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Neocosmospora vasinfecta (Nectriaceae): a new record as a fimicolous Ascomycota from Brazil

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Abstract

Neocosmospora vasinfecta (Ascomycota, Hypocreales, Nectriaceae) was found on feces of brocket deer (*Mazama gouazoubira*) collected in the Zoo Foundation of Brasília, Brasília, Federal District (DF), Brazil, after the feces were maintained in moist chambers. This is the first report to observe the fungus from feces of brocket deer and also the first record in center-west region of Brazil. Description and illustration of the fungus are presented in this study.

Key words – brocket deer – coprophilous fungi – decomposition – feces – moist chambers

Introduction

The genus *Neocosmospora*, proposed by Smith in 1899, belongs to the phylum Ascomycota, order Hypocreales and family Nectriaceae (Rossman et al. 1999; Doveri 2004). Guarro et al. (2012) determined eight species and one variety within the genus, whose distinctive features are having its pinkish reddish glabrous perithecia, not stromatic, cylindrical asci with uniseriate eight-spores, non- or rarely one-septate ascospores and acremonium-like anamorph (Cannon & Hawksworth 1984; Doveri 2004).

Several reports of the genus *Neocosmospora* have been showing that species of this genus were commonly found in soil as pathogenic or saprobic fungi for several plants (Mishra1988; Doveri 2004, 2011; Domsch et al. 2007; Dau et al. 2010; Ali et al. 2011). *Neocosmospora* have been also found from animal dungs. For instance, Cailleux (1971) isolated *N. vasinfecta* from dung samples in African collections, Doveri (2011) found it in rabbit feces in Italy and Cribb (1991) recorded *N. vasinfecta* var. *africana* in emu dung. Current researchers, thus, recognize the genus as coprophilous fungi as well. Cornely et al. (2001), interestingly, mentions the occurrence of an infection by *N. vasinfecta*, in a patient with acute nonlymphocytic leukemia, presenting resistance to common antifungal agents.

Neocosmospora vasinfecta, the type species of *Neocosmospora*, has two varieties: *vasinfecta* and *africana*. There had been several controversies to determine their taxonomic ranks because of subtle morphological differences (e.g., Smith 1899; Arx 1955; Van Warmelo 1976). Cannon and Hawksworth (1984) resolved this taxonomic confusion between the two varieties, and nowadays the main feature that distinguishes between them is the ornamentation of ascospores. Ascospores of

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N. vasinfecta bear conspicuously rugose ornamentation, while *N. vasinfecta* var. *africana* bears cerebriform ornamentation (Cannon & Hawksworth 1984; Rossman et al. 1999; Doveri, 2004).

In 2012, we found a species of *Neocosmospora* from feces of brocket deer (*Mazama gouazoubira* Fischer) collected in Zoo Foundation of Brasília, Brasília, Federal District (DF), Brazil. The deer lives only from southern Central America down through northern South America. Ruminat belonging to the order Cervidae, the brocket deer is one of eight cervid species that occur widely in Brazil. The deer has as habit, different Cerrado physiognomies (Martins et al. 2013). Individuals of this species have a color ranging from yellowish to reddish brown, with white areas in the ventral region and tail. The males, only, have horns simple, unbranched, characteristic of the genus. Is the most common deer species in South America, and in Brazil its distribution extends from the south of the country to the north of the state of Mato Grosso (Ferreira et al. 2011) (Fig. 1). In order to contribute to the dissemination of knowledge of coprophilous fungi in Brazil, this paper records for the first occurrence of *N. vasinfecta* in feces of brocket deer.

Materials & Methods

Dungs of brocket deer (*Mazama gouazoubira* Fischer) were collected at Zoo Foundation of Brasília, Brasília, Federal District (DF), Brazil, in 2012 and taken to the Laboratory of Biodiversity of Cerrado (LABBIC), in University of State of Goiás (UEG/ UnUCET), located in the city of Anápolis, state of Goiás, Brazil. The dungs were kept in moist chambers based on methodology proposed by Bell (1983, 2005) and Richardson (2001). The moist chambers were observed during two months to induce emergence of coprophilous fungi. Perithecia of the fungus were photographed under stereomicroscope and mounted in histological slides with sterile drop of water for observation under an optical microscope (Bell 1983). Samples were removed and deposited at the Herbarium of the State University of Goiás (HUEG) under number of registration HUEG-8762.

Fig. 1 – Brocket Deer (*Mazama gouazoubira* Fischer) in Zoo Foundation of Brasília.

Results

Neocosmospora vasinfecta (Fig. 2) appeared on the feces of brocket deer twelve days after incubation in the moist chamber. It was observed only once, being considered quite inconspicuously and never found after that. Here is description of the fungus we observed.

Neocosmospora vasinfecta E.F. Sm., *Bull. U.S. Department of Agriculture* **17**: 45 (1899).

Description – Perithecia vividly colored, pinkish reddish (sometimes orange), measuring up to 0.2 mm, globular to subpiriform with small neck (sometimes two necks); endoperidium pseudoparenchymatous, supporting numerous periphysis in the neck region; exoperidium with texture globulose to angular, with colored cells (10-25 x 10-15 µm); asci cylindrical, 8-spored, not amyloid, with truncated apex with a short pedicel, measuring 80-100 x 10-12 µm; ascospores uniseriate, spherical to slightly elliptical, hyaline when immature, becoming light brown at maturity, with conspicuously rugose ornamentation, sometimes with oil droplets, measuring between 9.5-10 x (8,5) 9-10 µm.

Examined Material – BRAZIL – Federal District: Brasília, Fundação Jardim Zoológico (FJZ), perithecia obtained on dung of brocket deer (*Mazama gouazoubira* Fisher). ARAÚJO, J.C. & CALAÇA, F.J.S. (FJSC/28), 22/VII/12, HUEG-8762.

Determines – Francisco Junior Simões Calaça & Yuuri Hirooka.

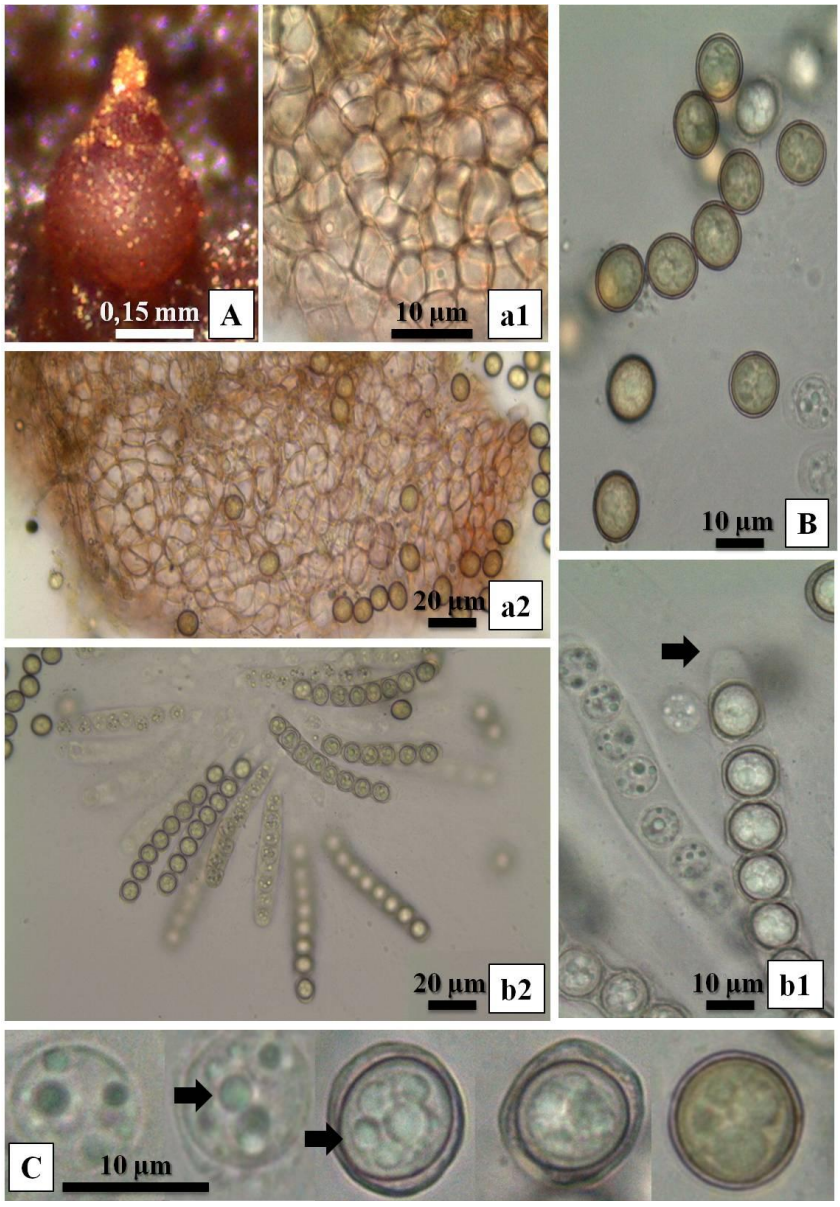

Fig. 2 – *Neocosmospora vasinfecta* HUEG-8762 (FJSC/28). A: Perithecia on substrate; a1: Cells of exoperidium; a2: Perithecium mounted on slides with some mature ascospores; B: Mature and immature ascospores; b1: Asci with immature ascospores, showing apex (arrow) and ascospores unisseriate; b2: Asci and ascospores; C: Ascospores in various stages of maturation. The arrows indicate oil droplets within the spores.

Discussion

The present study is the third reports to collect *N. vasinfecta* on dung and is the first time to find the fungus from the feces of Brocket Deer. In Brazil, there are several reports of the genus. Upadhyay (1967) mentioned the occurrence of *N. vasinfecta* in Amazonas, Roraima, Maranhão and Pernambuco state. Cavalcanti et al. (2006) isolated the species from soil of Sergipe state. *Neocosmospora vasinfecta* var. *africana* has been reported (like *N. africana* Arx) from four states in Brazil: Amazonas, Maranhão, Roraima, and Pernambuco state (Batista et al. 1965, 1966, 1967; Batista & Almeida 1966; Luna & Neto 1971). Pfenning (1995) reported the occurrence of a new *Neocosmospora* species, *N. spinulosa* Pfenning, obtained from cultures of ground cacao plantations (*Theobroma cacao* L.) in Capitão Poço, in the state of Pará. This is the first report of the genus on feces, in the country and also the first record to center-west region (Figure 3). These reports indicated that additional *Neocosmospora* including an unknown species would exist, and further studies will contribute for diversity of the genus in Brazil.

Fig. 3 – Distribution of the genus *Neocosmospora* in Brazil. AM: Amazonas (recorded by Batista et al. (1964) and Upadhyay (1967)), PA: Pará (recorded by Pfenning (1995)),RO: Roraima (recorded by Batista et al. (1967) and Upadhyay (1967)), MA: Maranhão (recorded by Batista & Almeida (1966), Batista et al. (1965, 1966) and Upadhyay (1967)), PE: Pernambuco (recorded by Luna & Neto (1971) and Upadhyay (1967)) SE: Sergipe (recorded by Cavalcanti et al. (2006)) and DF: Federal District, recorded in the current article. Maps available at D-maps.com (www.d-maps.com). Modified by the authors.

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