Additional records of *Gyalideopsis mexicana* (lichenized Ascomycota).

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Abstract: *Gyalideopsis mexicana* is recorded for the first time from the Mexican state Sonora. Notes on the available types, on the ecology including the report of facultative lichenicolous growth, and on the overall horizontal and vertical distribution are added.

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Introduction

Prior to the publication of the 'Lichen Flora of the Sonoran Desert Region' (NASH et al. 2002, 2004, 2007), Thomas Nash organized several field trips to various parts of the region, in order to improve both the knowledge about the taxa occurring in the area of investigation and about the distribution of individual species.

On occasion of such collecting trips, many new taxa have been detected the descriptions of which are scattered over the lichenological literature. Among the newly detected taxa was also a species of *Gyalideopsis*, *G. mexicana* (TRETIACH et al. 1996). The generic treatment of *Gyalideopsis* for the Flora was later written up by NASH & TØNSBERG (2004). The data they had available for *Gyalideopsis mexicana* were more or less the same as those given together with the original description.

At that time we had no free access to the material gathered during two of the mentioned field trips. Therefore for a number of species the information that can be withdrawn from the specimens at our disposal and from the labels could not be provided in time, neither to the authors of the generic treatments, nor to the editors of the flora. But now this material is accessible again and we are able to publish some additional information on *Gyalideopsis mexicana*.

Material and methods

The present study is based on dried herbarium specimens, including collections already examined for previous treatments. External morphology was studied with a dissecting microscope (WILD M3, 6.4–40×). Anatomical

studies of the thallus and the ascomata were carried out under the light microscope (LEICA DMRE, 100–1000×). Sectioning was performed with a freezing microtome (LEITZ, sections of 12–15 mm) but squash preparations were also used, especially for ascus analysis. Preparations were mounted in water. When necessary, contrasting was performed by a pretreatment with lactic acid-cotton blue (MERCK 13741). Amyloid reactions in hymenia were observed by the use of Lugol's reagent (I) (MERCK 9261). Sections and squash preparations were not pretreated with KOH (K) unless otherwise stated (K/I). Measurements refer to dimensions in tap water.

Abbreviations for institutional herbaria follow HOLMGREN et al. (1990). Abbreviations of author names are those proposed by BRUMMITT & POWELL (1992). Geographic units are defined and named according to HOLLIS & BRUMMITT (1992) or BRUMMITT (2001).

Results

Gyalideopsis mexicana Tretiach, Giralt & Vězda, The Bryologist 99(2): 236 (1996).

Typus: Mexico: Chihuahua, Sierra Madre Occidental, Rio Sirupa valley, 29° 10’55’’N / 108°18’45’’W, ca. 1700 m, on decaying moss, 20. VII. 1994, leg. M. Tretiach (TSB 20033 - holotype) n.v. (locality data from protologue). – Vězda, Lichenes Rariores Exs. 243 (GZU – called isotype)!

Full descriptions: TRETIACH et al. 1996: 236–238; NASH & TØNSBERG 2004: 127.

Icon.: TRETIACH et al. 1996: 237 1–5 (drawings of habit, section of apothecium, ascus and paraphyses, conidiophores, ascospores)

Key characters for identification: Thallus composed of flattened to hemispherical verrucae, whitish when dry and containing clusters of calcium oxalate crystals. Hyphophores usually abundant, up to 2 mm high and apically pointed, with apical conidial mass occasionally present, subglobose, translucent to brownish, consisting of branched diahyphae. Apothecia occasionally present, reddish-brown to middle-brown, sometimes covered by coarse white pruina, with flat discs and thin persisting concolorous margin; exciple biatorine; paraphyses branched and anastomosing, with narrow lumina and embedded in gelatinous matrix; asci with non-amyloid ascal wall, apically thickened to form a non-amyloid tholus, 2- to 8-spored; ascospores hyaline, submuriform, with lower end almost pointed, about 20–25(–30) x 9–14 µm.

Notes: 1. There are some noteworthy discrepancies concerning the labels of type specimens and the information on the type material in the protologue. According to the protologue, the holotype (TSB) and an isotype (MEXU) have been collected by M. Tretiach alone. Another specimen from the type locality has been collected by M. Giralt and is said to constitute a paratype (BCC). Furthermore the protologue indicates the distribution of further isotypes in Vězda, Lichenes Rariores Exsiccati. This material was included

in Vězda, Lichenes Rariores Exsiccati, Fasc. 25, as no. 243, but on the exsiccate label 'M. Tretiach & M. Giralt' are given as collectors. Applying the Code strictly, the duplicates of this exsiccate number are paratypes rather than isotypes, due to the differing collector information.

2. The reason for these discrepancies is the following: A variable number of lichenologists attended the field trips which Tom Nash had organized in connection with the Sonoran desert lichen flora he planned to publish at that time. The individual scientists often have designed their own labels, resulting in label texts that often differ in wording but might refer to identical localities. This is not of dramatic importance in case of additional collections for well known species, but it certainly matters when new taxa are described because it might remain unclear that a specimen comes from the *locus classicus* and *de facto* constitutes a 'topotype'. This also applies to some of our collections of *Gyalideopsis mexicana* which were collected in the company of the senior taxon author, at the same places and on the same date. Such specimens are explicitly annotated in the list of specimens below.

3. Based on phenotypic characters, the species was assigned to the *Gyalideopsis africana* group which is not strongly supported and includes also the generic type, *Gyalideopsis peruviana* G.Merr. ex Vězda (LÜCKING et al. 2005, VĚZDA 1972).

4. According to the world-wide key for *Gyalideopsis* (LÜCKING et al. 2006), the species appears to be most similar to *Gyalideopsis capitata* Sérus. (SÉRUSIAUX 1998) with regard to thallus type and the apical position of the diahyphal mass but differing from that species by much longer hypophores (only up to 0.35 mm in *G. capitata*) and asci with a variable number of relatively small ascospores (ascospores single and up to 110 µm long in *G. capitata*).

Ecology: The species is mostly found growing on and encrusting plant remnants, bryophytes and spikemosses. More rarely it was found growing directly on thin soil layers overlaying boulders.

Although regarded as a pioneer species, *Gyalideopsis mexicana* appears to be a relatively strong competitor as it has been observed invading squamules of *Cladonia* spec. and lobes of *Peltigera* spec. (duplicate of Dupl. Graec. Lichenum no. 1054 in GZU), as well as lobes of *Coccocarpia* spec. (Hafellner 54810) and *Scytinium* spec. (Hafellner 55520).

Distribution: The species was so far reported only from Chihuahua State in Mexico (NASH & TØNSBERG 2004). Apart from additional localities in that province, it is here also reported from Sonora State where it has been collected at two sites during the Sonoran Desert foray in 1993. The recorded localities listed below are situated within an altitudinal range of 960 to 2000 m.

Exsiccata seen: Vězda, Lichenes Rariores Exs. 243 (GZU). – Obermayer, Dupla Graecensia Lichenum 1054 (CANB, GZU, M, NY, UPS).

Further specimens seen:

NORTHERN AMERICA: **Mexico**: **Sonora:** Paso El Encino ca. 23 km ENE of Moctezuma, ca. 1160 m, 29°52'N / 109°28'W; N-facing outcrops in a small ravine, on thin soil layer over granite, 9. II. 1993, leg. J. Hafellner no. 54851 & A. Hafellner (GZU). – ca. 14 km ENE of Moctezuma, by the road to Huásabas, ca. 960 m, 29°50'N / 109°32'W; low sandstone outcrops on N-facing slope, open shrubland, on mossy mats between small outcrops, 9. II. 1993, leg. J. Hafellner no. 54810 & A. Hafellner (GZU). – **Chihuahua:** Sierra Madre Occidental, valley of Rio Sirupa W of Ciudad Madera, cliffs E above the river, ca. 1350 m, 29°11'N / 108°19'25''W; open oak forest, siliceous rocks, on plant debris, 20. VII. 1994, leg. J. Hafellner no. 54403 (GZU) [paratype locality of TSB 20042]. – Sierra Madre Occidental, western slopes of Sierra Chinaca E above Rio Sirupa, W of Ciudad Madera, ca. 1630 m, 29°10'55''N / 108°18'45''W, siliceous cliffs in open oak forest, over mosses and *Seliginella* in a shady ravine, 20. VII. 1994, leg. J. Hafellner 55699, 55702, 55710 (GZU) [type locality of TSB 20033]. – Sierra Madre Occidental, Barranca del Cobre, 1 km S above the bridge over Río Urique, ca. 1700 m, 27°22'20''N / 107°30'10''W, pine-oak forest on N-facing slope, over mosses on boulders, 21. VII. 1994, leg. J. Hafellner no. 55674 (GZU) [paratype locality of TSB 20037]. – Sierra Madre Occidental, Barranca del Cobre, secondary valley about 10 km S of Basihuare, ca. 1800 m, 27°26'20''N / 107°29'20''W, pine-oak forest with sandstone boulders along riverbank, over mosses and temporarily moist earth, 21. VII. 1994, leg. J. Hafellner no. 55520 (GZU) [duplicates distributed in Obermayer, Dupla Graecensia Lichenum no. 1054]. – Sierra Madre Occidental, Barranca del Cobre, small ridge S above Basihuare, ca. 2000 m, 27°27'N / 107°29'20''W, rhyolithe outcrops between low shrubs (*Arctostaphylos*, *Quercus*), over mosses on low N-facing outcrops, 21. VII. 1994, leg. J. Hafellner no. 55906 (GZU).

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