



## Discovery of *Russula rubropunctatissima* in Brazil

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### Abstract

*Russula rubropunctatissima* (Russulaceae), a species described from French Guiana, was collected for the first time in Northeast Brazil. It is characterized mostly by the reddish brown pileus, granules on the pileus and stipe and the small basidiospores  $4.6\text{--}6.1 \times (4.1\text{--})5.1\text{--}5.6 \mu\text{m}$ , that differ from the purplish-lilaceous species of the subsection *Pluviales*.

**Key words** – Agaricomycetes – Basidiomycota – Neotropic – Russulales – taxonomy

### Introduction

*Russula* Pers. has been recently receiving more attention in Brazil in the last few years. There are 17 species reported from Brazil, in the States of Amazonas, Paraná, Pernambuco, Rio Grande do Sul, Rondônia and São Paulo (Sá et al. 2013). In northeast Brazil, records were performed in the State of Pernambuco with *R. batistae* Singer, *R. metachromatica* ssp. *notholeuca* nom. inval., *R. pluvialis* Singer and *R. ominileuca* Sá & Wartchow (Singer 1955, Singer et al. 1983, Sá & Wartchow 2016). Here we report an interesting finding of a striking *Russula*, *R. rubropunctatissima*, previously described from French Guyana and now from Pernambuco State, Northeast Brazil.

### Materials & Methods

Data about the collection site and methodology of microscopic analysis were already briefly described by Sá & Wartchow (2016). Color codes follow Kornerup & Wanscher (1978). The material examined is deposited at UFRN-Fungos (Thiers, continuously updated).

### Results

*Russula rubropunctatissima* Cheype & E. Campo, Bull. Soc. Mycol. Fr. 128: 128. 2012. Figs 1–9

Basidiomata small, gregarious. Pileus 12–45 mm in diam., depressed, reddish brown (8D8), pellis dry, smooth at the center to wrinkled toward the margin with granules reddish brown and with concentric lines; margin smooth, decurved to straight; context up to 3 mm thick, pale cream, unchanging. Lamellae adnate, crowded, cream (4A3) with some brownish (6D8) spots, edge

smooth and entire, repeatedly dichotomously bifurcating with different lengths. Stipe 10–38 × 4–8 mm, central, subequal sometimes slightly narrowing downward, reddish brown (9F8), breaking into conspicuous concolorous granules over all lengths; context pale cream, unchanging, apparently hollow. Latex absent.

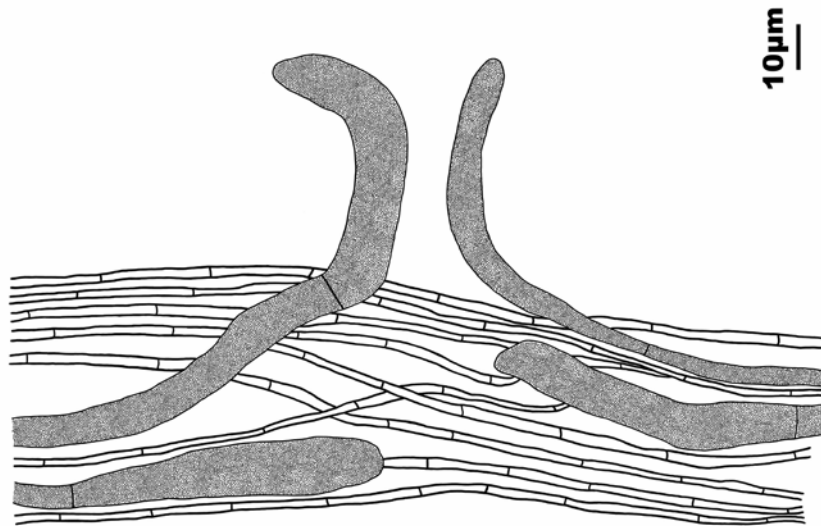


**Fig. 1** – *Russula rubropunctatissima*. Basidiomes.

Basidiospores  $4.6\text{--}6.1 \times (4.1\text{--})5.1\text{--}5.6 \mu\text{m}$  ( $L = 5.5 \mu\text{m}$ ,  $W = 4.9 \mu\text{m}$ ,  $Q = 1.00\text{--}1.22\text{--}(1.25)$ ,  $Q_m = 1.12$ ), globose to broadly ellipsoid; ornamentation amyloid, with irregular warts up to  $0.3 \mu\text{m}$  high, conic and isolated. Basidia  $22\text{--}36 \times 4\text{--}8 \mu\text{m}$ , clavate, 4 sterigmata  $2\text{--}3 \mu\text{m}$  wide. Lamella edge sterile, marginal cells  $15\text{--}16 \times 4\text{--}5 \mu\text{m}$ , clavate, thin-walled and hyaline in KOH3%. Macropleurocystidia abundant,  $60\text{--}90 \times 6\text{--}13 \mu\text{m}$  wide, capitate, rarely cylindrical and brownish in KOH3%, thin-walled. Hymenophoral trama heteromerous, with abundant isodiametric cells  $11\text{--}33 \times 8\text{--}22 \mu\text{m}$  and hyphae with  $2\text{--}3 \mu\text{m}$  diam. Subhymenium with oleiferous hyphae frequent  $6.5\text{--}8 \mu\text{m}$  diam, brownish in KOH3%. Pileipellis reddish brown to brown in KOH 3%; composed of abundant interwoven and radically orientated hyphae  $2\text{--}10 \mu\text{m}$  wide  $\mu\text{m}$ , sphaerocysts  $15\text{--}38 \times 15\text{--}35 \mu\text{m}$  at the base of the dermatocystidia; epicutis with abundant macrodermatocystidia  $25\text{--}68 \times 7\text{--}13 \mu\text{m}$ , capitate, fusoid and cylindrical, some with incrustations in sulfovanyliln, thin-walled; subcutis with abundant and large dermatocystidia  $41\text{--}82 \times 7\text{--}14 \mu\text{m}$ , rarely ascending, without incrustations in sulfovanyliln and reddish brown in KOH 3%. Stipitipellis similar to pileipellis in structure, with caulocystidia up to  $40\text{--}75 \times 8\text{--}13 \mu\text{m}$ , capitate to fusoid and cylindrical, with incrustations in sulfovanyliln and reddish brown in KOH 3%, thin-walled. Clamp connections absent.

Known distribution – French Guiana and Pernambuco, northeast Brazil. Duque Barbosa (2016) reported in his unpublished dissertation this species from Santa Catarina in South Brazil.

Material examined – Brazil, Pernambuco, Caruaru, Serra dos Cavalos, Parque Municipal João Vasconcelos Sobrinho ( $08^{\circ}21'43''$  S,  $36^{\circ}02'10''$  W), 859 m alt., 17.III.2009, V.R.M. Coimbra s.n. (UFRN-Fungos 2180).



**Fig. 2** – *Russula rubropunctatissima*. Detail of the subcutis and dermatocystidia.

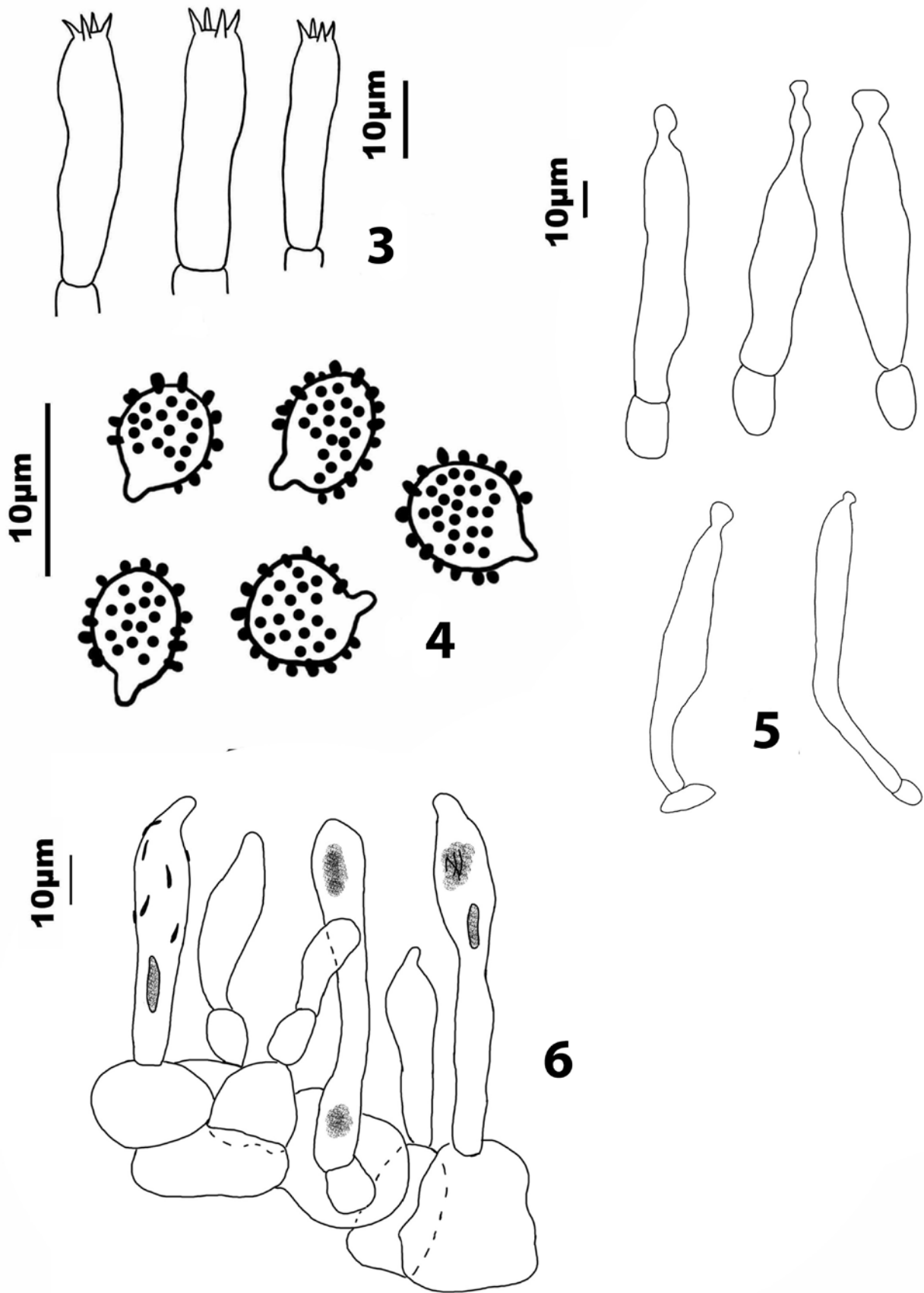
### Discussion

*Russula rubropunctatissima* is characterized by the reddish brown pileus, smooth at centre to wrinkled toward the margin; basidiospores  $4.6\text{--}6.1 \times (4.1\text{--})5.1\text{--}5.6 \mu\text{m}$  (excluding ornamentation), globose to broadly ellipsoid, amyloid, verrucose ornamentation, with warts up to  $0.3 \mu\text{m}$  high, isolated; pileipellis cutis-like, composed of abundant radially oriented hyphae  $2\text{--}10 \mu\text{m}$  wide  $\mu\text{m}$ ; dermatocystidia  $25\text{--}68 \times 7\text{--}13 \mu\text{m}$ , abundant, fusoid to cylindrical, with incrustations in sulfovanilin and thin-walled.

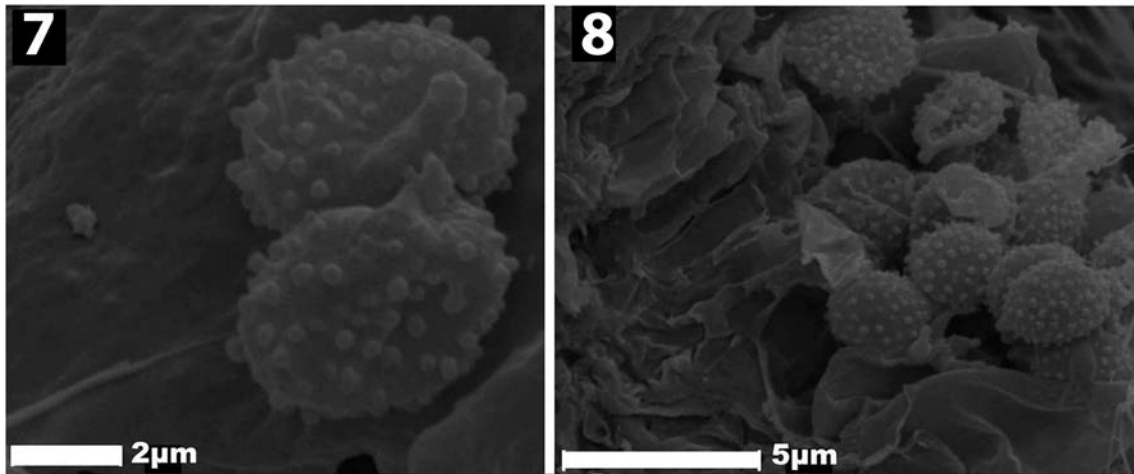
As previously reported by Cheype & Campo (2012) in the protologue of *R. rubropunctatissima* from French Guiana, this species is placed in the subsect. *Pluviales* Singer by the presence of macrodermatocystidia and the granules in the pileus and stipe. But this subsection is also characterized by the species with purple or violaceous pileus and basidiospores with isolate ornamentations. What makes *R. rubropunctatissima* very different from the two others species of this subsection, *R. pluviales* Singer and *R. leguminosarum* Singer that have lilac to purple pileus (Singer et al. 1983, Cheype & Campo 2012), is the reddish pileus. In addition, *R. pluvialis* from Amazonas and Pernambuco differs in the purple discoloring fuliginous-sepia pileus, purple to similar color stipe (Singer et al. 1983) and larger basidiospores  $7.01 \times 5.82 \mu\text{m}$  (Buyck 1988); *Russula leguminosarum* Singer differs in the lilac-violet or dirty violet pileus, white stipe (Singer et al. 1983) and also larger basidiospores  $8.03 \times 7.16 \mu\text{m}$  (Buyck 1988).

They considered *R. rubropunctatissima* in subsect. *Pluviales* and argued that it should be more studies of molecular phylogeny (Cheype & Campo 2012). In our case we tried to extract DNA from the species, but because of contamination of the samples it was unsuccessful.

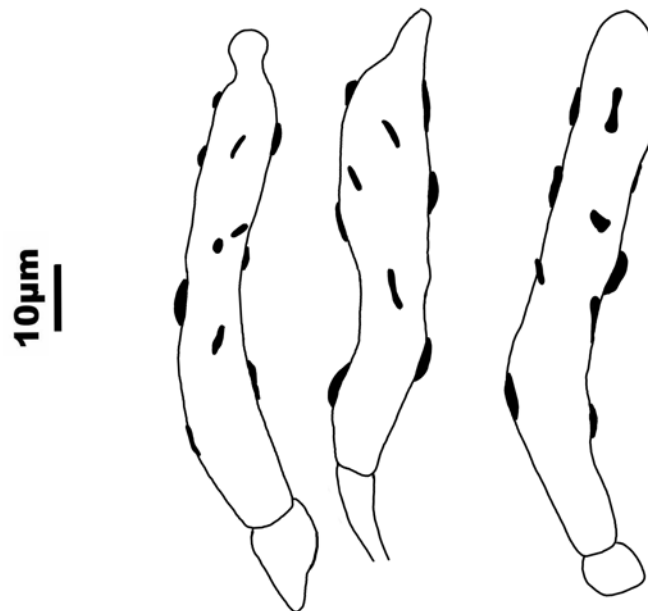
Cheype & Campo (2012) also discussed that the subsect. *Pluviales* belongs to the section *Pelliculariae* R. Heim, that regroup the little fleshy *Russulas* with acute pileus margin and wrinkled-grown surface in the adult state, and cream spore print. In this section there are two species with reddish pileus, *R. carmesina* R. Heim and *R. pseudocarmesina* Buyck (Buyck 1994). *Russula carmesina* differs by larger ornamentation with warts up to  $1.5\text{--}2 \mu\text{m}$  high and connected by fine lines in the spores and the structure of the pileipellis, while *R. pseudocarmesina* differs *rubropunctatissima* by the larger ornamentation with conic warts up to  $2\text{--}2.5 \mu\text{m}$  high in the spores connected by fine lines and the structure of the pileipellis (Buyck 1994). However, due the nature of the pileipellis structure as mentioned above, they belong to subsect. *Pseudoepitheliosinae* Buyck (Buyck 1990, 1992).



**Figs 3–6** – *Russula rubropunctatissima*. 3 Basidia. 4 Basidiospores. 5 Pleurocystidia. 6 Detail of pileipellis with macrodermatocystidia.



**Figs 7–8** – *Russula rubropunctatissima*. 8 SEM images of the detail of two basidiospores. 9 SEM images of the basidiospores.



**Fig. 9** – *Russula rubropunctatissima*. Detail of the caulocystidia.

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