

Ustilago neostapfiellae sp. nov. (*Ustilaginaceae*) on *Neostapfiella chloridiantha* (*Poaceae*) from Madagascar

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Abstract. A new smut fungus from Madagascar, *Ustilago neostapfiellae* on *Neostapfiella chloridiantha*, is described and illustrated. It differs from all other species of *Ustilago* by specialization on *Neostapfiella*, a grass genus endemic to Madagascar.

Key words: endemic grasses, Madagascar, *Neostapfiella chloridiantha*, *Poaceae*, smut fungi, taxonomy, *Ustilaginaceae*, *Ustilago*

Introduction

Neostapfiella A. Camus (*Poaceae*) is a small genus in the subfamily *Chloridoideae*, tribe *Cynodonteae* (Soreng et al. 2017). This is a genus endemic to Madagascar, consisting of three species (Vorontsova & Rakotoarisoa 2014; Kellogg 2015; Rabarivola et al. 2019).

During an examination of specimens of grasses in the herbarium of the National Museum of Natural History, Paris (P), a smut fungus belonging to the genus *Ustilago* (Pers.) Roussel was found on a specimen of *Neostapfiella chloridiantha* A. Camus. None of the currently recognized species of *Ustilago* is known to infect *Neostapfiella* species. This fungus was considered to represent an unknown species of *Ustilago*.

Species of *Ustilago* are parasites with hosts in various genera of grasses (*Poaceae*) (Vánky 2011). Sori are formed in various vegetative or generative organs of the infected plant, bursting open at maturity to expose a blackish or olive-brown, usually powdery, sometimes agglutinated spore mass. Columellae and sterile cells are absent. Spores are formed singly

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and are pigmented, usually ornamented (punctate, verruculose, echinulate, echinate or tuberculate), rarely smooth (Vánky 2011, 2013; Denchev & Denchev 2019).

In the present article, a new species of *Ustilago* on *Neostapfiella chloridiantha* is described and illustrated.

Material and methods

A dried specimen from the herbarium of the National Museum of Natural History, Paris was examined under light microscope (LM) and scanning electron microscope (SEM). For LM observations and measurements, spores were mounted in lactoglycerol solution (w : la : gl = 1 : 1 : 2) on glass slides, gently heated to boiling point to rehydrate the spores and then cooled. The measurements of spores are given as min–max (extreme values) (mean \pm 1 standard deviation). For SEM, spores were attached to a specimen stub by double-sided adhesive tape and coated with gold using an ion sputter coater. The surface structure of spores was observed and photographed at 10 kV accelerating voltage using a Hitachi SU3500 scanning electron microscope. The shapes of spores are arranged in descending order of frequency. The spore ornamentation pattern is in accordance with Denchev (2001). The description below is based entirely on the specimen examined.

Taxonomy

Ustilago neostapfiellae T. Denchev & Denchev, sp. nov.

Figs 1–6

Index Fungorum number: IF 904756

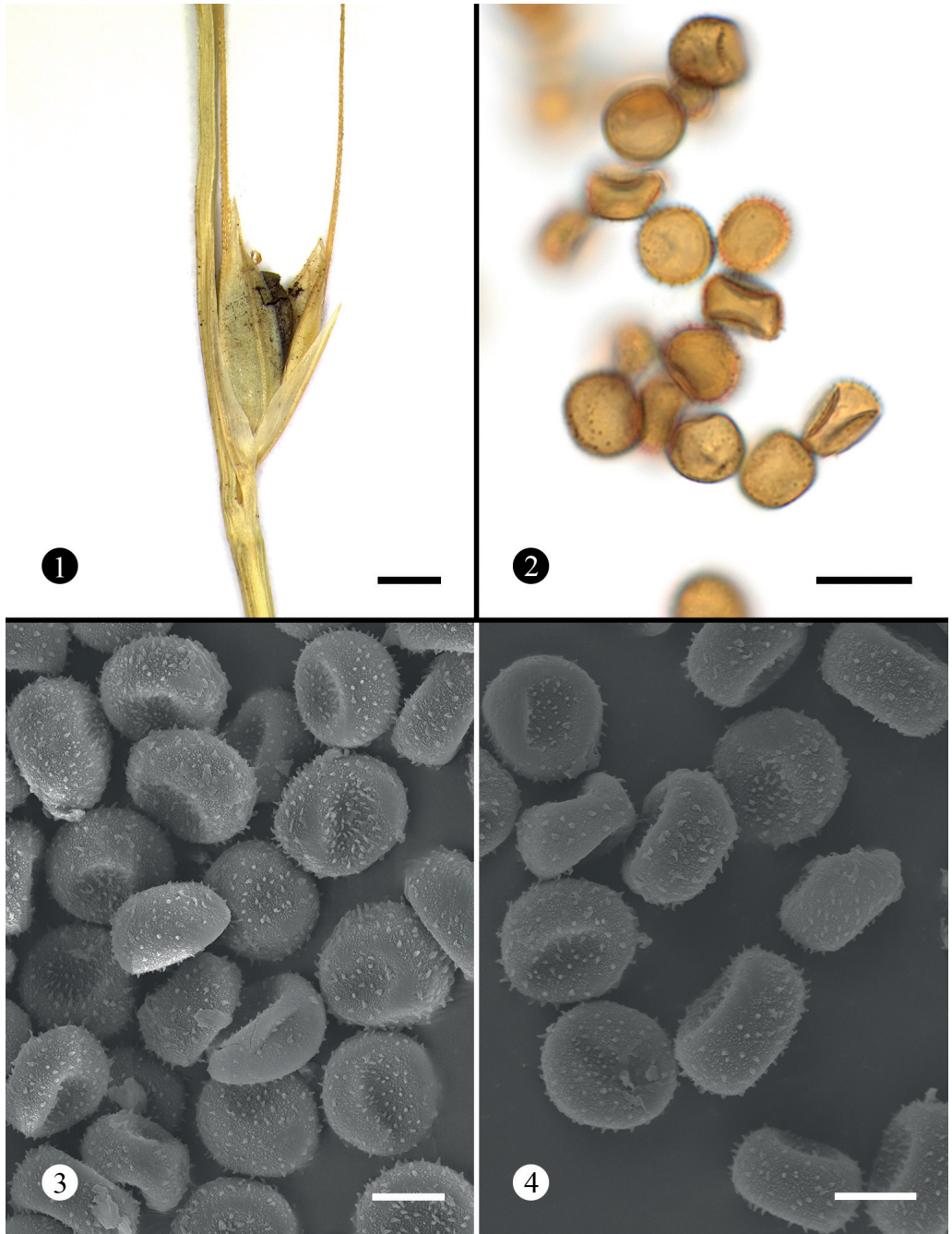
Type on *Neostapfiella chloridiantha* A. Camus, MADAGASCAR, MELAKY REGION, Antsalova District, 26 km SE Antsalova, 12 km ESE Ankiliromotsy, 30 March 1993, leg. Villiers, Klackenberg & Badré, no. 4992, fungus comm. & det. T.T. Denchev & C.M. Denchev (SOMF 30600, holotype).

Etymology — The epithet is derived from the generic name of the host plant, *Neostapfiella*.

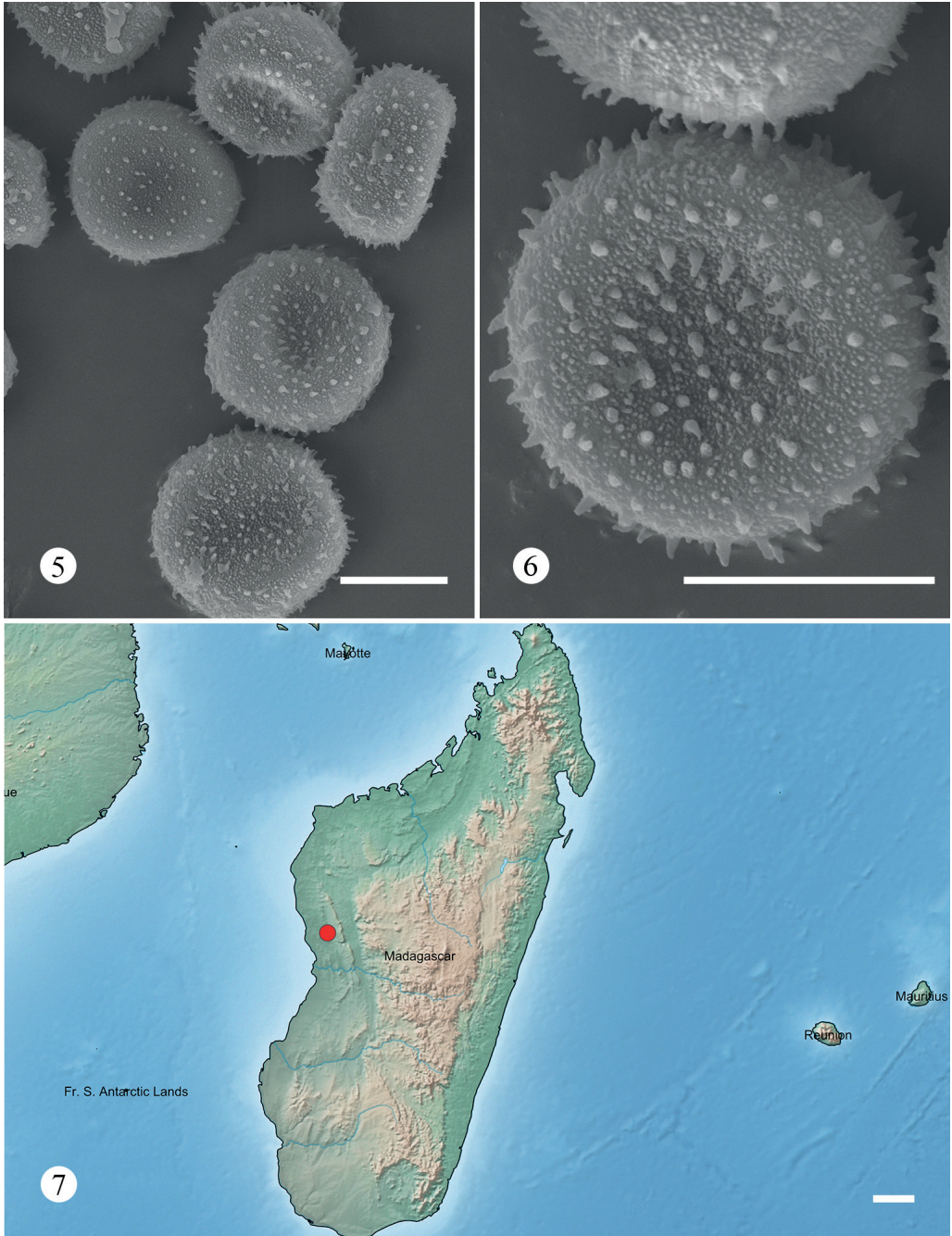
Sori in single ovaries of infected plant, inconspicuous, concealed by glumes, fusiform, ca. 2.0×0.7 mm, with a short tip, bearing rudimentary style and stigmas, covered by a thin, brownish pericarp that later ruptures exposing a powdery, very dark reddish brown mass of spores. **Spores** single, subglobose, globose or broadly ellipsoidal, sometimes ovoid or slightly irregular, $8\text{--}10.5 \times 7\text{--}10$ ($9.2 \pm 0.5 \times 8.6 \pm 0.5$) μm ($n = 200$), medium reddish brown; wall $1.0\text{--}1.4$ μm thick, minutely echinulate, spinules up to $0.4(-0.5)$ μm high. In SEM spore wall punctate between the spinules (Figs 3–6).

Known host and distribution — On *Poaceae*: *Neostapfiella chloridiantha*, Africa (Madagascar); known only from the type collection (Fig. 7).

Neostapfiella chloridiantha is endemic to Madagascar, where it grows in salt marshes on bays and wetlands in Sofia, Boeny, Melaky, and Menabe regions (Vorontsova & Rakotoarisoa 2014; Andriambololonerana & Faranirina 2017; Rabarivola et al. 2019). The plant is threatened by habitat degradation and destruction due to agriculture activities and urban development, and is assessed as Endangered (EN) (Andriambololonerana & Faranirina 2017). None of the currently recognized species of smut fungi is known to infect *Neostapfiella* species.



Figs 1–4. *Ustilago neostapfiellae* on *Neostapfiella chloridiantha* (holotype). 1. Habit. 2. Spores in LM. 3, 4. Spores in SEM. Scale bars: 1 = 1 mm, 2 = 10 μ m, 3, 4 = 5 μ m



Figs 5, 6. *Ustilago neostapfiellae* on *Neostapfiella chloridiantha* (holotype) – spores in SEM. 7. Geographic distribution of *Ustilago neostapfiellae* (type locality is marked with a red dot) (generated with Simple-Mapper, Shorthouse 2010). Scale bars: 5, 6 = 5 μ m, 7 = 100 km

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Conflict of interest. The authors declare that there is no conflict of interest.

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