

Discomycetes of Madagascar — I.
Phillipsia ranomafanensis sp. nov. and ascospore sculpture of
Cookeina colensoi proved by SEM
(Discomycetes, Pezizales, Sarcoscyphaceae)

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Moravec J. (1997): Discomycetes of Madagascar — I. *Phillipsia ranomafanensis* sp. nov. and ascospore sculpture of *Cookeina colensoi* proved by SEM. (Discomycetes, Pezizales, Sarcoscyphaceae). — Czech Mycol. 50: 21–33

Results of the author's investigation of discomycetes belonging to the family Sarcoscyphaceae recently collected on Madagascar are presented. *Phillipsia ranomafanensis* sp. nov. is described from Central Madagascar. The new species is distinguished by its large white apothecia with short, inconspicuous thin-walled hyphae on the external surface, and particularly by the small, symmetrical, ellipsoid to attenuate ellipsoid biguttulate ascospores which bear a fine longitudinal striation. The holotype (OSC) of *Phillipsia costaricensis* Denison — a species which also possesses symmetrical ascospores — has been examined. This Central-American species differs clearly by an ochraceous colour of the apothecia which are externally covered by long, rigid, and extremely thick-walled hypha-like hairs, and by uniguttulate, much larger, broadly ellipsoid ascospores bearing a finer and shallower striation and lower and flatter ridges. Type material of several other species of *Phillipsia* Berk. has also been examined and compared. Further collections of *Phillipsia domingensis* (Berk.) Berk. from Madagascar are reported and relations within the genus are discussed. Based on the author's examination of the type material (K) of *Peziza cordovensis* Cooke and *Phillipsia polyporoides* Berk., both are tentatively (as the material is in a poor state) considered synonyms of *P. domingensis*. Ascospore ornamentation of species of the genera *Phillipsia* and *Cookeina* Kuntze has been studied and the author concludes that the ornamentation can truly be recognized by SEM only. The discovery of a very fine "amoeboid"-verrucose ascospore ornamentation in *Cookeina colensoi* (Berk.) Rifai, proved by SEM, is an important result, as the species has commonly been considered a smooth spored one. Illustrations on line drawings and SEM photomicrographs of ascospores of *Phillipsia domingensis* and *Cookeina colensoi* and those of ascospores taken from the type material of *Phillipsia crenulata* Berk. & Br. (K), *P. ranomafanensis* and *P. costaricensis*, accompany the paper.

Key words: *Phillipsia ranomafanensis* sp. nov., *Phillipsia domingensis*, *Cookeina colensoi*, ascospore ornamentation, Discomycetes, taxonomy.

Moravec J. (1997): Discomycetes of Madagascar — I. *Phillipsia ranomafanensis* sp. nov. a skulptura askospor *Cookeina colensoi*, prokázána SEM. (Discomycetes, Pezizales, Sarcoscyphaceae). — Czech Mycol. 50: 21–33

Jsou zveřejněny výsledky studia diskomycetů čeledi Sarcoscyphaceae sbíraných v poslední době na Madagaskaru. *Phillipsia ranomafanensis* sp. nov. je popsána z centrálního Madagaskaru. Nový druh je význačný velkými bílými apothecií s nenápadnými, tenkostěnnými hyfami na jejich zevní ploše a zejména malými, symetrickými, elipsoidními až podlouhle elipsoidními dvoukápkatými askosporami s jemným podélným rýhováním. Holotyp (OSC) *Phillipsia costaricensis* Denison, která se rovněž vyznačuje symetrickými askosporami byl revidován a srovnáván. Tento středoamerický druh se však zřetelně liší okrově zbarvenými apothecií jejichž zevní plocha je pokryta dlouhými, tuhými, extrémně tlustostěnnými hyfovými chlupy, a také většími, široce elipsoidními askosporami nesoucími nižší a plošší žebra a mělčí rýhování. Typový materiál několika dalších druhů rodu *Phillipsia* Berk. byl studován za účelem srovnání. Jsou též uvedeny další

nálezy *Phillipsia domingensis* (Berk.) Berk. z Madagaskaru a diskutovány příbuzenské vztahy. Na základě studia skrovného typového materiálu (K) *Peziza cordovensis* Cooke a *Phillipsia polyporooides* Berk. jsou obě provizorně (pro špatný stav materiálu) považovány za synonyma *P. domingensis*. Ornamentika askospor u rodů *Phillipsia* a *Cookeina* Kuntze byla rovněž studována a autor dospěl k závěru, že je správně rozpoznatelná pouze použitím SEM. Důležitým výsledkem je objev velmi jemné „amoeboidně“ bradavčité ornamentiky askospor prokázané SEM u *Cookeina colensoi* (Berk.) Rifai, neboť tento druh byl dosud všeobecně pokládán za hladkovýtrosý. Příspěvek je doplněn kresbami a SEM mikrofotografiemi askospor *P. domingensis* a *C. colensoi* a SEM askospor z holotypového materiálu *Phillipsia crenulata* Berk. & Br. (K), *P. ranomafanensis* a *P. costaricensis*.

INTRODUCTION

In the course of scientific forays mostly to countries of the tropical climate zones in which I have participated, a great number of operculate discomycetes including members of the family Sarcoscyphaceae has been found. Many specimens of Sarcoscyphaceae including *Phillipsia* Berk. and *Cookeina* Kuntze have also been found by me in continental Africa and a paper on them is being prepared as these genera appear to be very interesting, and furthermore contain superficially known species. The first part of the results is presented here and covers the genera *Phillipsia* and *Cookeina* recently found in Madagascar.

The genus *Phillipsia* Berkeley, J. Linn. Soc. Bot. 18: 388, 1881, in its modern sense (Boedijn 1933, Le Gal 1953, 1959, Rifai 1968, Denison 1969), is characterised by small to large, sessile to substipitate apothecia the structure of which consists of a textura intricata to subepidermoidea, often forming a tomentose external surface, pink to purple-red or carmineous, orange, yellow, or rarely pure white hymenium, suboperculate asci, ellipsoid, mostly asymmetrical, or only in few species almost symmetrical ascospores which usually bear a longitudinal striation consisting of striae between raised ridges which do not stain in cotton blue in lactic acid (CB), and its occurrence on wood mostly in the tropics.

After my examinations, I agree with Le Gal (1953) and Rifai (1968) that several taxonomic groups (sections or series), but in my opinion not yet clearly delimited, can be recognized within the genus. A paper on species belonging to a group which accommodates species possessing small, substipitate to almost stipitate apothecia of a thin medullary excipulum and a firm consistency, also covering my collections made in continental Africa, is currently under preparation.

Regarding the colour of the hymenium, all fresh apothecia of my two collections of *Phillipsia* possessed a purely white hymenium despite their development under normal light conditions. One species, belonging to the second group mentioned above, comes from Zambia. The other, collected by me in central Madagascar, is treated here as a new species.

TAXONOMY AND DISCUSSION

Phillipsia ranomafanensis J. Moravec sp. nov.

Apothecia solitaria, magna, 12–30 mm in diam. sessilia vix stipitata, leniter patellaria dein paene discoidea, applanata et undulato lobata, tota pure alba, parte externa subtiliter albo-tomentosa, subglabra. Excipulum externum textura dense intricata usque subepidermoidea, parte externa hyphis superficialibus, hyalinis, septatis, tenuiter tunicatis, apice obtusis, laxe singulariterque prominentibus textum. Excipulum internum (medulla) textura dissite intricata, subhymenium textura intricata. Asci suboperculati, 185–225 (–250) × 12–15 μm , cylindracei, deorsum sensim angustati, crasse tunicati, octospori, non-amyloidei. Ascosporae ellipsoideae vel elongato-ellipsoideae, 15–19.5 (–21) × (7.5–) 9–10 (–10.7) μm (plerumque 18.5 × 9.7 μm), guttulis binis magnis instructae, perisporio longitudinaliter sulcato, sulcis simplicibus vel rare anastomosantibus atque costis obtusis (7–10 latere uno visibilibus) instructae. Paraphyses filiformes, 1–1.7 μm , apice non vel sensim dilatatae (1.3–4.5 μm).

Habitat: Ad lignum putridum ad viam publicam in silva pluviali, prope pagum Ranomafana, prov. Fianarantsoa, Madagascar centralis, 28. I. 1995 leg. J. Moravec; Holotypus in herbario mycologico Musei Brunensis (BRNM 612538) et duplicatum in herbario privato J. Moravecii (J. Mor.) asservantur.

Apothecia solitary, 12–30 mm diam., sessile to inconspicuously substipitate as contracted below into a thick and very short central stalk-like base, shallowly cupulate, becoming almost discoid, fleshy but comparatively firm, margin even or often undulate or lobed, hymenium purely white, outer surface whitish, almost smooth, only minutely white tomentose; dried apothecia cream coloured. Excipulum a textura intricata throughout, in the base of the apothecia occasional angular cells (textura subepidermoidea) are present. Ectal excipulum clearly differentiated as a much narrower layer of a compact textura intricata of hyaline hyphae which are 3–8 μm broad, septate or articulate, the articles often of a pyriform shape, with walls 0.2–0.6 μm thick, densely arranged but in the outermost layer occasionally freely and shortly protruding the outer surface in a form of short, mostly isolated, hyaline, thin-walled [the walls 0.2–0.4 (–0.6) μm] hyphae with obtuse tips (Fig. 10); the margin formed by long, thinner septate hyphae. Medullary excipulum thick (about four times thicker than the ectal layer), of looser, interwoven, branched and septate hyphae which are often constricted at their septa, 3–8 μm thick, often inflated up to 11 μm . Subhymenium a textura intricata of smaller interwoven hyphae. Asci suboperculate, 185–225 (–250) × 12–15 μm , cylindrical, constricted towards the simple base, thick-walled, eight-spored, non-amyloid. Ascospores ellipsoid or elongate-ellipsoid 15–19.5 (–21) × (7.5–) 9–10 (–10.7) μm (mostly 18.5 × 9.7 μm), containing two large oil guttules, with a perispore bearing a longitudinal striation which separates the longitudinal ridges rising between the

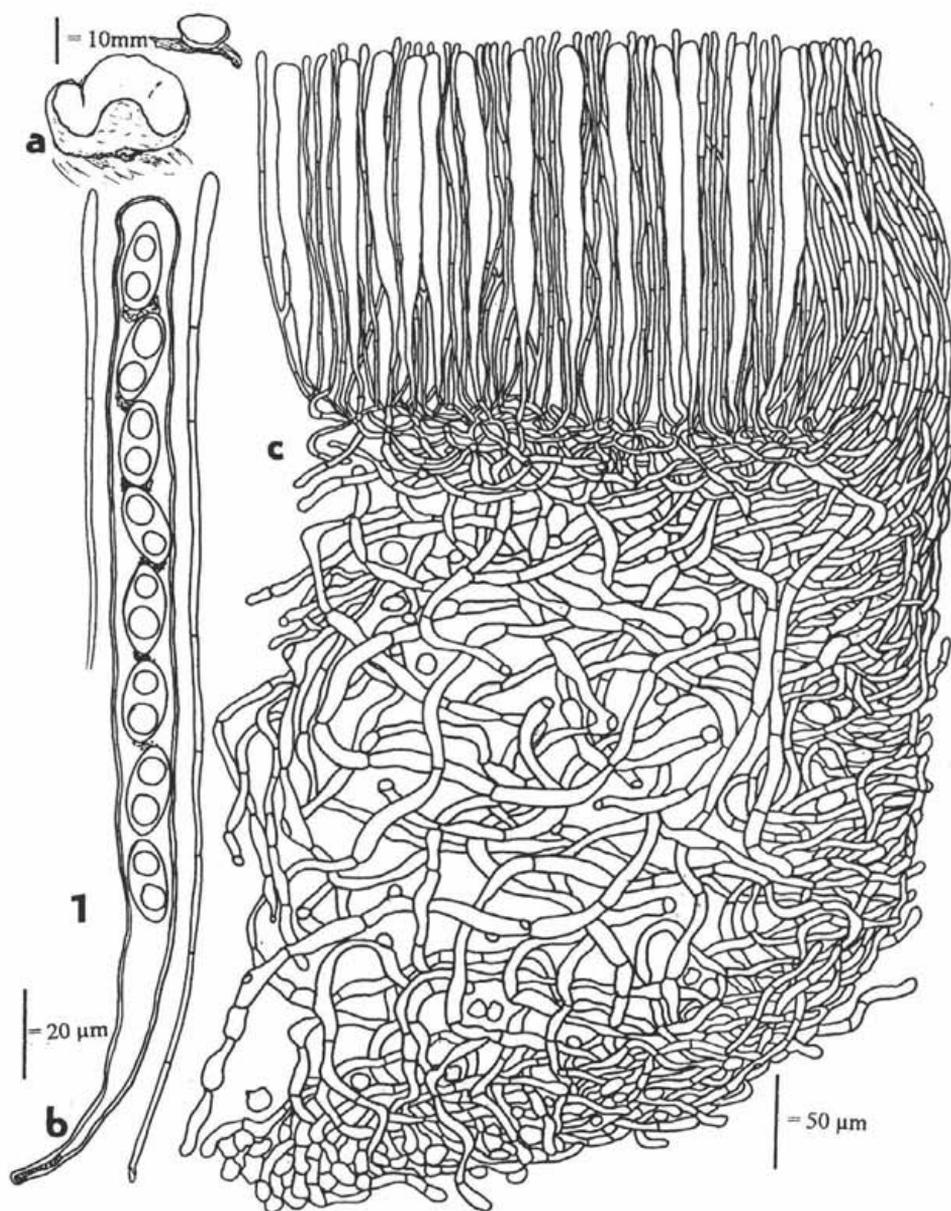


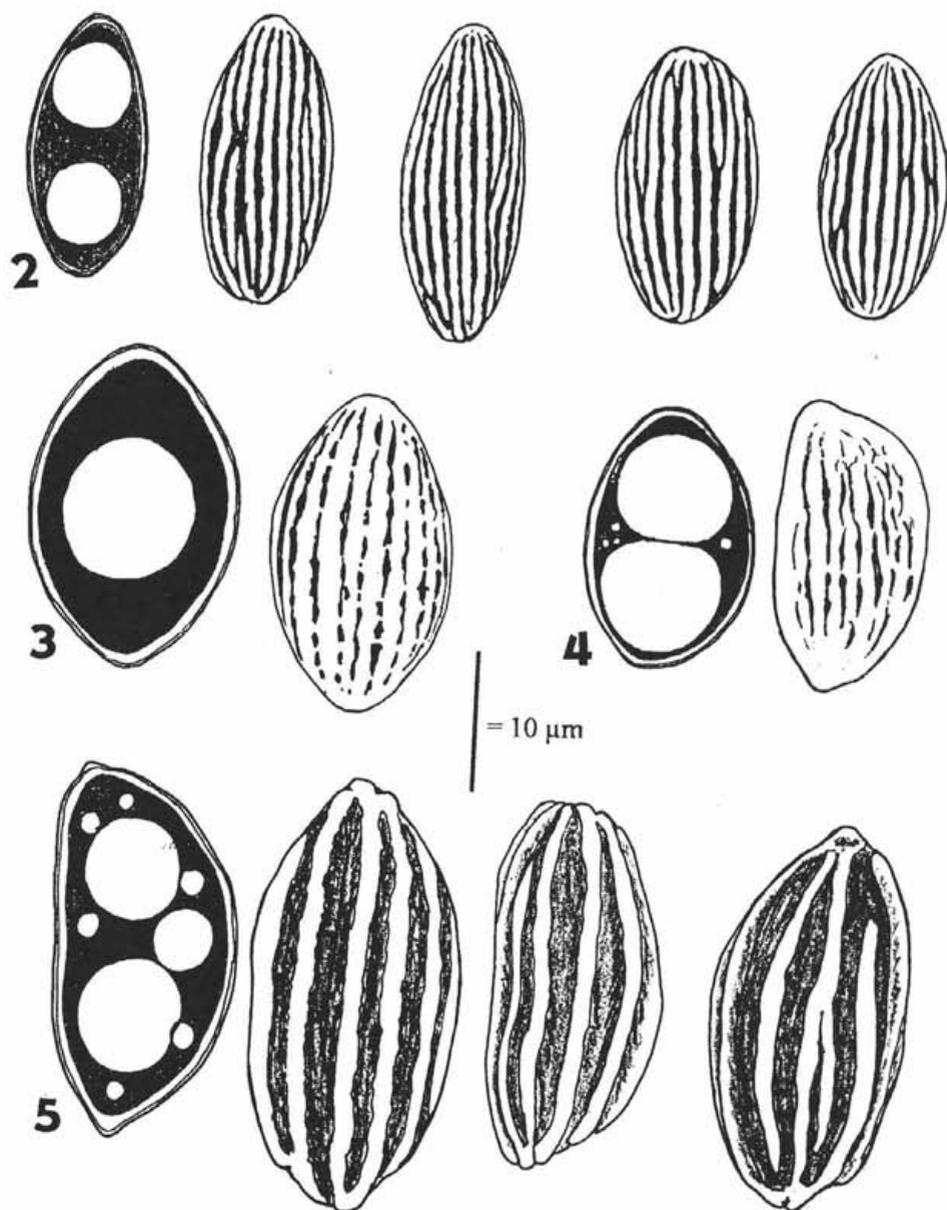
Fig. 1. *Phillipsia ranomafanensis* sp. nov.: a. apothecia, b. ascus and paraphyses, c. section of the marginal part of the apothecium.

striae (7–10 ridges seen on each side of the spore); the risen ridges are blunt, densely arranged, 0.3–0.8 μm broad, separated by the very narrow [0.2–0.3 (–0.6) μm] striae which are simple or rarely subparallelly anastomose or connected (SEM Figs 11–12). Paraphyses straight, filiform, 1–1.7 μm , not or slightly enlarged (1.3–4.5 μm) at their tips, septate, hyaline, with a cyanophilic content.

Habitat: Central Madagascar, prov. Fianarantsoa, near the village of Ranomafana, on decaying wood of a twig laying on an open place at the side of a non-paved road through a partly secondary rain forest, 28. I. 1995 leg. J. Moravec; Holotype BRNM 612538 (Mycological Herbarium of the Moravian Museum, Brno, Czech Republic), isotype in the herbarium of the author (J. Mor.).

P. ranomafanensis differs from other species of *Phillipsia* by the purely white colour of the apothecia (which were developed under normal light conditions), but especially by the shape, size and ornamentation of the ascospores. The ascospores are almost regularly ellipsoid in contrary to species which can be accommodated in a group represented by *Phillipsia domingensis* (Berk.) Berk. which possess ascospores mostly asymmetrical to subcymbiform as unequal-sided and with wider ridges (4–6 seen on each side). Similarly like in most other species of *Phillipsia*, scanning electron micrographs of ascospores of *P. ranomafanensis* show a different picture than that seen by a light microscope under an oil immersion lens (Fig. 2). The SEM (Figs 11–12) revealed that the ridges are blunt and densely arranged and consequently the striae between the ridges are very narrow.

Regarding the symmetrical ascospore shape, the new species is similar to *Phillipsia costaricensis* Denison (1969) described from Costa Rica. However, the examination of the holotype (Costa Rica: forest adjacent to Instituto Interamericano de Ciencias Agrícolas, Turrialba, Cartago, alt 520 m., on sticks and old wood, Sept. 1964, Denison 2358, OSC) has revealed that this Central-American species differs by smaller apothecia with a tan, ochraceous to yellow-brown hymenium and a pale ochraceous minutely tomentose external surface which is covered by obtuse, flexuous but rigid hairs – the hairs are 4.5–6 μm in diam. and up to 350 μm long, extremely thick-walled (the walls 1.5–2 μm thick) and consequently the cyanophilic interspace between the walls is very thin (Fig. 9). Also several other important features such as the shape and size of the ascospores separate the two species well. The ascospores of *P. costaricensis* are broadly ellipsoid, usually tapering towards the poles. Denison (1969) stated the ascospore size of (18–) 20–22 (–24) \times (11–) 12–14 (–15) μm which is much larger than those of *P. ranomafanensis*. After my reexamination of the holotype (OSC), I have found the size of mature ascospores (18–) 19–23 (–24) \times 10.5–13.5 (–14) μm – only immature ascospores up to 16 μm wide. The ascospores of *P. ranomafanensis* are much smaller and conspicuously narrower, 15–19.5 (–21) \times (7.5–) 9–10 (–10.7) μm . Their width does not extend 10.7 μm and they usually measure 18.5 \times 9.7 μm , whilst the size of most ascospores of *P. costaricensis* is 22 \times 12.2 μm . Another feature which can be considered

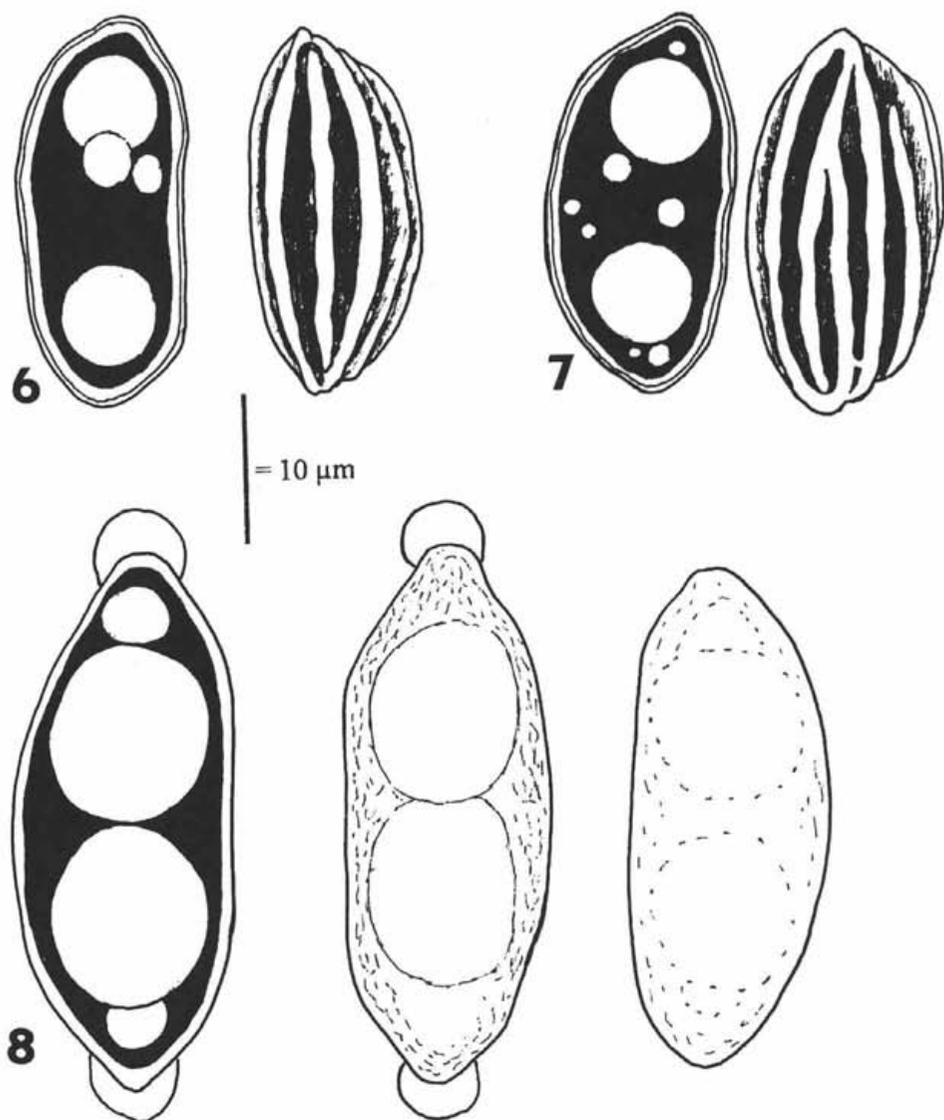


Figs 2-5. Ascospores of *Phillipsia* (oil immersion): 2. *P. ranomafanensis* sp. nov. (Holotype BRNM); 3. *P. costaricensis* Denison (holotype OSC); 4. *P. crenulata* Berk. et Br. (Type K); 5. *P. domingensis* (Berk.) Berk. (Madagascar, Ranomafana, J. Mor.).

a good difference are the biguttulate ascospores of *P. ranomafanensis* whilst those in *P. costaricensis* are regularly uniguttulate, or the large central guttula consists of a number of small ones densely arranged inside one such large central drop. Also, a conspicuous difference in ascospore ornamentation which well separates these two fungi has been revealed by SEM (Figs 13–14). The extremely fine striation on the perispore of ascospores of *P. costaricensis* is very shallow and thus the ridges between the striae are much lower and flatter than those in *P. ranomafanensis*. Last but not least, the asci of the Central-American species are much longer (270–350 μm), and so we can only speculate if these two species, despite their unique symmetrical shape of ascospores, belong to the same taxonomic group within the genus. The thick medullary excipulum indicates an affinity to *Phillipsia domingensis* (Berk.) Berk. — the type species of the genus, but the importance of this character is decreased by other features, especially by shorter asci of *P. ranomafanensis* which are not so flexuous towards their base and by the symmetrical ascospores which are, moreover, uniguttulate in *P. costaricensis*. This shows how complicated and difficult the infrageneric arrangement suggested by the cited authors may appear.

A rather similar ascospore ornamentation was demonstrated by Le Gal (1953) in *Phillipsia crenulata* Berk. et Broome (Journ. Linn. Soc. 14:104, 1875). She claimed the size of the biguttulate ascospores of *P. crenulata* to be 18–24 \times 11–15 μm . However, my examination of the type material (labelled *Humaria crenulata*, Ceylon, consisting of 4 dried dirty-orange apothecia, 0.5–2.5 mm diam., K ex herb. C. E. Broome), has revealed that the asymmetrical ascospores measure only 15–19.5 \times 9.5–10.5 μm and bear a much finer, denser, incomplete and more irregular ascospore striation (Fig. 4) than that illustrated by Le Gal (1953). The ornamentation is seen completely on SEM photographs only (Fig. 18). Besides the mentioned quite different form of ascospore ornamentation, *P. crenulata* differs clearly by its unequal shape of the ascospores and by much smaller apothecia (5–7 mm diam) possessing an orange hymenium. This species may belong to a different infrageneric taxonomic group of species which could accommodate species characterized by small stipitate apothecia with an orange, pale red to pink hymenium and a thin medullary excipulum of a firm consistence, represented by such species as *Phillipsia hartmannii* (Phill. in Cooke) Rifai (1968) and *Phillipsia carnicolor* Le Gal (1953). I have examined the type (K) of *P. hartmannii*, and in accordance with Rifai (1968) I have found the mature ascospores asymmetrical, smooth under the light microscope, but a fine irregular or even subreticulate ornamentation consisting of "amoeboid" and irregularly arranged wrinkles (without a regular longitudinal striation) was revealed by SEM. A paper on these species is being prepared.

Phillipsia umbilicata (Penz. et Sacc.) Boedijn (1940), characterized by small (4–10 mm diam.) apothecia with coral red hymenium, short asci and smooth



Figs 6–8. Ascospores of *Phillipsia* and *Cookeina* (oil immersion): 6. Type of *Peziza cordovensis* Cooke (K); 7. Type of *Phillipsia polyporoides* Berk. (K); 8. *Cookeina colensoi* (Berk.) Seaver (Madagascar, Moramanga, J. Mor.).

ascospores, is considered by Rifai (1968) a member of a third group. However, the asci of *P. carnicolor* are short too, and thus the delimitation is not clear.

All these species are well separated from *P. ranomafanensis*. They bear characters which indicate a certain resemblance with the genus *Nanoscypha* Denison (1972) erected for *Cookeina tetraspora* Seaver [= *Phillipsia tetraspora* (Seaver) Le Gal]. *Nanoscypha* can be considered a link between the genera *Phillipsia*, *Komposcypha* Pfister, *Pseudopithyella* Seaver, and last but not least *Sarcoscypha*. The genus *Komposcypha*, with the type species *K. chudei* (Pat. ex Le Gal) Pfister (1989) based on *Plectania chudei* Pat. ex Le Gal (1953) [= *Sarcoscypha chudei* (Pat. ex Le Gal) Eckblad] is very close to *Nanoscypha* as discussed by Pfister (1989) and its untenable position in the genus *Sarcoscypha* (especially for the quite different apothecial construction) and relations to *Pseudopithyella* were discussed earlier (Moravec 1983, Pfister 1989).

Regarding the difficulties in the ambiguous and not uniform features in species of *Phillipsia* mentioned in the discussion above, we can follow Denison's (1972) separation of *Nanoscypha* by which a division of *Phillipsia* into several genera would become possible after perfecting our knowledge.

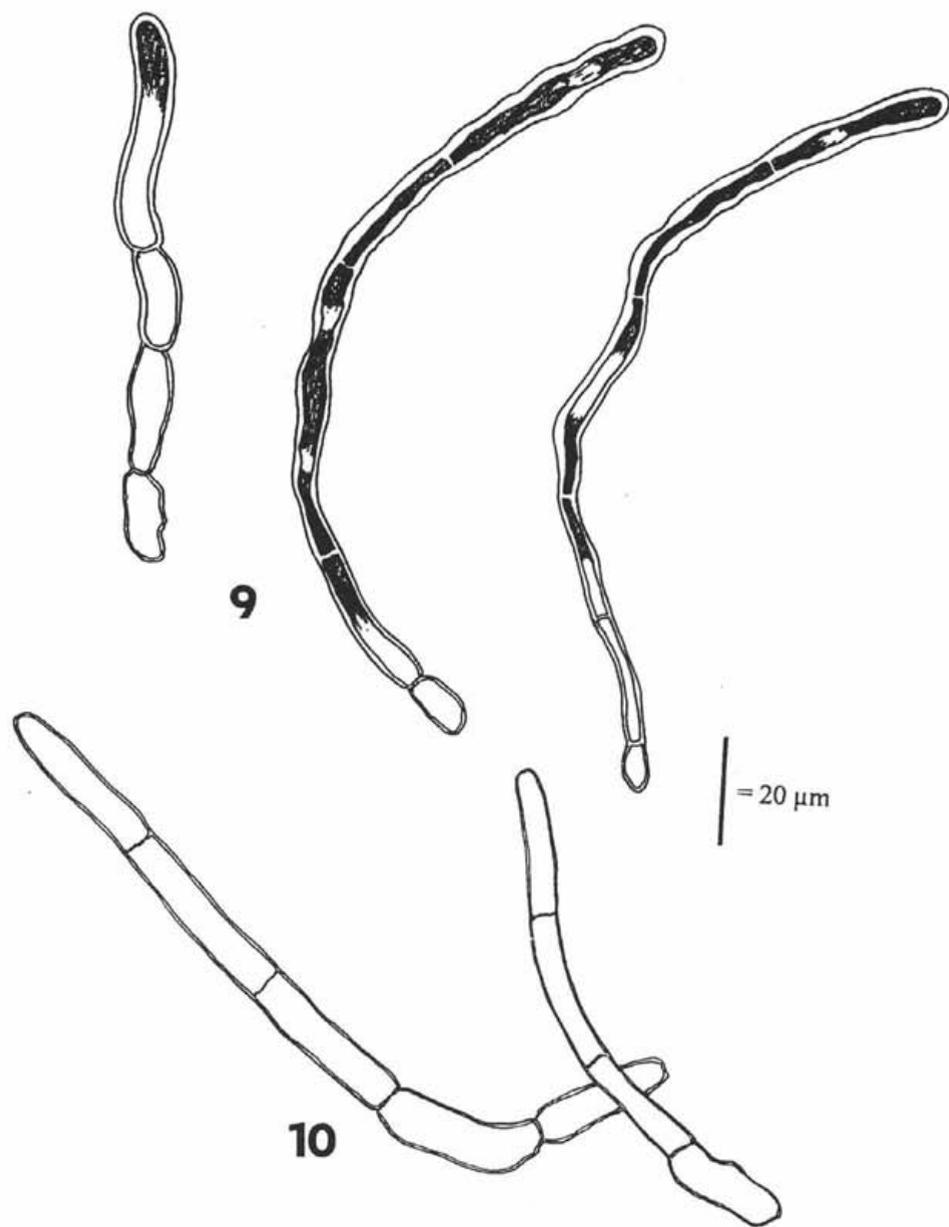
Phillipsia domingensis (Berk.) Berkeley, J. Linn. Soc. London Bot. 18:388, 1881.

Basionym: *Peziza domingensis* Berkeley, Ann. Mag. Nat. Hist. 9:201, 1852.

Central Madagascar: Ranomafana village, prov. Fianarantsoa, On decaying wet bark of a living plant of *Musa* sp. in a secondary forest and a plantation, 29. I. 1995 leg. J. Moravec (J. Mor.); East Madagascar: Moramanga, on bark of a twig in remnants of a partly burnt and destroyed rain forest, 22. I. 1995: Moramanga, on decaying wood on a path through a rain forest, 28. I. 1995 leg. J. Moravec (J. Mor.).

Apothecia of these three Madagascar collections of *P. domingensis* are rather variable in shape, size (up to 30 mm diam.), and especially in the colour of the hymenium, which ranges from pink-red to light pink-violaceous or red – to orange-violaceous. All these features are in accordance with the characters of *P. domingensis* and with the descriptions of this species in Boedijn (1933), Le Gal (1953) and Denison (1969). The ascospores of the Madagascar collections measure 21–27 (–30) × 10.5–14 (–15.5) μm (usually 26 × 12 μm).

Phillipsia subpurpurea Berk. et Br. is recognized by Le Gal (1953) and consequently by Rifai (1968) as a separate species. Rifai (1968) noted that this species differs only critically from *P. domingensis*, whilst Seaver (1928) and Boedijn (1933) united them. After my examination of a number of my collections coming from Sumatra, Zambia and Madagascar, and after reexamination of relevant type material, I am unable to recognize any basic or important feature which can be considered a leading character for such separation. Several features,



Figs 9–10. Hypha-like hairs and hyphae of the external surface of apothecia of *Phillipsia*: 9. Hypha-like hairs of *P. costaricensis* Denison (Holotype OSC); 10. Hyphae of *P. ranomafanensis* sp. nov. (Holotype BRNM).

considered to be distinguishing characters for *P. subpurpurea* stressed by Le Gal (1953) and Rifai (1968) – slightly different size, shape and colour of the apothecia (but always with a red tint), and a slight difference in thickness and number of the ridges of ascospore ornamentation can hardly be taken into consideration. SEM photographs of ascospores (see Figs 15–17) show a variability in thickness, shape and number of these ridges, seen also on individual ascospores which were taken from the hymenium of the same apothecium. Moreover, Le Gal (1953) measured the thickness of the ridges in *P. domingensis* as $0.75\ \mu\text{m}$, which this is evidently erroneous, as in reality the ridges are much thicker, $1.5\text{--}2\ \mu\text{m}$. This may be explained by the fact that the substances which form the ascospore ornamentation in most species of *Phillipsia* and *Cookeina* do not stain adequately with CB, Melzer reagens, safranin and other sorts of reagens and dyes, and are therefore hardly recognizable under a light microscope oil immersion lens. Consequently, the ridges and striae may be falsely measured and illustrated (e.g. Le Gal 1947, 1953, Rifai 1968). The inaccuracy that occurs when the space between the ridges is illustrated, may be especially caused by the fact that only the upper parts of the ridges are seen under the light microscope and thus the walls of the hyaline ridges merge with the dark striae between the ridges. As was mentioned above in the discussion on ascospore ornamentation of *P. ranomafanensis*, the ridges are in fact much thicker than the striae and the picture seen by the light microscope may be false. The elements which form the ascospore ornamentation are seen clearly only on SEM photomicrographs (see all the SEM figures in this paper). At present I have identified all my collections from Madagascar as *P. domingensis*, and only the fact that I have not examined the type of *P. subpurpurea*, prevents me to consider *P. subpurpurea* definitely a synonym of *P. domingensis*.

I managed to examine the supposedly lost (Le Gal 1953, Denison 1969) type of *Peziza cordovensis* Cooke, Hedwigia 14: 81, 1875 which was synonymized (with a question mark) with *P. domingensis* by Seaver (1928). The type material [Sallé – Mexico, "Cordova" (= Cordoba), Dec. 1874 on rotten wood, K], consists of one incomplete apothecium glued on a piece of paper. The dried apothecium (22 mm in diam.) is flat, brown coloured with dark spots. The ascospore size is in a range of that of *P. domingensis*, and also the ascospore ornamentation (Fig. 6) agrees well with that of this species. The type material is not in a good state. It is especially difficult to examine the construction of the apothecium and judge the possible existence or absence of a gelatinous tissue – the last feature being characteristic of a group of species around *Phillipsia dochmia* (Berk. et Curt. apud Berk) Seaver [= *Aurophora dochmia* (Berk. et Curt. apud Berk.) Rifai (1968)] which also possesses ascospores very similar to *P. domingensis*. Therefore, I only tentatively agree with Seaver (1928) and consider *P. cordovensis* a synonym of *P. domingensis*.

With a certain hesitation caused by similar reasons, but almost with certainty, I also consider *Phillipsia polyporoides* Berkeley, Journ. Linn. Soc. Bot. 18: 388,

1881, a synonym of *P. domingensis*. My examination of the type [labelled *Phillipsia polyporoides* and with the annotation "*Phillipsia expansa B*", on dead wood, Rockhampton coll. Thozet 852, K ex herb. William Phillips, consisting of a fragment of an apothecium, brownish with a purple tinge (when dried)] revealed ascospores which measure $21-30 \times 10.5-14 \mu\text{m}$ and correspond well with those of *P. domingensis* (Fig. 7).

Cookeina colensoi (Berk.) Seaver, Mycologia 5: 191, 1913.

Basionym: *Peziza colensoi* Berkeley, Hook. f., Fl. Nov. Zealand. 2:200, 1855.

East Madagascar: Moramanga, on a hard wood of dead twigs in a ditch along a path through remnants of a rain forest, 22. I. 1995 leg. J. Moravec (J. Mor.).

A great number of apothecia of the Madagascar collection were of a variable shape – substipitate to with a very long (up to 25 mm long) stipe, and with a beautifully egg-yellow, light yellow to yellow-orange hymenium; the external surface whitish, only very minutely pubescent. The structure of apothecia consists of the pseudoparenchymatous ectal excipulum (*textura angularis*) and a pro-enchymatous medulla of a *textura porrecta* to *intricata*, typical of the genus *Cookeina*. The unequally sided ellipsoid to subfusiform apiculate ascospores measure $29-36 (-37.5) \times 12-13.5 \mu\text{m}$ and appear almost smooth or possess occasional fine irregular wrinkles (seen by a light microscope under oil immersion lens). The concept of *C. colensoi* as a smooth-spored species is in accordance with the original sense of Berkeley (1855) adopted also by Le Gal (1953), Gamundí (1957), Rifai (1968) and Denison (1967). Seaver (1928) erroneously applied the name to another species which is now known under the name *Cookeina venezuelae* (Berk. et Curt.) Le Gal and is distinguished by ascospores bearing parallel wrinkles between coarse longitudinal and widely spaced ridges (see Denison 1969). Another related species, *Cookeina indica* Pfister et R. Kaushal (1984) is distinguished by a fine longitudinal ascospore striation.

Although the ascospores of *C. colensoi* appear almost smooth under the light microscope (Fig. 8), SEM revealed that they are ornamented by very fine, densely and irregularly arranged irregular warts of an "amoeboid" shape (SEM Figs 19–20). Such ornamentation, proved for the first time in this species, is quite different from that of *C. venezuelae*, *C. indica* and all other species of *Cookeina*.

A paper recording recent collections of species of the genus *Cookeina* and on the ascospore ornamentation in *Cookeina* is also under preparation.

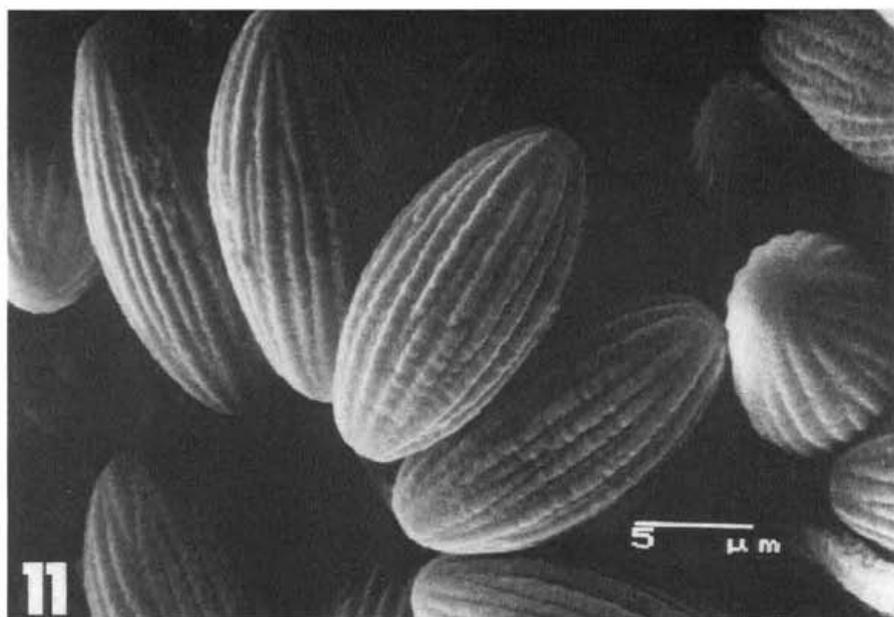
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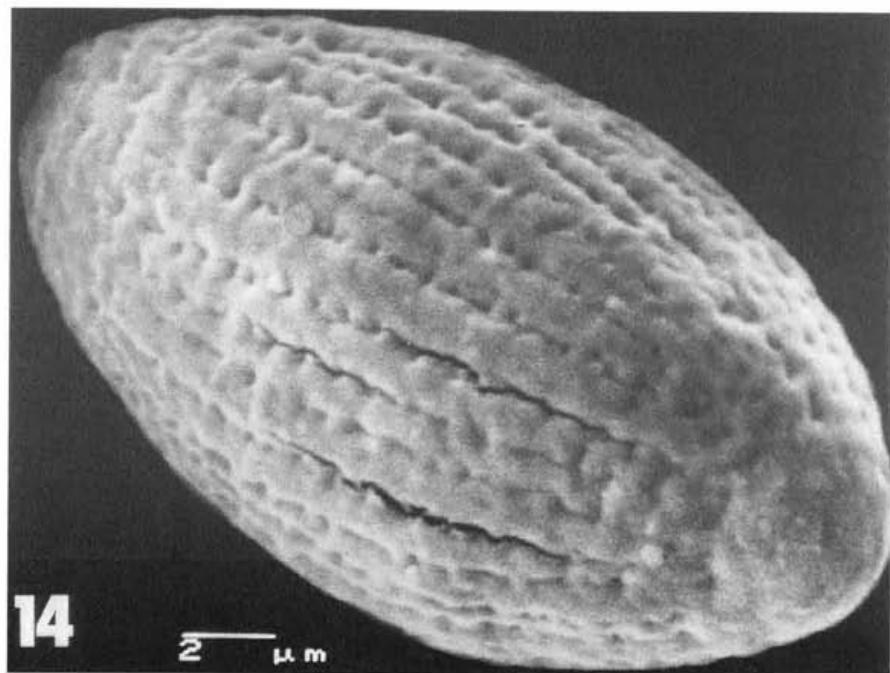
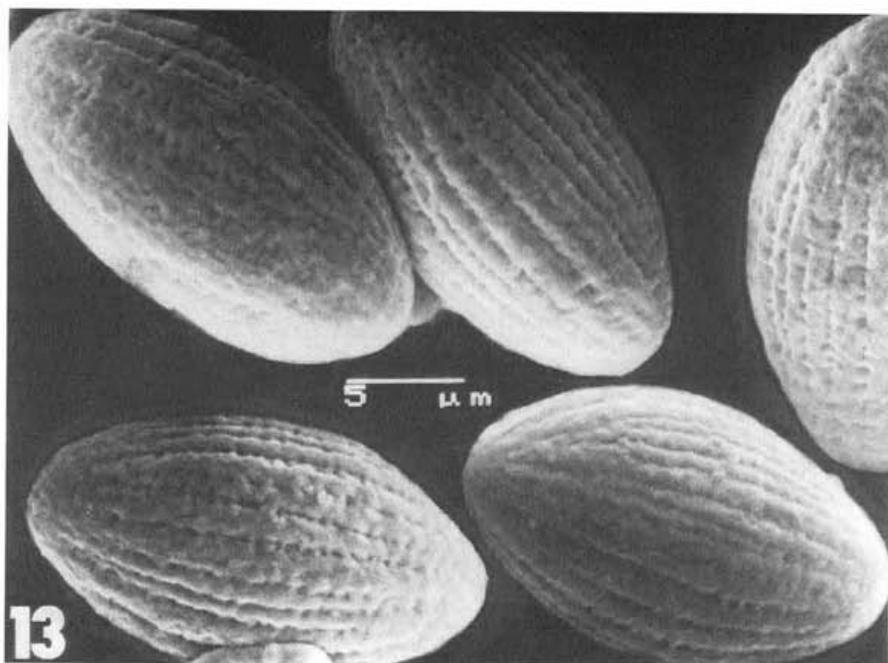
obliged to Dr. Brian M. Spooner (Kew) and curators of the K and OSC herbaria for arranging loans of type and other material. My particular gratitude belongs to Mr. Jiří Lhotecký, who kindly provided the SEM photomicrographs.

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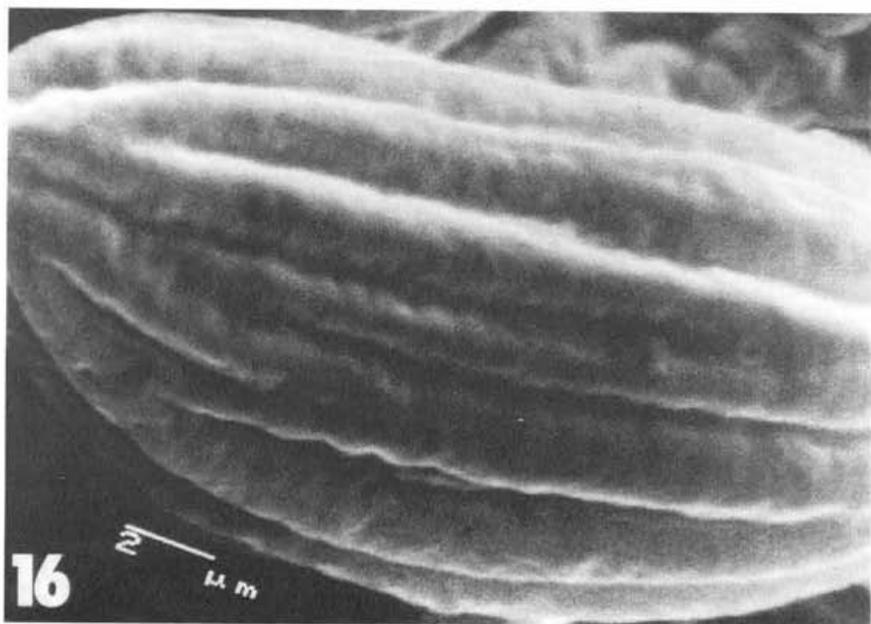
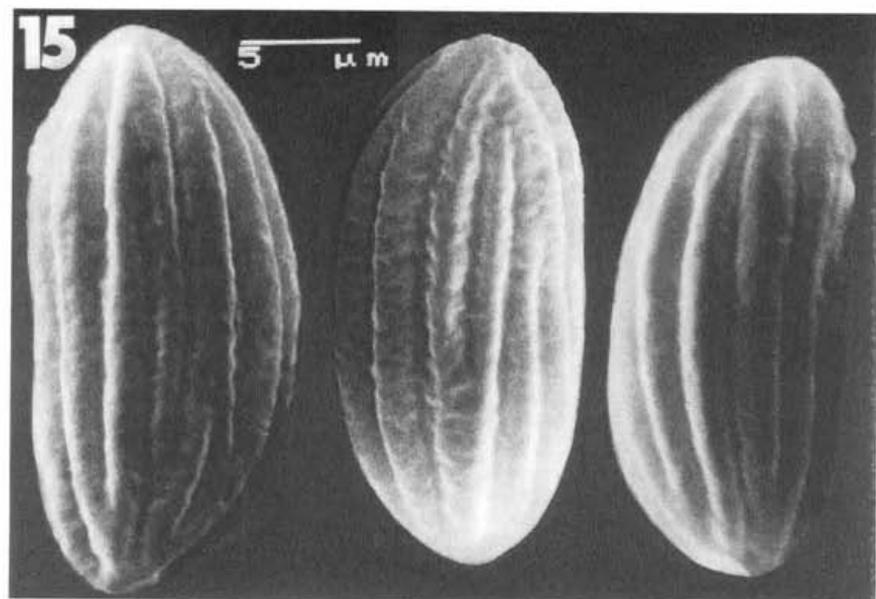
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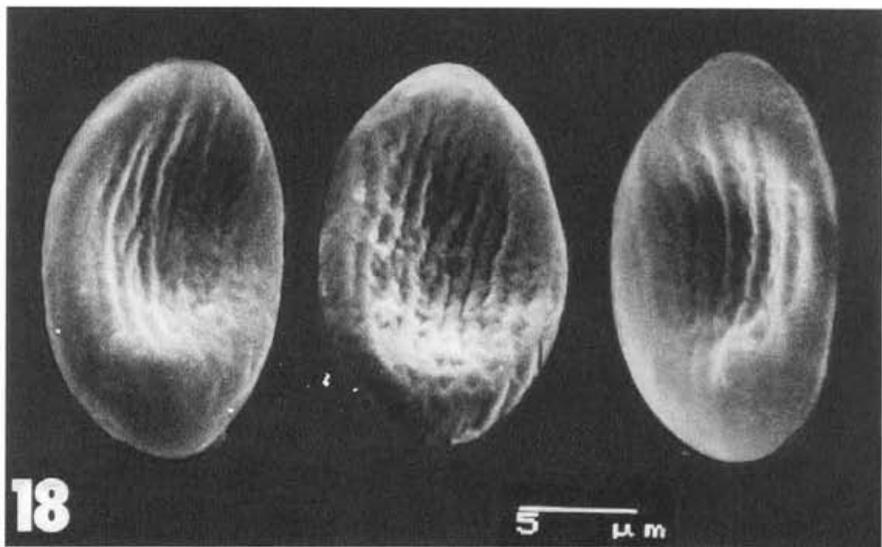
Figs 11–12. SEM photomicrographs of ascospores of *Phillipsia ranomafanensis* sp. nov. (Holotype BRNM).



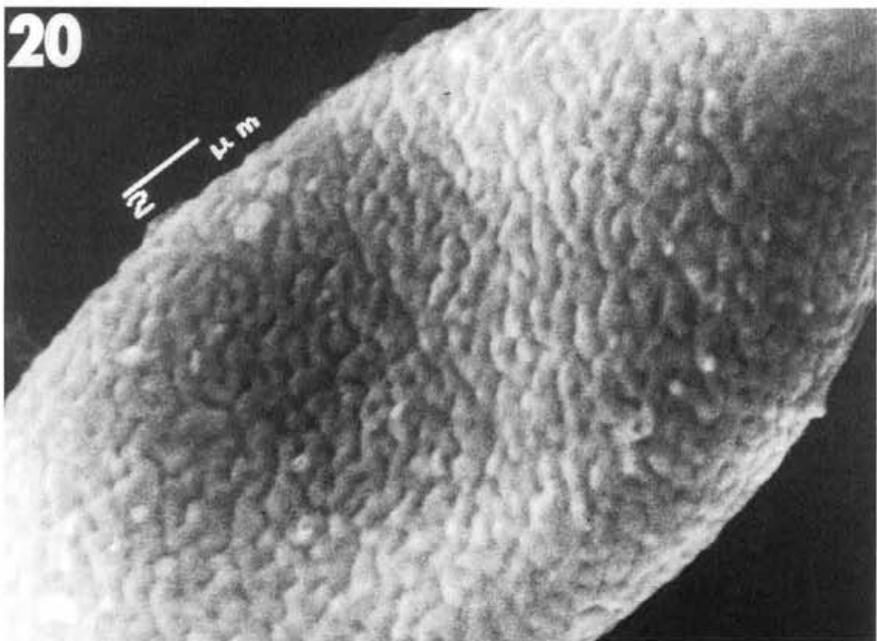
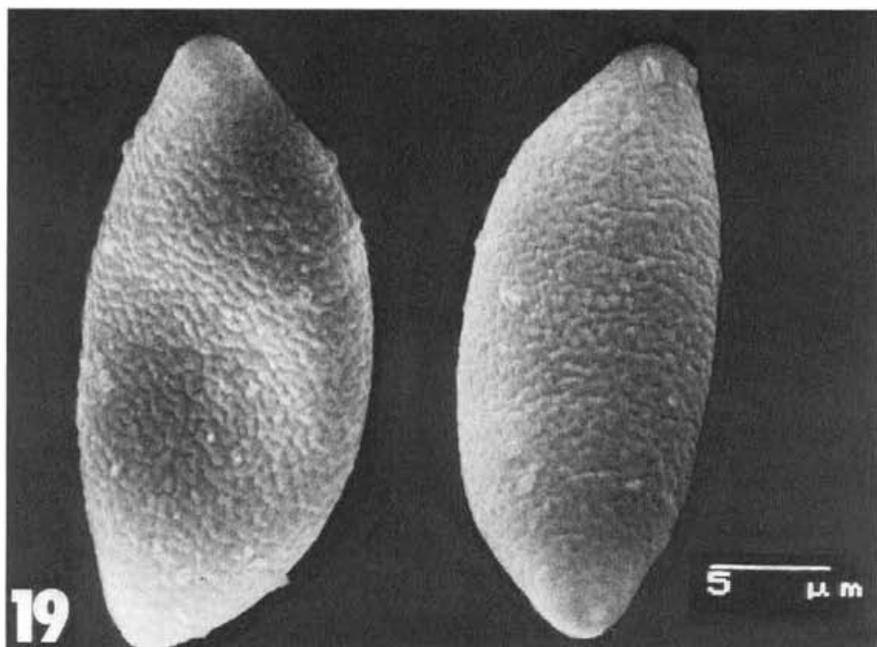
Figs 13–14. SEM photomicrographs of ascospores of *Phillipsis costaricensis* Denison (Holotype OSC).



Figs 15-16. SEM photomicrographs of ascospores of *Phillipsia domingensis* (Berk.) Berk. (Madagascar, Ranomafana, J. Mor.).



Figs 17-18. SEM photomicrographs of ascospores of *Phillipsia*: 17. *P. domingensis* (Berk.) Berk. (Madagascar, Moramanga, J. Mor.); 18. *P. crenulata* Berk. et Br. (type K).



Figs 19–20. SEM photomicrographs of ascospores of *Cookeina colensoi* (Berk.) Seaver (Madagascar, Moramanga, J. Mor.).