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More records of mosses from Dominican amber

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Abstract: *Hypnum* spec., *Orthostichella* cf. *pentasticha*, *Syrrhopodon flexifolius* and *Porotrichum* aff. *substriatum* are recorded from Dominican amber (c. 25 mio yrs. b.p.). The first two species were known before from Dominican amber, the last two are newly reported.

Dominican amber is a rich source for fossil mosses from the Tertiary (Eocene to Pliocene), by the same time a chance for reconstruction of the neotropical mossflora from the Tertiary and a tool for reconstruction of phylogeny, and for determination of the speed of evolutionary processes. So far six publications dealt with the mosses from Dominican amber (Frahm 1996, 2001, 2004, Frahm & Reese 1998, Frahm & Newton 2005). The latest publication (Frahm & Newton 2005) lists 29 taxa. Part of these could be named to the species, others to the genus, and one fossil remained unidentified. The species are known in different frequency from one to sixteen (*Calyptothecium duplicatum*) specimens. Most of the species exist still today, only one (*Acroporiites longirostris*) was described as extinct extinct species.

By the courtesy of Mr. Velten (Idstein, Germany), I received a small collection of mosses in Dominican amber for study, which are described here. The specimens are deposited in the private collection of Mr. Velten.

Hypnum spec. (Velten 16) Fig. 1.

Part of a branch of 7.5 mm length, narrowed towards the apex, with strongly falcate narrowly lanceolate, ecostate leaves. Such specimens were reported earlier from Dominican amber (Frahm 1993, 1996). As in these specimens, the leaf margins are entire, which excludes the extant species of this genus occurring today in the Carribbean, *H. amabile* and *H. polypterum*.

Syrrhopodon cf. *flexifolius* (Velten 15) Fig. 4.

The inclusion consists of a small fragment of a plant with four lingulate leaves plus three separate leaves. A costa is present and percurrent to very shortly excurrent. The leaves are bordered by hyaline elongate cells, hyaline basal

cells are not visible. The leaves show a hexagonal areolation in their upper part. Two separate leaves are much shorter and more ovate than lingulate. They show a less distinct to lacking leaf border. The leaf margins are entire, at least in the upper part where visible. Gemmae are lacking in this specimen. The moss is associated with a Lejeuneaceae.

The specimen resembles a species of Syrrhopodon, of which 30 species are accepted in the Neotropics. Amongst the limbate species, the relatively short lingulate leaves resemble *S. graminicola, cymbifolius, flexifolius, ligulatus* or *annotinus*.

The dimorphic leaves, apparently smooth laminal cells and entire leaf margins reduce this list of species to *S. flexifolius* amongst the extant species, if it is not a extinct one. However, all specimens of Calymperaceae studied so far (*Calymperes levyanum, palisotii, smithii*, *Syrrhopodon africanus* ssp. *graminicola, incompletus* var. *incompletus*) proved to be extant species.

Syrrhopodon flexifolius is nowadays a rare species reported from only 4 collections from Brazil, Panama, Costa Rica and Venezuela. This is in accordance with the record of *Calymperes smithii* reported by Frahm & Newton (2005) from Dominican amber, which is also very rare today but might have been more frequent 25 mio years ago.

Porotrichum aff. *substriatum* (Velten 12) Fig. 2.

The amber includes a tuft of 4 branches of each 5-6 mm length as well as a fragment of a branch of 2.5 mm length. The leaves are in five indistinct rows, are oval, concave, and end in a small apiculus. The costa reaches ¾ of the leaf length. The leaf margin is serrate from leaf tip down to half the leaf length. The laminal cells are not clearly visible, however, there have single papillae at the back of the leaf in the upper third or are prorate.

Although the typical dendroid appearance is not visible in this fossil, the fragment is referred here to the genus *Porotrichum* for the following reasons: the length of the costa, the shape of the leaves and coarse and irregular denticulation in the leaf apex fits this genus. Furthermore, the prorate laminal cells at the back of the leaf are found in *P. substriatum*,. wghich fits the fossil specimen also with regard to the leaf shape. A definite identification cannot be given since it requires the knowledge of characters such as the stipe leaves and the leaf bases, which are not present here or not visible.

Porotrichum is represented with several species in Central and South America, where the species grow on rocks and tree trunks. *Porotirhcum substriatum* occurs around the Carribbean from southern Mexico to Guiana and also on Hispaniola, Cuba and Jamaica.

Orthostichella pentasticha? (Velten 13) Fig. 3

Preserved is a 5 mm long branch of a pleurocarpous moss with distinctly 5-ranked foliation and ovate leaves ending in a short apiculus. The leaves are very concave (boat-shaped) and are very suddenly contracted in the apiculus. The laminal cells are elongate and there is no costa. Such plants have frequently been recorded from Domicican amber and published before as *Pilotrichella* sp. (Frahm 1993, 1996) or *Orthostichella* sp. (Frahm & Newton 2005). Species with five ranked concave leaves ending in a short apiculus are found in the Lembophyllaceae sensu Buck. In this family, *Squamidium* and *Pilotrichella* can be excluded by the presence of a costa. The genera *Pilotrichella* and *Orthostichella* differ by the presence of alar cells, a character which is, however, not visible in the fossil material. Concerning the leaf shape, the fossil specimens resembles *much Orthostichella pentasticha*.

Acknowledgements

I wish to thank Mr. Velten for the opportunity to study his specimens. This demonstrates the importance of amateur collectors, who buy such fossil material for their private collections and make these specimens available for science.

References

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Fig. 1: Hypnum sp. (Velten 16)

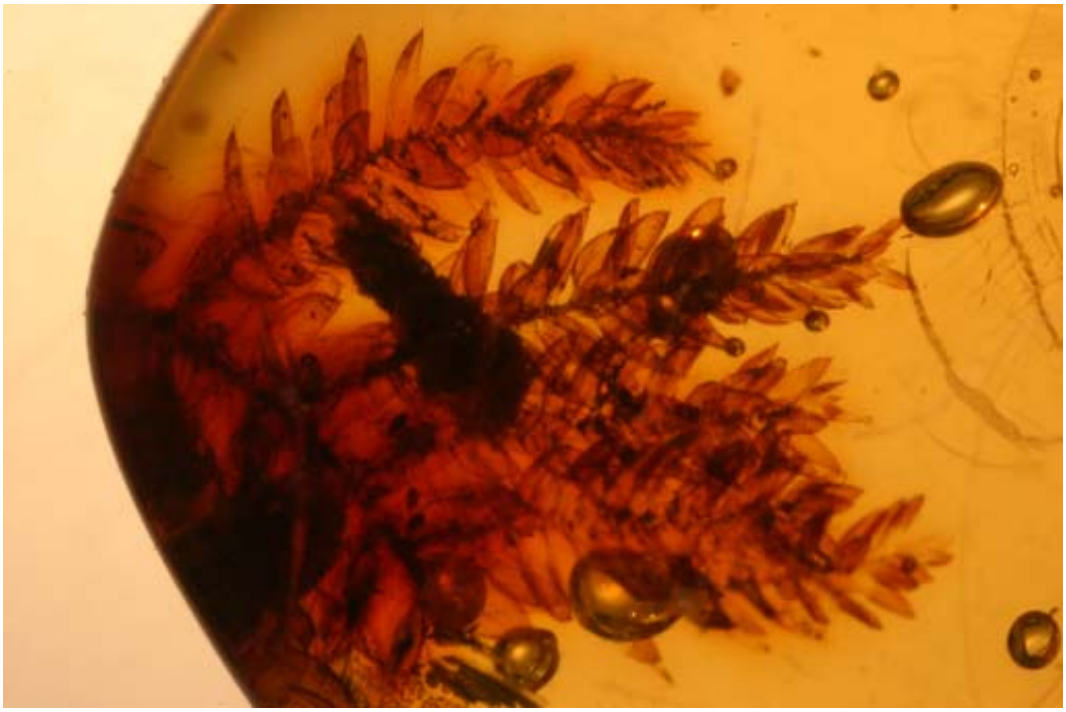

Fig. 2: Porotrichum aff. substriatum (Velten 12). The pictures are in colour in the CD-edition of the journal.

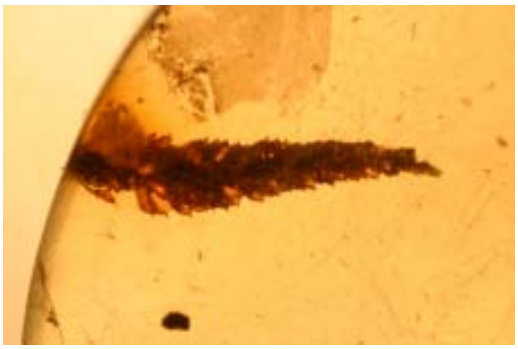

Fig. 3: *Orthostichella* cf. *pentasticha*

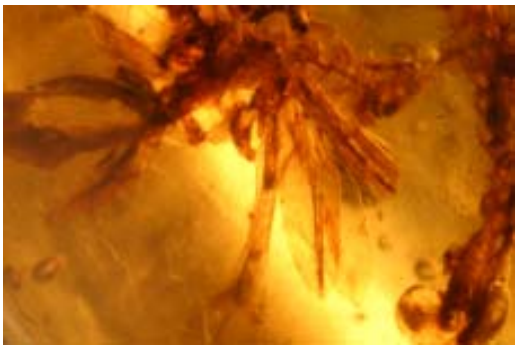

Fig. 4: *Syrropodon cf. flexifolius*

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