

Some additions to the Bryophyte Flora of Guadeloupe, West Indies, and new synonyms in the genera *Diplasiolejeunea* and *Lejeunea* (Lejeuneaceae)

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Abstract – 31 bryophytes, 29 hepatics and two mosses, are newly reported for Guadeloupe, among these five new generic records of hepatics: *Fossombronia*, *Heteroscyphus*, *Kymatocalyx*, *Monodactylopsis*, and *Zoopsidella*. The following new synonyms in the genera *Diplasiolejeunea* and *Lejeunea* are proposed: *Diplasiolejeunea matoubae* and *D. zacatepecensis* are synonymous with *D. cavifolia*; *D. malleiformis* subsp. *balnearia*, subsp. *bernardii*, and subsp. *elongata* are synonymized with *D. pellucida* var. *malleiformis*, and *D. cubensis*, *D. lanciloba* as well as *D. rudolphiana* var. *inflata* are considered to belong to *D. brunnea*. Furtheron, *Lejeunea filipes* is a synonym of *L. aphanes*, and *L. elliottii* is synonymous with *L. sporadica*.

Diplasiolejeunea / *Lejeunea* / new synonyms / new records / Guadeloupe / West Indies

Zusammenfassung – 31 Moose, 29 Leber- und zwei Laubmoose, werden erstmals für Guadeloupe nachgewiesen, darunter fünf neue Lebermoosgattungen: *Fossombronia*, *Heteroscyphus*, *Kymatocalyx*, *Monodactylopsis* und *Zoopsidella*. Folgende neue Synonyme werden in den Gattungen *Diplasiolejeunea* und *Lejeunea* vorgeschlagen: *Diplasiolejeunea matoubae* und *D. zacatepecensis* sind Synonyme von *D. cavifolia*; *D. malleiformis* subsp. *balnearia*, subsp. *bernardii*, sowie subsp. *elongata* werden als synonym mit *D. pellucida* var. *malleiformis* betrachtet, und *D. cubensis*, *D. lanciloba* als auch *D. rudolphiana* var. *inflata* gehören zu *D. brunnea*. Des weiteren werden *Lejeunea filipes* als Synonym von *L. aphanes* und *L. elliottii* als solches von *L. sporadica* erachtet.

INTRODUCTION

The bryophyte flora of Guadeloupe is relatively well known, however, the first comprehensive overview on the hepatics by Pagán (1942) is out of date; Jovet-Ast (1947, 1948, 1949, 1950) described several new species and reported numerous species as new to the island. Foucault (1977) provided keys for most

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species of bryophytes known from Guadeloupe, and all species not keyed out have been listed. The genera *Cololejeunea* and *Diplasiolejeunea* have been treated by Tixier (1985) who proposed many new names in *Diplasiolejeunea*. A first modern treatment for the pleurocarpous mosses was given by Buck (1998). Other recent treatments deal with single genera, e.g. *Ceratolejeunea* (Dauphin, 2003), *Echinocolea* and *Prionolejeunea* (Ilkiu-Borges, 2005, 2006), *Crossotolejeunea* (Reiner-Drehwald & Goda, 2000), *Metzgeria* (Costa, 2008), *Fissidens* (Pursell, 2007).

The here presented new records for the bryophyte flora of Guadeloupe are based on about 730 collections gathered by the senior author and his wife from 24 March to 6 April 2002. One of the main purposes of the recent field work in Guadeloupe has been the study of the great diversity of the genus *Diplasiolejeunea* as it was already described by Tixier (1985). As a result of this study, several new synonyms in *Diplasiolejeunea* could be recognized. Further new or interesting records are also presented. Part of our collections (*Prionolejeunea* and *Lejeunea-Echinocolea*) has already been published by Ilkiu-Borges (2005, 2006) and others.

The cited specimens are currently deposited in the private herbarium of the first author, which will be incorporated in the Herbarium JE later. Duplicates sent to other herbaria are indicated.

Abbreviations:

* = new to Guadeloupe

SV&V = leg. A. Schäfer-Verwimp & I. Verwimp

HEPATICAE

Alobiellopsis dominicensis (Spruce) Fulf.

Basse Terre: Northern slope above Sainte Rose, Sofaia, rain forest on trail to “Saut des trois cornes”, on humid soil at creek, 270 m, 24 Mar 2002, SV&V 22121; -, Route de la Traversée, rain forest on Morne à Louis, on road cut, c. per. and spor., 720 m, 25 Mar 2002, SV&V 22133, det Váña (PRC).

Distr.: Known only from the West Indies and cited from Puerto Rico, Dominica (type), Martinique and Trinidad (Fulford, 1968). This species has already been distributed from Guadeloupe in fascicle IV of *Bryophyta Neotropica Exsiccata* (Nr. 176, *Gradstein 6586*) in 1989, see also Gradstein (1993).

**Aphanolejeunea costaricensis* Bernecker (see comb. nov. under *Cololejeunea* in Pócs & Bernecker, in press).

Basse Terre: La Soufrière, trail from “Les Bains Jaunes” to “Chute du Galion”, rain forest, epiphyllous on fern frond, 830 m, 5 Apr 2002, SV&V 22619/C, det. T. Pócs (EGR).

Distr.: Costa Rica, Dominica (Schäfer-Verwimp, 1999); **new to Guadeloupe** and second record for the West Indies.

Aphanolejeunea sicaefolia (Gottsche) A. Evans (see comb. nov. under *Cololejeunea* in Pócs & Bernecker, in press)

Basse Terre: Northern slope above Sainte Rose, Sofaia, rain forest on trail to “Saut des trois cornes”, epiphyllous on Hymenophyllaceae, 300 m, 24 Mar 2002, SV&V 22117/C; -, La Soufrière, rain forest at Grand Étang below Chutes de Carbet, epiphyllous,

c. per., 400 m, 1 Apr 2002, *SV&V 22417/D*; -, rain forest on trail from Les Bains Jaunes to Chute du Galion, epiphyllous, 930 m, 5 Apr 2002, *SV&V 22593/A*, conf. T. Pócs (EGR).

Distr.: Widespread in the Neotropics including the West Indies (detailed distribution in Schäfer-Verwimp, 1999). First record from Guadeloupe by Jovet-Ast (1947).

**Cheilolejeunea adnata* (Kunze) Grolle

Basse Terre: Road to La Soufrière, picnic area Beausoleil, on root of big tree, 750 m alt., 30 Mar 2002, *SV&V 22334/B*.

Distr.: Widespread in the Neotropics (Schäfer-Verwimp, 1999); **first record for Guadeloupe.**

Cheilolejeunea oncophylla (Ångstr.) Grolle & E. Reiner

Basse Terre: Western slope above Pointe Noire, rain forest between Trou-Caverne and Piton Belle Hôtesse, on rotten log, 730 m, 29 Mar 2002, *SV&V 22322/B*; -, La Soufrière, Trace Victor Hugues between Matouba and Savane aux Ananas, epiphytic in *Clusietum*, 1100 m, 31 Mar 2002, *SV&V 22363/B*; -, rain forest between Les Bains Jaunes and Savane à Mulets, epiphytic on broken branches of tree and on bark of shrub in *Clusietum*, 970-1120 m, 2 Apr 2002, *SV&V 22449, 22468/B, 22481/B*; -, rain forest between Les Bains Jaunes and Chute du Galion, on rotten wood and dead twig, with *Cheilolejeunea inflexa* and *Harpalejeunea tridens*, 940 m, 5 Apr 2002, *SV&V 22591/A*.

Distr.: Widely distributed in the Neotropics, at altitudes of 320-3210 m. Known from Venezuela, Colombia, Peru, Brazil, Argentina, Cuba, Jamaica; from the Lesser Antilles known only from two collections, one from Dominica (type of *Trachylejeunea dominicensis* Steph.), and another one from Guadeloupe (Grolle & Reiner-Drehwald, 1997).

**Cololejeunea camillii* (Lehm.) A. Evans

Basse Terre: Monts Caraïbes near Gourbeyre, epiphyllous in rain forest, 530 m, 1 Apr 2002, *SV&V 22441/A*, det. T. Pócs (EGR).

Distr.: Widespread in the Neotropics, from Brazil and Argentina to Mexico and the West Indies (Jamaica, Cuba, Dominica); second record for the Lesser Antilles and **the first one for Guadeloupe.**

**Cololejeunea minutissima* (Sm.) Schiffn. [subsp. *myriocarpa* (Nees et Mont.) R.M.Schust.]

Basse Terre: Plateau Palmiste southwest of La Soufrière, urban aerea, epiphytic on ornamental shrub, c. spor., 550 m, 3 Apr 2002, *SV&V 22490/A*; -, South coast, Trois Rivières, urban aerea, epiphytic at base of ornamental shrub in private garden, c. per., 160 m, 5 Apr 2002, *SV&V 22623*; both specimens are intergrading into subsp. *minutissima*.

Distr.: Pantropical, but apparently **hitherto not reported from Guadeloupe.**

**Cololejeunea sintenisii* (Steph.) Pócs [= *Aphanolejeunea sintenisii* (Steph.) Steph.]

= *Aphanolejeunea ephemeroides* R.M.Schust., syn. fide Pócs & Bernecker, in press.

Basse Terre: Western slope above Pointe Noire, trail between Trou-Caverne and Piton Belle Hôtesse, epiphyllous, 700 m, 29 Mar 2002, *SV&V 22304/B*, conf. T. Pócs (EGR); La Soufrière, trail from “Les Bains Jaunes” to “Chute du Galion”, rain forest, epiphyllous on fern frond, growing with *Cololejeunea costaricensis*, 820 m, 5 Apr 2002, *SV&V 22613/A*, det. T. Pócs (as *Aphanolejeunea ephemeroides*; EGR).

Distr.: Nearly pantropical, known from Asia and Australia (as *Aphanolejeunea angustiloba*) (Pócs & Bernecker, 2009), Macaronesia (Azores, Madeira) (Grolle & Long, 2000); widespread in the Neotropics, ranging from Florida, Belize and Costa Rica to Venezuela, Ecuador and Brazil (mostly as

Aphanolejeunea ephemeroïdes), from the West Indies known from Cuba and Puerto Rico (Eggers, 1997; León-Yáñez *et al.*, 2006; Lücking, 1995; Pócs, 2003; Schuster, 1980); **hitherto not reported from Guadeloupe**.

Also **new to DOMINICA**: Humid slope on road side between Pont Cassé and Emerald Pool, epiphyllous on fern fronds, 500 m alt., 21 May 1996, *SV&V 17715/A, 17723/A*; rain forest on northern slope of Morne Trois Pitons, epiphyllous, 630 m, 21 May 1996, *SV&V 17744/A, 17748/A*; Morne Diablotin, rain forest on western slope, epiphyllous, 750 m alt., 26 May 1996, *SV&V 17920*; Roseau Valley, trail from Wotten Waven to Sulphur Springs, on humid, shady, decaying bamboo, 370 m, 28 May 1996, *SV&V 18066*, all det. Pócs, as *Aphanolejeunea ephemeroïdes* (EGR; JE).

***Cololejeunea subcardiocalpa** Tixier

Basse Terre: La Soufrière, Trace Victor Hugues above Matouba, rain forest on Rivière Rouge, epiphyllous, 780 m, 31 Mar 2002, *SV&V 22402/F*, det. T. Pócs (EGR).

Distr.: Widespread in tropical America but it seems to be the **first record for Guadeloupe** and the West Indies.

***Colura cylindrica** Herzog

Basse Terre: North coast above Sainte Rose, Sofaia, rain forest, trail to “Saut des trois cornes”, epiphytic on shrub, 350 m, 24 Mar 2002, *SV&V 22102*; -, Route de la Traversée, rain forest on Morne Louis, epiphytic on young tree along road, 700 m, 25 Mar 2002, *SV&V 22130/D*; -, elfin forest on Mamelle de Pigeon, epiphyllous on fern frond and epiphytic, 670-680 m, 25 Mar 2002, *SV&V 22147/A, 22149* (STU), *22154/B*; -, Northwest coast above Deshaies, rain forest near Morne Mazeau, epiphytic and epiphyllous in *Clusietum*, 610-650 m, 26 Mar 2002, *SV&V 22177, 22189/A* (EGR, STU), and *22198/B*; -, West coast above Pointe Noire, rain forest between Trou-Carverne and Piton Belle Hôteesse, epiphyllous, 700 m, 29 Mar 2002, *SV&V 22306/A*; -, La Soufrière, rain forest on trail from Les Bains Jaunes to Chute du Galion, epiphytic on small tree trunk, 900 m, 5 Apr 2002, *SV&V 22599*.

Distr.: Ecuador, Galapagos Islands, Brazil, the Guayanas, Dominica, and Africa (Tanzania); **new to Guadeloupe** and second record for the West Indies.

Diplasiolejeunea

More than 150 *Diplasiolejeunea*-specimens have been collected allowing evaluation of the conspicuous variability of some species (complexes) as described by Tixier (1985). Several new synonyms of *D. caribea* Tixier have already been published by Schäfer-Verwimp (2004); some further eight new synonyms are proposed as follows:

Diplasiolejeunea brunnea Steph., *Spec. Hepat.* 5: 922. 1916.

= *Diplasiolejeunea cubensis* Tixier, *Bryophyt. Biblioth.* 27: 389, fig. 19. 1985. TYPE: Cuba, s. l., s. d., Wright c, holotype BM; **syn. nov.**

= *Diplasiolejeunea lanciloba* Tixier, *Bryophyt. Biblioth.* 27: 386, fig. 18. 1985. TYPE: Bresil, s. l., s. d., Glaziou d, holotype BM; **syn. nov.**

= *Diplasiolejeunea rudolphiana* Steph. var. *inflata* Herzog, *Feddes Repert.* 57: 200, fig. 26. 1955. TYPE: [Peru], Dep. Junin, along Rio Perené, near “Hacienda 3”, colonia Perené, ca. 600 m, forest, no. 25 174/a, JE! - **syn. nov.**

Diplasiolejeunea brunnea is a highly polymorphic species concerning structure and dentition of leaf lobule, and, in lesser degree, shape and cell structure of underleaves. The size of the **leaf lobule** varies from fully developed, reaching up to more than half of leaf length, covering about 1/5 to 1/8 of leaf lobe, to highly reduced covering distinctly less than 1/10 or even 1/20 of leaf lobe as described for *D. lanciloba*. However, plants with lobule reduction of all degrees

occur, also in collections with mainly strongly reduced leaf lobules less or not reduced lobules can be found. *Diplasiolejeunea lanciloba* therefore is considered to be a phase of *D. brunnea* with (mainly) reduced lobules, environmentally caused as in many other species of Lejeuneaceae. Less conspicuous characters as a more or less inflated lobule as well as a more or less inrolled upper margin of the lobule are certainly within the varietal range of *D. brunnea*. Astonishing is the great variability of the **lobule teeth**, especially that of the **first tooth** (median tooth), which may be nearly “rudimentary” as in *D. cubensis*, consisting of only two superposed cells, or very conspicuous as for example in *D. rudolphiana* var. *inflata*, consisting of 8-15, sometimes up to 20 cells, then the tooth being fingerlike to triangular, 3-5 cells wide at base and (1-)2-3 superimposed cells at tip. In *Diplasiolejeunea galloana*, another synonym of *D. brunnea*, the first tooth is long and narrow, (1-)2(-3) cells wide at base and up to 8 or more cells long, the tip sometimes built up of 6 superimposed cells. However, all intermediates occur in a continuous line, not correlated to any other morphological character which may allow taxonomic separation. Beside this, considerable variation in the size of the first tooth can be found in the same specimen or even at the same plant. The **second tooth** (apical tooth) is variable, too, from apparently lacking as in *D. cubensis* up to 5 cells long in one row as can be observed in *D. rudolphiana* var. *inflata*. This character, too, is not a stable one, though there seems to be some correlation between stronger second teeth and larger first teeth. The second tooth has to be searched for, as it usually is wholly hidden below the lobule. *Diplasiolejeunea cubensis* and *D. rudolphiana* var. *inflata* are therefore considered two extreme forms of *D. brunnea*.

Also the **underleaves** show some variability, the underleaf lobes are usually widely spreading from 150° up to 180°, but sometimes also less spreading ones (90°-120°) occur, often the younger underleaves are less spreading than the older ones. The underleaf cells are usually longer than wide, the lobes ending with cells normally twice as long as wide; however, underleaves with mainly quadrate to hexagonal cells rarely occur, too, thus approaching the cell structure of the underleaves of *D. cavifolia*.

Selected specimens: Basse Terre, Route de la Traversée, elfin forest on Mamelle de Pigeon, on twigs of shrubs, 710 m, 25 Mar 2002, SV&V 22154/C (“*cubensis*-expression”); -, northwestern slope above Deshaïes, rain forest on trail from Morne Mazeau to point 758, epiphyllous, 610 m, 26 Mar 2002, SV&V 22175/C (transitional between *brunnea* and *cubensis*); -, western slope above Pointe Noire, rain forest between Trou-Caverne and Piton Belle Hôteesse, epiphyllous, 700 m, 29 Mar 2002, SV&V 22305/B (“*cubensis* ad trans *brunnea*”); -, La Soufrière, Trace Victor Hugues between Matouba and Savane aux Ananas, rain forest, epiphyllous, 1100 m, 31 Mar 2002, SV&V 22388/C (“*cubensis*-expression”). **BOLIVIA:** Cochabamba, Sacta, 17°05'47,5" S, 64°46'49,0" W, on leaves of *Besleria* in transitional forest, c. per., c. spor. and gemmae, 195 m, 10 Nov 2007, S. Abrahamczyk s.n. (herb. Schäfer-Verwimp 29013) (with many reduced lobules).

Diplasiolejeunea cavifolia Steph., *Engler's Bot. Jahrb. Syst.* 20: 318. 1895.
= *Diplasiolejeunea matoubae* Tixier, *Bryophyt. Biblioth.* 27: 401, fig. 25. 1985.
TYPE: La Guadeloupe, Haut Matouba, fonds Bernard, 720 m, 16.5.1960, *Le Gallo s.n.*, PC! - **syn. nov.**
= *Diplasiolejeunea zacatepecensis* Tixier, *Bryophyt. Biblioth.* 27: 399, fig. 24. 1985.
TYPE: La Guadeloupe, *Clusietum* près de la Savane Lignièrès, 11.4.1936, P. & V. Allorge s.n., holotype PC! PARATYPE: Mexico, Zacatepec, 1500 m, en forêt, 26.7.1959, R. Heim s.n., PC! - **syn. nov.**

Diplasiolejeunea cavifolia shows great variability in shape and size of the first lobule tooth which typically may be T-like, consisting of one vertical and two

horizontal cells, but it may also be fingerlike and only one cell wide and two to three cells long, or 2(-3) cells wide and 2-3 cells long, and then T-like or not, consisting of (1-)2-6(-8) cells. Especially in the Caribbean region there can be observed a tendency to a larger first tooth, not only in the “*cavifolia*-complex” but as well as in the “*pellucida-malleiformis*-complex” and the “*caribea*-complex”. *Diplasiolejeunea matoubae* and *D. zacatepecensis* are interpreted as “extreme” forms of *D. cavifolia*, which seem to be separable at first glance by the larger size of the first lobule tooth; however, many transitional teeth have been seen often on the same plant, including in the type specimens, especially in the paratype of *D. zacatepecensis* from Mexico. No other character could be correlated to plants with larger first teeth as in *D. matoubae* and *D. zacatepecensis*. Intermediate forms between *Diplasiolejeunea cavifolia* and *D. matoubae* have also been collected in **Brazil** (Rio de Janeiro, Serra de Itatiaia above Itatiaia, epiphytic in rain forest, 1150 m, 9. Jul 1991, *SV&V 14687/A*). In this specimen (originally labelled as “*Diplasiolejeunea* aff. *matoubae*”) the plants have mostly large first teeth with 4-6 cells in two rows, however, typical T-like “*cavifolia*-teeth” consisting of 3 cells rarely occur, too.

Selected specimens: **Basse Terre**, Route de la Traversée, rain forest at Morne à Louis, epiphytic, 700-743 m, 25 Mar 2002, *SV&V 22130/C* (“*zacatepecensis*-expression”), *22131/A*, *22137/B* (“*matoubae*-expression”); -, western slope above Pointe Noire, trail between Trou-Caverne and Piton Belle Hôtesse, on branchlets of treelets, 777 m, 29 Mar 2002, *SV&V 22314/B* (“*zacatepecensis*-expression”); -, La Soufrière, rain forest between Les Bains Jaunes and Savane à Mulets, on shrub in *Clusietum*, 1120 m, 2 Apr 2002, *SV&V 22475* (transitional between *zacatepecensis* and *matoubae*), *22480/A* (“*matoubae*-expression”).

Diplasiolejeunea pellucida var. *malleiformis* A. Evans, *Bull. Torrey Bot. Club* 39: 215. 1912.

= *Diplasiolejeunea malleiformis* (A. Evans) Tixier, *Bryophyt. Biblioth.* 27: 351, fig. 2. 1985 [subsp. *malleiformis*].

= *Diplasiolejeunea malleiformis* subsp. *balnearia* Tixier, *Bryophyt. Biblioth.* 27: 357, fig. 4. 1985. TYPE: La Guadeloupe, forêt des Bains Jaunes, 600-800 m, 6.5.1951, *Le Gallo 117*, PC! - **syn. nov.**

= *Diplasiolejeunea malleiformis* subsp. *bernardii* Tixier, *Bryophyt. Biblioth.* 27: 359, fig. 5. 1985. TYPE: La Guadeloupe, Haut Matouba, fonds Bernard, 690 m, 16.5.1960, *Le Gallo 579*, PC! - **syn. nov.**

= *Diplasiolejeunea malleiformis* subsp. *elongata* Tixier, *Bryophyt. Biblioth.* 27: 354, fig. 3. 1985. TYPE: La Guadeloupe, forêt de Duclos, 23.7.1953, *Le Gallo 1025*, PC! - **syn. nov.**

As already pointed out by Evans (1912) in his description of the new var. *malleiformis* of *Diplasiolejeunea pellucida*, the first tooth (“apical tooth”) “of the lobule is variable, sometimes as in the typical form of the species but usually t-shaped, the terminal portion consisting of two to four cells placed at right angles to a short stalk, the latter one cell or rarely two cells wide: in other respects agreeing closely with the type”. All the new subspecies of *Diplasiolejeunea malleiformis* proposed by Tixier (1985) fall well within the typical variety. The hyalin margin in one row, given as further distinguishing character of ssp. *balnearia*, is also quite variable, and the width of the hyalin margin in the *Diplasiolejeunea pellucida*-complex is considered not to be of taxonomic value. Modern methods including DNA-sequencing may elucidate if var. *malleiformis* even might stand as a variety, or if it better should be united with *Diplasiolejeunea pellucida* s. str., as already done by Lücking (1995), who did not synonymize the var. *malleiformis* with the main species but included this in her short description and figure 41.

Selected specimens: **Basse Terre**, Route de la Traversée, elfin forest at Mamelle de Pigeon, epiphytic on twigs of shrubs, 710 m, 25 Mar 2002, *SV&V 22154/D* (“subsp. *bernardii*”); -, Northwest coast above Deshaies, rain forest near Morne Mazeau, epiphyllous in *Clusietum*, 630 m, 26 Mar 2002, *SV&V 22192/A*; -, western slope above Pointe Noire, trail between Trou-Caverne and Piton Belle Hôtesse, epiphyllous, 590 m, 29 Mar 2002, *SV&V 22293/B*; -, La Soufrière, picknick area on Rivière Rouge near Matouba, epiphytic on shrub, 700 m, 30 Mar 2002, *SV&V 22328* (“subsp. *bernardii*”).

The occurrence of all species of *Diplasiolejeunea* hitherto known from Guadeloupe could be confirmed except of *D. guadalupensis* Steph. which remains a little known species. Study of the type specimen (G 16496 – Holotype) revealed some similarity to the *Diplasiolejeunea replicata* -complex concerning shape of the leaf lobes, underleaves, leaf cells with nodulose trigones and intermediate thickenings, strongly inflated lobules, but different lobule teeth; no hyaline margin could be observed as reported by Lücking (1995: 84). No specimen has been assigned to *D. evansii* Tixier because the taxonomic status is still unclear (see also Schäfer-Verwimp, 2004). Some collections of the rarer species are cited here:

Diplasiolejeunea alata Jov.-Ast, *Rev. Bryol. Lichénol.* 17: 31, fig. III. 1948.

Basse Terre: Route de la Traversée, top of Morne à Louis, epiphytic on shrub, 743 m, 25 Mar 2002, *SV&V 22137/A*; -, elfin forest on top of Mamelle de Pigeon, epiphytic on shrub, 758 m, 25 Mar 2002, *SV&V 22160*; -, northwestern slope above Deshaies, rain forest near Morne Mazeau, on shrub, 758 m, 26 Mar 2002, *SV&V 22207/B*; -, La Soufrière, Savane à Mulets, epiphytic in *Clusietum*, 1130 m, 4 Apr 2002, *SV&V 22538/B*.

Originally described from Guadeloupe, the species is now known to be widespread in the Neotropics, from Costa Rica to Bolivia and SE Brazil, from the West Indies known only from Guadeloupe (the type collections) and Dominica (Schäfer-Verwimp, 2004).

Diplasiolejeunea armatiloba Steph., *Hedwigia* 35: 80. 1896.

Syn.: *Diplasiolejeunea allorgeorum* Jov.-Ast, *Rev. Bryol. Lichénol.* 16: 31. 1947.

Basse Terre: La Soufrière, trail Victor Hugues from Matouba to Savane aux Ananas, epiphytic in *Clusietum*, associated with *Diplasiolejeunea leiocarpa*, 1100 m, 31 Mar 2002, *SV&V 22367/A*; -, trail from Les Bains Jaunes to Chute du Galion, rain forest, epiphyllous, 950 m, 5. Apr 2002, *SV&V 22580/C*.

Diplasiolejeunea armatiloba seems to be a rare species on Guadeloupe and was collected only twice. Specimens have also been seen from Dominica; furtheron it is reported from Cuba (Reyes, 1982), Mexico (Robinson, 1964), Colombia (Vasco-P. *et al.*, 2002), and from Ecuador by Arnell (1962). Records from outside the West Indies or even outside the Lesser Antilles need confirmation. The occurrence of *Diplasiolejeunea armata* in Ecuador has been doubted by Schäfer-Verwimp (2004). León-Yáñez *et al.* (2006) excluded the species from the hepatic flora of Ecuador. The specimen *Harling 4629* (in S, published by Arnell (1962) from Ecuador as *D. armatiloba*) belongs to *Diplasiolejeunea brunnea*, as already annotated by R. Grolle in 1974 and confirmed by the senior author in 2007.

Diplasiolejeunea leiocarpa Jov.-Ast, *Rev. Bryol. Lichénol.* 16: 34, fig. VIII. 1947.

Selected specimens only: **Basse Terre:** Route de la Traversée, top of Morne à Louis, epiphytic on shrub, 743 m, 25 Mar 2002, *SV&V 22138*; -, elfin forest on Mamelle de Pigeon, epiphytic on shrub, 670-758 m, 25 Mar 2002, *SV&V 22143*, *22154/A*, *22159*; -, northwestern slope above Deshaies, epiphytic in *Clusietum*, 650 m, 26 Mar 2002, *SV&V 22188*, *22198/A*, *22207/A*; -, western slope above Pointe Noire, top of Piton Belle Hôtesse, on treelets, 777 m, 29 Mar 2002, *SV&V 22318/B*; -, La Soufrière, trail Victor Hugues from Matouba to Savane aux Ananas, epiphytic in *Clusietum*, very abundant, 1100 m, 31 Mar 2002, *SV&V 22361/A*, *22367/B*; -, epiphytic on shrubs and epiphyllous in rain forest, 1160-

1170 m, locally abundant, 31 Mar 2002, *SV&V* 22380, 22381/A, 22384, 22385; -, La Soufrière, trail from Les Bains Jaunes to Chute du Galion, epiphytic in *Clusietum*, 1030 m, 2 Apr 2002, *SV&V* 22457, 22470, 22481/A; -, rain forest between Les Bains Jaunes and Chute du Galion, epiphyllous and epiphytic, 900-950 m, 5 Apr 2002, *SV&V* 22580/D, 22596.

Diplasiolejeunea leiocarpa is similar to *D. armatiloba* but easily distinguished by the constantly larger underleaves and the shape of the perianth. It is known only from Guadeloupe where it seems to be a locally frequent species (23 collections) though it was reported hitherto only from the two type collections (Jovet-Ast 1947, Tixier 1985).

It is reported here as **new to DOMINICA**: Roseau Valley, low and humid forest along trail between Freshwater Lake and Boeri Lake, epiphytic, 830 m, 19 May 1996, *SV&V* 17644/B; -, trail from Laudat to Valley of Desolation, epiphytic on branchlets in humid scrub, 860 m, 24 May 1996, *SV&V* 17874, 17879.

**Drepanolejeunea submuricata* R.M.Schust.

Basse Terre: La Soufrière, rain forest on trail from Les Bains Jaunes to Chute du Galion, on rotten log, 970 m, 5 Apr 2002, *SV&V* 22582/B.

Distr.: Hitherto known only from Dominica (type) and Venezuela (Dauphin & Ilkiu-Borges, 2002; Morales *et al.*, 2007), beside an unpublished record from Costa Rica (Schäfer-Verwimp 2009, in press). **New to Guadeloupe** and second record for the West Indies.

**Fossombronia porphyrorhiza* (Nees) Prosk. [= *Fossombronia brasiliensis* Steph.]

Basse Terre: North coast above Sainte Rose, Sofaia, rain forest, trail to “Saut des trois cornes”, on humid soil along a small river, c. spor., 270 m, 24 Mar 2002, *SV&V* 22120.

Distr.: Widespread in the Neotropics from Brazil northward to Central America, the West Indies, and to the southeastern United States; **new generic record for Guadeloupe**.

Harpalejeunea herzogii Jov.-Ast

Basse Terre: La Soufrière, southeastern slope east of parking area « Savane à Mulets », on exposed wet rock, 1260 m, 5 Apr 2002, *SV&V* 22565/A.

Distr.: Hitherto known only from the type from Guadeloupe (Jovet-Ast, 1955).

In contrary to Grolle & Reiner-Drehwald (1999), *Harpalejeunea herzogii* is considered distinct from *H. stricta* because

(1) the quite different appearance of the plants with leaves nearly parallel to the stem or only little spreading as in species of *Drepanolejeunea* section *Anoplantae* (widely spreading up to a right angle in *H. stricta*) (compare figs in Jovet-Ast, 1955 and Schuster, 1980)

(2) the consistently and strongly reflexed upper part of the leaves, always hidden in dorsal view (upper part of leaf more or less plane, only the very apex occasionally recurved in *H. stricta*) (compare figs in Jovet-Ast, 1955 and Schuster, 1980)

(3) the perianth keels are ciliate, the ciliae with 6 superposed cells (nearly smooth or only slightly denticulate in *H. stricta*), and

(4) the seemingly different ecology with preferable occurrence on exposed, humid to wet rocks, including the type (« sur rocher humide »), (*H. stricta* is growing predominantly [or exclusively?] on bark); however, there are available hitherto only few observations on the ecology of *H. herzogii*.

**Harpalejeunea subacuta* A.Evans

Basse Terre: West coast above Pointe Noire, rain forest trail from Trou-Caverne to Piton Belle Hotesse, epiphytic in elfin forest, 775 m, 29 Mar 2002, *SV&V* 22316/A; -, La

Soufrière, picknick area on Rivière Rouge near Matouba, on bark, 690 m, 30 Mar 2002, *SV&V 22325*; -, trail Victor Hugues above Matouba, rain forest, epiphyllous at Rivière Rouge, 780 m, 31 Mar 2002, *SV&V 22402/D*; -, trail from « Les Bains Jaunes » to « Chute du Galion », rain forest, epiphyllous on fern frond, 870 m, 5 Apr 2002, *SV&V 22605/B*.

Distr.: Costa Rica, El Salvador, Puerto Rico, and Dominica (Dauphin 2005; Schäfer-Verwimp 1999); similar plants have been reported from Brazil by Gradstein & Costa (2003). **New to Guadeloupe.**

**Harpalejeunea uncinata* Steph.

Basse Terre: La Soufrière, picknick area Beausoleil above St. Claude, on root of old tree, 750 m, 30 Mar 2002, *SV&V 22334/A*; -, trail Victor Hugues above Matouba, rain forest, on bark and epiphyllous on trail to « Savane aux Ananas », 770 m and 1000 m, 31 Mar 2002, *SV&V 22399/B*, *22403/B*.

Distr.: On bark and living leaves, occasionally on rocks, in lowland to montane rain forests. A tropical American species known from Costa Rica, Panama, Guyana, French Guiana, and from the West Indies reported from Cuba, Puerto Rico, Dominican Republic, Martinique, Trinidad (Evans, 1903, Grolle & Reiner-Drehwald, 1999; Stephani, 1896). Fulford *et al.* (1970) and Lücking (1995) list **Guadeloupe**, however, no original literature could be traced.

**Herbertus juniperoideus* (Sw.) Grolle subsp. *pensilis* (Taylor) Feldberg *et* Heinrichs

Basse Terre: La Soufrière, Trace Victor Hugues between Matouba and Savane aux Ananas, epiphytic in *Clusietum*, with *Cheilolejeunea inflexa* and *Eucamptodontopsis pilifera*, 1100 m, 31 Mar 2002, *SV&V 22369*; -, Savane à Mulets, upper part of trail of Les Bains Jaunes, epiphytic in *Clusietum*, 1130 m, 4 Apr 2002, *SV&V 22526*.

Distr.: From Costa Rica southwards to Bolivia and Brazil, from 700 up to 3300 m; from the West Indies known from Puerto Rico and Dominica (Feldberg & Heinrichs, 2006). **New to Guadeloupe** and second record for the Lesser Antilles.

**Heteroscyphus elliottii* (Steph.) Pagán

Basse Terre: Route de la Traversée, Mamelle de Pigeon, elfin forest, on soil along trail, 670 m, 25 Mar 2002, *SV&V 22146* (STU).

Distr.: Cuba, Haiti, Jamaica, Puerto Rico, Dominica, Mexico, Guatemala, and Venezuela (Fulford, 1987); seems to be a **new generic record for Guadeloupe**.

**Kymatocalyx dominicensis* (Spruce) Váña

Basse Terre: La Soufrière, rain forest between Les Bains Jaunes and Savane à Mulets, on small boulders along the track, c. per., 1000 m, 2 Apr 2002, *SV&V 22451*, conf. J. Váña (EGR, PRC); -, between Savane à Mulets and top of La Soufrière, northern slope, on rock, 1300 m, 4 Apr 2002, *SV&V 22550*; -, rain forest on trail between Les Bains Jaunes and Chute du Galion, on small boulders, 950 m, 5 Apr 2002, *SV&V 22590*, conf. J. Váña (PRC).

Distr.: Widespread in tropical America and Madagascar (see detailed distribution in Gradstein & Váña (1999), **new to Guadeloupe**. In Guadeloupe this species was found always along trails in rain forests, not as usually along rivers or in waterfalls; however, the area around La Soufrière, where *Kymatocalyx* only has been found on the island, is the area with the highest precipitation on Guadeloupe.

**Lejeunea adpressa* Nees

[Syn.: *Lejeunea magnoliae* Lindenb. & Gottsche, Reiner-Drehwald 2009]

Basse Terre: Northwest coast above Deshaies, secondary rain forest on “Le Dos d’Âne” near Caféière, rain forest, epiphyllous, 500 m, 28 Mar 2002, *SV&V 22261/B*; -, region of La Soufrière, Trace Victor Hugues above Matouba, rain forest on trail to Savane aux

Ananas, epiphyllous, c. per., 780-930 m, 31 Mar 2002, *SV&V 22400/B, 22402/C*; -, Monts Caraïbes near Gourbeyre, culture zone, secondary vegetation, at base of palm tree, c. spor., 340 m, 1 Apr 2002, *SV&V 22432*, all det. Reiner-Drehwald.

Distr.: Widely distributed in tropical America, from Guadeloupe known only from the above cited collections (Reiner-Drehwald, 2009).

**Lejeunea aphanes* Spruce, *J. Bot.* 19: 36. 1881. *Microlejeunea aphanes* (Spruce) Steph., *Spec. hepat.* 5: 817. 1915. Type. Venezuela. Amazonas, „ad fl. Casiquiari...“, *Spruce L551* (holotype, MANCH CC 19159 [sterile; + *Lejeunea* cf. *acanthogona* (1 shoot with ciliate perianth); + *Lejeunea* cf. *adpressa* (sterile, underleaves wider than the stem); + *Cheilolejeunea* sp.]).

= *Lejeunea filipes* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 275. 1884. Type: Peru. San Martín, Tarapoto, epiphyll on *Porella* sp., *Spruce L491* (holotype, MANCH CC 18611 [autoicous, c.per.]); **syn. nov.**

Basse Terre: Route de la Traversée, rain forest on Morne à Louis, epiphytic on *Cecropia*, c. per., 700 m, 25 Mar 2002, *SV&V 22127* p.p.; -, Northwest coast above Deshaies, secondary rain forest on „Le Dos d’Âne“ near Caféière, rain forest, epiphyllous, 500 m, 28 Mar 2002, *SV&V 22261* p.p., *22266/A*; -, region of La Soufrière near Matouba, picknick area on Rivière Rouge, on root of old tree, c. per. 700 m, 30 Mar 2002, *SV&V 22329*; -, Chutes de Carbet, rain forest, epiphyllous, 550 m, 1 Apr 2002, *SV&V 22405*; -, South coast, Monts Caraïbes near Goubeyre, rain forest, epiphyllous, c. per., 530 m, 1 Apr 2002, *SV&V 22441/B*, all det. Reiner-Drehwald.

Distr.: Widespread in the Americas and Africa (detailed distribution in Schäfer-Verwimp, 1999, as *L. filipes*); **new to Guadeloupe.**

Lejeunea asperrima Spruce

Known from South America and the West Indies, from where it is cited only from Dominica and Guadeloupe by *SV&V*-collections *22217/B, 22239* (Ilkiu-Borges, 2005).

**Lejeunea bermudiana* (A.Evans) R.M.Schust.

Basse Terre: Route de la Traversée, rain forest on Morne à Louis, epiphytic on *Cecropia*, c. per., 700 m, 25 Mar 2002, *SV&V 22127*, det. Reiner-Drehwald.

Distr.: So far known from the Bermudas, Southeastern United States, and also cited from Puerto Rico (Gradstein, 1989), and Brazil (Vital & Visnadi, 1994); these references cited also in Reiner-Drehwald & Goda (2000).

There is also a specimen from **DOMINICA:** Roseau Valley, trail from Laudat to Middleham Falls, on rock, 550 m, 20 May 1996, *SV&V I7679/A*, det. Reiner-Drehwald. **New to Guadeloupe and Dominica.**

**Lejeunea caulicalyx* (Steph.) E.Reiner *et* Goda

Basse Terre: South coast, Trois Rivières, primary forest on « Sentier Littoral », on rotting wood, c. spor., 20 m, 30 Mar 2002, *SV&V 22344*; -, West coast, Marigot, Beaugendre valley, culture zone, secondary vegetation, on root of solitary tree, c. per. 180 m, 4 Apr 2002, *SV&V 22502*, both det. Reiner-Drehwald.

Distr.: Widely distributed in tropical America, from Guatemala, West Indies to Bolivia and Brazil (Reiner-Drehwald, unpublished).

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

Basse Terre: Route de la Traversée, rain forest on Mamelle de Pigeon, epiphytic, c. per., 720 m, 25 Mar 2002, *SV&V 22153*; -, La Soufrière, picknick area on Rivière Rouge near Matouba, on rotten log, c. spor., 690 m, 30 Mar 2002, *SV&V 22326*; -, rain forest between Les Bains Jaunes and Savane à Mulets, on bark of shrub in *Clusietum*, c. per., 1120 m, 2 Apr 2002, *SV&V 22473*, all. det. or conf. Reiner-Drehwald.

Distr.: Widespread and common in tropical America, from Guadeloupe known since Husnot (1875, as *L. cerina* and *L. subsimplex*) who published the first account on hepatics from Guadeloupe, and consequently cited by Stephani (1890, as *Macro-Lejeunea subsimplex* and *Hygro-Lejeunea cerina*), Duss (1903, as *Lejeunea (Taxilejeunea) subsimplex*), Pagán (1942, as *Hygrolejeunea cerina* and *Macrolejeunea subsimplex*), Jovet-Ast (1947), Foucault (1977), and Grolle (1988).

****Lejeunea cladogyna* A.Evans**

Basse Terre: South coast, Monts Caraïbes near Gourbeyre, secondary forest, on rotting wood, 450 m, 1 Apr 2002, *SV&V 22438*, det. Reiner-Drehwald.

Distr.: A neotropical species reaching southeastern U.S.A., also known from Puerto Rico and Barbados (Schuster, 1980). The distribution of this species is probably imperfectly known because of easily confusion with *Lejeunea minutiloba*.

***Lejeunea controversa* Gottsche**

Basse Terre: Northwestern slope above Deshaies, rain forest on trail from Morne Mazeau to Sofaia, on bark, c. per., 650 m, 26 Mar 2002, *SV&V 22196*; -, La Soufrière, rain forest on trail from Les Bains Jaunes to Chute du Galion, on bark, c. per., 860 m, 5 Apr 2002, *SV&V 22608*, both conf. Reiner-Drehwald.

Distr.: Widely distributed in Central and South America (Costa Rica to Bolivia and Brazil), from the Caribbean region known from Cuba, Guadeloupe (type), Dominica, and Trinidad (Reiner-Drehwald & Goda, 2000).

***Lejeunea corynantha* Spruce**

Known only from Panama and the West Indies (Dominican Republic, Guadeloupe, Dominica (type), all *SV&V*-collections, from Guadeloupe *SV&V 22552* and *22565/B*), see Reiner-Drehwald & Schäfer-Verwimp (2008).

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

Basse Terre: Northwestern slope above Deshaies, Le Dos d'Âne near Caféière, secondary woody vegetation, on rotten log, c. spor., 420 m, 28 Mar 2002, *SV&V 22234*; -, La Soufrière, Plateau Palmiste above Gourbeyre, culture zone, on bark, 530 m, 3 Apr 2002, *SV&V 22493*, both det. or conf. Reiner-Drehwald.

Distr.: A common pantropical species, known from Guadeloupe since Stephani (1890, as *Eu-Lejeunea flava*), cited also by Pagán (1942), Jovet-Ast (1948), Foucault (1977), and Schuster (1980).

****Lejeunea grossitexta* (Steph.) E. Reiner et Goda**

Basse Terre: Region of La Soufrière, primary rain forest on Grand Étang below Chutes de Carbets, epiphyllous, 400 m, 1 Apr 2002, *SV&V 22422*, det. Reiner-Drehwald.

Distr.: Brazil, Argentina, Paraguay, Costa Rica (Reiner-Drehwald & Goda, 2000). **New to the West Indies.** *L. grossitexta* is usually growing as an epiphyte. This is the second known epiphyllous collection.

***Lejeunea huctumalcensis* Lindenb. et Gottsche**

A widespread neotropical species known from Mexico to Bolivia and Brazil, Cocos and Galapagos Islands, and from the West Indies, cited from Cuba and Guadeloupe (*SV&V 22200*, *22281/B*) by Reiner-Drehwald & Ilkiu-Borges (2007). Firstly reported from Guadeloupe by Stephani (1902, as type of *Pycnolejeunea dussiana*), and consequently listed by Pagán (1942) and Foucault (1977). Dauphin (2003) treated this species as *Ceratolejeunea dussiana*.

***Lejeunea laetevirens* Nees et Mont.**

Basse Terre: North coast above Sainte Rose, Sofaia, rain forest on trail to « Saut des trois cornes », on bark of tree, 350 m, 24 Mar 2002, *SV&V 22122*; -, Northwestern slope above Deshaies, Le Dos d'Âne near Caféière, secondary forest, on bark, 400 m, 28 Mar 2002, *SV&V 22229*, both conf. Reiner-Drehwald; -, La Soufrière, primary rain forest at Grand Étang below Chutes de Carbet, epiphyllous on fern fronds, c. per., 400 m, 1 Apr 2002, *SV&V 22417/C*.

Distr.: Very common in tropical America, firstly mentioned from Guadeloupe by Stephani (1915, as *Lejeunea glaucophylla*), consequently cited by Pagán 1942 and Jovet-Ast (1947), both as *Microlejeunea*, Foucault 1977, and Schuster (1980).

****Lejeunea minutiloba* A. Evans**

Basse Terre: Plateau Palmiste above Gourbeyre, culture zone, epiphytic, 530 m, 3 Apr 2002, *SV&V 22483/B*, det. Reiner-Drehwald.

Distr.: Known from the West Indies (Virgin Islands, Puerto Rico, Cuba) to Bermuda and the southeastern United States (Schuster, 1980); **new to Guadeloupe.**

****Lejeunea paucidentata* (Steph.) Grolle [= *Dactylolejeunea acanthifolia* R.M.Schust.]**

Basse Terre: La Soufrière, rain forest on trail between Les Bains Jaunes and Chute du Galion, epiphyllous on fern fronds, 820-870 m, 5 Apr 2002, *SV&V 22604* (c. per.), *22613/B, 22619/B*.

Distr.: A Caribbean endemic, hitherto known from Cuba, Puerto Rico, and Dominica from where it was described as *Dactylolejeunea acanthifolia*. Reiner-Drehwald & Goda (2000) showed the considerable variability of *Dactylolejeunea acanthifolia* and synonymized it with *Lejeunea paucidentata*. The plants from Guadeloupe have long spines at leaf margins and perianth keels as also seen in Dominican specimens.

***Lejeunea sporadica* Besch. et Spruce, Bull. Soc. Bot. France 36 (Suppl.: Congrès Bot. 1889): CLXXX (= p. 180). « 1889 » 1890. *Harpalejeunea sporadica* (Besch. & Spruce) Steph., Spec. hepat. 5: 259. 1913 [« *sporadia* »]. Type. Windward Islands: Guadeloupe, 1877, Marie s.n. (lectotype, BM 672281 [autoicous, c. per.], designated by Grolle & Reiner-Drehwald 1999; isolectotype, G 23520 [autoicous, c. per.]).**

= *Lejeunea elliottii* Spruce, J. Linn. Soc., Bot. 30: 346. 1895. Type: Windward Islands: St. Vincent, Monte Richmond, *Elliott 186* p.p. (lectotype, MANCH 18609 [autoicous, c. per.; + *Prionolejeunea* sp.], designated by Reiner-Drehwald & Goda 2000), **syn. nov.**

Basse Terre: Northwest coast above Deshaies, secondary rain forest on "Le Dos d'Âne" near Caféière, rain forest, on rotting wood, 490 m, 28 Mar 2002, *SV&V 22257*; -, epiphytic in secondary vegetation, c. spor., 450 m, *SV&V 22282/B*; -, West coast above Pointe Noire, rain forest between Trou-Caverne and Piton Belle Hôtesse, on rotting wood, 570 m, 29 Mar 2002, *SV&V 22292*, all det. or conf. Reiner-Drehwald.

Distr.: So far known from Cuba, Guadeloupe (type), Dominica, St. Vincent (Reiner-Drehwald & Goda, 2000).

***Lejeunea subspathulata* Spruce**

A widespread neotropical species, the collections *SV&V 22185, 22607, 22609* from Guadeloupe were cited by Ilkiu-Borges (2005).

****Lejeunea tapajosensis* Spruce**

Basse Terre: West coast, Pointe Noire, valley of Rivière Petite Plaine, culture zone, on rock under mango tree, 170 m, 27 Mar 2002, *SV&V 22228*; -, region of La Soufrière,

Plaine Palmiste above Gourbeyre, epiphyte in urban area, 530 m, 3 Apr 2002, *SV&V* 22483/A, both det. Reiner-Drehwald.

Distr.: Brazil, Peru, Argentina; first record for the West Indies (Dominica) by Schäfer-Verwimp (1999); **new to Guadeloupe.**

**Lejeunea trinitensis* Lindenb.

Basse Terre: South coast, Trois Rivières, primary forest on « Sentier Littoral », on rotting wood, c. spor., 20 m, 30 Mar 2002, *SV&V* 22338, 22342; -, -, Monts Caraïbes near Gourbeyre, culture zone, secondary vegetation, at base of palm tree, c. spor., 340 m, 1 Apr 2002, *SV&V* 22432 p.p., all det. Reiner-Drehwald.

Distr.: Widespread and common in the Neotropics, detailed treatment in Reiner-Drehwald (2000).

The following *Lejeunea* species are known to occur on Guadeloupe but have not been collected by *SV&V*.

– *Lejeunea boryana* Mont. – First report from Guadeloupe by Pagán (1942, as *Crossotolejeunea boryana*), listed by Foucault (1977) and thoroughly treated by Reiner-Drehwald & Goda (2000).

– *Lejeunea fulfordiae* (Jov.-Ast) R.L. Zhu (= *Amblyolejeunea fulfordiae*) – Known only from the type of Guadeloupe and a single collection by the senior author from Ecuador (Schäfer-Verwimp et al. 2006, as *Amblyolejeunea*; Zhu & Cheng 2008).

– *Lejeunea pulverulenta* (Gottsche ex Steph.) E. Reiner (= *Taxilejeunea pulverulenta* Gottsche ex Steph.) – Hitherto known from Guadeloupe (type only), Guayana, and Ecuador (Reiner-Drehwald 2005).

Finally, *Lejeunea orba* Gottsche (type from Brazil and reported from Guadeloupe by Pagán 1942 and Foucault 1977, both as *Hygrolejeunea orba*) and *L. smaragdina* Besch. et Spruce (type from Guadeloupe) are poorly known species and of doubtful status.

With now known 22 (24) species, the genus *Lejeunea* is the second richest genus of hepatics on Guadeloupe.

**Leptolejeunea moniliata* Steph.

Basse Terre: Northern slope above Sainte Rose, Sofaïa, rain forest on trail to “Saut des trois cornes”, epiphyllous on Hymenophyllaceae and palm frond, 300 m, 24 Mar 2002, *SV&V* 22117/A.

Distr.: Growing epiphyllous from sea level up to 1550 m, but usually below 600 m. Known from Central and South America (Guatemala, Honduras, Costa Rica, Venezuela, French Guiana, Suriname, Brazil, from the Caribbean region known only from Trinidad (Bischler, 1969, with distribution map). **New to the Lesser Antilles.**

**Leptolejeunea radicata* (Nees ex Mont.) Grolle [= *Leptolejeunea obovata* Bischl. fide Grolle, 1979]

Basse Terre: Northern slope above Sainte Rose, Sofaïa, rain forest on trail to « Saut des trois cornes », epiphyllous on palm leaf, admixed to *Leptolejeunea moniliata*, *Diplasiolejeunea brunnea* and *D. caribea*, 300 m, 24 Mar 2002, *SV&V* 22117/A p.p.; -, La Soufrière, primary rain forest at Grand Étang below Chutes de Carbet, epiphyllous, 400 m, 1 Apr 2002, *SV&V* 22415/A, 22417/E.

Distr.: On living leaves, between 100 and 800 m. In the Neotropics known from Costa Rica, Panama, Colombia, French Guiana, Jamaica, and Dominica (Bischler, 1969, as *L. obovata*; Schäfer-Verwimp, 1999). A record from Cuba needs to be verified (Grolle, 1979). **New to Guadeloupe.**

**Leucolejeunea uncioba* (Lindenb.) A. Evans

Basse Terre: Route de la Traversée, humid secondary vegetation on top of Morne Louis, epiphytic on shrub; with *Leucolejeunea xanthocarpa*; 743 m, 25 Mar 2002, *SV&V* 22139/B.

Distr.: Widespread but scattered in tropical America and Africa, apparently rare in the West Indies; **new to Guadeloupe**, where it was found only once and in small quantity.

**Monodactylopsis minima* (R.M. Schust.) R.M. Schust.

Basse Terre: Northwestern slope above Deshaies, secondary rain forest on “Le Dos d’Âne” near Caféière, on rotting wood, with *Zoopsidella antillana* between *Telaranea nematodes*, 420 m, 28 Mar 2002, *SV&V* 22235, conf. Váña (PRC).

Distr.: Known only from Rio Negro, Brazilian Amazon region, described and illustrated by Schuster (1999); **new to the West Indies**.

Physantholejeunea portoricensis (Hampe *et* Gottsche) R.M.Schust.

Basse Terre: La Soufrière, Trace Victor Hugues between Matouba and Savane aux Ananas, rain forest, epiphytic, 1170 m, 31 Mar 2002, *SV&V* 22349/A (EGR); -, rain forest on trail between Les Bains Jaunes and Chute du Galion, epiphytic, 810-900 m, 5 Apr 2002, *SV&V* 22600, 22615 (STU).

Distr.: Costa Rica (Cocos Island), West Indies (Cuba, Puerto Rico, Dominica); only record from Guadeloupe by Jovet-Ast (1947, as *Ceratolejeunea*).

Prionolejeunea – several new records for Guadeloupe, including one new species, *Prionolejeunea grollei*, have been already published by Ilkiu-Borges (2006) and Ilkiu-Borges & Schäfer-Verwimp (2005).

**Zoopsidella antillana* (Steph.) R.M.Schust.

Basse Terre: Northwest coast above Deshaies, primary rain forest on “Le Dos d’Âne” near Caféière, on rotting wood, with *Monodactylopsis minima* between *Telaranea nematodes*, 460 m, 28 Mar 2002, *SV&V* 22252, conf. Váña (PRC).

Distr.: Primarily a Caribbean species, known from Cuba, Puerto Rico, Dominica, and Trinidad; further single records from Costa Rica, Cocos Island and Brazil (Dauphin, 2005; Yano, 1987); **the genus *Zoopsidella* is new to Guadeloupe**.

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**Daltonia stenophylla* Mitt.

Basse Terre: La Soufrière, low, humid forest between Les Bains Jaunes and Savane à Mulets, epiphytic, 1050 m, 2 Apr 2002, *SV&V* 22461/A; -, northern slope of the volcano, epiphytic on shrub, 1200 m, 5 Apr 2002, *SV&V* 22561/B.

Distr.: Widespread but scattered from Costa Rica to Bolivia and Brazil, rather rare in the West Indies, known also from the Azores; **new to Guadeloupe**, where it is easily overlooked because it is growing usually in very small quantity.

Fissidens lagenarius Mitt. *var. *lagenarius*

Basse Terre: Northwestern slope above Deshaies, primary rain forest on “Le Dos d’Âne” near Caféière, on bark, c. spor., 560 m, 28 Mar 2002, *SV&V* 22280.

Distr.: A widespread tropical American species ranging from Mexico to Bolivia, Paraguay, and Brazil and throughout the West Indies, also known from Samoan and Fiji Islands (Pursell, 2007). The var. *muriculatus* (Spruce *ex* Mitt.) Pursell is known from Guadeloupe as *Fissidens corticola* Schimp. *ex* Besch. (type

from Guadeloupe) and *F. diplopus* (Foucault, 1977), the **var. *lagenarius* is new to Guadeloupe.**

Fissidens pellucidus* Hornsch. var. *pellucidus

Basse Terre: Northwestern slope above Deshaies, primary rain forest on “Le Dos d’Âne” near Caf  iere, on termite nest, 500 m, 28 Mar 2002, *SV&V 22260*.

Distr.: Widespread in the Americas from the U.S.A to Bolivia, Paraguay, and Brazil, the West Indies, and also known from Africa, Asia, and Australasia (Pursell, 2007). Single record from Guadeloupe by Foucault (1977, as *Fissidens flexinervis* Mitt.).

***Syrhropodon parasiticus* (Brid.) Besch.**

Basse Terre: Northwestern slope above Deshaies, primary rain forest on “Le Dos d’Âne” near Caf  iere, epiphytic, 615 m, 28 Mar 2002, *SV&V 22274*.

Distr.: Pantropical, throughout tropical and subtropical America; only once reported from an old Duss collection from Guadeloupe by Reese (1993).

CONCLUSION

About 515 species of bryophytes, 305 hepatics in 83 genera and 210 mosses in 80 genera are known to occur on Guadeloupe (Sch  fer-Verwimp, unpublished). In this paper, 31 species are newly reported, 29 hepatics and two mosses, raising the number of hepatics to about 334 species in 88 genera (new generic records: *Fossombronia*, *Heteroscyphus*, *Kymatocalyx*, *Monodactyloopsis*, and *Zoopsisidella*). Three species are newly recorded for the West Indies: *Cololejeunea subcardiocalyx*, *Lejeunea grossitexta* and *Monodactyloopsis minima*; *Lejeunea caulicalyx* and *Leptolejeunea moniliata* are new to the Lesser Antilles, and for *Cololejeunea camillii*, *C. costaricensis*, *Colura cylindrica*, *Drepanolejeunea submuricata*, *Herbertus juniperoides* subsp. *pensilis*, *Lejeunea bermudiana*, *L. cladogyna*, *L. paucidentata*, and *L. tapajosensis* the second record for the West Indies or the Lesser Antilles is provided.

Considering the high diversity of the hepatic flora of Guadeloupe (and Dominica) in comparison with other islands or mainland regions (see Table 1) it is evident that the preservation of the rain forests and other humid vegetation types, especially the *Clusietum*, in the mentioned islands is of great importance. As examples of narrow endemic species we can cite *Diplasiolejeunea leiocarpa*, *Frullania guadalupensis* and *Harpalejeunea herzogii* and rare species are *Cololejeunea fejeana*, *C. guadalupensis*, *Drepanolejeunea valiae*, *Nowellia dominicensis*, *Physantholejeunea portoricensis*, *Monodactyloopsis minima*, *Lejeunea fulfordiae*, *L. paucidentata*, *Prionolejeunea grollei* and *Riccia dussiana*.

Unfortunately there are only few revised checklists of hepatics for the Caribbean region. From Puerto Rico and the Virgin Islands with an area more than 5 times larger than that of Guadeloupe (and more than 10 times of that of Dominica), 237 hepatics are known (= 71.0% of Guadeloupe or 80.1% of Dominica). On the dry islands Cura  ao and Bonaire of the Netherlands Antilles, together comparable in size with Dominica (see Table 1), only 16 hepatics are known to occur. Cuba, famous for its rich flora of both phanerogams and cryptogams, and with an area 68 times as large as Guadeloupe (and 147 times as large as Dominica) has 377 hepatic species and thus the highest number of

Table 1. Number of hepatics (incl. hornworts) from selected geographic regions of the world.

<i>Geographical unit</i>	<i>Area</i>	<i>Number of species</i>	<i>Reference</i>
Guadeloupe	1 628 km ²	334	this paper
Dominica	754 km ²	296	Schäfer-Verwimp, 1999
Puerto Rico & Virgin Islands	8 870 km ² [344 km ²]	237	Gradstein, 1989
Curaçao & Bonaire	444 km ² 288 km ²	16	van Slageren, 1979
Cuba	110 860 km ²	377	Pócs, 1988
Madeira	780 km ²	170	Söderström <i>et al.</i> , 2007
Azores	2 334 km ²	158	Söderström <i>et al.</i> , 2007
Canary Islands	7 500 km ²	141	Söderström <i>et al.</i> , 2007
Switzerland	39 770 km ²	263	Söderström <i>et al.</i> , 2007
Austria	83 870 km ²	260	Söderström <i>et al.</i> , 2007
Germany	357 000 km ²	252	Söderström <i>et al.</i> , 2007
France (mainland)	544 000 km ²	308	Söderström <i>et al.</i> , 2007
Belize	22 966 km ²	65	Whittemore & Allen, 1996
Costa Rica	51 100 km ²	582	Dauphin, 2005
Bolivia	1 100 000 km ²	417	Gradstein <i>et al.</i> , 2003
Brazil	8 511 965 km ²	700-750	Gradstein & Costa, 2003
Colombia	1 140 000 km ²	840	Uribe & Gradstein, 1998

hepatics known from the West Indies, but even this number means only 12.9% more than the number for Guadeloupe (27.3% more than the number for Dominica). Considering that within two weeks of field work in Guadeloupe samples including 29 new records of hepatics have been collected, it seems possible, that further field work on the island will raise the number to at least 350.

A comparison with the number of hepatics of European countries and Macaronesia (see table 1) elucidates the rich hepatic flora of Guadeloupe (and Dominica). In Macaronesia, Madeira (794 km²) has the largest number of hepatics with 170 species (= 50.9% of Guadeloupe and 57.4% of Dominica), followed by the Azores (2334 km²) with 158 species (= 47.3% of Guadeloupe and 53.4% of Dominica) and the Canary Islands (7500 km²) with 141 species (= 42.2% of Guadeloupe, 47.6% of Dominica). **No single European country reaches the number of hepatics of Guadeloupe**, and only France (544 000 km²) with 308 hepatic species has slightly more species (4%) than Dominica (Söderström *et al.*, 2007). However, many Central and South American countries have high numbers of hepatic species, and Colombia with 840 species may belong to the countries with the highest hepatic diversity in the world (more species than Sub-Saharan Africa with 713 and nearly twice as many as Europe with 434 species).

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