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Contribution to the knowledge of the bryophyte flora of Ecuador

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Abstract

Fifty species, one subspecies and one variety of liverworts, as well as three species and one variety of mosses are newly reported for the bryophyte flora of Ecuador, based on extensive fieldwork in 2011 and 2012. 371 new province records of liverworts and 5 of hornworts are increasing the number of liverwort and hornwort state records from 1744 to 2120.

Key words: diversity, hornworts, liverworts, mosses, Neotropics

Introduction

The bryophyte flora of Ecuador is very diverse. León-Yáñez *et al.* (2006) reported 695 liverwort and 15 hornwort species, whereas Churchill (1994) and Churchill *et al.* (2000) list about 950 mosses. However, field work in 2003, 2004, 2011 and 2012 indicated that the bryophyte flora of Ecuador is only incompletely known. Even species new to science may be found in relatively well explored regions, e.g. *Archilejeunea nebeliana* Gradstein & Schäfer-Verwimp (2012: 108), *Cololejeunea kuciana* Pócs & Schäfer-Verwimp (2012: 51), *Cololejeunea stotleriana* Gradstein *et al.* (2011: 13), *Lobatiriccardia oberwinkleri* Preußing *et al.* (2010: 1435) and *L. verdoornioides* Preußing *et al.* (2010: 1437), as well as several still undescribed species of *Diplasiolejeunea* (Dong *et al.* 2012). León-Yáñez *et al.* (2006, table 3) also demonstrated that the knowledge on Ecuadorian bryophyte diversity differs between provinces.

In the present study we list the distributional data of newly reported Ecuadorian taxa referring to León-Yáñez *et al.* (2006), Churchill *et al.* (2009), Benitez & Gradstein (2011), Benitez *et al.* (2012) and Drehwald (2003); altitudinal ranges are only given if our new records represent altitudinal range extensions. In cases where we do not adopt the nomenclature of León-Yáñez *et al.* (2006) we add their corresponding taxon in brackets. Voucher specimens are deposited in STU, QCA and herb. ASV, further duplicates are indicated. All determinations were made by ASV if not indicated otherwise.

Abbreviations:

ASV & MN = leg. A. Schäfer-Verwimp with M. Nebel

MN & ASV = leg. M. Nebel with A. Schäfer-Verwimp

* = new to Ecuador

ANTHOCEROTOPHYTA

Dendroceros crispus (Sw.) Nees

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, epiphytic, 8 Mar 2012, ASV & MN 32813/B.

A widespread neotropical species, known from Galápagos and Tungurahua; new to Orellana.

Nothoceros vincentianus (Lehm. & Lindenb.) J.C.Villarreal [= *Megaceros vincentianus* (Lehm. & Lindenb.) Campb.]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest, in rivulet along the path from headquarters to the Mirador, submerged, 04°07' S, 79°10' W, 2880 m, 22 Jan 2011, *MN & ASV 111547*; -, on Sendero a las Lagunas del Compadre, upper montane rain forest, on dripping cliff, submerged, 04°07' S, 79°10' W, 2880 m, 23 Jan 2011, *MN & ASV 111582*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on stem of *Cyathea poeppigii* (Hook.) Domin, 27 Mar 2012, *ASV & MN 33195*. **Pichincha:** Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on dripping slope, 5 Mar 2012, *ASV & MN 32752*.

A tropical American species, recently reported from Ecuador, Zamora Chinchipe, 1800–2150 m (Nöske *et al.* 2003); new to Loja, Morona Santiago and Pichincha, a considerable extension of its altitudinal range.

Notothylias vitalii Udar & D.K.Singh

El Oro: Puyango, bosque petrificado, 295 m, 3°52.9' S, 80°04.8' W, dry forest, on sandy soil along path, sparse, 18 Mar 2012, *ASV & MN 32970/A*.

Recently reported from Ecuador (Loja and El Oro, Benitez *et al.* 2012), otherwise known only from Brazil; third locality for Ecuador.

MARCHANTIOPHYTA

**Adelanthus carabayensis* (Mont.) Grolle

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphytic in submontane rain forest (plot F 1), 4°6.8' S, 78°58.0' W, 1075 m, 25 Jan 2011, *ASV & MN 31911/B*.

Widespread but scattered from Costa Rica and the West Indies to Bolivia and Brazil.

**Alobiella husnotii* (Gottsche ex Spruce) Schiffn.

Zamora Chinchipe: Road Loja—Zamora, km 10, open shrubby vegetation near the top of the pass El Tiro, on earth slope, 2770 m, 17 Apr 2003, *ASV & M. Preußing 23313*; -, Estación Científica San Francisco, 3°58' S, 79°04' W, open shrubby vegetation along trail to antennas, on loamy soil, 2750 m, 21 Apr 2003, *ASV & M. Preußing MPE03104*.

Neotropical species, known from the Lesser Antilles, Venezuela, Guyana, Peru and Brazil at altitudes between 500 and 1900 m; new genus record for Ecuador, a considerable extension of its altitudinal range.

Anastrophyllum nigrescens (Mitt.) Steph.

Loja: PN Podocarpus above Cajanuma, páramo vegetation along Sendero a las Lagunas del Compadre, on exposed rock, 4°7.1' S, 79°9.7' W, 3271 m, 23 Jan 2011, *ASV & MN 31886*. **Napo:** Road Quito—Baeza, páramo vegetation near the top of Papallacta pass, 0°19.9' S, 78°12.2' W, 4080 m, 5 Feb 2011, *ASV & MN 32185*.

A tropical American páramo species; first record from Ecuador by Schuster (2002, as *A. paramicola* R.M.Schust., "crest of road from Pifo to Papallacta", however, without indicating the province; further records from Carchi, Pichincha and Zamora Chinchipe, 3370–4200 m (Benitez & Gradstein 2011); new to Loja and Napo; the Napo collection is from the same region as the type of *A. paramicola* which has been treated as a synonym by Váña *et al.* (2013).

Anastrophyllum tubulosum (Nees) Grolle

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chocheas east of El Cajas National Park, on rock, c. spor., 3530 m, 2°46.7' S, 79°10.0' W, 13 Mar 2012, *ASV & MN 32850*, det. J. Váña (PRC).

A widespread tropical American species occurring from Mexico to Bolivia and SE Brazil, from Ecuador known from a few recent collections from Napo and Zamora Chinchipe; new to Azuay.

Aneura pinguis (L.) Dumort.

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on rotting log, c. spor., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31722*, det. ASV & MN.

Subcosmopolitan species, hitherto known from Tungurahua and Zamora Chinchipe, 1200–2150 m; recently reported from Napo, 4200–4300 m (Benitez *et al.* 2012); second record for Napo, a considerable extension of its altitudinal range.

Archilejeunea fuscescens (Hampe ex Lehm. & Lindenb.) Fulford

Napo: Tena, Estación Biológica Jatunsascha, epiphytic in primary lowland rain forest, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31734*.

A tropical American lowland species, from Ecuador so far only cited by Stephani (1912–1917, as *Marchesinia fuscescens* (Hampe ex Lehm. & Lindenb.) Kuntze), without indicating locality or province; new to Napo.

Archilejeunea ludoviciana (De Not. ex Lehm.) P.Geissler & Gradst. subsp. *ludoviciana*

Napo: Tena, Estación Biológica Jatunsascha, epiphytic in primary lowland rain forest, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31733* (PC), det. S. R. Gradstein. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphytic in submontane rain forest (plot F 1), 4°6.8' S, 78°58.0' W, 1075 m, 25 Jan 2011, *ASV & MN 31924/B*.

A tropical American species, from Ecuador known only from Morona Santiago, 750–800 m; new to Napo and Zamora Chinchipe, an extension of its altitudinal range.

Archilejeunea parviflora (Nees) Schiffn.

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, c. per. & c. andr., 9 Mar 2012, *ASV & MN 32823/B*.

A widespread tropical American species, from Ecuador known only from Los Ríos; new to Orellana and seemingly the first epiphyllous record of this species.

**Aureolejeunea quinquecarinata* R.M.Schust.

Loja: PN Podocarpus above Cajanuma, Sendero El Mirador, on branches of shrub in páramo vegetation, c. per., 3000–3060 m, 15 Apr 2003, *ASV & M. Preußing 23282/A, 23299/A*; -, near the mirador, c. per., 3035 m, 4°6.7' S, 79°10.6' W, 22 Jan 2011, *ASV & MN 31771/A*; -, c. per., 3100 m, 24 Mar 2012, *ASV & MN 33152/B*. **Zamora Chinchipe:** Road Loja—Zamora, humid shrubby vegetation near the top of the pass El Tiro, on branches of shrub, c. per., 2780 m, 17 Apr 2003, *ASV & M. Preußing 23334*, det. S. R. Gradstein; -, upper montane rain forest east of El Tiro, epiphytic, c. per., 2500 m, 3°59' S, 79°08' W, 23 Mar 2012, *ASV & MN 33076/A*.

A rather rare northern Andean species, growing usually in single plants in very humid sites exposed to sunlight; known from Venezuela (type only), Colombia and the Dominican Republic (Schäfer-Verwimp & Pócs 2009); new to Ecuador.

Bazzania phyllobola Spruce

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic on *Weinmannia ovata* Cav., 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31799/B*.

Scattered in the Neotropics, from Ecuador hitherto known only from Zamora Chinchipe, 1340–2650 m (Churchill *et al.* 2009, León-Yáñez *et al.* 2006) and Morona Santiago, 1400–1600 m (Drehwald 2003); new to Loja; collected also in Zamora Chinchipe, Bombuscaro, at 1075 m and 1450 m altitude (*ASV & MN 31912, 33049*).

Accessions listed by Drehwald (2003) from National Park Sangay are referring to the province of Morona Santiago (U. Drehwald, pers. comm. 2013).

Bazzania schlimiana (Gottsche) Fulford

Loja: PN Podocarpus above Cajanuma, Sendero El Mirador, upper montane rain forest (plot L 4), on rotting log, 2900 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33132/A*. **Zamora Chinchipe:** Road Loja—Zamora, upper montane rain forest east of El Tiro, epiphytic, mixed with *Hypnella pilifera* (Hook.f. & Wilson) A.Jaeger, 2500–2550 m, 3°59' S, 79°08' W, 20 Mar 2012, *ASV & MN 33004*; -, PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphytic in submontane rain forest (plot U 1), with *Cheilolejeunea beyrichii*, 4°6–7' S, 78°58–59' W, 1450 m, 21 Mar 2012, *ASV & MN 33035*.

A tropical American species, from Ecuador known only from two old collections from Azuay and Pichincha, 2850–3400 m; new to Loja and Zamora Chinchipe, the collection 33035 from considerably lower altitude.

Blepharolejeunea incongrua (Lindenb. & Gottsche) van Slageren & Kruijt

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chocheas east of El Cajas National Park, epiphytic on shrub, c. per., 3700 m, 2°46.5' S, 79°09.9' W, 13 Mar 2012, *ASV & MN 32862/B*.

Loja: PN Podocarpus above Cajanuma, upper montane forest on Sendero a las Lagunas del Compadre, on small stem exposed to sunlight, c. per., 3000 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31857*; -, on twig in cloud forest, c. per., 3120 m, *ASV & MN 31878/B*.

A tropical American species, known from Carchi, Cotopaxi, Pichincha and Zamora Chinchipe; new to Azuay and Loja.

Blepharolejeunea securifolia (Spruce ex Steph.) R.M.Schust.

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chocheas east of El Cajas National Park, epiphytic on shrub, c. per., 3700 m, 2°46.5' S, 79°09.9' W, 13 Mar 2012, *ASV & MN 32861*.

Loja: PN Podocarpus above Cajanuma, on branches of shrub in páramo vegetation around Mirador, c. per., 3100 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33153/D*.

This common páramo species is reported from Carchi, Chimborazo, Imbabura, Morona Santiago, Napo and Pichincha; new to Azuay and Loja.

Brachiolejeunea phyllorhiza (Nees) Kruijt & Gradst.

Morona Santiago: Santiago de Mendez, park area in city centre, epiphytic on ornamental shrub, mixed with *Frullania arecae*, 495 m, 2°42.9' S, 78°19.4' W, 28 Mar 2012, *ASV & MN 33254/B*.

Widespread neotropical species, hitherto known from Pichincha and Zamora Chinchipe, 1800–2850 m; new to Morona Santiago, expanding considerably its known altitudinal range within Ecuador.

Bryopteris filicina (Sw.) Nees

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphytic on *Theobroma cacao* L. at margin of hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32900*.

A common neotropical species, from Ecuador reported from Chimborazo, Esmeraldas, Galápagos, Los Ríos, Morona Santiago, Pastaza, Zamora Chinchipe and recent records from El Oro and Loja (Benitez & Gradstein 2011); new to Azuay.

****Calypogeia laxa*** Gottsche & Lindenb.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.3' W, on rotting log in lower montane forest (plot M 6), 2020 m, 31 Jan 2011, *ASV & MN 32126*; -, PN Podocarpus, Río Bombuscaro, Sendero Mirador, on small roots in submontane rain forest (plot F 1), 4°6.8' S, 78°58.0' W, 1075 m, 25 Jan 2011, *ASV & MN 31923*.

A widespread neotropical species ranging from the West Indies and Mexico to Brazil; new to Ecuador.

Calypogeia lechleri (Steph.) Steph.

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic on roots, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31727/A*. **Zamora Chinchipe:** Mayayku south of Paquisha, on rotten log in remnant of rain forest, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32101/B*.

A tropical American species, from Ecuador hitherto known only from Zamora Chinchipe, 2150–2650 m; new to Napo. Both collections are from a considerably lower altitude than the previous records from Ecuador.

**Calypogeia subintegra* (Gottsche, Lindenb. & Nees) Bischl.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, on humus along small trail, 4°6.6' S, 79°10.7' W, 2820 m, 22 Jan 2011, *ASV & MN 31782*; -, on humus in plot M 1, 2859 m, *ASV & MN 31809*.

Widespread but scattered in the Neotropics, reported from Mexico, Panama, Venezuela, Brazil, Cuba, Guadeloupe and the Dominican Republic (Schäfer-Verwimp & Pócs 2009).

Caudalejeunea lehmanniana (Gottsche) A. Evans

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, on dead branchlets, c. per. & c. andr., 9 Mar 2012, *ASV & MN 32836/C*.

A scattered tropical American species known also from West Africa. From Ecuador (Pastaza) so far only known from the type of *Lejeunea harpaphylla* Spruce (Gradstein 1994); new to Orellana.

Cephalozia crassifolia (Lindenb. & Gottsche) Fulford

Zamora Chinchipe: Amazonian lowland rain forest remnant near Mayayku south of Paquisha, on rotten log, mixed with *Riccardia amazonica*, *Calypogeia lechleri* and *Mnioloma crenulatum*, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32101*.

A widespread neotropical and Atlantic European species, from Ecuador reported from Zamora Chinchipe, 1800–2150 m alt. (Nöske *et al.* 2003) and Morona Santiago, 1400–1600 m (Drehwald 2003); third record for Ecuador, a considerable extension of its local altitudinal range.

Cephalozia interspersa (Gottsche) R.M. Schust.

Morona Santiago: Santiago de Mendez, on mineral rich dripping slope along road to Cuenca, c. per., 2°42.5' S, 78°22.7' W, 950 m, 28 Mar 2012, *ASV & MN 33259*.

Scattered throughout tropical America, from Ecuador known from Galápagos and a recent record from Zamora Chinchipe (Benitez & Gradstein 2011); new to Morona Santiago and second record for mainland Ecuador.

Ceratolejeunea coarina (Gottsche) Schiffn.

Napo: Tena, Estación Biológica Jatunsascha, on various substrates in primary lowland rain forest (epiphytic on liana, living and dead tree stems, and epiphyllous), 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31704/A, 31709/B, 31725, 31735, 31737*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, 8–9 Mar 2012, *ASV & MN 32804/A, 32811* (epiphytic, c. per. & c. andr.), *32823/C* (c. spor.), *32847/B*.

Widespread neotropical species, from Ecuador hitherto known only from Esmeraldas, 200 m; new to Napo and Orellana; at both localities it seems to be common.

Ceratolejeunea cornuta (Lindenb.) Steph.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, on *Citrus* in hotel garden, c. per. & c. andr., 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32889*.

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphytic and epiphyllous, 8–9 Mar 2012, *ASV & MN 32812* (c. per. & c. andr.), 32822, 32831/C, 32833/A. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.3' W, epiphytic in lower montane forest between the station and Tarabita, 1825 m, 26 Jan 2011, *ASV & MN 31954/D*; -, on twigs in lower montane rain forest (plot U 1), 2002 m, *ASV & MN 31975*; -, on earth covered rock at brook below the station, 1800 m, 24 Jan 2011, *ASV & MN 31897/A*; -, PN Podocarpus, Río Bombuscaro, submontane rain forest near the park administration, epiphytic, c. per. & c. spor., 1040 m, 4°06.9' S, 78°58.0' W, 25 Jan 2011, *ASV & MN 31906/A*.

A widespread and common species, known from Chimborazo, Esmeraldas, Galápagos, Los Ríos, Morona Santiago, Napo, Pastaza and Pichincha, 150–1500 m; new to Azuay, Orellana and Zamora Chinchipe.

Ceratolejeunea cubensis (Mont.) Schiffn.

El Oro: Piñas, road to the Pacific coast, 970 m, 3°39.5' S, 79°45.1' W, on humid slope along trail, with *Symbiezidium barbiflorum* and *Ceratolejeunea filaria*, 17 Mar 2012, *ASV & MN 32955*.

Widespread neotropical species ranging from Florida and Mexico to Bolivia and SE Brazil; from Ecuador reported from Esmeraldas, Los Ríos, Morona Santiago and Napo, 20–750 m; new to El Oro.

Ceratolejeunea filaria (Taylor ex Lehm.) Steph.

El Oro: Piñas, epiphytic at edge of secondary rain forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32927*; -, on pile of pasture, *ASV & MN 32942/D*; -, road to the Pacific coast, 970 m, 3°39.5' S, 79°45.1' W, on humid slope along trail, with *Ceratolejeunea cubensis* and *Symbiezidium barbiflorum*, 17 Mar 2012, *ASV & MN 32955* p.p.

A tropical American species, from Ecuador known from Esmeraldas, Galápagos, Los Ríos and Zamora Chinchipe, and a recent record from Morona Santiago (Drehwald 2003); new to El Oro.

Ceratolejeunea grandiloba J.B.Jack & Steph.

Azuay: Cordillera Occidental, Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo and secondary woody vegetation, on bark of *Pinus patula* Schltdl. & Cham., 29 Mar 2012, *ASV & MN 33288/C*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°59.5' S, 79°04.1' W, shrubby vegetation along Camino das Antennas, 2700 m, 27 Jan 2011, *ASV & MN 32036/C*; -, epiphyllous in upper montane rain forest (plot A 4), 2532 m, *ASV & MN 32013/A, 32014/B*, the latter one with perianths; -, upper montane rain forest below El Tiro (plot C 3), on rotting bromeliad leaves, 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32074/A*; -, epiphytic on shrub, 2500 m, 23 Mar 2012, *ASV & MN 33081/A*.

Rather scattered in northern Andes and the Guayana Highlands (Dauphin 2003), first and single record from Ecuador, Zamora Chinchipe, by Nöske *et al.* (2003), reported only from San Francisco station at an altitude between 1800 and 2150 m; the cited specimens may indicate that this species seems to be locally frequent between 2500–2950 m in southern Ecuador. New to Azuay.

Ceratolejeunea patentissima (Hampe & Gottsche) A.Evans

Loja: PN Podocarpus above Cajanuma, páramo vegetation around Mirador, 3050 m, 4°07' S, 79°10' W, epiphytic on shrub, with *Radula tenera*, *Leptoscyphus cuneifolius* subsp. *fragilis*, *Drepanolejeunea granatensis*, 24 Mar 2012, *ASV & MN 33158/A*.

Widespread but scattered in the Neotropics (Costa Rica and West Indies to Bolivia and Brazil), from Ecuador known from Manabí, Tungurahua and Zamora Chinchipe, 2150–2650 m; new to Loja.

Cheilolejeunea acutangula (Nees) Grolle

El Oro: Piñas, epiphytic on pile of pasture along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32944/B*.

A tropical American species, first and single record for Ecuador, Zamora Chinchipe, by Nöske *et al.* (2003), 1800–2150 m; new to El Oro.

**Cheilolejeunea aneogyna* (Spruce) A.Evans

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, on bark of tree in hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32886/A* (PC), det. S. R. Gradstein; -, *32881/E*; -, in cacao plantation on bark of *Theobroma cacao*, with caducous leaves, 15 Mar 2012, *ASV & MN 32919*.

An Amazonian and Atlantic forest species, hitherto known from Brazil (incl. type), Suriname (as *Pycnolejeunea surinamensis* Steph. = *Cheilolejeunea surinamensis* (Steph.) Xiao L.He), Venezuela (Dauphin *et al.* 2008, as *Trachylejeunea*) and Bolivia (Bastos 2012). New to Ecuador and first record from the Pacific coast.

Cheilolejeunea beyrichii (Lindenb.) M.E.Reiner

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphytic in submontane rain forest, 4°6.8' S, 78°58.0' W, 1060–1075 m, 25 Jan 2011, *ASV & MN 31907* (c. per. & c. andr., autoicous), *31912/A, 31924/A* (c. per.); -, 1250–1450 m, 21 Mar 2012, *ASV & MN 33044* (c. spor.), *33054*.

Widely distributed in the Neotropics at elevations above 1000 m, single record from Ecuador published by Reiner-Drehwald (2006: Azuay, leg. Allioni 1909); new to Zamora Chinchipe.

Cheilolejeunea choachina (Gottsche) Gradst.

Loja: PN Podocarpus above Cajanuma, páramo vegetation around Mirador, 3100 m, 4°07' S, 79°10' W, epiphytic on shrub, 24 Mar 2012, *ASV & MN 33152/A*. **Pichincha:** Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on humid, partly dripping rocky slope and epiphytic on shrub, 5 Mar 2012, *ASV & MN 32725/A, 32729/C*. **Zamora Chinchipe:** Road Loja–Zamora, open shrubby vegetation around the top of the pass El Tiro, 2750–2780 m, on branch of shrub, 17 Apr 2003, *ASV & M. Preußing 23307/A*.

Known only from Colombia and a single locality in Ecuador, Zamora Chinchipe, 2150–2650 m (Nöske *et al.* 2003); new to Loja and Pichincha, a considerable extension of its altitudinal range.

Cheilolejeunea clausa (Nees & Mont.) R.M.Schust.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, mixed with *Lejeunea reflexistipula*, *L. aphanes*, *L. cancellata*, *Symbiezidium barbiflorum* and *Ceratolejeunea cornuta*, 27 Mar 2012, *ASV & MN 33196/B*.

A scattered tropical American species, from Ecuador so far known from a few old collections from Esmeraldas, Galápagos, Morona Santiago and Zamora Chinchipe; actual confirmation of its occurrence in Morona Santiago.

Cheilolejeunea comans (Spruce) R.M.Schust.

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, submontane rain forest near the park administration, epiphytic, c. per. & c. andr. (autoicous), 1040 m, 4°06.9' S, 78°58.0' W, 25 Jan 2011, *ASV & MN 31906/C*, conf. S. R. Gradstein.

Scattered in tropical South America, reported from Chimborazo and Tungurahua, ca. 2000 m; new to Zamora Chinchipe.

Cheilolejeunea holostipa (Spruce) Grolle & R.L.Zhu

Loja: PN Podocarpus above Cajanuma, upper montane rain forest between park administration and Mirador (plot L 4), 4°07' S, 79°10' W, 2900 m, on bark, mixed with *Drepanolejeunea anoplantha* and *Anoplolejeunea conferta* (C.F.W.Meissn. ex Spreng.) A.Evans, 24 Mar 2012, *ASV & MN 33135* p.p. **Napo:**

Tena, Estación Biológica Jatunascha, primary lowland rain forest, epiphytic, mixed with *Cheilolejeunea rigidula* and *Anoplolejeunea conferta*, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31714*.

Widespread neotropical species, from Ecuador known from Azuay, Los Ríos, Sucumbíos, Zamora Chinchipe, 500–3400 m; new to Loja and Napo.

Cheilolejeunea inflexa (Hampe ex Lehm. & Lindenb.) Grolle

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59.551' S, 79°04.252' W, sparsely epiphytic in upper montane rain forest (plot A 4), c. per., 2532 m, 27 Jan 2011, *ASV & MN 32011/B*; -, PN Podocarpus, Río Bombuscaro, submontane rain forest on trail to Mirador (plot U 1), single plants creeping on *Bazzania schlimiana*, 1450 m, 4°06–07' S, 78°58–59' W, 21 Mar 2012, *ASV & MN 33035/A*.

Scattered in tropical America, from Ecuador so far known only from Zamora Chinchipe, 1800–2150 m (Nöske *et al.* 2003).

Cheilolejeunea oncophylla (Ångstr.) Grolle & M.E.Reiner

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphytic on *Weinmannia ovata* (plot M 1), 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31799/C*; -, epiphytic on branch of small tree, 2920 m, *ASV & MN 31781*; -, on branch of shrub in páramo vegetation around Mirador, 3050 m, 15 Apr 2003, *ASV & M. Preußing 23288/A* (PC), det. S. R. Gradstein; -, epiphytic between Mirador and parking area, 4°07' S, 79°10' W, 2900 m, 22 Jan 2011, *ASV & MN 31820/A*. **Napo:** Road Quito—Baeza, páramo vegetation near the top of Papallacta pass, epiphytic on shrub, 0°19.9' S, 78°12.2' W, 4080 m, 5 Feb 2011, *ASV & MN 32186/A*.

Widespread neotropical species, known from Ecuador from Zamora Chinchipe (Nöske *et al.* 2003) and Napo (Benitez *et al.* 2012); new to Loja.

Cheilolejeunea rigidula (Nees ex Mont.) R.M.Schust.

Esmeraldas: Road Ibarra—San Lorenzo, humid secondary vegetation along Río Lita near Lita, epiphytic on liana, mixed with *Symbiezidium transversale* and *Microlejeunea acutifolia*, 500 m, 20 Aug 2004, *ASV* with *J. Heinrichs, R. A. Wilson & S. O. Yandún 24415/A* p.p. **Napo:** Tena, Estación Biológica Jatunascha, primary lowland rain forest, growing on *Plagiochila heterophylla* Lindenb. ex Lehm. on branch of shrub, 1°05' S, 77°37' W, 400–450 m, 20 Jan 2011, *ASV & MN 31703/A*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, on rotting log, 8 Mar 2012, *ASV & MN 32802/A*.

Widespread and common in tropical America and Africa, from Ecuador hitherto known from Galápagos, El Oro and Loja, 200–1920 m (Benitez & Gradstein 2011); new to Esmeraldas, Napo and Orellana.

Cheilolejeunea trifaria (Reinw., Blume & Nees) Mizut.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, on bark of tree in hotel garden and in neighbouring cacao plantation, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32897, 32910, MN & ASV 122060*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, 27 Mar 2012, *ASV & MN 33212/A, 33223/A*; -, culture zone along road near El Rosario, on bark of solitary tree, mixed with a few plants of *Lepidolejeunea involuta*, 900 m, 2°53.7' S, 78°23.6' W, 28 Mar 2012, *ASV & MN 33247*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, on bark of tree, 8 Mar 2012, *ASV & MN 32825*.

A common pantropical species, from Ecuador previously reported from Galápagos and Zamora Chinchipe, 200–1910 m; new to Azuay, Morona Santiago and Orellana.

Cheilolejeunea uncioloba (Lindenb.) Malombe [= *Leucolejeunea uncioloba* (Lindenb.) A.Evans]

Loja: PN Podocarpus above Cajanuma, shrubby páramo vegetation on Sendero El Mirador, 3000 m, 4°06' S, 79°10' W, on branch of shrub, 15 Apr 2003, *ASV* & *M. Preußing* 23282/B.

A widespread Afro-American species with a mainly coastal distribution, from Ecuador previously known only from Zamora Chinchipe, 1800 m (Parolly *et al.* 2004); new to Loja, a considerable extension of its altitudinal range.

Cheilolejeunea xanthocarpa (Lehm. & Lindenb.) Malombe [= *Leucolejeunea xanthocarpa* (Lehm. & Lindenb.) A.Evans]

El Oro: Piñas, epiphytic at edge of secondary rain forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV* & *MN* 32928/D.

This common pantropical species is known from Galápagos, Loja and Zamora Chinchipe; new to El Oro.

Cololejeunea antillana Pócs [= *Aphanolejeunea longifolia* Ast]

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous on *Achomanes* sp., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV* & *MN* 31720 (EGR), dupl. det. Pócs.

A widespread but scattered neotropical species, no Ecuadorian specimen so far cited in the literature, but Ecuador listed under its distributional range by Pócs (2003); new to Napo.

Cololejeunea azorica V.Allorge & Ast [= *Aphanolejeunea azorica* (V.Allorge & Ast) Bern.-Lück. & Pócs]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along Sendero El Mirador, 4°06' S, 79°10' W, 2880 m, epiphyllous on fern frond, 15 Apr 2003, *ASV* & *M. Preußing* 23267/C (EGR), det. T. Pócs.

A widespread but scattered species (Macaronesia, Venezuela and Brazil), from Ecuador recently reported from Zamora Chinchipe, 2180 m (Parolly *et al.* 2004); new to Loja, second record for Ecuador, a considerable extension of its altitudinal range.

**Cololejeunea bekkeri* Tixier

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 230 m, epiphyllous, sparse, with *Cololejeunea camillii* and *Diplasiolejeunea brunnea*, 9 Mar 2012, *ASV* & *MN* 32848/C.

A rather rare neotropical species, hitherto known from Suriname (type) and French Guiana; new to Ecuador.

Cololejeunea camillii (Lehm.) A.Evans [= *Aphanolejeunea camillii* (Lehm.) R.M.Schust.]

El Oro: Piñas, epiphyllous on humid slope along road to the Pacific coast, 980 m, 3°39.5' S, 79°45.1' W, 17 Mar 2012, *ASV* & *MN* 32959/C, 32960/B, 32961/A. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, mixed with *Cololejeunea gracilis* and others, 27 Mar 2012, *ASV* & *MN* 33244/D p.p. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 230–240 m, creeping on *Plagiochila* and epiphyllous, sparse, with *Diplasiolejeunea brunnea*, 8–9 Mar 2012, *ASV* & *MN* 32792/B, 32848/B.

Widespread neotropical species, first records for Ecuador, Zamora Chinchipe, 2000 m (Parolly *et al.* 2004) and Esmeraldas, 500 m (Schäfer-Verwimp *et al.* 2006); new to El Oro, Morona Santiago and Orellana.

Cololejeunea cardiocarpa (Mont.) A.Evans

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphyllous in hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV* & *MN* 32891/A. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, epiphyllous on *Citrus* near station, 1825 m, 19 Mar 2012, *ASV* & *MN* 32980/B.

This common tropical American species seems to be new to mainland Ecuador, reported only from Galápagos, 50–800 m.

Cololejeunea diaphana A.Evans [= *Aphanolejeunea truncatifolia* Horik.]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along Sendero El Mirador, 2900 m, epiphyllous, 15 Apr 2003, *ASV & M. Preußing 23269/C* (EGR), det. T. Pócs; -, northwest of the Mirador (plot M 1), epiphyllous, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31800/C*, conf. T. Pócs; -, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous, 3100 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31868/A*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33242*.

Widespread in tropical America and Asia; first record from Ecuador, Zamora Chinchipe, 1800–2150 m, by Nöske *et al.* (2003); new to Loja and Morona Santiago, a considerable extension of its altitudinal range.

Cololejeunea gracilis (Ast) Pócs [= *Aphanolejeunea gracilis* Ast]

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33239/A, 33244/D*.

Widespread tropical American species, from Ecuador previously known from Esmeraldas, Galápagos and Zamora Chinchipe; new to Morona Santiago.

Cololejeunea kuciana Pócs & Schäf.-Verw.

This species was collected by the authors at San Francisco station, Zamora Chinchipe, in 2011 and recently described by Pócs & Schäfer-Verwimp (2012). http://www.ib-pan.krakow.pl/pubs-pdf/Polish%20Botanical%20Journal/2012/Pbj57-1_s051-53.pdf

**Cololejeunea manaosensis* (Herzog) Herzog

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, lower montane rain forest along Q 5 (plot M 6), epiphyllous, 2020 m, 31 Jan 2011, *ASV & MN 32118/A* (EGR), dupl. det. T. Pócs.

Hitherto known only from Brazil and Venezuela.

Cololejeunea microscopica (Taylor) Schiffn. var. *africana* (Pócs) Pócs & Bern.-Lück. [= *Aphanolejeunea microscopica* (Taylor) A.Evans var. *africana* (Pócs) Pócs & Bern.-Lück.]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along Sendero Mirador, plot L 4, 2900 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33133*.

Widely distributed in tropical America and Africa, from Ecuador previously known from Imbabura, Napo and Zamora Chinchipe; new to Loja.

Cololejeunea microscopica (Taylor) Schiffn. var. *exigua* (A.Evans) Pócs [= *Aphanolejeunea microscopica* (Taylor) A.Evans var. *exigua* (A.Evans) Bern.-Lück. & Pócs]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along Sendero El Mirador, 2900 m, epiphyllous, mixed with *Cololejeunea diaphana*, 4°06' S, 79°10' W, 15 Apr 2003, *ASV & M. Preußing 23269/C* p.p.; -, 2880 m, epiphyllous on fern frond, mixed with *Cololejeunea azorica*, *ASV & M. Preußing 23267/C* p.p. (EGR), both det. T. Pócs. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, lower montane forest at Camino Canal, epiphytic on smooth bark of small tree, 1820 m, 28 Jan 2011, *ASV & MN 32059/C*; -, upper montane rain forest east of El Tiro, plot C 3, epiphyllous, 2550 m, 3°59.5' S, 79°07.8' W, 23 Mar 2012, *ASV & MN 33104/B*.

Widely distributed in tropical America and Africa, from Ecuador hitherto known from Pichincha, Pastaza and Sucumbíos; new to Loja and Zamora Chinchipe.

**Cololejeunea minuscula* Pócs [= *Aphanolejeunea minuta* R.M.Schust.]

El Oro: Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, epiphyllous in secondary rain forest, 17 Mar 2012, *ASV & MN 32951/C*. **Zamora Chinchipe:** Amazonian region south of Paquisha, remnants of rain forest near Mayayku, epiphyllous in understory, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32097/E* (EGR), dupl. det. T. Pócs.

A very scattered and rarely collected species of tropical America.

Cololejeunea minutissima (Sm.) Schiffn.

Pichincha: Quito, Botanical Garden, 0°11.2' S, 78°29.2' W, 2800 m, on bark of tree, c. per., 3 Mar 2012, *ASV & MN 32700*; -, road Quito—Imbabura, Parque Jerusalem, 0°0.05' N, 78°21.2' W, 2300 m, epiphytic in dry forest with dominant *Acacia macracantha* Humb. & Bonpl. ex Willd., 4 Mar 2012, *ASV & MN 32711/A*.

Pantropical, known from Azuay, Galápagos, Imbabura and Zamora Chinchipe (as subsp. *myriocarpa* (Nees & Mont.) R.M.Schust.); new to Pichincha.

Cololejeunea obliqua (Nees & Mont.) Schiffn.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33226/B, 33235* (c. spor.). **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous, c. per. & c. spor., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31716/C*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, 8–9 Mar 2012, *ASV & MN 32787/B* (c. spor.), 33844/B. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, Sendero Los Higuerones, epiphyllous in submontane rain forest (plot L 2), c. spor., 4°07.0' S, 78°58.1' W, 1026 m, 25 Jan 2011, *ASV & MN 31946/C*.

Pantropical, from Ecuador previously reported from Esmeraldas, Morona Santiago and Pastaza, 250–700 m; new to Napo and Zamora Chinchipe.

Cololejeunea papillosa (K.I.Goebel) Mizut. [= *Aphanolejeunea angustissima* Steph., = *A. cyathiphylla* Herzog]

El Oro: Piñas, epiphyllous at edge of humid secondary vegetation along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32934/E*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous, 2850 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31834/B*, conf. T. Pócs. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, 9 Mar 2012, *ASV & MN 32839/C, 33844/C, 33846/B*, always sparse.

This Asian-American species was hitherto known in Ecuador under its synonyms from Esmeraldas, Los Ríos, Sucumbíos and Zamora Chinchipe, 70–2150 m; new to El Oro, Loja and Orellana, a considerable extension of its altitudinal range.

**Cololejeunea planifolia* (A.Evans) R.M.Schust.

Esmeraldas: Road Ibarra—San Lorenzo, humid secondary vegetation along Río Lita near Lita, sparsely epiphytic on dead branchlet, 500 m, 20 Aug 2004, *ASV, J. Heinrichs, R. A. Wilson & S. O. Yandún 24410/D*, det. T. Pócs.

A rather rare neotropical species, known from Cuba, Puerto Rico, French Guiana (Pócs, pers. comm.), Panama and Colombia.

**Cololejeunea platyneura* (Spruce) A.Evans

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, sparse, with *Lejeunea adpressa* and *Cyclolejeunea foliorum*, 9 Mar 2012, *ASV & MN 33823/D*.

A pantropical species seemingly only scattered in the Neotropics (Brazil and French Guiana).

Cololejeunea sicifolia (Gottsche ex Steph.) Pócs & Bern.-Lück. subsp. **jamaicensis* (R.M.Schust.) Bern.-Lück. & Pócs

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, Sendero Mirador (plot F 1), epiphyllous in submontane rain forest, c. per. & c. spor., 4°06.8' S, 78°58.0' W, 1075 m, 25 Jan 2011, *ASV & MN 31918/A*, conf. T. Pócs; -, road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.5' W, lower montane rain forest (plot U 1), on rotting log, 2002 m, 26 Jan 2011, *ASV & MN 31974/C*; -, upper montane rain forest east of El Tiro (plot C 3), on dead leaves on forest floor, 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32087/A*.

This subspecies was previously known only from Jamaica (type); new to Ecuador and South America.

**Cololejeunea sintenisii* (Steph.) Pócs

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous, 3000 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31854* (EGR), dupl. conf. T. Pócs. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on rotting log, mixed with *Harpalejeunea oxyphylla* and *H. tridens*, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31715* p.p. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, 9 Mar 2012, *ASV & MN 32847/A*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.3' W, lower montane rain forest (plot M 6), creeping on *Radula tectiloba* Steph., epiphytic on root, together with *Cololejeunea gracilis*, 2020 m, 31 Jan 2011, *ASV & MN 32120/B* p.p. (EGR), dupl. det. T. Pócs.

Nearly pantropical, known from Asia, Australia, Réunion, Macaronesia and the Neotropics.

**Cololejeunea subsphaeroidea* (R.M.Schust.) Pócs [= *Aphanolejeunea subsphaeroidea* R.M.Schust.]

Loja: PN Podocarpus above Cajanuma, Sendero del Mirador, upper montane rain forest, epiphyllous on earth bromeliad, 2890 m, 15 Apr 2003, *ASV & M. Preußing 23268/C*, det. T. Pócs (2004, as *Aphanolejeunea*; EGR).

A rarely collected neotropical species, hitherto known from Venezuela, Brazil, the Dominican Republic and Guadeloupe (Pócs 2003, Schäfer-Verwimp & Pócs 2009, Lavocat Bernard & Schäfer-Verwimp 2011).

Cololejeunea verwimpii Tixier

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33239/B*.

Widespread but scattered Neotropical species, recently reported from Ecuador, Zamora Chinchipe, 1900 m (Parolly *et al.* 2004); new to Morona Santiago and second record for Ecuador.

**Cololejeunea vitalana* Tixier

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.3' W, lower montane rain forest along Q 5 (plot M 6), 2020 m, 31 Jan 2011, *ASV & MN 32133/D* (EGR), dupl. det. T. Pócs.

A widespread but scattered neotropical species, known from Mexico, Costa Rica and Brazil.

**Cololejeunea winkleri* (M.I.Morales & Bern.-Lück.) Pócs

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, with *Microlejeunea epiphylla*, 27 March 2012, *ASV & MN 33244/B*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31711*, conf. T. Pócs. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, 8 Mar 2012, *ASV & MN 32803/B*.

A rather rare species, hitherto known from Costa Rica, French Guiana, Suriname and Brazil (Pócs 2003, Pócs & Bernecker 2009). Its small size complicates recognition in the field.

Colura calyptrifolia (Hook.) Dumort.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphytic on shrub, c. per. & c. spor., 3250 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31885/C*.

An Afro-American and Atlantic-European species; first record for Ecuador by Schäfer-Verwimp *et al.* (2006) from Napo and Pichincha, 3670–3700 m; new to Loja.

Colura cylindrica Herzog

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic on dead branchlets and epiphyllous, 27 Mar 2012, *ASV & MN 33227/A, 33240*.

A widespread but scattered Afro-American species, from Ecuador previously known from Galápagos and old collections from Morona Santiago (Herzog 1952), 200–600 m.

****Colura greig-smithii*** Ast

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, sparse, 27 Mar 2012, *ASV & MN 33202/E, 33239/D*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic and on rotting log, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31715/B, 31748/C*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous and epiphytic, sparse, 8–9 Mar 2012, *ASV & MN 32795/C, 32834/D*.

Widespread but scattered in the Neotropics, known from Mexico, Colombia, Venezuela, Surinam, French Guiana, Brazil, Cuba and Trinidad (type).

Colura naumannii (Schiffn.) Steph.

Loja: PN Podocarpus above Cajanuma, Sendero del Mirador, epiphytic on shrub in páramo vegetation near the Mirador, 3030 m, 4°6.7' S, 79°10.6' W, 22 Jan 2011, *ASV & MN 31777*.

Scattered from Costa Rica to Tierra del Fuego, from Ecuador previously reported from Carchi and Pichincha, 3200–3800 m, and recorded by Eggers (1997) from "Zamora", 2900 m; new to Loja.

Colura tenuicornis (A.Evans) Steph.

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chocheras east of El Cajas National Park, 3580 m, 2°46.6' S, 79°10.0' W, epiphytic on shrub, c. per., together with *Colura ornithocephala* Herzog (*ASV & MN 32854*, c. spor.), 13 Mar 2012, *ASV & MN 32854/A*; -, Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphyllous in hotel garden, c. per., 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32887*. **El Oro:** Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, on bark of solitary tree in pasture, 17 Mar 2012, *ASV & MN 32947/C*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous, c. per., 3050 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31863/A*.

Pantropical, from Ecuador hitherto known from Carchi, Galápagos, Los Ríos, Pichincha and Zamora Chinchipe, 200–3750 m; new to Azuay, El Oro and Loja.

Colura tortifolia (Mont. & Nees) Trevis.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33239/C*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, Sendero Los Higuerones, submontane rain forest, on bark in the canopy of a fallen tree, 1060 m, 4°07' S, 78°58' W, 19 Apr 2003, *ASV & M. Preußing 23426/C*.

This widespread neotropical species is reported from Ecuador from Esmeraldas and Pastaza, 500–550 m; new to Morona Santiago and Zamora Chinchipe.

Cyclolejeunea convexistipa (Lehm. & Lindenb.) A.Evans

El Oro: Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, on branchlets at the edge of secondary forest, and epiphyllous, 17 Mar 2012, *ASV & MN 32938/A, 32951/A*.

A common neotropical species, from Ecuador previously reported from Esmeraldas, Los Ríos, Napo and Pastaza; new to El Oro.

Cyclolejeunea foliorum (Nees) Grolle

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31740*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–240 m, epiphyllous, 8 Mar 2012, *ASV & MN 32784, 32788/C, 32791/B*. **Zamora Chinchipe:** Amazonian lowland rain forest remnant near Mayayku south of Paquisha, epiphyllous in understory, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32104/A, 32104/C*.

First record from Ecuador, "Prov. Napo-Pastaza", by Grolle (1988); new to Napo, Orellana and Zamora Chinchipe. Otherwise, this tropical lowland rain forest species is known from French Guiana, Surinam, Venezuela, Colombia and Brazil; for further discussion of this distinct species see Grolle (1988).

Cyclolejeunea peruviana (Lehm. & Lindenb.) A.Evans

El Oro: Piñas, epiphytic at the edge of secondary rain forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32929*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33237/B*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 230 m, epiphyllous, 9 Mar 2012, *ASV & MN 32823/A*. **Zamora Chinchipe:** Road Loja—Zamora, upper montane rain forest east of El Tiro, 2500–2550 m, 3°59' S, 79°08' W, epiphyllous, 20 Mar 2012, *ASV & MN 33014/A*.

This widespread and common neotropical species is known from Los Ríos, Napo, Pastaza, Pichincha and Zamora Chinchipe, 250–2150 m; new to El Oro, Morona Santiago and Orellana. The collection from Zamora Chinchipe represents a new altitudinal record (at least) of its Ecuadorian range.

Dicranolejeunea axillaris (Nees & Mont.) Schiffn.

El Oro: Piñas, epiphytic at the edge of secondary rain forest along road to the Pacific coast, c. per., a few plants mixed with *Taxilejeunea* spec. and *Plagiochila raddiana*, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32932/A* p.p.

Widespread neotropical species, from Ecuador previously reported from Cañar, Chimborazo, Galápagos, Morona Santiago, Pastaza, Tungurahua, Zamora Chinchipe, and a recent record from Loja (Benitez & Gradstein 2011); new to El Oro.

Diplasiolejeunea alata Ast

Loja: PN Podocarpus above Cajanuma, Sendero El Mirador, on branch of shrub in páramo vegetation near the Mirador, c. per. and c. spor., 3050 m, 4°06' S, 79°10' W, 15 Apr 2003, *ASV & M. Preußing 23292/D*.

A widespread but scattered neotropical species (from Central America and the West Indies to Bolivia and Brazil), from Ecuador recently reported from Napo, Pichincha and Zamora Chinchipe, 1790–2870 m; new to Loja, an extension of its altitudinal range.

Diplasiolejeunea brunnea Steph.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, on leaves of *Citrus* in hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32893/A*. **El Oro:** Piñas, epiphyllous on *Selaginella geniculata* (C.Presl) Spring in secondary rain forest along road to the Pacific coast, with *Cyclolejeunea convexistipa*, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32952/B*; -, 980 m, 3°39.5' S, 79°45.1' W, on fern frond at humid slope along trail, 17 Mar 2012, *ASV & MN*

32960/A. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33236/A* (incl. "*lanciloba*-expression"). **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 230 m, epiphyllous, epiphytic and on dry dead wood, abundant, 8–9 Mar 2012, *ASV & MN 32788/B, 32795/A, 32834/B, 32839/B, 32847/C*.

This common neotropical species is reported from Esmeraldas, Los Ríos, Morona Santiago, Napo, Pastaza, Pichincha, Sucumbíos and Zamora Chinchipe; new to Azuay, El Oro and Orellana. See also note under *Diplasiolejeunea pellucida*.

Diplasiolejeunea cavifolia Steph.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic on branches of shrub, c. per., 27 Mar 2012, *ASV & MN 33202/A*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31748/A*.

This pantropical species is reported from Esmeraldas, Pichincha, Tungurahua, Zamora Chinchipe, 500–2780 m; new to Morona Santiago and Napo. As shown by Dong *et al.* (2012), the (neotropical) collections from above 2000 m alt. may represent an undescribed species.

Diplasiolejeunea involuta S.Winkl. subsp. *andicola* Pócs

Loja: PN Podocarpus above Cajanuma, Sendero El Mirador, epiphytic on shrub in páramo vegetation, 2970–3050 m, 4°6.7' S, 79°10.5' W, 15 Apr 2003, *ASV & M. Preußing 23279, 23296*, and 22 Jan 2011, *ASV & MN 31769/A*; -, around Mirador, 3100 m, 24 Mar 2012, *ASV & MN 33153/E*.

Scattered in the Neotropics, from Ecuador previously known from Pichincha and Zamora Chinchipe, 2150–2650 m; new to Loja.

Diplasiolejeunea lanceolata Grolle

El Oro: Piñas, epiphytic at the edge of secondary forest along road to the Pacific coast, sparse, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32928/C*.

This highly distinct species was hitherto known only from the type collection from Esmeraldas, epiphyllous in cloud forest at 500 m alt. (Grolle 1992, Schäfer-Verwimp 2004). New to El Oro and second record of the species.

Diplasiolejeunea pauckertii (Nees) Steph.

Azuay: Cordillera Occidental, remnants of páramo vegetation near Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, epiphytic on shrub, 29 Mar 2012, *ASV & MN 33283/A*. **Loja:** PN Podocarpus above Cajanuma, Sendero del Mirador, epiphytic on shrub in páramo vegetation near the Mirador, 2980–3050 m, 4°6.7' S, 79°10.6' W, 15 Apr 2003, *ASV & M. Preußing 23277, 23294*, and 22 Jan 2011, *ASV & MN 31771/B*; -, upper montane rain forest northwest of the Mirador (plot M 1), epiphyllous, 2859 m, 4°6.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31800/B*.

Widespread but scattered neotropical species, from Ecuador previously reported from Carchi, Napo, Tungurahua and Zamora Chinchipe; new to Azuay and Loja.

Diplasiolejeunea pellucida (C.F.W.Meissn. ex Spreng.) Schiffn.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, on leaves of *Citrus* in hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32893/D*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33236/B*.

Widespread and common neotropical species, from Ecuador previously reported from Esmeraldas, Napo, Pastaza, Pichincha and Zamora Chinchipe; new to Azuay and Morona Santiago.

Herzog (1952) reports "*Diplasiolejeunea pellucida* (Meissn.) var. *unidentata* Evs." from Morona Santiago which is a synonym of *Diplasiolejeunea unidentata* (Lehm. & Lindenb.) Schiffn.; the cited material, however, belongs to *D. brunnea*.

Diplasiolejeunea pocsii Reyes Montoya

Zamora Chinchipe: El Tiro east of Loja, epiphyllous in dense shrubby vegetation along small creek, c. per., 2780 m, 17 Apr 2003, *ASV & M. Preußing* 23325/B; -, upper montane rain forest east of El Tiro, 2500–2550 m, 3°59' S, 79°08' W, epiphyllous on terrestrial bromeliads (incl. plot C 3), 29 Jan 2011, 20/23 Mar 2012, *ASV & MN* 32070/C, 32080, 33014/B (with numerous gemmae), 33114/C (with numerous gemmae).

This rare species is hitherto known only from Cuba (type only, collected at 400 m alt.), Dominica, 350–400 m (Eggers 1997, Schäfer-Verwimp 2010) and southern Ecuador from where it was recently reported from Zamora Chinchipe, at 2000–2100 m alt. (Parolly *et al.* 2004) and 2780 m alt. (Schäfer-Verwimp 2004). These collections indicate that *D. pocsii* may be locally more frequent, especially around El Tiro region; however, it could not be traced in neighbouring Podocarpus National Park above Cajanuma or elsewhere in Ecuador or South America.

Two specimens (23320, 32080, the first one cited by Schäfer-Verwimp 2004) have been used for molecular studies by Dong *et al.* (2012). Interestingly, *D. pocsii* is closely related to the narrow endemics *D. armatiloba* Steph. and *D. leiocarpa* Ast from the Lesser Antilles with which it shares the highly distinctive lobule teeth and the broad hyaline leaf margin. However, *D. pocsii* is readily distinguished by its narrow triangular, acute underleaf lobes.

Diplasiolejeunea replicata (Spruce) Steph.

Azuay: Road Cuenca—Guayaquil, shrubby vegetation near pass height of El Cajas, epiphytic, 4150 m, 2°46.4' S, 79°14.1' W, 13 Mar 2012, *ASV & MN* 32875/B. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest along Sendero El Mirador, 4°06' S, 79°10' W, 2900 m, epiphyllous in understory, 15 Apr 2003, *ASV & M. Preußing* 23269/A, and páramo vegetation around Mirador, 3050 m, on branch of shrub, 23295; -, Sendero a las Lagunas del Compadre, epiphyllous, 3050 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN* 31864.

Widespread in the Neotropics (Costa Rica to Bolivia and SE Brazil), from Ecuador known from Azuay, Cañar, Carchi, Napo, Pastaza, Pichincha, Tungurahua and Zamora Chinchipe; new to Loja; the specimen from Azuay represents a new altitudinal record of its total range (1200–3750 m, Schäfer-Verwimp 2004, Schäfer-Verwimp *et al.* 2006).

Diplasiolejeunea rudolphiana Steph.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphytic and epiphyllous on ornamental shrub in hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN* 32882, 32891/B; -, same locality, epiphytic in cacao plantation, 15 Mar 2012, *ASV & MN* 32911. **El Oro:** Piñas, epiphytic on pile of pasture along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN* 32940.

This pantropical species was so far known from Ecuador only from Galápagos, 100–600 m (Gradstein 2009).

Drepanolejeunea andina Herzog

Azuay: Cordillera Occidental, Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo and secondary woody vegetation, on branches of shrub, 29 Mar 2012, *ASV & MN* 33283/B.

This rather scattered northern Andean species was known from Ecuador only from the type specimen until Schäfer-Verwimp *et al.* (2006) reported it from Carchi, Napo and Pichincha; new to Azuay. The collection represents a considerable extension of its geographical and altitudinal range, 3500–4100 m in Ecuador (León-Yáñez *et al.* 2006), 3350–4150 m in Colombia (Uribe & Gradstein 1998).

Drepanolejeunea anoplantha (Spruce) Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest between park administration and Mirador (plot L 4), 4°07' S, 79°10' W, 2900 m, on bark, mixed with *Anoplolejeunea conferta* and *Cheilolejeunea holostipa*, 24 Mar 2012, *ASV & MN 33135*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, Sendero Mirador (plot F 1), on lying small tree stem in submontane rain forest, c. spor., 4°06.8' S, 78°58.0' W, 1075 m, 25 Jan 2011, *ASV & MN 31917*.

Widespread neotropical species, only recently reported from Ecuador, Zamora Chinchipe, 2150–2650 m (Nöske *et al.* 2003); new to Loja, both cited collections extend its altitudinal range.

Drepanolejeunea bidens (Steph.) A.Evans

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, on root of giant tree in the hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32890* (PC), conf. S. R. Gradstein; -, epiphyllous, mixed on a single leaf with *Diplasiolejeunea rudolphiana*, *D. pellucida*, *Cololejeunea cardiocarpa*, *Microlejeunea acutifolia* and *Omphalanthus ovalis*, *ASV & MN 32891/C*.

Widespread tropical American species, known from three islands of Galápagos, 300–400 m (Gradstein 2009) and Zamora Chinchipe, 2150–2650 m; new to Azuay.

Drepanolejeunea campanulata (Spruce) Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphyllous, 2859 m, 4°6.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31800/A, 31819* (PC), the latter specimen conf. S. R. Gradstein; -, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous, 2850 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31834/D*; -, upper montane rain forest between park administration and Mirador (plot L 4), 2900 m, 24 Mar 2012, *ASV & MN 33130/B*. **Pichincha:** Northern slope of Pichincha above Nono, Reserva Yanacocha, 3550 m, 0°06.7' S, 78°35.1' W, upper montane rain forest, epiphyllous along road, 5 Mar 2012, *ASV & MN 32750/B*.

Scattered in northern Andes (Colombia, Venezuela and Ecuador) and SE Brazil, reported from Chimborazo, Napo, Pastaza, Sucumbíos, Tungurahua and Zamora Chinchipe, 550–2800 m; new to Loja and Pichincha, a considerable extension of its altitudinal range.

Drepanolejeunea crucianella (Taylor) A.Evans

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, creeping on *Plagiochila* and epiphyllous, sparse, the latter one mixed with *Leptolejeunea elliptica*, *Diplasiolejeunea brunnea*, *Colura cylindrica*, *C. tenuicornis*, *Cololejeunea papillosa* and *C. obliqua*, 27 Mar 2012, *ASV & MN 33205/A, 33243*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, 8–9 Mar 2012, *ASV & MN 32795/B* (only a few plants between *Leptolejeunea elliptica*), *32844/D* (sparsely on fern frond).

This tropical American species is reported from Loja, Los Ríos, Pastaza, Sucumbíos and Zamora Chinchipe, 400–3000 m; new to Morona Santiago and Orellana.

Drepanolejeunea inchoata (C.F.W.Meissn. ex Lehm. & Lindenb.) Schiffn.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous and on smooth bark of small tree, 3050–3080 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31865, 31866/D*. **El Oro:** Piñas, epiphyllous in the understory of secondary rain forest along road to the Pacific coast, c. spor., with richly *Cyclolejeunea convexistipa*, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32951/D*, and epiphyllous on *Selaginella geniculata*, *ASV & MN 32934/A*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic on branches of shrub, and epiphyllous, 27 Mar 2012, *ASV & MN 33202/D, 33245*.

Widespread tropical American species, from Ecuador previously reported from Esmeraldas, Galápagos, Los Ríos, Morona Santiago, Napo, Pastaza, Pichincha, Sucumbíos, Tungurahua and Zamora Chinchipe, 70–2800 m; new to El Oro and Loja, confirmed for Morona Santiago.

Drepanolejeunea lichenicola (Spruce) Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic on *Prumnopitys montana* (Humb. & Bonpl. ex Willd.) de Laub., 2859 m, 4°6.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31792/C, 31794/A*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on rotting log, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31715/A*.

A tropical American species, from Ecuador previously known from Los Ríos, Sucumbíos, Tungurahua and Zamora Chinchipe, 750–2800 m; new to Loja and Napo.

****Drepanolejeunea navicularis*** Steph.

Azuay: Road Cuenca—Guayaquil, Laguna Dos Chocheras east of El Cajas National Park, 3800 m, 2°46.4' S, 79°09.6' W, epiphytic on bark of *Polylepis racemosa* Ruiz & Pav. in *Polylepis* stand, 13 Mar 2012, *ASV & MN 32868/A*, conf. S. R. Gradstein; -, in páramo vegetation near Laguna Dos Chocheras, on bark of shrub overgrown by *Frullania paradoxa*, 3540 m, *ASV & MN 32851/A*; -, Eastern Cordillera, remnants of páramo vegetation and secondary shrub near Gualaquiza above Sigsig, on bark of *Pinus patula*, 2950 m, 3°06.4' S, 78°47.7' W, 29 Mar 2012, *ASV & MN 33288/B*. **Loja:** PN Podocarpus above Cajanuma, Sendero del Mirador, epiphytic on shrub in páramo vegetation near the Mirador, 3035–3050 m, 4°6.7' S, 79°10.6' W, 15 Apr 2003, *ASV & M. Preußing 23285/C*, 22 Jan 2011, *ASV & MN 31772/A*, 24 Mar 2012, *ASV & MN 33145*; -, páramo vegetation on Sendero a las Lagunas del Compadre, on branch of shrub, 3250 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31885/B*. **Zamora Chinchipe:** Road Loja—Zamora, upper montane rain forest east of El Tiro, 2500–2550 m, 3°59' S, 79°08' W, on bark of small tree stem and on branch of shrub (incl. plot C 3), 23 Mar 2012, *ASV & MN 33070/C, 33092/C*.

Hitherto known only from highlands of Venezuela and Colombia; new to Ecuador where it seems to be locally abundant.

Drepanolejeunea navicularis belongs to a group of species having often (broadly) rounded underleaf lobes similar to those of *Harpalejeunea*. The species shares this feature with *D. granatensis* J.B.Jack & Steph. The latter one, however, never has leaf lobules running along the ventral margin of the leaf lobe nearly up to the apex.

Frullania aculeata Taylor

El Oro: Piñas, epiphytic on pile of pasture and on branchlets at edge of secondary forest along road to the Pacific coast, abundant, c. per., 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32939*; -, on humid slope along trail near road to the Pacific coast, 990 m, 3°39.5' S, 79°45.1' W, 17 Mar 2012, *ASV & MN 32965*.

This subendemic species (Ecuador, Peru) was previously reported from Ecuador from Azuay, Chimborazo, Cotopaxi, Galápagos, Loja, Pichincha and Los Ríos; new to El Oro.

Frullania arecae (Spreng.) Gottsche (var. *arecae*)

Morona Santiago: Santiago de Mendez, park area in city centre, epiphytic on ornamental shrub, mixed with *Brachiolejeunea phyllorhiza*, 495 m, 2°42.9' S, 78°19.4' W, 28 Mar 2012, *ASV & MN 33254/B* p.p.

A pantropical species, previously reported from Azuay, Chimborazo, Cotopaxi, Galápagos, Sucumbíos, Tungurahua and Zamora Chinchipe; from Morona Santiago reported by Drehwald (2003); confirmed for Morona Santiago.

Frullania atrata (Sw.) Nees ex Mont.

Azuay: Eastern Cordillera, Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo and secondary woody vegetation, epiphytic on shrub and on bark of *Pinus patula*, 29 Mar 2012, *ASV*

& MN 33285, 33288/A. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphytic, c. per., 2880 m, 4°7' S, 79°10' W, 22 Jan 2011, *ASV & MN 31757*; -, on shrub in páramo vegetation near the Mirador, c. per., 3030 m, 22 Jan 2011, *ASV & MN 31778*; -, same locality, 3100 m, 24 Mar 2012, c. per., *ASV & MN 33147*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, upper montane rain forest, epiphytic, exposed to sunlight, c. per., 2150 m, 27 Jan 2011, *ASV & MN 31987/A*; -, on branches in plot A4, c. per., 2532 m, 27 Jan 2011, *ASV & MN 32033/C*; -, lower montane rain forest on Camino Canal, on rocky slope, 1820 m, 28 Jan 2011, *ASV & MN 32061*; -, upper montane rain forest east of El Tiro (plot C 3), on branch of tree, c. per., 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32081*, collected also outside the plot on 20 March 2012, *ASV & MN 33007, 33013*.

Widespread in tropical America, from Ecuador hitherto known from Azuay, El Oro and Tungurahua, with some doubts, see Uribe & Gradstein (2003) and note in León-Yáñez *et al.* (2006); recently reported from Cordillera del Cóndor, Zamora Chinchipe (Churchill *et al.* 2009); new to Loja and San Francisco station area in Zamora Chinchipe.

Frullania bicornistipula Spruce

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphytic in submontane rain forest, 4°06–07' S, 78°58–59' W, 1250 m, 21 Mar 2012, *ASV & MN 33029*.

This rather scattered neotropical species (Costa Rica to Peru and Guayana) was previously known from Chimborazo, Pastaza, Pichincha and Tungurahua, 1500–1800 m; new to Zamora Chinchipe and southern Ecuador.

Frullania brasiliensis Raddi

Azuay: Cordillera Occidental, Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo, epiphytic on shrub, 29 Mar 2012, *ASV & MN 33286*. **El Oro:** Piñas, epiphytic on pile of pasture along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32943*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic, c. per., 2859 m, 4°6.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31802*; -, epiphytic at parking area, c. per., 2830 m, 23 Jan 2011, *ASV & MN 31821*. **Morona Santiago:** Santiago de Mendez, park area in city centre, epiphytic, 495 m, 2°42.9' S, 78°19.4' W, 28 Mar 2012, *ASV & MN 33250*.

A common neotropical species, hitherto known from Azuay, Galápagos, Los Ríos, Morona Santiago, Napo, Pastaza, Pichincha, Tungurahua and Zamora Chinchipe; new to El Oro and Loja, confirmed for Azuay and Morona Santiago.

Frullania cuencensis Taylor

Napo: Road Quito—Baeza, páramo vegetation near the top of Papallacta pass, epiphytic on shrub, c. per. & c. andr. (dioicous), 4080 m, 0°19.9' S, 78°12.2' W, 5 Feb 2011, *ASV & MN 32183*.

Scattered in the Neotropics from Mexico and Costa Rica to Bolivia, Northern Argentina (Reiner 1992) and the Dominican Republic (Schäfer-Verwimp 2010), from Ecuador previously known from Azuay, Pichincha, Zamora Chinchipe, 1800–3400 m; new to Napo, a considerable extension of its altitudinal range.

Frullania dusenii Steph.

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chocheas east of El Cajas National Park, 3540 m, 2°46.7' S, 79°10.0' W, epiphytic on shrub, c. per., 13 Mar 2012, *ASV & MN 32851/A*.

This tropical American species was previously known from Chimborazo, Cotopaxi, Napo, Pichincha and Zamora Chinchipe, 1850–3500 m; new to Azuay.

Frullania ericoides (Nees) Mont.

Pichincha: Quito, Av. Amazonica, epiphytic on old tree, c. andr., 2800 m, 0°13' S, 78°29.5' W, 4 Feb 2011, *ASV & MN 32153* (PC), rev. S. R. Gradstein.

Pantropical, from Ecuador hitherto known from Galápagos, Pastaza, Tungurahua and Zamora Chinchipe, 10–2000 m; new to Pichincha, a considerable extension of its altitudinal range.

The leaves of the cited specimen are not or hardly squarrose when moist, and there are only very few caducous leaves; otherwise the plants match the description of *F. ericoides* in Schuster (1992).

Frullania intumescens (Lehm. & Lindenb.) Lehm. & Lindenb.

Morona Santiago: Santiago de Mendez, on humid rocky slope along road to Cuenca, 950 m, 2°42.5' S, 78°22.7' W, 28 Mar 2012, *ASV & MN 33263*.

This tropical American species is reported from Tungurahua and Zamora Chinchipe, 1400–2150 m, besides a recent record from Morona Santiago. Gradstein (2009) listed it under "doubtful and excluded records" from Galápagos.

The plants of the cited specimen have (at least in part) styli with a large basal appendage as shown in fig. 10e-f by Yuzawa & Koike (1989).

Frullania lobatohastata Steph. [= *Frullania villosa* Steph. = *Frullania apollinarii* Steph.]

Azuay: Cordillera Occidental, Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo, epiphytic on shrub, c. spor., 29 Mar 2012, *ASV & MN 33290*. **Pichincha:** Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on dripping rocky slope, c. per., 5 Mar 2012, *ASV & MN 32741*, conf. S. R. Gradstein.

This rather scattered northern Andean species (Colombia, Ecuador) was previously known from Ecuador from the type of *Frullania villosa* Steph. (Stephani 1909–12, Uribe 2004) and another historical collection (Herzog 1942, without indicating locality, as *F. villosa*), and listed as a dubious taxon in León-Yáñez *et al.* (2006). *Frullania villosa* has been synonymized with *F. apollinarii* by Uribe (2004). The latter taxon was thereafter placed in the synonymy of *F. lobatohastata* (Gradstein & Uribe 2011). New to Azuay and Pichincha.

In both Ecuadorian specimens the perianths are sharply three keeled instead of subterete as described by Stotler (1969) and Gradstein & Uribe (2011), or terete as given for *F. apollinarii* (Uribe 2004). The long, undulate auricles of the underleaves, however, are distinctive.

Frullania macrocephala (Lehm. & Lindenb.) Lehm. & Lindenb.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, on open rocky slope at brook near below the station, c. per., 1800 m, 24 Jan 2011, *ASV & MN 31893/B* (PC), det. S. R. Gradstein.

Scattered in the Neotropics, from Ecuador previously known only from an old collection from Pastaza, 1500 m; new to Zamora Chinchipe.

****Frullania meridana*** Steph.

Pichincha: Road Quito—Baeza, páramo vegetation near the top of Papallacta pass, epiphytic on *Hesperomeles ferruginea* (Pers.) Benth., 3980 m, 10 Aug 2004, *ASV* with *J. Heinrichs*, *R. A. Wilson* & *S. O. Yandún 24182/A*, det. S. R. Gradstein (PC).

Hitherto known only from few collections from Venezuela (type) and Colombia, 1500–3200 m (Gradstein & Uribe 2011); new to Ecuador, a considerable extension of its altitudinal range.

Frullania mirabilis J.B. Jack & Steph. [= *Frullania pendulostyla* Steph.]

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, upper montane rain forest, epiphytic, 2150 m, 27 Jan 2011, *ASV & MN 31987/B*; -, upper montane rain forest (plot A 4), on branch of tree, exposed to sunlight, 2532 m, 27 Jan 2011, *ASV & MN 32033/A* (PC), conf. S. R. Gradstein; -, upper montane rain forest east of El Tiro, on forest floor, 2500–2550 m, 3°59' S, 79°08' W, 20 Mar 2012, *ASV & MN 33000*; -, PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphytic in submontane rain forest, 4°06–07' S, 78°58–59' W, 1250 m, 21 Mar 2012, *ASV & MN 33055*.

A rather scattered neotropical species (northern Andes and Costa Rica), in Ecuador known only from a few old collections from Morona Santiago, 750–1200 m (Stotler 1969, as *F. pendulostyla*); new to Zamora Chinchipe, a considerable extension of its altitudinal range. Churchill *et al.* (2009) reported "*Frullania cf. mirabilis*" from Cordillera del Cóndor, Zamora Chinchipe.

Frullania paradoxa Lehm. & Lindenb.

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chochochas east of El Cajas National Park, 3540 m, 2°46.7' S, 79°10.0' W, epiphytic on shrub, c. per., 13 Mar 2012, *ASV & MN 32849, 32851*; -, Laguna Dos Chochochas, 3800 m, 2°46.4' S, 79°09.6' W, epiphytic on *Polylepis racemosa* in *Polylepis* stand, c. per., 13 Mar 2012, *ASV & MN 32865*; -, Cordillera Oriental, Gualaquiza above Sigisig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo, epiphytic on shrub, c. per., 29 Mar 2012, *ASV & MN 33266, 33268, 33271, 33284, 33284/A*. **Loja:** PN Podocarpus above Cajanuma, Sendero del Mirador, epiphytic on shrub in páramo vegetation near the Mirador, c. per., 3000–3060 m, 4°07' S, 79°10' W, 15 Apr 2003, *ASV & M. Preußing 23281/B, 23299*, and 24 Mar 2012, *ASV & MN 33159*. **Pichincha:** Road Quito—Baeza, páramo vegetation west of Papallacta pass height, remnants of *Polylepis* stands, epiphytic on shrub, c. per., 3995 m, 0°20.3' S, 78°12.6' W, 5 Feb 2011, *ASV & MN 32163* (PC), conf. S. R. Gradstein; -, same locality, 6 Mar 2012, *ASV & MN 32765, 32772*; -, northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, epiphytic on shrub, c. per. & c. andr., and on dripping cliff, c. per., 5 Mar 2012, *ASV & MN 32718, 32729/A, 32735, 32736*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, upper montane rain forest, epiphytic, c. per., 2530 m, 27 Jan 2011, *ASV & MN 32005/A*; -, open secondary vegetation along Camino Canal, on shrub, c. per., 1800 m, 28 Jan 2011, *ASV & MN 32063/A*.

A tropical Andean species, from Ecuador previously known from Azuay and Loja, 3600 m; the record from Galápagos has been excluded by Gradstein (2009); new to Pichincha and Zamora Chinchipe. *Frullania paradoxa* seems to be one of the more common liverworts in shrubby páramo vegetation.

Frullania peruviana Gottsche

El Oro: Piñas, on solitary tree in pasture near road to the Pacific coast, 1000 m, 3°39.5' S, 79°45.1' W, 17 Mar 2012, *ASV & MN 32966*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphytic, c. per., 2850 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31828*; -, epiphytic at parking area, c. per., 2830 m, 22 Jan 2011, *ASV & MN 31754*. **Pichincha:** Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, epiphytic on shrub, 5 Mar 2012, *ASV & MN 32735/A*.

Known from Central America and northern Andes, from Ecuador previously reported from Carchi, Cotopaxi, Galápagos, Imbabura, Morona Santiago, Pichincha, Tungurahua and Zamora Chinchipe; new to El Oro and Loja.

Frullania pluricarinata Gottsche

Pichincha: Quito, Av. Amazónica, epiphytic on old tree, c. per., 2800 m, 0°13' S, 78°29.5' W, 4 Feb 2011, *ASV & MN 32154* (PC), conf. S. R. Gradstein; -, Botanical Garden, epiphytic, c. per., 2800 m, 0°11.2' S, 78°29.2' W, 3 Mar 2012, *ASV & MN 32705*; -, Parque El Ejido, epiphytic, c. per., 2800 m, 0°14' S, 78°29.5' W, 31 Mar 2012, *ASV & MN 33291*; -, road Quito—Imbabura, Parque Jerusalem, 2300 m, 0°0.05' S, 78°21.2' W, dry forest, epiphytic on *Acacia macracantha*, c. per., abundant, 4 Mar 2012, *ASV & MN 32709*.

A widespread but scattered species known from Mexico to Chile, from Ecuador previously reported only from a few old collections from Azuay and Pichincha (type of *F. subalpina* Spruce) (Yuzawa 1991). The species seems to prefer sites drying up periodically, at least all cited collections are from the interandean dry valley.

Frullania rio-janeirensis (Raddi) Ångstr.

Pichincha: Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, epiphytic on shrub, c. per., and on dripping cliff, c. per., 5 Mar 2012, *ASV & MN* 32733, 32729/B.

A pantropical species, from Ecuador reported from Cotopaxi, Galápagos, Pastaza, Zamora Chinchipe, and a recent record from El Oro (Benitez & Gradstein 2011), 50–2400 m; new to Pichincha, a considerable extension of its altitudinal range within Ecuador.

Frullania setigera Steph.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, on open rocky slope at brook near below the station, c. per., 1800 m, 24 Jan 2011, *ASV & MN* 31893/A (PC), conf. S. R. Gradstein.

This tropical American species was recently reported from Loja, 2800 m (Benitez *et al.* 2012); second record for Ecuador.

Frullania tunguraguana L.Clark & Frye

Morona Santiago: Santiago de Mendez, park area in city centre, epiphytic on ornamental shrub, 495 m, 2°42.9' S, 78°19.4' W, 28 Mar 2012, *ASV & MN* 33254/A.

A rarely collected species, known from scattered localities from Mexico to Argentina (Yuzawa 1991); from Ecuador known only from the type of *Frullania brachyclada* Spruce, from Tungurahua, ca. 2000 m. New to Morona Santiago and second record for Ecuador.

Frullanoides densifolia Raddi subsp. *densifolia*

Loja: PN Podocarpus above Cajanuma, Sendero del Mirador, epiphytic on shrub in páramo vegetation near the Mirador, 3100 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN* 33151.

This common neotropical species was previously reported from Ecuador from Azuay, Carchi, Chimborazo, Napo, Pichincha, Tungurahua and Zamora Chinchipe (records of subsp. *densifolia* from Galápagos are erroneous, Gradstein (2009)); new to Loja.

Frullanoides tristis (Steph.) van Slageren

Sucumbíos: Shushufindi, on bark of solitary tree along the main road in the city centre, 265 m, 0°11.3' S, 76°38.6' W, 7 Mar 2012, *ASV & MN* 32778/A (PC), det. S. R. Gradstein.

Within Ecuador this pantropical species was hitherto known only from Galápagos; new to Sucumbíos and mainland Ecuador.

Fulfordianthus pterobryoides (Spruce) Gradst.

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic, single plants between *Calymperes lonchophyllum* Schwägr., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN* 31746/A.

A rather scattered neotropical species occurring from Costa Rica to northern Peru, primarily along the Pacific coast; from Ecuador hitherto known only from the types of *Lejeunea pterobryoides* Spruce (Pastaza) and *Bryopteris wallisii* Steph. (Manabí), both 19th century collections (Gradstein 1994); new to Napo.

Gongylanthus liebmanianus (Lindenb. & Gottsche) Steph.

Pichincha: Road Quito—Baeza, at road cut west of the top of Papallacta pass, 0°20.3' S, 78°12.6' W, 3995 m, 5 Feb 2011, *ASV & MN* 32178.

Widespread Neotropical species, from Ecuador previously reported from Chimborazo, Napo, Zamora Chinchipe, and recently also from Loja (Váña *et al.* 2012, Benitez *et al.* 2012); new to Pichincha.

Gongylanthus limbatus (Herzog) Grolle & Vána

Pichincha: Rucu Pichincha, páramo vegetation at base of summit region, on dripping cliff, 4430 m, 0°09' S, 78°34' W, 6 Feb 2011, *ASV & MN 32206, 32209*; -, northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on soil along road, 5 Mar 2012, *ASV & MN 32714*.

A rather scattered species known from Costa Rica, Colombia, Bolivia and Ecuador (Vána *et al.* 2012). From Ecuador previously known only from Cotopaxi (type of *Haplozia limbata*) and a second collection from Napo (Schäfer-Verwimp *et al.* 2006, Vána *et al.* 2012), 4030–4100 m; new to Pichincha.

Gymnomitrion bolivianum (Steph.) Vána [= *Marsupella lacerata* (Steph.) Vána]

Loja: PN Podocarpus above Cajanuma, Sendero del Mirador, páramo vegetation near the Mirador, 3050 m, 4°6' S, 79°10' W, on rock, 15 Apr 2003, *ASV & M. Preußing 23290* (PRC), det. J. Vána, as *Marsupella lacerata*.

A widely distributed species, known under many synonyms from Southern Africa, Mexico, Central America, Northern and Western South America (Vána *et al.* 2010); from Ecuador reported from Chimborazo, Napo and Pichincha; new to Loja.

Gymnomitrion truncatoapiculatum Herzog [= *Marsupella truncatoapiculata* (Herzog) Vána]

Azuay: Road Cuenca—Guayaquil, just west of El Cajas pass height, 4120 m, 2°46.4' S, 79°14.1' W, on humus, exposed to sunlight, 13 Mar 2012, *ASV & MN 32874* (PRC), det. J. Vána.

Known from high altitudes from Mexico to Bolivia, from Ecuador only from a single collection from Chimborazo (Vána 2003, as *Marsupella*); new to Azuay and second record for Ecuador.

Harpalejeunea cinchonae (Nees) Schiffn.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphytic on *Prumnopitys montana* (plot M 1), 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31792/B*; -, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphytic on twigs of shrub, 3120 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31878/A*; -, on shrub in páramo vegetation, 3250 m, *ASV & MN 31885/A*. **Napo:** Road Quito—Baeza, páramo vegetation near the top of Papallacta pass, epiphytic on shrub, 0°19.9' S, 78°12.2' W, 4080 m, 5 Feb 2011, *ASV & MN 32186/B*. **Zamora-Chinchipe:** Road Loja—Zamora, upper montane rain forest east of El Tiro, on branch of tree, c. per., 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32085/B*; -, Estación Científica San Francisco, 3°59' S, 79°04' W, upper montane rain forest (plot A 4), epiphytic, c. per., 2532 m, 27 Jan 2011, *ASV & MN 32017/B*; -, on shrub, 2450 m, *ASV & MN 31998/A*.

Only scattered records from the Neotropics, from Ecuador hitherto known from Azuay, Sucumbíos and Zamora Chinchipe, 800–3400 m; new to Loja and Napo, a considerable extension of its altitudinal range.

Harpalejeunea oxyphylla (Nees & Mont.) Steph.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, sparse, 27 Mar 2012, *ASV & MN 33212/D*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on rotting log (with *Harpalejeunea tridens* and *Cololejeunea sintenisii*) and epiphytic, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31715, 31748/B*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–230 m, epiphyllous, 8–9 Mar 2012, *ASV & MN 32804/D, 32846/A*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, Sendero Los Higuerones, submontane rain forest (plot L 2), epiphyllous, 1026 m, 4°7.0' S, 78°58.1' W, 25 Jan 2011, *ASV & MN 31936/D*.

Widespread neotropical species, from Ecuador previously reported from Morona Santiago, Pastaza and Zamora Chinchipe, 550–600 m; new to Napo and Orellana.

Harpalejeunea tridens (Besch. & Spruce) Steph.

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on branch of shrub, epiphytic on stem of *Croton* and on rotting log (with *Harpalejeunea oxyphylla*), 450 m, 1°05' S, 77°37' W, 20 Jan 2011, *ASV & MN* 31705, 31706, 31715 p.p.

Widespread but scattered tropical American species, from Ecuador hitherto known only from Zamora Chinchipe, 1800–2150 m; new to Napo, with a considerable extension of its altitudinal range.

Herbertus juniperoideus (Sw.) Grolle subsp. ***bivittatus*** (Spruce) K.Feldberg & Heinrichs [= *Herbertus divergens* (Steph.) Herzog]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphytic on *Prumnopitys montana* (plot M 1), 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN* 31789. **Zamora**

Chinchipe: PN Podocarpus, Río Bombuscaro, submontane rain forest on Sendero Mirador (plot F 1), on broken branch from tree crown, 1075 m, 4°6.8' S, 78°58.0' W, 25 Jan 2011, *ASV & MN* 31930; -, epiphytic, 1250 m, 21 Mar 2012, *ASV & MN* 33056.

Widespread in the Neotropics, from Ecuador known from Galápagos Islands (Feldberg & Heinrichs 2006, Gradstein 2009, as *H. bivittatus* Spruce) and Zamora Chinchipe (Nöske *et al.* 2003, as *H. divergens*); new to Loja.

Heteroscyphus polyblepharis (Spruce) Schiffn.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on slope, 2900 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN* 31844.

Very scattered in Central and northern South America, from Ecuador previously reported from Pastaza, Pichincha and Tungurahua; new to Loja.

Isotachis serrulata (Sw.) Gottsche

Morona Santiago: Santiago de Mendez, on dripping, mineral rich slope along road to Cuenca, 950 m, 2°42.5' S, 78°22.7' W, 28 Mar 2012, *ASV & MN* 33256.

A widespread neotropical species, from Ecuador previously known from old collections from Esmeraldas, Morona Santiago and Pichincha, and recent ones from Loja (Benitez *et al.* 2012) and Zamora Chinchipe.

Jensenia spinosa (Lindenb. & Gottsche) Grolle

Loja: PN Podocarpus above Cajanuma, Sendero del Mirador, upper montane rain forest, on humid slope, 2850 m, 4°7' S, 79°10' W, 22 Jan 2011, *ASV & MN* 31756.

An Afro-American species, from Ecuador previously known from Carchi, Napo, Zamora Chinchipe, and recently also reported from Loja (Benitez *et al.* 2012).

****Kurzia flagellifera*** (Steph.) Grolle

Azuay: Between Gualaceo and General L. Plaza, western slope of eastern Cordillera, on earth slope, 3000 m, 30 Jul 1991, *T. Arts* 30/027, det. R. Grolle (dupl. Herb. ASV). **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on rotting leaves on slope, 2850 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN* 31825/A. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, upper montane rain forest, on soil along trail, 2150 m, 27 Jan 2011, *ASV & MN* 31988/A; -, upper montane rain forest east of El Tiro, on humus and on rotting log, 2500–2550 m, 3°59' S, 79°08' W, 20 + 23 Mar 2012, *ASV & MN* 33003, 33093, 33117.

A scattered but probably overlooked tropical American species (Guatemala, Costa Rica, Venezuela, Colombia and Brazil); new to Ecuador, where it seems to be at least locally common; no other species of *Kurzia* has been collected by the authors in Ecuador.

Lejeunea acanthogona Spruce

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°05' W, lower montane rain forest (plot U 1), on rotting log, c. per., 2002 m, 26 Jan 2011, *ASV & MN 31967*, conf. M. E. Reiner-Drehwald, 31974/B, det. M. E. Reiner-Drehwald, 31973/B.

A rather scattered neotropical species, hitherto known only from type specimens collected in Ecuador (Tungurahua), Colombia and Venezuela, (the record from Costa Rica has been rejected), altitudinal range unknown (Reiner-Drehwald & Goda 2000); new to Zamora Chinchipe, and the first record of specimens collected since the type material more than 100 years ago.

Lejeunea adpressa Nees

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphytic on ornamental shrub in hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32881/C*. **Guayas:** Pacific coast south of Guayaquil, Reserva Ecologica Manglares Churute near E 25 km 45, epiphytic in dry forest, 15 m, 2°27.2' S, 79°37.7' W, 15 Mar 2012, *ASV & MN 32903*. **Napo:** Tena, Estación Biológica Jatunascha, rain forest, on bark of *Croton*, 450 m, 1°05' S, 77°37' W, 20 Jan 2011, *ASV & MN 31706/B*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous on various substrates, also epiphytic and on dead branchlets, very common, 8–9 Mar 2012, *ASV & MN 32790, 32791/A* (c. per.), 32803/A (c. spor.), 32815/A, 32833/B, 32834/C, 32836/A (c. per.).

A common neotropical species, from Ecuador known under several synonyms (*Lejeunea caespitosa* sensu Schuster 1980, *L. carolensis* Spruce, *L. drymophila* Spruce, *L. magnoliae* Lindenb. & Gottsche, Reiner-Drehwald 2009) from Esmeraldas, Morona Santiago, Pastaza, Pichincha, Tungurahua, Sucumbíos and Zamora Chinchipe; new to Azuay, Guayas, Napo and Orellana.

Lejeunea angusta (Lehm. & Lindenb.) Mont.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.4' W, lower montane rain forest along Camino Canal, epiphytic, c. per., mixed with *Lejeunea deplanata* and *L. prionoides*, 1820 m, 26 Jan 2011, *ASV & MN 32054/B*, det. M. E. Reiner-Drehwald.

This scattered neotropical species was first reported from Ecuador, Pichincha, by Schäfer-Verwimp *et al.* (2006) and from Zamora Chinchipe by Gradstein *et al.* (2007); confirmed for Zamora Chinchipe.

Lejeunea aphanes Spruce [= *Lejeunea filipes* Spruce]

El Oro: Piñas, epiphytic at edge of secondary forest along road to the Pacific coast, sparse, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32926/C*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark, very sparse, one plant c. per. and c. andr. (autoicous), 27 Mar 2012, *ASV & MN 33196/C*.

A scattered neotropical species, from Ecuador previously known from Cotopaxi, 2400 m (Arnell 1962), Morona Santiago, 700 m (Herzog 1952, as *L. filipes*) and Zamora Chinchipe, 1000–1100 m (Benitez & Gradstein 2011); a record from Galápagos is listed under doubtful and excluded records by Gradstein (2009); new to El Oro.

Lejeunea asperrima Spruce

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic and on rotten log, 27 Mar 2012, *ASV & MN 33230/A, 33232/B*. **Napo:** Tena, Estación Biológica Jatunascha, primary lowland rain forest, epiphytic, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31742/B*.

Widely distributed in the Neotropics, from Ecuador known only from a single record from Zamora Chinchipe, Río Bombuscaro, 1000 m (Ilkiu-Borges 2005) where it was collected again in 2012 (*ASV & MN 33176/A*); new to Morona Santiago and Napo.

Lejeunea asthenica Spruce [= *Taxilejeunea asthenica* (Spruce) Steph.]

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°05' W, on earth cut at the station, c. per., 1825 m, 19 Mar 2012, *ASV & MN 32985*.

A widespread but scattered neotropical species, from Ecuador previously known from Galápagos, Morona Santiago, Napo, Sucumbíos and Zamora Chinchipe (Arnell 1962, Herzog 1952, both as *Taxilejeunea*); new to the San Francisco station area.

**Lejeunea boryana* Mont.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, c. per., 27 Mar 2012, *ASV & MN 33218*.

Widely distributed in the Neotropics (Lesser Antilles and Amazonian regions of Venezuela, French Guiana and Brazil) as shade epiphyte from sea level to 400 m (Reiner-Drehwald & Goda 2000); new to Ecuador.

Lejeunea cancellata Nees & Mont. ex Mont.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphytic on ornamental shrub in hotel garden, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32881/D*. **El Oro:** Piñas, epiphytic at edge of secondary forest and on bark of solitary tree in pasture along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32936, 32947/A*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark, mixed with *Lopholejeunea subfusca* and *L. nigricans*, 27 Mar 2012, *ASV & MN 33197/B*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, lower montane rain forest on Camino Canal, epiphytic, 1820 m, 28 Jan 2011, *ASV & MN 32054/A*.

Widely distributed in tropical America, known from Florida and the Greater Antilles to Brazil and Argentina and reported also from Hawaii; single record from Ecuador, Pichincha, 2050 m (Schäfer-Verwimp *et al.* 2006); new to Azuay, El Oro, Morona Santiago and Zamora Chinchipe.

Lejeunea capensis Gottsche

Loja: PN Podocarpus above Cajanuma, upper montane rain forest at parking area, on bark of tree, c. per., 2830 m, 4°07' S, 79°10' W, 22 Jan 2011, *ASV & MN 31753*.

Widely distributed in Sub-Saharan Africa and Madagascar, extending to the Yemeni Arab Republic, scattered in tropical America from Mexico to Argentina, only common in SE Brazil (Reiner-Drehwald & Schäfer-Verwimp 2008); from Ecuador previously known from Zamora Chinchipe, 1800 m (Parolly *et al.* 2004); new to Loja, a considerable extension of its altitudinal range.

**Lejeunea caulicalyx* (Steph.) M.E.Reiner & Goda

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on rotting wood, c. spor., with *Callicostella pallida* (Hornsch.) Ångstr., 27 Mar 2012, *ASV & MN 33201*. **Napo:** Tena, Estación Biológica Jatunascha, primary lowland rain forest, on dead wood, c. per., with *Harpalejeunea oxyphylla*, 450 m, 1°05' S, 77°37' W, 20 Jan 2011, *ASV & MN 31709/C*.

Rather scattered in the Neotropics, hitherto known from Cuba (type), the Dominican Republic, Guadeloupe, Costa Rica and French Guiana (Reiner-Drehwald 2009a, Reiner-Drehwald & Goda 2000, Schäfer-Verwimp & Pócs 2009).

Lejeunea cerina (Lehm. & Lindenb.) Gottsche, Lindenb. & Nees

El Oro: Piñas, epiphytic at edge of secondary forest and on pile of pasture along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32926/B, 32942/B*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, 27 Mar 2012, *ASV & MN 33230/B*.

A common neotropical species, from Ecuador only recent records from Loja (Benitez & Gradstein 2011), Pichincha (Schäfer-Verwimp *et al.* 2006) and Zamora Chinchipe; new to El Oro and Morona Santiago.

Lejeunea controversa Gottsche

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous on *Achomanes*, with *Phyllodon truncatulus* (Müll.Hal.) W.R.Buck, 450 m, 1°05' S, 77°37' W, 20 Jan 2011, *ASV & MN 31728/C*.

A tropical American species, from Ecuador previously known from Esmeraldas, Los Ríos, Pastaza, Pichincha and Zamora Chinchipe; new to Napo.

****Lejeunea cristuliflora*** (Gottsche ex Steph.) M.E.Reiner & Goda

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphyllous on epiphytic fern frond, c. per., 4°6.6' S, 79°10.7' W, 2900 m, 22 Jan 2011, *ASV & MN 31785/C*, conf. M. E. Reiner-Drehwald.

This rather rare species has so far been known only from southeastern Brazil, at 700–1350 m (Reiner-Drehwald & Goda 2000).

Lejeunea cyathophora Mitt.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°05' W, 1825 m, epiphyllous on *Citrus* at the station, c. per., 19 Mar 2012, *ASV & MN 32980/C*.

Scattered in the Neotropics (Costa Rica to Bolivia), from Ecuador previously known from Pichincha, Tungurahua and Zamora Chinchipe (León-Yáñez *et al.* 2006, Reiner-Drehwald & Schäfer-Verwimp 2008); confirmed for Zamora Chinchipe, representing the first epiphyllous collection of the species which is otherwise known as epiphyte on mature trees and saplings and from rotten logs.

Lejeunea debilis (Lehm. & Lindenb.) Nees & Mont. [= *Taxilejeunea debilis* (Lehm. & Lindenb.) Steph.]

El Oro: Piñas, road to the Pacific coast, 980 m, 3°39.5' S, 79°45.1' W, on branchlets on humid slope along trail, 17 Mar 2012, *ASV & MN 32963/B*.

Widespread in the Neotropics, from Ecuador previously known only from Galápagos, ca. 700 m (Gradstein 2009, as *Taxilejeunea*) and Zamora Chinchipe (Gradstein *et al.* 2007, as *Taxilejeunea*); new to El Oro and second record for mainland Ecuador.

Lejeunea deplanata Nees

Carchi: Reserva Ecologica El Ángel, shrubby vegetation along the road from El Angel to El Voladero, epiphytic on shrub, 3420 m, 19 Aug 2004, *ASV* with *J. Heinrichs, R. A. Wilson & S. O. Yandún 24389/B*; -, Sendero El Voladero ca. 15 km above El Ángel, *Espeletia* páramo, epiphytic on shrub, 3750 m, 19 Aug 2004, *ASV* with *J. Heinrichs, R. A. Wilson & S. O. Yandún 24373/D*.

This common Andean species is known from Ecuador also under its synonyms *L. hebetata* Spruce, *L. maxonii* (A.Evans) Xiao L.He, *L. megalostipa* Spruce and *Rectolejeunea longiloba* Steph. from Azuay, Chimborazo, Cotopaxi, Galápagos, Imbabura, Morona-Santiago, Napo, Pastaza, Pichincha, Tungurahua and Zamora Chinchipe (Reiner-Drehwald 2010a); new to Carchi.

****Lejeunea drehwaldii*** Heinrichs & Schäf.-Verw. [= *Sphaerolejeunea umbilicata* Herzog]

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro ca. 5 km south of Zamora, Sendero Los Higuerones, submontane rain forest, epiphyllous, c. per., 1000 m, 4°06' S, 78°58' W, 25 Mar 2012, *ASV & MN 33172/B*.

A rare, critically endangered neotropical species, known only from the type of *Sphaerolejeunea umbilicata* Herzog from Colombia and a second collection from Peru (Reiner-Drehwald & Drehwald 2002). Heinrichs *et al.* (2012) showed that *Sphaerolejeunea* is nested in *Lejeunea* and proposed the new name.

Though searching for the species intensively, we found it only on a single leaf; however, it may be present at more localities along Río Bombuscaro since the ecological conditions seem to be suitable for *L. drehwaldii*.

***Lejeunea flava* (Sw.) Nees**

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphyllous on *Citrus* in hotel garden, c. spor., 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32893/C*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, c. per., 27 Mar 2012, *ASV & MN 33223/B*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, on bark of trees, roots and on dead branches, 8–9 Mar 2012, *ASV & MN 32797, 32800, 32831/A* (c. per.), *32836/B* (c. per.).

This pantropical species was previously known from Ecuador from Azuay, Galápagos, Morona Santiago and Zamora Chinchipe; new to Orellana and confirmed for Azuay and Morona Santiago.

***Lejeunea galeata* Spruce**

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.6' W, lower montane rain forest along Camino Canal, on humid rotten log, c. per., 1820 m, 28 Jan 2011, *ASV & MN 32055*, det. M. E. Reiner-Drehwald.

A poorly known and rarely collected species, hitherto known only from the type collections made by Spruce in Peru and Ecuador, Chimborazo; new to Zamora Chinchipe.

***Lejeunea intricata* J.B. Jack & Steph.**

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, 27 Mar 2012, *ASV & MN 33217*.

A widespread but scattered neotropical species (Costa Rica, El Salvador, Colombia, Reiner-Drehwald & Goda 2000) and the Dominican Republic (Schäfer-Verwimp & Pócs 2009), recently reported from Zamora Chinchipe (Parolly *et al.* 2004), from ca. 1950 m alt.; new to Morona Santiago and second record for Ecuador, a considerable extension of its local altitudinal range.

***Lejeunea laetevirens* Nees & Mont.**

Azuay: Pacific coast south of Guayaquil, Camacho, on bark of *Theobroma cacao* in cacao plantation between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, 15 Mar 2012, *ASV & MN 32924*. **El Oro:** Piñas, epiphyllous in secondary forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32951/B*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic on *Prumnopitys montana*, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31791/A*. **Morona Santiago:** Santiago de Mendez, park area in city centre, on bark of small tree, 495 m, 2°42.9' S, 78°19.4' W, 28 Mar 2012, *ASV & MN 33253*; -, cultivation area along road near El Rosario, on bark of solitary tree, mixed with a few plants of *Microlejeunea epiphylla* and *Cheilolejeunea trifaria*, 900 m, 2°53.7' S, 78°23.6' W, 28 Mar 2012, *ASV & MN 33246*. **Orellana:** Yasuní National Park, park-like area around Yasuní Research Station, 0°40' S, 76°24' W, 215 m, epiphytic, 8 Mar 2012, *ASV & MN 32782*. **Sucumbíos:** Shushufindi, on bark of solitary tree along the main road in the city centre, 265 m, 0°11.3' S, 76°38.6' W, 7 Mar 2012, *ASV & MN 32778/B*.

Widespread and common in tropical America, from Ecuador previously reported from Galápagos, Napo, Pastaza, Zamora Chinchipe and recently from Morona Santiago (Drehwald 2003) and Loja (Benitez & Gradstein 2011), at altitudes from 50–2150 m; new to Azuay, El Oro, Orellana and Sucumbíos; the record from Loja represents a considerable extension of its altitudinal range.

**Lejeunea meridensis* Ilk.-Borg.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphytic (also in plot M 1), 4°6.6' S, 79°10.7' W, 2920 m and 2859 m, 22 Jan 2011, *ASV & MN 31784/A, 31796/A*.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59.5' S, 79°04.4' W, upper montane rain forest, on dead branch, 2500 m, 27 Jan 2011, *ASV & MN 32002/C*; -, epiphytic in plot A 4, 2532 m, 27 Jan 2011, *ASV & MN 32011/A*; -, upper montane rain forest east of El Tiro (plot C 3), on humus over rotting log, 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32088/A*.

Hitherto known only from the type from Venezuela (Ilkiu-Borges 2005).

The five Ecuadorian collections may indicate that this very small and easily overlooked species is possibly more widespread in the northern Andes. As in the type collection no perianth could be traced.

Lejeunea pallescens Mitt. [= *Macrolejeunea pallescens* (Mitt.) Schiffn.]

Azuay: Eastern Cordillera, Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo, epiphytic on shrub, 29 Mar 2012, *ASV & MN 33269/C*. **Pichincha:** Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on bark of young tree, 5 Mar 2012, *ASV & MN 32731*.

Reiner-Drehwald & Schäfer-Verwimp (2008) clarified the relationships between *Lejeunea pallescens* and *L. osculatiana* De Not. (= *Lejeunea flavicans* Gottsche) the first one being concentrated in the Andes of Colombia with a few collections from Costa Rica, Venezuela and Ecuador, between 2600–3700 m, the latter one with a wider distribution from Mexico to Bolivia at altitudes between 1000–3200 m. The specimen *SV 23201* from 1800 m cited in Parolly *et al.* (2004) as *Macrolejeunea pallescens* from Zamora Chinchipe as well as all specimens of *L. pallescens* cited in Schäfer-Verwimp *et al.* (2006) from Napo and Pichincha (from altitudes between 1800 and 2120 m) belong to *L. osculatiana*. Therefore, the records for this species given in León-Yáñez *et al.* (2006) need confirmation. For now, the records for Zamora Chinchipe and Napo have to be rejected; confirmed specimens from Ecuador are known from "Andes Quitenses, Mt. Guayrapata" and "Mt. Azuay" (leg. Spruce) and from Loja (Reiner-Drehwald & Schäfer-Verwimp 2008).

Lejeunea phyllobola Nees & Mont. ex Mont.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, c. per., c. andr. and caducous leaves, mixed with *Lejeunea puiggariana*, 27 Mar 2012, *ASV & MN 33221* p.p.

Widespread in the Neotropics, from Africa known as *Lejeunea brittoniae* (A.Evans) Grolle and from India as *Rectolejeunea brittoniae* A.Evans (Srivastava & Agarwal 1986); from Ecuador previously known from Sucumbíos, 2400 m (Arnell 1962, as *Rectolejeunea*) and Zamora Chinchipe, 1800–2150 m; Drehwald (2003) reported it from Morona Santiago; further on, an uncertain record from Morona Santiago, 600 m, is listed by Herzog 1952 (as "*Rectolejeunea spec. phyllobolae* (Mont.) Evs. proxima (?)"); confirmed for Morona Santiago. See also note under *Lejeunea puiggariana*.

Lejeunea prionoides Spruce

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, lower montane rain forest near Tarabita, epiphytic, c. per., 1825 m, 26 Jan 2011, *ASV & MN 31954/B*.

This rather rare neotropical species was for a long time only known from the type collection made by Spruce in Ecuador, Tungurahua, until Reiner-Drehwald (2010) reported it from two recent collections from Pichincha and Zamora Chinchipe along with two collections from Peru.

Lejeunea pterigonia (Lehm. & Lindenb.) Mont. [= *Taxilejeunea pterigonia* (Lehm. & Lindenb.) Schiffn.]

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, c. per., 27 Mar 2012, *ASV & MN 33198*. **Pichincha:** Cordillera Occidental northwest of Quito, road Quito—Mindó, km 48, 1800 m, humid secondary vegetation, on slope, c. per., 17 Aug 2004, *ASV*

with *J. Heinrichs*, *R. W. Wilson* & *S. O. Yandún* 24311; -, Bella Vista Cloud Forest Reserve, 2050 m, epiphytic, c. per., 25 Aug 2004, *ASV* with *J. Heinrichs*, *R. W. Wilson* & *S. O. Yandún* 24528.

This widespread and common neotropical species was previously known from Ecuador from Esmeraldas, Galápagos, Morona Santiago, Napo, Pastaza and Zamora Chinchipe; new to Pichincha and actual confirmation for Morona Santiago.

**Lejeunea puiggariana* Steph.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, c. per., 27 Mar 2012, *ASV* & *MN* 33221.

A rather scattered neotropical species, hitherto known from Brazil and Argentina (Reiner-Drehwald 2000), Costa Rica and Mexico (Dauphin 2005).

The specimen is a mixture of *L. puiggariana* and *L. phyllobola*, both with perianths, the latter one also with conspicuous androecia and numerous caducous leaves. The two species can be readily distinguished when fertile, *L. puiggariana* being autoicous, *L. phyllobola* dioicous, and by the oil bodies, which are numerous and homogeneous in *L. puiggariana* whereas *L. phyllobola* has only 2–5 finely segmented oil bodies.

**Lejeunea raddiana* Lindenb.

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, Sendero Los Higueros, submontane rain forest (plot L 2), on (humus of) rotten log, c. per., 1026 m, 4°7.0' S, 78°58.1' W, 25 Jan 2011, *ASV* & *MN* 31939/B.

A rather rare neotropical species, previously known only from Brazil and Bolivia, occurring from near sea level to 700 m (Reiner-Drehwald & Goda 2000).

Lejeunea ramulosa Spruce

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along road near park administration, epiphytic, 4°07' S, 79°10.1' W, 2820 m, 24 Mar 2012, *ASV* & *MN* 33161.

A widespread but scattered neotropical species (from Mexico to Bolivia and Brazil, Reiner-Drehwald 2010, the Dominican Republic, Schäfer-Verwimp & Pócs 2009), from Ecuador previously known from Chimborazo, Los Ríos, Morona Santiago, Napo, Pichincha, Sucumbíos, Tungurahua and Zamora Chinchipe; new to Loja.

Lejeunea reflexistipula (Lehm. & Lindenb.) Gottsche, Lindenb. & Nees (var. *reflexistipula*)

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV* & *MN* 31804/C; -, on bark of tree near park administration, 2820 m, 24 Mar 2012, *ASV* & *MN* 33162. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, c. per., 27 Mar 2012, *ASV* & *MN* 33196/A.

Widespread in tropical America, from Ecuador previously reported from Carchi, Morona Santiago, Napo, Pastaza, Pichincha, Tungurahua, Zamora Chinchipe and recently from Loja; confirmed for Loja and Morona Santiago (see also Reiner-Drehwald 2005).

Lejeunea rotundifolia Mitt. [= *Dicladolejeunea rotundifolia* (Mitt.) M.E.Reiner ex León-Yáñez, Gradst. et Wegner 2006, nom. inval.]

Zamora Chinchipe: Mayayku south of Paquisha, in the village epiphytic on tree stem, 850 m, 3°59.3' S, 78°38.9' W, 30 Jan 2011, *ASV* & *MN* 32092/C; -, road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, lower montane rain forest along Camino Canal, on bark of tree, 1850 m, 23 Apr 2003, *ASV* & *M. Preußing* 23539.

Scattered neotropical species, from Ecuador hitherto known from Loja, Morona Santiago, Pastaza, Pichincha and Tungurahua; new to Zamora Chinchipe.

Reiner-Drehwald (2005a) synonymized the genus *Di cladolejeunea* with *Lejeunea* and treated *Di cladolejeunea saccatiloba* (Steph.) R.M.Schust. and *D. anomala* R.M.Schust. as new synonyms of *Lejeunea rotundifolia*.

Lejeunea saccatiloba (Steph.) R.L.Zhu & W.Ye [= *Oryzolejeunea saccatiloba* (Steph.) Gradst.]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along road near park administration, epiphytic, 4°07' S, 79°10' W, 2820–2830 m, 22 Jan 2011, *ASV & MN 31753/B*; -, same locality, 24 Mar 2012, *ASV & MN 33163*.

A tropical American species, from Ecuador known only from recent collections from Napo, Tungurahua and Zamora Chinchipe, 1540–2650 m; new to Loja.

Recent phylogenetic studies (Ye *et al.* 2013) clarified the systematic position of the small neotropical genus *Oryzolejeunea*, which is nested in *Lejeunea*.

Lejeunea subspathulata Spruce

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous on *Achomanes*, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31728/B*.

Widespread in the Neotropics, from Ecuador hitherto known only from Pastaza, ca. 500 m; new to Napo.

Lejeunea tapajosensis Spruce

Orellana: Yasuní National Park, park-like area around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphytic, 9 Mar 2012, *ASV & MN 32829*.

A rather scattered tropical American species (Peru, Brazil and Argentina) beside a single record from the West Indies (Schäfer-Verwimp 1999), from Ecuador previously reported from Esmeraldas and Zamora Chinchipe, 500–2150 m; new to Orellana.

Numerous of our *Lejeunea* specimens, especially of subgen. *Heterolejeunea*, could not yet be assigned to species.

Lepicolea pruinosa (Taylor) Spruce

Morona Santiago: Between Gualaceo and General L. Plaza, eastern slope of eastern Cordillera, on earth slope, 2730 m, 30 Jul 1991, *T. Arts 30/140*, det. R. Grolle (dupl. Herb. ASV).

Known from Costa Rica to Chile, from Ecuador previously reported from Azuay, Loja, Pastaza, Pichincha, Tungurahua and Zamora Chinchipe; new to Morona Santiago.

****Lepicolea ramentifissa*** Herzog

Azuay: At the pass of the Eastern Cordillera between Gualaceo and General L. Plaza, on rock slope along the road, 3300 m, 30 Jul 1991, *T. Arts 30/204*, det. R. Grolle (dupl. Herb. ASV).

So far known only from Costa Rica, Venezuela and Bolivia.

Lepidolejeunea cordifissa (Taylor) M.E.Reiner [= *Lepidolejeunea ornata* (H.Rob.) R.M.Schust.]

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, 27 Mar 2012, *ASV & MN 33219*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous and epiphytic, c. per., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31716/B, 31738*.

A scattered neotropical species, from Ecuador hitherto known from Bolívar, Chimborazo, Esmeraldas (type of *Lejeunea cordifissa* Taylor), Los Ríos, Morona Santiago and Zamora Chinchipe (Herzog 1952, as *Lejeunea cordifissa* Taylor; León-Yáñez *et al.* 2006, as *L. ornata* and *Lejeunea pentotantha* Spruce; Reiner-Drehwald 2006); new to Napo.

Lepidolejeunea eluta (Nees) R.M.Schust.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, 27 Mar 2012, *ASV & MN 33212/B*.

A widely distributed tropical American species (reported from Mexico and Cuba to Bolivia and Brazil) which has been described several times under different names (Piippo 1986). From Ecuador previously known only from the type and some further old collections of *Lejeunea pastasensis* Spruce from Morona Santiago (Herzog 1952, Reiner-Drehwald 2006).

Lepidolejeunea involuta (Gottsche) Grolle

Morona Santiago: Cultivation area along road near El Rosario, on bark of solitary tree, a few plants mixed with *Cheilolejeunea trifaria*, 900 m, 2°53.7' S, 78°23.6' W, 28 Mar 2012, *ASV & MN 33247 p.p.*

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphytic, 8–9 Mar 2012, *ASV & MN 32799, 32819*.

A tropical American species, from Ecuador previously known from Galápagos, Pastaza and Zamora Chinchipe; new to Morona Santiago and Orellana.

**Lepidozia squarrosa* Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31806 (PC)*, conf. S. R. Gradstein; -, upper montane rain forest on Sendero a las Lagunas del Compadre, on rotting log, 2850 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31836*.

A rare neotropical species, known from Costa Rica and Colombia.

Lepidozia subdichotoma Spruce

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphytic, 3150 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31881*. **Zamora Chinchipe:** Road Loja–Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, upper montane rain forest (plot A 4), on humus, 2532 m, 27 Jan 2011, *ASV & MN 32031/A*; -, upper montane rain forest east of El Tiro, on humus, 2500–2550 m, 3°59' S, 79°08' W, 20 Mar 2012, *ASV & MN 33011/B*; -, PN Podocarpus, Río Bombuscaro, submontane rain forest on Sendero Mirador, on soil along trail, 1200 m, 4°06–07' S, 78°58–59' W, 21 Mar 2012, *ASV & MN 33027*.

This rather rare neotropical species was reported from Azuay and Pastaza, 1400–3300 m; new to Loja and Zamora Chinchipe. Included in the red data book by Gradstein & León-Yáñez (2011).

Leptolejeunea elliptica (Lehm. & Lindenb.) Schiffn.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33227/B, 33241*. **Napo:** Tena, Estación Biológica Jatunzascha, primary lowland rain forest, epiphyllous and epiphytic, 1°05' S, 77°37' W, 400–450 m, 20 Jan 2011, *ASV & MN 31702, 31748*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous and epiphytic, 8–9 Mar 2012, *ASV & MN 32788/A, 32794, 32834/A, 32844/A, 32845/B, 32848/A (c. per.)*.

Pantropical, from Ecuador previously known from Azuay, Galápagos, Guayas, Morona Santiago, Pichincha and Sucumbíos; new to Napo and Orellana.

**Leptolejeunea maculata* (Mitt.) Schiffn.

Zamora Chinchipe: Amazonian lowland rain forest remnant near Mayayku south of Paquisha, epiphyllous in understory, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32097/F, 32104/D*.

A pantropical species, widespread also in the Neotropics from Mexico and Costa Rica to Brazil and the West Indies (Schäfer-Verwimp & Pócs 2009).

Leptoscyphus amphibolius (Nees) Grolle

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), on soil, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31818*.

A tropical American species, from Ecuador previously reported from Tungurahua and Zamora Chinchipe, 1800–2150 m; new to Loja, a considerable extension of its altitudinal range.

Leptoscyphus cuneifolius (Hook.) Mitt. subsp. *fragilis* (J.B.Jack & Steph.) Grolle

Azuay: Road Cuenca—Guayaquil, Laguna Dos Chochochas, 3800 m, 2°46.4' S, 79°09.6' W, epiphytic on *Polylepis racemosa* in *Polylepis* stand, 13 Mar 2012, *ASV & MN 32862*. **Loja:** PN Podocarpus above Cajanuma, single plants between other bryophytes on branch of shrub in páramo vegetation near the Mirador, 3050–3060 m, 4°07' S, 79°10' W, 15 Apr 2003, *ASV & M. Preußing 23299/B*, and 24 Mar 2012, *ASV & MN 33158/B*. **Zamora Chinchipe:** Road Loja—Zamora, upper montane rain forest east of El Tiro, on branch of shrub between *Anoplolejeunea conferta*, *Cheilolejeunea xanthocarpa*, *Aureolejeunea quinquecarinata* and others, 2500 m, 3°59' S, 79°08' W, 23 Mar 2012, *ASV & MN 33070/A*.

Widespread but scattered in the Neotropics. A small, easily overlooked species, from Ecuador previously known from Pichincha and Zamora Chinchipe, 2150–3820 m (León-Yáñez *et al.* 20006, Schäfer-Verwimp *et al.* 2006, both as *L. cuneifolius*). The record from Galápagos has been excluded by Gradstein 2009 (as *L. cuneifolius*); new to Azuay and Loja.

Vanderpoorten *et al.* (2010) reinstated subsp. *fragilis*.

Leptoscyphus gibbosus (Taylor) Mitt.—see note under *Leptoscyphus hexagonus*—

L. gibbosus may be restricted to the Caribbean region, as already pointed out by Grolle (1963). Specimens of *L. gibbosus* have been seen also from Costa Rica and Panama by ASV. All specimens collected by ASV in southern Ecuador (Loja and Zamora Chinchipe) and previously determined as *L. gibbosus* belong to *L. hexagonus*. Therefore the two Ecuadorian records of *L. gibbosus* from Zamora Chinchipe (Churchill *et al.* 2009, Nöske *et al.* 2003) should be confirmed.

Leptoscyphus hexagonus (Nees) Grolle

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphytic on shrub, 3250 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31883*. **Zamora Chinchipe:** Road Loja—Zamora, upper montane rain forest east of El Tiro (plot C 3), on branch of shrub, c. per., 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32076*.

A rather rare Andean species, known from Peru and Ecuador, from where it is previously reported from Carchi and Morona Santiago, the record from Galápagos has already been rejected by Grolle (1963); new to Loja and Zamora Chinchipe.

The records of *L. hexagonus* from Pichincha (specimen *SV 24429*) and *L. gibbosus* from Napo (specimen *SV 24296*) by Schäfer-Verwimp *et al.* (2006) are both referring to *L. jackii* (Vanderpoorten & Long 2006). Therefore, the occurrence of *L. hexagonus* in Pichincha has to be confirmed.

Leptoscyphus jackii (Steph.) Grolle

Pichincha: Road Quito—Baeza, west of the top of Papallacta pass, remnants of *Polylepis* stands, on dripping rock, 3995 m, 0°20.3' S, 78°12.6' W, 6 Mar 2012, *ASV & MN 32769*.

Only known from Colombia and Ecuador (Carchi, Pichincha); see also note under *Leptoscyphus hexagonus*; the specimen *SV 24296* (Schäfer-Verwimp *et al.* 2006, as *L. gibbosus*) represents a new record of *L. jackii* for Napo; confirmed for Pichincha.

Leptoscyphus trapezoides (Mont.) L.Söderstr. [= *Lophocolea trapezoides* Mont.]

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chochochas east of El Cajas National Park, 3700 m, 2°46.5' S, 79°09.9' W, on rock, 13 Mar 2012, *ASV & MN 32859*. **Pichincha:** Road

Quito—Baeza, páramo vegetation west of the top of Papallacta pass, remnants of *Polylepis* stands, on steep slope over wet humus, 00°20.3' S, 78°12.6' W, 4010 m, 05 Feb 2011, *MN & ASV 111758*.

Widespread neotropical species, from Ecuador previously reported from Cañar, Chimborazo, Galápagos, Tungurahua and Zamora Chinchipe, also from Morona Santiago (Drehwald 2003); new to Azuay and Pichincha.

Nomenclature of Lophocoleaceae follows Söderström *et al.* (2013, 2013a).

Lindigianthus cipaconeus (Gottsche) Kruijt & Gradst.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous and epiphytic, 3100–3150 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31868/B, 31880*; -, on ground of páramo vegetation near the Mirador, 3100 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33156*.

Scattered neotropical species (Costa Rica to Peru), from Ecuador previously reported from Pichincha, Tungurahua and Zamora Chinchipe; new to Loja.

Lobatiriccardia oberwinkleri Nebel, Preussing, Schäf.-Verw. & D.Quandt

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on dripping cliff, 2880 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31840*, det. ASV & MN.

A recently described species from Ecuador, hitherto known only from the type collections in Zamora Chinchipe, 1850 m (Preußing *et al.* 2010), and newly reported also from Brazil (Schäfer-Verwimp & Nebel 2011); new to Loja, a considerable extension of its altitudinal range.

Lobatiriccardia verdoornioides Nebel, Preussing, Schäf.-Verw. & D.Quandt

Pichincha: Road Quito—Baeza, west of the top of Papallacta pass, remnants of *Polylepis* stands, on very wet ground, 3995 m, 0°20.3' S, 78°12.6' W, 5 Feb 2011, *ASV & MN 32155*; -, same locality, on dripping cliff, 6 Mar 2012, *ASV & MN 32768*.

Two further specimens of this recently described species (Preußing *et al.* 2010) known to date only from Azuay and Pichincha where it seems to be locally frequent near the top of Pifo—Papallacta road.

Lophocolea bidentata (L.) Dumort.

Pichincha: Rucu Pichincha, páramo vegetation at base of summit region, on earth cut along trail, 4430 m, 0°09' S, 78°34' W, 6 Feb 2011, *ASV & MN 32203* (PRC), dupl. det. J. Váña.

A subcosmopolitan species, reported from Cañar, Chimborazo, Cotopaxi, Morona Santiago, Pichincha, Tungurahua and Zamora Chinchipe, 600–4000 m; our collection seems to represent a new altitudinal record even for its total range.

Lophocolea fragmentissima R.M.Schust. [= *Campanocolea fragmentissima* (R.M.Schust.) R.M.Schust.]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on small stem exposed to sunlight, 3080 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31866/A*. **Pichincha:** Road Quito—Baeza, páramo vegetation west of the top of Papallacta pass, remnants of *Polylepis* stands, epiphytic on shrub, 0°20.3' S, 78°12.6' W, 3995 m, 5 Feb 2011, *ASV & MN 32159*.

A scattered north Andean and Caribbean species, at high altitudes above 2200 m; from Ecuador previously known only from Carchi and Napo, 3500–4120 m; new to Loja and Pichincha, extending the known distribution to southern Ecuador, where it was collected at considerably lower altitude.

Lophocolea liebmanniana Gottsche

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, on bark of tree, a single plant between a mixture of *Prionolejeunea scaberula* and other bryophytes, 9 Mar 2012, *ASV & MN 32835* p.p.

A widespread neotropical species, only recently reported from Ecuador, Zamora Chinchipe (Parolly *et al.* 2004); new to Orellana and second record for Ecuador.

Lophocolea muricata (Lehm.) Nees

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphyllous on frond of epiphytic fern, 4°6.6' S, 79°10.7' W, 2900 m, 22 Jan 2011, *ASV & MN 31785/B*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, submontane rain forest on Sendero Los Higueros, epiphytic on tree fern (*Cyathea*), 1000 m, 4°06' S, 78°58' W, 25 Mar 2012, *ASV & MN 33181*.

Widespread in temperate regions of the southern hemisphere and in tropical mountains, in America known from southeastern United States to Tierra del Fuego in southern Chile; from Ecuador previously reported from Azuay and Zamora Chinchipe, 1800–3400 m, and from Morona Santiago, 1400–1600 m (Drehwald 2003); new to Loja, a considerable extension of its altitudinal range.

Lopholejeunea nigricans (Lindenb.) Schiffn.

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic on *Croton*, c. per., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31706/A*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, on bark of tree, c. per., 8 Mar 2012, *ASV & MN 32813/A*.

Pantropical, from Ecuador previously reported from Galápagos, Morona Santiago, Pastaza and Pichincha; new to Napo and Orellana.

Lopholejeunea subfusca (Nees) Schiffn.

Azuay: Pacific coast south of Guayaquil, Camacho, on bark of *Theobroma cacao* in cacao plantation between Naranjal and Machala, c. per., 100 m, 2°48.6' S, 79°38.9' W, 15 Mar 2012, *ASV & MN 32920/A*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, c. per., sparse, mixed with *Lejeunea reflexistipula*, *L. aphanes* and *Ceratolejeunea cornuta*, 27 Mar 2012, *ASV & MN 33197/A*; -, Santiago de Mendez, park area in city centre, epiphytic on bark of tree, 495 m, 2°42.9' S, 78°19.4' W, 28 Mar 2012, *ASV & MN 33255*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, on bark of tree, c. per., 8 Mar 2012, *ASV & MN 32815/B*.

A common pantropical species, from Ecuador previously reported from Esmeraldas, Morona Santiago, Napo and Zamora Chinchipe; new to Azuay and Orellana.

Macrocolura sagittistipula (Spruce) R.M.Schust. [= *Colura sagittistipula* (Spruce) Steph.]

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on bark of tree, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31750*.

A scattered neotropical species, only once reported from Ecuador, Zamora Chinchipe, 1000 m (Lüth & Schäfer-Verwimp 2004); new to Napo and second record for Ecuador.

In a recent molecular study *Macrocolura* was placed sister to a well supported *Colura* clade. Based on morphology and molecular topologies it was tentatively accepted as a genus (Heinrichs *et al.* 2012).

Marchesinia bongardiana (Lehm. & Lindenb.) Trevis.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, at base of old tree in hotel garden, with caducous leaves, 100 m, 2°48.6' S, 79°38.9' W, 14 Mar 2012, *ASV & MN 32894*; -, same locality, on bark of *Theobroma cacao* in cacao plantation, 15 Mar 2012, *ASV & MN 32916*.

A widespread tropical American species, reported from Galápagos (Gradstein 2009), further records may be included under *M. brachiata* (Sw.) Schiffn. by León-Yáñez *et al.* (2006); new to Azuay.

Heinrichs *et al.* 2009 found evidence for the existence of two further species in the *Marchesinia-brachiata*-complex, *M. bongardiana* and *M. languida* (Nees & Mont.) Steph. which were previously

considered to be synonyms of *M. brachiata* (Gradstein & Geissler in Gradstein 1994). An overview of the genus *Marchesinia* including a key has been provided by Gradstein (2012).

Marsupella miniata (Lindenb. & Gottsche) Grolle

Pichincha: Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on exposed rock, 5 Mar 2012, *ASV & MN 32737* (PRC), conf. J. Váña.

A widespread neotropical species (Mexico to Argentina), single record from Ecuador, Cotopaxi, 3600 m, by Váña (2003).

Metzgeria agnewiae Kuwah.

Azuay: Road Cuenca—Guayaquil, epiphytic at El Cajas pass height, 4150 m, 2°46.4' S, 79°14.1' W, 13 Mar 2012, *ASV & MN 32875/A*. **Pichincha:** Rucu Pichincha, páramo vegetation on rocky slopes near summit region, 4430 m, 0°09' S, 78°34' W, on branchlets of shrub, 6 Feb 2011, *ASV & MN 32207*.

This Afro-American species was previously known from Carchi, Napo, Pichincha and Zamora Chinchipe, 1900–4000 m (Costa 2008); first record for Azuay. Both cited specimens represent new altitudinal records for its total range.

Metzgeria albinea Spruce var. **albinea*

El Oro: Piñas, epiphytic at edge of secondary forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32926/E, 32930*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, lower montane rain forest along T 2 (plot U 1), epiphytic, 2002 m, 26 Jan 2011, *ASV & MN 31979/A*; -, 2020 m (plot M 6), epiphytic, *ASV & MN 32127*.

A common Latin American species, known from Mexico to Brazil and Chile (Costa 2008); the var. *albinea* is new to Ecuador. Gradstein *et al.* (2007) reported *Metzgeria albinea* from Zamora Chinchipe, however, without indicating the variety level.

Metzgeria ciliata Raddi [= *Metzgeria decipiens* (C.Massal.) Schiffn.]

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), on rotting log, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31815*. **Napo:** Tena, Parque Amazónica La Isla, primary rain forest, epiphytic at base of old tree, 500 m, 0°58.5' S, 77°48.4' W, 19 Jan 2011, *ASV & MN 31701*.

A common pantropical species, from Ecuador known from Galápagos, Los Ríos and Zamora Chinchipe (Costa 2008); new to Loja and Napo.

Metzgeria claviflora Spruce

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, lower montane rain forest along Q 5 (plot M 6), epiphytic, 2020 m, 31 Jan 2011, *ASV & MN 32113*.

Widespread neotropical species (Nicaragua to Bolivia and West Indies to Surinam and French Guiana), from Ecuador previously known only from old collections from Cañar and Chimborazo; new to Zamora Chinchipe.

Metzgeria cylindra Kuwah.

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chocheras, 3700 m, 2°46.5' S, 79°09.9' W, on branch of shrub, 13 Mar 2012, *ASV & MN 32862/A*. **Loja:** PN Podocarpus above Cajanuma, páramo vegetation on Sendero a las Lagunas del Compadre, epiphytic on shrub, growing on and between *Syzygiella setulosa*, 3270 m, 4°07.2' S, 79°09.7' W, 23 Jan 2011, *ASV & MN 31889/B*. **Pichincha:** Road Quito—Baeza, west of the top of Papallacta pass, páramo vegetation and remnants of *Polylepis* stands, epiphytic on *Gynoxis*, 3995 m, 0°20.3' S, 78°12.6' W, 5 Feb 2011, *ASV & MN 32176/A, 32177*.

A rather rare high-Andean species known from Costa Rica, Colombia, Peru and Bolivia at altitudes from 2900–3700 m (Costa 2008). Single record from Ecuador by Benitez & Gradstein (2011) from Loja; new to Azuay and Pichincha, and second specimen from Loja; the specimens from Pichincha represent a new altitudinal record.

Metzgeria filicina Mitt.

Loja: PN Podocarpus above Cajanuma, upper montane forest (cloud forest) on Sendero a las Lagunas del Compadre, on small branches of trees and epiphyllous, partly c. per. and c. spor., 3120 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31874, 31875/A*. **Pichincha:** Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, epiphytic, 5 Mar 2012, *ASV & MN 32730*.

This Andean species is known from Venezuela to Bolivia. From Ecuador previously reported from Azuay, Pichincha and Tungurahua, 2000–3300 m; new to Loja, the specimen from Pichincha extending its altitudinal range.

Metzgeria furcata (L.) Corda

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.4' W, lower montane rain forest along Camino Vado, on thin tree stem, 1820 m, 28 Jan 2011, *ASV & MN 32044*, identified by molecular markers (*trnL-F*).

Probably subcosmopolitan, from Ecuador known from a single specimen (Costa 2008, without indicating locality).

Based on molecular evidence, Fuselier *et al.* (2009) point out that Southern Hemispheric "*Metzgeria furcata*" often belong to *Metzgeria* lineages other than to *M. furcata* s.str. However, chloroplast DNA sequences of the specimen *ASV & MN 32044* indicate that it belongs to *Metzgeria furcata* s.str. (Nebel *et al.*, unpublished data).

Metzgeria lechleri Steph.

Loja: PN Podocarpus above Cajanuma, páramo vegetation around Mirador, 4°06' S, 79°10' W, 3060 m, on branch of shrub, 15 Apr 2003, *ASV & M. Preußing 23298*.

Widely distributed in the Neotropics, Réunion Island and Sri Lanka; from Ecuador known only from two specimens from Chimborazo and Zamora Chinchipe (Costa 2008); new to Loja.

Metzgeria leptoneura Spruce

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on slope along trail, 3020 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31860*; -, upper montane rain forest along Sendero Mirador (plot L 4), epiphytic, 2900 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33125*. **Napo:** Road Quito—Baeza, east of the top of Papallacta pass, remnants of *Polylepis pauta* Hieron. stands, on the floor, 3875 m, 0°21.4' S, 78°12.2' W, 6 Mar 2012, *ASV & MN 32775*.

A widespread and common pantropical to subcosmopolitan species, in Ecuador reported from Azuay, Bolívar/Chimborazo, Carchi, Chimborazo, Imbabura, Los Ríos, Morona Santiago, Napo, Pastaza, Pichincha, Sucumbíos, Tungurahua and Zamora Chinchipe, 1100–3500 m (Costa 2008, Drehwald 2003, León-Yáñez *et al.* 2006); new to Loja, the specimen from Napo representing a new altitudinal record for its local range.

Metzgeria polytricha Spruce

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on small branch of tree, 3120 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31877*.

A tropical American species reported from Costa Rica, Panama, Colombia, French Guiana, Peru, Bolivia, and in Ecuador known from Carchi, Imbabura, Morona Santiago, Napo, Pastaza, Pichincha and Zamora Chinchipe (Costa 2008); new to Loja.

Metzgeria scyphigera A.Evans

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphyllous, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31800/D*; -, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous on bromeliad leaves, 3120 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31875*; -, epiphyllous in understory of upper montane rain forest along Sendero Mirador (plot L 4), 2900 m, 24 Mar 2012, *ASV & MN 33130/A*. **Pichincha:** Quito, Botanical Garden, 2800 m, 0°11.2' S, 78°29.2' W, on bark of tree, 3 Mar 2012, *ASV & MN 32701*; -, northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, epiphyllous, 5 Mar 2012, *ASV & MN 32717/A, 31750/C*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, lower montane rain forest along T 2 (plot U 1), epiphyllous, 2002 m, 26 Jan 2011, *ASV & MN 31976*; -, upper montane rain forest along T 1, epiphytic on shrub, 2520 m, 3°59.5' S, 79°04.4' W, 27 Jan 2011, *ASV & MN 32004*; -, on bark of ornamental shrub and epiphyllous on *Citrus* at the station, 1830 m, 19 Mar 2012, *ASV & MN 32976, 32982/A*.

Widespread in Latin America from Mexico to southern Chile, in Ecuador known from Napo and Pichincha, 4200–4700 m; new to Loja and Zamora Chinchipe, a considerable extension of its altitudinal range within Ecuador.

Microlejeunea acutifolia Steph.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, epiphyllous, 14 Mar 2012, *ASV & MN 32892/B*. **El Oro:** Piñas, road to the Pacific coast, 980 m, 3°39.5' S, 79°45.1' W, epiphyllous at humid slope along trail, 17 Mar 2012, *ASV & MN 32961/C*. **Esmeraldas:** Road Ibarra—San Lorenzo, humid secondary vegetation along Río Lita near Lita, epiphytic on liana, sparse between *Cheilolejeunea rigidula* and *Symbiezidium transversale*, 500 m, 20 Aug 2004, *ASV* with *J. Heinrichs, R. A. Wilson & S. O. Yandún 24415/A*. **Loja:** PN Podocarpus above Cajanuma, Sendero El Mirador, on branch of shrub in páramo vegetation near the Mirador, 3050 m, 4°06' S, 79°10' W, 15 Apr 2003, *ASV & M. Preußing 23292/C*, det. A. L. Ilkiu-Borges. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on dead tree stem, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31709/A*.

This widespread but uncommon (possibly overlooked) neotropical species is known from Ecuador only by a single collection from Pichincha, 2350 m (Schäfer-Verwimp *et al.* 2006); new to Azuay, El Oro, Esmeraldas, Loja and Napo, a considerable extension of its altitudinal range.

Microlejeunea bullata (Taylor) Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along road near park administration, on bark of tree, 4°07' S, 79°10' W, 2770 m, 24 Mar 2012, *ASV & MN 33166/C*.

Widespread tropical American species, from Ecuador previously reported from Azuay, Chimborazo, Esmeraldas, Galápagos, Morona Santiago, Tungurahua and Zamora Chinchipe; new to Loja.

****Microlejeunea capillaris*** (Gottsche) Steph.

El Oro: Piñas, epiphyllous at edge of secondary forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32934/F*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphyllous on epiphytic fern frond, 2900 m, 4°6.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31785/D*; -, upper montane rain forest at parking area, epiphytic, 2830 m, 4°07' S, 79°10' W, 22 Jan 2011, *ASV & MN 31753/A*; -, on Sendero a las Lagunas del Compadre, epiphyllous, 2850–3100 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31834/C, 31868/C*.

A widespread but scattered neotropical species, probably the first record for Ecuador.

This species has crenate keels, an emarginate leaf apex, relatively large underleaves composed of more than 20 cells and an outer leaf margin (between apex and keel) upcurved to incurved, sharing these features with *M. colombiana* Bischl.; however, it may be distinguished from the latter by the thicker stems (50–55 µm in *M. capillaris*, 25–35 µm in *M. colombiana*), the larger plants (up to 375 µm wide in *M. capillaris* (in

specimen from El Oro), 180–260(–280) μm wide in *M. colombiana*) and the less involute to almost plane upper margin of the lobule in *M. capillaris* (see also key in Bischler *et al.* 1963).

Microlejeunea epiphylla Bischl.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, sparse, with *Cololejeunea winkleri*, 27 Mar 2012, *ASV & MN 33244/B* p.p.; -, cultivation area along road near El Rosario, on bark of solitary tree, mixed with a few plants of *Lejeunea laetevirens* and *Cheilolejeunea trifaria*, 900 m, 2°53.7' S, 78°23.6' W, 28 Mar 2012, *ASV & MN 33246* p.p.

A widespread tropical American species, first and single record for Ecuador by Parolly *et al.* (2004), from Zamora Chinchipe, 1790–1880 m; new to Morona Santiago, an extension of its local altitudinal range.

Microlejeunea globosa (Spruce) Steph. [= *Lejeunea cardotii* Steph.]

Pichincha: Road Quito—Imbabura, Parque Jerusalem, dry forest with dominant *Acacia macracantha*, epiphytic, c. per. and c. andr. (dioicous), 2300 m, 4 Mar 2012, *ASV & MN 32711/B*, det. M. E. Reiner-Drehwald.

A widespread but scattered tropical American species (Florida, Mexico, Argentina, Paraguay and Brazil), from Ecuador recently reported from the same locality (León-Yáñez *et al.* 2006, as *Lejeunea cardotii*, Werner & Gradstein 2009, as *Lejeunea cardotii* and *Microlejeunea globosa*).

The plants are somewhat deviating from those of northern Argentina described by Reiner-Drehwald (1994) in having larger underleaves often consisting of 60–70 cells, with lobes being 5–6 cells wide at base. The numerous ocelli, in some leaves up to 5 or 6 in one row, are very conspicuous.

Microlejeunea stricta (Gottsche, Lindenb. & Nees) Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31812/B*; -, upper montane rain forest on Sendero a las Lagunas del Compadre, epiphyllous, 3100 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31868/D*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous on *Achomanes*, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31728/D*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, lower montane rain forest along Q 5 (plot M 6), epiphytic on root of tree, 2020 m, 31 Jan 2011, *ASV & MN 32120/D*.

Widespread tropical American species, from Ecuador previously known only from a single record from Zamora Chinchipe, 1900 m; new to Loja and Napo, a considerable extension of its altitudinal range from 450–3100 m.

****Micropterygium lechleri*** Reimers

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro S of Zamora, 4°06' S, 78°58' W, 1000 m, submontane rain forest, on shady overhanging rock on river side, 19 Apr 2003, *ASV & M. Preußing 23414*.

A rather rare species hitherto known from Colombia, Peru and Brazil.

Micropterygium trachyphyllum Reimers

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, submontane rain forest on Sendero Mirador (plot U 1), on humus, 1450 m, 4°06–07' S, 78°58–59' W, 21 Mar 2012, *ASV & MN 33040*.

A widespread neotropical species, in Ecuador rather scattered and known only from some recent collections from Zamora Chinchipe (Churchill *et al.* 2009, Benitez & Gradstein 2011, Parolly *et al.* 2004).

****Mnioloma cellulosum*** (Spreng.) R.M.Schust.

Zamora Chinchipe: Amazonian lowland rain forest remnant near Mayayku south of Paquisha, on rotting log, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32100/A*.

Hitherto known from the West Indies and Brazil.

Mnioloma crenulatum (Bischn.) R.M.Schust.

Zamora Chinchipe: Amazonian lowland rain forest remnant near Mayayku south of Paquisha, on rotting log, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32101/A*. -, road Loja—Zamora, upper montane rain forest east of El Tiro (plot C 3), on humus over rotten log, 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32088*.

A rather scattered neotropical species (West Indies, Colombia to Peru, SE Brazil), previously reported from old collections from Tungurahua (without altitudinal range) and recently from Morona Santiago, 1400–1600 m (Drehwald 2003) and Zamora Chinchipe (Churchill *et al.* 2009).

Mnioloma cyclostipum (Spruce) R.M.Schust.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on soil, 2870 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31837*.

A montane species of northern South America, from Ecuador previously reported from Tungurahua and Zamora Chinchipe, 1800–2650 m; new to Loja.

Nardia succulenta (A.Rich. ex Lehm. & Lindenb.) Spruce

Morona Santiago: Santiago de Mendez, on dripping, mineral rich slope along road to Cuenca, 950 m, 2°42.5' S, 78°22.7' W, 28 Mar 2012, *ASV & MN 33257, 33258*; -, between Gualaceo and General L. Plaza, eastern slope of eastern Cordillera, on wet rock slope along the road, 2730 m, 30 Jul 1991, *T. Arts 30/143*, det. R. Grolle (dupl. Herb. ASV).

Widespread but scattered neotropical species, from Ecuador previously known from Azuay, Carchi, Pichincha and Tungurahua, 1500–4000 m; new to Morona Santiago.

Nesioscyphus carneus (Nees) Grolle

Morona Santiago: Santiago de Mendez, on humid, mineral rich slope along road to Cuenca, 950 m, 2°42.5' S, 78°22.7' W, 28 Mar 2012, *ASV & MN 33261*.

A rather rare species mainly distributed in southeastern Brazil, from Ecuador known only from an old collection from Pichincha, 2000 m; new to Morona Santiago and second record for Ecuador.

Odontolejeunea decemdentata (Spruce) Steph.

El Oro: Piñas, epiphyllous in secondary forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32934/B* (c. per.), *32952/A*; -, epiphyllous on humid slope, with *Lejeunea adpressa*, 970 m, 3°39.5' S, 79°45.1' W, 17 Mar 2012, *ASV & MN 32959/A*. **Tungurahua:** Río Topo between Baños and Puyo, secondary submontane rain forest, on shrub, 1540 m, 1°21' S, 78°12' W, 12 Aug 2004, *ASV* with *J. Heinrichs, R. A. Wilson & S. O. Yandún 24243*.

A widespread but scattered neotropical species, from Ecuador reported from Azuay, Chimborazo, Los Ríos, Morona Santiago, Napo, Pastaza, Pichincha and Zamora Chinchipe; new to El Oro and Tungurahua.

Odontolejeunea lunulata (F.Weber) Schiffn.

El Oro: Piñas, epiphyllous in secondary forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32934/D*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphyllous, 27 Mar 2012, *ASV & MN 33202/B, 33237/A*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, epiphyllous, 8 Mar 2012, *ASV & MN 32804/C*.

This common Afro-American species was previously known from Ecuador from Azuay, Chimborazo, Esmeraldas, Los Ríos, Morona Santiago, Napo, Pastaza, Pichincha, Sucumbíos, Tungurahua and Zamora Chinchipe; new to El Oro and Orellana, confirmed for Morona Santiago.

Odontoschisma variable (Lindenb. & Gottsche) Trevis.

Loja: PN Podocarpus above Cajanuma, páramo vegetation along Sendero del Mirador, on floor between shrubs, 3035 m, 4°06.7' S, 79°10.6' W, 22 Jan 2011, *ASV & MN 31776* (PC), det. S. R. Gradstein; -, upper montane rain forest northwest of Mirador, on humus, 2920 m, 4°06.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31780* (PC), conf. S. R. Gradstein.

A tropical American species, previously known from Ecuador from Galápagos and Zamora Chinchipe, 450–1900 m, as *Odontoschisma falcifolium* Steph. (Gradstein pers. comm.); new to Loja.

Omphalanthus filiformis (Sw.) Nees

El Oro: Piñas, on pile of pasture along road to the Pacific coast, c. per., 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32944/A*.

A common neotropical species, from Ecuador known from Galápagos, Loja, Los Ríos, Morona Santiago, Napo, Pastaza and Zamora Chinchipe; new to El Oro.

Omphalanthus ovalis (Lindenb. & Gottsche) Gradst.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, on branches of ornamental shrub in hotel garden, 14 Mar 2012, *ASV & MN 32883*.

El Oro: Piñas, road to the Pacific coast, 1000 m, 3°39.5' S, 79°45.1' W, hanging from branches of solitary tree in pasture, c. per., 17 Mar 2012, *ASV & MN 32967*; -, 960 m, 3°39.3' S, 79°44.3' W, on pile of pasture, *ASV & MN 32941*; -, epiphytic at edge of secondary forest, mixed with *Ceratolejeunea filaria*, *ASV & MN 32927/A*.

A neotropical species, from Ecuador previously known from Chimborazo, Galápagos, Los Ríos, Pichincha and Tungurahua, and recently reported from Loja (Benitez & Gradstein 2011); new to Azuay and El Oro where it seems to be locally rather common.

****Omphalanthus platycoleus*** Herzog

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59' S, 79°04' W, lower montane rain forest along Camino Zigzag, epiphytic, c. per., 1820 m, 28 Jan 2011, *ASV & MN 32051/A*.

A rather scattered (north) Andean species, known from Costa Rica, Colombia and Bolivia.

Pallavicinia lyellii (Hook.) Carruth.

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic on bark of a large tree 1,5 m above forest floor, 01°05' S, 77°37' W, 450 m, 20 Jan 2011, *MN & ASV 111535*.

Subcosmopolitan, from Ecuador previously known from Pastaza, Sucumbíos and Zamora-Chinchipe, 600–2800 m; new to Napo.

Paracromastigum bifidum (Steph.) R.M.Schust.

Azuay: Eastern Cordillera, Gualaquiza above Sigsig, 2950 m, 3°06.4' S, 78°47.7' W, remnants of shrub páramo, on road cut, 29 Mar 2012, *ASV & MN 33276*. **Loja:** PN Podocarpus above Cajanuma, páramo vegetation along Sendero El Mirador, on rock cliff, 3050 m, 4°06' S, 79°10' W, 15 Apr 2003, *ASV & M. Preußing 23291*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro S of Zamora, 4°06.9' S, 78°58.1' W, 1035 m, shady soil (road cut) in submontane rain forest along Sendero Los Higuerones, 25 Jan 2011, *ASV & MN 31932*; -, along Sendero del Mirador, 1100 m, 21 Mar 2012, *ASV & MN 33026*.

This Caribbean-Andean species is known from Ecuador only from Zamora Chinchipe, 1850–1900 m, listed under *Paracromastigum pachyrhizum* (Nees) Fulford by León-Yáñez *et al.* (2006). New to Azuay and Loja, a considerable extension of its altitudinal range.

****Paracromastigum granatense*** (Gottsche) R.M.Schust.

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro S of Zamora, 4°06' S, 78°58' W, 1000 m, shady soil (road cut) in submontane rain forest, 19 Apr 2003, *ASV & M. Preußing 23395* (PRC), det. J. Váña.

A rather scattered neotropical species, reported from Colombia and Costa Rica (Fulford 1966, as *Bonneria*).

Plagiochila aerea Taylor

El Oro: Piñas, road to the Pacific coast, 970 m, 3°39.5' S, 79°45.1' W, on humid slope, 17 Mar 2012, *ASV* & *MN* 32953/A.

A widespread neotropical species, from Ecuador previously reported from Chimborazo, Esmeraldas, Galápagos, Los Ríos, Napo, Pastaza, Pichincha, Sucumbíos, Tungurahua and Zamora Chinchipe, and recently from Loja (Benitez & Gradstein 2011) and Morona Santiago (Drehwald 2003); new to El Oro.

Plagiochila deflexirama Taylor

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV* & *MN* 31794, 31801.

A tropical American species, previously known from Ecuador from Pichincha and Zamora Chinchipe, 1800–2150 m; new to Loja.

Plagiochila disticha (Lehm. & Lindenb.) Lindenb.

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, on bark of tree, 8 Mar 2012, *ASV* & *MN* 32810.

A common tropical South American species in lowland and lower montane rain forests, from Ecuador previously reported from Esmeraldas, Morona Santiago, Napo, Pastaza and Zamora Chinchipe; new to Orellana. This species, together with *P. montagnei* and *P. raddiana*, has been fully described and illustrated by Heinrichs & Gradstein (2000).

Plagiochila fuscolutea Taylor

Loja: PN Podocarpus above Cajanuma, páramo vegetation near the Mirador, on the floor, 4°6.7' S, 79°10.6' W, 3035 m, 22 Jan 2011, *ASV* & *MN* 31775.

Widespread neotropical species (Costa Rica to Bolivia), from Ecuador previously known from Azuay, Carchi, Cotopaxi, Pichincha, Tungurahua and Zamora Chinchipe, and recently reported from Loja; second record for Loja.

****Plagiochila gymnocalycina*** (Lehm. & Lindenb.) Lindenb.

Azuay: Road Cuenca—Guayaquil between El Cajas and the coast, lower montane rain forest, on broken branch, c. per., 745 m, 2°38.2' S, 79°26.9' W, 14 Mar 2012, *ASV* & *MN* 32880.

A tropical American species, seemingly new to Ecuador.

The "naked" perianths placed at some distance from the leaves and not enveloped by bracts characterize this species. *Plagiochila simplex* (Sw.) Lindenb. is very similar to *P. gymnocalycina*, but in the latter the leaves are conspicuously more elongate and our specimen fits well the figures of *P. gymnocalycina* by Heinrichs *et al.* (1998). As pointed out by the latter authors, further study is necessary to determine the taxonomic status of *P. simplex* and its allies. Of *P. simplex*, there is only a 19th century record by Spruce (1884–1885) from Pastaza.

Plagiochila montagnei Nees

Azuay: Pacific coast south of Guayaquil, Camacho, cacao plantation between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, on bark of *Theobroma cacao*, 15 Mar 2012, *ASV* & *MN* 32918. **El Oro:** Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, on solitary tree in pasture, 17 Mar 2012, *ASV* & *MN* 32925/B. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, epiphyllous, 8 Mar 2012, *ASV* & *MN* 32802/B.

This widespread tropical American species was previously known from Guayas, Los Ríos, Morona Santiago, Napo, Pastaza, Sucumbíos and Zamora Chinchipe, 150–2400 m; new to Azuay, El Oro and Orellana.

Plagiochila pachyloma Taylor

Loja: PN Podocarpus above Cajanuma, Sendero del Mirador, upper montane rain forest (plot L 4), 2900 m, 4°7' S, 79°10' W, epiphytic, 24 Mar 2012, *ASV & MN 33128*.

A scattered neotropical species (Costa Rica to Ecuador), known from Azuay, Carchi, Imbabura, Napo, Pastaza, Pichincha, Sucumbíos, Tungurahua and Zamora Chinchipe; new to Loja.

Plagiochila raddiana Lindenb.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, on bark of *Theobroma cacao* at edge of hotel garden, 14 Mar 2012, *ASV & MN 32899*. **El Oro:** Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, on bark of solitary tree and on branchlets in secondary rain forest, 17 Mar 2012, *ASV & MN 32925/A, 32938/B, 32949/B*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on bark of tree, 27 Mar 2012, *ASV & MN 33205*.

A common neotropical species, from Ecuador previously reported from Galápagos, Morona Santiago, Pastaza, Sucumbíos and Zamora Chinchipe beside a recent record from El Oro (Benitez & Gradstein 2011); new to Azuay and second record for El Oro and Morona Santiago.

Plagiochila superba (Nees ex Spreng.) Mont. & Nees var. *superba*

El Oro: Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, on branchlets in secondary rain forest, 17 Mar 2012, *ASV & MN 32948/C*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphytic, c. per. and andr., 2880 m, 4°6.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31786*; -, between park administration and Mirador (plot L 4), epiphytic, 2900 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33129/A*.

Widespread neotropical species (Mexico to Bolivia and Brazil, West Indies and the Guianas), from Ecuador previously known from Chimborazo, Cotopaxi, Los Ríos, Morona Santiago, Napo, Pastaza, Pichincha, Tungurahua and Zamora Chinchipe; new to El Oro and Loja.

Pleurozia paradoxa (J.B.Jack) Schiffn.

Loja: PN Podocarpus above Cajanuma, páramo vegetation around Mirador, on the floor between shrubs, 4°06' S, 79°10' W, 3050 m, 15 Apr 2003, *ASV & M. Preußing 23289*.

Known only from South America, scattered in the northern Andes and in coastal areas of southern Chile (Thiers 1993), from Ecuador previously reported from Napo, Pastaza and Zamora Chinchipe; new to Loja.

Porella crispata (Hook.) Trevis.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic, very sparse, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31811/B*.

A widespread neotropical species, from Ecuador cited from Azuay, Cañar, Chimborazo, Pichincha, Tungurahua and Zamora Chinchipe, 1800–2150 m; new to Loja.

Prionolejeunea aemula (Gottsche) A.Evans

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, c. per. and andr. (autoicous), 27 Mar 2012, *ASV & MN 33203*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, on shady rock at brook near the buildings, c. per., 1800 m, 24 Jan 2011, *ASV & MN 31895/B*.

Widespread neotropical species, known from the West Indies, Central and Northern South America including Galápagos Islands, also known from mainland Ecuador (Chimborazo, El Oro, Pichincha and Zamora Chinchipe (Ilkiu-Borges 2006); new to Morona Santiago.

**Prionolejeunea ampliretis* Herzog

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–230 m, epiphytic, 8 Mar 2012, *ASV & MN 32789, 32808* (both c. per. and andr., autoicous).

A scattered neotropical species of lowland and submontane forests, 200–1300 m, reported from Panama, West Indies (Jamaica, Guadeloupe and Dominica), Colombia, Guyana and French Guiana (Ilkiu-Borges 2006).

Prionolejeunea decora (Taylor) Steph.

El Oro: Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, on branchlets in secondary rain forest, with caducous leaves, 17 Mar 2012, *ASV & MN 32948/A*; -, 970–980 m, 3°39.5' S, 79°45.1' W, on rotting wood and branchlets on humid slope, *ASV & MN 32956, 32963/D* (with caducous leaves and marginal rhizoids). **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, 27 Mar 2012, *ASV & MN 33215/B*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, epiphyllous, with numerous caducous leaves, 8 Mar 2012, *ASV & MN 32785*.

A Caribbean-northern-Andean species, only recently reported from Pichincha and Morona Santiago (Ilkiu-Borges 2006, Schäfer-Verwimp *et al.* 2006). New to El Oro and Orellana, and second locality for Morona Santiago.

Prionolejeunea denticulata (F. Weber) Schiffn.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on rotting log, 27 Mar 2012, *ASV & MN 33231/B*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic, c. per., and epiphyllous on *Achomanes*, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31742/A, 31728/E*.

Widespread neotropical species, from Ecuador known from Chimborazo and Esmeraldas (Ilkiu-Borges 2006); new to Morona Santiago and Napo.

Prionolejeunea scaberula (Spruce) Steph.

El Oro: Piñas, road to the Pacific coast, 970 m, 3°39.5' S, 79°45.1' W, on rotting wood on humid slope, 17 Mar 2012, *ASV & MN 32958/A*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic on thin stem, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31725/A*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, on bark of tree, 9 Mar 2012, *ASV & MN 32835*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, submontane rain forest on Sendero Mirador (plot U 1), epiphytic, with numerous caducous leaves and marginal gemmae, 1450 m, 4°06–07' S, 78°58–59' W, 21 Mar 2012, *ASV & MN 33036/A*.

A scattered neotropical species, known from the West Indies, Colombia, French Guiana, Brazil and Ecuador, from where it was known from a single collection from Zamora Chinchipe, 1000 m (Ilkiu-Borges 2006); new to El Oro, Napo and Orellana, second specimen from Zamora Chinchipe.

Prionolejeunea schlimiana (Gottsche) Steph.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, on stem of *Cyathea poeppigii*, 27 Mar 2012, *ASV & MN 33210*.

This Central and northern South American species was previously known from Ecuador from Bolívar, Chimborazo, Esmeraldas, Los Ríos and Pichincha, 30–750 m (Ilkiu-Borges 2006, León-Yáñez *et al.* 2006); Drehwald (2003) reported it from Morona Santiago, 1400–1600 m; second record for Morona Santiago.

Pseudomarsupidium decipiens (Hook.) Grolle [= *Adelanthus decipiens* (Hook.) Mitt.]

Loja: PN Podocarpus above Cajanuma, upper montane forest on Sendero a las Lagunas del Compadre, on small stem exposed to sunlight, 3080 m, 4°7.1' S, 79°9.9' W, 23 Jan 2011, *ASV & MN 31867/D*; -, upper montane rain forest along Sendero Mirador, on bark of tree, 2940 m, 15 Apr 2003, *ASV & M. Preußing 23275*; -, on stem of tree fern, sparse, 2920 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33143/C*.

Widespread but scattered in Atlantic Europe, Africa, Mascarenes, Atlantic Islands and the Neotropics from Mexico to Bolivia and Brazil including the West Indies, from Ecuador previously reported from Carchi, Galápagos, Pastaza, Tungurahua and Zamora Chinchipe; new to Loja.

Recent phylogenetic studies of Adelanthaceae (Feldberg *et al.* 2010) supported *Pseudomarsupidium* as an independent genus.

**Pycnolejeunea contigua* (Nees) Grolle

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58.5' S, 79°04.5' W, epiphytic in lower montane forest (plot U 1), 2002 m, 26 Jan 2011, *ASV & MN 31969/A*; -, at base of tree near the station, 1830 m, 19 Mar 2012, *ASV & MN 32987*.

A pantropical species which occurs in southeast Asia, tropical Africa and in northern South America from the West Indies to Bolivia and Brazil (He 1999).

Radula antilleana Castle

Pichincha: Tinalandia estate, about 18 km East of Sto. Domingo de los Colorados, on tree twig along the jungle trail, 830 m, 18 Jul 1991, *T. Arts 18/028*, det. K. Yamada (dupl. Herb. ASV).

Known from Costa Rica to Peru, but common only in the Caribbean region; from Ecuador hitherto known only from Zamora Chinchipe (Parolly *et al.* 2004).

Radula episcia Spruce

Pichincha: Toachi river valley, along the old road from Quito to Sto. Domingo, near the conjunction with the new road, on shadowed rock side, 1100 m, 17 Jul 1991, *T. Arts 17/0003a*, det. K. Yamada (dupl. Herb. ASV).

A mainly Andean species, known from Colombia to Bolivia, from Ecuador previously reported from Bolívar, Chimborazo, Galápagos and Pastaza; new to Pichincha.

Radula flaccida Lindenb. & Gottsche

Napo: Tena, Estación Biológica Jatunascha, primary lowland rain forest, epiphyllous, c. per., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31716/A*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–230 m, epiphyllous, 8–9 Mar 2012, *ASV & MN 32787/A, 32845/A*.

Widespread Afro-American species, first and single record from Ecuador, Esmeraldas, 500 m, by Schäfer-Verwimp *et al.* (2006); new to Napo and Orellana.

Radula javanica Gottsche

Azuay: Pacific coast south of Guayaquil, Camacho, on bark of *Theobroma cacao* in cacao plantation between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, 15 Mar 2012, *ASV & MN 32922/A*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic on *Myrica pubescens* Humb. & Bonpl. ex Willd., 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31803/B*; -, upper montane rain forest between park administration and Mirador, epiphytic, 2900 m, 22 Jan 2011, *ASV & MN 31820/C*. **Morona Santiago:** Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, c. per., 27 Mar 2012, *ASV & MN 33213*. **Napo:** Tena, Estación Biológica Jatunascha, primary lowland rain forest, on dead wood, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31709*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research

Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous and on bark of tree, 8 Mar 2012, *ASV & MN 32786, 32806/A, 32807*.

A common, polymorphic pantropical species, from Ecuador previously reported from Morona Santiago, Loja and Zamora Chinchipe, 600–2150 m (Benitez & Gradstein 2011); new to Azuay, Napo and Orellana, confirmed for Loja and Morona Santiago, a considerable extension of its altitudinal range.

Radula kegelii Gottsche ex Steph.

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, 27 Mar 2012, *ASV & MN 33199, 33208, 33234/A*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphytic, 8–9 Mar 2012, *ASV & MN 32792/A, 32817/A*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, submontane rain forest on Sendero Los Higuerones, on bark of tree and on branchlets, 1000 m, 4°06' S, 78°58' W, 21 Mar 2012, *ASV & MN 33170, 33178*.

A widespread neotropical species, from Ecuador only known from mid last century collections from Guayas, Sucumbíos and Zamora Chinchipe (Arnell 1962); new to Morona Santiago and Orellana, confirmed for Zamora Chinchipe.

Radula mammosa Spruce

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along Sendero Mirador (plot L 4), epiphyllous in understory, 2900 m, 4°07' S, 79°10' W, 24 Mar 2012, *ASV & MN 33142/A*.

Widespread but scattered in Latin America (Central America to Chile and Brazil), from Ecuador previously known only from a recent collection from Zamora Chinchipe, 1800–2150 m; new to Loja, a considerable extension of its local altitudinal range.

Radula mazarunensis K.Yamada

El Oro: Piñas, on humid slope along trail near road to the Pacific coast, c. per., 970 m, 3°39.5' S, 79°45.1' W, 17 Mar 2012, *ASV & MN 32954*. **Pichincha:** Tinalandia estate, about 18 km East of Sto. Domingo de los Colorados, on fallen tree stem along forest trail, 830 m, 9 Jul 1991, *T. Arts 19/028*, det. K. Yamada (dupl. herb. ASV).

A rather scattered neotropical species, described from Guayana and reported from Bolivia and Dominica; first record from Ecuador, Zamora Chinchipe, 1800–2150 m, by Nöske *et al.* (2003); new to El Oro and Pichincha, a considerable extension of its altitudinal range.

Radula nudicaulis Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador, epiphyllous on epiphytic fern, 2900 m, 4°6.6' S, 79°10.7' W, 22 Jan 2011, *ASV & MN 31785/A*.

Widespread in tropical America and Macaronesia, only once reported from Ecuador, Zamora Chinchipe, 1800–2150 m; new to Loja, a considerable extension of its altitudinal range.

****Radula schaefer-verwimpii*** K.Yamada

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, lower montane rain forest along Camino Canal, on shady earth slope, with caducous leaves, 1850 m, 20 Apr 2003, *ASV & M. Preußing 23443/A*; -, on bark of tree along Camino San Francisco, with caducous leaves, 1780 m, 20 Mar 2012, *ASV & MN 33017*; -, 3°59.5' S, 79°04.4' W, upper montane rain forest along T 1, on dead branch of tree, with caducous leaves, 2500 m, 27 Jan 2011, *ASV & MN 32002/B*. **Loja:** PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on thin stem exposed to sunlight, with caducous leaves, 3080 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31866/B*.

A rather scattered neotropical species, hitherto known from Brazil, Bolivia and Colombia. The specimen 23443/A has been used for molecular-phylogenetic studies (Devos *et al.* 2011).

**Radula sinuata* Gottsche ex Steph.

El Oro: Piñas, epiphytic at edge of secondary forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, 17 Mar 2012, *ASV & MN 32931*.

A scattered neotropical species, known from Costa Rica, Colombia, Bolivia and Brazil, often under its synonyms *R. montana* Steph. and *R. obtusifolia* Steph.

Radula tenera Mitt. ex Steph.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest and páramo vegetation on Sendero a las Lagunas del Compadre, epiphyllous and epiphytic on shrub, 3100–3250 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31868/E, 31883/A*; -, páramo vegetation around Mirador, 3050 m, 4°07' S, 79°10' W, epiphytic on shrub, 15 Apr 2003, *ASV & M. Preußing 23292/A*; -, with *Ceratolejeunea patentissima* and *Leptoscyphus cuneifolius* subsp. *fragilis*, 24 Mar 2012, *ASV & MN 33158/A* p.p.

A widespread but scattered neotropical species (Costa Rica, Colombia, Ecuador and Brazil), from Ecuador previously known from Carchi, Imbabura, Napo, Pichincha and Zamora Chinchipe; new to Loja.

Radula yanoella R.M.Schust.

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphyllous on *Achomanes*, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31728*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, Sendero Los Higueros, submontane rain forest (plot L 2), epiphyllous, 1026 m, 4°7.0' S, 78°58.1' W, 25 Jan 2011, *ASV & MN 31946/D*.

A rare and highly interesting neotenic species, known from Brazil and Costa Rica, from Ecuador previously reported from two collections from Zamora Chinchipe, 1880–2100 m (Parolly *et al.* 2004); new to Napo, a considerable extension of its altitudinal range within Ecuador.

Rectolejeunea berteriana (Gottsche ex Steph.) A.Evans

Napo: Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic, c. per. & c. andr. (dioicous), 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31735/A*.

Widespread in the Neotropics, earlier records for Ecuador are from Esmeraldas, Morona Santiago and Zamora Chinchipe, 500–1830 m; new to Napo.

Reiner-Drehwald & Grolle (2012) provided a key to the species introducing new taxonomic concepts and stated that "the geographical distributions of the species are still poorly known and must be considered preliminary". The only records of *R. berteriana* from Esmeraldas reported by Schäfer-Verwimp *et al.* (2006) belong to *R. emarginuliflora*.

**Rectolejeunea emarginuliflora* (Gottsche ex Schiffn.) A.Evans

Esmeraldas: Road Ibarra—San Lorenzo, humid secondary vegetation along Río Lita at Lita, epiphytic, 500 m, 20 Aug 2004, *ASV, J. Heinrichs, R. A. Wilson & S. O. Yandún 24411, 24421/A* (Schäfer-Verwimp *et al.* 2006 erroneously as *R. berteriana*, see also note under *R. berteriana*). **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphytic, 9 Mar 2012, *ASV & MN 32840*. **Zamora Chinchipe:** Amazonian lowland rain forest remnant near Mayayku south of Paquisha, epiphyllous in understory, 980 m, 3°58.8' S, 78°37.6' W, 30 Jan 2011, *ASV & MN 32097/D*.

Widespread but scattered in the Neotropics (Antilles, NE South America and SE Brazil), from sea level to 800 m (Reiner-Drehwald & Grolle 2012).

**Rectolejeunea flagelliformis* A.Evans

Morona Santiago: Cordillera del Cutucú northeast of Macas, 2°07.7' S, 77°46.0' W, 650 m, primary rain forest, epiphytic, sparse, 27 Mar 2012, *ASV & MN 33212/C*.

Widespread neotropical species (Honduras to Peru, Antilles, N to SE South America), from sea level to 900 m (Reiner-Drehwald & Grolle 2012).

Riccardia amazonica (Spruce) Schiffn. ex Gradst. & Hekking

Loja: PN Podocarpus above Cajanuma, upper montane forest on Sendero del Mirador, on humus along trail, 2940 m, 4°6.7' S, 79°10.5' W, 22 Jan 2011, *ASV & MN 31768*; -, NW of Mirador, on rotting log, 2920 m, 22 Jan 2011, *ASV & MN 31783*.

This widely distributed Afro-American species is known from Ecuador from Napo, Pastaza, Zamora Chinchipe, 1250–2200 m; new to Loja, a considerable extension of its altitudinal range within Ecuador.

****Riccardia chamedryfolia*** (With.) Grolle

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on dripping cliff, 2880 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31841*, identified by molecular markers (*trnL-F*) (Nebel *et al.*, unpublished data).

Widespread in temperate regions of the northern hemisphere, in the Neotropics known only from Brazil and Guadeloupe (Lavocat Bernard & Schäfer-Verwimp 2011); new to Ecuador and first record for the Andes.

Riccardia ciliolata (Spruce) Horik.

Loja: PN Podocarpus above Cajanuma, upper montane forest on Sendero a las Lagunas del Compadre, epiphytic on tree trunk, 3120–3150 m, 4°07.1' S, 79°09.9' W, 23 Jan 2011, *ASV & MN 31873, 31879*.

A high Andean species, reported from Venezuela, Colombia, Peru and Ecuador, from where it was so far known only from Tungurahua.

Riccardia digitiloba (Spruce) Pagán

El Oro: Piñas, road to the Pacific coast, 970 m, 3°39.5' S, 79°45.1' W, on rock and rotting wood at humid slope along trail, mixed with *Cyclodictyon albicans* (Hedw.) Kuntze, 17 Mar 2012, *ASV & MN 32957*. **Loja:** PN Podocarpus above Cajanuma, upper montane forest on Sendero a las Lagunas del Compadre, on slope along trail, 2850 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31825, 31830*. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on rotting log, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31723*.

A tropical American species, so far only one record from Ecuador from Zamora Chinchipe, 1800 m; new to Loja and Napo, a considerable extension of its altitudinal range.

****Riccardia latifrons*** (Lindb.) Lindb.

Loja: PN Podocarpus above Cajanuma, upper montane rain forest, on the path from headquarters to the Mirador, 2900 m, 04°07' S, 79°10' W, on humose soil, 22 Jan 2011, *MN & ASV 111550*, identified by molecular markers (*trnL-F*) (Nebel *et al.*, unpublished data).

A widespread holarctic species, from the Neotropics known only from Cuba and Panama; new to South America. Morphologically similar to European specimens, but the thalli are somewhat wider.

Riccardia parasitans (Steph.) Meenks & C.De Jong

Loja: PN Podocarpus above Cajanuma, upper montane rain forest along Sendero Mirador, 2880 m, 4°07' S, 79°10' W, on soil and earth covered rock, 24 Mar 2012, *ASV & MN 33120*, det. ASV & MN.

A high Andean species (Venezuela to Bolivia); from Ecuador previously known from Cotopaxi, Pichincha and Napo, 3000–4500 m; new to Loja.

****Riccardia smaragdina*** Meenks & C.De Jong

Loja: PN Podocarpus above Cajanuma, upper montane rain forest on Sendero a las Lagunas del Compadre, on humid soil on slope, 3020 m, 4°07' S, 79°10' W, 23 Jan 2011, *ASV & MN 31861*. **Pichincha:** Road Quito—Baeza, west of the top of Papallacta pass, páramo vegetation and remnants of *Polylepis* stands, epiphytic on horizontal stem of *Polylepis*, 3995 m, 0°20.3' S, 78°12.6' W, 5 Feb 2011, *ASV & MN 32161*.

Hitherto known only from Venezuela and Colombia, 2350–3620 m (Meenks 1987); new to Ecuador, an extension of its total altitudinal range.

Scapania portoricensis Hampe & Gottsche

Morona Santiago: Between Gualaceo and General L. Plaza, eastern slope of eastern Cordillera, on earth slope along the road, 2730 m, 30 Jul 1991, *T. Arts* 30/127, det. R. Grolle (dupl. Herb. ASV).

Widespread in mountains of tropical America, from Ecuador known so far from Azuay, Loja, Pastaza and Zamora Chinchipe; new to Morona Santiago.

Stephaniella paraphyllina J.B.Jack

Pichincha: Rucu Pichincha, páramo vegetation at base of summit region, on humid rocky slope, 4440 m, 0°09' S, 78°34' W, 6 Feb 2011, *ASV & MN* 32208/A.

Widespread tropical American species at higher altitudes (Mexico to northern Argentina and SE Brazil), also known from South Africa; from Ecuador previously reported from Carchi, Cotopaxi and Pichincha, 3400–4000 m; here confirmed for Pichincha, a new altitudinal record.

Stictolejeunea squamata (Willd. ex F.Weber) Schiffn.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, epiphytic in hotel garden, 14 Mar 2012, *ASV & MN* 32881/B, 32901; -, on bark of *Theobroma cacao* in cacao plantation, 15 Mar 2012, *ASV & MN* 32923. **El Oro:** Piñas, road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, epiphytic on horizontal branch in secondary rain forest, 03°39.3' S, 79°44.3' W, 960 m, 17 Mar 2012, *MN & ASV* 122066. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, epiphyllous, 8 Mar 2012, *ASV & MN* 32804/B. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, on rock along trail, 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN* 31712.

A common neotropical species, from Ecuador reported from Chimborazo, Esmeraldas, Los Ríos, Morona Santiago, Pastaza, Pichincha and Zamora Chinchipe, 150–1000 m (Gradstein 1994, León-Yáñez *et al.* 2006); new to Azuay, El Oro, Napo and Orellana.

Symbiezidium barbiflorum (Lindenb. & Gottsche) A.Evans

Azuay: Pacific coast south of Guayaquil, Camacho, cacao plantation between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, on bark of *Theobroma cacao*, c. per., 15 Mar 2012, *ASV & MN* 32912. **El Oro:** Piñas, road to the Pacific coast, 970 m, 3°39.5' S, 79°45.1' W, on humid slope along trail, with *Ceratolejeunea cubensis* and *C. filaria*, 17 Mar 2012, *ASV & MN* 32955 p.p. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, on bark of tree, 8 Mar 2012, *ASV & MN* 32806/B.

A widespread neotropical species (Mexico and West Indies to Peru and SE Brazil), from Ecuador known from Chimborazo, Esmeraldas, Los Ríos, Morona Santiago, Pichincha and Zamora Chinchipe (Churchill *et al.* 2009, Gradstein 1994, Herzog 1952); new to Azuay, El Oro and Orellana. See also note under the following species.

Symbiezidium transversale (Sw.) Trevis.

Azuay: Pacific coast south of Guayaquil, Camacho, Hostería Kaluz between Naranjal and Machala, 100 m, 2°48.6' S, 79°38.9' W, on bark of tree in hotel garden, 14 Mar 2012, *ASV & MN* 32896. **Esmeraldas:** Road Ibarra—San Lorenzo, epiphytic on liana along Río Lita near Lita, 500 m, 20 Aug 2004, *ASV* with *J. Heinrichs*, *R. A. Wilson & S. O. Yandún* 24415. **Napo:** Tena, Estación Biológica Jatunsascha, primary lowland rain forest, epiphytic, common, c. per. (var. *transversale*), 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN* 31708. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, on bark of tree, 9 Mar 2012, *ASV & MN* 32826/B. **Zamora Chinchipe:** PN

Podocarpus, Río Bombuscaro, Sendero Los Higuerones, submontane rain forest (plot L 2), epiphytic, 1026 m, 4°7.0' S, 78°58.1' W, 25 Jan 2011, *ASV & MN 31940/B*; -, Mayayku south of Paquisha, in the village on bark of tree, 850 m, 3°59.3' S, 78°38.9' W, 30 Jan 2011, *ASV & MN 32092/E*.

Reported from old collections from Bolívar, Chimborazo and Esmeraldas, without indication of its altitudinal range; new to Azuay, Napo, Orellana and Zamora Chinchipe.

Only two of all *Symbiezidium* specimens seen included perianths (*S. barbiflorum* 32912 and *S. transversale* 31708). Due to lack of perianths *S. transversale* could usually not be determined to varietal level. *S. barbiflorum* was usually distinguished from *S. transversale* by its smaller size (plants 1.5–3 mm wide in *S. barbiflorum*, 2.5–5 mm wide in *S. transversale*) and the number of ventral merophytes, 4 in *S. barbiflorum*, (4–)6 in *S. transversale* (see Gradstein & van Beek 1985).

Symphygyna aspera Steph. ex F.A.McCormick

El Oro: Piñas, secondary rain forest along road to the Pacific coast, 960 m, 3°39.3' S, 79°44.3' W, on base of tree beside brook, with *Cyclodictyon bicolor* (Schimp. ex Besch.) Kuntze, 17 Mar 2012, *ASV & MN 32950*.

Napo: Tena, Estación Biológica Jatunascha, primary lowland rain forest, on decaying wood, 01°05' S, 77°37' W, 450 m, 20 Jan 2011, *MN & ASV 111539*.

A widespread tropical American species, from Ecuador known only from a recent collection from Zamora Chinchipe, 1800–2150 m; Drehwald (2003) reported *S. cf. aspera* from Morona Santiago, 1400–1600 m; new to El Oro and Napo, a considerable extension of its altitudinal range.

Syzygiella anomala (Lindenb. & Gottsche) Steph.

Loja: PN Podocarpus above Cajanuma, upper montane forest on Sendero a las Lagunas del Compadre, epiphytic, c. per., 3120 m, 4°7.1' S, 79°9.9' W, 23 Jan 2011, *ASV & MN 31871*.

Widespread in the Neotropics, from Ecuador previously known from Pichincha and Zamora Chinchipe; new to Loja.

**Syzygiella bilobata* Inoue

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°05' W, 1780 m, lower montane rain forest along Camino Vado, on slope, 20 Mar 2012, *ASV & MN 33019*.

A rarely collected species, previously known only from the type specimen from Panama and from Costa Rica (Dauphin 2005); new to South America.

Syzygiella concreta (Gottsche) Spruce

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, 1840 m, lower montane rain forest along Camino Canal, on rocky slope, 20 Apr 2003, *ASV & M. Preußing 23441*, redet. K. Feldberg.

Only recently, Feldberg *et al.* (2011) distinguished *Syzygiella concreta* (highly variable in terms of size and leaf shape) from *S. perfoliata* (Sw.) Spruce based on morphological and molecular data and reported this tropical Afro-American species from Loja, Napo and Zamora Chinchipe; first record for Ecuador by Churchill *et al.* (2009) from Cordillera del Cóndor, Zamora Chinchipe, based on a specimen also cited by Feldberg *et al.* (2011). New to the San Francisco station area.

Syzygiella setulosa Steph.

Azuay: Road Cuenca—Guayaquil, páramo vegetation near Laguna Dos Chochoeras east of El Cajas National Park, 3670 m, 2°46.50' S, 79°09.9' W, on large boulder, 13 Mar 2012, *ASV & MN 32858* (PRC), conf. J. Váña. **Loja:** PN Podocarpus above Cajanuma, páramo vegetation on Sendero a las Lagunas del Compadre, epiphytic on shrub, c. per., 3270 m, 4°7.2' S, 79°9.7' W, 23 Jan 2011, *ASV & MN 31889/A*.

A rather scattered neotropical species (West Indies, Costa Rica, Colombia, Bolivia and Brazil, Inoue 1966, Uribe & Gradstein 1998 and Dauphin 2005), from Ecuador previously known only from recent

collections from Zamora Chinchipe, 1800–2650 m; new to Azuay and Loja, a considerable extension of its altitudinal range.

Syzygiella sonderi (Gottsche) K.Feldberg, Váňa, Hentschel & Heinrichs [= *Cryptochila grandiflora* (Lindenb. & Gottsche) Grolle]

Pichincha: Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on exposed, dripping cliff, 5 Mar 2012, *ASV & MN 32742*.

From Ecuador previously known from Azuay ("Gualaquiza" in Grolle 1971), Morona Santiago, Pichincha and Tungurahua (Grolle 1971, as *Cryptochila grandiflora*; Spruce 1884–85, as *Jungermannia grandiflora* Lindenb. & Gottsche).

Recent molecular work on Adelanthaceae including Jamesoniellaceae (Feldberg *et al.* 2010) resulted in the synonymization of *Cryptochila* under *Syzygiella*.

Syzygiella tonduzana Steph.

Loja: PN Podocarpus above Cajanuma, shrubby páramo vegetation on Sendero El Mirador, 3050 m, 4°06' S, 79°10' W, on the floor between shrubs, 15 Apr 2003, *ASV & M. Preußing 23284*.

A very scattered neotropical species, from Ecuador, Zamora Chinchipe, 2150–2650 m, recently reported by Nöske *et al.* (2003); new to Loja, and second record for Ecuador.

****Syzygiella uleana*** Steph.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°05' W, 1780 m, lower montane rain forest along Camino San Francisco, on slope, 22 Mar 2012, *ASV & MN 33058*.

A rare species, previously considered an endemic of SE Brazil.

This species is characterized by its narrowly lanceolate "underleaves" which, surprisingly, in the cited specimen are sometimes arising from the base of the leaf lobe rather than from the stem. Underleaves arising from the ventral stem surface and leaf lobe appendages occur on the same plant.

Taxilejeunea* species—see under *Lejeunea

****Telaranea bicruris*** (Steph.) M.Howe

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59.551' S, 79°04.252' W, upper montane rain forest along T 1 (plot A 4), on shady humid humus, with *Fuscocephaloziopsis subintegra* Gradst. & Váňa and *Telaranea sejuncta*, 2532 m, 27 Jan 2011, *ASV & MN 32032/A* (PRC), dupl. det. J. Váňa.

Apparently so far known only from Brazil (Engel & Smith Merrill 2004).

Telaranea diacantha (Mont.) J.J.Engel & G.L.Merr. [= *Arachniopsis diacantha* (Mont.) M.Howe]

Orellana: Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220 m, on bark of old tree, 8 Mar 2012, *ASV & MN 32793*.

Widespread neotropical species, from Ecuador previously known only from Zamora Chinchipe, 2000–2500 m; new to Orellana, a considerable extension of its local altitudinal range.

****Telaranea rectangularis*** R.M.Schust.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59.551' S, 79°04.252' W, upper montane rain forest along T 1 (plot A 4), on forest floor, with *Cephalozia crassifolia*, *Fuscocephaloziopsis subintegra* and *Telaranea sejuncta*, 2532 m, 27 Jan 2011, *ASV & MN 32032/A*; -, upper montane rain forest east of El Tiro (plot C 3), on humus and leaf litter, 2550 m, 3°59.5' S, 79°07.8' W, 29 Jan 2011, *ASV & MN 32086* (PC), det. S. R. Gradstein; -, same locality, on rotting wood and leaf litter, 23 Mar 2012, *ASV & MN 33109, 33110*.

Hitherto known only from the type from Venezuela (Schuster 1978, 2000).

**Telaranea sejuncta* (Ångstr.) S.W. Arnell

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°59.551' S, 79°04.252' W, upper montane rain forest along T 1 (plot A 4), on forest floor, with *Cephalozia crassifolia* and *Fuscocephalozia subintegra*, 2532 m, 27 Jan 2011, *ASV & MN 32026* (PRC), dupl. det. J. Váña.

Probably widespread but scattered in the Neotropics, specimens seen by Engel & Smith Merrill (2004) only from Brazil and Cuba.

Triandrophyllum subtrifidum (Hook.f. & Taylor) Fulford & Hatcher [var. *subtrifidum*]

Napo: Road Quito—Baeza, páramo vegetation near the top of Papallacta pass, on wet soil in depression, partly submerged, 4250 m, 0°19.3' S, 78°11.8' W, 5 Feb 2011, *ASV & MN 32194* (PC), dupl. det. S. R. Gradstein. **Pichincha:** Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on exposed, dripping cliff, 5 Mar 2012, *ASV & MN 32727, 32740, 32748*.

Widespread in temperate southern hemisphere and mountains of tropical America and Asia, from Ecuador previously reported from Carchi and Pichincha (without locality), and Zamora Chinchipe, 1800–4000 m; new to Napo, and new altitudinal record for Ecuador.

**Trichocolea floccosa* Herzog & Hatcher

Loja: PN Podocarpus above Cajanuma, upper montane rain forest northwest of the Mirador (plot M 1), epiphytic, 4°6.6' S, 79°10.7' W, 2859 m, 22 Jan 2011, *ASV & MN 31804/A*; -, upper montane forest on Sendero a las Lagunas del Compadre, epiphytic at base of tree, 3120 m, 4°7.1' S, 79°9.9' W, 23 Jan 2011, *ASV & MN 31870*. **Zamora Chinchipe:** Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, on shady rock at brook below the station, 24 Jan 2011, *ASV & MN 31895*; -, PN Podocarpus, Río Bombuscaro, submontane rain forest along Sendero Los Higuerones, 4°06' S, 78°58' W, 1000 m, 25 Mar 2012, *ASV & MN 33174*.

Scattered in the Neotropics, reported from Colombia, Costa Rica and Guadeloupe.

Trichocolea sprucei Steph.

Zamora Chinchipe: Road Loja—Zamora, upper montane rain forest east of El Tiro, epiphytic, 2500–2550 m, 3°59' S, 79°08' W, 20 Mar 2012, *ASV & MN 33005/B*.

A rather scattered neotropical species (West Indies and Colombia), from Ecuador recently reported from Azuay and Pichincha (Schäfer-Verwimp *et al.* 2006); new to Zamora Chinchipe.

Trichocolea tomentosa (Sw.) Gottsche

Loja: PN Podocarpus above Cajanuma, upper montane rain forest, northwest of the Mirador, steep slope, epiphytic on tree base and stem, 04°06.551' S, 79°10.689' W, 2860 m, 22 Jan 2011, *MN & ASV 111570*.

Widespread tropical American species, from Ecuador previously known from Pastaza, Pichincha, Tungurahua and Zamora Chinchipe, 600–2150 m; new to Loja, a considerable extension of its altitudinal range.

**Xylolejeunea crenata* (Nees & Mont.) Xiao L. He & Grolle

Napo: Tena, Estación Biológica Jatunasascha, primary lowland rain forest, epiphytic on root, c. per. & c. spor., 1°05' S, 77°37' W, 450 m, 20 Jan 2011, *ASV & MN 31727*. **Orellana:** Yasuní National Park, Amazonian lowland rain forest around Yasuní Research Station, 0°40' S, 76°24' W, 220–250 m, on rotting wood, 9 Mar 2012, *ASV & MN 32727/A*. **Zamora Chinchipe:** PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphyllous on terrestrial Hymenophyllaceae in submontane rain forest (plot F 1), 4°6.8' S, 78°58.0' W, 1075 m, 25 Jan 2011, *ASV & MN 31918/B*.

Widespread and locally common neotropical lowland forest species, known from Mexico and Costa Rica to Bolivia and Brazil (He & Grolle 2001), usually growing on rotting wood; new to Ecuador, and the first epiphyllous record.

Note: The origin of the single record from Ecuador given by He & Grolle (2001) is actually from Brazil (León-Yáñez *et al.* 2006).

MOSSES

**Acroporium exiguum* (Broth.) W.R.Buck & Schäf.-Verw.

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58.524' S, 79°04.289' W, lower montane rain forest along Q 5 (plot M 6), epiphytic on bamboo, 2020 m, 31 Jan 2011, *ASV & MN 32134/A*.

Hitherto known only from Brazil (Buck & Schäfer-Verwimp 1993).

Brachymitrium laciniatum (Spruce) A.K.Kop.

Pichincha: Northern slope of Pichincha, Reserva Yanacocha above Nono, 0°06.7' S, 78°35.1' W, 3550 m, upper montane rain forest, on dead branchlets in small barranco, c. spor., 5 Mar 2012, *ASV & MN 32760*; -, on humid slope, single plants between *Metzgeria fruticola*, *ASV & MN 32756/A*.

A very rare species, collected so far only once by Richard Spruce more than 150 years ago ("Andes Quitenses ... monte Azuay", as *Tayloria laciniata*); included in the Red Data Book of Ecuadorian bryophytes (Gradstein & León-Yáñez 2011).

**Streptopogon matudianus* H.A.Crum

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, epiphytic on young tree at the station, 1825 m, 24 Jan 2011, *ASV & MN 31902/C*.

Previously known only from Mexico and northern Argentina (Matteri & Schiavone 1998).

Syrhobodon incompletus Schwägr. var. **lanceolatus* (Hampe) W.D.Reese

Zamora Chinchipe: PN Podocarpus, Río Bombuscaro, Sendero Mirador, epiphytic in submontane rain forest (plot F 1), 4°6.8' S, 78°58.0' W, 1075 m, 25 Jan 2011, *ASV & MN 31928/A*.

A rather rare variety, known from Colombia, the Guianas and Brazil (Reese 1993).

**Tortella alpicola* Dixon

Zamora Chinchipe: Road Loja—Zamora, Estación Científica San Francisco, 3°58' S, 79°04' W, lower montane rain forest along Camino Canal, on rock, 1880 m, 23 Apr 2003, *ASV & M. Preußing 23521/A* (L), det. P. Sollman.

A widely distributed but rather scattered species, known from U.S.A. and Canada, further on reported from single localities in Antarctica and Hawaii; the type is from India, Himalaya. Occurrences in Russia and adjacent countries have been mapped by Otnyukova *et al.* (2004). Rams *et al.* (2006) reported it from Spain and provided a global distribution map; from the Neotropics previously known only from Colombia.

Discussion

In this paper we report 371 new provincial records of liverworts (table 3) including 50 species, 1 subspecies and one variety new to Ecuador (table 1), as well as five new provincial records of hornworts (table 3, hornworts in brackets). Furthermore we list three species and one variety of mosses as first records for Ecuador (table 2).

TABLE 1. New records of liverwort taxa for Ecuador with provincial origin

Species	Origin
<i>Adelanthus carabayensis</i>	Zamora Chinchipe
<i>Alobiella husnotii</i>	Zamora Chinchipe
<i>Aureolejeunea quinquecarinata</i>	Loja, Zamora Chinchipe
<i>Calypogeia laxa</i>	Zamora Chinchipe
<i>Calypogeia subintegra</i>	Loja
<i>Cheilolejeunea aneogyna</i>	Azuay
<i>Cololejeunea bekkeri</i>	Orellana
<i>Cololejeunea manaosensis</i>	Zamora Chinchipe
<i>Cololejeunea minuscula</i>	El Oro, Zamora Chinchipe
<i>Cololejeunea planifolia</i>	Esmeraldas
<i>Cololejeunea platyneura</i>	Orellana
<i>Cololejeunea sicifolia</i> subsp. <i>jamaicensis</i>	Zamora Chinchipe
<i>Cololejeunea sintenisii</i>	Loja, Napo, Orellana, Zamora Chinchipe
<i>Cololejeunea subsphaeroidea</i>	Loja
<i>Cololejeunea vitalana</i>	Zamora Chinchipe
<i>Cololejeunea winkleri</i>	Morona Santiago, Napo, Orellana
<i>Colura greig-smithii</i>	Morona Santiago, Napo, Orellana
<i>Drepanolejeunea navicularis</i>	Azuay, Loja, Zamora Chinchipe
<i>Frullania meridana</i>	Pichincha
<i>Kurzia flagellifera</i>	Azuay, Loja, Zamora Chinchipe
<i>Lejeunea boryana</i>	Morona Santiago
<i>Lejeunea caulicalyx</i>	Morona Santiago, Napo
<i>Lejeunea cristuliflora</i>	Loja
<i>Lejeunea drehwaldii</i>	Zamora Chinchipe
<i>Lejeunea meridensis</i>	Loja, Zamora Chinchipe
<i>Lejeunea puiggariana</i>	Morona Santiago
<i>Lejeunea raddiana</i>	Zamora Chinchipe
<i>Lepicolea ramentifissa</i>	Azuay
<i>Lepidozia squarrosa</i>	Loja
<i>Leptolejeunea maculata</i>	Zamora Chinchipe
<i>Metzgeria albinea</i> var. <i>albinea</i>	El Oro, Zamora Chinchipe
<i>Microlejeunea capillaris</i>	El Oro, Loja
<i>Mnioloma cellulosum</i>	Zamora Chinchipe
<i>Omphalanthus platycoleus</i>	Zamora Chinchipe
<i>Paracromastigum granatensis</i>	Zamora Chinchipe
<i>Plagiochila gymnocalycina</i>	Azuay
<i>Prionolejeunea ampliretis</i>	Orellana
<i>Pycnolejeunea contigua</i>	Zamora Chinchipe
<i>Radula schaefer-verwimpii</i>	Zamora Chinchipe
<i>Radula sinuata</i>	El Oro
<i>Rectolejeunea emarginuliflora</i>	Esmeraldas, Orellana, Zamora Chinchipe
<i>Rectolejeunea flagelliformis</i>	Morona Santiago
<i>Riccardia chamedryfolia</i>	Loja
<i>Riccardia latifrons</i>	Loja
<i>Riccardia smaragdina</i>	Loja, Pichincha
<i>Syzygiella bilobata</i>	Zamora Chinchipe
<i>Syzygiella uleana</i>	Zamora Chinchipe
<i>Telaranea bicurvis</i>	Zamora Chinchipe
<i>Telaranea rectangularis</i>	Zamora Chinchipe
<i>Telaranea sejuncta</i>	Zamora Chinchipe
<i>Trichocolea floccosa</i>	Loja, Zamora Chinchipe
<i>Xylolejeunea crenata</i>	Napo, Orellana, Zamora Chinchipe

TABLE 2. New taxa of mosses for Ecuador with provincial origin

Species	Origin
<i>Acroporium exiguum</i>	Zamora Chinchipe
<i>Streptopogon matudianus</i>	Zamora Chinchipe
<i>Syrrhopodon incompletus</i> var. <i>lanceolatus</i>	Zamora Chinchipe
<i>Tortella alpicola</i>	Zamora Chinchipe

TABLE 3. Number of new provincial records of liverworts and hornworts (in brackets)

Province	Number of new records	Province	Number of new records
Azuay	41 (+ 1)	Napo	46
Carchi	1	Orellana	41 (+ 1)
El Oro	40	Pichincha	19 (+ 1)
Esmeraldas	4	Sucumbíos	2
Guayas	1	Tungurahua	1
Loja	86 (+ 1)	Zamora Chinchipe	57
Morona Santiago	32 (+ 1)	Total:	371 (+ 5)

Among the new records for Ecuador *Alobiella husnotii* represents a new genus record. Three taxa, *Cololejeunea sicifolia* subsp. *jamaicensis*, *Riccardia latifrons* and *Syzygiella bilobata* are new to South America. *Cololejeunea sicifolia* subsp. *jamaicensis* and *Syzygiella bilobata* have been regarded as Caribbean and Central American endemics, the former known only from the type collection. Two species, *Lejeunea cristuliflora* and *Syzygiella uleana* are not southeast Brazilian endemics but also occur in Ecuador. Further remarkable new records of rare or locally distributed bryophytes include *Cololejeunea subsphaeroidea*, *C. vitalana*, *C. winkleri*, *Colura greig-smithii*, *Drepanolejeunea navicularis*, *Lejeunea caulicalyx*, *L. drehwaldii*, *L. meridensis*, *L. puiggariana*, *L. raddiana*, *Lepidozia squarrosa*, *Micropterygium lechleri*, *Radula schaefer-verwimpai*, *Riccardia chamedryfolia* as well as *Acroporium exiguum*, *Brachymitrium laciniatum*, *Streptopogon matudianus*, *Syrrhopodon incompletus* var. *lanceolatus* and *Tortella alpicola*.

Frullania meridana, *F. setigera*, *Kurzia flagellifera*, *Lejeunea boryana*, *Leptolejeunea maculata*, *Metzgeria albinea* var. *albinea*, *Microlejeunea capillaris*, *Mnioloma cellulosum*, *Omphalanthus platycoleus*, *Paracromastigum granatensis*, *Plagiochila gymnocalycina*, *Prionolejeunea ampliretis*, *Pycnolejeunea contigua*, *Radula sinuata*, *Rectolejeunea emarginuliflora*, *R. flagelliformis*, *Riccardia smaragdina*, *Telaranea bicurris*, *T. sejuncta*, *Trichocolea floccosa* and *Xylolejeunea crenata* are widespread species or were at least already known from neighbouring countries.

A few widespread species have been reported so far only from Galápagos and are new to mainland Ecuador: *Cololejeunea cardiocarpa*, *Diplasiolejeunea rudolphiana* and *Frullanoides tristis*. Gradstein *et al.* (2007) reported one species (*Taxilejeunea debilis*), Benitez & Gradstein (2011) three species and Churchill *et al.* (2009) one hornwort in this category, thus the number of Ecuadorian species confined to Galápagos (Gradstein 2009) is decreasing considerably to less than one third.

Concerning the numbers of new province records (see table 3) it seems quite interesting that the second highest number of new records is from Zamora Chinchipe, with 368 species (León-Yáñez *et al.* 2006, plus 11 species recently reported by Churchill *et al.* 2009 and 20 species by Benitez & Gradstein 2011) the Ecuadorian province with the highest number of known liverworts. With 57 additional species, Zamora Chinchipe is the first Ecuadorian province exceeding 400 species of liverworts. For all other provinces the number of known liverworts lies far below 200 except for Pichincha with 177 species known so far (including 6 taxa recently reported by Benitez *et al.* 2012), reaching now 197 species. Only 73 bryophyte species were known from Loja previous to this study (León-Yáñez *et al.* 2006, Benitez & Gradstein 2011, Benitez *et al.*

2012); now 160 species are known from this southern province. However, knowledge on the bryophyte diversity of Loja is still very incomplete since all 87 new records are from a single locality, the upper montane rain forest and páramos of Podocarpus National Park above Cajanuma. A single excursion in the province of El Oro yielded 40 new records, since only 9 species were previously reported from there (León-Yáñez *et al.* 2006, Benitez & Gradstein 2011, Benitez *et al.* 2012). New records from El Oro include *Cololejeunea minuscula*, *Metzgeria albinea* var. *albinea*, *Microlejeunea capillaris* and *Radula sinuata* new to Ecuador; *Diplasiolejeunea lanceolata* was previously known only from the type collection from Esmeraldas, and *Diplasiolejeunea rudolphiana*, abundant at the collection site, is new to mainland Ecuador.

Surprisingly, a considerable number of taxa (37 liverworts and 2 mosses) could be added to the area of the San Francisco Biological Reserve in Zamora Chinchipe (table 4), from where already 527 species (320 liverworts, 204 mosses, 3 hornworts) have been reported, "being the highest number ever recorded from such a relatively small tropical area" (Gradstein *et al.* 2007). These additions on the one hand demonstrate the extraordinary rich flora of the Andes of southern Ecuador and especially of the San Francisco Reserve area, and on the other hand add to growing evidence that the bryophyte flora of tropical America is still rather incompletely known.

TABLE 4. New records for Biological Reserve San Francisco, Zamora Chinchipe

<i>Alobiella husnotii</i>	<i>Lejeunea meridensis</i>
<i>Calypogeia laxa</i>	<i>Lejeunea rotundifolia</i>
<i>Ceratolejeunea cornuta</i>	<i>Lepidozia subdichotoma</i>
<i>Cololejeunea cardiocarpa</i>	<i>Metzgeria albinea</i> var. <i>albinea</i> **
<i>Cololejeunea kuciana</i>	<i>Metzgeria claviflora</i>
<i>Cololejeunea manaosensis</i>	<i>Metzgeria furcata</i>
<i>Cololejeunea microscopica</i> var. <i>exigua</i>	<i>Metzgeria scyphigera</i>
<i>Cololejeunea sicifolia</i> subsp. <i>jamaicensis</i>	<i>Omphalanthus platycoleus</i>
<i>Cololejeunea sintenisii</i>	<i>Pycnolejeunea contigua</i>
<i>Cololejeunea vitalana</i>	<i>Radula schaefer-verwimpii</i>
<i>Frullania atrata</i>	<i>Syzygiella bilobata</i>
<i>Frullania macrocephala</i>	<i>Syzygiella concreta</i>
<i>Frullania mirabilis</i>	<i>Syzygiella uleana</i>
<i>Frullania paradoxa</i>	<i>Telaranea bicurris</i>
<i>Frullania setigera</i>	<i>Telaranea rectangularis</i>
<i>Kurzia flagellifera</i>	<i>Telaranea sejuncta</i>
<i>Lejeunea acanthogona</i>	<i>Trichocolea floccosa</i>
<i>Lejeunea asthenica</i>	<i>Acroporium exiguum</i>
<i>Lejeunea cancellata</i>	<i>Tortella alpicola</i>
<i>Lejeunea catimulifera</i> Spruce*	

* specimen ASV & M. Preußing 23206/C has already been mentioned by Reiner-Drehwald (2005).

** Gradstein *et al.* (2007) reported *M. albinea* without indicating varietal level.

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