

***CRUCIBULUM LAEVE* (HUDS.) KAMBLY IN CERRADO
VEGETATION OF SÃO PAULO, BRAZIL**

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RESUMO – *Crucibulum laeve* (Huds.) Kambly, um raro gasteromicete lignícola nos trópicos, é registrado pela primeira vez para o Estado de São Paulo e pela segunda vez para o Brasil, crescendo sobre madeira em decomposição e ocasionalmente sobre outros fragmentos de plantas em solo, sob vegetação de cerrado. É dada a descrição das características macro e microscópicas a partir de basidiocarpos frescos e secos, usando a metodologia tradicional para estudos de Gasteromycetes. O substrato e as características taxonômicas concordam com a literatura consultada.

Palavras-chave – Gasteromycetes, *Crucibulum laeve*, taxonomia, cerrado, espécie rara

ABSTRACT – (*Crucibulum laeve* (Huds.) Kambly in cerrado vegetation of São Paulo - Brazil). A rare lignicolous gasteroid fungus of the tropics, *Crucibulum laeve* (Huds.) Kambly is recorded for the first time from State of São Paulo and for de second time from Brazil, growing on decaying wood, occasionally on other plant debris, on soil under cerrado vegetation. Macro and microscopic features were described from fresh and dried basidiocarps using the traditional methods for Gasteromycetes. The substrate and the taxonomic characteristics agree closely with the literature consulted.

Key words – Gasteromycetes, *Crucibulum laeve*, taxonomy, cerrado, rare species

Introduction

This work represent part of extensive studies regarding the Gasteromycetes from the Brazilian cerrado vegetation, which includes the Reserva Ecológica de Jataí and Reserva Biológica de Moji Guaçu (State of São Paulo).

The genus *Crucibulum* was established by Tulasne brothers in 1844 and currently includes three species, *C. cyathiforme* H. J. Brodie, *C.*

parvulum H. J. Brodie and *C. laeve* (Huds.) Kambly (Brodie 1984). Although this taxon was not found until 1844, for nearly a century and a half, fungus belonging to it has been known and unmistakably figured. Ray (1696), in a list of fungi collected by D. Samuel Doody, mentions this specie in "*Fungus seminifer minor*".

Crucibulum is segregated from *Cyathus* by the thick peridium wall consisting of a single

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layer of hyphae as well as the funiculus of single structure; from *Nidula* it is separated by the presence of a funiculus (Brodie 1975; 1984).

The nidulariaceous fungi are poorly known in Brazil, probably due to the fact that studies on Brazilian Gasteromycetes are scarce. There are some registers reported by Rick (1961) from the State of Rio Grande do Sul, including: *Cyathus ambiguus* Tul., *C. byssisedus* (Jungh.) Tul., *C. montagnei* Tul., *C. poeppigii* Tul., *C. stercoreus* (Schw.) De Toni, *C. striatus* (Huds.) Hoffm., *C. vernicosus* (Bull.) DC., *Crucibulum laeve*, named as *C. vulgare* Tul. Bononi *et al.* (1981) and Bononi (1984) reported from the State of São Paulo, *Cyathus limbatus* Tul., *C. poeppigii*, *C. stercoreus* and *C. striatus*.

Material and methods

Specimens of *Crucibulum laeve* were collected, during the rainy season of 1999 (January to July), in the Estação Ecológica de Jataí, located in an area of 4.532,18 ha, at 21°33'-21°37'S and 47°45'-46°51'W; and Reserva Biológica de Moji Guaçu, located in an area of 343,42 ha, at 22°15'-22°16'S and 47°08'-47°-12'W, both in State of São Paulo. Climatic conditions are of the AW type according to Köppen System.

Hand-cut sections of dried material were mounted in Melzer's reagent, 5% KOH, water or cotton blue for microscopical examination (Dominguez de Toledo 1993). Permanent slides were made using PVL resin (Alcohol Polyvinilic and Lactophenol), according to Trappe & Schenck (1982). Colour terms in parenthesis are those of Kornerup & Wanscher (1978), abbreviated as KW. The material is preserved in the Herbarium of Instituto de Botânica, Seção de Micologia e Liquenologia (SP), abbreviated by acronyms according to the Index Herbariorum (Holmgren *et al.* 1990).

Results and discussion

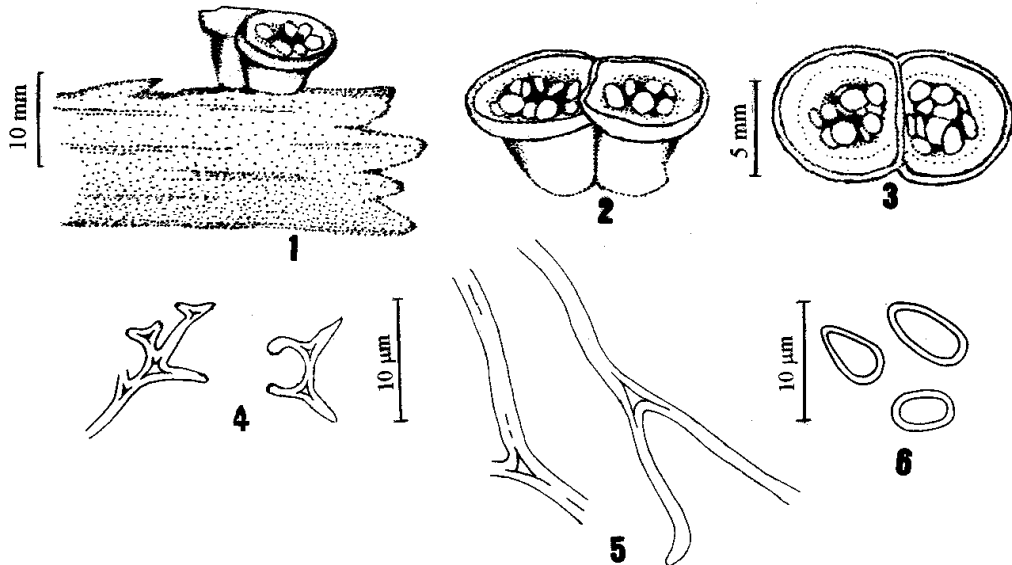
Crucibulum laeve (Huds.) Kambly, Univ. of Iowa Stud. Nat. Hist. 17(4): 167, 1936.

Synonyms: *Crucibulum vulgare* Tul., Ann. Sci. Nat. 3(1): 90, 1844; *Cyathus laevis* DC., Fl. Fr. 2: 269, 1805; *Cyathus crucibulum* Pers., Syn. Fung. 238, 1801; *Nidularia crucibulum* (Pers.) Secret., Mycogr. Suisse 3: 378, 1833; *Nidularia junglandicola* Schw., Trans. Am. Phil. Soc. II(4): 253, 1834; *Crucibulum junglandicolum* (Schw.) de Toni, in Saccardo, Syll. Fung. 7: 44, 1888; *Crucibulum crucibuliforme* Write, Bull. Torr. Club 29: 269, 1902 (according to Brodie 1975).

Peridium bell-shaped, 7-9 mm high (Fig. 1-2), 6-7 mm across the top (Fig. 3), when young subglobose, at maturity narrowed slightly from the top toward the sessile truncate base which attached to a subiculum; outer surface greyish brown (KW-5D3), finely tomentose but glabrous in age; inner surface light grey (KW- 1D1), smooth, margin thick, wall of a single layer of woven hyphae 1-2 µm diam., branched (Fig. 4). Peridioles light grey (KW- 1D2), lenticular almost irregular, 1,5-2 mm wide, attached to the cup by a funiculus, covered with a yellowish white membrane (KW- 1D1); peridiole hyphae 1,5-3 µm diam., hyaline, branched (Fig. 5). Basidiospores almost hyaline, smooth, elliptical to subovate, 5-6,4-8,2 x 3,5-4,7-5,5 µm. (Fig. 6)

Material examined: **BRAZIL. São Paulo:** Município de Luís Antônio, Estação Ecológica de Jataí, 23/II/1999, *Baseia I. G. 338*, SP 307295, gregarious on wood debris; **BRAZIL. São Paulo:** Município de Moji Guaçu, Reserva Biológica de Moji Guaçu, 2/V/1999, *Baseia I. G. 405*, SP 307296, scattered in shading places on decaying wood or leaves; **BRAZIL. São Paulo:** Município de Moji Guaçu, Reserva Biológica de Moji Guaçu, 11/VII/1999, *Baseia I. G. 418*, SP 3072297, gregarious on soil in which wood is buried.

Additional material examined (donated to SP Herbarium): **UNITED STATES OF AMERICA. Iowa:** North Liberty, 11/IX/1926, det. *G. W. Martin*, SP 61671; Iowa City, 6/VII/1948, det. *G. W. Martin*, SP 62187; **FRANCE: Briançonnais,** 14/X/1958, coll. *L. Kofler*, SP 61483



Figuras 1-6. *Crucibulum laeve* Pers. - 1. habit; 2. lateral view; 3. top view; 4. hyphae of peridium; 5. hyphae of peridiole; 6. basidiospores.

Although cited as *Crucibulum vulgare* Tul. & C. Tul., it is incorrect (Coetzee *et al.* 1997) because *Crucibulum laeve* is the correct name to be used for this fungus (Eckblad 1955; Brodie 1984; Calonge & Demoulin 1975, Liu 1984, Kreisel 1990). All of the aforementioned authors, however, use different author citation. The present authors agree with Kreisel (1990) and Coetzee *et al.* (1997) in using the combination *Crucibulum laeve* (Huds.) Kambly.

Concerning the distribution of this taxon, Write (1902) and Coker & Couch (1928) reported it for North America, Bottomley (1948), for Southern Africa and Liu (1984) for China. According to Brodie (1984) and Hawksworth *et al.* (1995) the major distribution records of *Crucibulum laeve* is from temperate zones. In tropical zones it appears to be rather rare, judging from the few records of *Crucibulum* (Gomes & Perez-Silva 1988). This is the first register for this lignicolous genus from the State of São Paulo and the second from Brazil. The first record was given by Rick (1961) from State of Rio Grande do Sul, as *C. vulgare* Tul.

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References

- Bononi, V. L.; Trufem, S. F. & Grandi R. A. 1981. Fungos Macroscópicos do Parque Estadual das Fontes do Ipiranga, São Paulo (SP), Brasil, Depositados no Herbário do Instituto de Botânica. **Rickia** **9**: 37-53.
- Bononi, V. L. 1984. Basidiomycetos do Cerrado da Reserva Biológica de Moji-Guaçu, SP. **Rickia** **11**: 1-25.
- Bottomley, A. M. 1948. Gasteromycetes of South Africa. **Bothalia** **4**: 473-810.
- Brodie, H. J. 1975. **The bird's Nest Fungi (Nidulariaceae)**. University of Toronto Press, Toronto.
- Brodie, H. J. 1984. More Bird's Nest Fungi (Nidulariaceae) - A supplement to "The bird's nest fungi." (1975). **Lejeunia** **112**: 1-72.
- Calonge, F. D. & Demoulin, V. 1975. Les Gastéromycètes d'Espagne. **Bulletin de la Société Botanique de France** **91**(2): 247-292.

- Coetzee, J. C.; Eicker, A. & Van Wyk, A. E. 1997. Taxonomic notes on the Geastraceae, Tulostomataceae, Nidulariaceae and Sphaerobolaceae (Gasteromycetes) *sensu* Bottomley, in southern Africa. **Bothalia** **27**(2): 117-123.
- Coker, W. C. & Couch, J. N. 1928. **The Gasteromycetes of the eastern United States and Canada**. The University of North Carolina Press. Chapel Hill. 201p.
- Dominguez de Toledo, L. D. 1993. Gasteromycetes (Eumycota) del Centro Oeste de la Argentina I. Analisis critico de los caracteres taxonomicos, clave de los generos y orden Podaxales. **Darwiniana** **32**(1-4): 195-235.
- Eckblad, F. E. 1955. The Gasteromycetes of Norway. The epigaeal genera. **Nytt magasin for Botanikk** **4**: 19-86.
- Gomes, C. L. & Perez-Silva, E. 1988. Especies de Nidulariales comunes en Mexico. **Revista Mexicana de Micologia** **4**: 161-183.
- Hawksworth, D. L.; Kirk, P. M.; Sutton, B. C. & Pegler, D. N. 1995. **Dictionary of the fungi**. Survey, 8 ed., International Mycological Institute, 412p.
- Holmgren, P. K.; Holmgren, N. H. & Barnett, L. C. 1990. **Index Herbariorum**, part I, The Herbaria of the world, 8th edn. Reg. Veg., New York Botanical Garden, Bronx, 120p.
- Kornerup, A. & Wanscher, J. E. 1978. **Methuen Handbook of Colour**. 3th edn., London: Methuen, 243p.
- Kreisel, H. 1990. *Crucibulum laeve* (Huds.) Kambly. Tiegel-Teuerling. **Boletus** **14**(2): front & inside front cover.
- Liu, B. 1984. The Gasteromycetes of China. Beiheftezur, **Nova Hedwigia** **74**: 1-235.
- Ray, R. 1696. Fungus seminifer minor. **Synopsis** **333**.
- Rick, J. 1961. Basidiomycetes Eubasidii no Rio Grande do Sul. Brasília. **Iheringia série Botânica** **9**: 451-480.
- Trappe, J. M. & Schenck, N. C. 1982. Taxonomy of the fungi forming endomicorrhizae. In: **Methods and principles of micorrhizal research** (N. C. Schenck, Ed.), The American Phytopathological Society, St. Paul, 1-9p.
- Write, V. S. 1902. The Nidulariaceae of North America. **Bulletin of the Torrey Botanical Club** **29**: 251-280.