**Punctelia (Parmeliaceae, lichenized Ascomycota) from roadsides and slopes in the Serra Geral of Rio Grande do Sul, Brazil**

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**RESUMO**


**Palavras-Chave:** Punctelia, Parmeliaceae, liquens, Brasil, florística.

**ABSTRACT**

Seven species of Punctelia Krog from the roadsides and slopes of Geral Range, Rio Grande do Sul State central region, Brazil, are described, illustrated, and keyed, including comments about a positive medullary reaction to para-phenylenediamine, recorded for the first time in this genus.

**Keywords:** Punctelia, Parmeliaceae, lichens, Brazil, floristic.

**INTRODUCTION**

Krog (1982) proposed the genus *Punctelia* as a segregate of the collective genus *Parmelia* Ach., including those species characterized by atranorin (subgenus *Punctelia*) or usnic acid (subgenus *Flavopunctelia*) as cortical substances. *Flavopunctelia*, which has additionally bifusiform conidia, was recognized as a genus by Hale (1984). Therefore, *Punctelia*, with a mainly tropical distribution, remained to include those species with a green-gray upper cortex (atranorin), pseudocyphellae mainly orbicular, conidia uniciform or, less commonly, filiform, and marginal cilia lacking (Elix 1993). Kirk *et al.* (2001) and Egan & Aptroot (2004) accepted about 30 species of *Punctelia*, 16 already recorded for Brazil (Marcelli 2004), and 14 of them listed for Rio Grande do Sul State (Spielmann 2006).

This paper presents the species of *Punctelia* found during a *Parmeliaceae* survey of the slopes and cliffs of the Serra Geral (Geral Range), a central mountainous region of Rio Grande do Sul, the southernmost Brazilian state, which has a subtropical climate. The area is about 28°57′–29°41′S and 52°26′–53°01′W and is covered by several types of grasslands and subtropical forest vegetation, chiefly the deciduous forestal station (Rambo 1956). A more detailed overview of the studied area can be found in Spielmann (2005).

**MATERIAL AND METHODS**

The specimens were studied through classical lichenological methods. Lichen substances were identified by TLC and spot tests following Huneck & Yoshimura (1996), Orange *et al.* (2001) and Bungartz (2001).

We use here the term boundary to describe the underside part where the color change between the marginal and central portion of the thallus occurs. Boundaries are defined as clear-cut or attenuate (when a gradual color change is observed).

**RESULTS AND DISCUSSIONS**

**KEY TO THE SPECIES OF PUNCTELIA FOUND IN SERRA GERAL**

1 Thallus with soredia, isidia or lobulae ........... 2
   Thallus without soredia, isidia and lobulae ...... 4

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2(1) Thallus with soredia ................. P. reddenda
Thallus with isidia or lobulae ................. 3

3(2) Thallus isidiate, conidia filiform ................. P. colombiana
Thallus lobulate, conidia unciniform .......... P. constantimontium

4(1) Medulla with an orange pigment, reacting K+ purplish ................. P. purpurascens
Medulla entirely white ....................... 5

5(4) Lower surface brown, medulla with lecanoric acid (C+ red) ................. P. graminicola
Lower surface black or mottled white, medulla with gyrophoric acid (C+ rose or reddish) .... 6

6(5) Medulla with fatty acids and variable concentrations of gyrophoric acid (C+ rose or C-): ascospores 20.0–26.5 × 12.5–16.0 µm ...... P. riograndensis
Medulla with gyrophoric acid only; ascospores 11.0–15.0 × 7.5–12.0 µm ......... P. subpraesignis

**Punctelia colombiana** Sérus.

Type: Colombia, Dept. Antioquia, Medellín, ca. 1800 m alt., October 1930, Archer 1380 (holotype: S), fide Sérusiaux (1984).

*Thallus* greenish gray or brownish in herbarium, lobate, adnate, 18 cm broad; *lobes* irregularly branched, laterally overlapping, 1.5–8.0 mm wide, with rounded apices; *margin* smooth to crenate; *distal surface* smooth to rugose or sometimes foveolate, lustrous, pruinose close to the margin, becoming rugose and foveolate in the center. *Lacinulae, maculae, pustulae* and *soredia* lacking. *Isidia* concolorous with the thallus or with brown apices, cylindrical to coralloid or squamiform, 0.05–0.50 × 0.05–0.60 mm, erect, firm, abundant, marginal and on pseudocyphellae, with eilicate apices. *Pseudocyphellae* conspicuous, although normally covered by isidia, abundant, punctiform to irregular, elongated when on the wrinkles crests, convex to plane, not distinctly margined, (0.05–) 0.10–0.4 (–1.4) mm in diameter, laminal, originating isidia. *Medulla* white. *Lower surface* black, lustrous, smooth, rugose or papillate; *margin* brown, lustrous, 1–4 mm wide, naked, smooth, rugose or papillate, boundary clear-cut to attenuate; *rhizinae* black to pale brown, simple to irregularly branched, 0.10–1.40 × 0.02–0.20 mm, abundant, evenly dispersed. *Apothecium* very immature in our material, urceolate, stipitate, 1.6 mm of diameter, laminal, with smooth margin, amphithecia with pseudocyphellae, disc concave, pruinose, imperfect. *Ascospores* lacking [according to Sérusiaux (1984), ascospores ellipsoid, 14–16 (–17) × (9–) 10–12 (–13) µm, epispor 1 µm thick]. *Pycnidia* laminal to submarginal, rare, conspicuous, with or without prominent margin, ostiole black. *Conidia* filiform, 9–13 × ca. 1 µm.

**Chemistry.** Cortex K+ yellow, UV–; medulla K–, C+ intense rose, KC+ intense rose, P–, UV–; containing atranorin (cortex) and gyrophoric acid (medulla).

**Specimen examined.** Brazil, Rio Grande do Sul State, Sinimbu Municipality, Cava Funda, 29°27’33.4”S, 52°31’05.1”W, 520 m alt., saxicolous, on roadside, open place, 05 January 2004, A.A. Spielmann & L.S. Canêz 1000 (SP).

**Notes.** The presence of isidia, black lower surface, filiform conidia, and gyrophoric acid (C+ intense rose) characterize *Punctelia colombiana*. *Punctelia constantimontium* Sérus. also has a black lower surface and produces gyrophoric acid, but its conidia are uniciform and the lobulae are always flat, never developing into isidia. *Punctelia stictica* (Delise ex Duby) Krog differs by the presence of granular soredia, sometimes mixed with “isidioid structures” (Adler 1996). *Punctelia colombiana* was recently found in Brazil (Canêz 2005), and this is the second record for this country.

**Distribution.** Argentina (Adler 1989, Calvelo & Liberatore 2002), Brazil (Canêz 2005) and Colombia (Sérusiaux 1984). In Brazil, it is known from Rio Grande do Sul State (Canêz 2005, Spielmann 2005).

**Punctelia constantimontium** Sérus.


*Thallus* greenish gray or brownish in herbarium, lobate, adnate, corticolous or saxicolous, 8.5–13.5 cm broad; *lobes* irregularly branched, laterally overlapping, 1–7 mm wide, with rounded apices; *margin* crenate to incised; *surface* smooth to rugose and foveolate, pruinose on the lobe apices. *Lacinulae, maculae, pustulae, soredia* and *isidia* lacking. *Lobulae* laminal to marginal, irregularly incised, numerous and covering most of the thallus, become imbricate and erect with ageing, 0.05–2.00 × 0.05–1.50 mm, lower cortex entire or soon becoming eroded and showing the medullary tissue, upper surface usually pruinose and sometimes with small pseudocyphellae. *Pseudocyphellae* conspicuous, more dense in the distal areas, abundant, punctiform, ellipsoid or irregular to elongated, especially along ridges, plane to concave or rarely little convex, 0.10–10.00 × 0.10–0.40 mm, laminal, on the thallus ridges, and marginal on the lobulae, becoming lobulate toward the thallus center. *Medulla* white. *Lower surface* black, lustrous, smooth to papillate or rugose; *margin* pale brown to dark brown, sometimes white variegated, lustrous, 1–3 mm wide, naked, smooth, rugose or slightly foveolate, boundary clear-cut to attenuate; *rhizinae* black, cream, white or white with a black base, simple to irregularly branched, 0.10–1.50 × 0.02–0.20 mm, abundant, evenly dispersed. *Apothecia* urceolate, 0.5–4.2 mm in diameter, stipitate, laminal, with crenate margin, amphithecia pseudocyphellate and verruculose, disc brown, pruinose,
imperforate; **epithecium** 7-10 µm; **hymenium** 35–50 µm; **subhymenium** 12–25 µm. **Ascospores** ellipsoid to subglobose, 13.0–16.5 × 7.5–10.0 µm, epispore ca. 1.0 µm.

**Pyenia** submarginal, ostiole black. **Conidia** unciniform, 4.0–6.5 × ca. 1.0 µm.

**Chemistry.** Cortex K+ yellow, UV–; medulla K–, C+ rose, KC+ rose, P–, UV–; containing atranorin (cortex), gyrophoric acid and an unidentified substance with Rf 22 (orcinyl lecanorinate?) in solvent C (medulla).

**Specimens examined.** Brazil, Rio Grande do Sul State. Boqueirão do Leão Municipality, Linha Sinimbuzinho, Peru da Nega, 29°20'02.2"S, 52°26'27.9"W, 440 m alt., saxicolous, on roadside, slightly shaded, 24 February 2004, A.A. Spielmann & L.S. Canêz 720 (SP); idem, on boulder, close to the stream and the street, slightly shaded, 24 February 2004, A.A. Spielmann & L.S. Canêz 936 (SP), 1321 (SP). Idem, Herveiras Municipality, next to “Balneário Tio Juba”, corticolous, on roadside, shaded, 06 February 2004, A.A. Spielmann & L.S. Canêz 1370 (SP). Idem, Sinimbu Municipality, Cava Funda, 29°27'33.4"S, 52°31'05.1"W, 520 m alt., saxicolous, on roadside, open place, 05 January 2004 A.A. Spielmann & L.S. Canêz 978 (SP).

**Notes.** *Punctelia constantinontium* is characterized by the abundant flat lobulae, black lower surface, gyrophoric acid (C+ rose) and unciniform conidia. *Punctelia colombiana* differs by the isidiate thallus (with some flattened isidia) and filiform conidia. In the specimens Spielmann & Canêz 720 and 978 the lobulae under margin is decorticated. However, in Spielmann & Canêz 720 the underside has shiny dark brown margins, while in Spielmann & Canêz 978 the underside has a wide pale brown opaque margin. The only specimen with apothecia (Spielmann & Canêz 1370) has crowded lobes, pruinose at lobe tips, and the lobulae generally rise as small isidia, soon becoming flattened.

**Distribution.** Africa and South America (Sérisiaux 1983, Swinscow & Krog 1988). In South America it is known from Argentina (Sérisiaux 1983, Calveto & Liberatore 2002), Brazil (Marcelli 2004) and Uruguay (Osorio 1992a; Sérisiaux 1983). In Brazil it was recorded in the States of Mato Grosso do Sul (Osorio 1992b), Mato Grosso (Sérisiaux 1983), Paraná (Eliasaro 2001), Rio Grande do Sul (Spielmann 2006) and Santa Catarina (Sérisiaux 1983).

*Punctelia graminicola* (B. de Lesd.) Egan


**Basionym:** Parmelia graminicola B. de Lesd., Revue Bryologique et Lichénologique 12: 59, 1942.

**Type:** United States, New Mexico, Chimayo Dam, 1.900 m alt., 18 July 1935, Arsène 22533 (lectotype: ASU), fide Egan (2003).


*Thallus* greenish gray or brownish in herbarium, lobate, adnate, corticolous or saxicolous, 3.0–14.5 cm broad; **lobes** irregularly branched, laterally overlapping to crowded, 1.0–4.5 mm wide, with rounded apices; **margin** crenate to incised-crenate (sublacinulate); surface smooth to rugose and foveolate. **Lacinulae** present or lacking. **Maculae**, **pustulae**, **soredia** and **isidia** lacking. **Pseudocyphellae** conspicuous, abundant, punctiform, rounded to irregular, generally concave, 0.03–0.60 × 0.03–0.40 mm, laminal and on the amphitheicum. **Medulla** white. **Lower surface** brown to olivaceous brown, lustrous, smooth, rugose, veined or papillate; **margin** usually indistinct or pale brown to beige, lustrous, naked, papillate; **rhizinae** brown, white, beige or grayish,简单 to irregularly branched, often flattened, 0.10–3.50 × 0.01–0.20 mm, abundant, evenly dispersed. **Apothecia** urceolate, 1–9 mm of diameter, stipitate, laminal, margin crenate to smooth, amphitheicum pseudocyphellate, striate and areolate, disc brown, epruinose, imperforate. **Ascospores** ellipsoid to subglobose, 10.0–14.0 × 6.5–10.0 µm, epispore 0.8–1.2 µm.

**Pyenia** submarginal, ostiole black. **Conidia** unciniform, 4.0–7.0 × ca. 1.0 µm.

**Chemistry.** Cortex K+ yellow, UV–; medulla K–, C+ red, KC+ red, P–, UV–; containing atranorin (cortex, not detected in TLC, but indicated by spot test) and lecanoric acid (medulla).

**Specimens examined.** Brazil, Rio Grande do Sul State. Boqueirão do Leão Municipality, Cascata do Gamelo, 29°18'13.7"S, 52°26'51.7"W, 500 m alt., in a tree branch with mosses, on the edge of a stream, diffuse light, 01 February 2004, A.A. Spielmann & M.A. Sulzbacher 747 (SP). Idem, Herveiras Municipality, 29°27'12.5"S, 52°37'57.7"W, 540 m alt., on trunk of Eucalyptus, on roadside, open place, 24 January 2004, A.A. Spielmann, L.S. Canêz & C. Trentin 730 (SP), 1309 (SP); idem, 29°25'53.7"S, 52°40'19.6"W, 570 m alt., on trunk of Eucalyptus, on roadside, open place, 24 January 2004, A.A. Spielmann, L.S. Canêz & C. Trentin 1326 (SP). Idem, Sinimbu Municipality, Cava Funda, 29°27'41.8"S, 52°31'11.7"W, 500 m alt., saxicolous, on roadside, open place, 12 February 2003, A.A. Spielmann 73 (SP); idem, 29°27'33.4"S, 52°31'05.1"W, 520 m alt., saxicolous, on roadside, open place, 05 January 2004, A.A. Spielmann & L.S. Canêz 721 (SP). Idem, Sobradinho Municipality, margin of RST-481, next to the crossroad, 29°24'20.2"S, 53°01'25.9"W, 375 m alt., saxicolous, on roadside, open place, 17 July 2003, A.A. Spielmann 358 (SP).

**Notes.** *Punctelia graminicola* is a species with or without lacinulae, characterized by the brown lower surface, presence of lecanoric acid (medulla C+ red), and unciniform conidia. *Punctelia hypoleucites* (Nyl.) Krog is differentiated by the 11–12 µm long filiform conidia (Culberson & Culberson 1980). *Punctelia riograndensis* (Lynge) Krog and *P. subpraesignis* (Nyl.) Krog have a black or white variegated lower surface and gyrophoric acid in the medulla (C+ rose or red). It must be noted, however, that the concept of *Punctelia graminicola*
currently in use is very broad, since it includes specimens without lacinulae (Fig. 04) as well as completely lacinulate ones (Fig. 05).

Punctelia graminicola was formerly widely known as *P. semansiana* (W.L. Culb. & C.F. Culb.) Krog, until Egan (2003) discovered an older name. The epithet *graminicola* suggests that the lichen was collected on some *Gramineae*, but Bouly de Lesdain (1942) asserted that the substrate consisted of mosses and *Selaginella* (a spikemoss).

**Distribution.** Africa (Swinscow & Krog 1988, as *Punctelia semansiana*), North America (Lamb 1963; Esslinger 2007; Egan & Apton 2004), and South America (Marcelli 2004, as *P. semansiana*). In South America it is known from Argentina (Adler 1989, Calvelo & Liberatore 2002, both as *P. semansiana* and Brazil (Marcelli 2004, as *P. semansiana*). In Brazil it was recorded in the States of Minas Gerais (Ribeiro 1998, as *P. semansiana*), Paraná (Eliasaro 2001, as *P. semansiana*), Rio Grande do Sul (Spielmann 2006), and São Paulo (Ribeiro 1998, Marcelli 1998, both as *P. semansiana*).

**Punctelia purpurascens** Marcelli & Canêz


Type: Brazil, Rio Grande do Sul State, Municipality of Vacaria, Fazenda da Estrela, open field, 28°04'01.8"S, 50°57'45.4"W, 920 m alt., on a basaltic rock in an open place, leg. L. S. Canêz & A. A. Spielmann 869, 13-I-2004 (holotype: SP), fide Canêz & Marcelli (2007).

**Thallus** greenish gray or pale brownish in herbarium, lobate, adnate, corticolous, 13 cm broad; lobes irregularly branched, laterally overlapping to crowded, 1.5–6.0 mm wide, with rounded apices; margin crenate to incised-crenate (sublacinulate); surface rugose. *Lacinulae* simple to branched, 0.5–4.0 × 0.3–2.0 mm, with rounded to slightly acute apices. *Maculae*, *pustulae*, *soredia* and *isidia* lacking. *Pseudocyphellae* inconspicuous, abundant, punctiform to ellipsoid or elongated, concave to convex, 0.05–0.30 × 0.05–0.20 mm, laminal, often raising in cortical protuberances. *Medulla* white or orange-pigment. *K*+ purplish or brown, lustrous, smooth to rugose or veined; margin concolorous with the center of the thallus, naked; *rhizinae* concolorous with the lower surface, simple to irregularly branched, 0.10–2.00 × 0.01–0.20 mm, abundant, evenly dispersed. *Apothecia* lacking (description in Canêz & Marcelli 2007).

**Pycnidia** usually submarginal, sometimes reaching the margin, with or without prominent margin, ostiolar black. *Conidia* inconspicuous, 4.0–6.5 × ca. 1.0 µm.

**Chemistry.** Cortex *K*+ yellow, UV−; white medulla *K*−, KC−, P−, UV−; orange medulla *K*+ ilic to purple; containing atranorin (cortex, not detected by TLC) and caperatic acid (medulla).

**Specimen examined.** Brazil, Rio Grande do Sul State, Herveiras Municipality, 29°25'53.7"S, 52°40'19.6"W, 570 m alt., at the base of a shrub, on roadside, open place, 24 January 2004, A.A. Spielmann, L.S. Canêz & C. Trentin 1007 (SP).

**Notes.** *Punctelia purpurascens* is characterized by the lower surface beige to dirty white, medulla white or with an orange pigment, *K*+ purplish, and unciniform conidia. This recently proposed (Canêz & Marcelli 2007) species is the second *Punctelia* described with a medullary pigment, the first one noted being *P. neutralis* (Hale) Krog (Krog & Swinscow 1977, Krog 1982).

**Distribution.** Known only from Rio Grande do Sul State, southern Brazil (Canêz & Marcelli 2007 and the present report).

**Punctelia reddenda** (Stirton) Krog


**Thallus** brownish in herbarium, lobate, adnate, saxicolous, 5.0–7.5 cm broad; lobes irregularly branched, laterally overlapping, 1.0–5.5 mm wide, with rounded apices; margin crenate to incised-crenate (sublacinulate); surface smooth to rugose. *Lacinulae*, *maculae*, *pustulae* and *isidia* lacking. *Soralia* capitulate, laminal or marginal to submarginal, usually arising from pseudocyphellae, commonly confluent in the older parts; *soredia* coarse granular. *Pseudocyphellae* conspicuous, abundant, punctiform, ellipsoid to irregular, usually convex, 0.05–0.80 × 0.05–0.40 mm, laminal to marginal, giving rise to soredia, lobes or lacinulae. *Medulla* white. *Lower surface* black, lustrous, smooth to rugose or veined; margin brown, lustrous, 1–3 mm wide, naked, smooth, rugose, veined or papillate, boundary clear-cut to attenuate; *rhizinae* black to pale brown, often with paler apices, simple, sometimes coalescing, 0.10–1.00 × 0.02–0.15 mm, frequent, evenly dispersed.

*Apothecia* unknown.

**Pycnidia** lacking [according to Canêz (2005), pycnidia submarginal, ostiolar black, 0.05–0.10 mm of diameter; *conidia* inconspicuous, 5.0–7.0 × 1.0 µm].

**Chemistry.** Cortex *K*+ yellow, UV−; medulla *K*−, *C*−, *KC*−, *P*−, UV−; containing atranorin (cortex), prasorediosic acid, protoprasorediosic acid, protolichisterinic acid, and an unidentified fatty acid with Rf 44 in solvent C (medulla).

**Specimen examined.** Brazil, Rio Grande do Sul State, Sinimbu Municipality, Cava Funda, 29°27’33.4”S, 52°31’51.5”W, 520 m alt., saxicolous, on roadside, open place, 05 January 2004, A.A. Spielmann & L.S. Canêz 977 (SP).

**Notes.** *Punctelia reddenda* is distinguished by the sorediate thallus, black lower surface and medulla with only fatty acids (negative with all spot tests). *Punctelia appalachensis* (W.L. Culb.) Krog has also a black lower...
surface and a medulla negative to spot tests, but forms abundant laminal and marginal lobulae instead of soredia (Culberson 1962, Hale 1965). *Punctelia borreri* (Sm.) Krog, a sorediate species with a black lower surface, produces gyrophoric acid (medulla C+ rose; Swinscow & Krog 1988).

*Distribution.* Africa (Krog & Swinscow 1977, Swinscow & Krog 1988), Europe (Culberson 1962, Krog 1970, Purvis et al. 1992), North America (Esslenger 2007), and South America (Feuerer 2005). In South America it is known from Brazil (Marcelli 2004), Chile and Venezuela (Feuerer 2005). In Brazil it was recorded in the States of Minas Gerais (Ribeiro 1998), Rio Grande do Sul (Spielmann 2006) and São Paulo (Marcelli 1998, Jungbluth 2006).

**Punctelia riograndensis** (Lyne) Krog


*Thallus* greenish gray, lobate, adnate, corticolous, 6.0–8.5 cm broad; *lobes* irregularly branched, laterally overlapping to crowded, 1.5–6.0 mm wide, with rounded apices; *margin* smooth to irregularly crenate or erose in older parts; *surface* smooth to rugose or scrobiculate, covered by numerous nodules (starting apothecia?); *lacinulae* lacking, except for some adventitious irregular projections unevenly distributed along the older margins. *Maculae, pastulae, soredia* and *isidia* lacking. *Pseudocyphellae* conspicuous, abundant, punctiform to ellipsoid or irregular, plane, 0.05–0.25 × 0.05–0.15 mm, laminal, usually at the thallus ridges, and on the amphitheicum. *Medulla* white. *Lower surface* black to white variegated, lustrous, smooth, rugose, papillate or veined; *margin* brown to dark reddish brown, usually white variegated, lustrous, 1–3 mm wide, naked, smooth, rugose, papillate or veined, boundary clear-cut to attenuate; *rhizinae* black to grayish or concolorous with the lower surface, usually with pale apices, or entirely white, simple to irregularly branched, cylindrical or sometimes flattened, sometimes coalescing, 0.10–1.00 × 0.01–0.30 mm, frequent, evenly dispersed. *Apothecia* urceolate, 0.5–3.7 mm in diameter, stipitate, laminal to submarginal, *margin* smooth to crenate or dentate, amphitheicum pseudocyphellate, sometimes slightly escrobiculate, stipe longitudinally rugose, disc brown, entire or incised, epruinose, imperforate; *epithecium* 7–14 µm; *hymenium* 50–70 µm; *subhymenium* 25–35 µm. *Ascospores* ellipsoid to ovoid, with one or two slightly spiky apices, 20.0–26.5 × 12.5–16.0 µm, episporae 1.5–2.0 µm.

**Pycnidia** submarginal to laminal, usually with a prominent margin, ostiolar black. *Conidia* unciniform, 4–7 × ca. 1 µm.

**Chemistry.** Cortex K+ yellow, UV–; medulla K–, C–, KC+ rose or KC– in the same thallus, P–, UV–; containing atranorin (cortex, not detected by TLC), gyrophoric acid (trace) and a unidentified fatty acid RF 42 in solvent C (medulla).

**Specimens examined.** Brazil, Rio Grande do Sul State. Herveiras Municipality, 29°27′12.5″S, 52°37′57.7″W, 540 m alt., on trunk of *Eucalyptus*, on roadside, open place, 24 January 2004, A.A. Spielmann, L.S. Canêz & C. Trentin 1369 (SP). Idem, Sobradinho Municipality, edge of RST–481 road, next the crossroad, 29°24′20.2″S, 53°01′25.9″W, 375 m alt., corticolous, on roadside, open place, 17 July 2003, A.A. Spielmann 328 (SP).

**Notes.** The absence of vegetative propagules, medulla C–, KC– or KC+ rose in a same thallus (amount of gyrophoric acid small and variable), large ascospores (20.0–26.5 × 12.5–16.0 µm), unciniform conidia and a black or white variegated lower surface identify *P. riograndensis*. Other morphologically similar *Punctelia* species without vegetative propagules and with a black lower surface can be distinguished in the following way: *Punctelia subpraesignis* (Nyl.) Krog is similar by the unciniform conidia, however has a constant amount of gyrophoric acid (medulla always C+ rose or red) and smaller ascospores (11.0–15.0 × 7.5–12.0 µm). *Punctelia negata* (Nyl.) Krog has ascospores of similar size, 22–25 × 10–13 µm on the type specimen (Krog & Swinscow 1977). Nevertheless, gyrophoric acid is lacking and the conidia are filiform (Krog 1982, Ribeiro 1998, Eliasaro 2001). However Lyne (1914), on the basis of Nylander’s description, claimed that *P. negata* is an isidiate species, both the holotype (H!, a small fragment of a central portion of thallus) and isotype (M! several fragments) have no isidia at all, but many small marginal vegetative lobulae. In *P. microsicta* (Müll. Arg.) Krog, gyrophoric acid is lacking (Hale 1960), the ascospores are smaller (16.0–20.0 × 10.5–14.0 µm), and the conidia filiform, 16–20 µm long (Lyne 1914).

The type of *P. borrerina* (Nyl.) Krog, described from Rio Grande do Sul State, is a mixture of C+ and C– thalli with two distinct ascosporous sizes (Krog & Swinscow 1977). According the original description of Nylander (1896), this species is C–, KC–, and should have long filiform conidia, since he describes the presence of “spermata sicut is Parmelia stictica Del. … 10.0–18.0 × 0.5 µm”, information confirmed by Canêz (15.0–19.0 µm long, pers. comm.), who is studying the type material, and by Adler (1996) based upon material from South and North America. Both these characters distinguish *Punctelia borrerina* from *P. riograndensis*. However, Krog (1982) keyed out *P. borrerina* based in the presence of unciniform conidia, without stating the source of this information. The specimen Spielmann 328 (Fig. 09) has a thallus covered by nodules (apothecia primordia?) and the underside margin usually white variegated, features not mentioned in the literature on *Punctelia riograndensis* (Eliasaro 2001, Ferraro 1986, Krog & Swinscow 1977, Lyne 1914, Ribeiro 1998, Sérusiaux 1983). However, as ascospores and conidia agree with the published descriptions, and since it was not possible to decide the nature of the nodules, the specimen is treated provisionally as a variation of *P. riograndensis*. 

Punctelia subpraesignis (Nyl.) Krog


Thallus greenish gray, lobate, adnate to loosely adnate, corticolous or saxicolous, 4.5–14.0 cm broad; lobes irregularly branched, laterally overlapping, 1.0–5.5 mm wide, with rounded usually pruinose apices; margin smooth, crenate, incised or erose; surface smooth to more often rugose and scrobiculate. Lacinulae, maculae, pustulae, soredia and isidia lacking. Pseudocyphellae conspicuous, abundant, punctiform, usually rounded or ellipsoid, at times more elongated, plane to concave or sometimes convex, 0.05–0.60 × 0.05–0.30 mm, laminal to marginal, commonly on small protuberances, and on the amphitheicum. Medulla white or sometimes slightly rose. Lower surface black, lustrous to opaque, smooth, papillate or rugose; margin pale brown or beige to dark brown, sometimes white variegated, lustrous or almost opaque, 0.5–2.5 mm wide, bare or papillate, smooth to rugose, boundary clear-cut to attenuate; rhizinae black, brown, beige or brown with beige apices, simple to irregularly branched, 0.10–2.00 × 0.02–0.20 mm, frequent to abundant, evenly dispersed to somewhat aggregate. Apothecia urceolate to concave, 0.3–12 mm in diameter, stipitate, laminal, margin smooth to finely crenulated or crenate, amphitheicum pseudocyphellate and verruculose, sometimes foveolate when old; disc brown, pruinose, imperforate; epithecium 5–12 μm; hymenium 50–70 μm; subhymenium 15–25 μm. Ascosporae ellipsoid to subglobose, 11.0–15.0 × 7.5–12.0 μm, epispore ca. 1.0 μm. Pycnidia submarginal to laminal, ostiole black. Conidia unicellular, 4–7 × ca. 1.0 μm.

Chemistry. Cortex K+ yellow, UV–; medulla K–, C+ rose or red, KC+ rose or red, P–, UV–; containing atranorin (cortex, traces) and glyphoric acid (medulla).

Specimens examined. Brazil, Rio Grande do Sul State. Herveiras Municipality, 29°25′53.7″S, 52°40′19.6″W, 570 m alt., on roadside Eucalyptus trunk, open place, 24 January 2004, A.A. Spielmann, L.S. Canêz & C. Trentin 1329 (SP); idem, next to “Balneário Tio Juba”, corticolous, on roadside, shaded place, 06 February 2004, A.A. Spielmann & L.S. Canêz 691 (SP). Idem, 29°27′12.5″S, 52°37′57.7″W, 540 m alt., roadside, saxicolous in open place, 24 January 2004, A. A. Spielmann, L. S. Canêz & C. Trentin 939 (SP). Idem, Sinimbu Municipality, Cava Funda, 29°27′33.4″S, 52°31′05.1″W, 520 m alt., saxicolous, on roadside, open place, 05 January 2004, A.A. Spielmann & L.S. Canêz 686 (SP), 756 (SP), 975 (SP). Brazil, Rio Grande do Sul State, Herveiras Municipality.

Notes. The absence of vegetative propagules, the black lower surface, medulla with glyphoric acid (C+ rose or red), and unicellular conidia characterize *P. subpraesignis* (see other species with a black lower surface and without vegetative propagules under the *P. riograndensis*).

The specimen Spielmann 939 (SP) is C+ red → orange, KC+ red → orange, P+ orange, and has the following chemistry: atranorin [minor], chloroatranorin [trace], glyphoric acid [major], orcinyl lecanorate [major], lecanoric acid [trace], orcinyl orsellinate [trace] (Elix, pers. comm.). This is the first *Punctelia* species reported with a positive medullary reaction with P. At first, we thought this would be a new species, but more specimens are required to confirm this.

Distribution. Africa (Krog & Swinscow 1977, Swinscow & Krog 1988), North America (Culberson 1962, Wilhelm & Ladd 1992, Esslinger 2007) and South America (Feuerer 2005). In South America it is known from Argentina (Zahlbrucker 1930, Culberson 1962, Calvelo & Liberatore 2002), Bolivia (Feuerer et al. 1998), Brazil (Marcelli 2004) and Uruguay (Osorio 1992a). In Brazil it was recorded in the States of Paraná (Eliasro 2001), Rio Grande do Sul (Ferraro 1986, Spielmann 2006) and São Paulo (Marcelli 1998).

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Figure 1: *Punctelia colombiana* (A.A. Spielmann & L.S. Canêz 1000). Scale in milimeters.

Figure 2: *Punctelia constantimontium* (A.A. Spielmann & L.S. Canêz 1370). Scale in milimeters.
Figure 3: *Punctelia graminicola* (A.A. Spielmann 73). Scale in millimeters.

Figure 4: *Punctelia graminicola*, thallus with lacinulae (A.A. Spielmann & M.A. Sulzbacher 747). Scale in millimeters.
Figure 5: *Punctelia purpurascens* (A.A. Spielmann, L.S. Canêz & C. Trentin 1007). Scale in milimeters.

Figure 6: *Punctelia reddenda* (A.A. Spielmann & L.S. Canêz 977). Scale in milimeters.
Figure 7: *Punctelia riograndensis* (A.A. Spielmann, L.S. Canêz & C. Trentin 1369). Scale in millimeters.

Figure 8: *Punctelia riograndensis*, with arrows indicating the nodules (A.A. Spielmann 328). Bar = 1 cm.
Figure 9: *Punctelia subpraesignis* (A.A. Spielmann & L.S. Canéz 686). Scale in millimeters.

Figure 10: *Punctelia subpraesignis* (A.A. Spielmann, L.S. Canéz & C. Trentin 939), specimen P+ orange. Scale in millimeters.