

Nymphaeaceae, *Nymphaea belophylla* Trickett: New state record

Gisaine de Andrade Amador^{1*}, Geraldo Alves Damasceno-Júnior^{1,2}, Rosa Helena da Silva², Arnildo Pott² and Vali Joana Pott³

- 1 Universidade Federal de Mato Grosso do Sul (UFMS), Centro de Ciências Biológicas e da Saúde. Programa de Pós-graduação em Ecologia e Conservação. Cidade Universitária s/n, Caixa Postal 549. CEP 79070-900. Campo Grande, MS, Brazil.
 - 2 Universidade Federal de Mato Grosso do Sul (UFMS), Centro de Ciências Biológicas e da Saúde. Laboratório de Botânica. Cidade Universitária s/n, Caixa Postal 549. CEP 79070-900. Campo Grande, MS, Brazil.
 - 3 Universidade Federal de Mato Grosso do Sul (UFMS), Centro de Ciências Biológicas e da Saúde. Herbarium CGMS. Cidade Universitária s/n, Caixa Postal 549. CEP 79070-900. Campo Grande, MS, Brazil.
- * Corresponding author. E-mail: gisaineaa@gmail.com

ABSTRACT: We report the first record of *Nymphaea belophylla* for the Pantanal wetland in the State of Mato Grosso do Sul, Brazil, being the southernmost record of this waterlily. It is one of the seven neotropical species of this genus in the Pantanal. We collected *N. belophylla* during a study on seasonality of herbaceous species composition in a remote area of the Paraguay river floodplain, what reinforces the importance of floristic surveys to improve knowledge on species distribution.

The family Nymphaeaceae presents six genera containing 50 species (Burkart *et al.* 1987), of which 40 are *Nymphaea* L. (Cook 1990). However, the number of genera and species of this family may be different according to the author: Bosch *et al.* (2008) presents Nymphaeaceae with seven genera and 70 species and Judd *et al.* (2008) considers eight genera and 70 species. The wide distribution of species in the family encloses tropical and temperate regions, occurring in rivers, ponds, lakes, and other freshwater wetlands (Judd *et al.* 2008). Nymphaeaceae are aquatic plants fixed and rooted on the substrate with floating leaves, sometimes submerged, long petiolated (Pott 1998). The genus *Nymphaea* was divided into five subgenera: *Anecphyra* Casp., *Brachyceras* Casp., *Hydrocallis* Planch., *Lotus* (L.) Willd. and *Nymphaea* (Conard 1905).

The genera *Nymphaea* and *Victoria* Lindl. occur in Brazil (Souza and Lorenzi 2008). In the Pantanal occurs *Victoria amazonica* (Poepp.) Sowerby and seven species of the genus *Nymphaea*: *N. amazonum* Mart. & Zucc. subsp. *amazonum* and subsp. *pedersenii* Wiersema, *N. belophylla* Trickett, *N. gardneriana* Planch., *N. jamesoniana* Planch., *N. lingulata* Wiersema, *N. oxypetala* Planch. and *N. prolifera* Wiersema, all belonging to the subgenus *Hydrocallis*, a neotropical plant with nocturnal flowers, stamens inserted in series with the petals, entire leaves or dentate-sinuate with obtuse teeth (Conard 1905; Wiersema 1987; Pott 1998; Pott and Pott 1997).

Nymphaea belophylla in the Pantanal wetland

Nymphaea belophylla (Trickett 1971) was considered restricted to Amazonia, where Amanda Bleher collected it in Guaporé river (1962). *Nymphaea belophylla* has very low number of collections (Wiersema 1987) and was recorded for the first time for the Pantanal by Pott (1998), with only three collections in waterbodies of the Paraguay river floodplain, in Cáceres (V.J. Pott 2049), Poconé (V.J. Pott 3039) and Santo Antônio do Leverger (V.J. Pott 3065),

in the State of Mato Grosso, kept in the Herbarium CPAP (Embrapa Pantanal), with duplicates in the Herbarium CGMS (UFMS). Other collections of *N. belophylla* in the State of Mato Grosso were performed by M. Schessl (5726) in Cáceres (deposited in the Herbarium UB, UNB) and R.H. Silva (502) in Poconé (Herbarium CGMS, UFMS). *Nymphaea belophylla* is considered as a species of restricted or rare occurrence in the Pantanal (Pott and Pott 2000; Pott *et al.* 2011).

In spite of lack of geographic barriers which could hinder dispersal of *N. belophylla* from Mato Grosso (MT) to Mato Grosso do Sul (MS), there had been no previous record of this species so far South, although the Paraguay river floodplain had been lately rather well surveyed.

New state record

In May 2011, we collected *Nymphaea belophylla* (Figure 1) on a floodplain under approximately 110 cm of flood by the Paraguay river, at Porto Esperança, municipality of Corumbá, Mato Grosso do Sul, Brazil (Figure 2) at the coordinates 19°37'22.70" S and 57°27'15.80" W. This is the southernmost record of the species. The vegetation is a floodable grassland savanna, with scattered trees of *Tabebuia aurea* (Silva Manso) Benth. and Hook.f. ex S.Moore.

The species identification was based on Wiersema (1987) and checked by comparison in the Herbarium CGMS (UFMS). The main character of the species is the peculiar strongly sagittate leaf, twice or three times as longer than wide, elliptic-sagittate; with acicular trichescleides and sclereides in the mesophyll, floating flowers with petals gradually changing to cream-colored stamens and cream-colored, slightly clavated carpelar appendices up to 1.7 cm long (Wiersema 1987, Pott 1998).

The collected material is consistent with the descriptions given by these authors. However, it is worth noting some of the characters observed in the study material, such as sagittate leaf on the base and acute



FIGURE 1. A - *Nymphaea belophylla* specimen n. 30920, kept in Herbarium CGMS, collected in the Pantanal wetland at Porto Esperança, Corumbá, Mato Grosso do Sul, Brazil. B - Detail of leaf and flower. C - Plant habitat in the floodable savanna.

on the apex with 20 cm long, to 7 cm wide, with acicular sclereides; flowers with sepals and petals in distinct whorls of four; sepals ca. 5-6 cm long and 2 cm wide, green, oblong-ovate; petals shorter than sepals, the inner ca. 2.6-3.2 cm long and 1.3-1.8 cm wide, creamy and light yellow; the outermost stamens ca. 3.0 cm long, creamy and light yellow; carpelar appendices ca. 1.3 cm long, cream-colored to light yellow. The collected specimens were kept in the Herbarium CGMS (UFMS) under the record numbers CGMS-30919 (G.A. Amador 234) and CGMS-30920 (G.A. Amador 235). New collection records are necessary for better characterization and documentation of *N. belophylla*.

Final Considerations

Porto Esperança is a remote microregion with low botanical collection index, probably for its difficult access, most part of the year only by boat plus long walks in marshy grassland, what has kept the area less attractive for research. Only few people live on the port embankment, where iron ore brought by train is stored and shipped downriver. This new record of *Nymphaea belophylla* emphasises the importance of floristic surveys, as they may reveal new occurrence of various species and so contribute to the yet little known geographic distribution of plants in the region.

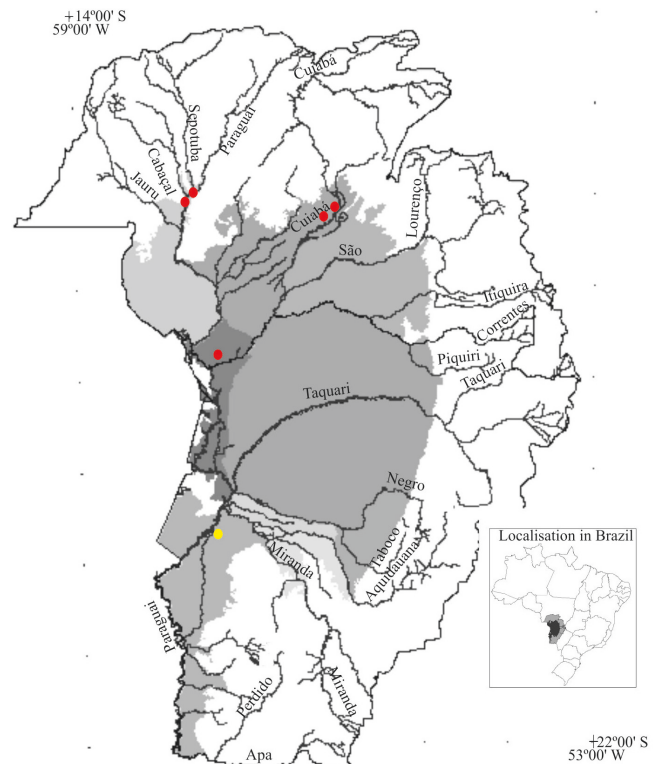


FIGURE 2. Map of the Pantanal wetland, Brazil. The yellow dot is where *Nymphaea belophylla* was found in the state of Mato Grosso do Sul. The red dots are the collections in the state of Mato Grosso. Names distributed on map indicate main rivers in the region. Adapted from Silva and Abdon (1998).

By low collection rates in the Amazon and the Pantanal few records, the occurrence of *Nymphaea belophylla* is an interesting aspect for an evaluation as to their geographical distribution, which can be disjunct. In this sense, for a better understanding of their distribution pattern, studies assessing environmental factors related to the biology of the species and that may determine its occurrence are needed. The knowledge of how species considered from the Amazon are distributed in extra-Amazonian context is an important biogeographic information as they could generate modeling of geographic distribution and even climate change.

ACKNOWLEDGMENTS: To FUNDECT (Fundação de Apoio ao Desenvolvimento do Ensino, Ciência e Tecnologia do Estado de Mato Grosso do Sul), INAU (Instituto Nacional de Ciência e Tecnologia em Áreas Úmidas) and CPP (Centro de Pesquisa do Pantanal) for the financial support; to the owner of Inocência ranch, at Porto Esperança, for allowing entrance. A. Pott is supported by the Brazilian agencies CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) and CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico).

LITERATURE CITED

- Bosch, T., C. Löhne and J.H. Wiersema. 2008. Phylogeny and evolutionary patterns in Nymphaeales: integrating genes, genomes and morphology. *Taxon* 57 (4): 1052-1081.
- Burkart, A., N.S.T. Burkart and N.M. Bacigalupo. 1987. *Flora Ilustrada de Entre Rios*. Dicotiledóneas Arqui-clamídeas (Dialipétalas). A: Salicales a Rosales (Incluso Leguminosas). Tomo VI, parte III. Buenos Aires: Instituto Nacional de Tecnología Agropecuaria. 763 p.
- Cook, C.D.K. 1990. *Waterplants of the World*. The Hague: Dr. W. Junk Publishers. 561 p.
- Conard, H.S. 1905. The waterlilies: a monograph of the genus *Nymphaea*. *Publications of the Carnegie Institutions of Washington* 4: 1-279.
- Judd, W.S., C.S. Campbell, E.A. Kellogg and P.F. Stevens. 2008. *Plant systematics: a phylogenetic approach*. Third edition. Sinauer Associates, Inc. Publishers Sunderland, Massachusetts, USA. 611 p.

- Pott, V.J. and A. Pott. 1997. Checklist das macrófitas aquáticas do Pantanal. *Acta Botanica Brasílica* 11(2): 215-227.
- Pott, V.J. 1998. A família Nymphaeaceae no Pantanal, Mato Grosso do Sul, Mato Grosso, Brasil. *Acta Botanica Brasílica* 12(2): 183-194.
- Pott, V.J. and A. Pott. 2000. *Plantas aquáticas do Pantanal*. Corumbá: Empresa Brasileira de Pesquisa Agropecuária do Pantanal. 404 p.
- Pott, A., A.K.M. Oliveira, G.A. Damasceno-Junior and J.S.V. Silva. 2011. Plant diversity of the Pantanal wetland. *Brazilian Journal of Biology* 71(1): 265-273.
- Silva, J.S.V. and M.M. Abdon. 1998. Delimitação do Pantanal Brasileiro e suas sub-regiões. *Pesquisa Agropecuária Brasileira* 33: 1703-1711.
- Souza, V.C. and H. Lorenzi. 2008. *Botânica sistemática: guia ilustrado para identificação das famílias de Fanerógamas nativas e exóticas no Brasil, baseado em APG II*. 2 ed. Instituto Plantarum, Nova Odessa. 640 p.
- Trickett, R.S. 1971. A New Tropical American Waterlily, *Nymphaea belophylla*. *Kew Bulletin* 26(1): 29-31.
- Wiersema, J.H. 1987. A monograph of *Nymphaea* subgenus *Hydrocallis* (Nymphaeaceae). The American Society of Plant Taxonomists. *Systematic Botany Monographs* 16: 46-101.

RECEIVED: July 2012

ACCEPTED: January 2013

PUBLISHED ONLINE: May 2013

EDITORIAL RESPONSIBILITY: Pedro V. Eisenlohr