

STUDIES ON PARASITIC FUNGI FROM SOUTH EAST ASIA, 48.

CERCOSPORA AND ALLIED GENERA OF TAIWAN, VIII.

by J.-M. YEN* and S.-K. SUN**

SUMMARY. — The eighth of a series of studies on *Cercosporae* from Taiwan includes descriptions and illustrations of four new species and a new combination: *Cercospora althaeicola*, sp. nov., on *Althaea rosea* (L.) Cav.; *C. althaeigena* sp. nov., on *Althaea rosea* (L.) Cav.; *Mycovellosiella paulownicola* sp. nov., on *Paulownia taiwaniana* Hu & Chang; *Phaeoisariopsis paulowniae* sp. nov., on *Paulownia taiwaniana* Hu & Chang; and *Pseudocercospora fengshanensis* (Lin & Yen) comb. nov., on *Musa* sp.

RÉSUMÉ. — Dans la série des notes consacrées aux *Cercospora* de Formose, cette huitième étude présente les descriptions illustrées de quatre espèces nouvelles: *Cercospora althaeicola* et *C. althaeigena* sur *Althaea rosea* (L.) Cav., *Mycovellosiella paulownicola* et *Phaeoisariopsis paulowniae* sur *Paulownia taiwaniana* Hu & Chang; une combinaison nouvelle: *Pseudocercospora fengshanensis* (Lin & Yen), sur *Musa* sp., est également proposée.

CERCOSPORA ALTHAEICOLA Yen & Sun, sp. nov.

(Fig. 1)

Maculis indistinctis. Caespitulis amphiphillis, areis parvis, effusis, velutinis, griseo-olivaceis, angularis et nervuli limitatis vel irregularis, dispersis, 0.5-3 mm diam., interdum confluentis. Mycelium immersum: hyphis pallidissime olivaceis, septatis, ramosis, laevibus, 3-4.5 µm latis. Stromatibus nullis vel valde inchoatis. Conidiophoris amphigenis, 2-32 in fasciculo per stomatibus emergentis, simplicibus, erectis, cylindraceis, laevibus, 1-12 septatis, 0.3 geniculatis, olivaceis, sursum pallidioris, ad apicem rotundatis et cicatricibus conidialis (3-3.5 µm diam.) atro-brunneis ornatis, 35-440 x 5-7 µm. Conidiis hyalinis, filiformis, rectis vel leniter curvatis, 3-12 septatis, laevibus, non constrictis, apice rotundatis, basi cylindraceis et truncatis, 40-162 x 3.5-5 µm.

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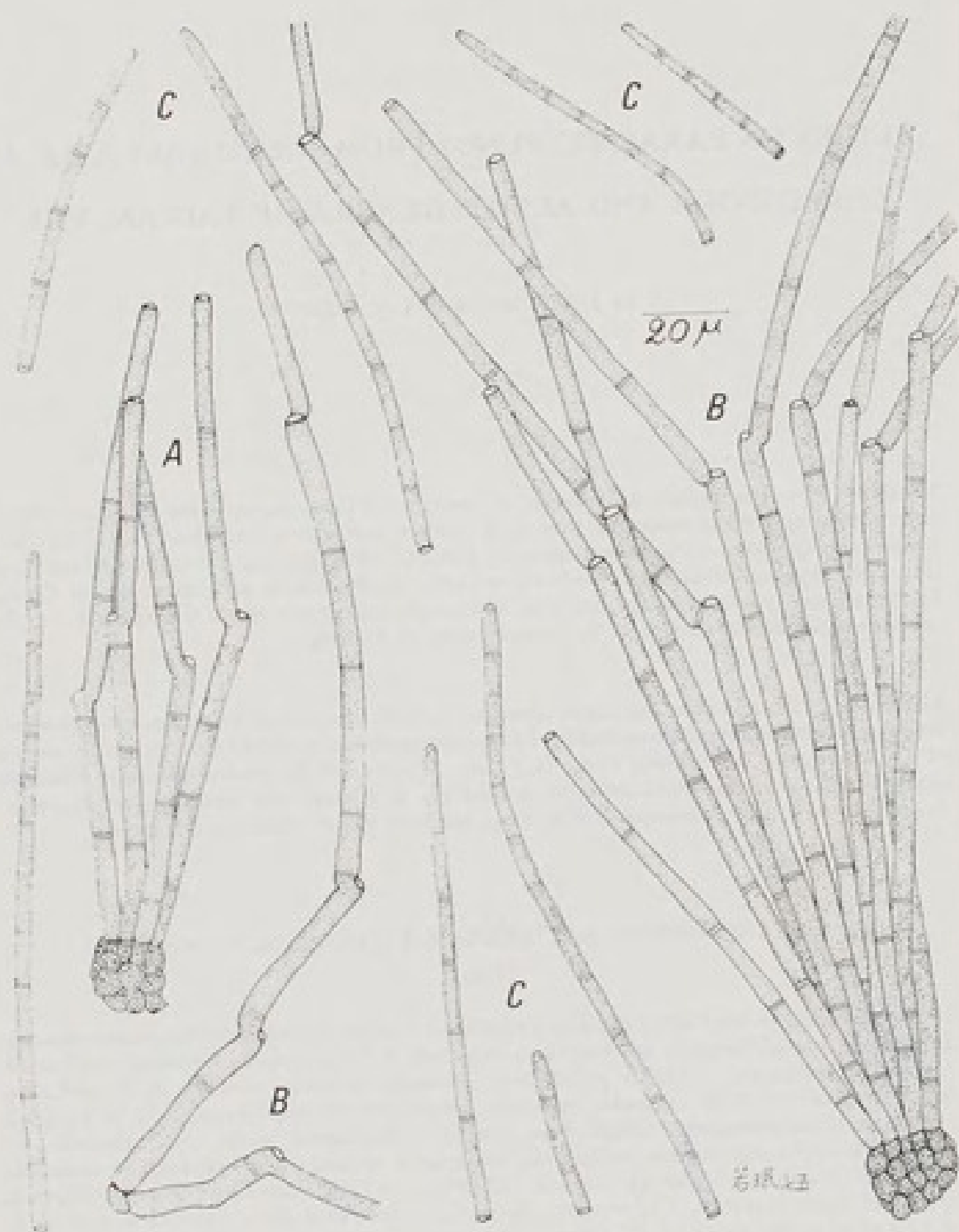


Fig. 1. — *Cercospora althaeicola*: A, Young conidiophores; B, Old conidiophores and formation of geniculations; C, Conidia.

Habitat in foliis vivis *Althaeae roseae* (L.) Cav. (Malvaceae), ad Lishan, Taiwan, leg. S.K. SUN, 7.XI 1981, N° SUN : 120 (Herb. LAM YEN 10612, holotypus).

Leaf spot indistinct or none. Caespituli amphigenous, forming small angular and vein-limited or irregular areas, effuse, velutinous, deep gray, scattered, 0.5-3 mm in diameter, sometimes confluent. Mycelium internal : hyphae very pale olivaceous, septate, branched smooth, 3-4.5 μm wide. Stromata none or very rudimentary. Conidiophores amphiphylous, 2-32 in fascicles emerging through the stomata, simple, straight, cylindric, 1-12 septate, 0-3 geniculate, olivaceous and paler (or subhyaline) to the tip, smooth, conidial scars thickened and dark brown (3-3.5 μm in diameter) on the tip or on the shoulders, 35-440 x 5-6.5 (7) μm . Conidia filiform, hyaline, straight or slightly curved, 3-12 septate, smooth, not constricted, apex rounded, base cylindric (never obconic) and truncate, 40-162 x 3.5-5 μm .

On living leaves of *Althaea rosea* (L.) Cav. (Malvaceae), in Lishan, Taiwan, leg. S.K. SUN, 7.XI 1981, N° SUN : 120 (Herb. LAM YEN 10612).

Note : *Cercospora althaeina* Saccardo differs from this fungus by its distinct leaf spot and its acicular conidia. On other hand, *Cercospora nebulosa* Saccardo differs from this species in having distinct leaf spot only on stems.

CERCOSPORA ALTHAEIGENA Yen & Sun, sp. nov.

(Fig. 2)

Maculis angularis vel irregulariter orbicularis, flavo-brunneis, nervuli limitatis, margine linearis et atro-brunneis, in epiphyllis plus visibilib, dispersis, 1-4 mm diam. Caespitulis invisibilib, amphiphyllis, autem principaliter hypophyllis. Mycelium immersum : hyphis pallidissime olivaceis, septatis, ramosis, laevibus, 3-5 μm latis. Stromatibus aliquantum evolutis, brunneo-olivaceis, irregulariter globosis, 20-40 μm diam. Conidiophoris principaliter hypophyllis, 2-20 in fasciculo per stomatibus emergentibus, olivaceis vel pallide olivaceis, sursum pallidioris, plerumque simplicibus, interdum ramosis, tortuosis, 1-5 septatis, 1-6 geniculatis, ad apicem leniter attenuatis et rotundatis et cicatricibus conidialibus (2,5-3 μm diam.) atro-brunneis ornatis, 30-100 x 5-6,5 μm . Conidiis obclavatis vel obclavato-cylindraceis, pallide olivaceis, rectis vel leniter curvatis, 1-7 septatis, laevibus, non constrictis, apice obtusis vel subrotundatis, basi obconico-truncatis, 25-90 x 3,5-5 μm .

Habitat in foliis vivis Althaeae roseae (L.) Cav. (Malvaceae), ad Lishan, Taiwan, leg. S.K. SUN 7 XI 1981, N° SUN : 120 (Herb. LAM YEN 10620, holotypus).

Leaf spot angular or irregularly circular, (on the same leaves parasitized by *Cercospora althaeicola* Yen & Sun), yellowish brown, vein-limited, with a linear dark brown margin, more distinct on upper surface, scattered, 1-4 mm in diameter. Caespituli invisible, amphigenous, but chiefly hypogenous. Mycelium internal : hyphae pale olivaceous or very pale olivaceous, septate, branched, smooth, 3-5 μm wide. Stromata rather developed, brown olivaceous, irregularly globular, 20-40 μm in diameter. Conidiophores generally hypophyllous, 2-20 in fascicles emerging through the stomata, olivaceous to pale olivaceous and paler towards the tip, generally simple, sometimes branched, 1-5 septate, with 1-6 small geniculations, tortuous, with a thickened dark brown conidial scar (2,5-3 μm in diameter) on the end or on the shoulders, apex attenuate and rounded, 30-100 x 5-6,5 μm . Conidia obclavate or obclavate-cylindric,

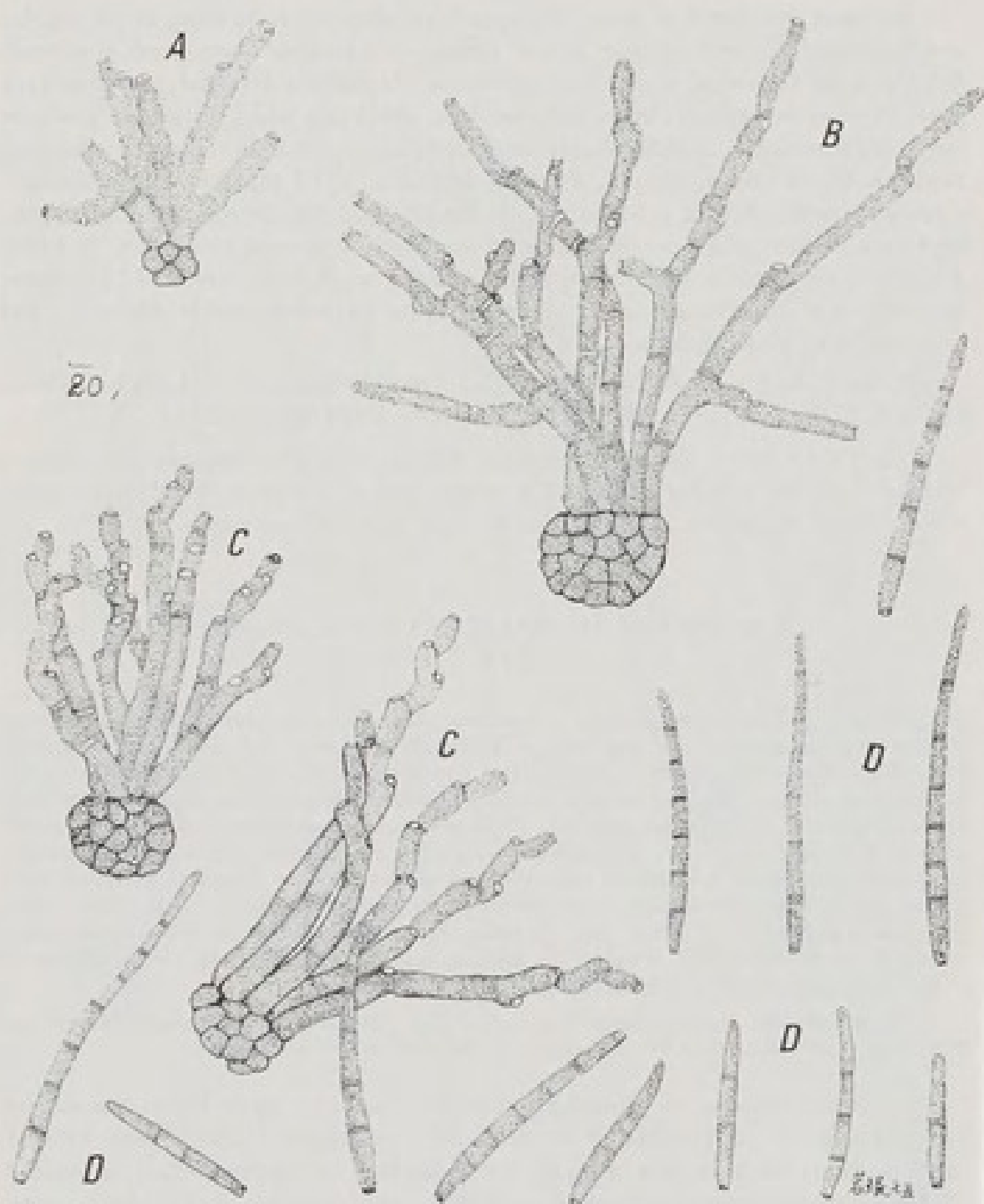


Fig. 2. — *Cercospora althaeigena*: A, Young conidiophores; B, Old and branched conidiophores; C, Old conidiophores and formation of geniculations; D, Conidia.

pale olivaceous, straight or slightly curved, 1-7 septate, smooth, not constricted, apex obtuse or subrounded, base obconically truncate, $25-90 \times 3.5-5 \mu\text{m}$.

On living leaves of *Althaea rosea* (L.) Cav. (*Malvaceae*), in Lishan, Taiwan, leg. S.K. SUN 7 XI 1981, n^o SUN : 120 (Herb. LAM YEN 10620).

Note : This species differs from others on *Althaea* in having colored obclavate or obclavato-cylindric conidia.

CLADOSPORIUM OXYSPORUM Berk. & Curt.

J. Linn. Soc., 10 : 46, 1868

(Fig. 3)

Colonies effuse, pale gray or grayish brown, very thinly hairy. Conidiophores macronematous, generally straight, distinctly nodose, dark brown below, pale olivaceous towards the tip and almost hyaline for the young prolongation, smooth, 2-8 septate, not geniculate, apex irregularly rounded and decorated by 1-3 dark brown conidial scars (2-2.5 μm in diameter), 115-500 $\times$ 6-7 μm . Conidia acrogenous, on one terminal swelling producing generally two to three conidia, simple or catenate, ellipsoidal, limoniform, or cylindric, pale to mid brown, smooth, 0-3 septate, straight, rounded at both ends which are decorated with 1-2 dark brown conidia scars, 7-24 $\times$ 3.5-6 μm .

On living leaves of *Althaea rosea* (L.) Cav. (Malvaceae), in Lishan, Taiwan, leg. S.K. SUN, 7 XI 1981, N^o SUN : 120 (Herb. LAM YEN 10621).

MYCOVELLOSIELLA PAULOWNICOLA Yen & Sun, sp. nov.

(Fig. 4)

Maculis indistinctis. Caespitulis hypophyllis, invisibilis. Mycelium primarium immersum : hyphis pallidissime olivaceis vel subhyalinis, septatis, ramosis, laevis, 2.5-3.5 μm latis. Stromatibus nullis. Mycelium secundarium superficiale : hyphis ex stomatibus oriundis, septatis, ramosis, repentis vel arcuatis, laevis, saepe pilos folii adscendentis, pallide olivaceis, 2-4 μm latis. Conidiophoris distincte hypophyllis, ex mycelium secundarium oriundis, semper simplicibus, erectis vel flexuosis, brunneo-olivaceis vel pallide olivaceis, concoloris, laevis, 1-10 septatis, non geniculatis, ad apicem rotundatis vel irregulariter rotundatis, interdum attenuatis, cicatricibus conidialis interdum visibilibus (1-2 μm diam.), 25-75 $\times$ 3-4 μm . Conidiis ellipticis, fusiformis vel ovalis, rectis, 0-3 septatis (plerumque 1 septatis), laevis, non constrictis, utrumque subrotundatis, in hilum per cicatricibus atro-brunneis ornatis, solitariis vel interdum catenulatis, 8-16(20) $\times$ 4.5-6 μm .

Habitat in foliis vivis Paulowniae taiwanianae Hu & Chang (Scrophulariaceae), ad Nantou, Taiwan, leg. S.K. SUN, 20 XI 1981, N^o SUN : 121 (Herb. LAM YEN 10622, *holotypus*).

Leaf spot indistinct or none. Caespituli hypophyllous, invisible even under hand lens. Primary mycelium internal : hyphae very pale olivaceous or subhyaline, septate, branched, smooth, 2.5-3.5 μm wide. Stromata none. Secondary mycelium external : hyphae arising from stomata, septate, branched, smooth, arcuate, generally climbing the leaf hairs, olivaceous, 2-4 μm wide, producing laterally abundant conidiophores as branches. Conidiophores strictly hypophyllous, always simple, lateral and terminal on the external mycelial hyphae, straight or flexuous, brown olivaceous or pale olivaceous, generally concolorous or somewhat paler near the apex, smooth, 1-10 septate, not geniculate, apex

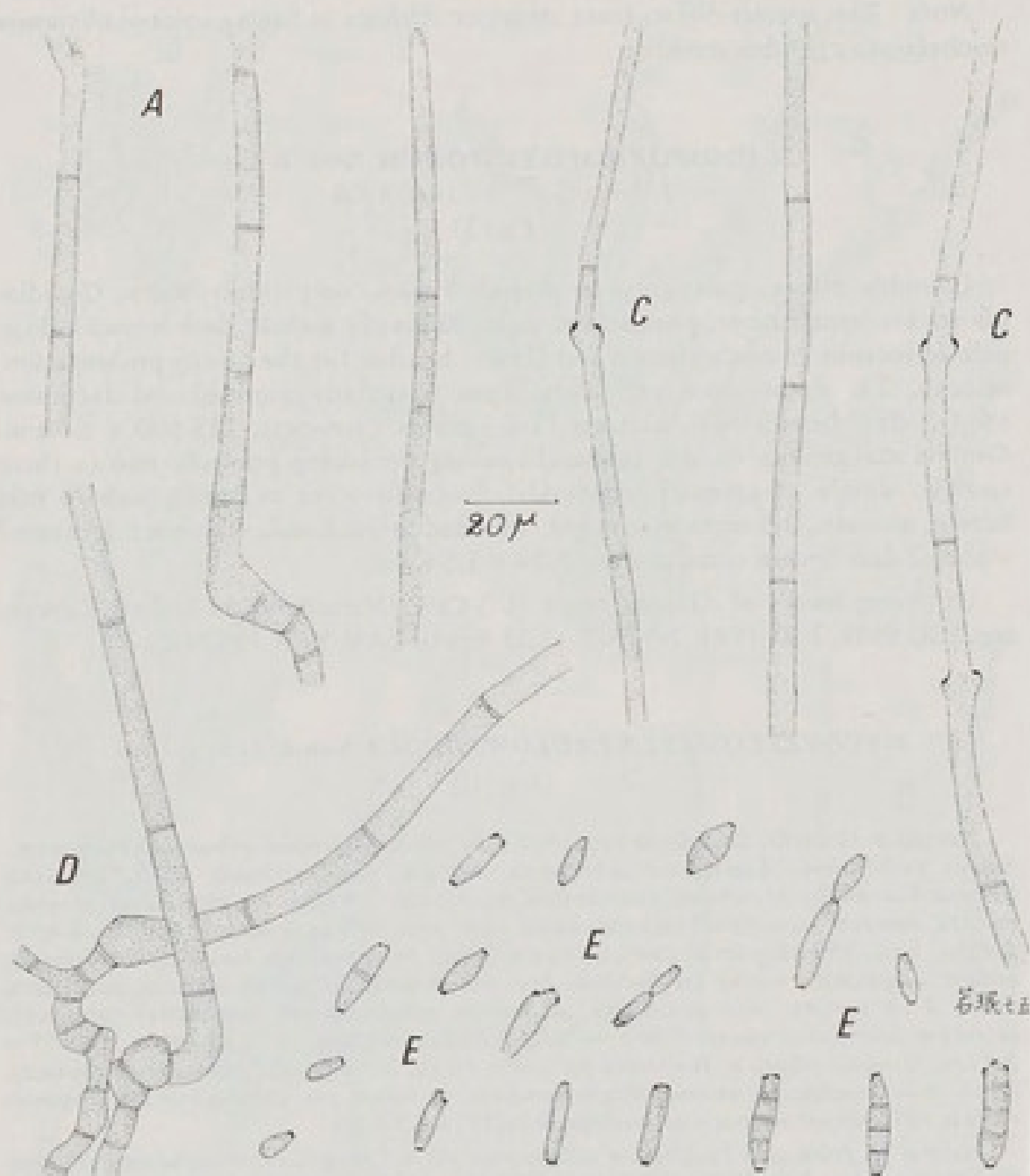


Fig. 3. — *Gladosporium oxysporum*; A, Young conidiophores; B, Formation of conidia; C, Formation of nodosity; D, Mycelial hyphae and formation of conidiophores; E, Conidia.

rounded or irregularly rounded sometimes attenuate for the old ones, conidial scars sometimes visible ($1-2\ \mu\text{m}$ in diameter), $25-75 \times 3-4\ \mu\text{m}$. Conidia elliptical, oval or fusiform, olivaceous or pale olivaceous, generally 1 septate, sometimes 0 or 3 septate, subrounded on both two ends, base decorated with a dark brown cicatrice, solitary or occasionally catenate, $8-16-(20) \times 4,5-6\ \mu\text{m}$.

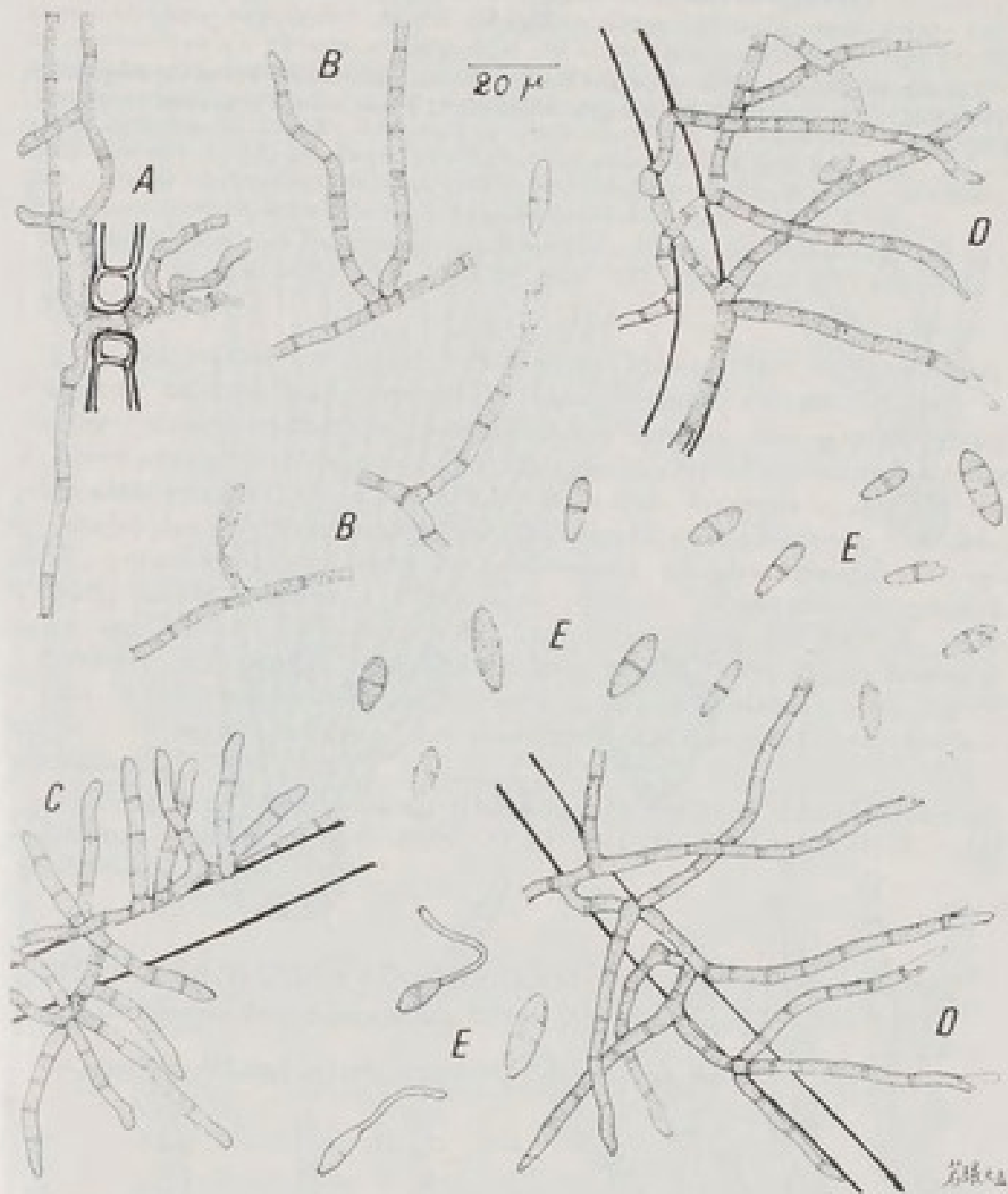


Fig. 4. — *Mycosvellosiella paulowniae*: A, Formation of external mycelium; B, Formation of conidia; C, Young conidiophores; D, Old conidiophores; E, Conidia.

On living leaves of *Paulownia taiwaniana* Hu & Chang (*Scrophulariaceae*), in Nantou, Taiwan, leg. S.K. SUN, 20 XI 1981, N° SUN : 121 (Herb. LAM YEN 10622).

Phaeoisariopsis paulowniae Yen & Sun, sp. nov.

(Fig. 5)

Maculis indistinctis vel in epiphyllis leniter visibilibus, pallidissime brunnis, irregulariter orbicularis, zona lata brunnea restrictis, dispersis, 1-8 mm diam., interdum confluentis.

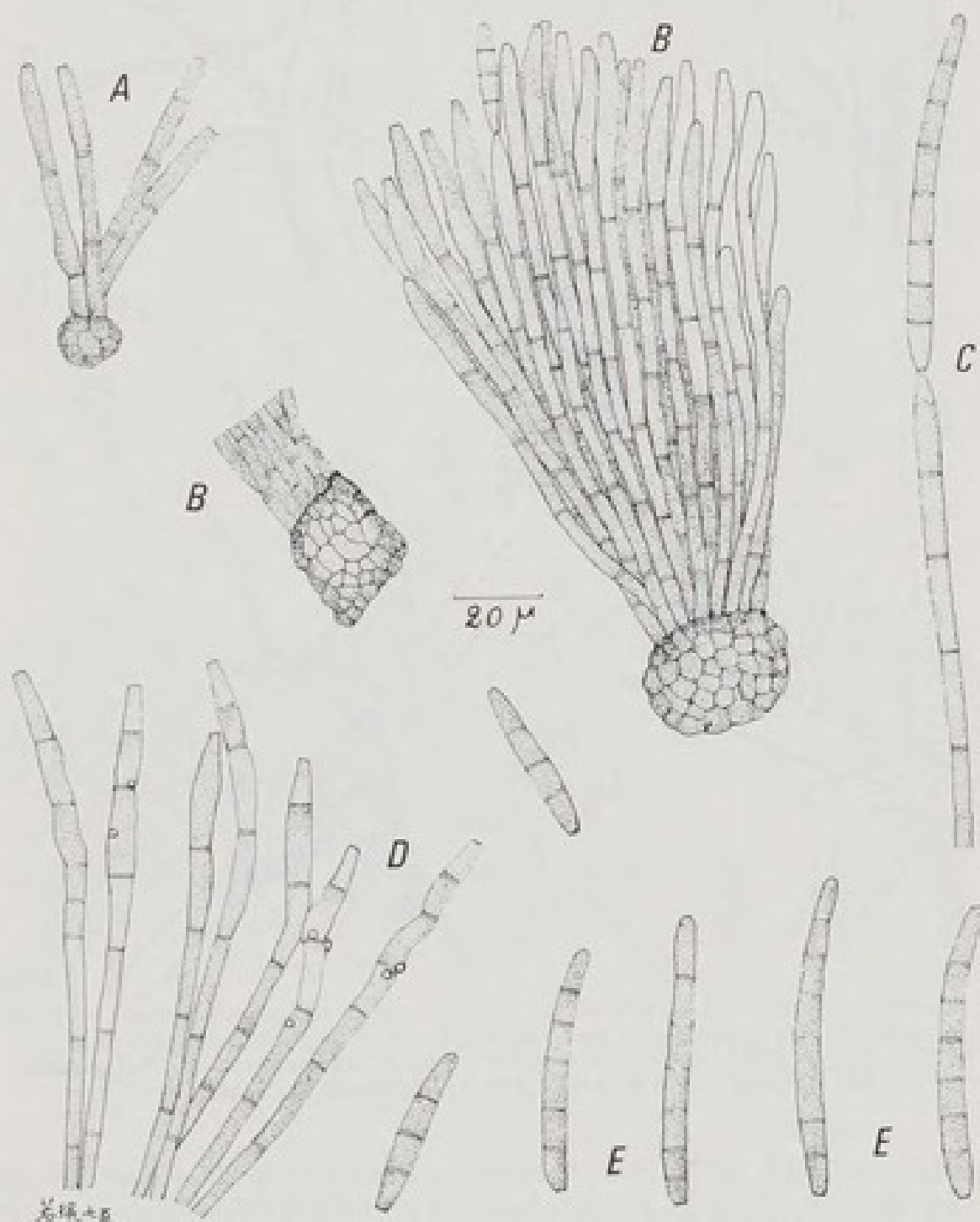


Fig. 5. — *Phaeoisariopsis paulowniae*: A, Young conidiophores; B, Stromata and synnemalous fascicles; C, Formation of conidia; D, Upper part of conidiophores; E, Conidia.

Caespitulis amphiphyllis, in hypophyllo atro-griseis et effusis, in epiphyllis atro-punctiformis. Mycelium immersum : hyphae subhyalinis, laevibus, ramosis, septatis, 3-4 μm latis. Stromatibus brunnis, globosis, vel subglobosis, 18-35 μm diam. Conidiophoris amphiphyllis, pallide olivaceis, concoloris, numerosis in fasciculo synnematiforme aggregatis, per stomatibus emergentis, plerumque rectis, simplicibus, ad apicem rotundatis vel subtruncatis, inferne cylindraceis, 3,5-4 μm latis, superne leniter superlatis, 6-6,5 μm latis, 1-8 septatis, non geniculatis, 40-135 μm longis, cicatricibus conidialis visibilibus, atro-brunnis, 2-2,5 μm diam. Conidiis obclavato-cylindraceis, pallide olivaceis, saepe leniter curvatis, 3-8 septatis, laevibus, non constrictis, apice rotundatis, basi obconico-subtruncatis, 30-92 x 5-7 μm .

Habitat in foliis vivis *Paulowniae taiwanianae* Hu & Chang (*Scrophulariaceae*), ad Nan-tou, Taiwan, leg. S.K. SUN, 20 XI 1981, N° SUN : 121 (Herb. LAM YEN 10622, Holotypus).

Leaf spot indistinct or slightly visible on the upper surface, very pale brown, irregularly orbicular and bordered by brown margin, scattered, 1-8 mm in diameter, sometimes confluent. Caespituli amphigenous, dark grey and effuse on lower surface, dark punctiform on upper surface. Mycelium internal : hyphae subhyaline, smooth, septate, branched, 3-4 μm wide. Stromata brown, globular or subglobular, 18-35 μm in diameter. Conidiophores amphigenous, pale olivaceous, concolorous, numerous in synnematous fascicles emerging through stomata, simple, generally straight, apex rounded or subtruncate, cylindric below and 3,5-4 μm wide, more or less hypertrophic above and 6-6,5 μm wide, 1-8 septate, not geniculate, 40-135 μm long, conidial scars visible, brown, 2-2,5 μm in diameter. Conidia obclavate-cylindric, pale olivaceous, often slightly curved, 3-8 septate, smooth, not constricted, apex rounded, base obconic-subtruncate, 30-92 x 5-7 μm .

On living leaves of *Paulownia taiwaniana* Hu & Chang (*Scrophulariaceae*), in Nan-tou, Taiwan, leg. S.K. SUN, 20 XI 1981, N° SUN : 121 (Herb. LAM YEN 10622).

PSEUDOCERCOSPORA FENGSHANENSIS (Lin & Yen) Yen, comb. nov.

= *Cercospora fengshanensis* Lin & Yen. *Rev. de Mycol.* 35 : 317, 1971.

On *Musa* sp. (*Musaceae*), in Fengshan, Taiwan.

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