

PHAEOSEPTORIA EUCALYPTI AND CONIOTHYRIUM OVATUM ON EUCALYPTUS SPP. IN SOUTH AFRICA*

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ABSTRACT

Key words: *Eucalyptus*, foliar pathogens, *Phaeoseptoria eucalypti*, *Coniothyrium ovatum*

We report the host range and distribution of two *Eucalyptus* leaf pathogens, *Coniothyrium ovatum* and *Phaeoseptoria eucalypti* in South Africa. *C. ovatum* occurred mainly on *E. cladocalyx* at Stellenbosch, whereas *P. eucalypti* was found on a wide range of *Eucalyptus* spp. in various localities. The symptoms and possible importance of these two pathogens are discussed.

Uittreksel

PHAEOSEPTORIA EUCALYPTI EN CONIOTHYRIUM OVATUM OP EUCALYPTUS SPP. IN SUID-AFRIKA

Die gasheerreeks en verspreiding in Suid-Afrika van twee *Eucalyptus*-blaarpatogene, *Coniothyrium ovatum* en *Phaeoseptoria eucalypti* word aangeteken. *C. ovatum* het hoofsaaklik op *E. cladocalyx* in die Stellenbosch-omgewing voorgekom. *P. eucalypti* is op verskeie plekke in Suid-Afrika op 'n wye *Eucalyptus*-gasheerreeks gevind. Die simptome en moontlike inslag wat die twee patogene op klonale vermeerdering kan hê, word bespreek.

Eucalypts are important commercial timber species and cover approximately half the forest plantings in South Africa (Department of Environment Affairs, 1987). The number of foliar parasites recorded on eucalypts exceeds that on any other tree genus (Marks, Fuhrer & Walters, 1982). Despite this, very little atten-

tion has been given to the local foliicolous pathogens of *Eucalyptus* spp. A recent abstract (Wingfield, 1987) reported the presence of two previously unrecorded eucalypt leaf pathogens, *Phaeoseptoria eucalypti* Hansf. emend. Walker and *Coniothyrium ovatum* Swart in South Africa. Here we provide details of the occurrence

TABLE 1 Distribution and host range of *Phaeoseptoria eucalypti* in South Africa

Host	Location	Province ^a	Collection date
<i>E. bicostata</i>	Helvetia	E.T.	March 1988
<i>E. camaldulensis</i>	Stellenbosch	C	June 1986, November 1987
<i>E. cladocalyx</i>	Kwambonambi	N	April 1987
<i>E. dunnii</i>	Helvetia	E.T.	March 1988
<i>E. globulus</i>	Stellenbosch	C	June 1986, November 1987
<i>E. globulus</i>	Franschhoek	C	February 1988
<i>E. grandis</i>	Tokai	C	November 1987
<i>E. grandis</i>	Kwambonambi	N	April 1987
<i>E. grandis</i>	Pietermaritzburg	N	April 1987
<i>E. grandis</i>	Stellenbosch	C	January 1988
<i>E. grandis</i>	Helvetia	E.T.	March 1988
<i>E. grandis</i>	Sabie	E.T.	April 1987
<i>E. grandis</i>	Isidengi	E.C.	April 1987
<i>E. grandis</i> (cuttings)	Kwambonambi	N	April 1987
<i>E. grandis</i> (cuttings)	Pietermaritzburg	N	April 1987
<i>E. grandis</i> (eucalypt hedges)	Kwambonambi	N	April 1987
<i>E. grandis</i> (eucalypt hedges)	Port Durnford	N	April 1987
<i>E. grandis</i> (eucalypt hedges)	Pietermaritzburg	N	April 1987
<i>E. grandis</i> × <i>camaldulensis</i>	White River	E.T.	March 1988
<i>E. grandis</i> × <i>cladocalyx</i>	Kwambonambi	N	April 1987
<i>E. grandis</i> × <i>nitens</i>	White River	E.T.	March 1988
<i>E. grandis</i> × <i>tereticornis</i>	White River	E.T.	March 1988
<i>E. grandis</i> × <i>tereticornis</i>	Kwambonambi	N	April 1987
<i>E. grandis</i> × <i>urophylla</i>	White River	E.T.	March 1988
<i>E. grandis</i> × <i>urophylla</i>	Kwambonambi	N	April 1987
<i>E. macarthurii</i>	Helvetia	E.T.	March 1988
<i>E. macarthurii</i> × <i>grandis</i>	White River	E.T.	March 1988
<i>E. macarthurii</i> × <i>grandis</i>	Seven Oaks	N	July 1986
<i>E. macarthurii</i> × <i>tereticornis</i>	Seven Oaks	N	July 1986
<i>E. maidenii</i>	Stellenbosch	C	June 1986
<i>E. nitens</i>	Stellenbosch	C	June 1986, January 1988
<i>E. nitens</i>	Sabie	E.T.	January 1988
<i>E. nitens</i>	Durban	N	April 1987
<i>E. nova-anglica</i>	Stellenbosch	C	January 1988
<i>E. quadrangulata</i>	Frankfort	E.T.	March 1988
<i>E. resinifera</i>	Frankfort	E.T.	March 1988
<i>E. saligna</i>	Helvetia	E.T.	March 1988
<i>E. saligna</i>	Stellenbosch	C	June 1986
<i>E. tereticornis</i>	Seven Oaks	N	July 1986
<i>E. tereticornis</i>	Kwambonambi	N	April 1987
<i>E. urophylla</i>	Kwambonambi	N	April 1987

^a C = Cape Province; E.C. = Eastern Cape; E.T. = Eastern Transvaal; N = Natal

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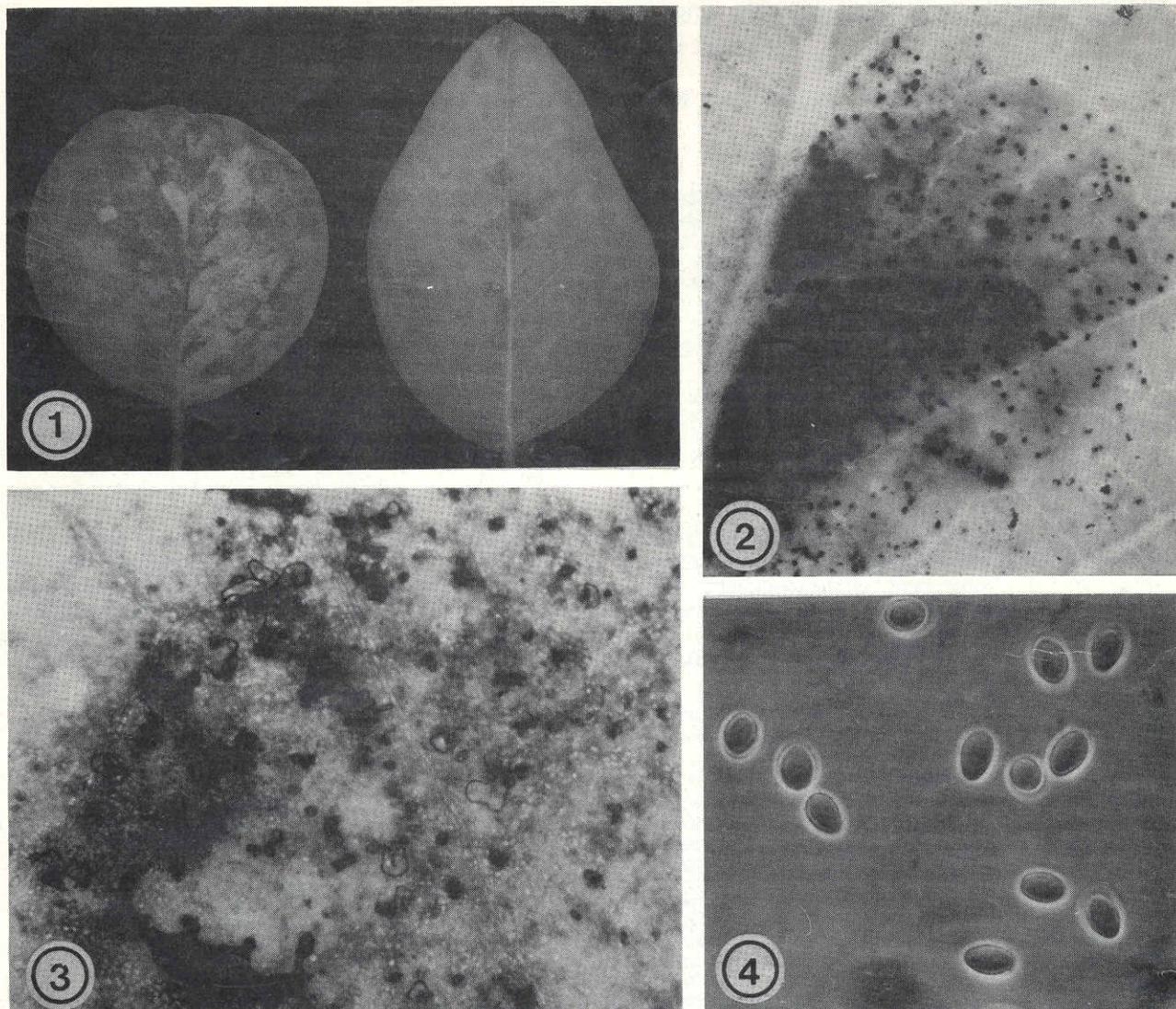


FIG. 1-4 Symptoms, pycnidia and conidia of *Coniothyrium ovatum*. FIG. 1 Symptoms on lower and upper leaf surfaces; FIG. 2 Substomatal pycnidia ($\times 10$); FIG. 3 Pycnidia with conidia exuding in cirri ($\times 32$); FIG. 4 Dark brown, verrucose conidia ($\times 1\ 500$)

and host ranges of these pathogens and their possible impact on local eucalypt propagation.

Provenance trials of *Eucalyptus* spp. established at Stellenbosch in the Cape Province and at Seven Oaks in Natal were examined. Both stands had been planted in 1980. The Stellenbosch stand consisted of 19 species from 90 progenies, whereas the Seven Oaks stand had 15 species from 71 progenies (Wattle Research Institute, 1981). Diseased eucalypt leaves were also collected during routine forest disease surveys throughout South Africa.

Leaves were examined after incubation for 24 h at 25 °C in moist chambers under mixed fluorescent and near-ultraviolet (360 nm) lights.

Coniothyrium ovatum

According to Sutton (1971, 1975) only three species of *Coniothyrium* Cda. are known from *Eucalyptus*: *C. eucalypticola* Sutton, *C. ahmadii* Sutton and *C. kallangurensis* Sutton & Alcorn. However, Swart (1986) recently distinguished two additional leaf-spotting species, *C. ovatum* and *C. parvum* from Australia.

We recorded a leaf spot caused by a *Coniothyrium* sp. on *E. cladocalyx* F. Muell. in the Brandwacht and Pagaaiberg areas of Stellenbosch, and on *E. cladocalyx* and

E. lehmannii Preiss: Schauer at Kuilsriver and Gordon's Bay. It occurred mainly on the lower branches of mature trees, and on young coppice undergrowth, causing a prominent discolouration of the upper surface of juvenile leaves. The leaf spots were irregular and dispersed randomly over the leaf (Fig. 1). They were dark purple to almost black in the middle, changing to purplish-brown towards the edges. On the upper leaf surface they were light to dark brown but black in places due to extruded conidia (Fig. 2, 3). Pycnidia were black, substomatal, gregarious and concentrated only on the abaxial leaf surface. Abundant conidia (Fig. 4) were forced from pycnidia in long, curling, black cirri. Pycnidia and conidia were typical of members of the genus *Coniothyrium*. Conidia measured 7-(8,5)-10 \times 5-(5,2)-6 μm , approximating those of *C. ovatum* (Swart, 1986).

C. ovatum has a limited distribution and host range and seems to be of little importance at this stage.

Specimens of *C. ovatum* (PREM 49001) have been deposited in the National Collection of Fungi, Plant Protection Research Institute, Pretoria.

Phaeoseptoria eucalypti

P. eucalypti has been recorded on six *Eucalyptus* spp. in Australia (Hansford, 1957; Heather, 1967a, 1967b; Walker, 1962), five in Malawi (Chipompha, 1987), two

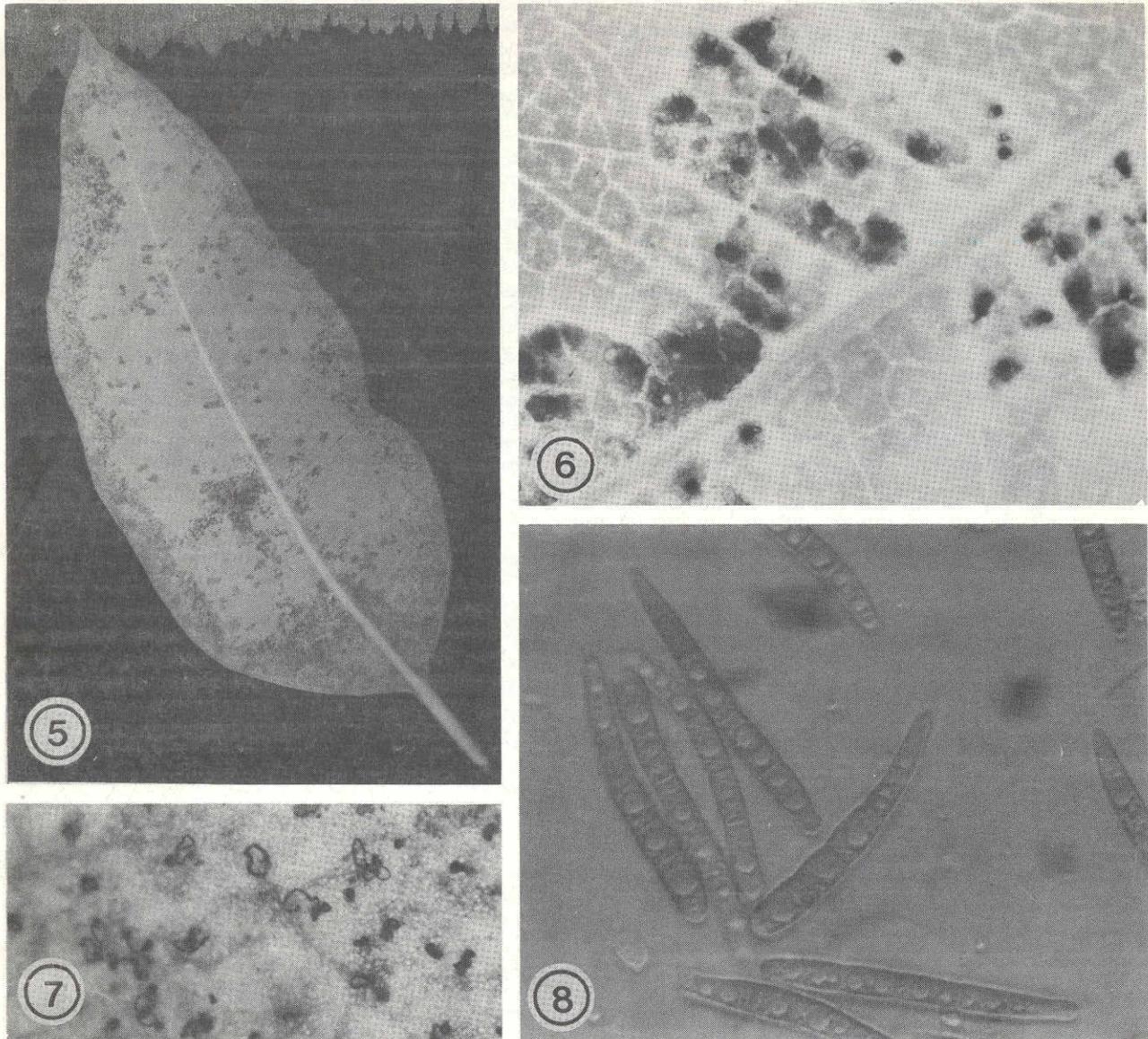


FIG. 5-8 Symptoms, pycnidia and conidia of *Phaeoseptoria eucalypti*. FIG. 5 Lower leaf surface showing lesions and conidial masses; FIG. 6 Lesions with substomatal pycnidia ($\times 10$); FIG. 7 Black cirri exuding from pycnidia ($\times 32$); FIG. 8 Light brown conidia with 3-4-7 septa ($\times 1750$)

in India (Sharma & Mohanan, 1981) and one in New Zealand (Dick, 1982).

We collected *P. eucalypti* on a number of *Eucalyptus* spp. from many localities in South Africa (Table 1). Lesions were discrete, irregularly shaped, amphigenous and purple to brownish (Fig. 5). Substomatal pycnidia were predominant on the lower sides of the leaves (Fig. 6). Conidia were forced from pycnidia in long black cirri (Fig. 7). Pycnidia and conidia resembled those of *P. eucalypti* and spores measured $40\text{--}(47)\text{--}55 \times 4\text{--}(5)\text{--}6 \mu\text{m}$ (Fig. 8). Measurements fitted those given by previous authors (Walker, 1962; Dick, 1982; Chipompha, 1987) for *P. eucalypti*.

Heather (1967b) noted that the lower leaves of *E. grandis* are more susceptible than the younger, upper leaves. In this study we found *P. eucalypti* on the older leaves of a number of hosts of varying ages, ranging from nursery stock to young and mature trees. Heather (1971) observed that all the members of the subgenus *Symphyomyrtus* are susceptible to *P. eucalypti*. According to a classification of eucalypts (Pryor & Johnson, 1971) all the South African hosts of *P. eucalypti* belong to this subgenus, with *E. grandis* Hill: Maid. covering

almost 80 % of all the plantings (Department of Environment Affairs, 1987).

Chipompha (1987) has reported severe infection of *E. camaldulensis* Dehnh. and *E. tereticornis* Sm. in Malawi. He also reported increased disease intensity in closely-spaced plantings and a higher disease intensity and death of seedlings in nurseries.

P. eucalypti is potentially an important pathogen in South Africa. It is widely distributed and occurs on the most widely planted *Eucalyptus* spp. in this country. The recent change to clonal propagation of *Eucalyptus* spp. also raises the concern that certain clones could be particularly susceptible to this pathogen.

Specimens of *P. eucalypti* (PREM 49009, 49010, 49011, 49012, 49013, 49014, 49031, 49032, 49033, 49034, 49035) have been deposited in the National Collection of Fungi, Plant Protection Research Institute, Pretoria.

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