

Tilletia micrairae



Fungal Planet 33 – 30 June 2009

***Tilletia micrairae* R.G. Shivas, M.D. Barrett, R.L. Barrett & McTaggart, sp. nov.**

Sporae globosae, subglobosae, ovoideae vel late ellipsoideae, 24–33(–37) × (22–)24–32 µm, luteolae ad atras-rubellas vel fuscas, subopaceae vel opaceae, paries 1.5–6.5 µm densus, cum verrucis dense sitis, (1–)1.5–6 µm altis, altioribus in sporis luteolis brunneis quam in sporis fuscioribus; verrucae in sporis luteolis brunneis acutae vel subacutae, spiniformes; in sporis fuscis verrucae sunt obtusae vel clavicipites, sub-hyalinae, superficiali aspectu visae maculae irregulares, subpolyangulares, 10–15(–20) µm per sporam diametro, segregatae vel fusae in ordines vel greges breves, irregulares, 40–55 in sporae ambitu, facies sporae levis propter vaginam in qua verrucae sunt inclusae.

Etymology. Derived from the name of the host plant *Micraira*.

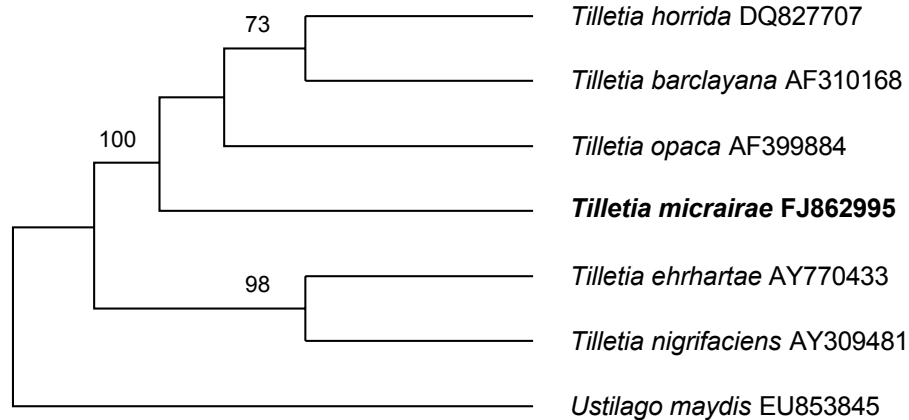
Sori in some ovaries of an inflorescence, obovoid, more rarely broadly ellipsoidal or lemon-shaped, 0.5–1 × 0.7–1.2(–1.5) mm, covered by a thin greyish brown pericarp that ruptures irregularly, exposing the black powdery mass of spores mixed with numerous sterile cells. *Spores* globose, subglobose, ovoid or broadly ellipsoidal, 24–33(–37) × (22–)24–32 µm, yellowish to dark reddish or chocolate-brown, sub-opaque or opaque; wall 1.5–6.5 µm thick, including the densely situated warts, (1–)1.5–6 µm high, higher in yellowish brown spores than in darker spores; warts in yellowish brown spores acute or subacute, spiniform, in dark spores the warts are blunt or nail-headed, sub-hyaline, in surface view appearing as irregular subpolyangular spots, 10–15(–20) per spore diam, isolated or fusing into short, irregular rows or groups, 40–55 on the spore circumference, spore profile smooth due to the sheath in which the warts are embedded. *Sterile cells* globose, subglobose,

broadly ellipsoidal to slightly irregular, 12–33(–40) × 12–26 µm, sub-hyaline, content homogenous or usually with droplets; wall 1.5–7 µm thick, smooth.

Typus. AUSTRALIA, Western Australia, Morgan River near 'Cypress Valley', c. 4 km SE of Theda Station Homestead, 14° 48' 52" S, 126° 30' 51" E, *Micraira dunlopii*, 28 Jan. 2007, M.D. & R.L. Barrett, BRIP 52433, holotype; HUV 21566, PERTH 08018987, isotypes; GenBank FJ862995, MycoBank MB513234.

Notes — Thirty-seven species of *Tilletia* have been reported from Australia^{1,2} of which 13 are endemic to northern Australia. The host plant *Micraira* is the only member of its tribe (*Micraireae*) in the small subfamily *Micrairoideae*³ (along with the tribes *Eriachneae* and *Isachneae*). All *Micraira* spp. are resurrection plants that are endemic to Australia with limited distributions. The genus *Micraira* is currently under revision and there are several undescribed species that are restricted to sandstone pavements. There are no previous records of smut fungi on *Micraira*.

BLASTn results of the ITS sequence of *T. micrairae* (GenBank FJ862995) had high identity to sequences of *T. opaca* on *Spiniflex littoreus* (AF399884, 93 % identical), *T. barclayana* on *Paspalum distichum* (AF310168, 93 % identical) and *T. horrida* strain JA1 on *Oryza sativa* (DQ827707, 93 % identical). Genomic DNA of *T. micrairae* (holotype) is stored in the Australian Biosecurity Bank (<http://www.padi.gov.au/pbt/>).



Majority-rule consensus tree (TL = 319; CI = 0.900; RI = 0.660; RC = 0.5930) obtained using parsimony in a heuristic search with 100 random taxon additions from an ITS sequence alignment using PAUP v4.0b10. The bootstrap support values from 1 000 replicates are shown at the nodes. The species described here is printed in **bold face**. The tree was rooted to *Ustilago maydis* (DC.) Corda (GenBank EU853845).

Colour illustrations. *Micraira dunlopii* near Theda Station Homestead, Western Australia; plants infected with *T. micrairae*; sori in ovaries of *M. dunlopii*; spores and sterile cells; spore wall seen in SEM. Scale bars (from left to right) = 1 cm, 1 mm, 20 µm, 20 µm.

Acknowledgements The authors acknowledge the assistance of John Kuo at the Australian Microscopy & Microanalysis Research Facility, Centre for Microscopy, Characterisation & Analysis, University of Western Australia. Dunkeld Pastoral is thanked for permission to work on their property and for logistical support. ARM would like to acknowledge the support of the Cooperative Research Centre for National Plant Biosecurity.

References. ¹Ványk K, Shivas RG. 2008. Fungi of Australia: The smut fungi. ABRIS, Canberra; CSIRO Publishing, Melbourne. ²Shivas RG, McTaggart AR. 2009. Three new species of *Tilletia* on native grasses from northern Australia. *Australasian Plant Pathology* 38: 128–131. ³Sánchez-Ken JG, Clark LG, Kellogg EA, Kay EE. 2007. Reinstatement and emendation of subfamily *Micrairoideae* (Poaceae). *Systematic Botany* 32: 71–80.

Matthew D. Barrett & Russell L. Barrett, Botanic Gardens and Parks Authority, Fraser Ave, West Perth 6005, Western Australia and School of Plant Biology, Faculty of Natural and Agricultural Science, University of Western Australia, Crawley 6009, Western Australia; e-mail: matthew.barrett@bgpa.wa.gov.au, russell.barrett@bgpa.wa.gov.au
 Roger G. Shivas, Plant Pathology Herbarium, Department of Employment, Economic Development and Innovation (DEEDI), 80 Meiers Road, Indooroopilly 4068, Queensland, Australia; e-mail: roger.shivas@dpi.qld.gov.au
 Alistair R. McTaggart, Cooperative Research Centre for National Plant Biosecurity, c/- DEEDI; e-mail: alistair.mctaggart@dpi.qld.gov.au