Phytotaxa 174 (2): 097–104
www.mapress.com/phytotaxa/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

http://dx.doi.org/10.11646/phytotaxa.174.2.4

Polianthes alboaustralis (Asparagaceae, Agavoideae), a new species from the State of Oaxaca, Mexico

ELOY SOLANO[1*] & RAMIRO RÍOS-GÓMEZ[1]
[1]*Unidad de Investigación en Sistemática Vegetal y Suelo, Carrera de Biólogo, Facultad de Estudios Superiores Zaragoza, Universidad Nacional Autónoma de México. Batalla 5 de mayo s/n. Col. Ejército de Oriente, Iztapalapa, 09230. México, D. F., México; e-mail: solacael@yahoo.com.mx.*
[*]*author for correspondence*

Abstract

Polianthes alboaustralis, a new species endemic to the State of Oaxaca, Mexico, is described and illustrated. This species is morphologically similar to *Polianthes nelsonii*, which is distributed in Durango and Zacatecas, and *P. palustris* from Nayarit, but it differs from these by having larger leaves, first bract, inflorescence, anthers, and longer filaments; the perigone lobes are broadly ovate, the anthers are longer, and extrafloral nectaries are usually present. A dichotomous key to the species of *Polianthes* thus far described for the State of Oaxaca is included.

Resumen

Se describe e ilustra a *Polianthes alboaustralis* como especie nueva, endémica del estado de Oaxaca, México. Esta especie es similar morfológicamente a *Polianthes nelsonii* con distribución en Durango y Zacatecas, y *P. palustris* propia de Nayarit, pero difiere de éstas por presentar hojas más largas, primera bráctea floral, inflorescencia, anteras y filamentos de mayor longitud; lóbulos del perianto anchamente ovados, anteras más largas y nectarios extraflorales generalmente presentes. Se incluye una clave dicotómica de las especies hasta ahora descritas para el estado de Oaxaca.

Key words: Agavaceae, Mixteca Alta, Sierra Madre del Sur

Introduction

The type species of the genus *Polianthes* Linnaeus (1753: 316) *P. tuberosa*, was most likely described from plants already cultivated in Mexico during the pre-Cortesian period and introduced to Europe a few years after the Spanish conquest (Del Campo 1993). *Polianthes tuberosa* was one of the first Mexican ornamental plants known in Europe (Rzedowski 1995). However, all congeneric species have ornamental potential, and some are currently used for ceremonial purposes [*P. sessiliflora* Rose (1903: 10)*, P. tuberosa* L. 'Mexicana', and *P. platyphylla* Rose (1903: 11)] (Solano 2000). *Polianthes longiflora* Rose (1903: 10) is used for medicinal purposes (Solano 2000).

According to Dahlgren *et al.* (1985), the genus *Polianthes* belongs to the family Agavaceae, although it has also been placed in Agapanthaceae (Endlicher, 1836–1840), Amaryllidaceae (Baker 1888, Rose 1899), and, most recently, in Asparagaceae, subfamily Agavoideae (APG III 2009). However, Stevens (2001, onward, 28 August 2013) recognizes that Asparagaceae *sensu* APG III is a family without morphological characteristics that define it and that some of its subfamilies have easily recognizable apomorphies, while the recognition is difficult in others. The author indicates that Asparagoideae, especially Nolinoideae and Agavoideae, are morphologically heterogeneous. In a nomenclatural review of the families of angiosperms, and considering the provisions of the Melbourne Code (McNeill *et al.* 2012), Reveal (2012) recognizes and accepts Agavaceae as a distinct family.

Based on morphological and molecular studies conducted by Hernández-Sandoval (1993, 1995) and Bogler & Simpson (1996), Thiede & Eggli (1999, 2001) transferred the species of *Manfreda* Salisbury (1866: 78), *Polianthes*, and *Prochnyanthes* Watson (1887: 457) to the genus *Agave*; however, according to Hernández-Sandoval *et al*. (2008), it is preferred to treat *Polianthes* as a genus different from *Agave.*

Accepted by Lorenzo Peruzzi: 13 Jun. 2014; published: 9 Jul. 2014

2. Inflorescence a raceme; flowers 2–2.6 cm long, perigone tube slightly widened between the curvature and the base of the tepals; perigone tube orange, perigone lobes green ..... *P. bicolor*
- Inflorescence spike-like; flowers 4.5–5.2 cm long, perigone tube-abruptly widened between the curvature and the base of the tepals; perigone tube pink on the exterior, yellowish inside ..... *P. oaxacana*

Acknowledgements

Abisaí García-Mendoza and Aarón Rodríguez reviewed the final manuscript and made important comments that substantially improved it. Elvia Esparza prepared the illustrations, and Miguel Rivera the map of the geographical distribution. Aarón Rodríguez provided the photographs of *Polianthes nelsonii* and *P. palustris.* The authors also thank the IEB, IBUG, MICH, MEXU, NY, UAMIZ, and US herbaria for the consultation of their specimens. This project was funded by DGAPA PAPIIT, UNAM, Contract IN225210.

References

APG III. (2009) An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Botanical Journal of the Linnean Society* 161: 105–121. http://dx.doi.org/10.1111/j.1095-8339.2009.00996.x

Baker, J.G. (1888) *Handbook of Amaryllidae, including Alstromerieae and Agaveae*. George Bell and Sons, London, 216 pp.

Bogler, D. & Simpson, B. (1996) Phylogeny of Agavaceae based on ITS rDNA sequence variation. *American Journal of Botany.* 83: 1225–1235. http://dx.doi.org/10.2307/2446206

Browne, P. (1756) *The Civil and Natural History of Jamaica.* Part 1. Printed for the author, London, 503 pp.

Campo, I. Del (1993) *Introducción de plantas americanas en España*. Ministerio de Agricultura, Pesca y Alimentación, [Fisheries and Food]. Madrid, 506 pp.

Cavanilles, A.J. (1791) *Icones et descriptiones plantarum, quae aut sponte in Hispania crescunt, aut in hortis hospitantur. Volumen I.* Imprenta Real, Madrid, 176 pp.

Dahlgren, R.M., Clifford, H.T. & Yeo, P.F. (1985) *The families of the monocotyledons. Structure, evolution and taxonomy*. Springer Verlag, New York, 520 pp.

Desvaux, N.A. (1813) Précis de caracteres de plusieurs geners de la famille des Légumineuses. *Journal de Botanique, Appliquée à l'Agriculture, à la Pharmacie, à la Médecine et aux Arts* 1(3): 1–320.

De La Federación, D.O. (2002) *Norma Oficial Mexicana NOM-059-ECOL-2001. Protección ambiental- Especies nativas de México de flora y fauna silvestres. Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio. Lista de especies en riesgo. Anexo normativo I, método de evaluación del riesgo de extinción de las especies silvestres en México MER*. Diario Oficial de la Federación, segunda sección, 6 de marzo de 2002, 84 pp.

Endlicher, S.L. (1836–1840) *Genera Plantarum.* Vindobonae, Wien, 1483 pp.

García-Mendoza, A.J. & Solano, E. (2007) *Polianthes oaxacana* y *P. geminiflora* var. *pueblensis* (Agavaceae) taxa nuevos de México. *Acta Botanica Mexicana* 78: 111–123.

García-Mendoza, A.J. (2004) Integración del conocimiento florístico del estado. *In:* García Mendoza, A.J., Ordoñez Ma, de J. & Briones-Salas, M. (Eds.) *Biodiversidad de Oaxaca.* Instituto de Biología, Universidad Nacional Autónoma de México; Fondo Oaxaqueño para la Conservación de la Naturaleza. México, D. F., México, pp. 305–325.

Hernández-Sandoval, L. (1993) *Character analysis of the American Genera of Asparagales, a systematic study of* Beaucarnea *(Nolinaceae) and the taxonomic revision of* Hemiphylacus *(Hyacinthaceae).* Ph.D. Thesis. Botany Departament, University of Texas, Austin, TX, 201 pp.

Hernández-Sandoval, L. (1995) Análisis cladístico de la familia Agavaceae. *Boletín de la Sociedad Botánica de México* 56: 57–68.

Hernández-Sandoval, L., Orellana, R. & Carnevali, G. (2008) Two new species of *Manfreda* Salisb. (Agavaceae) from the Yucatan Peninsula, Mexico. *Journal of the Torrey Botanical Society* 135: 168–177. http://dx.doi.org/10.3159/08-ra-023.1

IUCN (2001) *The IUCN Red List Categories and Criteria*, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, U.K. Available from: http://www.iucn.org/(accessed: 17 May 2013).

Linnaeus, C. (1753) *Species Plantarum*. Holmiae, Stockholm, 1200 pp.

McNeill, J., Barrie, F.R., Buck, W.R., Demoulin, V., Greuter, W., Hawksworth, D.L., & Turland, N.J. (2012) *International Code of*

Nomenclature for algae, fungi, and plants (Melbourne Code). Koeltz Scientific Books, Koenigstein, 208 pp.

McVaugh, R. (1989). Bromeliaceae to Dioscoreaceae. *In:* W.R. Anderson (Ed.) *Flora Novo-Galiaciana.* 15. University of Michigan Press. Ann Arbor, 398 pp.

Morrone, J.J. (2010) Fundamental biogeographic patterns across the Mexican Transition Zone: An evolutionary approach. *Ecography* 33: 355–361.
http://dx.doi.org/10.1111/j.1600-0587.2010.06266.x

Ortega, C.G. (1800) *Novarum, aut Rariorum Plantarum Horti Reg. Botan. Matrit. Descriptionum Decades*. Imprenta Real, Madrid, 138 pp.

Pursh, F.T. (1814) *Flora Americanae Septentrionalis*. White, Cochrane and Co., London, 751 pp.

Reveal, J.L. (2012) An outline of a classification scheme for extant flowering plants. *Phytoneuron* 37: 1–221.

Rose, J.N. (1899) Studies of Mexican and Central American Plants No.2. A proposed rearrangement of the suborder *Agaveae. Contributions from the National Herbarium* 5(4): 151–157.

Rose, J.N. (1903) Studies of Mexican and Central American Plants Part.1. *Contributions from the National Herbarium* 8(3): 1–55.

Rzedowski, J. (1995) Aspectos de las plantas ornamentales mexicanas. *Revista Chapingo, Ser. Horticultura* 1: 5–7.

Schmidel, C.C. (1762) *Icones Plantarum et Analyses Partium. Editio II.* 1. Ioannem Jacobum Plam, Erlangae, 280 pp.

Solano, C.E. & García-Mendoza, A. (1998) Una nueva especie de *Polianthes* (Agavaceae) del estado de Oaxaca, México. *Sida* 18: 473–477.

Solano, E. & García-Mendoza, A. (2007) *Polianthes oaxacana* y *P. pueblensis* (Agavaceae) taxa nuevos de México. *Acta Botanica Mexicana* 78: 111–123.

Solano, E., & Feria, A.T.P. (2007) Ecological niche modeling and geographic distribution of the genus *Polianthes* L. (Agavaceae) in Mexico: using niche modeling to improve assessments of risk status. *Biodiversity and Conservation* 16: 1885–1900.
http://dx.doi.org/10.1007/s10531-006-9091-0

Solano, C.E. (2000) *Sistemática del género* Polianthes *L. (Agavaceae). Tesis de doctorado*. Facultad de Ciencias, Universidad Nacional Autónoma de México. México, D. F., 291 pp.

Stevens, P.F. (2001 onwards) Angiosperm Phylogeny Website. Version 12, July 2012. http://www.mobot.org/MOBOT/research/Apweb/ Accessed February 2014.

Thiede, J. & Eggli, U. (1999) Einbeziehung von Manfreda Salisbury, *Polianthes* Linné und *Prochnyanthes* in *Agave*. (Agavaceae) *Kakteen und andere Sukkulenten* 50: 109–113.

Thiede, J. & Eggli, U. (2001) Einbeziehung von *Manfreda* Salisbury und *Polianthes* Linné in *Agave* Linné (Agavaceae). *Kakteen und andere Sukkulenten* 52: 166–167.

Thiers, B. (2014) *Index Herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. http://sweetgum.nybg.org/ih/ Accessed February 2014.