

Additions to the lichenized and lichenicolous fungi of Bolivia

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Abstract: FEUERER, T. & SIPMAN, H. J. M. 2005. Additions to the lichenized and lichenicolous fungi of Bolivia. – *Herzogia* 18: 139–144.

In a list of 57 taxa 40 lichenized and 5 lichenicolous fungi are reported as new for Bolivia. For *Collema flagellatum* a second record is presented; it was previously known only from the Peruvian type specimen.

Zusammenfassung: FEUERER, T. & SIPMAN, H. J. M. 2005. Ergänzungen zur Flora lichenisierter und lichenicoler Pilze von Bolivien. – *Herzogia* 18: 139–144.

In einer Liste mit 57 Taxa werden 40 Flechten und 5 flechtenbewohnende Pilze erstmalig für Bolivien angegeben. Ein Zweitfund für *Collema flagellatum* wird gemeldet. Diese Art war bisher nur von der Typusaufsammlung aus Peru bekannt.

Key words: Andes, biodiversity.

Introduction

Bolivia continues to be one of the least investigated countries in South America lichenologically. A recent survey of the state of affairs was published by FEUERER et al. (1998). It contains 60 additional species and increases the number of reliably reported taxa to about 260. Since then, 41 species have been added: DIEDERICH & ETAYO (2000) & DIEDERICH (2003) contributed three lichenicolous fungi, FERRARO (2002) 30 epiphyllous species, and JØRGENSEN & ARVIDSSON (2002) and MAYRHOFER et al. (2001) eight epiphytic and terricolous lichens. A compilation of all literature records of Bolivian lichens is present in the internet (FEUERER 2004). It lists 336 taxa though a considerable number of records seem doubtful.

Material

The samples listed below were collected by the first author (abbreviated T. F.) in the Eastern Cordillera and the Altiplano north of La Paz during the period 1979 to 1985, unless otherwise indicated. Taxa recorded as new for Bolivia are indicated by an asterisk.

Species list

**Abrothallus parmeliarum* (Sommerf.) Arnold s. lat.

Depto. La Paz, Prov. Bautista Saavedra, steep stony slope below Charazani, on *Cereus peruvianus* in Senno-Mutisietum hirsutae, on *Xanthoparmelia* spec., 3100 m, 28.3.1982, T. F. 15550 (HBG).

**Amandinea brugierae* (Vain.) Marbach

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, righthand side of valley above Rio Charazani ford below Ciliz, on twigs of *Senna birostris* var. *huancavensis*, 2780 m, 29.9.1979, T. F. 16027 (HBG).

**Arthonia destruens* Rehm

Depto. La Paz, Prov. Murillo, Rio abajo, little valley below Mecapaca, lefthand side of Rio de La Paz valley, in thornbush savanna on *Josefpoeltia boliviensis*, 2500 m, 12.12.1979, T. F. 16368 (HBG).

**Buellia excellens* H.Magn.

Depto. La Paz, Prov. Murillo, Zongo valley, on granite boulder, 3200 m, 27.10.1980, T. F. 6005 (HBG).

**Buellia mexicana* J.Steiner

Depto. Cochabamba, Prov. Arque, ca. 10 km east of Oruro along road to Cochabamba, west of Arque just beyond the sign „130 Kilometer to Cochabamba“, on sandstone, 3000 m, 30.6.1980, T. F. 15919 & N. Höhne (HBG).

**Coccocarpia erythroxyli* (Spreng.) Swinscow & Krog

Depto. La Paz, Prov. Larecaja, below Sorata, path to San Pedro, bottle-neck in San Cristobal valley above confluence of Rio Ilabaya, on giant boulder, 2490 m, 8.5.1985, T. F. 15555 (HBG).

**Coccocarpia palmicola* (Spreng.) Arv. & D.J.Galloway

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, righthand side of valley just beyond ford below Cilij, on soil and stones, 2750 m, 4.10.1979, T. F. 16059 (HBG).

**Collema flagellatum* Degel.

Second record for this species, described from Peru (DEGELIUS 1986: 345).

Depto. La Paz, Prov. Larecaja, Sorata, road bank a little below the village, on limestone, 2420 m, 8.5.1985, T. F. 16683 (HBG).

**Diploschistes actinostomus* (Pers.) Zahlbr.

Depto. La Paz, Prov. Murillo, near Mecapaca southeast of La Paz, east of Cerro Sankapata, 3000 m, 12.12.1979, T. F. 16510 (HBG).

**Diploschistes aeneus* (Müll.Arg.) Lumbsch

This species is known in Latin America from Mexico, Paraguay, and Uruguay (LUMBSCH et al. 1993: 304).

Depto. La Paz, Prov. Murillo, near Mecapaca southeast of La Paz, east of Cerro Sankapata, 3000 m, 12.12.1979, T. F. 16509 (HBG). *

Diploschistes scruposus (Schreb.) Norman

Mentioned in NYLANDER (1861: 379 sub *Urceolaria scruposa*) from the vicinity of Sorata, Prov. Larecaja.

Depto. La Paz, Prov. Bautista Saavedra, above ford through Rio Amarete to Mina Sica, on Devonian slate rock, 3400 m, 19.11.1979, T. F. 16179 (HBG).

**Endocarpon pusillum* Hedw.

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, righthand slope of valley a little above ford near former Estancia Cilij, in Senna-Mutisia-coppice, 2790 m, 18.12.1979, T. F. 16425 (HBG); ibidem, Charazani valley, path to Khata, opposite Charazani, on soil over Devonian schist, 3180 m, 26.5.1980, T. F. 15286 (HBG).

Heterodermia boryi (Fée) Hale

Mentioned in Nylander (1859: 216 sub *Physcia leucomela* f. *angustifolia*) without locality and in Nylander (1861: 375 sub *Physcia leucomela* var. *angustifolia*) from Pongo at 3200 meter.

Depto. La Paz, Prov. Larecaja, Sorata, along higher road to Conzata, ca. 5 km after junction, on road bank in elfin forest, 3200 m, 11.3.1982, T. F. 15202 (HBG).

**Heterodermia obscurata* (Nyl.) Trevis.

Depto. La Paz, Prov. Bautista Saavedra, path from Niñokorin to lower bridge crossing Rio Curva, on Devonian schist, 3200 m, 17.4.1982, T. F. 15244 (HBG).

**Hypotrachyna andensis* Hale

Depto. La Paz, Prov. Murillo, Zongo valley, near lake Viscachani, 3800 m, 16.3.1982, T. F. 15817 (HBG).

Hypotrachyna chicitae (Hale) Hale

Recorded before from Zongo Valley, Prov. Murillo (FEUERER et al. 1998: 76).

Prov. Larecaja, highest point of pass between Achacachi and Sorata, in *Aciachme acicularis*-mountain pasture, 4200 m, 10.3.1982, T. F. 15894 (HBG).

**Hypotrachyna ducalis* (Jatta) Hale

Dept. La Paz, Prov. Murillo, Zongo valley, on *Clusia* near the river, 3060 m, 22.6.1980, T. F. 15994 (HBG).

**Hypotrachyna protenta* Hale

Depto. La Paz, Prov. Murillo, Zongo valley, on andesite boulder, 2350 m, 7.11.1980, T. F. 10088 (HBG).

Hypotrachyna pulvinata (Fée) Hale

Recorded before from Cochabamba and Prov. Larecaja (HALE 1975: 59).

Depto. La Paz, Prov. Bautista Saavedra, Amarete valley, above plain along road above Chacabaya towards Pumazani, in *Aciachne acicularis*-mountain pasture, 4070 m, 1.10.1979, T. F. 16043 (HBG).

**Lecanora caesiorubella* Ach. subsp. *prolifera* (Fink) R.C.Harris

Depto. La Paz, Prov. Bautista Saavedra, steep Devonian schist slope below Charazani, on *Cereus peruvianus* in Senno-Mutisetum hirsutae, 3100 m, 28.3.1982, T. F. 15551 (HBG); Prov. Bautista Saavedra, Charazani valley, lefthand slope of valley just beyond ford below Cilij, border between *Baccharis pentlandii*-coppice and elfin forest, 2750 m, 29.9.1979, T. F. 16006 (HBG); Prov. Bautista Saavedra, Charazani valley, righthand slope near Rio Charazani ford below Cilij, on twigs of *Senna birostris* var. *huancavensis*, 2780 m, 29.9.1979, T. F. 16025 (HBG).

Lecanora coronulans Nyl.

Depto. Santa Cruz, Prov. Santiesteban, 1 km south of Guabira along road to Santa Cruz, on extremely hard wood of pasture fence, 500 m, 24.5.1981, T. F. 15467 (HBG).

**Lecanora flavidomarginata* de Lesd.

Depto. La Paz, Prov. Murillo, Rio Abajo, side-valley below Mecapaca, left slope of Rio de La Paz valley, in thorn coppice savanna, 2500 m, 12.12.1979, T. F. 16374 (HBG).

Lecanora garovaglii (Körb.) Zahlbr.

Recorded from Bolivia by FEUERER et al. (1998: 77). The additional record is from the highest known altitude for this species. Field observations in Peru have shown that it is rather common in the drier parts of the Andes.

Depto. La Paz, Prov. Murillo, Zongo valley, upper end of valley along path along southern delivery channel to reservoir, on granite, 4830 m, 10.8.1980, T. F. 15045 & H. Preiß (HBG).

**Lecanora plumosa* Müll.Arg.

Depto. La Paz, Prov. Bautista Saavedra, depression below double lake in region of small lakes east of lake Llacho Kkota, 4440 m, 26.3.1982, T. F. 15945 (HBG); Prov. Bautista Saavedra, churchyard above Curva, 3950 m, 29.10.1979, T. F. 16080 (HBG).

Leptogium andinum P.M.Jørg.

Described from Bolivia (JØRGENSEN 1975: 440) without exact location; the collector, G. Mandon, worked mainly in the vicinity of Sorata, the same area from where the following record came.

Depto. La Paz, Prov. Larecaja, valley of Rio Kuribaya, above Sorata, path to Apacheta, in elfin forest with abundant epiphytes, on *Baccharis pentlandii*, 3380 m, 9.5.1985, T. F. 15573 (GB, HBG).

**Leptogium burgessii* (L.) Mont.

Depto. La Paz, Prov. Nor Yungas, Coroico, road to La Paz, in elfin forest, 2440 m, 7.3.1982, T. F. 12235 (HBG).

**Leptogium cyanescens* (Rabenh.) Körb.

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, righthand slope just beyond ford below Cilij, on Devonian schist, 2750 m, 5.10.1979, T. F. 15955 (HBG).

**Leptogium laceroides* de Lesd.

Depto. La Paz, Prov. Larecaja, valley of Rio Kuribaya, above Sorata, path to Apacheta, in elfin forest with abundant epiphytes, on *Baccharis pentlandii*, 3380 m, 9.5.1985, T. F. 15574 (HBG); Prov. Bautista Saavedra, Charazani valley, near bridge at upper end of Chari, 3540 m, 22.3.1982, T. F. 15782 (GB, HBG).

Leptogium mandonii P.M.Jørg.

The type of this rare species comes from the vicinity of Sorata, Prov. Larecaja (JØRGENSEN 1975: 444).

Depto. La Paz, Prov. Bautista Saavedra, below Canizaya at the rivulet, on bark of *Polylepis*, 3840 m, 10.6.1980, T. F. 15182 (HBG); Prov. Bautista Saavedra, Amarete valley, on righthand slope westwards above Atique, above upper path from Pojroyoj to Atique, near ford through side-rivulet of Rio Amarete, in *Baccharis pentlandii*-coppice, 3800 m, 25.4.1981, T. F. 15195 (GB, HBG, hb. Seaward).

**Leptogium vesiculosum* (Sw.) Malme

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, lefthand slope opposite confluence of Rio Amarete with Rio Charazani, on Devonian schist in narrow side-valley in upper mountain wood, 2700 m, 29.9.1979, T. F. 16013 (HBG).

**Muellerella pygmaea* (Körb.) D.Hawksw. var. *pygmaea*

Depto. La Paz, Prov. Bautista Saavedra, southern area of Pumazani between Cerro Jacusiri and Cerro Tiluscun, siliceous limestone, on *Rhizocarpon pulverulentum*, 4590 m, 27.4.1981, T. F. 15500 (CONC); Depto. La Paz, Prov. Los Andes, at road to Mina Fabulosa, above last lake west of highest point of pass, on *Rhizocarpon superficiale* on Devonian schist, 4800 m, 10.2.1980, T. F. 15163 (HBG); Depto. La Paz, Prov. Manco Kapac, southwestern crest of Cerro Pabellón, in puna, on *Rhizocarpon geographicum* on red granite, 4270 m, 28.4.1985, T. F. 15515 (HBG).

**Muellerella pygmaea* var. *ventosicola* (Mudd) Triebel

Depto. La Paz, Prov. Franz Tamayo, at highest point of pass between Antaguilla and Pelechuco, at stone cross between two lakes, on *Rhizocarpon superficiale* on siliceous rock, 4800 m, 3.1980, T. F. 12760 (HBG).

**Pannaria malmei* C.W.Dodge

The sample previously identified as *Pannaria rubiginosa* (FEUERER et al. 1998: 78) is *P. malmei* according to the revised concept of the species in JØRGENSEN & SIPMAN (2004). The specimen has been studied by these authors but is not mentioned in their publication.

**Parmelinopsis minarum* (Vain.) Elix & Hale

Depto. La Paz, Prov. Bautista Saavedra, Amarete valley, righthand slope above ford in road to Mina Sica, on Devonian schist, steep wall of rock, 3200 m, 19.11.1979, T. F. 15313 (HBG).

Peltigera didactyla (With.) J.R.Laundon

Previously recorded for Bolivia by FEUERER et al. (1998: 79). The additional collection is from the highest known altitude for this species.

Depto. La Paz, Prov. Murillo, on large boulders along road to Chacaltaya, 4950 m, 10.12.1979, T. F. 16491 (HBG).

**Peltigera fibrillosa* (Gyeln.) Vitik.

Depto. La Paz, Prov. Bautista Saavedra, near bridge in path from Khata to Upinwaya, in side-valley, 3670 m, 23.4.1982, T. F. 15841 (HBG).

**Peltigera praetextata* (Sommerf.) Zopf

Depto. La Paz, Prov. Murillo, Zongo valley, near lake Viscachani, 3800 m, 16.3.1982, T. F. 15193 (B, BM, HBG, UME); Depto. La Paz, Prov. Bautista Saavedra, lower Charazani valley below confluence of Rio Amarete, 2.8 km below ford near Cilij, in mountain forest, 2650 m, 28.5.1980, T. F. 12756 (HBG).

**Peltigera soledians* Vitik.

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, lefthand slope opposite confluence of Rio Amarete with Rio Charazani, road bank, on soil, 2700 m, 29.9.1979, T. F. 16008 (HBG).

**Pertusaria acromelana* Müll.Arg.

Depto. La Paz, Prov. Franz Tamayo, below Pelechuco, at pass to the lowlands, upper mountain forest, 3200 m, 10.3.1980, T. F. 15716 (HBG).

**Phaeophyscia endococcina* (Körb.) Moberg var. *endococcina*

Depto. La Paz, Prov. Bautista Saavedra, Curva valley, near lowermost bridge west of Curva, on Devonian schist boulder in coppice with *Siphocampylus boliviensis*, 3100 m, 6.5.1981, T. F. 15027 (GZU, HBG, M); Prov. Bautista Saavedra, Charazani valley, on gravel of Rio Charazani near ford below Cilij, righthand slope, on lower jawbone of mule, 2750 m, 15.4.1980, T. F. 15496 (HBG); Prov. Murillo, Zongo valley, upper end of valley at path along southern delivery channel to reservoir, on granite, 4830 m, 18.8.1980, T. F. 15072 & H. Preiß (HBG).

**Physcia biziana* (A.Massal.) Zahlbr.

Depto. La Paz, Prov. Murillo, near Mecapaca southeast of La Paz, east of Cerro Sankapata, on twigs, 3000 m, 12.12.1979, T. F. 16525 (HBG).

**Placidium andicola* (Breuss) Breuss

Depto. La Paz, Prov. Bautista Saavedra, Pumazani, small path just beyond road crossing at Cerro Kacata, 4600 m, 17.12.1979, T. F. 16406 (HBG).

**Placidium pilosellum* (Breuss) Breuss

Depto. La Paz, Prov. Larecaja, valley of Rio San Cristobal, path to San Pedro below narrow part below confluence of Rio Chayllasuyu, 2520 m, 9.5.1985, T. F. 15559 (HBG).

**Placidium squamulosum* (Ach.) Breuss

Depto. La Paz, Prov. Bautista Saavedra, Pumazani, small path just south of road crossing at Cerro Kacata, 4600 m, 17.12.1979, T. F. 15909, 16413 (HBG); Depto. La Paz, Prov. Murillo, Cerro Calvario north of La Paz, 3950 m, 9.12.1979, T. F. 16454 (HBG).

**Pseudephebe minuscula* (Nyl. ex Arnold) Brodo & D.Hawksw.

Depto. La Paz, Prov. Murillo, Chacaltaya, road bank, on granite, 4950 m, 10.12.1979, T. F. 15973 (HBG); ibidem, 5050 m, T. F. 16495 (HBG).

**Pseudephebe pubescens* (L.) M.Choisy

Depto. La Paz, Prov. Los Andes, road to Mina Fabulosa, above forelast lake west of highest point of pass, on Devonian schist, 4800 m, 10.2.1980, T. F. & B. de Smeth 15167 (HBG); Depto. La Paz, Prov. Murillo, above Cerro Calvario north of La Paz, 4800 m, 9.12.1979, T. F. 16324 (HBG).

****Ramalina asahinae*** W.L.Culb. & C.F.Culb.

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, below confluence of rivulet from Chullina with Rio Charazani on lefthand slope, in elfin forest, 2750 m, 25.9.1980, T. F. 15794 (HBG).

Ramalina celastri (Spreng.) Krog & Swinscow

Listed by NYLANDER (1859: 213 sub *Ramalina ecklonii*, 1861: 371 sub *Ramalina calicaris* f. *ecklonii*) without exact locality. HERZOG (1922: 267, 1923: 42) recorded *R. celastri* from Samaipata, Dept. Santa Cruz, Prov. Florida.

Depto. La Paz, Prov. Bautista Saavedra, Curva, in the village on Devonian schist, 3800 m, 2.11.1979, T. F. 10036 (HBG, M); Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, lefthand slope above bridge in path to Khata, on rock, 3200 m, 26.5.1980, T. F. 15320 (HBG); Prov. Bautista Saavedra, Charazani valley, winding path above Playa towards Chullina, on Devonian schist, 3100 m, 17.5.1985, T. F. 15602 (HBG, Kashiwadani); Prov. Bautista Saavedra, path from Niñokorin to lower bridge crossing Rio Curva, on Devonian schist, 3200 m, 17.4.1982, T. F. 15243 (HBG); Prov. Larecaja, Sorata, road towards Rio Kuriwaya, about halfway, in upper elfin forest, on *Eucalyptus globulus*, 2750 m, 11.4.1985, T. F. 15913 (HBG, Hb. Kashiwadani).

****Sarcogyne regularis*** Körb.

Only twice recorded for South America: Argentina (CALVELO & LIBERATORE 2002: 143) and Uruguay (OSORIO 1972: 35 sub *Sarcogyne pruinosa*).

Depto. La Paz, Prov. Los Andes Yaurichambi, hill along road from La Paz to Peru near hotel Petit Andino, on Permian limestone, 3950 m, 18.5.1980, T. F. & N. Höhe 15084 (HBG).

****Siphula implicata*** Kantvilas & Elix

Depto. La Paz, Prov. Murillo, Cerro Calvario north of La Paz, 4750 m, 9.12.1979, T. F. 16317 (HBG).

Siphula pteruloides Nyl.

Recorded before from the Altiplano at the Peruvian border in the province Franz Tamayo (FEUERER et al. 1998: 82).

Depto. La Paz, Prov. Larecaja, highest point of pass between Achacachi and Sorata, in *Acicahne acicularis*-mountain pasture, 4200 m, 10.3.1982, T. F. 15895 (HBG); Prov. Murillo, Huari Pampa at base of Cerro Huaranka north of La Paz, 4600 m, 10.12.1979, T. F. 16467 (HBG).

****Stereocaulon pileatum*** Ach.

Depto. La Paz, Prov. Murillo, on large boulders along road to Chacaltaya peak, 4950 m, 10.12.1979, T. F. 16493 (HBG).

****Stereocaulon vesuvianum*** Pers.

Depto. La Paz, Prov. Bautista Saavedra, above ford through Rio Amarete in road to Mina Sica, on Devonian schist, 3400 m, 19.11.1979, T. F. 16167 (HBG); Prov. Murillo, Cerro Calvario north of La Paz, 4750 m, 9.12.1979, T. F. 16342 (HBG); Prov. Murillo, large boulders along road to Chacaltaya peak, 5050 m, 10.12.1979, T. F. 16495 beside *S. meyeri* (HBG).

****Tremella parmiliarum*** Diederich

Depto. La Paz, Prov. Bautista Saavedra, Charazani valley, righthand slope a little above ford near former Estancia Cilij, in Senna-Mutisia-coppice on *Rimelia cetrata*, 2790 m, T. F. 16422 (HBG).

Xanthoparmelia callifolioides Adler, Elix & J.Johnst.

Recorded before from the Altiplano in the province Aroma (NASH et al. 1995: 37).

Depto. La Paz, Prov. Murillo, Cerro Calvario north of La Paz, 3950 m, 9.12.1979, T. F. 16458 (HBG).

****Xanthoparmelia subtaractica*** Nash & Elix

Depto. La Paz, Prov. Aroma, road from La Paz to Oruro, 6 km north of Callamarca, 4000 m, 29.12.1979, T. F. 16597 (HBG).

****Xanthoparmelia tegeta*** Elix & J.Johnst.

Depto. La Paz, Prov. Los Andes, Patamanta, in Puna, 4000 m, 14.12.1979, T. F. 16533 (HBG).

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