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## Polyporaceae of Eastern Africa:

### 1. The genus *Favolus* Fr.

By N. C. OTIENO

#### Introduction

A period of conducting mycological courses for degree Students at the University College, Nairobi, by the writer, revealed that there was no information about East African tropical fungi on which one could base his teaching. Collections of specimens have hardly been carried out; and the few that were collected by European mycologists were deposited in herbaria in Europa or America where they are out of reach of the local workers. Intensive and extensive collections have therefore been carried out and various genera of *Polyporaceae* worked out upon which a series of publications is going to be based—starting with the genus *Favolus*.

For our purposes the geographical area covered in this work will comprise mainland countries of East Africa including Uganda, Kenya, Tanzania, Mauritius, Seychelles, Malagasy, Malawi, Rhodesia, Zambia, Sudan, Ethiopia and Somalia.

It is interesting to note that of the several species of *Favolus* known so far, only six have been reported from our area. We postulate, however, that there is a possibility that many more species occur in this vast region and that further collection might change the picture entirely about the number of *Favolus* species in this region.

The occurrence of some species only on the Indian Ocean Islands and not on the mainland raises important questions which might be answered only when further specimens have been collected.

*Favolus* Fr., Elench. Fung. p. 44. 1828.

Sporophore annual, often laterally stipitate but centrally stipitate in one species, leathery to tough-fleshy when fresh, moderately thin, but thick in *F. hepaticus*, creamy white to brownish when fresh. Hymenial surface of short, hexagonal tubes which may be radially elongate and sometimes appearing pseudolamellate.

Abhymenial surface smooth or fibrous-scaly, tessellate, zonate or azonate. Basidiospores hyaline, cylindrical. Type species: *Favolus brasiliensis* Fries.

### Key to our species of *Favolus*

- |   |                        |
|---|------------------------|
| 1. Stipe central, over 20 mm long,<br>spores $6.5-8.0 \mu \times 2.5-3.0 \mu$         | <i>F. ciliaris</i>     |
| 1. Stipe lateral  | (2)                    |
| 2. Back surface strongly tessellate   | (3)                    |
| 2. Back surface only slightly tessellate  | (4)                    |
| 3. Hymenium pseudolamellate,<br>spores $6.5-7.5 \mu \times 2.5-3.0 \mu$               | <i>F. hepaticus</i>    |
| 3. Hymenium with distinct hexagons,<br>spores $8.0-10.0 \mu \times 2.8-3.0 \mu$       | <i>F. bipindensis</i>  |
| 4. Back surface striate, spores<br>$6.0 \mu \times 2.5-3.1 \mu$                       | <i>F. spathulatus</i>  |
| 4. Back surface smooth, spores with 1-2 guttules,<br>$5.0-8.5 \mu \times 2.0-3.2 \mu$ | <i>F. brasiliensis</i> |
| 4. Back surface fibrous-scaly,<br>spores $10.0-11.0 \mu \times 3.0-3.5 \mu$           | <i>F. boucheanus</i>   |

### FAVOLUS BRASILIENSIS FRIES (Plate I, 1-2)

Elench. Fung. 1828, p. 44

Syn: *Daedalea brasiliensis* Fries. Syst. Myc. 1, 1821, p. 332.

*Hexagona Daedalea* Link ex Murr. Torrey Bot. Club Bull. 31, 1904, p. 328.

*Favolus caespitosus* Lloyd. Myc. Notes 58, 1919, p. 821.

#### Macroscopic characters:

Sporophore pyriform, orbicular, flabellate, broadly spathulate, reniform, with wide range of dimensions as shown by seven specimens below:

25-45 mm × 30-40 mm	50-55 mm × 40-45 mm	130 mm × 70 mm
25-30 mm × 35-40 mm	50-55 mm × 35-55 mm	35 mm × 30 mm
18-26 mm × 18-42 mm		

Very variable in size depending on locality of collection and age of sporophore, ranging from 18-42 mm in smaller specimens to 40-70 mm × 50-130 mm in the larger specimens.

With a lateral stipe—markedly cylindrical, attached to woody substratum by a bulbous base of mycelial mat (10-20 mm, 5 to 10 mm, 11-16 mm, 5-10 mm) in length; gradually merging into the expanding pileus.

White or creamy in colour, soft fleshy or slightly leathery when fresh, or with continuous or dentate margin. Leathery to brittle with pale brown colour and with margins incurved towards

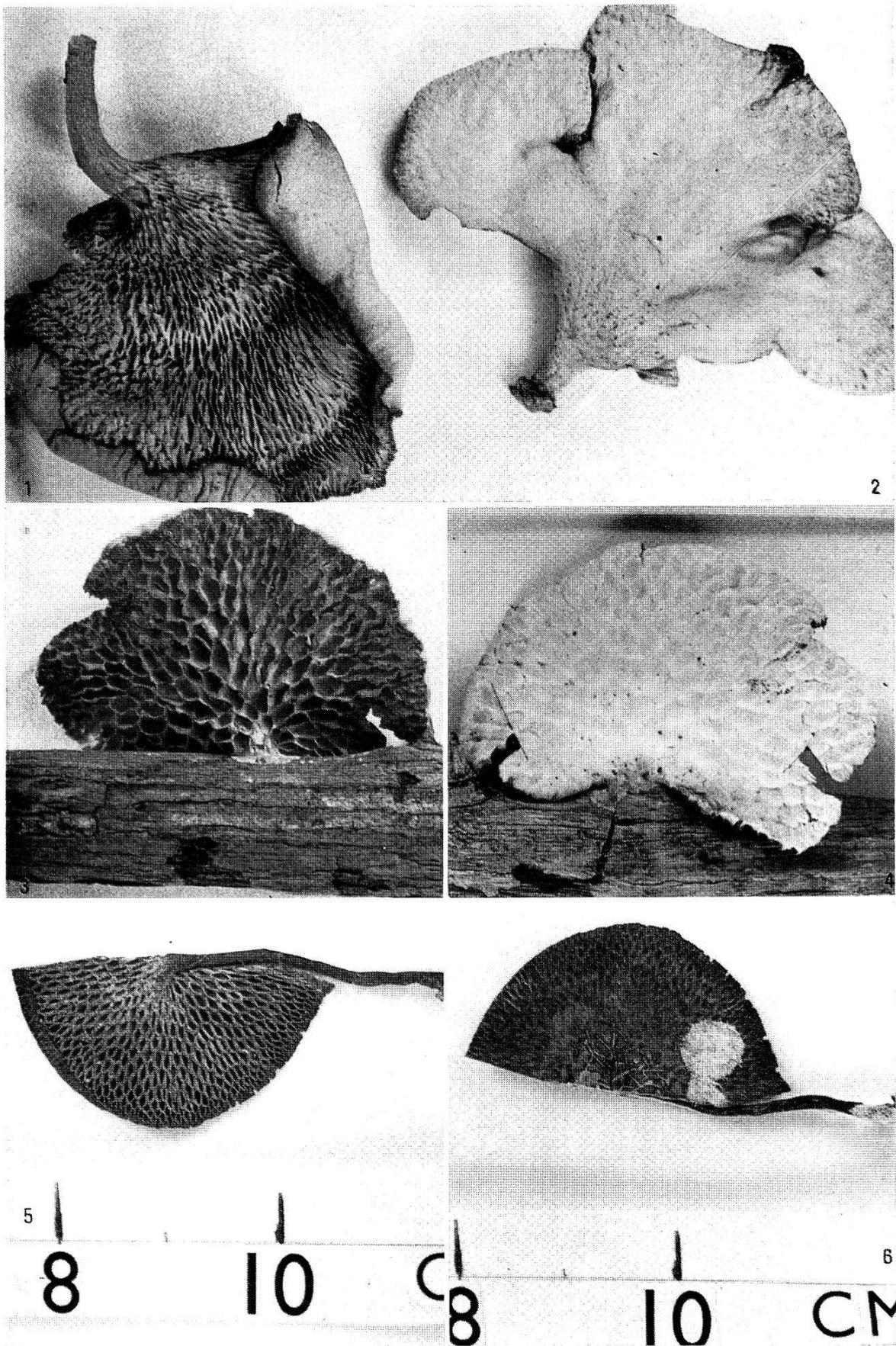


Plate I. Three species of *Favolus* showing hymenial surface of *F. brasiliensis* (1), abhymenial surface of *F. brasiliensis* (2); hymenial and abhymenial surfaces of *F. bipindensis* (3 and 4 respectively); hymenial and abhymenial surfaces of *F. ciliaris* (5 and 6 respectively). Scale in centimetres.

the hymenium when dry. Back surface smooth near stipe or slightly tomentose towards the stipe, usually azonate, and of uniform colour throughout the pileus (concolorous); radially striate, becoming tessellate towards the rim—the individual hexagonal units reflecting the inner hexagons of the hymenium. Pores of the hymenial surface white or cream coloured when fresh; markedly wide and composed of radially elongated hexagonal shallow pores with irregular margins (up to 5 mm long)—the hexagons fanning out in the expanding pileus—occasionally hymenial surface appearing pseudo-lamellate.

*Microscopic characters:*

Spores ovoid to short cylindrical, with curved tapering ends; and 1-2 guttules, smooth walled, hyaline,

$$6.0-7.5 \mu \times 2.5-3.0 \mu$$

$$5.0-8.5 \mu \times 2.5-3.2 \mu$$

$$6.0-8.0 \mu \times 2.0-2.5 \mu$$

$$5.75-8.0 \mu \times 2.0-2.5 \mu$$

Cystidia absent; hyphae thin-walled, with hypha pegs, sparingly branched, aseptate. Found growing on dead wood in forest during or after the rainy season in the localities where it has been collected.

*Distribution:*

In forests in the highlands of Kenya; the thick tropical rain forests of Uganda—and wet western parts of Tanzania. Records not available from Coastal Islands, Central Africa, Ethiopia, Sudan or Somalia. Here again, one would expect it to be widespread all over this geographical region and further collections might reveal more about its distribution.

*Material examined and their collectors:*

- |                                  |                                  |
|----------------------------------|----------------------------------|
| 1. D. Maitland. No. 121. 1915.   | Kabulamuliro, Ssinga, Uganda.    |
| 2. I. A. S. Gibson, No. 725 A. ? | Kenya.                           |
| 3. I. Pirozynski. No. M 326 ?    | Rutanga, Kigoma, Tanzania.       |
| 4. A. Calder. No. 57. 64.        | Mpanga Forest. Uganda.           |
| 5. I. A. S. Gibson. 1961.        | Katimok Forest, Kabarnet, Kenya. |
| 6. D. Maitland. No. 121. 1915.   | Katonga Forest. Uganda.          |
| 7. W. Small. No. 177. 1915.      | Mt. Elgon. Uganda.               |
| 8. W. French. No. 4. 1956.       | Mpanga Forest. Uganda.           |
| 9. D. Maitland. No. 36. ?        | Lake Region. Uganda.             |

## FAVOLUS BIPINDENSIS P. HENN (Plate I, 3-4)

Fungi camerunsenses nov. III. In: Englers Bot. Jahrb. 30, 1901, p. 43.

*Macroscopic characters:*

Sporophore reniform, attached laterally to woody substratum by a short lateral stipe 2 mm long; with white mycelial felt at point of attachment to substratum. Pileus hard and coriaceous in the herbarium, with edges curved slightly towards the hymenium—41 mm  $\times$  22 mm in size.

Back surface creamy white in colour with a narrow brown band on the periphery. Strongly tessellate at the back. Hymenium with radially elongated, rhomboid or hexagonal pores, whose edges appear purple, and which fan out into the expanding pileus. Pores unusually large for the genus (3.5-4 mm  $\times$  2-3 mm).

*Microscopic characters:*

Spores hyaline, smooth walled, ovoid, with one tapering end, usually with two guttules; 8-10  $\mu$   $\times$  2.8  $\mu$ -3.0  $\mu$ .

*Distribution:*

Tanzania. Also collected from the Cameroons by HENNINGS (type locality). Further collections should produce more specimens from the forests of the East African Coast. Extensive collection from the cooler highland areas of Kenya shows its distribution restricted to warmer, low-lying areas of East Africa.

*Material examined:*

Miss. H. G. Faulkner—from Magunga Estate in Tanga District of Tanzania in Eastern Usambara Mts.

## FAVOLUS CILIARIS MONT. (Plate I, 5-6)

Cent. IV, n. 82, t. 15, f. 2.

Syll. Crypt. p. 551.

Syll. Fungorum 6, 1888, p. 391.

*Macroscopic characters:*

Sporophore centrally stipitate—pileus 30 mm in diameter, flattened, thin, leathery and dark brown in colour.

Central stipe cylindrical, thin, up to 26 mm long and attached to substratum by a swollen base.

Back surface of pileus markedly tessellate due to inward depression of the walls of the pores resulting in favoloid ridges on the

back; tomentose. Dark areas round the edges of the pileus surround lighter coloured area in the centre. Hymenial surface of radially elongate, rhomboid or pentagonal pores which become shallower towards the periphery.

*Microscopic characters:*

Spores hyaline, smooth walled, ovoid to cylindric with tapering ends;  $6.5-8.0 \mu \times 2.5-3.0 \mu$ .

*Distribution:*

Malagasy and Ceylon.

*Remarks:*

Almost reminiscent of *Polyporus arcularius* with which it might be confused but from which it differs on account of spore size. LLOYD (1912) noted *F. ciliaris* had smaller pores than *P. arcularius* but my comparisons do not reveal any significant differences.

*Material examined:*

1. Boncard 1907—Malagasy.
2. Also collected from Ceylon. Collection not seen.

FAVOLUS SPATHULATUS (JUNGH.) BRES. (Plate II, 1-2)

Ann. Mycol. 8, 1910, p. 587.

Syn: *Laschia spathulata* Jungh. Syll. Fungorum 5, 1887, p. 653.

*Macroscopic characters:*

Sporophore reniform, spathulate, orbiculate or flabelliform, 10 to 15 mm  $\times$  15-30 mm, with a lateral stipe 5-7 mm long. Stipe may be very short and indistinct, merging undifferentiated into pileus or long woody, and cylindric, 15-35 mm  $\times$  15-30 mm. Mycelial web found at point of attachment to the substratum. Pileus white and shiny when fresh, with soft to leathery consistency, but turning pale tan brown, hard and brittle when dry in the field or in herbarium, the thin edges usually infolding toward the hymenium and cracking to make the sporophore appear deltoid.

Back surface radially striate from the stipe base and appearing tessellate (i.e. raised rhomboid mounds delimited by furrowed lines); azonate concentrically around stipe base, but stipe and central areas of pileus light or paler in colour than the darker zone towards the edges.

Pore surface white to cream coloured in fresh specimens; pale

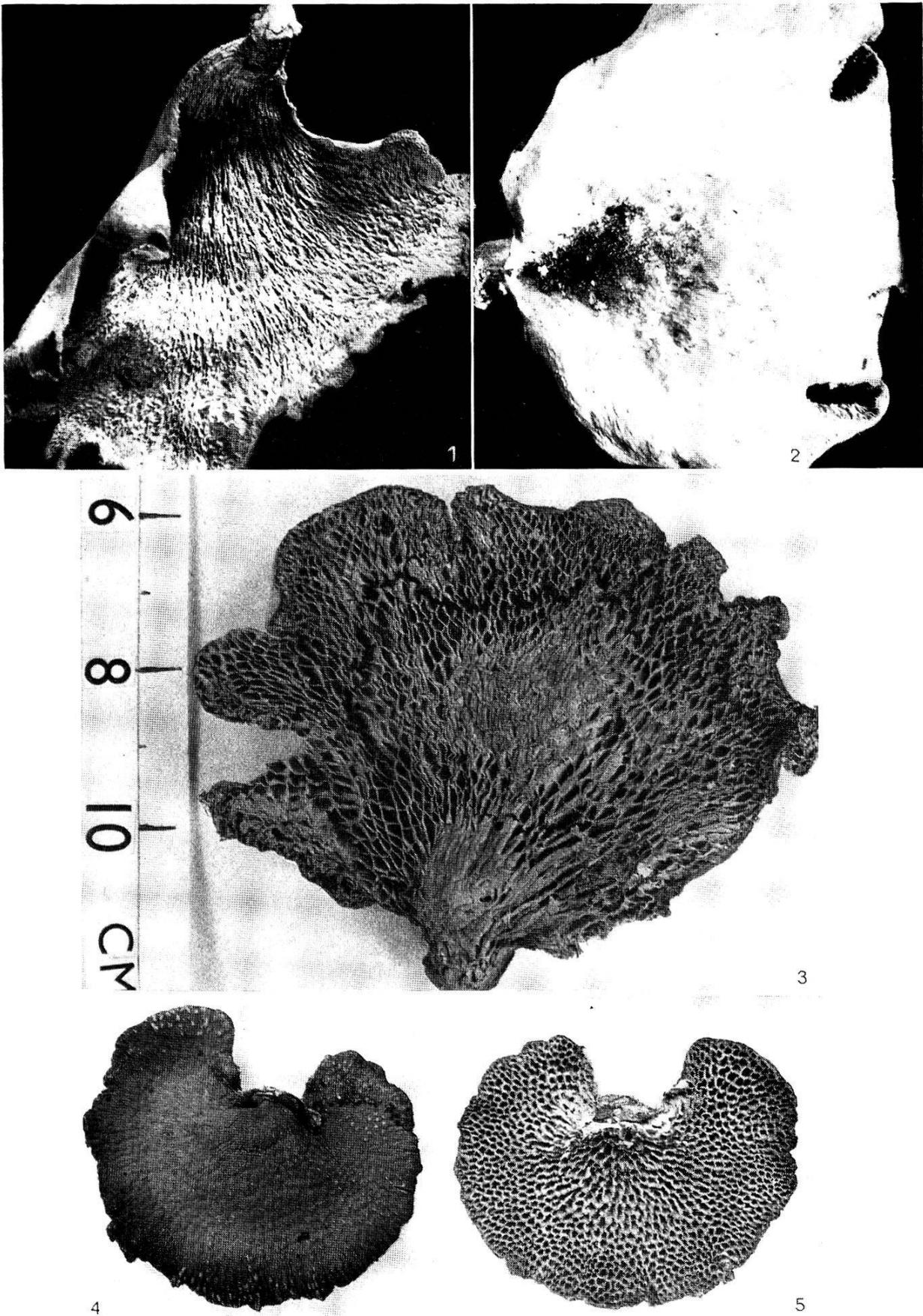


Plate II. Three species of *Favolus* showing *F. spathulatus* above with hymenial surface (1), and abhymenial surface (2); *F. hepaticus* in the middle showing hymenial surface (3); and *F. boucheanus* with abhymenial surface (4), and hymenial surface (5).

ochraceous in dried specimens and made of radially elongated, minute hexagonal pores with uneven edges.

*Microscopic characters:*

Basidiospores short-cylindric, smooth, hyaline,  $6.0 \mu \times 2.5-3.1 \mu$ ; cystidia absent. Hyphae narrow, continuous, thin walled, sparingly branched and without clamp connections.

Growing on dead wood found lying on the ground during or after the rainy seasons in the localities mentioned.

*Remarks:*

It is interesting to note that the distribution of *F. spathulatus* according to our present knowledge in East and Central Africa is restricted to the Highland areas of Kenya, to the very wet areas of Usambara Mountains in Tanzania and to a single locality in Mauritius. Ecological features similar to those found in these areas occur in several parts of East and Central Africa, so that one would expect a wider distribution of *F. spathulatus* over East and Central Africa including the Islands of the Indian Ocean, Ethiopia and Southern Sudan. Probably if more collection is done, this species could be found to be more widespread than we have reported in this paper.

*Material examined:*

- |                                   |  |
|-----------------------------------|--|
| 1. P. O. Wiehe. No. 127. 1947.    | St. Hubert. Mauritius (Kew).                       |
| 2. I. A. S. Gibson. 1961.         | Aberdares. Kenya (Kew).                            |
| 3. N. C. Otieno & students. 1964. | Lower Kamweti Forest. Kenya.                       |
| 4. N. C. Otieno. 1964.            | Castle Forest Station. Kenya.                      |
| 5. N. C. Otieno. 1963.            | Kimakia Forest. Kenya.                             |
| 6. Miss. H. E. Faulkner. 1964.    | Magunga Estate. West of<br>Usambara Mts. Tanzania. |
| 7. I. A. S. Gibson. No. 86. 1961. | Kieni Forest. South of Aber-<br>dares. Kenya.      |

FAVOLUS HEPATICUS KL. (Plate II, 3)

Linnaea VIII, 1833, p. 197.

Fries, E. Epicrisis Systematis Mycologici, Uppsala, 1836-38, p. 499.

Berkeley, M. J. Exotic Fungi, p. 379.

*Macroscopic characters:*

Sporophore orbicular to deltoid, 50-110 mm  $\times$  30-70 mm with dentate edges; with a short or rudimentary lateral stipe up to 10 mm long which gradually merges into the pileus. Creamy white

in colour—becoming pale brown and leathery on drying. Strongly tessellate at the back showing hexagonal delimitations of pores; azonate. Hymenial pores large, radiately hexagonal and the tangential walls of the pores indistinct so that a pseudolamellate condition is evident.

*Microscopic characters:*

Spores ovoid to ellipsoid or short cylindrical—sometimes with a pointed curved tip; smooth, hyaline,  $6.5-7.5 \mu \times 2.5-3.0 \mu$ .

*Substratum:*

Growing on wood to which stipe is attached by a mycelial mat.

*Distribution:*

Has been collected in Mauritius off the East African Coast. It would appear this species is restricted to the Indian Ocean Islands off the East African Coast—and the only places with ecological conditions comparable to that of Mauritius where it might be found are the warm coastal forests of Eastern Africa.

FAVOLUS BOUCHEANUS KL. (Plate II, 4-5)

Linnaea VIII, 1833, p. 318.

Fries, E. Epicrisis Systematis Mycologici, Uppsala, 1836-38, p. 431.

Hym. Europ. 1874, p. 533.

*Macroscopic characters:*

Sporophore orbicular to spathulate, with edges rolled towards the hymenium in the brittle dry specimens; with a thick lateral stipe 5 mm long which spreads out into the pileus.

Abhymenial surface fibrous-scaly, rust-brown, markedly tessellate. Hymenium of radially elongate hexagons, with thin-walled pores, and light brown in colour.

*Microscopic characters:*

Spores hyaline, smooth, ovoid to cylindrical, with two distinct guttules and tapering ends;  $10.0-11.0 \mu \times 3.0-3.5 \mu$ .

*Distribution:*

The Island of Mauritius in the Indian Ocean. This is the second species of *Favolus* from Mauritius which has not yet been reported from the East African mainland. Although it would, at present, appear to be restricted to the Indian Ocean Island, similar climatic and ecological conditions exist on the lowlying coastal forests of

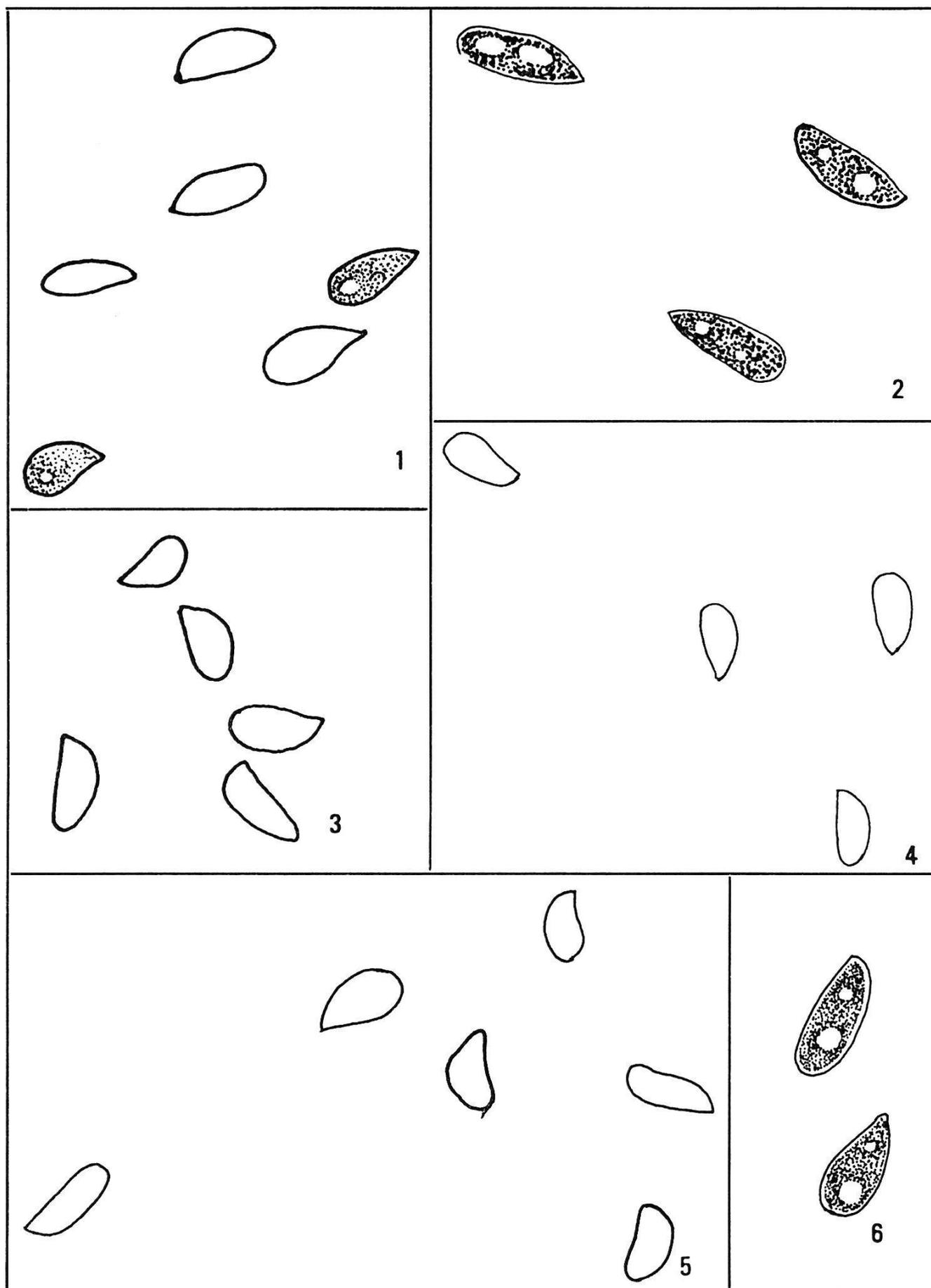


Plate III. Basidiospores of *Favolus brasiliensis* (1), *Favolus bipindensis* (2), *Favolus ciliaris* (3), *Favolus spathulatus* (4), *Favolus hepaticus* (5), and *Favolus boucheanus* (6).

the mainland so that, with more extensive collections, we would expect this species to be found on the East African mainland.

### Discussion

The distribution of the six species of *Favolus* reported from our area shows an interesting pattern. Two species—*F. hepaticus* and *F. boucheanus* have only been collected from the Island of Mauritius and not from the East African mainland. The same applies to *F. ciliaris* which has been collected from the Island of Malagasy.

*F. spathulatus*, however, has been collected from Mauritius, and from the Highland areas of Kenya (Aberdares and Mt. Kenya Slopes), as well as from Usambara mountains in Tanzania. The remaining two species—*F. brasiliensis* and *F. bipindensis* have been collected in Kenya and Tanzania and not in any of the islands.

It is probable that this discontinuity is a result of isolation of the island-species which have evolved separately without invading the mainland, or, we might postulate that very little collection of *Favolus* has been carried out over our area so that, in future, many more species might be found inhabiting both the islands and the mainland. It is hoped that this paper will stimulate further collection so that our knowledge about the distribution of *Favolus* over Eastern Africa becomes complete.

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### Zusammenfassung

Das Vorkommen und die Verbreitung von 6 Arten der Gattung *Favolus* in Ostafrika (Uganda, Kenya, Tansania, Mauritius, Seychellen, Madagaskar, Ma-

lawi, Rhodesien, Sambia, Sudan, Äthiopien und Somaliland) wird untersucht.

2 Arten, *F. hepaticus* und *F. boucheanus*, wurden ausschließlich auf der Insel Mauritius gefunden, nicht aber auf dem ostafrikanischen Festland. *F. ciliaris* konnte nur auf der Insel Madagaskar gesammelt werden. Hingegen kommt *F. spathulatus* auf Mauritius, im Hochland von Kenya (Aberdares und an den Hängen des Mount Kenya) und in den Usambarabergen in Tansania vor. *F. brasiliensis* und *F. bipindensis* fanden sich in Kenya und Tansania, kommen aber auf keiner der Inseln vor.

Es ist möglich, daß diese Lücke in der Verbreitung durch die Isolation der Insel-Arten verursacht wurde, indem diese auf den Inseln evoluierten, ohne in das Festland einzudringen. Man muß jedoch berücksichtigen, daß die bisherigen Funde von *Favolus* lückenhaft sind. Es wäre denkbar, daß bei neuen Suchaktionen weitere *Favolus*-Arten gefunden werden könnten, die sowohl auf dem Festland als auch auf den Inseln vorkommen.

### Résumé

On a étudié la présence et la répartition de 6 espèces du genre *Favolus* en Afrique de l'Est (Ouganda, Kenya, Tanzanie, île Maurice, les Seychelles, Madagascar, Malawi, Rhodésie, Zambie, Soudan, Ethiopie et Somalie).

*F. hepaticus* et *F. boucheanus* n'ont été trouvés que sur l'île Maurice exclusivement et non pas sur la partie orientale du continent. De même *F. ciliaris* n'a pu être récolté que sur l'île de Madagascar. Par contre, *F. spathulatus* se rencontre aussi bien sur l'île Maurice que sur les hauts plateaux du Kenya (Aberdares et sur les pentes du Mount Kenya), de même que dans les montagnes Usambara de Tanzanie. *F. brasiliensis* et *F. bipindensis* existent au Kenya et en Tanzanie, mais pas dans les îles mentionnées.

Il est possible d'expliquer ces irrégularités dans les distributions par le fait que les espèces insulaires, isolées, ont évolué sans pouvoir pénétrer sur le continent. On doit cependant ne pas oublier que les collections de *Favolus* réunies jusqu'à ce jour sont par trop incomplètes. On peut s'attendre à ce que la recherche d'un matériel plus abondant permettra la découverte d'autres espèces de *Favolus*, lesquelles existeraient aussi bien sur les îles que sur le continent.