. 2001. – Philipp. Agricult. Sci. 84: 325–331.
- Valmayor, R. V. et al. 2004. Rediscovery of *Musa splendida* A. Chevalier and description of two new species (*Musa viridis* and *Musa lutea*). – Philipp. Agricult. Sci. 87: 110–118.