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6.5—7.5 mm long; stigma 2-lobed; lobes ± 1 mm long, densely woolly. Fruit strongly laterally compressed, transversely oblong-elliptic, 9—10 mm wide, 4—5 mm high, 2—3 mm thick, pubescent, strongly nerved, with persistent calyx, lobes, dehiscing by transverse slit on top; seeds numerous, subglobose, angular, strongly ridged, ± 0.5 mm diam., brownish red.

This species differs from *0. trichoca/rpos* Bl. in bracts being conspicuous, linear-lanceolate, up to 4 mm long, persistent; calyx lobes linear-lanceolate up to 5 mm long; anthers longer, up to 3 mm long; style longer, up to 7.5 m long. The presence of dimorphous stamens and heterostyly is unusual in the genus. A review of different floras indicate that this has not been reported so far in *Ophiorrhiza,* even though certain other genera in Rubiaceae exhibit this feature.

GREAT NICOBAR ISLAND: 17 km from Campbell Bay to Alexandra River, ca. 75 m. above m.s.l., 21 Aug. 1975, *Balakrishnan 3027* A-B (CAL), *ibid, 3027 C-F* (PBL); *ibid. 3027 G-H* (L); *ibid. 3027 1* (BO).

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TYPE STUDIES IN THE CLAVARIOID FUNGI. V. THE TAXA DESCRIBED BY CASPAR VAN OVEREEM

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ABSTRACT

Type specimens of Javanese clavarias described by van Overeem — i.e. *Clavaria depokensis. Clavaria luteo-tenerrima, Clavaria sanguineo-acuta* and *Clavulinopsis sulcata* — are extant and well preserved in Herbarium Bogoriense. These are reexamined and reassigned to their respective genera and infrageneric complexes.

ABSTRAK

Spesimen tipe jenis-jenis Clavariaceae yang dipertelakan van Overeem dari Jawa —• yaitu *Clavaria depokensis, Clavaria luteo-tenerrima, Clavaria sanguineo-acuta* dan *Clavulinopsis sulcata* — masih ada dan disimpan di Herbarium Bogoriense. Spesimen ini diperiksa kembali dan ditunjukkan marga dan bagian marga yang layak menampungnya.

Although not many, the taxa proposed and illustrated by van Overeem (1923a, b, c) have been important to an understanding of tropical clavarioid fungal relationships. In the only modern works to deal with these taxa (Corner 1950, 1970), they were disposed of equivocally for the types had not been examined, although van Overeem's descriptions and plates were extremely accurate for their day. A recent very brief visit to the Herbarium Bogoriense allowed me to examine the type specimens concerned and therefore to assign them accurately to genera and to infrageneric complexes. It is to that end that this paper offered.

The following items of reliquiae support these specimens: 1) all specimens include fruit bodies fixed in liquid and in excellent condition for analysis; 2) an empty, accessioned packet usually accompanies the specimens in liquid, often bearing collection data not included on the fixed specimen; 3) in one instance dried fruit bodies are in a packet separate from the material in liquid; 4) published illustrations (van Overeem 1923b, c) of fruit bodies and microscopic characters were apparently consistently made from type specimens; and 5) the original

aquarelles of the published illustrations (or close facsimiles, cf. *C. luteo-tenerrima)* are extant at BO (and a virtually complete transparency record of the clavarioid fungi at TENN). Together, these materials offer an excellent opportunity for accurate analysis of the taxa.

In almost every instance, the type collection is the sole representative of the taxon, so a breadth of variation cannot be reported. Nevertheless, van Overeem's aquarelles were very painstaking and accurate, so a good concept of color and stature may be gained. Although several of the paintings of fungi were executed by his technician Mr. Hamzah, none of the specimens herein discussed are included in that situation.

A rather complete life-sketch of van Overeem (Danser 1927) has been presented, emphasizing his involvement in mycology and especially his belief that in the tropics, descriptions and illustrations had to substitute for herbaria. But he was wrong, for his specimens are in good condition.

CLAVARIA DEPOKENSIS van Overeem

Clavaria depokensis van Overeem *in* Bull. Jard. Bot. Buitenz. Ill, 5: 271. 1923. *Clavulinopsis depokensis* (van Overeem) Corner *in* Ann. Bot. Mem. 1: 364. 1950.

TYPE (holotype): BP — Java, Nat'l. Monument Depok, iv.22, ± 93 m alt., leg. *C. & D. van Overeem-de Haas,* "rottende bladeren en takjes," Herb. Hort. Bot. Bogor, no. 748.

The specimen is fixed in liquid, and an empty packet bears the same collection data. The fixed specimen was illustrated by van Overeem (1923c), and, interestingly, there are no other specimens listed under this name in the accession book at BO. The illustration shows macroscopic characters, of which the basal pad of mycelium must be emphasized. The following microscopic characters may also be furnished.

Tramal hyphae 3.5—12 μm diam, clamped at primary septa, parallel; secondary septa common, unconstricted, without clamp connections; gloeoplerous hyphae absent. Basidia clavate, clamped, refringent under phase contrast; contents golden yellow.

Spores 5.3—6.4 x 3.5—4.3 *μm,* ellipsoid to somewhat narrowly ovate, smooth, pale yellow under bright field; apiculus up to 2 *μm* long, very prominent, conical; contents often uniguttulate.

Another packet at BO bears the same accession number, but the contents include only some leaves with white mycelium. Apparently Corner (1970) examined only this packet, drawing the conclusion that the illustration by van Overeem must serve as an iconotype. The original aquarelle in reliquiae van Overeem at BO is numbered 129, the second number also on packet no. 748 with sterile white mycelium on leaves.

So in spite of the misnumbering, the illustrated specimen still exists (fixed in liquid), and must serve as the implicit holotype, with the original aquarelle and published illustration as excellent supporting material.

The specimen represents a *Clavulinopsis,* very closely related to *C. laeticolor* in the general shape of the spores and very prominent apiculus. Van Overeem astutely compared the two, but had no information on the spores of Berkeley's species. *Clavulinopsis laeticolor,* however, has slightly larger spores and bright golden orange coloration, not deep orange-red. Moreover, both show a basal pad of mycelium on the fruit body, and so consistently differ from others of the same complex *(C. fusiformis, C. corniculata,* etc.), the fruit bodies of which seem to arise below the surface of the substrate and then from a minute primordium with rounded base, not an appressed mycelial pad.

Van Overeem illustrated amorphous crystalline material, but I found copious needle-shaped or very slender awl-shaped crystals. Concommitantly, I found only very few measurable spores, so the spore dimensions above may be somewhat inaccurate.

Corner (1950), while correctly retaining the taxon as discrete in *Clavulinopsis,* indicated his equivocation of placement, and later (Corner 1970), concluded that no type existed.

CLAVARIA LUTEO-TENERRIMA van Overeem

Clavaria luteo-tenerrima van Overeem *in* Bull. Jard. Bot. Buitenz. Ill 5(4): 269. 1923. *Clavulinopsis luteo-tenerrima* (van Overeem) Corner *in* Ann. Bot. Mem. 1: 377. 1950.

TYPE (holotype, implicit): BO - Java, Naturschutzgebiet Depok, ± 93 m alt., iv. 1921, leg. *C. & D. van Overeem-de Haas,* Herb. Hort. Bot. Bogor. no. 747.

The specimen is fixed in liquid, and probably is the same as that illustrated by van Overeem (1923c). It is the only specimen matching the necessary data furnished by van Overeem, and therefore is an implicit holotype.

The published illustration is a variation of an original in reliquiae van Overeem at BO. Both show seven fruit bodies in identical postures, but the three left-most fruit bodies in the publication appear at the far right of the original aquarelle at BO. Nevertheless, the details are identical, so the two are not mirror images produced during publication. Coloration is very close, but the shading is more extensive and subtle on the BO aquarelle and not quite so green. The original aquarelle at BO also shows a figure of tramal tissue, including what I suspect is a gloeoplerous hyphal tip.

To the macroscopic characters in the illustrations may be added the following microscopic features.

Tramal hyphae up to 15 pan diam., parallel, clamped; gloeoplerous hyphae up to 3.5 sxm diam., abundant, not inflated. Subhymenial tissue very thick, pseudoparenchymatous through crushing. Basidia clavate, clamped, about 50 ^m long.

Spores 5.3—6.7 x 3.9—4.6 pun, ellipsoid to broadly ovate, thin-walled, smooth; contents now aguttulate; apiculus up to 1 ^m long, conical, not prominent.

The species belongs in *Clavulinopsis,* but its closer affinities are somewhat enigmatic. I think it is most closely related to *C. gracillima* and others with elongate spores and apiculus length between the extremes of the genus.

Copious crystals are present on the fruit bodies. They are blunty fusiform and often congregate in cruciform pairs.

Fruit bodies are on soil, and arise just below the soil surface, just as others in this complex.

Corner (1950) first associated the taxon with strongly-apiculate spored members of *Clavulinopsis,* but later (Corner 1970) withdrew from that position to one less valid by declaring at the same time that *C. luteo-tenerrima* was (in his view) indistinguishable from *C. flavella,* but that no type for *C. luteo-tenerrima* existed at BO. Solution of the second misconception would have resolved the first. *Clavaria flavella* (by examination of its type specimen) belongs in *Multiclavula* (cf. Petersen 1967b), a very different group of fungi from *Clavulinopsis.*

CLAVARIA SANGUINEO-ACUTA van Overeem

Clavaria sanguineo-acuta van Overeem *in* Bull. Jard. Bot. Buitenz. Ill, 5: 273. 1923.

TYPE (holotype, implicit): BO - Java, Hortus Bogoriensis, vi. 1921, Herb. Hort. Bot. Bogor. no. 488.

The specimen is represented by fixed material in liquid, dried fruit bodies in a separate packet, an empty packet with identical collection data, and a published illustration of the type fruit bodies (van Overeem 1923c). To the macroscopic characters supplied by the illustration, the following microscopic characters may be added.

Tramal hyphae hyaline, clamped, parallel, of two widths: a) 4.5—12 \t,va diam., uninflated, thin- to slightly thick-walled (wall up to 0.3 [im thick), and b) 1.5—2.5 jxm diam., uninflated, thin-walled. Basidia 34—45 x 6—8 jj.m, clavate, clamped, often with amorphous crystalline material within; sterigmata 4, erect, not divergent, up to 7 \>*m* long.

Spores 5.6—6.7 jmi diam., spherical, smooth, thin-walled; contents usually amorphous, refringent under phase contrast; apiculus small, papillate.

As expected, the specimen represents a *Clavulinopsis.* Van Overeem's observations included much of the above data. I find an amorphous crystalline crust on the hymenium of the fixed material. The fruit bodies in liquid are quite young, the basidia too immature to bear sterigmata or spores, and these details have been furnished from the accompanying dried fruit bodies.

The species was compared by van Overeem to *Clavaria cardinalis* Boud. & Pat. and a description of the type specimen of that taxon has already been offered (Petersen 1967a). The two names seem synonymous. *Clavaria phoenicea* Zoll. & Mor. was also compared, but I have not seen type or authentic material of that taxon and so I reserve judgement.

The name *Clavaria sanguineo-acuta* was placed in synonymy under *Clavulinopsis miniata* var. *sanguinea* Corner (1950) with no evidence that the type had been seen. Later (Corner 1970) the specimen was reported, but with no description. This synonymy must be questioned further, for *C. miniata* var. *sanguinea* is yet without a type specimen (although it might be assumed that the name was gained from van Overeem's taxon). When one has been declared, then final taxonomy can be accomplished.

CLAVULINOPSIS SULCATA van Overeem

Clavulinopsis sulcata van Overeem, *in* Bull. Jard. Bot. Buitenz. Ill, 5: 279. 1923.

TYPE (holotype, implicit): BO - Java, Bogor, Hortus Bogoriensis, on soil, 11. 1920, coll. & det. *C. van Overeem,* Herb. Hort. Bot. Bogor. no. 185. Isotype: TENN.

The specimen is represented by fixed material in liquid, of which a small portion is at TENN, an empty packet under the same number with additional collection data, and a published illustration of the type fruit bodies (van Overeem 1923b). A description of the fixed material was furnished previously (Petersen 1967a) and is paraphrased here for completeness.

Fruit bodies simple, fasciculate in clusters of 6—8, 1—4 cm X 5—7 mm, somewhat compressed laterally, longitudinally channeled or ridged, tips bluntly to broadly obtuse, stem portions not markedly attenuate, 3—4 mm thick.

Tramal hyphae generally parallel, hyaline, thin-walled to slightly thick-walled especially toward the fruit body base, clamped, not inflated, of two different widths; a) 4—7 ,um diam., b) 2—3 \>,*m* diam. Subhymenial hyphae tortuous, 1.5—3 (jun diam., clamped. Basidia 35—65 x 4—7 {jun, hyaline, clamped, elongate-clavate to clavate, 1—4-sterigmate; sterigmata of various lengths and dispositions.

Spores 4.5—7.5 pim diam., globose to subglobose, uniguttulate, smooth, thin-walled; apiculus small, abrupt, papillate.

As mentioned previously (Petersen 1967a) I agree with Corner (1950) on the synonymy of *C. sulcata* with *Clavaria (Clavulinopsis) miniata*, but I can find no evidence that Corner has seen the type of *C. sulcata.* In fact (personal communication with Dr. Mien A. Rifai), there is some evidence to the contrary.

Corner (1950) pointed out that *Clavaria miniata* Purton had priority over *C. miniata* Berk., and that *C. phoenicea* Zoll. & Mor. might be the name of choice for "purists." I have not seen type or authentic material of *C. phoenicea* and no transfer of that name *Clavulinopsis* has been proposed, so I have chosen to retain *Clavulinopsis sulcata* as both the taxonomic and nomenclatural type of the genus (cf. Petersen 1967a).

The small-apiculate spored members of *Clavulinopsis* present a bewildering reticulum of color characters. I have little faith in the primacy of pigment location (hymenium and subhymenium versus trama and subhymenium). At the same time, carotene pigments are confusing in their biochemical expression, as in *Cantharellus* subg. *Leptocantharellus,* so I have tried to adhere to Corner's (1950) scheme on taxonomic disposition of color forms, but with little success (cf. Petersen 1971). The fault is not in the scheme, but my inability to correctly interpret it. One concept is obvious, however: *Clavulinopsis sulcata* is the red-orange pole of the complex.

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AN UNDESCRIBED SPECIES OF CALOTHYRIOPSIS ON APPLE

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ABSTRACT

The new species *Calothyriopsis mali* Subhedar & V.G. Rao (Fam.: Microthyriaceae), collected for the first time on apple fruits from India, is described and illustrated.

ABSTRAK

Jenis baru *Calothyriopsis mali* Subhedar & V.G. Rao (Microthyriaceae) yang dikumpulkan pertama kali pada buah apel di India dipertelakan dan digambar.

During our survey for post-harvest diseases of fruits and vegetables, an unusual blemish disease was observed on several stored fruits of apple *(Mains pumila* L.) in the Poona market (India). The infection was particularly detected on varieties like 'Maharaja', 'Simla' and to some extent on 'Golden Delicious', and found to be restricted to the fruit coat only, never reaching deep into the pulp. Critical examination of these blemish areas revealed the presence of numerous black thyrothecia of a species *of Calothyriopsis* (Microthyriaceae) hitherto unreported on apples'. These fructifications were gregarious, dark, superficial and typically arranged in concentric rings (Fig. 1). With such severe infection, the fruits lose their normal glistening light-pink colour, and thus lowering their market value. The infection areas remain firm and do not show any symptoms of decay. No conidial state was found to be associated with this ascomycetous fungus.

As for its diagnosis and identity, a critical search of literature revealed no report of any species of *Calothyriopsis* on apple. Besides, the present fungus was also compared with other species viz. *C. conferta* (Theiss.) Hohn. and *C. roupalae* (Syd.) von Arx (Muller & von Arx 1962) and found to be quite distinct in its morphology in possessing smaller thyrothecia, asci and ascospores. Hence, it is described here as a new species.

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