

Fungi Associated with Moribund Branches of Rosa Species

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During routine plant disease survey of the Allahabad Agricultural Institute campus twelve different species of fungi were found to be associated with dying branches of *Rosa* spp. The present paper includes their description. Among these fungous species, two were found to belong to undescribed genera, and seven to undescribed species. Of the latter seven, four belong to the genera *Leptosporella*, *Diplopeltis*, *Leptothyrella* and *Actinothyrella* thus far unreported from India. The remaining three, however, belong to species of *Fusicoccum*, *Discosia* and *Macrophoma*. New species of *Leptosporella*, *Diplopeltis*, *Leptothyrella*, *Actinothyrella*, *Fusicoccum* and *Macrophoma* have been created on the basis of their occurrence on a hitherto unreported host.

Leptosporella rosae sp. nov.

Perithecia carbonacea, plus minusve globosa, 224—340 μ diam.; ostiolo 50 μ longo, 70 μ crasso praedita; asci numerosi, clavati, crassiuscule tunicati, 48—85 $\mu \times$ 9—10 μ , aparaphysati; sporae subhyalinae, aciculares, plerumque 32-septatae, 48—86 $\mu \times$ 1,5 μ .

Perithecia dark, almost carbonous, more or less spherical, 224—340 μ in diameter with ostiole on a short neck about 50 μ high up to 70 μ wide, paraphyses not observed; asci numerous, clavate, wall hyaline, somewhat thickened at free end and evanescent, measuring 48—85 $\mu \times$ 9—10 μ ; ascospores sub-hyaline, acicular, muricate with mostly 32 septa, measuring 48—86 $\mu \times$ 1.5 μ .

Microthyrium quercus Fuckl.

Ascomata dark-brown, superficial, dimidiate, measuring 200—300 μ wide and 30—40 μ high, covered by scutellum with thick-walled, irregularly shaped cells, 4—8 μ long and 3—4 μ wide, radiating from centre and transversely by septate, 2—3 μ wide, pale-brown hyphae; wall of ascoma a layer of dark cells, 2—4 μ thick, apex of ascoma consisting of a group of light-coloured, relatively smaller cells, forming a circular region, 7—12 μ wide, disintegrating later to form ostiole; the base

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of ascoma lined by 4—5 layers of hyaline, polygonal cells, 2—3 μ wide each; asci in a central cluster, intermixed with septate, hyaline, pseudoparaphysis-like hyphae and surrounded by hyaline pseudoparenchymatous cells, broadly clavate, 4—5 μ wide at apex and 2—2.5 μ wide at base: 29—36 μ long and 9—10 μ wide, bitunicate, converging towards ostiole; ascospores mostly biseriate, hyaline, two-celled, 7—9 $\times$ 3—4 μ , the apical cell broader with rounded end somewhat larger than the conoid basal cell. In India this is the first report of the fungus on rose although it has been reported on *Quercus incana* by Munjal et al. (1959).

Kellermanniopsis gen. nov.

Pycnidia subepidermalia, subglobosa, ostiolata; *Conidia* acrogena, hyalina vel subhyalina, fusioidea, 4-cellularia, superne ciliis hyalinis praedita; conidiophori simplices, continui.

Pycnidia dark, subepidermal, sphaeroid, ostiolate; conidiophores hyaline, simple, continuous, bearing hyaline to sub-hyaline, fusoid, singly and vertically arranged, four-celled conidia each with a single hyaline seta at the free end.

This genus differs from *Kellermannia* Ellis & Everh. in having always 4-celled conidia with the middle two cells sub-hyaline and larger than the terminal cells (Barnett, 1960).

Kellermanniopsis rosae sp. nov.

Pycnidia subepidermalia, plus minerve globosa, obscure brunnea, 130—260 μ diam.; ostiolo 15—20 μ lato, aperto, conidia acrogena, hyalina vel subhyalina, fusioidea, 4-cellularia, 17—20 $\mu \times$ 3—4 μ , cellulis duabus mediis majoribus cylindraceis, apicalibus conoideis, setis hyalinis, 3—6 μ longis terminalibus praedita; conidiophori simplices, continui, 4—5 $\mu \times$ 2 μ .

Pycnidia subepidermal, more or less sphaerical, dark-brown 130—260 μ in diameter, opening by ostiole, 15—20 μ wide; conidiophores lining practically the entire inner surface of pycnidial wall, hyaline, simple, non-septate, measuring 4—5 $\mu \times$ 2 μ , bearing single fusoid, subhyaline, four-celled conidia, measuring 17—20 $\mu \times$ 3—4 μ , the middle two cells larger than the more or less conoid end cells, the apical cells bearing hyaline, simple setae, 3—5 μ long.

Fusicoccum rosae sp. nov.

Pycnidia obscura, interdum depressa, subepidermalia, erumpentia, 140—245 $\times$ 87—110 μ ; ostiolo rotundato, 10—15 μ lato; conidia acrogena, subfusioidea, continua, 4—5,5 $\times$ 1,5—2 μ ; conidiophori 7—11 $\times$ 1,5—2 μ .

Pycnidia dark, somewhat flattened, subepidermal, becoming erumpent later, stromatic, measuring 140—245 $\times$ 87—100 μ , ostiole circular,

10—15 μ wide, pycnidial inner wall lined by hyaline, aseptate conidiophores, measuring 7—11 $\times$ 1.5—2 μ , bearing singly hyaline, one-celled, fusoid conidia 4—5.5 μ long and 1.5—2 μ wide.

Dothiorella phaseoli (Maubl.) Petr. and Syd.

Pycnidia dark-brown to almost black, scattered, erumpent, globose, 150—212 μ in diameter, ostiole circular, 12—15 μ wide, inner pycnidial wall lined by one-celled, hyaline conidiophores, bearing single, hyaline, thin-walled, more or less cylindrical conidia measuring 10—14 $\times$ 3.5—5 μ with width to length ratio of nearly 1 : 3.

Macrophoma rosae sp. nov.

Pycnidia dispersa, obscura, innata, ostiolo 16—20 μ lato erumpentia, 140—420 μ diam.; conidia ovoidea, hyalina, unicellularia, episporio crassiusculo, 15—24 $\times$ 8.5 μ ; conidiophori simplices, 15—18.5 $\times$ 1.5—2.5 μ .

Pycnidia dark, more or less scattered, 140—420 μ in diameter, almost buried in the host tissue except for short, slightly protruding ostiole, 16—20 μ wide. Inner wall of pycnidia lined by hyaline, continuous, simple conidiophores, measuring 15—18.5 $\times$ 1.5—2.5 μ , bearing ovoid, hyaline, thick-walled, one-celled conidia measuring 15—24 $\times$ 8.5 μ .

Botryodiplodia theobromae Pat.

Pycnidia dark, carbonous, sphaerical, erumpent, about 250 to 300 μ in diameter, ostiolate; conidiophores simple, hyaline, short, measuring 20—25 $\times$ 10—12 μ , mature conidia dark-brown to sub-hyaline, ovoid with measurements of mature conidia.

Discosiopsis gen. nov.

Pycnidia subcuticularia, dimidiata, clypeiformia, ostiolata; conidia 4-cellularia, cylindraceo-fusoidea, antice cilia 2—3-ramulosa terminata; conidiophori unicellulares, hyalini.

Pycnidia subcuticular, dark-brown, separate, dimidiate, shield-like, ostiolate; conidiophores hyaline, one-celled, bearing hyaline, four-celled cylindroid conidia with hyaline, dichotomously to trichotomously branched cilia from apical cell.

The genus is close to *Discosia* Lib. but differs from it in having four-celled conidia with dichotomously to trichotomously branched cilia from apical cells with no appendage from the basal cell (Barnett, 1960).

Discosiopsis rosae sp. nov.

Pycnidia dispersa, obscure brunnea, dimidiata, plerumque orbicularia, 210—245 μ diam., pariete apicali pseudoparenchymatico e cellulis irregulariter angulosis, 5—8 μ composito, in centro ostiolo 8—13 μ

lato aperto; conidia 4-cellularia, cylindraceo-fusoidea, $12-14 \times 3-4 \mu$, antice cilia 2—3-ramulosa terminata; conidiophori unicellulares, simplices $4,5-5 \times 2 \mu$.

Pycnidia scattered, dark-brown, dimidiate, almost circular, $210-245 \mu$ in diameter, the shield-like outer wall composed of polygonal cells, measuring $5-8 \mu$, radiating from more or less centrally located ostiole, $8-13 \mu$ wide; conidiophores simple, hyaline, measuring $4,5-5 \times 2 \mu$, bearing single, hyaline, more or less cylindrical, four-celled conidia, measuring $12-14 \times 3-4 \mu$ with apical cell possessing dichotomously to trichotomously branched hyaline cilia almost as long as the conidia.

***Discosia rosae* sp. nov.**

Pycnidia dispersa, minuta, obscure brunnea, dimidiata, subcuticularia, plus minusve orbicularia, $182-245 \mu$ diam., pariete apicali clypeiformi pseudoparenchymatico e cellulis marginalibus $4,2-7 \times 3-6 \mu$ et centralibus $10-15 \mu$ composito; conidia anguste fusoidea utrinque paulatim attenuata et acuminata, plus minusve arcuata, $14-18 (15,4) \times 1,2-2,1 (1,9) \mu$, utrinque appendiculo $2-3 \mu$ longo, acuminato praedita; conidiophori continui, $3-5 \mu$ longi.

Pycnidia scattered, minute, dark-brown, dimidiate, non-subiculate, subcuticular, more or less circular, measuring $182-245 \mu$ in diameter, the shield-like wall of pycnidium composed of polygonal to elongate rectangular cells with middle and outer cells measuring $4,2-7 \mu$ and $3-6 \mu$ respectively, the central cells within a diameter of $10-15 \mu$ somewhat loosely packed forming ostiole after dissolution; conidiophores simple, short, $3-5 \mu$ long, bearing single, fusoid, three-celled, hyaline conidia, measuring $14-18 \mu (15,4 \mu) \times 1,2-2,1 \mu (1,9 \mu)$ with the tips extended to form non-septate, beak-like structure, $2-3 \mu$ long, beak of apical cell usually a little longer than that of the basal; average width to length ratio of conidia, $1:8$. *D. rosae* is close to *D. artocreas* reported by Choma et al. (1957) on *Pyrus communis* and by Hasija (1962) on *Terminalia* but differs from it in having narrower conidia with width to length ratio of $1:8$ as against $1:4$ in the latter and being found associated with rose.

***Diplopeltis rosae* sp. nov.**

Pycnidia singularia, obscura, orbicularia, dimidiata, erumpentia, $140-245 \mu$ diam, pariete apicali clypeiformi pseudoparenchymatico e cellulis angulosis $5-7 \mu$ diam. composito, ostiolo $12-7 \mu$ lato aperto, conidia ellipsoidea vel oblongo-ovoidea, utrinque late rotundata, medio septata, obscure brunnea, $6-8 \times 5 \mu$; conidiophori simplices, continui, $5-8 \times 1,5-2 \mu$.

Pycnidia dark, separate, circular, dimidiate, erumpent, measuring $140-245 \mu$ in diameter, the outer shield-like wall of pycnidium com-

posed of polygonal cells measuring 3—7 μ , radiating from the centrally located circular ostiole, 12—17 μ wide; conidiophores simple, aseptate 5—8 $\times$ 1,5—2 μ , bearing singly dark-brown, two-celled, oblong, thick-walled conidia, measuring 6—8 $\times$ 5 μ .

***Leptothyrella rosae* sp. nov.**

Pycnidia dispersa, minuta, obscure brunnea, dimidiata, subcuticularia, plus minusve orbicularia, 150—250 μ diam., pariete apicali clypeiformi pseudoparenchymatico e cellulis angulosis 4—6 $\times$ 3—4 μ composito, ostiolo 20—25 μ lato aperto; conidia oblongo fusioidea, utrinque plus minusve attenuata, obtusa, medio septata, ad septum vix contracta, hyalina, 10—11 $\times$ 2—3 μ ; conidiophora simplicia, continua, previa.

Pycnidia scattered, minute, dark-brown, dimidiate, subcuticular, more or less circular, 150—250 μ in diameter, the shield-like wall of pycnidium composed of polygonal to elongate rectangular cells with middle and outer cells measuring 4—6 $\times$ 3—4 μ respectively, radiating from the centrally located circular ostiole, 20—25 μ wide; conidiophores simple, short, non-septate, hyaline, bearing singly hyaline, ellipsoid, two-celled conidia, measuring 10—11 $\times$ 2—3 μ .

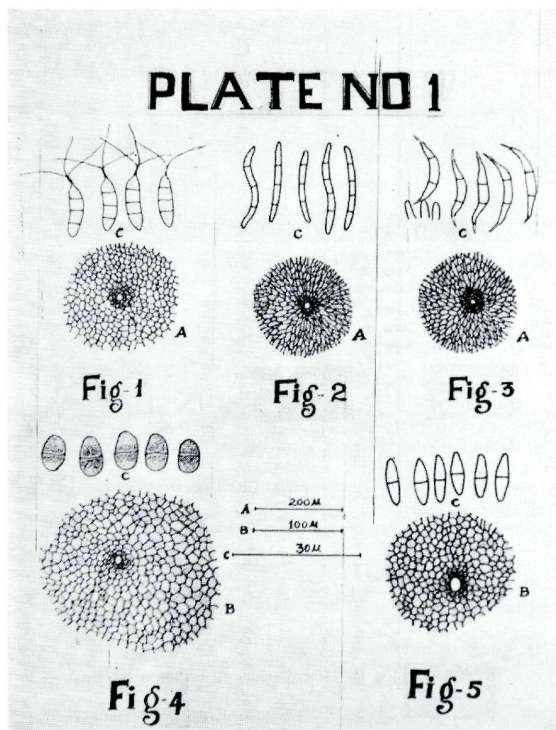
***Actinothyrella rosae* sp. nov.**

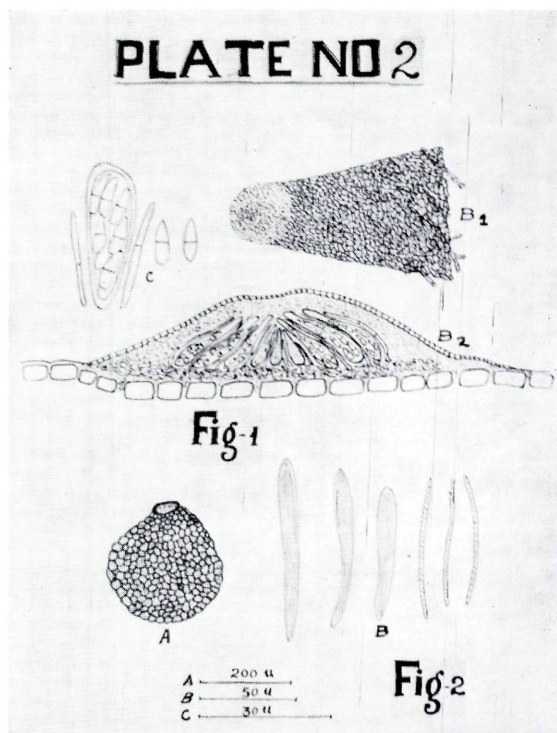
Pycnidia dispersa, minuta, obscure brunnea, dimidiata, subcuticularia, plus minusve orbicularia, 150—280 μ diam., pariete apicali clypeiformi pseudoparenchymatico e cellulis angulosis 3—5 μ vel 4—9 $\times$ 2—4 μ composito, ostiolo 12—17 μ lato, aperto; conidia crassiuscule filiformia, utrinque parum sed distincte attenuata, obtusa, 3—4-septata, hyalina, plus minusve curvula vel undulata, raro fere recta, 18—25 $\times$ 1,4 μ ; conidiophori simplices, 3—4 $\times$ 1,5 μ .

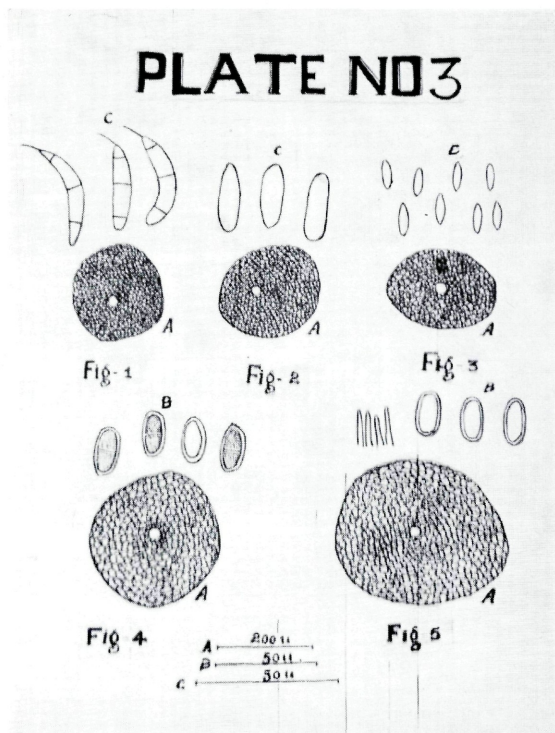
Pycnidia scattered, minute, dark-brown, dimidiate, non-subiculate, subcuticular, more or less circular, measuring 150—280 μ in diameter, the shield-like wall of pycnidium composed of polygonal to elongate rectangular cells with middle and outer cells measuring 3—5 μ and 4—9 $\times$ 2—4 μ respectively, the central cells within a diameter of 10—15 μ , somewhat loosely packed, forming an ostiole after dissolution, 12—17 μ wide; conidiophores short, hyaline, simple, measuring 3—4 $\times$ 1,5 μ , bearing single, simple, hyaline, 3—4 septate, filamentous, straight to undulating conidia with bluntly conoid tips, measuring 18—25 $\times$ 1,4 μ , the average width to length ratio being 1 : 16.

A c k n o w l e d g e m e n t

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Plate No. 1

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| Fig. 1. <i>Discosiopsis rosae</i> | A. Pycnidium | C. Conidia |
| Fig. 2. <i>Actinothyrella rosae</i> | A. Pycnidium | C. Conidia |
| Fig. 3. <i>Discosia rosae</i> | A. Pycnidium | C. Conidia |
| Fig. 4. <i>Diploteltis rosae</i> | B. Pycnidium | C. Conidia |
| Fig. 5. <i>Leptothyrella rosae</i> | B. Pycnidium | C. Conidia |

Plate No. 2

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|--------------------------------------|-------------------------|
| Fig. 1. <i>Microthyrium quercus</i> | C. Ascus and Ascospores |
| B1. Part of surface view of Ascomata | |
| B2. T.S. of Ascomata | |
| Fig. 2. <i>Leptospora rosae</i> | B. Asci and Ascospores |
| A. Perithecium | |

Plate No. 3

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| Fig. 1. <i>Kellermanniaopsis rosae</i> | A. Pycnidium | C. Conidia |
| Fig. 2. <i>Dothiorella phaseoli</i> | A. Pycnidium | C. Conidia |
| Fig. 3. <i>Fusicoccum rosae</i> | A. Pycnidium | C. Conidia |
| Fig. 4. <i>Botryodiplodia theobromae</i> | A. Pycnidium | C. Conidia |
| Fig. 5. <i>Macrophoma rosae</i> | A. Pycnidium | C. Conidia |

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