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Discovery of *Gyalideopsis mexicana* in the United States

James C. Lendemer¹ and Erin A. Tripp²

¹Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY 10458-5126, U.S.A. email: jlendemer@nybg.org; ²University of Colorado, Department of Ecology and Evolutionary Biology and CU Museum of Natural History, UCB 350, Boulder CO 80309, U.S.A. email: erin.tripp@colorado.edu

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Corresponding author: James C. Lendemer (jlendemer@nybg.org). Accepted for publication September 20, 2014. <http://pnwfungi.org> Copyright © 2014 Pacific Northwest Fungi Project. All rights reserved.

Abstract: *Gyalideopsis mexicana* is reported for the first time from the United States, from a specimen collected in 1957 by Sam Shushan in Mora County, New Mexico. The species is illustrated and the range of the species is discussed.

Key words: Gomphillaceae, southern Rocky Mountains, cordillera, Mexico, biogeography.

Introduction: During a recent visit to the University of Colorado in Boulder, the first author spent several hours examining undetermined specimens in the herbarium of the University of Colorado Museum of Natural Herbarium (COLO). These undetermined

specimens represent the residual problems from accumulated life's work of the seminal western North American lichenologist William A. Weber and his colleagues such as Sam Shushan and Roger Anderson. Although the COLO collection is worldwide in geographic scope, there is a strong

emphasis on the western United States, and especially the central Rocky Mountains. Among the specimens examined was an unusual crustose lichen growing on soil from New Mexico. Study with a dissecting microscope immediately led the first author to recognize it as *Gyalideopsis mexicana* Tretiach et al., a species originally described from Mexico (Tretiach et al. 1996) and subsequently reported by the first author from the Yukon (Lendemer 2011). Further study of the diahyphae and discussion with Robert Lücking confirmed the identification. The purpose of the present contribution is to report the first discovery of *G. mexicana* in the United States, to provide further illustrations of the morphological variability of the species, and to place this new report into a broader geographical context.

Materials and Methods: This study is based on material held in the herbaria of The New York Botanical Garden (NY) and the University of Colorado's Museum of Natural History (COLO). Specimens were examined dry using a Bausch and Lomb StereoZoom 7 dissecting microscope. Dissecting light micrographs were captured using a Nikon DXM1200F digital camera attached to a Nikon SZM 1500 dissecting microscope and Nikon ACT-1 software. Microscopic examination of the hyphae and hyphophores was conducted on material hand cut with a razor blade, mounted in water, and observed using an Olympus Bx53 compound light microscope. Micrographs of the diahyphae were captured using the same microscope, fitted with an Olympus DP72 digital camera and CellSens Standard imaging system. The figures were assembled in Adobe Photoshop.

Results and Discussion: *Gyalideopsis mexicana* was presumed endemic to central Mexico until it was found growing on bryophytes in a roadside boreal forest in the Yukon Territory of Canada (Lendemer 2011). With the discovery of this second population, it was hypothesized that the species likely occurred elsewhere in western North America, particularly the Rocky Mountains, and had been overlooked (Lendemer

2011). Here, the species is reported for the first time from the United States from a collection made more than half a century ago, along the Canadian River in Mora County, New Mexico.

The known range of *Gyalideopsis mexicana* now spans nearly 3,000 miles (4828 kilometers), extending from central-western Chihuahua (Mexico) to central-western Yukon Territory (Canada). The newly reported population from Mora County, New Mexico, documents an important biogeographical link between its currently known southern and northern population limits. Regarding the central and southern portions of its known distribution, Axelrod and Raven (1985) discussed floristic similarities between the southern Rocky Mountains and the cordillera that extends into northern Mexico. Further to north, *Gyalideopsis mexicana* exhibits a biogeographical pattern that has been documented in numerous organisms native to the region. A conspicuous botanical example of this pattern is seen in *Pseudotsuga menziesii* (Douglas Fir), which occupies lower altitudes at higher latitudes and increasingly higher altitudes at more southerly occurrences, into Mexico. Carabid beetles belonging to the genus *Harpalus* occur in lower elevation habitats in northerly portions of their range and shift progressively upwards in elevation to montane habitats in more southerly portions of their range (Noonan 1990). We are unsurprised by the finding of *Gyalideopsis mexicana* in the southern Rocky Mountains (specifically, the Sangre de Cristo Range) and expect that this taxon will be documented from intervening portions of this large swath in short time, especially with increased inventory efforts in the southern Rocky Mountains (Tripp & Lendemer, in prep.).

Color illustrations of the material from New Mexico are provided here to further aid in the search for more populations, as well as to illustrate the morphological variability of the species. Unlike the material from the Yukon, the material from New Mexico is associated with a

very well developed, nearly verruculose thallus that appears to be covered by a thick layer of necrotic tissue. The presence of a well-developed thallus may be due to the occurrence on soil and humus rather than on bryophytes and woody detritus. Although hyphophores typical of *G. mexicana* are present in the New Mexican specimen, many are poorly developed, with unusually short and squat stalks or irregularly shaped apical bundles of diahyphae. It is possible that these differences correspond to the occurrence of the species in environmental conditions that are harsher than those of the Yukon and Mexico. It is also possible that “typical” hyphophores were more abundant when the specimen was originally collected, but that these became broken and damaged during storage and compression in the herbarium.

Specimen examined. – **U.S.A. NEW MEXICO.** MORA CO.: 3 mi W of bridge of Canadian River, E of Wagon Mound, elev. 600 ft., 18.ix.1957, on organic matter and bryophytes, *S. Shushan 11307* (COLO-126215!).

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Literature cited

Axelrod, D.I. and P.H. Raven. 1985. Origins of the Cordilleran flora. *Journal of Biogeography* 12: 21-47. <http://dx.doi.org/10.2307/2845027>

Lendemer, J.C. 2011. *Gyalideopsis mexicana*, a new report for North America and a remarkable disjunction from Central America. *North American Fungi* 6(16): 1-5. <http://dx.doi.org/10.2509/naf2011.006.016>

Noonan, G.R. 1990. Biogeographical patterns of North American *Harpalus* Latreille (Insecta: Coleoptera: Carabidae). *Journal of Biogeography* 17: 583-614. <http://dx.doi.org/10.2307/2845142>

Tretiach, M., M. Giralt and A. Vězda. 1996. *Gyalideopsis mexicana*, a new lichen species from Chihuahua, Mexico. *Bryologist* 99(2): 236-239.

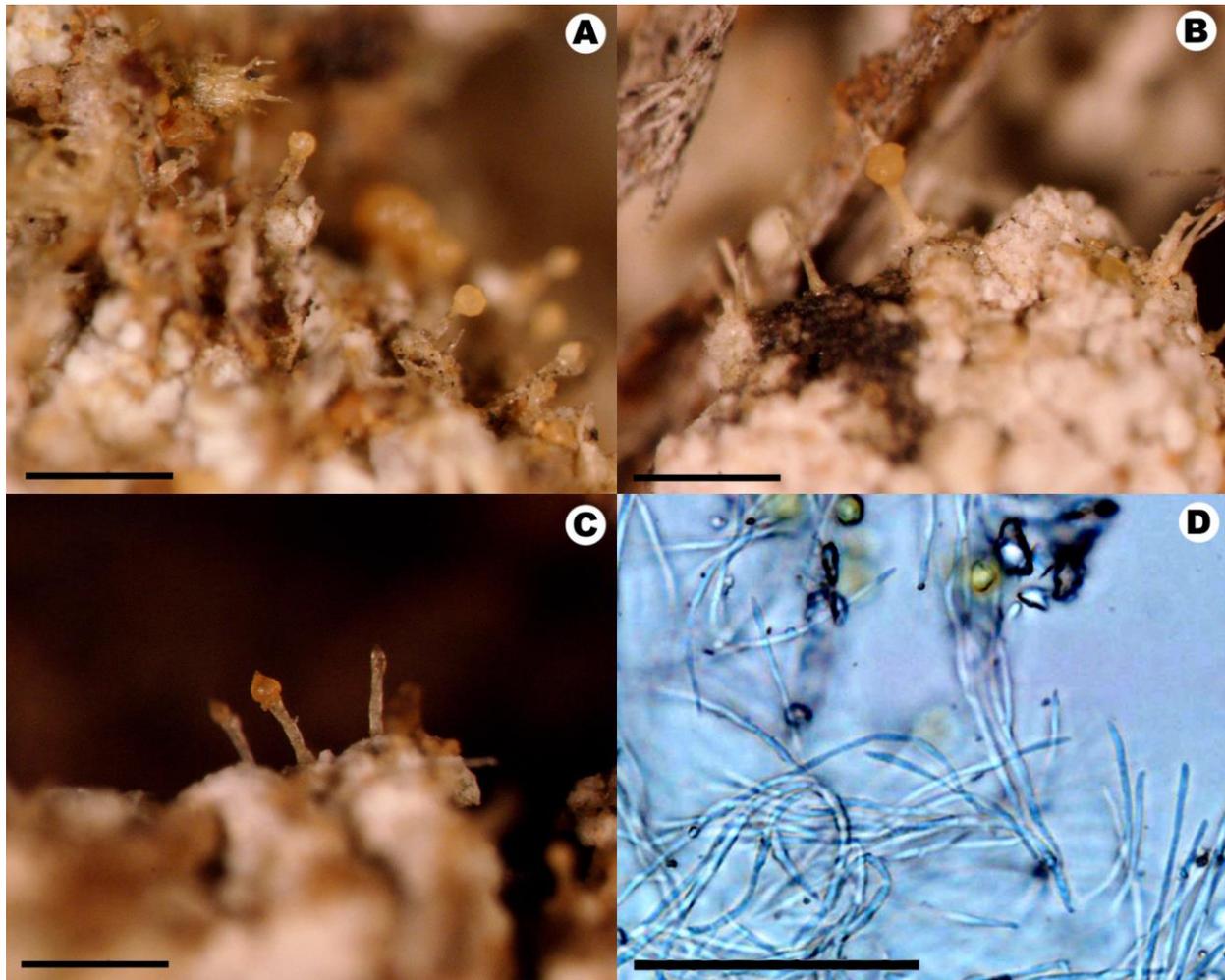


FIGURE 1, morphology of the newly discovered material of *Gyalideopsis mexicana* (all from *Shushan 11307*). A-C. Morphological variation of the hyphophores and thallus. D. Morphology of the diahyphae. Scales = 0.5 mm: A-C; 50 μ m: D.