

versity. A voucher specimen was submitted to the University Herbarium (voucher number Husain-33701).

The dried and powdered leaf material of *R. alata* (1 kg) was defatted with light petrol and extracted with EtOH. The EtOH extract was concentrated and the residue was refluxed with light petrol and benzene, and treated with boiling water. Since the petrol-soluble fraction of EtOH extract and the straight petrol extract show similar components on TLC, they were mixed together. The combined petrol-soluble fraction was chromatographed over a silica gel column. The column was run with light petrol. The fractions eluted with light petrol were crystallized from hexane to give white crystals of RA5 (100 mg, m.p. 129°C). It was found to be dimethylterephthalic acid. Then the column was eluted with petrol-benzene (9:1-1:1), which gave inseparable mixtures of urushiol derivatives. Elution with benzene and benzene-EtOAc (9:1, 8:2) gave a greenish mass of chromatographically comparable components, which solidified on trituration with CHCl<sub>3</sub>-EtOH. The solid mass, after repeated crystallization from CHCl<sub>3</sub>-MeOH, gave two isomeric products, RA9 (50 mg, m.p. 283-284°C, *R<sub>f</sub>* 0.56, benzene-acetone 5:1) and RA10 (60 mg, m.p. 260-261°C, *R<sub>f</sub>* 0.48 benzene-acetone 5:1). RA9 was characterized as benulin (I) and RA10 as semimoronic acid (II).

RA9: <sup>1</sup>H NMR (CDCl<sub>3</sub>), δ: 4.72 and 4.62 (1H, br s each, =CH<sub>2</sub>), 4.24 and 3.72 (1H, ABd each, *J* = 8 Hz, -CH<sub>2</sub>O-), 1.66 (3H, br s, vinylic CH<sub>3</sub>), 1.00 (3H, s, CH<sub>3</sub>), 0.94 (6H, s, 2 × CH<sub>3</sub>), 0.84 (3H, s,

CH<sub>3</sub>). MS *m/z* (rel. int.): 470 (M<sup>+</sup>, 26%), 455(1), 452(2), 439(2), 424(9), 409(2), 397(5), 313(13), 223(18), 205(20), 203(10), 201(13), 189(34), 187(34), 175(26), 163(24), 161(20), 159(19), 155(15), 133(34), 121(50), 119(53), 109(68), 107(60), 105(66), 44(100).

RA10: <sup>1</sup>H NMR (CDCl<sub>3</sub>) δ: 5.16 (1H, brs, =CH-), 4.28 and 3.72 (1H, AB *d* each, *J* = 8 Hz, -CH<sub>2</sub>O-), 0.98-0.92 (12H, overlapping s, 4 × CH<sub>3</sub>), 0.84 and 0.72 (3H-*s* each, 2 × CH<sub>3</sub>). MS *m/z* (rel. int.): 470 (M<sup>+</sup>, 15%), 452(4), 426(70), 424(41), 411(8), 409(8), 397(9), 246(10), 236(55), 203(32), 191(15), 190(80), 189(68), 175(46), 163(100), 133(22), 121(27), 119(38), 109(30), 107(35), 105(40).

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## TWO NEW SPECIES OF *PSEUDOCERCOSPORA* FROM INDIA

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DURING a survey for plant parasitic fungi, two interesting foliicolous hyphomycetes were collected. These fungi proved to be two new taxa of species rank. They are described below:

*Pseudocercospora tephrosiae* A. N. Rai et Kamal sp. nov.

Maculae pleraeque epigenosae, interdum in superficie inferiori, parvae, dispersae per totam superficiem folii, atro-brunneae; coloniae pleraeque epiphyllosae et raro hypophyllosae, sericae, velate brunneae;

mycelium hypharum immersum, septatum, angustum, ramosum; stromata bene formata, immersa, pseudoparenchymatosa, fusce olivacea, 27.6  $\mu\text{m}$  diametro; conidiophori caespitosi, parvi (in fasciculis densis), macronematosi, mononematosi, suberecti, vix flexuosi, aliqui geniculati, usque 3-transverse septati, raro ramosi, cum parietibus laevibus, pallide vel moderate olivacei, 16.0–59.8  $\times$  3.5–6.9  $\mu\text{m}$ ; cellulae conidiogenosae integratae, terminales, polyblastae, sympodiales, denticulatae, cum denticulis stipatis brevibus et acutis vel late conoidibus, cum cicatricibus spissis; conidia simplicia solitaria, arida, acropleurogenosa, pallide olivacea, cylindrata vel obclavatocylindrata, cum parietibus laevibus, 2–6 transverse septata, cum apice subacuto vel obtuso et basi obconicotruncata vel subtruncata et hilis spissis, 20.7–64.4  $\times$  3.5–4.6  $\mu\text{m}$ .

Infection spots predominantly epigenous sometimes on the undersurface, small, distributed all over the leaf surface, blackish brown; colonies predominantly epiphyllous and rarely hypophyllous, velvety, dull brown; mycelium of hyphae immersed; stromata pseudoparenchymatous, dark olivaceous, 27.6  $\mu\text{m}$  in diameter; conidiophores caespitose, small (in loose) to large (in dense) fascicles, macronematous, mononematous, suberect, somewhat flexuous, some geniculate, up to 3-transversely septate, rarely branched, smooth-walled, light- to mid-olivaceous, 16.0–59.8  $\times$  3.5–6.9  $\mu\text{m}$ ; conidiogenous cells integrated, terminal, polyblastic, sympodial, denticulate, with short pointed to broad conoid closely set denticles with thickened scars; conidia simple solitary, dry acropleurogenous, light-olivaceous, cylindric to obclavatocylindric, smooth-walled, 2–6-transversely septate, with subacute to obtuse apex and obconicotruncate to subtruncate base and thickened hila, 20.7–64.4  $\times$  3.5–4.6  $\mu\text{m}$  (figure 1).

On living leaves of *Tephrosia purpurea* (L.) pers. (Fabaceae); September, 1979; Gorakhpur (Gorakhpur South Forest Division); leg. A. N. Rai, KR 370, type IMI 246396.

A survey of the literature shows that many *Pseudocercospora* species have been reported on the host family<sup>1–5</sup>. However, of all the species of *Pseudocercospora* described so far, the present collection comes close only to *P. pantoleuca* (Sacc.) Deighton<sup>1</sup>. For justifying the distinct identity of the proposed taxon, a comparative account of the morphological characters of the two is given in table 1.

Table 1 reveals that the present collection resembles *P. pantoleuca* in stroma, conidiophores and conidia to some extent only. But it differs from

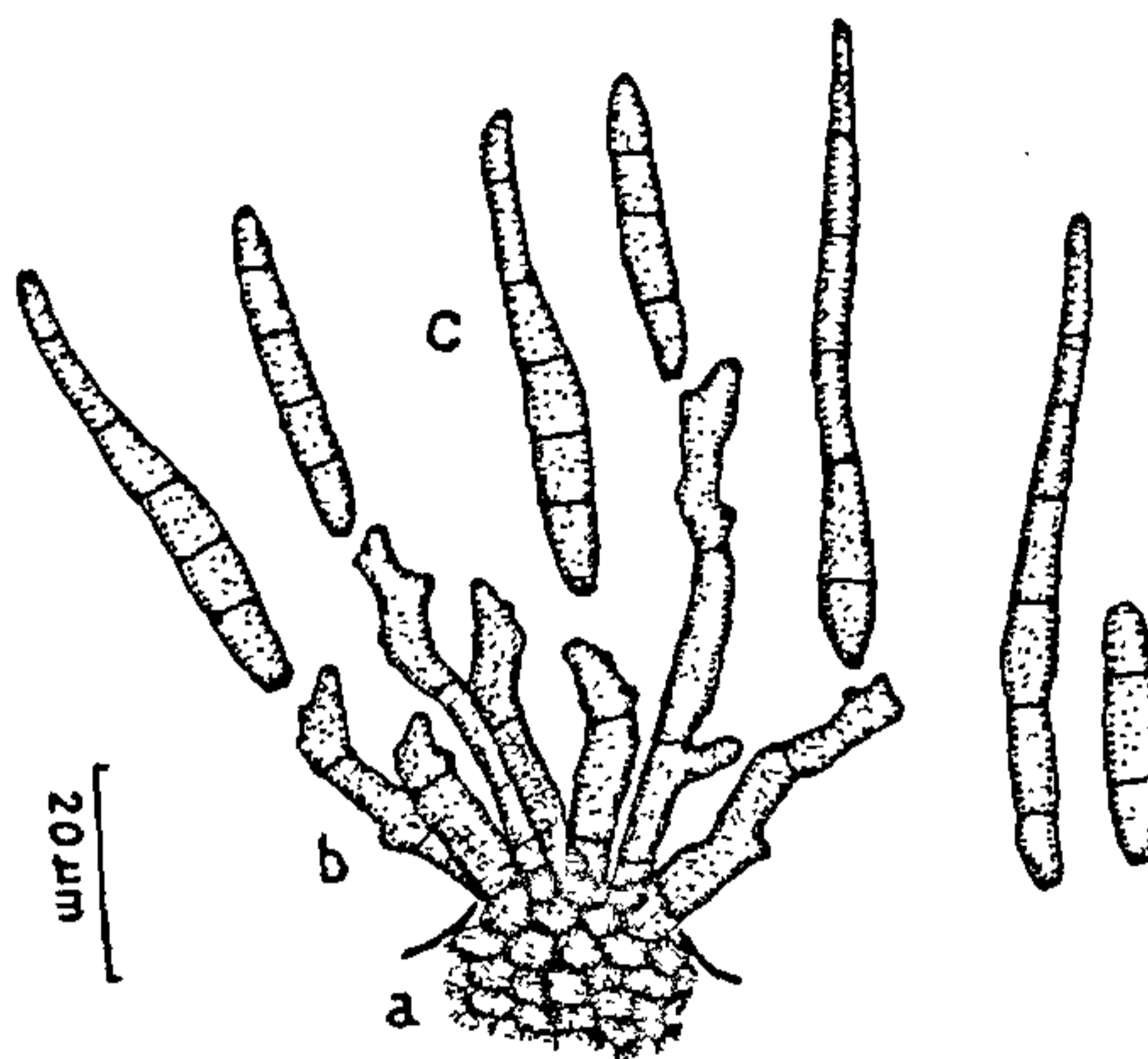


Figure 1. *Pseudocercospora tephrosiae* A. N. Rai et Kamal sp. nov. a, Stroma; b, conidiophores; c, conidia.

the latter in having darker stroma; distinctly cicatrized, comparatively longer and much wider conidiophores and shorter conidia bearing thickened hila. Besides, the proposed species also differs from *P. pantoleuca* in having predominantly epigenous spots and predominantly epiphyllous colonies as against amphigenous spots and amphiphyllous colonies distributed on both the leaf surfaces in *P. pantoleuca*.

The present collection therefore warrants description as a new species. It is also noteworthy that no species of *Pseudocercospora* is reported on the host genus in question.

*Pseudocercospora tinosporae* A. N. Rai et Kamal sp. nov.

Maculae amphigenae, perparvae vel majores, necroticae, nervisequae, irregulares, griseobrunneae, interdum halone viridi circumcinctae; coloniae amphiphyllae, ad partem necroticam limitatae, griseobrunneae; hyphae immersae, septatae, glabrae, ramosae; stromata bene evoluta, irregularia, pseudoparenchymatica, medio-olivacea, 9.2–23.0  $\mu\text{m}$  diametro; conidiophora macronemata, mononemata, caespitosa, dense conferta, usque 3-septata, ramosae, suberecta, apices versus subflexuosa, pallide olivacea, 11.5–59.8  $\times$  3.5–4.6  $\mu\text{m}$ ; cellulae conidiiferae integratae, terminales, polyblasticae, sympodiales, denticulis brevibus vellatis subacutis interdum dense confertis ornatae;

Table 1 Comparative morphological characters of *P. pantoleuca* and *P. tephrosiae*

Species	Conidiophores				Conidia	
	Stromata	Structure	Colour	Size ( $\mu\text{m}$ )	Structure	Colour and septation and size ( $\mu\text{m}$ )
<i>P. pantoleuca</i>	Small, 15-25, composed of a knot of rather pale oliv. swollen hyphae	In dense fascicles, smooth, straight or sinuous, sometimes slightly geniculate, usually simple but occasionally with a short lateral branch, continuous or the longer ones septate, conidial scars inconspicuous	Rather pale oliv.	15-40 long. occasionally up to 52 long 2.0-3.5 wide	Obclav., cylindrical, straight or very slightly curved smooth, hila unthickened	Rather pale oliv. 1-7 transverse 25-85 x 3.5-4.5
<i>P. tephrosiae</i>	27.6 $\mu\text{m}$ in diam., pseudoparench., dark oliv.	In small (loose) to large (dense) fascicles, smooth, suberect, somewhat flexuous, some geniculate, rarely branched, septate (up to 3) denticles with thickened scars	Light to mid oliv.	16.0-59.8 x 3.5-6.9	Cylindrical, to obclavate cylindrical smooth hila thickened	Light oliv. 2-6 transverse 20.7-64.4 x 3.5-4.6

conidia simplicia, solitaria, sicca, acropleurogena, pallide olivacea, usque 8 transverse septata, obclavata usque subcylindrica ad bases obconicotruncata vel subtruncata, ad apices subacuta usque obtusa hilo non incompressato donata, glabra,  $27.6-59.8 \times 2.8-4.6 \mu\text{m}$ .

Infection spots amphigenous, very small to considerably large, necrotic, irregular, greyish-brown, sometimes surrounded by green haloes; colonies amphiphylous, confined to the necrotic region of the spots, greyish-brown; hyphae immersed, septate, smooth, branched; stromata well-developed, irregular, pseudoparenchymatous, mid-olivaceous,  $9.2-23.0 \mu\text{m}$  in diameter; conidiophores macronematous, mononematous, caespitose, densely packed, up to 3-septate, branched, suberect, slightly flexuous towards the apices, light-olivaceous,  $11.5-59.8 \times 3.5-4.6 \mu\text{m}$ ; conidiogenous cells integrated, terminal, polyblastic, sympodial, denticulate, with short broad to slightly pointed denticles, sometimes denticles closely set; conidia simple, solitary, dry, acropleurogenous, light-olivaceous, up to 8-transversely-septate, obclavate to subcylindric, bases obconicotruncate to subtruncate, apices subacute to obtuse, hila unthickened, smooth,  $27.6-59.8 \times 2.8-4.6 \mu\text{m}$  (figure 2).

On living leaves of *Tinospora cordifolia* (Willd.) Miers. (Menispermaceae); October, 1979; Nichlaul (North Gorakhpur Forest Division); leg. A. N. Rai, KR 324, type IMI 243041.

The present fungus bears some resemblance of *P. cocculi* (H. Syd.) Deighton, one of the two species that have been reported earlier on the host family<sup>1</sup>.

The length of conidiophores is more or less the same in both species. However, the author's

collection differs from *P. cocculi* in other characters such as well-developed stroma; denticulate and narrower conidiophores; smooth, much shorter and narrower conidia with a small number of septa in the former, compared to less-developed stroma; nondenticulate and wider conidiophores; smooth, wrinkled or verruculose, much longer and wider conidia with a larger number of septa in *P. cocculi*. Hence, the new collection is described as a new species, *P. tinosporae*. So far no species of *Pseudocercospora* has been reported on the host genus.

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#### FIRST REPORT OF OCCURRENCE OF OOSPORES OF *PSEUDOPERONOSPORA CUBENSIS* ON TWO CUCURBITACEOUS HOSTS

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DOWNY mildew of muskmelon (*Cucumis melo* L.) and other cucurbitaceous plants, caused by *Pseudoperonospora cubensis* (Berk and Curt.) Rostow, is a serious disease that occurs annually under favourable climatic conditions. Under Punjab conditions, the pathogen is known to perpetuate in the form of active mycelium on self-sown or cultivated sponge gourd (*Luffa aegyptiaca* Mill.) vines growing in sheltered places during severe winter and also in open spaces during milder winters<sup>1</sup>. Bains *et al.*<sup>2</sup> also reported the occurrence of oosporic stage on a wild host *Melothria maderaspatana*. The present communication reports the occurrence of oosporic stage of *P. cubensis* on two cucurbitaceous hosts, pumpkin (*Cucurbita moschata* Duchesne) and sponge gourd (*Luffa aegyptiaca* Mill.) under local conditions.

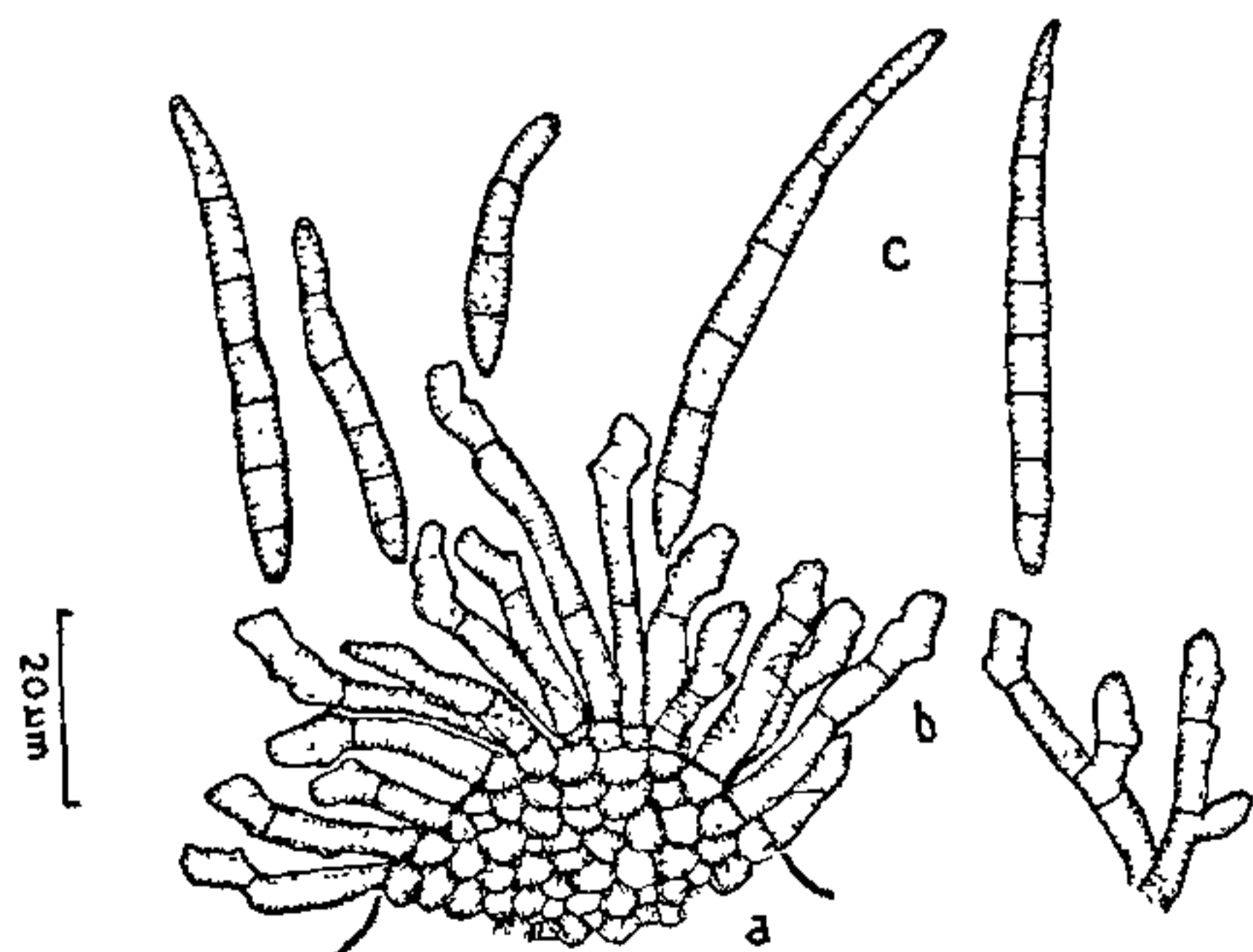


Figure 2. *Pseudocercospora tinosporae* A. N. Rai et Kamal sp. nov. a, Stroma; b, conidiophores; c, conidia.