



Three new species of *Xyris* (Xyridaceae) from the Espinhaço Range, Brazil

MARIA G. L. WANDERLEY^{1,4} & NARA F. O. MOTA^{2,3}

¹ Instituto de Botânica de São Paulo, Seção de Curadoria do Herbário, SP. CEP 04.301-902, São Paulo, São Paulo, Brazil; e-mail: gracaw@me.com

² Programa de Pós Graduação em Biologia Vegetal, Departamento de Botânica, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, CEP 31.270-901, Belo Horizonte, Minas Gerais, Brazil; e-mail: nara.mota@gmail.com

³ Museu Paraense Emílio Goeldi. Avenida Magalhães Barata, 376, São Braz, Belém - PA, 66040-170, Brazil

⁴ Author for correspondence: gracaw@me.com

Abstract

Three new species of *Xyris* from Brazil are described and illustrated. *Xyris nevata* is characterized by bracts with conspicuous veins and a reddish androecium and gynoecium; *X. pulchella* also exhibits a reddish androecium and gynoecium, and is further characterized by its small size and terete to subterete leaf blades; *X. rostrata* has a turbinate spike and bracts with a rostrate-acuminate apex. Commentary is provided for each species on habitat, distribution, phenology and conservation status, and the new species are compared with morphologically similar species.

Key words: *campos rupestres*, Minas Gerais, Poales, *Xyris* sect. *Nematopus*

Introduction

The genus *Xyris* Linnaeus (1753: 42) comprises about 400 species of annual or perennial herbs (Campbell 2005, Wanderley 2011). The species usually have rhizomatous stems with short internodes, leaves with open sheaths and isobilateral blades and the inflorescence consists of a spike borne on an exerted peduncle. The flowers have dimorphic sepals (the anterior one cucullate and membranous and usually soon deciduous, while the other two are navicular, firm, sclerotic and persistent) and yellow, unguiculate petals. The androecium consists of three antesealous staminodia and three epipetalous stamens. The capsule is loculicidal with numerous seeds that are usually less than 1.5 mm long. Most of the taxonomically informative morphological characters in the genus are found in the leaves, spike bracts, sepals, and ovary (e.g. Smith & Downs 1960, 1968, Kral 1988, Wanderley 2011).

Most species of *Xyris* occur in tropical and subtropical areas, but some are found in temperate regions of the world (Wanderley 2011). The genus is particularly diverse in mountainous regions of South America, especially in the Guyana Shield and in Brazil in the *campos rupestres* of the Espinhaço Range, located in Bahia and Minas Gerais states and in central Brazil (Kral 1988, Campbell 2005, 2012, Mota & Wanderley 2013, 2014). The Espinhaço Range represents the major center of diversity of the genus, including more than 100 species, of which at least 65% are endemic to this mountain chain (Mota & Wanderley 2013, 2014). Other groups of plants exhibit a similar pattern of high diversity and endemism in the Espinhaço Range, such as Eriocaulaceae and Velloziaceae (Alves & Kolbek 1994, Mello-Silva *et al.* 2011, Echternacht *et al.* 2011, 2014, Trovó *et al.* 2013). The increased effort in the botanical survey of this region has resulted in a large number of recently described species of *Xyris* (e.g. Wanderley 2010, 2011, Mota & Wanderley 2013, 2014). Several other species are currently awaiting description, while many mountain areas of the Espinhaço Range remain botanically unexplored.

This paper presents three new species of *Xyris*, as part of continuing studies leading to a monograph of the Neotropical species of the genus by the first author and collaborators. The novelties were recorded during a taxonomic study of the Xyridaceae of the Espinhaço Range of the State of Minas Gerais. Part of the studied collection was obtained during the monograph of the Xyridaceae of the Rio Preto State Park (Mota 2009). All three species are included in *Xyris* sect. *Nematopus* Seubert (1855: 211), characterized by the presence of basal placenta (Smith & Downs 1968).

Additional specimens examined:—BRAZIL. **Minas Gerais:** Buenópolis, Parque Nacional da Sempre-Viva, entre Campos de São Domingos e Serra do Landi, 1,211 m, 17°55'00.6" S, 43°47'11" W, 29 April 2007 (fl, fr), *T.E. Almeida & D. Souza 833* (BHCB); Campos de São Domingos, 17°55'0.2" S, 43°47'12" W, 1277 m, 19 June 2008 (fl), *T.E. Almeida & D. Souza 1384* (BHCB); São Gonçalo do Rio Preto, Parque Estadual do Rio Preto, caminho para a Chapada do Couto, 1100 m, 18°09'54" S, 43°19'20" W, 23 February 2007 (fr), *N.F.O. Mota, P.L. Viana & Souza 630* (BHCB, SP); 1700 m, 18°12'27" S, 43°18'38" W, 24 February 2007 (fr), *N.F.O. Mota, P.L. Viana & D. Souza 666* (BHCB, SP, MG); Chapada do Couto, campo em frente da Lapa do Nezinho, 1312 m, 18°12'15" S, 43°20'27" W, 19 March 2007 (fr), *N.F.O. Mota, P.L. Viana, J.A.N. Batista, & R.C. Mota 737* (BHCB, SP, SPF, R); Chapada do Couto, subindo para o Pico Dois Irmãos, caminho alternativo pelo córrego da Garrincha, 1200–1400 m, 18°11'34" S, 43°20'13" W, 11 July 2007 (fl, fr), *N.F.O. Mota 819* (BHCB, NY, SP, US); brejo próximo da casa da Chapada do Couto, margem direita do Rio Preto, 1576 m, 18°14'06" S, 43°19'38" W, 28 April 2008 (fl.), *N.F.O. Mota & V.T. Giorni 1320* (BHCB, SP, SPF); caminho para o Pico Dois Irmãos, 1520 m, 18°12'69" S, 43°19'55" W, 21 March 2004 (fl), *P.L. Viana, N.F.O. Mota, A.M. Teles, J.A.N. Batista & R.C. Mota 2771* (BHCB); área brejosa, 22 May 2007 (fl), *M.G.L. Wanderley, N.F.O. Mota, P.L. Viana, V.T. Giorni & R. Louzada 2573* (BHCB, SP, MO).

Acknowledgments

We thank Antonio Augusto Tonhão de Almeida and the staff of Rio Preto State Park for helpful field support, Pedro L. Viana and Victor T. Giorni for help in the field, Queila S. Garcia for supervising part of this project and Eduardo L. Borba, Ana M. Giuliatti and Pedro L. Viana for valuable comments on the manuscript. Lisa M. Campbell provided linguistic advice and comments, and Tarciso S. Filgueiras provided the Latin diagnoses. Financial support was provided by O Boticário Foundation and CNPq.

References

- Alves, R.J.V. & Kolbek, J. (1994) Plant species endemism in savanna vegetation on table mountains (*campo rupestre*) in Brazil. *Vegetatio* 113 (2): 125–139.
<https://dx.doi.org/10.1007/BF00044230>
- Campbell, L.M. (2005) Contributions towards a monograph of Xyridaceae: A revised nomenclature of *Abolboda*. *Harvard Papers in Botany* 10 (2): 137–145.
[http://dx.doi.org/10.3100/1043-4534\(2005\)10\[137:CTAMOX\]2.0.CO;2](http://dx.doi.org/10.3100/1043-4534(2005)10[137:CTAMOX]2.0.CO;2)
- Campbell, L.M. (2012) Pollen morphology of Xyridaceae systematic (Poales) and its potential. *The Botanical Review* 78 (4): 428–439.
<http://dx.doi.org/10.1007/s12229-012-9110-7>
- Echternacht, L., Sano, P.T., Bonillo, C., Cruaud, C., Couloux, A. & Dubuisson, J.-Y. (2014) Phylogeny and taxonomy of *Syngonanthus* and *Comanthera* (Eriocaulaceae): Evidence from expanded sampling. *Taxon* 63 (1): 47–63.
<http://dx.doi.org/10.12705/631.36>
- Echternacht, L., Sano, P.T., Trovó, M. & Dubuisson J.-Y. (2011) Phylogenetic analysis of the Brazilian microendemic *Paepalanthus* subgenus *Xeractis* (Eriocaulaceae) inferred from morphology. *Botanical Journal of the Linnean Society* 167 (2): 137–152.
<http://dx.doi.org/10.1111/j.1095-8339.2011.01170.x>
- IUCN (2012) *IUCN Red List Categories and Criteria*. Vol. 3.1. 2nd Edition. IUCN, Gland/Cambridge, 32 pp.
- Kral, R. (1988) The genus *Xyris* (Xyridaceae) in Venezuela and contiguous Northern South America. *Annals of the Missouri Botanical Garden* 75: 522–722.
<http://dx.doi.org/10.2307/2399434>
- Kral, R. & Wanderley, M.G.L. (1993) Five new taxa of *Xyris* (Xyridaceae) from Brazil. *Kew Bulletin* 48 (3): 577–588.
<http://dx.doi.org/10.2307/4118722>
- Kunth, C.S. (1843) *Enumeratio Plantarum Omnium hucusque cognitarum* 4, Stutgardiae et Tubingae, 313 pp.
<http://dx.doi.org/10.5962/bhl.title.67381>
- Linnaeus, C. (1753) *Species Plantarum*. Laurentius Salvius, Stockholm, 1200 pp.
- Malme, G.O.A. (1929) *Xyridaceae* brasilienses Hilarianae. *Arkiv för Botanik* 22A (15): 1–6.
- Martius, C.F.P. (1841) Herbarium Florae brasiliensis. *Flora* 24 (2): 1–112.

- Mello-Silva, R., Santos, D.Y.A.C., Salatino, M.L.F., Motta, L.B., Cattai, M.B., Sasaki, D., Lovo, J., Pita, P.B., Rocini, C., Rodrigues, C.D.N., Zarrei, M. & Chase, M.W. (2011) Five vicarious genera from Gondwana: the Velloziaceae as shown by molecules and morphology. *Annals of Botany* 108 (1): 87–102.
<http://dx.doi.org/10.1093/aob/mcr107>
- Mota, N.F.O. (2009) *A família Xyridaceae C. Agardh no Parque Estadual do Rio Preto, Minas Gerais, Brasil*. MSc. thesis. Department of Botany, Universidade Federal de Minas Gerais, 147 pp.
- Mota, N.F.O. & Wanderley, M.G.L. (2013) *Xyris riopretensis* (Xyridaceae): uma nova espécie para Minas Gerais, Brasil. *Rodriguésia* 64 (3): 555–560.
<http://dx.doi.org/10.1590/s2175-78602013000300007>
- Mota, N.F.O. & Wanderley, M.G.L. (2014) Three new species of *Xyris* (Xyridaceae) from Diamantina Plateau in Brazil, Minas Gerais. *Brittonia* 66 (1): 42–50.
- Seubert, M. (1855) Xyrideae. In: Martius, C.F.P. (Ed.) *Flora Brasiliensis* vol. 3 (1). Leipzig, Frid. Fleischer, pp. 211–224.
- Smith, L.B. & Downs, R.J. (1960) Xyridaceae from Brazil II. *Proceedings of the Biological Society of Washington* 73: 245–260.
- Smith, L.B. & Downs, R.J. (1966) Xiridáceas novas ou críticas do Brasil. *Arquivos de Botânica do Estado de São Paulo* 4 (2): 1–31.
- Smith, L.B. & Downs, R.J. (1968) Xyridaceae IX: II. In: Hoehne, F.C. & Teixeira, A.R. (Eds.) *Flora Brasílica*. Instituto de Botânica de São Paulo, Brazil, pp. 1–214.
- Steudel, E.G. (1855) Xyrideae. In: Metzler, J.B. (Ed.), *Synopsis Plantarum Glumacearum*. Stuttgart, pp. 283–289.
- Trovó, M., De Andrade, M.J.G., Sano, P.T., Ribeiro, P.L. & Van den Berg, C. (2013) Molecular phylogenetics and biogeography of Neotropical Paepalanthoideae with emphasis on Brazilian *Paepalanthus* (Eriocaulaceae): Evolution of Paepalanthoideae. *Botanical Journal of the Linnean Society* 171 (1): 225–243.
<http://dx.doi.org/10.1111/j.1095-8339.2012.01310.x>
- Wanderley, M.G.L. (2010) Cinco novas espécies de *Xyris* (Xyridaceae) da Serra do Cipó, Minas Gerais, Brasil. *Rodriguésia* 61 (1): 83–94.
- Wanderley, M.G.L. (2011) Flora da Serra do Cipó, Minas Gerais: Xyridaceae. *Boletim de Botânica de São Paulo* 29 (1): 69–134.
<http://dx.doi.org/10.11606/issn.2316-9052.v29i1p69-134>
- Wanderley, M.G.L. & Cerati, T.M. (1987) Studies in Xyridaceae II. Two new species of *Xyris* from Brazil. *Brittonia* 39: 298–301.
<http://dx.doi.org/10.2307/2807399>