AN ACCOUNT OF THE GENERA RICHELLA A. GRAY AND OXYMITRA (BL.) HOOK. F. & TH. (ANNONACEAE)

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As the name of the hepatic genus is still in use it seemed to me impossible to suppress it and consequently I proposed a new generic name for the annonaceous genus, viz. Friesodielsia, without making any new combinations under that name.

A. C. Smith acknowledged this homonymy and proposed — in view of the admitted undesirability of name change of the large annonaceous genus — its conservation. Cf. J. Arn. Arb. 31 (1950) 164—165. As there is no alternative to the acceptance of a new name the proposal to conserve Oxymitra Hook. f. & Th. was turned down by the International Botanical Congress (Taxon 3, 1954, 115).

Pending the decision on this proposal Sinclair did not accept Friesodielsia in his revision of the Malayan Annonaceae (Gard. Bull. Sing. 14, 1955, 448—449). Also Boutique provisionally maintained Oxymitra for the same reason (Fl. Congo Belg. 2, 1957, 358, in footnote).

It appeared doubtful, however, whether Friesodielsia would be the correct new name to be used. I had overlooked that there was a presumed taxonomic synonym of Oxymitra, viz. Richella A. Gray, created for an endemic, monotypic genus of the Fiji Is. (cf. Proc. Am. Ac. Sc. 2, 1852, 325; Bot. U. S. Expl. Exp. 1, 1854, 28, t. 2), based on R. monosperma A. Gray. Bentham & Hooker f. (Gen. Pl. 1, 1862, 26) kept Richella apart from Polyalthia, Oxymitra, and Goniothalamus, stating that the difference between Richella and Oxymitra is in the fruit.

Bailon reduced Richella to Oxymitra (Hist. Pl. 1, 1868, 237), although with an incorrect specific epithet, as O. grayana Baill. and described a second species of 'Richella' from New Caledonia, under Oxymitra (Adansonia 8, 1868, 178). This reduction was accepted by Prantl (Pfl. Fam. ed. 1, 3, 2, 1891, 34), although he included also the genus Goniothalamus in this concept, which is not followed by later authors.

Also A. C. Smith agreed with this generic disposition (Bern. P. Bish. Mus. Bull. 141, 1936, 62). He made additional remarks on the presumed difference between the Fijian species and others from Malesia and believed that New Caledonian species, O. obtusata Baill. provided more or less a transition to the Malesian species. Later he recorded several new collections of O. monosperma from Fiji which exactly fit Gray’s very accurate account, with the exception that fruits often contain 2 seeds. Cf. Sargentia 1 (1942) 33.

In 1955 Smith (J. Arn. Arb. 36: 278) in his interesting paper on genera terminating their distribution in Fiji, came to the conclusion that Richella is ‘apparently the correct name for the large genus currently passing as Oxymitra Hook. f. & Th., if the view prevails that the two taxa are congeneric. In that case Friesodielsia Steen. will not be necessary’ and new combinations will be needed under Richella.

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This has led me to check the question whether or not *Richella* and *Oxymitra* should be merged as this is decisive for the generic name of the large genus hitherto known as *Oxymitra*.

In the first place Fries's generic description needs some amendment. He cited the number of ovules as 1, but this is really 1—2; he mentioned himself 2 ovules in the third 'type' of African species; moreover the type species *R. monosperma* has 2 ovules and often 2 seeds, for which reason Baillon incorrectly changed its specific epithet *monosperma* to *grayana*. Also the type species of *Oxymitra* has 1—2 seeds (cf. Blume, Fl. Jav. Anon. t. 36 D 7—8). Baillon even mentioned to have seen 3—4 ovules but that was another collection (*Hornb*ron, from Balaou). But also in other species 1 or 2 ovules are found in each carpel, for example in *O. biglandulosa*, and occasionally there are 2 seeds developed, one above the other.

A second point is that Fries says that the genus consists of 'Sträucher, ± hochkletternd' from which I derive that he believes them all to be woody climbers. Sinclair also stressed that all Malayan species are climbers. This is, however, not true for the entire genus as *O. gracilis* is described as a tree, and the African *O. obanensis* even as a tall tree. Both species of *Richella, R. monosperma* from Fiji and *R. obtusata* from New Caledonia are trees, according to Däniker and Smith. Some other species are described as of sprawling habit.

Another point is that Fries designated *Richella cuneiformis* (Bl.) R. E. Fries as type species of the genus; this is, however, the type species of *Oxymitra*. The type species of *Richella is* of course *R. monosperma* A. Gray.

The main difference between *Richella* and *Oxymitra* is in the fruit and seed and Fries gave only meagre information about these differences. They were more or less minimized by A. C. Smith who wrote (1936, l.c.): 'the remarkable winged seeds of the Fijian species find a lesser development in a New Caledonia species, thus providing a transition to Malayan species which have the seeds variously marked.'

Baillon was in his description of the New Caledonian *O. obtusata* very clear (Adansonia 8, 1868, 171): 'Fructus obovoideus 4 cm longis 2 cm latis, basi attenuatus, apice rotundatis, ... 1—2-spermatis. Semina obsolete 2—3-quadata; angulis in alam obtusatam productis (ad 2 cm longa, 1 cm lata)'. This means that the seeds are somewhat smaller than those of the Fijian species which are c. 3 by 2 cm, but the fruiting carpels are of about the same size and also sessile. Fig. 1 h. Another remarkable character of *R. monosperma* is that in the herbarium the seeds lie loose in the pericarp cavity and they have a very hard, almost bony, proportionally thick, dark-brown, 3-angular testa. Although true wings are not developed in *O. obtusata*, they are represented by a protruding crested ridge; apart from specific difference, the outward structure of the seed agrees very well with that of *R. monosperma*. In both species the leaves are not glaucous beneath as is often the case in Malayan *Oxymitras*.

All *Oxymitra* species which I could examine from Malesia, Asia, and Africa have much smaller fruits, mostly c. 1 by $\frac{5}{8}$—$\frac{8}{8}$ cm (in *O. biglandulosa* some measuring $\frac{12}{2}$—2 by $\frac{8}{8}$—1 cm) in which the pericarp very closely envelops the seed they are subglobular to ellipsoid, nipple-tipped at the apex and distinctly stipitate; the seed is globular to oblong, the testa thin, papery, smooth and slightly corrugated following the pattern of the endosperm sections.
Fig. 1. *Friesodielsia biglandulosa* (Bl.) Steen. — a. Stipitate fruiting carpel; b. cross-section showing the 4 longitudinal walls of the endosperm, in one quarter the thin lamellar transversal plates of the endosperm of which the attachment can be observed in c, in the three other quarters the testal quarters are not removed; c. longitudinal section of seed, somewhat excentric. — *Richella monosperma* A. Gray — d. Fruiting carpel; e—f. seed, ventral and dorsal, in f the impression is caused by press of a second seed; g. cross-section of seed, somewhat schematic as the testal intrusions have only been drawn dorsally. — *Richella obtusata* (Baill.) R. E. Pries. — h. Fruit; i—j. seed, ventral and dorsal; k. cross-section of seed showing the irregular intrusions of inner testa in endosperm. (All nat. size except b, c, g, and k, which are 2/1).
There is, therefore, definitely no 'transition' from Richella to the genuine species of Oxymitra in the fruit structure of O. obtusata.

Furthermore, the difference is strengthened if we examine the inward structure of the seed.

In Richella monosperma the oily endosperm forms one body with very irregular thick lamellae, oblique and partly vertical and of different size. Between them protrude irregular fringes of the inner testa as depicted in fig. 1g.

In O. obtusata the endosperm structure exactly matches that of R. monosperma. Fig. 1k.

In Oxymitras of India and Malesia, as far as fruits were available, the structure of the endosperm is consistently very different. Here the endosperm consists of 4 cross-wise longitudinal thin 'walls' over the length of the seed which are subregularly arranged in 4 rows of transversal flat and thin lamellae, between each pair of which the inner testa is produced as a quarter segment of a circle. In pealing out such a very regularly built seed in the herbarium, the testal segments and endosperm segments get easily loose. This was already well figured by Blume for the type species O. uneiformis (cf. Fl. Jav. Anon. t. 35, 36 D 7—12). Fig. 1b—c.

In African Oxymitras the overall seed structure is similar to that of the Indo-Malesian species, as Dr J. P. M. Brenan (Kew) kindly communicated from examination of four species; in some species fruits may be more than 2-seeded.

Though these details of seed structure seem not to have been observed hitherto, I believe their consistency is important systematically. Although in the system of the Annonaceae the flower structure prevails as distinctive for genera, it is my conviction that, although Richella and Oxymitra are possibly allied genera, they should not be merged.

With respect to the importance of fruit and seed structure in this family I refer to Corner who wrote that 'the structure of the annonaceous seed offers many new criteria, even to the extent of regrouping genera and parts of genera' (The New Phyt. 48, 1949, 362).

One could naturally argue that as a rule marginal specimens deviate from central ones and that marginal species sometimes deviate from central species. This may be due to centrifugation of genetic qualities in progressive distribution, but it can also be understood as marginal presence of relicts cut off from the centre where subsequent evolution evolved changing the aspect of these species. It is difficult to discriminate between the two cases; Melanesia has several ones unsolved. A good example of marginal deviation is that the largest fruited species of Gonystylus known occurs in Fiji, the terminus of the genus. Another case is that of the Sapotaceous genera Cassidispernum and Chelonespermum, from Fiji and the Solomon Is, both described by Hemsley and recently reviewed by Van Royen (Nova Guinea n.s. 10, 1959, 136—142, fig. 3). These genera are closely related to Burckella, and to Lam and myself they are more extremes of that genus than good genera. It is remarkable that their hard flat seeds show a superficial resemblance with those of Richella.

I regret that this examination will inevitably lead to some name changes, but this cannot be helped. Below I have given the differential generic characters.

RICHELLA


Trees. Fruiting carpels without distinct stipe, obovate, attenuate towards the base but
essentially sessile, large, c. 4 by 2½ cm, without a distinct nipple-shaped tip. Seed(s) in the dried state lying loose in the endocarp, 3-quetrous but by compression of the two seeds about 2-sided, winged or angled; seed coat very hard and thick, 2—3 by 1—2 cm. Endosperm rather irregularly ruminate, in various directions, the interstices partly filled with irregularly shaped or fringed intrusions of the inner testa.

Type species: R. monosperma A. Gray.

Distribution: three species, one in Fiji, one in New Caledonia, and one in Borneo.


Note. Guillaumin’s mention of the combination in 1932 is illegitimate as he mentioned this name from a sheet together with the combination under Oxymitra and did not accept any of these alternative combinations but postponed opinion by adding to his accepted account of New Caledonian Annonaceae ‘plus un genre non précisé’.


Friesodielsia


Mostly climbing shrubs, more rarely trees. Fruiting carpels distinctly stiped, subglobular to barrel-shaped or ellipsoid, small, with a distinctly nipple-shaped tip, 1—2 by ½—2½ cm. Seed(s) in the dried state closely enveloped by the thin pericarp, subglobular to broad-ellipsoid; seed coat thin, papyraceous. Endosperm very regularly storied-ruminate, consisting of four cross-wise longitudinal and very numerous transversal thin plates; inner testa membraneously intruding each quarter of a circle between the endosperm storeys.

Type species: F. cuneiformis (Bl.) Steen.

Distribution: many species from Africa through Asia to Malesia as far as and including the Moluccas, but possibly also in New Guinea (unidentified material).

Friesodielsia acuminata (Merr.) comb. nov.


Friesodielsia albida (Engl. & Diels) comb. nov.

Friesodielsia alpina (J. Sinclair) comb. nov.

Friesodielsia argentea (J. Sinclair) comb. nov.

Friesodielsia auriculata (Elm.) comb. nov.

Friesodielsia bakeri (Merr.) comb. nov.

Friesodielsia beccarii (Diels) comb. nov.

Friesodielsia biglandulosa (Bl.) comb. nov.

Friesodielsia borneensis (Miq.) comb. nov.

Friesodielsia caesia (Miq.) comb. nov.

Friesodielsia calycina (King) comb. nov.
Oxymitra calycina King, J. As. Soc. Beng. 61, ii (1892) 99.

Friesodielsia cuneiformis (Bl.) comb. nov.

Friesodielsia desmoides (Craib) comb. nov.

Friesodielsia diadema (Miq.) comb. nov.
Friesodielsia dielsiana (Engl.) comb. nov.


Friesodielsia discostigma (Diels) comb. nov.

Friesodielsia excisa (Miq.) comb. nov.

Uvaria fornicata Roxb., Fl. Ind. ed. Carey 2 (1832) 662. — Oxymitra fornicata Hook. f. & Th., Fl. Ind. 1 (1853) 146; Fl. Br. Ind. 1 (1872) 146.

Friesodielsia glauca (Hook. f. & Th.) comb. nov.

Friesodielsia glaucifolia (Hutch. & J. M. Dalz.) comb. nov.

Friesodielsia gracilipes (Bth.) comb. nov.

Friesodielsia gracilis (Hook. f.) comb. nov.

Friesodielsia grandiflora (Boutique) comb. nov.
Friesodielsia hirsuta (Bth.) comb. nov.

Friesodielsia hirta (Miq.) comb. nov.

Friesodielsia kingii (J. Sinclair) comb. nov.

Friesodielsia korthalsiana (Miq.) comb. nov.

Friesodielsia lagunensis (Elm.) comb. nov.

Friesodielsia lanceolata (Merr.) comb. nov.

Friesodielsia latifolia (Hook. f. & Th.) comb. nov.

Friesodielsia linderifolia (Ridl.) comb. nov.

Friesodielsia longiflora (Merr.) comb. nov.

Friesodielsia longipedicellata (Baker f.) comb. nov.


Friesodielsia mindorensis (Merr.) comb. nov.
Oxymitra mindorensis Merr., Philip. J. Sc. 26 (1925) 455.

Friesodielsia montana (Engl. & Diels) comb. nov.

Friesodielsia multinervia (Merr.) comb. nov.
Friesodielsia obanensis (Baker f.) *comb. nov.*


Friesodielsia obtusifolia (Elm.) *comb. nov.*


Friesodielsia oligophlebia (Merr.) *comb. nov.*

*Oxymitra oligophlebia* Merr., Philip. J. Sc. 17 (1920) 250.

Friesodielsia oxyphylla (Miq.) *comb. nov.*


Friesodielsia paucinervia (Merr.) *comb. nov.*


Friesodielsia philippinensis (Merr.) *comb. nov.*


Friesodielsia platyphylla (Merr.) *comb. nov.*


Friesodielsia pubescens (Merr.) *comb. nov.*


Friesodielsia rosea (Sprague & Hutch.) *comb. nov.*


Friesodielsia soyauxii (Sprague & Hutch.) *comb. nov.*


Friesodielsia unonaefolia (A. DC.) *comb. nov.*


Friesodielsia velutina (Sprague & Hutch.) *comb. nov.*