



*Dedicated to the memory  
of A. A. PULLE*

# DEDICATION

The completion of the fifth volume of this Flora brings the pleasant task of dedicating it to the memory of my former teacher in systematic botany, the late professor doctor August Adriaan Pulle, of Utrecht University.

As I have explained on a former occasion, descriptive botany and plant geography had since Miquel's time lost a great deal of attention and recognition. It is largely due to Pulle that *scientia amabilis* in Holland owes its remarkable *réveil*.

Stimulated in his turn by his teacher, our common, venerated professor of general botany, F. A. F. C. Went, who never failed to interest his pupils in tropical botany, Pulle focussed his attention first on the flora of Surinam and later on that of New Guinea. Through personal exploration in both countries he acquired an excellent field knowledge. Owing to his ability as an organizer and editor, and to long sustained hard work, his efforts gradually led to increased publication facilities. He soon gave up his own research work in favour of organizing the herbarium and library at Utrecht, and of his teaching, and succeeded gradually in attracting capable students for various sections of plant taxonomy and geography. His tolerant, sympathetic personality, his convivial students' excursions in Holland and abroad, and his versatile and wide knowledge created a most agreeable working sphere in his laboratory. He varied the subject of his *capita selecta* for advanced graduates regularly: the course on plant sociology led D. M. de Vries to initiate practical plant sociology in Holland, that on phytopalaeontology led R. G. Koopmans to a thesis on the Netherlands carboniferous flora and stimulated F. Florschütz to initiate a centre for practical palynology of the Netherlands Pleistocene. Pulle's main achievement materialized in raising a school of systematists, including the large majority of present Netherlands taxonomists who have jointly made research on the floras of Holland, the West, and the East Indies. The centre of research on the West Indies remained at Utrecht and found its expression in the Flora of Suriname; the centre for the East Indies was shared by the Bogor and Leyden herbaria. But he kept a vigilant eye on both all the time and in his most excellent address at the opening of the enlarged Utrecht Herbarium and Museum in 1938 he dwelt at length on 'De inventarisatie van het erfdeel der vaderen' (The inventory of our heritage).

Before I went to Bogor I was invited by Went and Pulle to a private talk on the subject of the future outline, coordination, and development of the work on the Malaysian flora for which they suggested in a general way that I should consider a very gradual planning of a final, regional Flora, with the emphasis on gradual as I had first to acquire a large pre-knowledge for this task. Neither of my wise tutors believed in *ad hoc* planning of long-range scientific objectives. In this way Pulle and Went can be considered as the mental progenitors of the initiative towards the present work. They were ultimately responsible for the magnificent body of biological research work performed by the best of their students in the former colonies. It is their everlasting monument, and our pride.

It is due to their education and wisdom that botany in the Netherlands has developed harmoniously, in both the descriptive and experimental fields. Their pupils who are now in leading positions have been impregnated with this ideal and will maintain it. This satisfactory situation of mutual appreciation has been decisive, I feel, for the joyful news just received that my country will be the first official body to grant funds to cope with the financial emergency with which our Foundation was confronted recently. I trust that this emergency will be temporary and that the Governments in the immense Malaysian area will appreciate the basic value of this Flora for the development of pure and applied botany for their peoples and will take a liberal share in the project.

C. G. G. J. VAN STEENIS

# ABBREVIATIONS AND SIGNS

- acc. = according  
 Ak. Bis. = Aklan Bisaya (Philip. language)  
 Alf. Cel. = Alifurese Celebes (language)  
 alt. = altitude  
 Anat. = Anatomy  
 Ap. = Apayao (Philip. language)  
 app. = appendix, appendices  
 appr. = approximate  
 Apr. = April  
 Arch. = Archipelago  
 atl. = atlas  
*auct. div.* = *auctores diversi*; various authors  
*auct(i). mal.* = *auctores malayenses*; authors dealing with Malaysian flora  
*auct(i). plur.* = *auctores plures*; several authors  
 Aug. = August  
 Bag. = Bagobo (Philip. language)  
 basionym = original name of the type specimen; its epithet remains permanently attached to the taxon which is typified by it provided it is of the same rank  
 Bg = Buginese (language)  
 Bik. = Bikol (Philip. language)  
 Bil. = Bilá-an (Philip. language)  
 Bill. = Billiton  
 Bis. = Bisaya (Philip. language)  
 Bon. = Bontók (Philip. language)  
 Born. = Borneo  
 Bt = Bukit; mountain  
 Bug. = Buginese (language)  
 Buk. = Bukidnon (Philip. language)  
*c.* = *circiter*; about  
 C. Bis. = Cebu Bisaya (Philip. language)  
*cf.* = *confer*; compare  
 Chab. = Chabecano (Philip. language)  
 citations = see references  
 cm = centimetre  
*c.n.* = see *comb. nov.*  
*comb. nov.* = *combinatio nova*; new combination  
*c.s.* = *cum suis*; with collaborators  
*cum fig.* = including the figure  
*cur.* = *curante*; edited by  
 D (after a vernacular name) = Dutch  
 Daj. = Dyak (language)  
 Dec. = December  
 D.E.I. = Dutch East Indies  
*descr.* added behind a reference = means that this contains a valid description. Compare for example p. 107a lines 7 & 8 from bottom where the combination *Salix zollingeriana*, originally referred to as a *nomen nudum*, was 5 years later provided with a description; nomenclaturally the date of publication is that of its valid description  
 diam. = diameter  
 Distr. (as an item) = Distribution  
 Distr. (with a geographical name) = District  
*ditto* = the same, see *do*  
 Div. = Division  
*div.* = *diversus* (masc.) = various  
*do* = *ditto* (Ital.); the same  
 Dum. = Dumágat (Philip. language)  
 dupl. = duplicate  
 E = east (after degrees: eastern longitude)  
 E (after a vernacular name) = English  
 Ecol. = Ecology  
 ed. = edited; edition; editor  
*e.g.* = *exempli gratia*; for example  
*elab.* = *elaboravit*; revised  
*em.* = *emendavit*; emended  
 em(erg). ed. = *emergency edition*  
 Engl. = English  
*etc., &c.* = *et cetera*; and (the) other things  
*ex auctt.* = *ex auctores*; according to authors  
*excl.* = *exclusus* (masc.); excluding, exclusive of  
*f.* (before a plant name) = *forma*; form  
*f.* (after a personal name) = *filius*; the son  
 f. (in citations) = figure  
 fam. = family  
 Feb. = February  
*fide* = according to  
 fig. = figure  
*fl.* = *flore, floret (floruit)*; (with) flower, flowering  
 For. Serv. = Forest Service  
*fr.* = *fructu, fructescit*; (with) fruit, fruiting  
 Fr. (after a vernacular name) = French  
 G. = Gunung (Malay); mountain  
 Gad. = Gaddáng (Philip. language)  
*gen.* = *genus*; genus  
*genus delendum* = genus to be rejected, see p. 344b  
*Lemairea*  
 Germ. = German  
*geront.* = Old World  
*haud* = not, not at all  
 holotype = the specimen on which the original description was actually based or so designated by the original author  
 homonym = a name which duplicates the name of an earlier described taxon (of the same rank) but which is based on a different type species or type specimen; all later homonyms are nomenclaturally illegitimate, unless conserved  
*ib(id).* = *ibidem*; the same, in the same place  
 Ibn. = Ibanág (Philip. language)  
*ic.* = *icon, icones*; plate, plates  
*ic. inedit.* = *icon ineditum, icones inedita*; inedited plate(s)  
*id.* = *idem*; the same  
*i.e.* = *id est*; that is  
 If. = Ifugáo (Philip. language)  
 Ig. = Igorot (Philip. language)  
 Ilg. = Ilongót (Philip. language)  
 Ilk. = Ilóko (Philip. language)  
*in adnot.* = *in adnotatione*; in note, in annotation  
*incl.* = including, inclusive(ly); *inclusus* (masc.)  
*indet.* = indetermined  
 Indr. = Indragiri (in Central Sumatra)  
*inedit.* = *ineditus* (masc.); inedited  
*in herb.* = *in herbario*; in the herbarium  
*in litt.* = *in litteris*; communicated by letter  
*in sched.* = *in schedula*; on a herbarium sheet  
*in sicco.* = *in sicco*; in a dried state  
*in syn.* = *in synonymis*; in synonymy  
 Is. = Isinái (Philip. language)  
 Isl. = Islands  
 Ism. = Isámal (Philip. language)  
 isotype = a duplicate of the holotype; in arboreous plants isotypes have often been collected from

## FLORA MALESIANA

- a single tree, shrub, or liana from which the holotype was also derived
- Iv.** = Ivatán (Philip. language)
- J(av).** = Javanese (language)
- Jan.** = January
- Jr** = Junior
- Klg.** = Kalínga (Philip. language)
- Kul.** = Kuláman (Philip. language)
- Kuy.** = Kuyónon ( Philip. language)
- Lamp.** = Lampong Districts (in S. Sumatra)
- Lan.** = Lánao (Philip. language)
- lang.** = language
- l.c.** = *loco citato*; compare reference
- lectotype** = the specimen selected a posteriori from the authentic elements on which the taxon was based when no holotype was designated or when it is lost
- livr.** = livraison, part
- ll.cc.** = *l.c.* (plur.)
- m** = metre
- M** = Malay (language)
- Mag.** = Magindanáo (Philip. language)
- Mak.** = Makassar, Macassar (in SW. Celebes)
- Mal.** = Malay(an)
- Mal. Pen.** = Malay Peninsula
- Mand.** = Mandáya (Philip. language)
- Mang.** = Mangyán (Philip. language)
- Mar.** = March
- Mbo** = Manóbo (Philip. language)
- Md** = Madurese (language)
- Minangk.** = Minangkabau (a Sumatran language)
- min. part** = *pro minore parte*; for the smaller part
- mm** = millimetre
- Mng.** = Mangguánga (Philip. language)
- ms(c)** = manuscript
- Mt(s)** = Mount(ains)
- N** = north (after degrees: northern latitude); or New (e.g. in N. Guinea)
- NE.** = northeast
- nec** = not
- neerl.** = Netherlands, Netherlands edition
- Neg.** = Negrito (Philip. language)
- N.E.I.** = Netherlands East Indies
- neotype** = the specimen designated to serve as nomenclatural type when no authentic specimens have existed or when they have been lost; a neotype retains its status as the new type as long as no authentic elements are recovered and as long as it can be shown to be satisfactory in accordance with the original description or figure of the taxon
- N.G.** = New Guinea
- N.I.** = Netherlands Indies
- no** = number
- nom.** = *nomen*; name (only) = *nomen nudum*
- nom. al.** = *nomen aliorum*; name used by other authors
- nom. al.(ern).** = *nomen alternativum*; alternative name
- nom. cons(erv).** = *nomen conservandum*, *nomina conservanda*; generic name(s) conserved by the International Rules of Botanical Nomenclature
- nom. fam. cons.** = *nomen familiarum conservandum*; conserved family name
- nom. gen. cons. prop.** = *nomen genericum conservandum propositum*; generic name proposed for conservation
- nom. illegit.** = *nomen illegitimum*; illegitimate name
- nom. legit.** = *nomen legitimum*; legitimate name
- nom. nov.** = *nomen novum*; new name
- nom. nud.** = *nomen nudum*; name published without description and without reference to previous publications
- nom. rej.** = *nomen rejiciendum*; name rejected by the International Rules of Botanical Nomenclature
- nom. seminudum** = a name which is provided with some unessential notes or details which cannot be considered to represent a sufficient description which is, according to the International Rules of Botanical Nomenclature, compulsory for valid publication of the name of a taxon. See for example p. 401a line 2
- nom. subnudum** = *nomen seminudum*
- nom. superfl.** = a name superfluous when it was published; in most cases it is a name based on the same type as an other earlier specific name. See for example p. 342b lines 32 & 33 from top
- non** followed by author's name and year, not placed in parentheses, and put at the end of a citation = means that this author has published the same name mentioned in the citation *independently*. These two (names) combinations are therefore homonyms. Compare p. 327 lines 15 & 16 from top; there are two independent genera of the name *Lophiocarpus*. Compare p. 310b lines 21 & 22 from bottom; there are two independent species described under the name *Dichapetalum holopetalum*, by MERRILL and by RUHLAND respectively
- (**non** followed by abbreviation of author's name) before a reference (citation) headed by an other author's name = means that the second author has misinterpreted the taxon of the first author. Compare for example p. 339a under *Scaevola sericea* lines 9 & 10 where the citation means that BURMAN *f.* misapplied the name *Lobelia plumieri*, in other words wrongly identified the plant he had in hand with a species described by LINNAEUS
- non al.** = *non aliorum*; not of other authors
- non vidi** = not seen by the author
- nov.** = *nova* (femin.); new (species, variety, etc.)
- Nov.** = November
- n.s.** = new series
- n. sp.** = *nova species*; new species
- n. (sp.) prov.** = *nomen (specificum) provisorium*; provisional new (specific) name
- n.v.** = *non vidi*; not seen
- NW.** = northwest
- Oct.** = October
- op. cit.** = *opere citato*; in the work cited
- p.** = *pagina*; page
- P.** = Pulau, Pulu (in Malay); Island
- Pal(emb).** = Palembang
- Pamp.** = Pampánga (Philip. language)
- Pang.** = Pangasinán (Philip. language)

## Abbreviations and signs

paratype = a specimen cited with the original description other than the holotype

*part. alt.* = for the other part

P. Bis. = Panay Bisaya (Philip. language)

P.I. = Philippine Islands

pl. = plate

*plurim.* = most

*pr. max. p.* = *pro maxima parte*; for the greater part

*pro* = as far as is concerned

*prob.* = *probabiliter*; probably

*prop.* = proposed

Prov. = Province

*p(r).p.* = *pro parte*; partly

pt = part

*quae est* = which is

*quoad* basionym, syn., specimina, etc. = as far as the basionym, synonym(s), specimen(s), etc. are concerned

references = see for abbreviations the list pp. cxlv-cxlv

Res. = Residency

resp. = respective(ly)

S = south

S = Sundanese (language)

Sbl. = Sambali (Philip. language)

SE. = southeast

*sec.* = *secus*; according to

*sect.* = *sectio*; section

*sens. ampl. (ampliss.)* = *sensu amplo (amplissimo)*; in a wider sense, in the widest sense

*sens. lat.* = *sensu lato*; in a wide sense

*sens. str. (strictiss.)* = *sensu stricto (strictissimo)*; in the narrow sense, in the narrowest sense

Sept. = September

*seq., seqq.* = *sequens, sequentia*; the following

ser. = series

*s.l.* = see *sens. lat.*

S.-L. Bis. = Samar-Leyte Bisaya (Philip. language)

Sml. = Sámal (Philip. language)

*s.n.* = *sine numero*; (specimen) without the collector's number

Sp. = Spanish (language)

*sp(ec).* = *species*; species

*specim.* = specimen(s)

*sphalm.* = *sphalmate*; by error, erroneous

*spp.* = *species*; species (plural)

Sr = Senior

*s.s.* = see *sens. str.*

*ssp.* = *subspecies*; subspecies

*s.str.* = see *sens. str.*

*stat. nov.* = *status nova*; proposed in a new rank

Sub. = Subánun (Philip. language)

*subgen.* = *subgenus*; subgenus

*subsect.* = *subsectio*; subsection

*subsp.* = *subspecies*; subspecies

Sul. = Súlu (Philip. language)

Sum. E.C. = Sumatra East Coast

Sum. W.C. = Sumatra West Coast

Suppl. = *supplementum*; Supplement

SW. = southwest

*syn.* = *synonymum*; synonym

synonyms = the names of taxa which have been referred to an earlier described taxon of the same rank and with which they have been

united on taxonomical grounds or which are bound together nomenclaturally

syntypes = the specimens used by the original author when no holotype was designed or more specimens were simultaneously designated as type

t. = *tabula*; plate

Tag. = Tagalog (Philip. language)

Tagb. = Tagbanúa (Philip. language)

Tagk. = Tagaká-ólo (Philip. language)

Tapan. = Tapanuli (in NW. Sumatra)

taxon = each entity throughout the hierarchic ranks of the plant kingdom which can be described and discriminated from other taxa of the same rank

Tg = Tandjung (Malay); cape

Ting. = Tinggián (Philip. language)

Tir. = Tirurai (Philip. language)

transl. = translated

type = each taxon above the rank of a species is typified by a type belonging to a lower rank, for instance a family by a genus, a genus in its turn by a species; a species or infraspecific taxon is typified by a specimen. The name of a taxon is nomenclaturally permanently attached to its type; from this it can not be inferred that the type always represents botanically the most typical or average structure found in the circumscription of the taxon

type specimen = the specimen or other element to which the name of a species or infraspecific taxon is (nomenclaturally) permanently attached; botanically a type specimen is a random specimen on which the name was based by description. Therefore, it does not need to represent the average or most typical representative of a population. See holotype, isotype, lectotype, syntype, paratype, and neotype

*typ. excl.* = *typo excluso*; type excluded

*typ. incl.* = *typo incluso*; type included

*typus* = see type and type specimen

*var.* = *varietas*; variety

*var. nov.* = *varietas nova*; new variety

Vern. = Vernacular

*vide* = see

*viz* = *videlicet*; namely

vol. = volume

W = west

Yak. = Yakán (Philip. language)

± = about

& = and

♂ = male (flower, etc.)

♀ = female (flower, etc.)

♂ = bisexual (flower)

(♂)(♀) = dioecious with unisexual flowers

(♂♂) = monoecious with unisexual flowers

(♂♂) = polygamous

(♀♀) = polygamous

∞ = very many

> = diminishing (in size, number, etc.)

< = accrescent (size, number, etc.)

× <sup>2</sup>/<sub>5</sub> = <sup>2</sup>/<sub>5</sub> of natural size

× montana = means that the epithet montana is that of a hybrid