

## New records of bryophytes for Pernambuco State, Brazil

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**Abstract:** The known geographical distribution of 12 bryophyte species is extended by confirmation of their presence in the state of Pernambuco. *Leptoscyphus porphyrius* (Nees) Grolle, *Harpalejeunea uncinata* Steph., *Chryso-hypnum diminutivum* (Hampe) Buck and *Porotrichum korthalsianum* (Dozy & Molk.) Mitt. are new to northeastern Brazil. The material studied was collected in remnants of Atlantic Forest situated at altitudes of 100-1.100m. The principal taxonomic characteristics are cited, with ecological and distributional commentary provided.

**Resumo:** A distribuição geográfica conhecida de 12 espécies de briófitas é ampliada, com o registro de sua ocorrência no estado de Pernambuco. *Leptoscyphus porphyrius* (Nees) Grolle, *Harpalejeunea uncinata* Steph., *Chryso-hypnum diminutivum* (Hampe) Buck e *Porotrichum korthalsianum* (Dozy & Molk.) Mitt. constituem-se novas referências para a região Nordeste. O material estudado foi coletado em remanescentes da Floresta Atlântica, situados de 100 a 1.100m de altitude. Faz-se referência às principais características taxonômicas do material, bem como, breves comentários ecológicos e de distribuição geográfica.

### Introduction

As part of an ongoing study of the bryophyte flora of Pernambuco, this work presents information on 12 species reported here as new records for the state or for the entire northeast Region. Some of these species were previously cited in student research projects or theses (Valdevino 1995, Sá 1996).

### Material and methods

The material used in this study was collected on excursions carried out between 1992 and 1999. Seven municipalities within the state of Pernambuco were visited (Figure 1).

Specimens were deposited in UFP the Herbarium of the Department of Botany at the Federal University of Pernambuco (UFPE) in

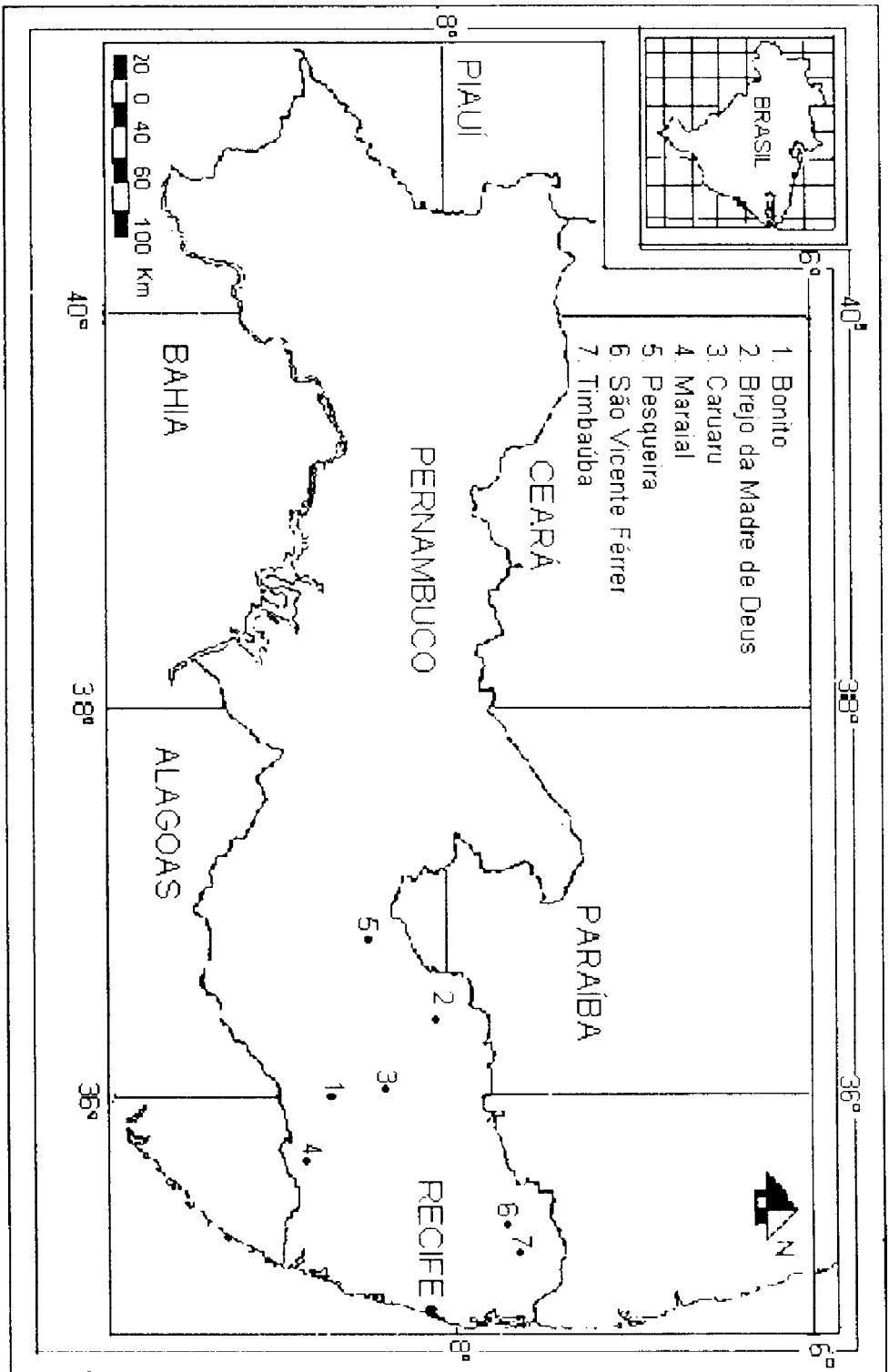


FIGURE 1. Map of Pernambuco state, with municipalities of collection indicated.

Recife.

Species are listed in alphabetical order according to family. Sources of descriptions and illustrations are indicated for each taxon, with commentaru on morphological characteristics, geographical distribution, and habitat.

## Results and Comments

### HEPATICOPSIDA

#### GEOCALYCACEAE

1. *Leptoscyphus porphyrius* (Nees) Grolle, Österr. Bot. Zeitschr. 117:3. 1969.

Description and illustration: Fulford (1976).

Specimen examined: Brazil, Pernambuco, Municipality of Bonito, Reserva Municipal, dead trunk, K. C. Pôrto, 28 /IV/1995 (UFP 24814).

Comments: *Leptoscyphus porphyrius* is characterized by its prostrate and medium sized, greenish brown to deep brown and irregularly branched gametophore; leaves are imbricate, succubous, rounded-quadrate, ca. 0,8 X 1,0mm, margin entire and apex truncate, cuticle smooth; hexagonal or sub-quadrate cells, (25-)30-35 µm diam, trigones well developed; underleaves connate with the leaves on one or both sides, 2,0-2,5 X stem width, bifid to ½ length, 2-3 lateral teeth; perianth exerted, laterally compressed and inflated below, mouth broad, truncate and undulate, 2-lateral keels.

Neotropical. In Brazil it has been reported for the states of Minas Gerais, Rio de Janeiro, São Paulo (Yano 1984) and Espírito Santo (Yano 1995). This is the first record for the Northeast region.

This species is found commonly above 500m altitude, growing on soil or tree bark.

The material was collected on a dead trunk in a shaded site in a submontane forest, ca. 720m altitude, associated with *Ceratolejeunea cubensis* (Mont.) Schiffn. and *Cheilolejeunea clausa* (Nees ex Mont.) Schust.

#### FRULLANIACEAE

2. *Frullania (Meteoriopsis) atrata* (Sw.) Nees, Syn. Hep. 464. 1833.

Description and illustration: Clark & Svihla (1945).

Specimen examined: Brazil, Pernambuco, Municipality of Caruaru, Brejo dos Cavalos, dead twig, K. C. Pôrto, 05/III/1998 (UFP 23754).

Comments: *Frullania atrata* is easily recognized by the pendent habit, more or less regularly pinnate or bipinnate branched gametophore, dark red to almost black; leaves convolute and apiculate, lobules narrowly cylindrical, 4-6 X longer than wide, occasionally lamellate, parallel or subparallel to the stem; cell walls with large trigones and occasionally intermediate thickenings; underleaves ovate, ca. 2 X longer than broad, 2-3(-4) X stem width, slightly convex line of insertion.

This is a common species of the subgenus *Meteoriopsis* within the neotropical zone. It has a wide distribution in Brazil; in the northeaster region it occurs in Bahia state, at ca. 1.150m (Yano & Costa 1992).

It usually is found growing pendently from branches and twigs in montane or submontane cloud forests, from 1.000m to 4.000m altitude (Kron 1988).

The material was collected on a decaying twig among litter in a shaded site in a submontane forest, ca. 940m altitude.

#### LEJEUNEACEAE

3. *Harpalejeunea uncinata* Steph., Hedwigia 35: 97. 1896.

Description and illustration: Evans (1903).

Specimen examined: Brazil, Pernambuco, Municipality of Bonito, Reserva Municipal, live trunk, K. C. Pôrto, 28/IV/1995 (UFP 24811).

Comments: *Harpalejeunea uncinata* is characterized by the small size of the gametophore, which is light green to yellow-green when dry; leaves ovate to falcate-ovate,

0,2-0,3mm long, margins entire to irregularly crenulate, apex acuminate ending in 4-5 cells; median cells isodiametrical, ca. 14µm diam., small trigones, ocelli basal, 2-3, sometimes obscure or inconspicuous with age, the same size or slightly larger than median cells; perianth oblong or obovate, ½ exerted, 5-keels.

This species is closely related to *H. subacuta* Evans, which has leaves shortly acute to short acuminate, with 1-2(3) cells in apex and entire margins.

Neotropical. In Brazil it is reported from Rio de Janeiro (Oliveira e Silva & Yano 1998). This is the first record for the Northeast region.

The material was collected on bark in submontane forest, ca. 720m altitude, in association with *Ceratolejeunea maritima* (Spruce) Steph.

4. *Lejeunea* (*Chaetolejeunea*) *trinitensis* Lindenb., in Gottsche et al., Syn. Hep.: 381. 1845.

Description and illustration: Schuster (1980) as *Rectolejeunea pililoba* (Spruce) Schust.

Specimen examined: Brazil, Pernambuco, Municipality of Maraial, live trunk, S. M. Oliveira, 12/I/1997 (UFP 24381).

Comments: Gradstein (1989) cites *Lejeunea trinitensis* as the valid epithet for *Rectolejeunea pililoba*. The subgenus *Chaetolejeunea* has been placed into *Rectolejeunea* (Schuster 1980), which includes the taxa with highly specialized lobules and dorsiventrally flattened perianth, characteristics uncommon in *Lejeunea*.

*Lejeunea trinitensis* is easily recognized by its small- or moderate-sized gametophore, which is pale or light green, leaves are subrounded, contiguous to slightly imbricate, without ocelli; typically reduced, filiform lobules, parallel to the stem, 6-10(-15) cells, tooth and hyaline papilla apical; underleaves distant, narrowly ovate, sinus U-shaped.

Neotropical. It is widely distributed throughout Brazil; in the Northeast region it is found in the states of Sergipe (Yano 1994) and

Bahia (Bastos et al. 1998). This species has been reported from sea level to ca. 800m altitude.

The material was collected on bark, ca. 150m altitude.

5. *Odontolejeunea lunulata* (Web.) Schiffn., in Engler & Prantl, Nat. Pflanzenfam. 1(3): 128. 1893.

Description and illustration: Gradstein (1994).

Specimens examined: Brazil, Pernambuco, Municipality of Caruaru, Reserva of Brejo dos Cavalos, on leaves, K. C. Pôrto, 10/VIII/1998 (UFP 22856); *ibid.* (UFP 23692).

Comments: *Odontolejeunea lunulata* is easily recognized by its green plants, becoming brownish green with age; leaves crisped and convoluted when dry, wide spreading when moist, with dentate margins, underleaves undivided, subrounded, (2-)3-4(-5) X stem width, dentate margins, insertion line arched; perianth 3-keeled, the 2 lateral keels dentate and a ventral keel slightly dentate or sometimes smooth.

This species is distributed in tropical America and Africa, from sea level to 3.000m altitude. It is widespread in Brazil; in the Northeast it is reported from the Serra de Baturité, Ceará state (Yano 1989).

This species grows on a wide range of substrates, although it is most common as epiphyllous.

The material was found over the leaves of *Heliconia* sp., at a humid site in submontane forest, ca. 900m., in association with *Crossomitrium patrisae* (Brid.) C. Muell., *Leptolejeunea elliptica* (Lehm. & Lindenb.) Schiffn. and other facultatively epiphyllous species.

## BRYOPSIDA

### ARCHIDIACEAE

6. *Archidium ohioense* Schimp. ex C. Muell., Syn. Musc. Frond. 2: 517. 1851.

Description and illustration: Sharp et al. (1994).

Specimens examined: Brazil, Pernambuco, Municipality of Maraial, on soil, J. A. Siqueira Filho, 24/IV/1997(UFP 22833); Municipality of São Vicente Férrer, Mata do Estado, on soil, J. P. N. Coimbra et al., 14/VI/1999 (UFP 25043).

Comments: The plants of *Archidium ohioense* are small to moderate size, single or rarely branched; leaves lanceolate or long-lanceolate to long-triangular, ca. 1,2-1,5mm long, loosely inserted to the stem; alar cells quadrate to short-retangular and costae percurrent to short-excurrent. The sporophyte is reduced to a sessile capsule, immersed, unistratose and cleistocarpic; the spores are very large and finely roughened.

This species is closely related to *A. alternifolium* (Dicks. ex Hedw.) Schimp., it is paroecious, while *A. ohioense* is autoecious with perigonia and perichaetia in short lateral branches.

A widely distributed species of tropical, subtropical and temperate zones. In Brazil it is only reported from the Northeast region: Paraíba (Yano 1993) and Bahia (Bastos & Bôas-Bastos 1998).

This species usually occurs on soil, along roadsides or banks of ditches (Sharp et al. 1994). The specimens were collected growing in loosely tufted populations, on wet soil, at forest edges, at 150 and at 800m altitude.

#### BRYACEAE

7. *Brachymenium exile* (Dozy & Molk.) Bosch. & Lac., Bryol. Jav. 1: 139. 1860.

Description and illustration: Sharp et al. (1994).

Specimen examined: Brazil, Pernambuco, Municipality of Brejo da Madre de Deus (950m), live trunk, O. Yano, 09/VIII/1998, det. O. Yano (UFP 24380).

Comments: *Brachymenium exile* are moderate-sized plants, yellowish green, usually unbranched or scarcely branched, leaves ovate to oblong, scarcely bordered, short acuminate, margins entire; cells hexagonal to linear-hexagonal, alar cells not differentiated, costae

percurrent, short to long-excurrent; capsule suberect, pyriform, 2-3mm long; small spores, 8-10 µm diam.

Pantropical. In Brazil this species has been reported only from the Federal District; this is the first record for the Northeast region.

*Brachymenium moracicum* Besch. also occurs in Pernambuco (Valdevino 1994), but can be distinguished from *Brachymenium exile*, principally by its lustrous leaves, long-excurrent costae, quadrate to subquadrate median cells, frequently hyaline upper cells and larger spores (14-20µm).

This species is found growing in relatively extensive tufts, usually on sunny to semi-shaded sites or tree trunks. The material was collected on a living tree, in submontane forest, ca. 950m altitude.

#### ENTODONTACEAE

8. *Entodon beyrichii* (Sw.) C. Muell., Linnaea 18: 708. 1845.

Description and illustration: Buck (1998).

Specimens examined: Brazil, Pernambuco, Municipality of Pesqueira, Brejo de Ororubá, live trunk and dead trunk, K. C. Pôrto, 27/XII/1996 (UFP 21572); Municipality of Brejo da Madre de Deus, Fazenda Bituri Grande, dead trunk, J. A. Valdevino, 21/10/1992 (UFP 09617), as *Erythrodontium squarrosus* (C. Muell.) Par.

Comments: *Entodon beyrichii* is easily identified by its medium- to relatively robust-sized plants, golden green to pale-green; leaves ovate to oblong, 0,6-0,8 X 1,2-1,5 mm, concave, acute to short acuminate; short and double costae, rarely reaching ½ to the midleaf; linear median cells, alar cells quadrate to subquadrate, sometimes extending to the costae; setae reddish, 1,5-2,0cm long, capsule erect, long-cylindric, ca. 4mm long, peristome papillose.

Neotropical. This species is common in lowland to elevated mesic forests. It is found in several regions of Brazil; in Northeast it is reported from Bahia (Yano 1981).

It grows on a wide range of substrates. The specimens were collected on rock and bark, in submontane forest, ca. 900m altitude.

#### HYPNACEAE

9. *Chryso-hypnum diminutivum* (Hampe) Buck, Brittonia 36: 182. 1984.

Description and illustration: Buck (1998).

Specimen examined: Brazil, Pernambuco, Municipality of Pesqueira, Brejo de Ororubá, live trunk, K. C. Pôrto, 27/XII/1996, det. O. Yano (UFP 23753).

Comments: *Chryso-hypnum diminutivum* can be recognized by its relatively small- to medium-sized plants, green to yellowish green, subpinnately branched; branch leaves ovate-lanceolate to oblong, ca. 0,6-1,0 X 0,4-0,5mm, margin serrulate from median region to apex, short and double costae; cells linear to oblong-linear with papillae at both ends, alar cells weakly differentiated, quadrate, or subquadrate to retangular, in 3-6 rows, setae elongate, reddish brown, 1,0-1,5 cm long.

Neotropical. In Brazil *Chryso-hypnum diminutivum* has been reported in several regions; this is the first record for the Northeast.

This species is found growing on a wide range of substrates, especially on dead wood or living trunks in mesic forest from sea level to the highest altitudes.

The material was collected on bark in submontane forest, at ca. 940m altitude.

10. *Vesicularia vesicularis* (Schwaegr.) Broth., in Engler & Prantl, Nat. Pflanzenfam. 1(3): 1094. 1908.

Description and illustration: Buck (1998).

Specimens examined: Brasil, Pernambuco, Municipality of Timbaúba, Engenho Água Azul, on rock, P. S. A. Sá, 24/VIII/1992 (UFP 10516); *ibid.* live root (UFP 10526); Municipality of São Vicente Férrer, Mata do Estado, M. A. Silva, 30/X/1998 (UFP 24645).

Comments: A very polymorphic species, characterized by moderate size, pale-green to yellowish green color, regularly or irregularly pinnate branched; leaves inserted in rows, stem and branch leaves differentiated; branch leaves ovate to oblong-ovate, symmetric or weakly asymmetric, ca. (0,5-)0,7 X 1,0 mm, ventral leaves smaller, gradually acuminate and truncate at base; median cells hexagonal to rhombic, alar cells scarcely differentiated; costae very short and double, or absent; setae elongate, reddish brown, 1,5-2,0cm long; capsule elliptic, caliptra cucullate, naked.

Neotropical. The species grows on a large variety of substrates from sea level to high elevations. It is widely distributed in Brazil; in the Northeast region it is reported from the states of Bahia (Yano & Bastos 1994/5) and Piauí (Castro 1997).

The material was collected on rocks and roots of living trees, in a shaded site, near a river in forest, at 150 and at 890m altitude.

#### METEORACEAE

11. *Zelometeorium patulum* (Hedw.) Manuel, J. Hattori Bot. Lab. 43: 118. 1977.

Description and illustration: Buck (1998).

Specimen examined: Brazil, Pernambuco, Municipality of Bonito, Reserva Municipal, dead twig, D. P. Costa, 06/VIII/1998 (UFP 23755).

Comments: *Zelometeorium patulum* can be identified by its pendent habit, irregularly pinnate, and differentiation of main stem and branch leaves; the stem leaves are erect to spreading; branch leaves wide-spreading to squarrose, ovate, ca. 1,5-1,8mm long, short or long-acuminate, rarely piliferous with cordate base; costae single and slender, usually ending near midleaf or to ca.  $\frac{3}{4}$  the leaf length; cells fusiform to linear and smooth, alar cells scarcely or not differentiated; no capsules seen.

Neotropical. This species occurs in several regions in Brazil; in the Northeast it was reported from Alagoas (Yano & Costa 1992) as *M. recurvifolium* (Hornsch.) Mitt., recently

considered to be a synonym of *Zelometeorium patulum* (Buck 1998).

This species usually grows pendent on branch and twig trees in tropical forests, from sea level to 2.500m. The material was collected on bark at a shaded site in submontane forest, ca. 720m altitude.

#### NECKERACEAE

12. *Porotrichum korthalsianum* (Dozy & Molke.) Mitt., J. Linn. Soc. Bot. 12:463. 1869.

Description and illustration: Buck (1998).

Specimens examined: Brazil, Pernambuco, Municipality of Timbaúba, Engenho Água Azul, on rock, P. S. A. Sá, 09/VII/1993 (UFP 10627); Municipality of Bonito, Reserva Municipal, live trunk, K. C. Pôrto, 21/I/1998 (UFP 24228); *ibid.*, S. R. Germano, 06/VIII/1998 (UFP 25042).

Comments: *Porotrichum korthalsianum* is recognized by its medium to moderately robust size, dark green color becoming yellow-green with age, stipitate-frondose habit; primary stems are prostrate with leaves reduced, spaced, spreading and long-acuminate; secondary branches erect, regularly to irregularly pinnate or bipinnate, flagellate branches frequently present; leaves complanate, ovate-ligulate, short acuminate, obtuse apex, concave base and margins serrate; costae single, sometimes forked, reaching ca.  $\frac{3}{4}$  the leaf length; cells fusiform, becoming ovate to rhombic toward the apex, smooth; no capsules seen.

*Porotrichum korthalsianum* is closely related to *P. mutabile* Hampe, which is pale to yellow-green and has leaves shorter with more obtuse apex (Buck 1998). It is related also to *P. substriatum* (Hampe) Mitt., which occurs in Pernambuco, as *P. plicatulum* Mitt. (Pôrto 1990), but can be separated from the latter species which has squarrose-recurved leaves on the primary stems and cells papillose at both ends (Buck 1998).

Neotropical. In Brazil this species has been found in Rio de Janeiro (Yano 1981) and Rio Grande do Sul (Lemos-Michel 1999); this

is the first record from Northeast region.

This species is found growing often on rocks in streams and trunks in humid forest, from 500m to 2.200m altitude (Florschütz-de Waard 1986, Buck 1998).

The material was collected at a humid and shaded site near a stream, at ca. 100 and at 500m altitude.

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