

## NOTA CIENTÍFICA

Three new species records of *Symplocos* (Symplocaceae) from northern PeruTres nuevos registros de especies de *Symplocos* (Symplocaceae) para el norte de Perú

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Email Tim Böhnert: [tim.boehnert@uni-bonn.de](mailto:tim.boehnert@uni-bonn.de)Email Maximilian Weigend: [mweigend@uni-bonn.de](mailto:mweigend@uni-bonn.de)ORCID Tim Böhnert: [orcid.org/0000-0003-1415-7896](http://orcid.org/0000-0003-1415-7896)ORCID Maximilian Weigend: <http://orcid.org/0000-0003-0813-6650>**Abstract**

Even in times of "big data", the holdings of local herbaria worldwide are of increasing value for taxonomic discoveries and phylogeographic analyses. Based on our research in Peruvian herbaria we present new records for three species of *Symplocos* (Symplocaceae) for Peru, which were previously known only from Southern Ecuador.

**Keywords:** *Symplocos*; Symplocaceae; Peru; local herbaria; specimens.

**Resumen**

Actualmente, incluso en la era de las grandes bases de datos, las colecciones de los herbarios locales de todo el mundo siguen representando invaluables fuentes de información para los descubrimientos taxonómicos y los análisis fitogeográficos. Con base en la investigación llevada a cabo en diferentes herbarios del Perú, presentamos nuevos registros de tres especies de *Symplocos* (Symplocaceae) para el Perú, las cuales eran conocidas anteriormente sólo para el sur de Ecuador.

**Palabras clave:** *Symplocos*; Symplocaceae; Perú; herbarios locales; especímenes

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**Introduction**

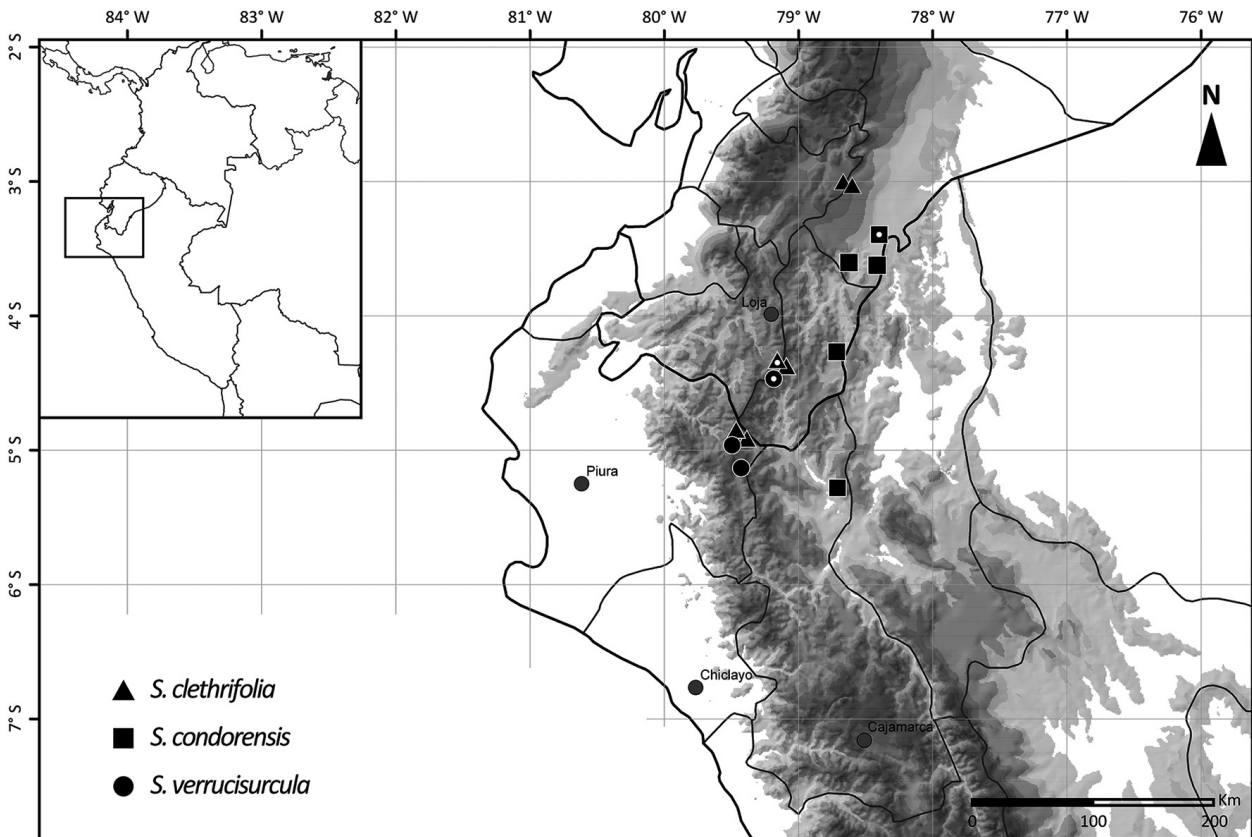
Making georeferenced specimens and observation data available for a broad scientific community, e.g. “Global Biodiversity Information Facility” (GBIF.org), is one of the great efforts of modern biological sciences. Nevertheless, such databases still suffer major flaws regarding mistaken identity of collection specimens (Goodwin et al. 2015), accuracy of the georeferencing process, or the correct spelling of scientific names (Amano et al. 2016). Using such data on a global scale might reduce this underlying bias due to the high amount of data, but making prediction on a mesoscale level is, on the contrary, highly problematic (Yang et al. 2015). On the other hand, holdings of herbaria are increasingly recognized as a highly valuable source for the discovery of new species (c.f. Bebbler et al. 2010) as well as for a wide variety of research questions in biodiversity. Additionally, more accurate distribution data are urgently needed for revisions as well as for biogeographical analyses on a mesoscale level in order to achieve an improved understanding of the patterns of diversity and areas of particular conservation concern.

Based on our research in the herbaria of the Universidad Nacional Mayor de San Marcos in Lima (USM) we present new records for three species of *Symplocos* Jacquin (1760: 5) for Peru, which were previously known only from Southern Ecuador (c.f. Ståhl 2010b). The genus *Symplocos* with over 300 species is the largest genus in Symplocaceae Desfontaines (1820: 9) (Fritsch et al. 2008, 2015) in Ericales (APG IV 2016). The majority of the usually evergreen tree species is

native to tropical montane forest distributed in the Americas, South East Asia and tropical Australia. South American *Symplocos* are exclusively evergreen trees or shrubs primarily found in tropical montane forests. The leaves are always simple, without stipules, and with entire or dentate margins. Flowers are borne singly or arranged in inflorescences with many flowers, usually axillary, sometimes terminal. Flowers have usually five sepals and five or more petals which are fused at the base (Nooteboom 2004). Several new *Symplocos* species were described from or reported as new to Peru and southern Ecuador during the last years by Ståhl (1993, 1995, 2010a, 2010b) and Ulloa Ulloa et al. (2015). Nevertheless, three additional *Symplocos* species from northern Peru are reported here for the first time. The number of Peruvian *Symplocos* species thus rises to 40 in comparison to 32 species known from Ecuador (c.f. Brako 1993, Ulloa Ulloa 2004, Ståhl 2010a). All collections presented here are from northern Peru near the Ecuadorian boarder, often less than 60 km from the type localities (Fig. 1).

**Material and methods**

During a field campaign in northern Peru in March and April 2015, herbarium specimen of *Symplocos* were revised in three Peruvian herbaria (USM, HUT & CPUN). For USM 237 specimen of *Symplocos* were revised by using the key presented by Ståhl (2010b). Datasets of the relevant species from USM were supplemented by additional specimen information from publications (Ståhl 1991, 2010a) as well as tropicos.org.



**Figure 1.** Map section of the border region between Ecuador and Peru with collection locations of *Symplocos* ssp. on both side of the border. Type localities are marked with a white dot within the symbols.

## Taxonomy

***Symplocos clethrifolia* Ståhl (1991: 23)**

TYPE: ECUADOR. **Loja:** ca 7 km ESE of Yangana on road to Cerro Toledo, 3100–3200 m, [04°21'17"S 79°06'52"W], 4 September 1985, *B. B. Larsen & B. Dall 231* (holotype QCA, isotypes AAU, GB, MO, NY).

**Additional specimens examined:** ECUADOR. **Loja:** Parque Nacional Podocarpus, Road Yangana - Cerro Toledo, at entrance to crest; subparamo scrub and bogs in the pass, 3100 m, 04°23'S 79°06'W, 26 February 1985, *B. Ollgaard, S. Løgaard, K. Thomsen, J. Korning & T. Illum 58231* (AAU); **Morona-Santiago:** Carretera Cuenca-Macas, colecciones en borde de carretero, Gualaceo-Limon, E del paso, 3100 m, 03°00'35"S 78°38'25"W, 14 August 1987, *C. Ulloa 487* (AAU, GB, MO, QCA); Gualaceo - Limón, km 33.3 Roadside, 3010 m, 03°02'S 78°35'W, 27 December 1990, *P.M. Jørgensen, C. Ulloa & B. Ollgaard 92876* (MO). PERU. **Piura:** Huancabamba, El Carmen de la Frontera, 3353 m, 04°54'09.1"S 79°23'45.5"W, 29 July 2006, *A. Cano, W. Mendoza & N. Valencia 16848* (USM 212345!, USM 212977!).

***Symplocos condorensis* Ståhl (2010a: 86)**

TYPE: ECUADOR. **Zamora-Chinchipe:** El Pangui, Cordillera del Cóndor, 1 km S of military camp Cóndor Mirador, 2000 m, 03°23'S 78°03'W, 16 December 2000, *E. Freire 4379* (holotype QCNE; isotypes MO, S).

**Additional specimens examined:** ECUADOR. **Zamora-Chinchipe:** El Pangui, [Tundayme], Cordillera del Condor, 2 km N of Condor Mirador, 1975 m, 03°37'S 78°23'W, 06 September 2003, *D. Neill, E. Rodríguez, W. Quizhpe & J. Homeier 14423* (QCNE); Cordillera del Cóndor, Summit of sandstone plateau of Cordillera, southeast headwaters of Río Wawaime, above proposed Ecuacorriente copper mine area, 1930 m, 03°35'40"S 78°35'40"W, 19 September 2006, *D. Neill & W. Quizhpe 15251* (CAS, GB, MO, NY, QCNE); Cordillera del Cóndor, Summit of sandstone plateau of Cordillera, southeast headwaters of Río Wawaime, above proposed Ecuacorriente copper mine area, 1930 m, 03°35'40"S 78°35'40.5"W, 19 September 2006, *D. Neill & W. Quizhpe 15254* (MO, QCNE); Nangaritzá, Cordillera del Cóndor region, upper Río Nangaritzá, Area de Conservación Los Tepuyes, on upper portion of sloping sandstone plateau southwest of Las Orquídeas, 1620 m, 04°15'32"S 78°41'04"W, 06 November 2006, *D. Neill & NSF dendrology course 15417* (AAU, F, K, MO, QCNE); Nangaritzá, Cordillera del Cóndor region, upper Río Nangaritzá, Area de Conservación Los Tepuyes, on upper portion of sloping sandstone plateau southwest of Las Orquídeas, 1620 m, 04°15'32"S 78°41'04"W, 06 November 2006, *D. Neill & NSF dendrology course 15418* (MO, QCNE). PERU. **Cajamarca:** San Ignacio, Huarango, 05°16'12"S 78°40'28"W, 2300 m., 14 July 2005, *E. Rodríguez, E. Alvítez & S. Arroyo 2821* (USM 229960!).

***Symplocos verrucisurcula* Ståhl (1991: 41)**

TYPE: ECUADOR, Zamora-Chinchipe, Nudo de Sabanilla, pass on road Yangana-Valladolid, 2800–2900 m, [04°26'49"S 79°08'45"W], 05 April 1985, *G. H. Harling & L. Andersson 23685* (holotype GB, isotype QCA).

**Additional specimens examined:** PERU. Piura: Huancabamba, El Carmen de la Frontera, 3100–3200 m, 05°07'20.2"S 79°23'21.7"W, 24 April 2006, *A. Cano, N. Valencia & I. Salinas 16481* (USM 211993!); El Carmen de la Frontera, 3160 m, 04°54'09" S 79°23'02.8" W, 27 July 2006, *A. Cano, W. Mendoza & N. Valencia 16837* (USM 212338!, USM 212976!).

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**Literature cited**

- Amano T., J.D.L. Lamming & W.J. Sutherland. 2016. Spatial gaps in Global Biodiversity Information and the role of Citizen Science. *BioScience* 66: 393–400. <http://dx.doi.org/10.1093/biosci/biw022>
- Angiosperm Phylogeny Group [APG]. 2016. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. *Botanical Journal of the Linnean Society* 181: 1–20. <http://dx.doi.org/10.1111/boj.12385>
- Bebber D.P., M.A. Carine, J.R.I. Wood, et al. 2010. Herbaria are a major frontier for species discovery. *Proceedings of the National Academy of Sciences* 107: 22169–22171. <http://dx.doi.org/10.1073/pnas.1011841108>
- Brako L. 1993. Symplocaceae. In: Brako L. & J.L. Zarucchi (Eds). *Catalogue of the flowering plants and Gymnosperms of Peru*. Monographs in Systematic Botany from the Missouri Botanical Garden 45: 1142–1144.
- Desfontaines R.L. 1820. Description de quatre nouveaux genres. *Mémoires du Muséum d'Histoire Naturelle* 6: 5–19.
- Fritsch P.W., L.M. Kelly, Y. Wang, F., et al. 2008. Revised infrafamilial classification of Symplocaceae based on phylogenetic data from DNA sequences and morphology. *Taxon* 57: 823–852.
- Fritsch P.W., S.R. Manchester, R.D. Stone, et al. 2015. Northern Hemisphere origins of the amphi-Pacific tropical plant family Symplocaceae. *Journal of Biogeography* 42: 891–901. <http://dx.doi.org/10.1111/jbi.12442>
- Goodwin Z.A., D.J. Harris, D. Filer, et al. 2015. Widespread mistaken identity in tropical plant collections. *Current Biology* 25: R1066–R1067. <http://dx.doi.org/10.1016/j.cub.2015.10.002>
- Jacquin N.N.J.v. 1760. Pentandria. In Jacquin, N.N.J.v. (Ed.). *Enumeratio Systematica Plantarum, quas in insulis Caribaeis*.
- Nooteboom H.P. 2004. Symplocaceae. In: Kubitzki, K. (Ed.). *The Families and genera of vascular plants*. VI: 443–449.
- Ståhl E.B. 1991. Symplocaceae, Oleaceae. In: G. Harling & L. Andersson (Eds.). *Flora of Ecuador* 43: 1–44.
- Ståhl E.B. 1993. The genus *Symplocos* (Symplocaceae) in Peru. *Candollea* 48: 351–382.
- Ståhl E.B. 1995. New or noteworthy Andean species of the genus *Symplocos* (Symplocaceae). *Candollea* 50: 445–452.
- Ståhl E.B. 2010a. Additions to the knowledge of the genus *Symplocos* (Symplocaceae) in Ecuador and Peru. *Novon* 20: 84–94. <http://dx.doi.org/10.3417/2008079>

- Ståhl E.B. 2010b. Four new species and new records of *Symplocos* (Symplocaceae) from Peru and Bolivia, and a key to all species of *Symplocos* known to occur in Ecuador, Peru and Bolivia. *Nordic Journal of Botany* 28: 79–87. <http://dx.doi.org/10.1111/j.1756-1051.2009.00445.x>
- Ulloa Ulloa, C., J.L. Zarucchi & B. León. 2004. Diez años de adiciones a la Flora del Perú: 1993-2003. *Arnaldoa Edic. Espec.*, Nov. 2004: p 203.
- Ulloa Ulloa C., B. Ståhl, D. Minga & R. Ansaloni. 2015. A new species of *Symplocos* (Symplocaceae) from southern Ecuador. *PhytoKeys* 56: 41–46. <http://dx.doi.org/10.3897/phytokeys.56.5306>
- Yang W., K. Ma & H. Kreft. 2013. Geographical sampling bias in a large distributional database and its effects on species richness-environment models. *Journal of Biogeography* 40: 1415–1426. <http://dx.doi.org/10.1111/jbi.12108>