

## **A contribution to the moss flora of French Guiana: a collection from the surroundings of Kaw**

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**Résumé** – Cinq espèces de mousses (*Callicostella bernoullii*, *Calymperes bartramii*, *Fissidens amoenus*, *Fissidens santa-clarensis* et *Plaubelia sprengelii*) sont recensées pour la première fois de la Guyane Française, sur la base de collections faites dans la région Kaw en 2006. Une liste de 30 espèces représentant 22 genres est présentée avec des remarques sur leurs fréquences et leurs substrats. Le nombre d'espèces de mousses connues en Guyane Française s'élève ainsi à 199. Cette contribution floristique sur la base de la prospection d'une région restreinte suggère que la diversité de bryologique de la Guyane reste sous-estimée.

**Bryophytes / Guyane Française / Kaw / Mousses / Forêt tropicale humide**

**Abstract** – Five species (*Callicostella bernoullii*, *Calymperes bartramii*, *Fissidens amoenus*, *Fissidens santa-clarensis* and *Plaubelia sprengelii*) of mosses are first recorded from French Guiana. This is based on a collection of mosses gathered from the Kaw area in 2006. A list of 30 species (22 genera) is presented, including notes on frequencies and substrata. The number of moss species currently known from French Guiana is now 199. This contribution based on an inventory of a fairly restricted area suggests that the diversity of the bryoflora of French Guyana remains underestimated.

**Bryophytes / French Guiana / Kaw / Mosses / Tropical rainforest**

### **INTRODUCTION**

French Guiana, an overseas department of France, is located on the northern coast of South America, adjacent to the Amazon basin. The majority of its territory is covered by a lowland tropical rainforest with annual mean precipitation of more than 2000 mm. Kaw and its surroundings are situated in the northeastern part of the country. This region has the highest mean precipitation in the country, more than 3700 mm per year (Atlas de la Guyane, 2001). Here the low mountains (up to 400 m. a. s. l.) catch the humid air coming from the Atlantic Ocean and cause frequent rainfalls.

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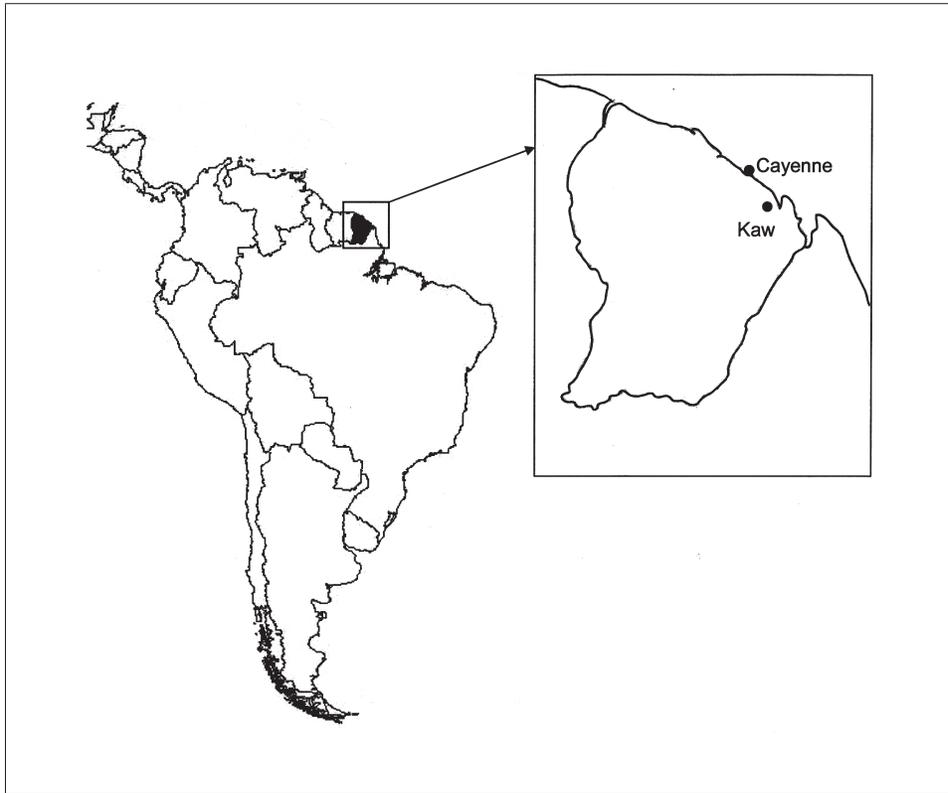


Fig. 1. Location of collection area.

The richness of the bryoflora of lowland tropical rainforests is often not high, due to the high temperatures that are unsuitable for the majority of mosses (Frahm, 1990). Liverworts appear to tolerate high temperatures better, since the number of liverworts is higher than that of mosses in the lowland forests of the Guianas (Gradstein *et al.*, 1990). A new type of forest, a tropical lowland cloud forest was described by Gradstein (2006) in French Guiana. This type of forest can be found in moist river valleys with night and morning fogs, and are hotspots for liverworts. The epiphytic moss flora in these forests was also registered to be higher than in other lowland forest sites with a similar amount of precipitation (Gradstein, 2006). The bryoflora of tree crowns is often neglected due to inaccessibility, but can harbour many species (Gradstein, 2006). Therefore the conditions in lowland rainforests can be quite variable and offer habitats for a great number of species, both liverworts and mosses.

The earlier data about the mosses of French Guiana have been compiled in the paper by Florschütz-de Waard (1990). The mosses of the central part of French Guiana have been thoroughly studied by W. R. Buck (2003a). He has also compiled the checklist of mosses of French Guiana on the web page of the New York Botanical Garden (Buck, 2003b). This checklist includes 194 species.

This study aims to present the first preliminary list of mosses of the Kaw region and make some additions to the list of mosses of French Guiana.

The moss samples were collected in January 2006 by N. Ingerpuu during four days of random walking trips around Kaw forest station (4°33'35"N; 52°12'22"W) in the north-eastern part of French Guiana (Fig. 1). The epiphytic species were only collected up to a height of 2 m from the forest floor. The nomenclature follows the web page of Missouri Botanical Garden (Tropicos.org., 2009).

Table 1. The preliminary list of mosses at Kaw, French Guiana. New taxa for French Guiana in bold. Frequency according to the number of specimens in the collection: R – rare (1); S – sparse (2); C – common (3-7). Substrate: b – tree boles and branches; w – decaying wood; r – rock; s – soil.

<i>Taxon</i>	<i>Frequency</i>	<i>Substrate</i>
<i>Acroporium pungens</i> (Hedw.) Broth.	C	b, w
<i>Bryum</i> sp.	R	R
<b><i>Callicostella bernoullii</i></b> (Hampe) Broth.	R	W
<i>Callicostella rufescens</i> (Mitt.) A. Jaeger	C	r, b, w
<b><i>Calymperes bartramii</i></b> W.D. Reese	R	B
<i>Calymperes lonchophyllum</i> Schwägr.	C	B
<i>Calymperes smithii</i> E.B. Bartram	R	B
<i>Calymperes venezuelanum</i> (Mitt.) Broth. ex Pittier	C	B
<b><i>Fissidens amoenus</i></b> Müll. Hal.	R	S
<i>Fissidens guianensis</i> Mont. var. <i>guianensis</i>	C	W
<i>Fissidens prionodes</i> Mont.	R	S
<b><i>Fissidens santa-clarensis</i></b> Thér.	R	R
<i>Groutiella mucronifolia</i> (Hook. et Grev.) H.A. Crum et Steere	R	B
<i>Isopterygium</i> sp.	R	W
<i>Lepidopilum surinamense</i> Müll. Hal.	C	B
<i>Leucobryum martianum</i> (Hornsch.) Hampe ex Müll. Hal.	C	w,b,r
<i>Leucoloma mariei</i> Besch.	R	B
<i>Octoblepharum cocuiense</i> Mitt.	R	B
<i>Octoblepharum cylindricum</i> Schimp. ex Mont.	C	B
<i>Orthostichopsis praetermissa</i> W.R. Buck	C	B
<i>Philonotis uncinata</i> (Schwägr.) Brid.	R	R
<i>Phyllodrepanium falcifolium</i> (Schwägr.) Crosby	C	b, r
<i>Pilosium chlorophyllum</i> (Hornsch.) Müll. Hal.	C	b, w
<i>Pilotrichum bipinnatum</i> (Schwägr.) Brid.	C	B
<b><i>Plaubelia sprengelii</i></b> (Schwägr.) R.H. Zander	R	R
<i>Rosulabryum billardierei</i> (Schwägr.) J.R. Spence	R	R
<i>Sematophyllum subsimplex</i> (Hedw.) Mitt.	S	b, w
<i>Syrrhopodon lanceolatus</i> (Hampe) W.D. Reese	C	B
<i>Syrrhopodon rigidus</i> Hook. et Grev.	R	R
<i>Taxithelium planum</i> (Brid.) Mitt.	C	b, w
<i>Taxithelium pluripunctatum</i> (Renauld et Cardot) W.R. Buck	R	R
<i>Trichosteleum papillosum</i> (Hornsch.) A. Jaeger	C	b, w, r

## RESULTS AND DISCUSSION

Twenty-two genera and thirty species were identified in the collections. *Calymperes* and *Fissidens* were represented by the greatest number of species (four in both genera). We could not identify the species of genus *Bryum* due to its sterile state. The species of genus *Isopterygium* did not belong to any of the species known from Latin America (Ireland, 1992) and thus remained unidentified.

Except for two species of *Fissidens* all mosses were collected on rocks, decaying wood or trees. A total of 20 species were found growing on tree boles or branches, ten on decaying wood and ten on rocks (Table 1). The balance between the numbers of species on different substrates reflects the amount and stability of the suitable area of these substrata in the forests. The substrate area of rocks and decaying wood in these forests is less than that of tree boles and branches. The area of suitable soil patches is small due to instability, since the majority of the forest floor is covered with leaves. A similar balance between the moss species on different substrata is presented in a study of the forests of Surinam (Florschütz-de Waard & Bekker, 1987).

Five species are hereby reported as new for French Guiana (Table 1), raising the diversity of mosses (Buck, 2003b) to 199. All these species occur in Central and South America (Buck, 2003a; Gradstein *et al.*, 2001) and their presence in French Guyana is therefore not surprising. Some species have very sparse distribution. *Plaubelia sprengelii*, for example, was until now known only from locations in Venezuela, Brazil and Bolivia (Gradstein *et al.*, 2001; Cano *et al.*, 2008). The result of five new records being added to the bryoflora of French Guiana during limited collecting suggests that many more moss species are likely to be added to the known bryoflora with more intensive field work.

The specimens of this study are deposited in the bryophyte herbarium of the Natural History Museum of the University of Tartu (TU). In addition, a small number of unidentified liverwort specimens, collected at Kaw are also kept at TU.

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