

## ***Trachycarpidium echinatum* and *Weissia platystegia*, new to Vietnam and Continental SE Asia**

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**Abstract** – Nine species and one subspecies of mosses are reported new to Vietnam. They are *Calymperes crassinerve* (Mitt.) Jaeg., *Calymperes erosum* C. Muell., *Calymperes motleyi* Mitt., *Calymperes subintegrum* Broth., *Fissidens crassinervis* Sande Lac., *Leucoloma mittenii* Fleisch., *Mitthyridium fasciculatum* (Hook. & Grev.) Robins. subsp. *obtusifolium* (Lindb.) M. Menzel, *Pelekiium investe* (Mitt.) Touw, *Trachycarpidium echinatum* Dix., and *Weissia platystegia* (Dix.) A. Eddy. The last two taxa are also new records for Continental SE Asia, previously known only from Papua New Guinea. *Calymperes crassinerve* is new to Indochina region.

### **Vietnam / SE Asia / bryoflora**

The moss flora of Vietnam, with ca 600 species in 181 genera, is relatively better known than that of other countries in Indochina (Tan & Iwatsuki 1993; Tran 1993; Tan & Tran 1998). Even so, an examination of new collections from Yokdon National Park in Dac-Lac Province, Takou Mountain in Binh Thuan Province, and Binh Chau Nature Reserve in Baria-Vungtau Province, all in southern Vietnam, has yielded nine species and one subspecies of moss new to Vietnam. Two of these, *Trachycarpidium echinatum* Dix. and *Weissia platystegia* (Dix.) Eddy, are also new to continental South East Asia, and belong to a group of ephemeral and pygmy mosses whose continued presence or absence in a locality can not be assured and is difficult to ascertain. Their discovery in southern Vietnam represents a significant expansion of range from their previously known distribution in Australasia, and highlights the need to conduct more field work before the regional moss flora can be considered complete.

**1. *Trachycarpidium echinatum* Dix.** [Pottiaceae] – Dac-Lac Province, Yokdon National Park, on soil at base of tree, coll. *VTT Huong 51a*, 26 July 2002, (SINU, Herbarium of University of Ho Chi-Minh). – Figs 1-4.

The species, with its immersed, spiculose and cleistocarpous capsules, is very distinctive under the microscope, although the minute plants are difficult to

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observe in the field even with a magnifying lens. The specimen from Vietnam forms a small greenish felt on soil. Individual shoots produce long, narrowly lanceolate leaves that are strongly circinate when dry and possess a single costa that is strongly excurrent and smooth, both abaxially and adaxially. Except at the margins and base of the leaf, the cells of the lamina are quadrate and stoutly pluripapillose. The leaf margin is formed by a single row of rectangular, weakly papillose cells, and a well-defined v-shaped area in the leaf base is formed by rectangular to oblong, thick-walled, epapillose cells.

This species is most easily identified by its orange to brown, spiculate capsules that look like small durian fruits in the tropics. The spiculate appearance of the capsule is due to its exothecial cells that are both strongly mammillose and unipapillose. The capsules seem easily detached from their very short setae. Within a 1 sq mm quadrat, three loose capsules were found scattered among a few still attached to plants. The perichaetial leaves are oblong-lanceolate, much shorter in length than the vegetative leaves, and with a slightly excurrent costa. Only female plants were observed.

The vegetation of Yokdon National Park where this and the next species were collected consists of dry-open Dipterocarp forest under the influence of a strong monsoonal climate with at least six months of dry season. The soil is the lateritic and the average rainfall is about 1 500 mm yearly.

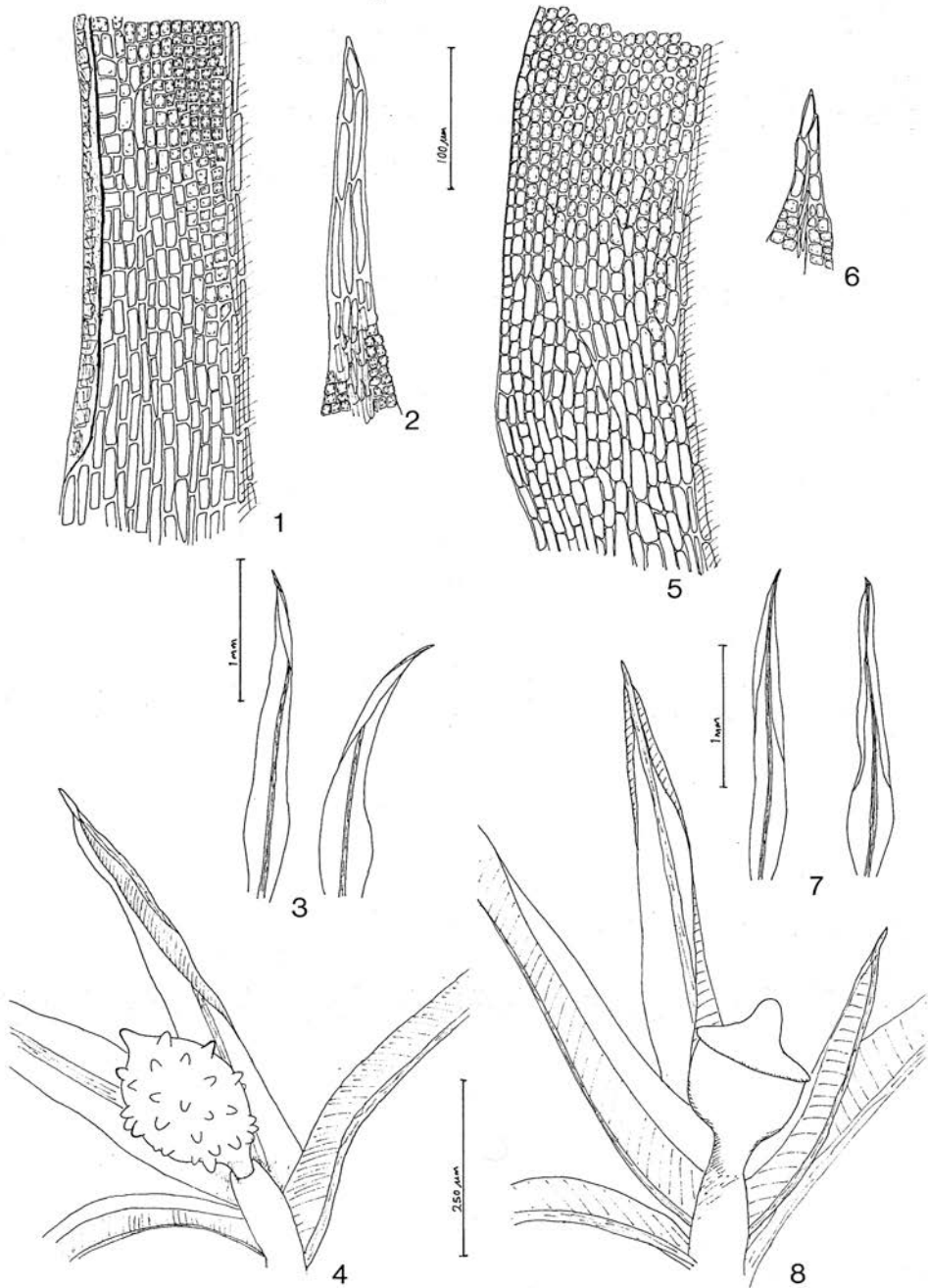
*Trachycarpidium echinatum* was formerly considered endemic to Papua New Guinea and known only from the type collection (Norris & Koponen, 1989). The genus has five recognized species (Zander 1993), all with minute shoots and a distribution in the southern hemisphere that includes northern Australia, New Caledonia, New Guinea, South Africa and Brazil. The Vietnamese collection is therefore the first record of the genus from north of the equator!

**2. *Weissia platystegia* (Dix.) A. Eddy** (syn. *Astomum platystegium* Dix.) [Pottiaceae] – Dac-Lac Province, Yokdon National Park, on soil at base of tree, coll. *VTT Huong 51b*, 26 July 2002, (SINU, Herbarium of University of Ho Chi Minh). – Figs 5-8.

Like *Trachycarpidium echinatum*, *Weissia platystegia* is an ephemeral, pygmy moss in the family Pottiaceae. It was originally described as endemic to Papua New Guinea. Norris and Koponen (1989) reported additional collections of this species from Queensland of Australia.

At the Yokdon National Park, a population of *Weissia platystegia* was found growing mixed with *Trachycarpidium echinatum*. Both plants have long and narrowly lanceolate, strongly circinate leaves, and small, immersed capsules. However, in *Weissia platystegia* the bowl-shaped capsule is not spiculate and has a well defined operculum with a conic lid and its wide-mouthed capsule is without a peristome. In the Vietnamese collection many plants possess capsules, and the papillose to warty spores measure 25-30  $\mu\text{m}$  diam. No male plant was observed.

Sterile plants of *Weissia platystegia* can be separated from *Trachycarpidium echinatum*, although both taxa have similarly lanceolate-linear leaves. The leaf margins of *Weissia platystegia* are typical of the genus, being inrolled and circinate when dry. Those of *Trachycarpidium echinatum* are plane, wet or dry. In *Weissia platystegia* the leaf apex is slightly bent and cucullate with the costa excurrent as a short mucro, whereas the leaf apex in *Trachycarpidium echinatum* is flat and the costa excurrent in a long cusp. Lastly, the leaf cells of *Weissia platystegia* are not stoutly pleuripapillose, but have 3-5 small, low papillae.



Figs 1-8. *Trachycarpidium echinatum* and *Weissia platystegia*. – Figs 1-4. *Trachycarpidium echinatum* (based on VTT Huong 51a): Fig. 1. Leaf margin near base. Fig. 2. Leaf apex. Fig. 3. Leaves. Fig. 4. Capsule. – Figs 5-8. *Weissia platystegia* (based on VTT Huong 51b): Fig. 5. Leaf margin near base. Fig. 6. Leaf apex. Fig. 7. Leaves. Fig. 8. Capsule. All specimens at SINU.

Owing to the odd combination of gametophytic and sporophytic characters, especially the sessile and eperistomate capsule, Norris and Koponen (1989) regarded *Weissia platystegia* as a species of *Astomum*. Here we follow Eddy (1990) and Zander (1993) in placing the species in *Weissia*, giving more emphasis to the similarities of the gametophytic characters of these taxa.

It is indeed a very unusual and extraordinary to find a mixed population of *Weissia platystegia* and *Trachycarpidium echinatum* in a single locality in Vietnam. Both taxa are ephemeral and opportunistic mosses in the same family and previously known only from Papua New Guinea. How these two taxa reached Vietnam together from PNG can only be explained by the rare chance event of long distance dispersal.

Other new records of Vietnamese mosses that we have identified with less spectacular phytogeographical significance are listed below. Most of them are widespread in SE Asia and have been reported previously from Thailand. Their presence in Vietnam can be expected.

**(3) *Calymperes crassinerve* (Mitt.) Jaeg.** [Calymperaceae] – Baria-Vungtau Province, Binh Chau Nature Reserve, on tree, *VTT Huong H002*, 24 May 2000 (Herbarium of University of Ho Chi-Minh). – This species is new also to Indochina region (see Tan and Iwatsuki, 1993).

**(4) *Calymperes erosum* C. Muell.** [Calymperaceae] – Binh Thuan Province, Ta Kou Mountain, on tree, *VTT Huong T007*, 17 Jan. 2002 (Herbarium of University of Ho Chi-Minh).

**(5) *Calymperes motleyi* Mitt.** [Calymperaceae] – Baria-Vungtau Province, Binh Chau Nature Reserve, on tree, *VTT Huong C001*, 24 July 2001 (Herbarium of University of Ho Chi-Minh).

**(6) *Calymperes subintegrum* Broth.** [Calymperaceae] – Baria-Vungtau Province, Binh Chau Nature Reserve, on tree, *VTT Huong s.n.*, 25 July 2001 (SINU, Herbarium of University of Ho Chi-Minh). – *Calymperes subintegrum* was reduced to a synonym of *Calymperes schmidtii* Broth. by Reese & Mohamed (1985). According to Ellis and Tan (1999), these two species are different in several characters. The gemmiferous leaf tip of *C. subintegrum* has a slightly developed saucer-shape receptacle and all the gemmae are attached to it on one side (see figs 9i & 9j in Ellis & Tan, 1999). In *C. schmidtii*, which is probably a form of *Calymperes tenerum* C. Muell. (Ellis, *pers. comm.*), the gemmiferous apex is formed solely by the excurrent costa.

**(7) *Fissidens crassinervis* Sande Lac.** [Fissidentaceae] – Baria-Vungtau Province, Binh Chau Nature Reserve, on sandy soil, *VTT Huong H019*, 23 July 2001 (Herbarium of University of Ho Chi-Minh).

**(8) *Leucoloma mittenii* Fleisch.** [Dicranaceae] – Binh-Thuan Province, Takou Mountain, on ground, *VTT Huong T016*, 18 Jan. 2002 (SINU, Herbarium of University of Ho Chi-Minh).

**(9) *Mitthyridium fasciculatum* (Hook. & Grev.) Robins. subsp. *obtusifolium* (Lindb.) M. Menzel** [Calymperaceae] - Binh-Thuan Province, Takou Mountain, on tree, *VTT Huong T015*, 18 Jan. 2002 (Herbarium of University of Ho Chi-Minh).

**(10) *Pelekium investe* (Mitt.) Touw** [syn. :*Thuidium investe* (Mitt.) Jaeg.] [Thuidiaceae] – Binh-Thuan Province, Takou Mountain, on rock, *VTT Huong T004*, 17 Jan. 2002 (SINU, Herbarium of University of Ho Chi-Minh).

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