THE REDISCOVERY OF CENOLOPHON RUBRUM

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ABSTRACT. A recently collected species of Zingiberaceae from Celebes is identified as *Cenolophon rubrum* Bl., the type of which has been lost. The relationship of *Cenolophon* to *Alpinia* subgenus *Probolocalyx* is discussed.

When writing the account of Zingiberaceae for *Das Pflanzenreich*, K. Schumann made a note under *Alpinia vitellina* that the type specimen of *Cenolophon rubrum* Bl., collected in Celebes by Reinwardt, could no longer be found (Pflanzenr., Zingib. p. 321:1904). He therefore proposed "to delete" this species, which is the type of the genus *Cenolophon*, and made no further mention of it. Nevertheless, Schumann retained the generic name for a section of *Alpinia*, but endeavoured to dissociate it from the original author, Blume, by citing it, quite unjustifiably, as section *Cenolophon* (Horan.). Horaninow (Monogr. Scitam. 36, 1862) had maintained the genus as distinct and had been the first to add to it a further species, *Alpinia vitellina* Lindl., a species which K. Schumann retained at the head of his section.

Further search in the Rijksherbarium, Leiden by Dr R. C. Bakhuizen van den Brink and ourselves unfortunately confirms that the type specimen of *C. rubrum* is missing.

However, recent examination of unnamed Zingiberaceae in the British Museum herbarium has brought to light a specimen collected in 1954 by the late A. H. G. Alston in Celebes near Tomohon, an area visited by Reinwardt. The material is excellent, showing both flower and fruit and unmistakably belongs to *Cenolophon* as currently used for plants from Malaya and Borneo. Furthermore, it in no way differs from Blume's rather brief description, which was in fact taken from Reinwardt's manuscript. We have no hesitation in using this specimen as a neotype of *Cenolophon rubrum*. The plant has a simple racemose pink inflorescence, the petiolate lanceolate leaves are softly hairy below and there is a conspicuous obscurely dentate anther-crest. All this is in accordance with Blume. A few basal remains of primary bracts are to be seen on the inflorescence and the singly-borne flowers, on pedicels up to 3 mm long, are purplish white with a red-striped labellum. The more or less globose capsules are wine red, and pubescent. The infructescence indicates that a second and probably rudimentary flower may occasionally be produced. This has also been observed by Holttum in the Malayan *C. oxymitrum*.

Cenolophon was revived as a genus by Holttum (Gard. Bull. Sing. 13:132, 1950) diagnosed by its simply racemose inflorescence, usually small, not deciduous, primary bracts, and by the complete absence of bracteoles: this latter feature had not been explicitly mentioned by Schumann, although it was implicit in his descriptions. Holttum was satisfied that the Malayan species placed in Section *Cenolophon* by Schumann, which included *C. vitellinum*, adequately fitted Blume's description. The only remaining species of Schumann's section, the Singhalese *A. rufescens* (Thwait.) K. Schum. was

misplaced and belongs to subgenus *Dieramalpinia*. Holttum added *C. mollissimum* (Ridl.) Holtt. and *C. corneri* Holtt. although both of them lack anther-crests.

In a previous paper (Notes R.B.G. Edinb. 31:212, 1972) we concurred with Holttum's conception of *Cenolophon* and added to it (l.c. 310–311). Examination of the Bornean material of the genus has shown that the primary bracts may, in fact, be quickly deciduous or perhaps absent. The generic description given below is, therefore, amended.

While maintaining *Cenolophon* as a section of subgenus *Alpinia* (*Autalpinia* in his nomenclature), Schumann had also established a new subgenus *Probolocalyx*. This was distinguished because the bracts were early deciduous or altogether absent and the flower only received effective protection from the calyx. In subgenus *Alpinia*, and thus in section *Cenolophon*, the primary bracts and flowering bracts might be very small, but were persistent during flowering. Section *Cenolophon* has a simple racemose inflorescence, similar to that of at least half the species of subgenus *Probolocalyx*. The distinction between the groups is weakly conceived and we find in subgenus *Probolocalyx*, probably because of inadequate material, a number of unrelated species.

Schumann's subgenus *Probolocalyx* comprised 19 species. Of these *A. orchioides* K. Schum. and *A. pterocalyx* K. Schum. have been transferred to *Riedelia* [Valeton in Nova Guinea (Botanique) 8:974–976, 1913]. Six (possibly seven; *A. submutica* K. Schum., see below) are clearly referable to *Cenolophon*—these will be discussed and listed below—and *A. mutica* Roxb. (syn. *A. korthalsii* K. Schum.) together with *A. laxiflora* Gagnep. belong to subgenus *Catimbium*. The position of *A. ligulata* K. Schum. has yet to be resolved (see Burtt & Smith in Notes R.B.G. Edinb. 31:308, 1972).

The remainder of Schumann's subgenus falls into two geographical groups of species. One is Sino-Japanese and includes *A. japonica*, *A. officinarum* and *A. oxyphylla*, as well (probably) as species described by Hayata and others from Taiwan (Formosa) and *A. macrocarpa* Gagnep. from Vietnam: this group requires more detailed study than our material permits. The other group is Bornean: *A. flexistamen* K. Schum., *A. glabra* Ridl. (recently united under *A. glabra*, Burtt & Smith l.c. 307) and *A. angustifolia* K. Schum. With these are to be placed 3 or 4 closely related and as yet undescribed plants recently collected from Borneo. Both Schumann and Ridley described their plants as paniculate and certainly lateral branches are produced, usually at the base of the inflorescence, in which case the remains of sheathing bracts may be seen. More often the cincinni are borne directly on the main rhachis, characteristically on long, up to c. 2·5 cm stalks; there are no primary bracts. Each cincinnus normally bears 2 flowers, the second may not develop and there is evidence from *A. glabra* that bracteoles are formed. The type material of both of Schumann's species is very inadequate; it is from the undescribed Bornean material that we have made observations on the fugacious character of these bracteoles. In *Burtt & Martin, B.* 4876 (Sarawak, Third Div., SE Hose Mts) which flowered at Edinburgh in 1970, each young bud was at first protected by a membranous c. 1–1·25 cm bracteole which fell from the plant before anthesis. No primary bracts were formed. That such bracteoles are usually missing in the herbarium is not unexpected but their presence surely indicates that the affinity of this group of plants lies with subgenus *Catimbium* rather than *Cenolophon*.

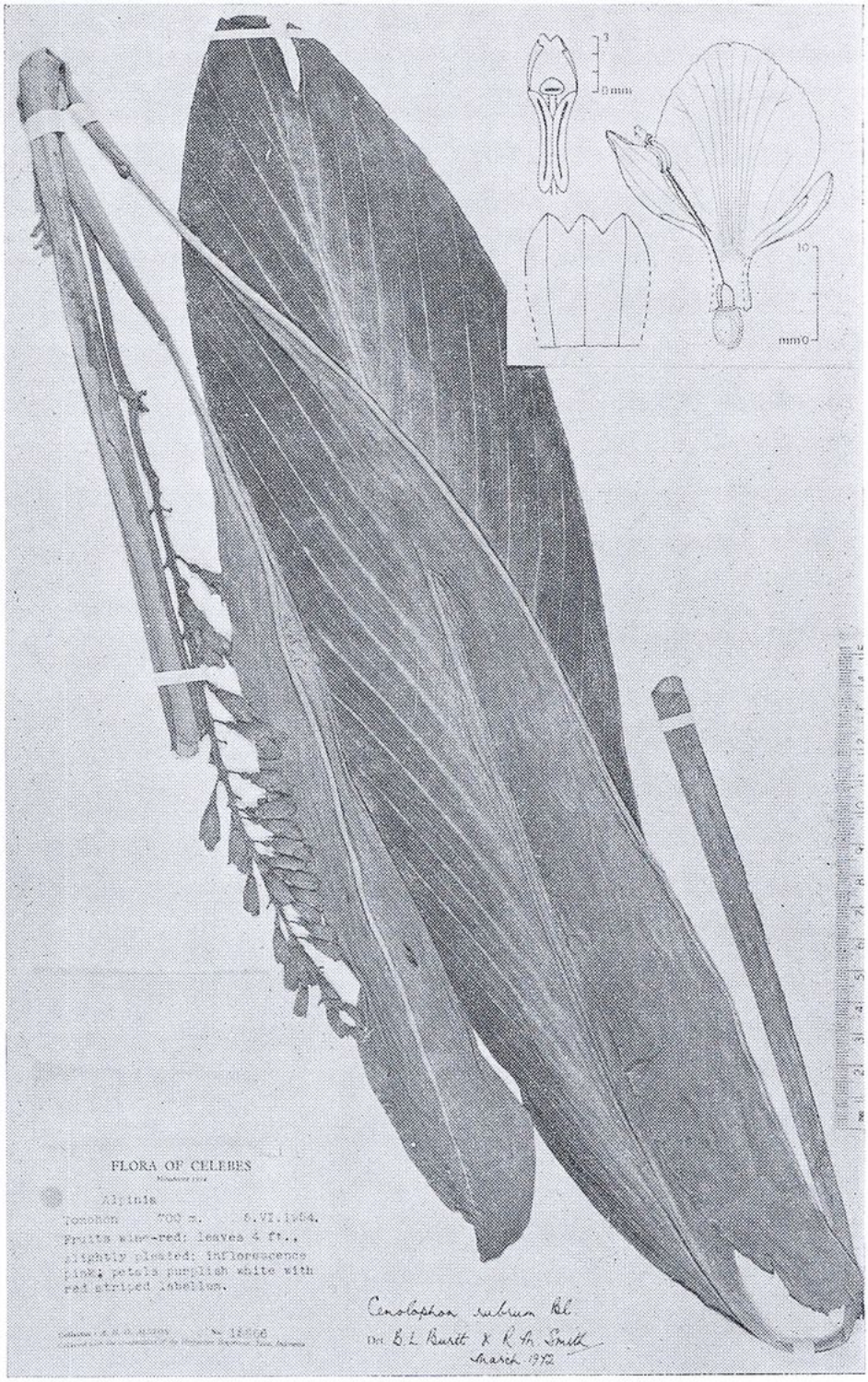

PLATE 3. Neotype of *Cenolophon rubrum*; flowering specimen.

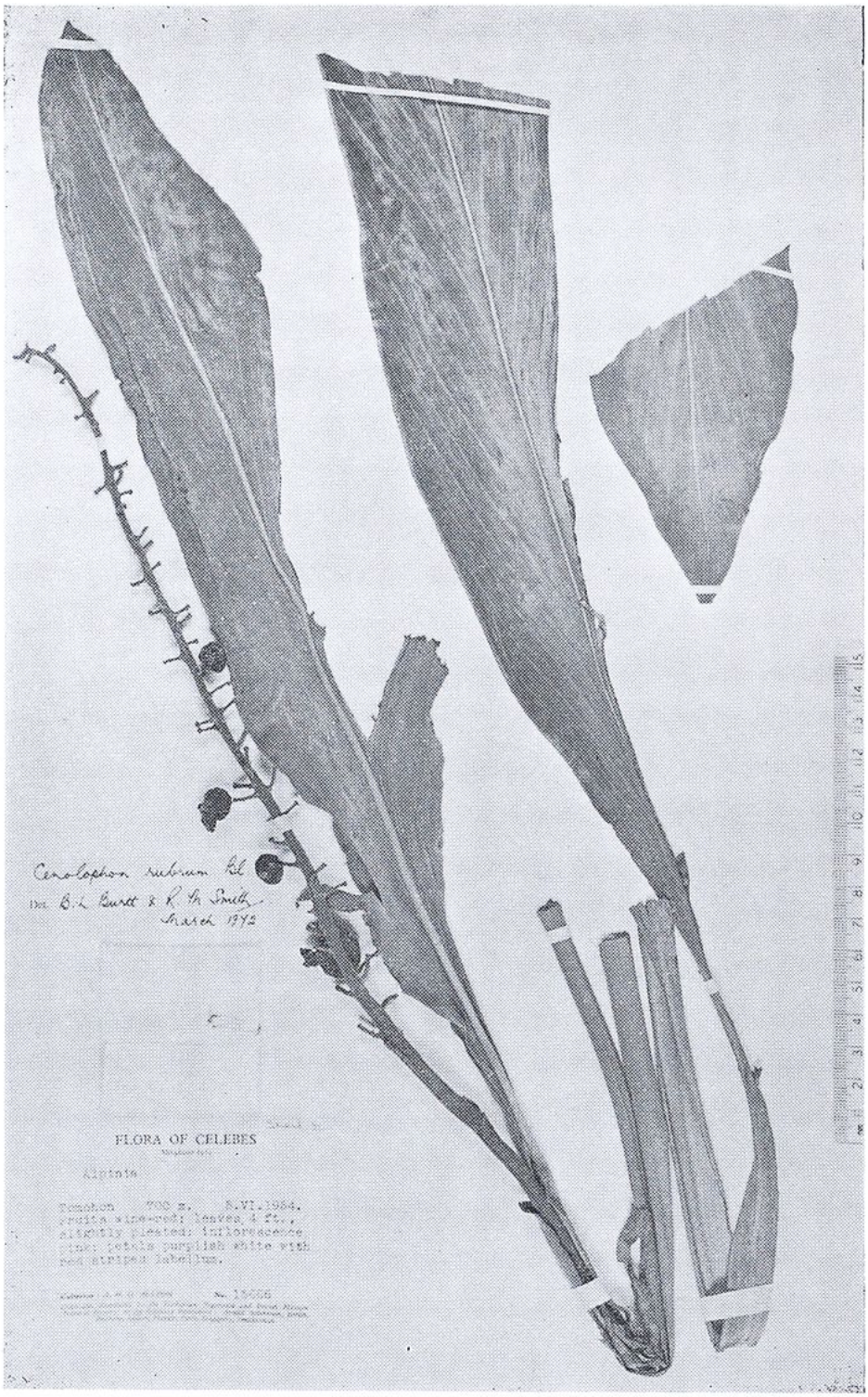

PLATE 4. Neotype of *Cenolophon rubrum*; fruiting specimen.

That the anther connective of both described and undescribed species develops a usually small crest, as yet unknown in *Catimbium*, should not be regarded as of great importance; *Cenolophon*, as it stands at present, includes species with both crested and crestless anthers. It would be premature to decide now whether the name *Probolocalyx* is most likely to prove useful for the Sino-Japanese or Bornean group; no lectotype is therefore chosen at present.

Although they lay outwith the scope of his work, Holttum realised that several species of Schumann's subgenus *Probolocalyx* might be referred to *Cenolophon*. Four of these are native to the extreme NE tip of Celebes. The types of all these species were destroyed in Berlin and we have been unable to trace duplicates. *A. orthostachys* K. Schum. (*Sarasin* 687) lacks an anther-crest and *Alpinia warburgii* K. Schum. (*Warburg* 15736) is described as having linear-lanceolate long caudate leaves and a small 1·5 mm crest, characters which seem to distinguish it from the remaining species. *A. rubricaulis* K. Schum. (*Sarasin* 202) was collected from Tomohon, the same locality as Alston's plant, and the description fits *C. rubrum* well, differing only in the glabrous leaf undersurfaces, long pedicels and emarginate labellum. Finally there is *C. versicolor* (K. Schum.) Burtt & Smith (*Alpinia versicolor* K. Schum.) based on *Sarasin* 229 from Masarang and *Warburg* 15735 from Bogong. Here the leaves are softly hairy below, and pilose above, in *C. rubrum* the upper surface is only sparsely hairy, becoming glabrous. More important differences appear to be the longer pedicels, minutely puberulous calyx, longer corolla tube, 5 mm anther-crest and the narrowly obovate red-striped and green-spotted labellum. The accompanying figure shows the lip to be divided in the upper third; no mention of this is made in the text. Experience has shown the unreliability of some of Schumann's descriptions and until further collections are available we propose to place only *A. rubricaulis* in synonomy under *C. rubrum*. When more is known of variability within the species of *Cenolophon* further reduction may be desirable.

More information on the fruit of *Cenolophon* is also necessary. It is unfortunate that nothing is known of the capsules of *A. orthostachys*, *A. warburgii*, *A. rubricaulis* and *C. versicolor*; such is also the case in the Bornean species of *Cenolophon*. As we have remarked, the fruit of Alston's plant is spherical, but in the Malay peninsula the genus tends to produce ellipsoid, often ribbed capsules. This is particularly well seen in *C. oxymitrum* and it may be noted that it was a fruit of this species which was used to represent the genus by Friedrich & Koch (in Lethaia 5:47–60, 1972) when comparing their fossil material of *Spirematospermum wetzleri* with living genera. Some generic concepts may well need re-definition when fruit forms of all the species are known.

Cenolophon Blume, Enum. Pl. Jav. 60 (1827); Horan., Monogr. Scitam. 36 (1862); Holttum in Gard. Bull. Sing. 13:132 (1950).

Syn.: *Amomum* subgen. *Cenolophon* (Bl.) Bak. in Hook. f., Fl. Brit. Ind. 6:242 (1892).

Alpinia sect. *Cenolophon* (Bl.) K. Schum., Pflanzenr. Zingib. 320 (1904); Loesen. in Engl. & Prantl, Nat. Pflanzenfam. 2 Aufl., 15a:614 (1930).

Inflorescence terminal on a leafy stem, erect or drooping, unbranched. Flowers borne singly on the rhachis (occasionally with a rudimentary second flower). *Primary bracts* usually small, soon breaking off above the base or completely deciduous, occasionally calyptrate (*C. oxymitrum*), sometimes absent. *Bracteoles* O. *Corolla tube* shorter than the unilaterally split calyx, glabrous or hairy at throat. *Labellum* broad, crisped, sometimes emarginate, more usually entire. *Lateral staminodes* present, usually flat and more or less petaloid, more rarely subulate, often with a fleshy papillose swelling at the base. *Anther connective* usually produced into a conspicuous crest, sometimes absent. *Fruit* spherical or ellipsoid, sometimes very much longer than wide, smooth or ribbed.

Type species: *C. rubrum* Bl.

Distribution: Celebes, Borneo, Malaya, Philippines (?).

Cenolophon rubrum Bl., Enum. Pl. Jav. 61 (1827); Burtt & Smith in Notes R.B.G. Edinb. 31:212 (1972). Plates 3 & 4.

Type: Celebes in sylvis, *Reinwardt* (lost).

Syn.: *Alpinia rubricaulis* K. Schum. in [Bot. Jahrb. 27:281 (1899) nomen.] Pflanzenr. Zingib. 330 (1904). Type: Celebes, Tomohon, 14 iii 1892, *Sarasin* 202 (n.v.).

CELEBES. Tomohon, 700 m, leaves [i.e. frond] 1·30 m, [blade] slightly pleated, inflorescence pink, petals purplish white with red striped labellum; fruits wine red; 5 vi 1954, *Alston* 15666 (BM).

NEW DESCRIPTION

Rhizomatous herb, height unknown; sheaths lightly pubescent, ligule c. 4 mm long, hairy, obtuse. *Leaves* petiolate, petioles 1–2·5 cm, pubescent, lamina plicate, lanceolate to lanceolate-oblong, 30–45 × 5–11 cm, attenuate at the base, subacute apically, softly tomentose below, very sparsely short-haired or more or less glabrous above. *Inflorescence* pink, c. 20–35 cm long, unbranched, tomentose; flowers borne singly on the main axis (the fruiting inflorescence shows that a second, probably rudimentary, flower can occur); primary bracts probably minute, only a few basal remains seen; secondary bracts (bracteoles) absent; pedicels 2–3 mm long (in flower), up to 8 mm at base of infructescence; calyx 1–1·2 cm, narrowly funnel-shaped, divided into 3 c. 2 mm long triangular teeth, unilaterally split, lightly tomentose; corolla pubescent outside, tube 6–7 mm long, densely hairy at the throat within; lobes purplish white, dorsal 1·5 × 0·5 cm, broadly lanceolate margins inrolled at apex; laterals shorter and narrower; labellum red striped, more or less ovate, 2 cm long, c. 1·5 cm wide, sometimes slightly emarginate, usually entire, margins crisped; lateral staminodes strap-shaped, 6 × 0·75 mm, thickened at the base; filament c. 6 mm long, less than 0·5 mm wide but becoming broader just below the 3 mm anther-thecae; anther connective prolonged into a 3 mm oval, obscurely dentate crest; style and stigma hairy; ovary subglobose 2–4 × 2–3 mm, densely pubescent, trilocular, placentation axile; epigynous glands 2 m long × 1 mm wide, thick, free from each other dorsally. *Capsule* wine-red, globose, up to 1·3 cm in diameter, pubescent, surmounted by the remains of the calyx, many seeded.

As it stands at present *Cenolophon* includes the following species: *C. oxymitrum* (K. Schum.) Holtt., *C. macrostephanum* (Bak.) Holtt., *C. pulcherrimum* (Ridl.) Holtt., *C. petiolatum* (Bak.) Holtt., *C. vitellinum* (Lindl.) Horan., *C. mollissimum* (Ridl.) Holtt., *C. corneri* Holtt., all from the Malay Peninsula, *C. argenteum* Burtt & Smith from Borneo, and from Celebes *C. versicolor* (K. Schum.) Burtt & Smith and *C. rubrum*. Future additions will include: *Alpinia havilandii* K. Schum. and *A. ptychanthera* K. Schum., both Bornean and lacking anther crests; *A. orthostachys* K. Schum., *A. warburgii* K. Schum., *A. hulstijnii* Val. (in Bull. Jard. Bot. Buitenz. ser. 3, 5:344, 1923) and *A. padacanca* Val. (in Heyne, Nutt. Pl. Ned.-Ind. ed 2:530, 1922), all from Celebes. Finally, *A. vanoverbergii* Merr. (in Philip. Journ. Sc. 7:75, 1912) may also prove to belong to *Cenolophon*, thus extending the distribution of the genus to the Philippines.

A. submutica K. Schum. has been omitted from the above list. Described by him in 1899 from Java (*Teysmann* 2030) it reappeared in 1904, under subgenus *Probolocalyx*, as *A. submutica* Roxb. with the addition of a Bornean citation (*Haviland* 1579). Nothing further is known of this plant which is unknown in Java and may have been described from Sumatra (see Koorders, Excursionsflora von Java 1:334, 1911).

Ridley's *A. longilora* described from Borneo in 1913 (Journ. Bot. 51:247) and placed in section *Cenolophon* has recently been found to be a *Burbidgea* (see Smith in Notes R.B.G. Edinb. 31:306, 1972). *A. microlophon* Ridl. (in Journ. Str. Br. Roy. As. Soc. 54:58, 1909), also from Borneo and referred to section *Cenolophon* by Ridley, is described as having 2-3-flowered cincinni and spathaceous bracts; it is clearly not a *Cenolophon*.