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RESEARCH NOTE

NEWLY-RECORDED FOLIAGE FUNGI OF *EUCALYPTUS* SPP. IN SOUTH AFRICA*

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ABSTRACT

Key words: *Botryosphaeria ribis, Eucalyptus, Fairmaniella leprosa, Harknessia eucalypti, Harknessia globosa*

Fairmaniella leprosa, Harknessia eucalypti, H. globosa and *Botryosphaeria ribis* are newly-recorded on leaves of *Eucalyptus* in South Africa. Material filed as *Harknessia uromycoides* (PREM 2261) had been incorrectly identified.

Uittreksel

EERSTE AANMELDING VAN BLAARSWAMME VAN EUCALYPTUS *SPP. IN SUID-AFRIKA*

Fairmaniella leprosa, Harknessia eucalypti, H. globosa *en* Botryosphaeria ribis *is vir die eerste keer op* Eucalyptus-*blare in Suid-Afrika aangemeld. Dit is gevind dat materiaal geliaseer as* Harknessia uromycoides *(PREM 2261) verkeerd geïdentifiseer is.*

Eucalyptus spp. are becoming increasingly important to the South African forest industry (Directorate National Forestry Planning, 1987). A study of *Eucalyptus* leaf diseases was therefore initiated. It included surveys of *Eucalyptus* plantations and provenance trials throughout the country. In this paper we report on the occurrence of *Fairmaniella leprosa* (Fairm.) Petrak & Syd., *Harknessia eucalypti* Cke. apud Cke. & Hark. and *Harknessia globosa* Sutton as pathogens, and *Botryosphaeria ribis* Gross. & Dugg. as a saprophyte on eucalypts in South Africa.

Fairmaniella leprosa

F. leprosa was found only on *E. globulus* Labill. at Franschhoek in the Cape Province. The fungus caused shoot and leaf necrosis with distinct corky circular lesions (Fig. 1). Lesions and acervuli (Fig. 2, 3) were concentrated largely on the upper leaf surface. Brown, thick-walled conidia varied from elongate to broadly elliptical (Fig. 4), and were 4–(5)–6,5 × 3–(4)–4,5 μm in size. These dimensions were similar to those previously recorded for this fungus (Hansford, 1956; Sutton, 1971). Attempts to grow *F. leprosa* on water agar, potato-dextrose agar and malt-extract agar (MEA) in the laboratory were unsuccessful.

F. leprosa has been reported on four *Eucalyptus* spp. from various countries, including Australia, Chile, Hawaii, U.S.A., New Zealand and Zambia (Sutton, 1971, 1980; Swart, 1988). There are, however, no reports of serious disease problems caused by this fungus.

Harknessia globosa

H. globosa caused a leaf spot disease on young *E. grandis* Hill: Maid. at White River in the Eastern Transvaal. Lesions were round, amphigenous, brown and 0,5–1,5 cm in diameter (Fig. 5). Conidiomata were abundant, and amphigenous with conidia accumulating as globose masses on narrow bases (Fig. 6, 7). Conidia were dark brown, smooth-walled, globose to subglobose and 10–(13,5)–15 × 9–(11)–13 μm in size. The hyaline appendages were 1–(4)–9 μm long (Fig. 8). These measurements correspond with those of Sutton (1971, 1980) for *H. globosa*. No cultures were obtained because the leaf material was too old. This fungus has previously been found in Brazil and New Zealand on two *Eucalyptus* spp. (Sutton, 1971). There is very little literature available on this fungus. Its importance as a pathogen can be established only after suitable inoculation studies.

Harknessia eucalypti

Harknessia eucalypti caused a leaf and stem necrosis (Fig. 9) on eight-year-old *E. nitens* (Deane et Maid.) Maid., *E. globulus* and *E. maidenii* F. Muell. at Stellenbosch in the Cape Province.

Leaves were held for 24 h at 25 °C in moist chambers under a combination of near-ultraviolet (360 nm) and fluorescent lights to promote sporulation. Abundant amphigenous conidiomata developed, with black conidial masses on the leaf surfaces (Fig. 10). Conidia were dark brown, smooth-walled, broadly ventricose with bluntly apiculate apices, and 16–(19)–22 × 8–(12)–14 μm in size. Their hyaline appendages were 2–(8,5)–18 μm long (Fig. 11), corresponding with the measurements given by Sutton (1971) for *H. eucalypti*. Dimensions of the conidia and conidial appendages in the descriptions of *H. eucalypti* given by Cooke & Harkness (1881) and Rambelli (1962) appear to be those of *H. uromycoides*. Because of variations in conidial size, various authors have found it difficult to distinguish between *H. eucalypti* and *H. uromycoides*. The two species can, however, be distinguished by comparing the short basal appendage of *H. eucalypti* (2–12 μm) and the longer appendage of *H. uromycoides* (30–90 μm) (Sutton, 1971). *H. eucalypti* grew readily on MEA at 25 °C and colonies were white to cream coloured with a fluffy texture. This fungus has previously been found on *Eucalyptus* spp. in Australia, New Zealand, and the U.S.A. (Sutton, 1971, 1980). No inoculations have yet been done. Therefore its relative importance remains uncertain.

In a recent review of fungi occurring on *Eucalyptus* spp. in South Africa, Lundquist & Baxter (1985) referred to a 1912 record of *Harknessia uromycoides* (Speg.) Speg. on *E. amygdalina* Labill. in South Africa. We examined this material (PREM 2261). Due to the presence of conidia with transverse septa, we concluded that it had been incorrectly identified. Sutton (1971) mentions that some conidia can have a longitudinal band of lighter pigment. The few conidia that were found on PREM 2261 had a transverse septum, but this is not typical of *H. uromycoides*. Because of the limited material available, we were unable to reclassify PREM 2261.

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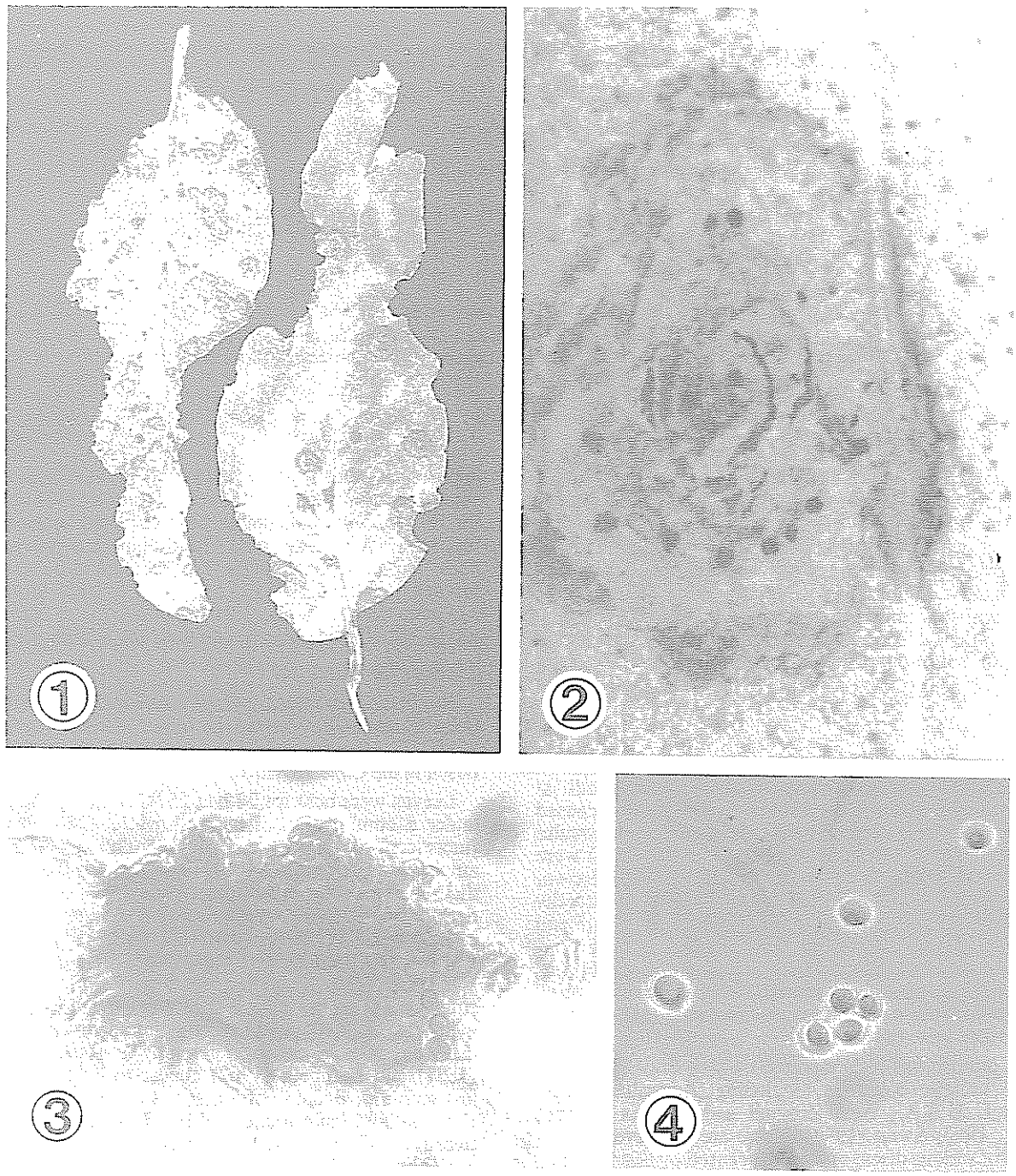

FIG. 1–4 Symptoms, acervuli and conidia of *Fairmaniella leprosa* on *Eucalyptus* leaves
1 Symptoms on upper leaf surface of *E. globulus*
2 Lesion with acervuli (× 175)
3 Transverse section through acervulus (×1500)
4 Brown thick-walled conidia (× 1500)

Botryosphaeria ribis

Conidiomata of *H. eucalypti* occurred in close proximity to pseudothecia of *Botryosphaeria ribis* Gross. & Dugg. [= *B. dothidea* (Moug. ex Fr.) Ces. & de Not.] on leaves of *E. maidenii* in the Stellenbosch area. *B. ribis* seems to have a wide host range, and occurs throughout the Cape Province. This fungus was also found on lesions in association with other *Eucalyptus* leaf pathogens, *Mycosphaerella nubilosa* (Cke.) Hansf., *Coniothyrium ovatum* Swart and *Phaeoseptoria eucalypti* Hansf. *emend.* Walker (Wingfield, 1987). *B. ribis* is an opportunistic fungus (Crist & Schoeneweiss, 1975; Sinclair, Lyon & Johnson, 1987) colonising lesions caused by primary pathogens. However, we also found *B. ribis* alone, causing tip blight on apparently stressed *E. camaldulensis* Dehn., *E. nitens*, *E. grandis* (Fig. 12), *E. globulus* and *E. cladocalyx* F. Muell. (Fig. 13) in the Western Cape. Both teleomorph and anamorph (*Fusicoccum aesculi* Sacc.) stages of *B. ribis* were found on leaves. Globose pycnidia and pseudothecia usually developed in necrotic areas on the leaves. Initially they were covered by the epidermis, which later ruptured. Hyaline pycnidiospores varied in shape from ellipsoidal to fusoid with truncate bases. Conidia were mostly non-septate, although some one-septate conidia were observed. Rumbos (1987), reports conidia having up to three septa. In this study dimensions were as follows: conidia 7–30 × 3,5–8 μm, asci 80–130 ×

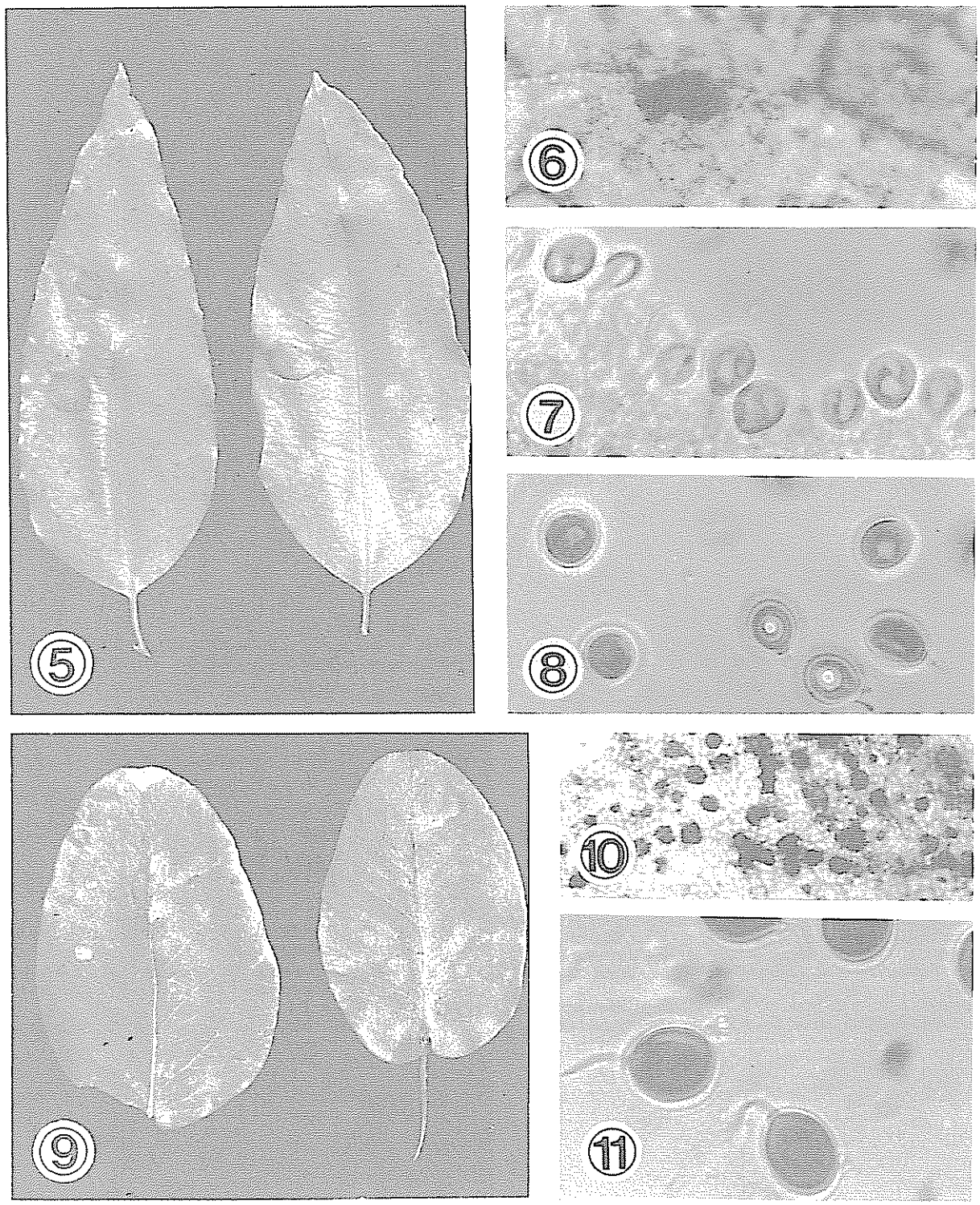

FIG. 5–11 Symptoms, conidiomata and conidia of *Harknessia globosa* (Fig. 5–8), and *H. eucalypti* (Fig. 9–11) on *Eucalyptus* leaves

5 Symptoms on upper leaf surface on *E. grandis*
6 Lesion with conidioma (× 680)
7 Transverse section through conidioma (× 1500)
8 Dark brown conidia with appendages (× 1700)
9 Symptoms on upper leaf surface of *E. maidenii*
10 Lesion with conidiomata (× 280)
11 Dark brown conidia with appendages (× 1500)

17–31 μm, and ascospores 13–30 × 7–14 μm. The fungus grew rapidly on MEA at 25 °C. Cultures were initially white, becoming grey to black with fluffy aerial mycelium. Although this fungus frequently causes a canker and dieback disease on *Eucalyptus* spp. (Davison & Tay, 1983), no study has yet been made to establish its role as a leaf pathogen.

This is the first record of *F. leprosa, H. globosa, H. eucalypti* and *B. ribis* on *Eucalyptus* leaves in South Africa. Specimens have been deposited in the National Collection of Fungi, Plant Protection Research Institute, Pretoria (*F. leprosa*, PREM 49106; *H. eucalypti*, PREM 49104, 49105; *H. globosa*, PREM 49165; *B. ribis*, PREM 49298).

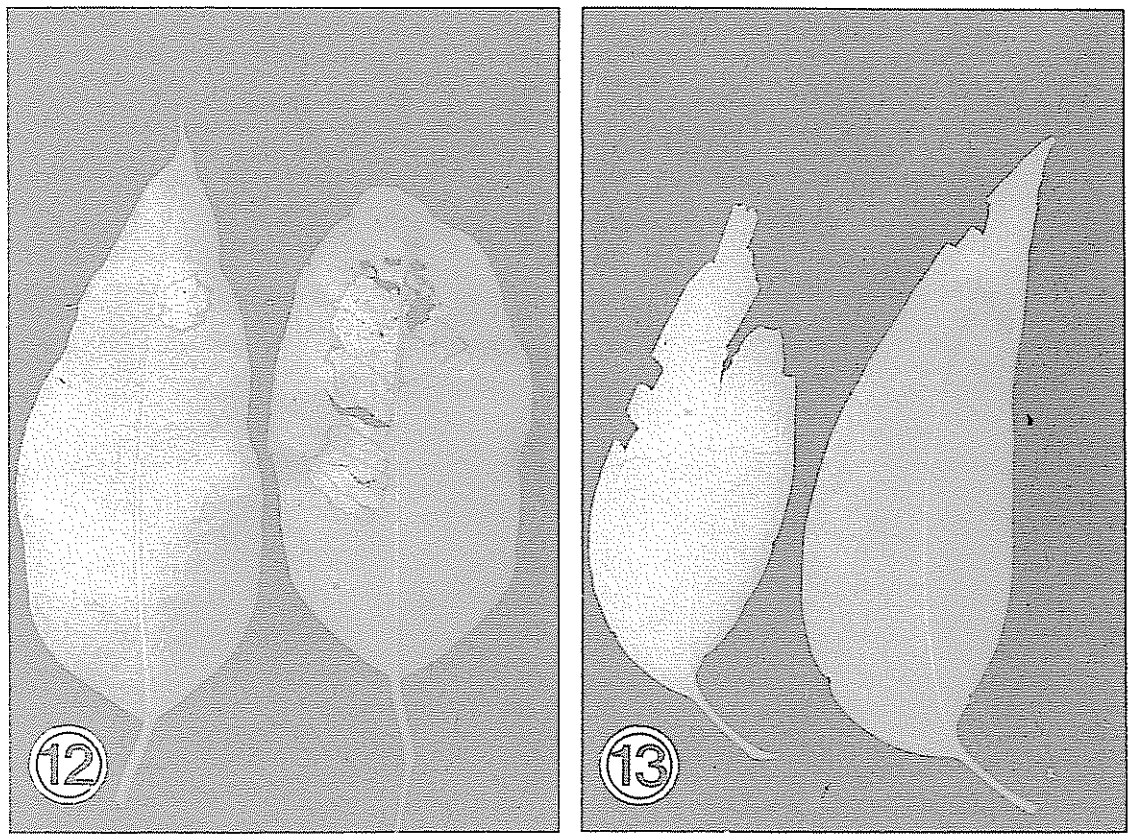

FIG. 12–13 Symptoms of *Botryosphaeria ribis* on the lower leaf surfaces of *E. grandis* (Fig. 12), and *E. cladocalyx* (Fig. 13)

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