

DATA TO THE MALAYSIAN LIVERWORT FLORA, I

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Abstract. 120 liverwort specimens collected in peninsular Malaysia for oil body studies belonged to 80 species, 6 of which (*Frullania subocellata* S. Hatt., *Chiloscyphus integerrimus* Schiffn., *Bazzania assamica* (Steph.) S. Hatt., *Bazzania bilobata* Kitag., *Telaranea quadriseta* (Steph.) J. Engel & G. L. Merrill and *Radula assamica* Steph.) proved to be new for Malaysia and 9 to its peninsular part or to Selangor or Pahang states. The most interesting occurrences were of *Frullania subocellata*, hitherto known only from Seram Island, *Chiloscyphus integerrimus*, known from Java, and *Telaranea quadriseta*, an Australian element. The majority of the collected species are of Indomalaysian distribution. Microphotos and distribution maps of the more interesting species are provided.

Key words: *Frullania*, Indomalaya, Lejeuneaceae, Lepidoziaceae, Pahang, Selangor

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INTRODUCTION

A.M. Haji Mohamed, who at the time of the beginning of this research was Professor at the University of Malaya, initiated a project to investigate the oil bodies of Malaysian liverworts. As a result, in 2006 K.-Th. Yong and P.-S. Cheah collected more than a hundred specimens of Malaysian liverworts and prepared microphotos of their habit and oil bodies at the Institute of Biological Sciences. The material was sent to T. Pócs to identify the species and their oil body types. During the identification work the collected material proved to belong to 80 liverwort species, 6 of which are new for Malaysia and a further 9 new for the whole of peninsular Malaysia or to Selangor or Pahang states according to the checklists of Chuah-Petiot (2011) and Lee *et al.* (2013). Most species are Indomalaysian in distribution. A few of them, which belong to critical and recently revised groups, show a very disjunct distribution pattern. These elements may be rare

or even more widespread but only overlooked or lying unidentified in herbaria. Such species are *Chiloscyphus integerrimus*, *Frullania subocellata* and *Telaranea quadriseta*. Here we enumerate these species with their new localities and worldwide distribution. The results of oil body studies will be published separately. Voucher specimens are deposited in the herbarium of the University of Malaya (KLU), and duplicates in the herbarium of Eszterházy College in Eger (EGR).

ENUMERATION OF SPECIES

FRULLANIACEAE

Frullania subocellata S. Hatt. Figs 1B & 3

SPECIMENS EXAMINED: PAHANG, Cameron Highland, Tanah Rata, vicinity of Cool Point Hotel, 1400 m, Cheah & Yong 31, 26 Aug. 2006.

DISTRIBUTION. New for Malaysia, previously known only from Seram Island, Indonesia (Hatori 1986).

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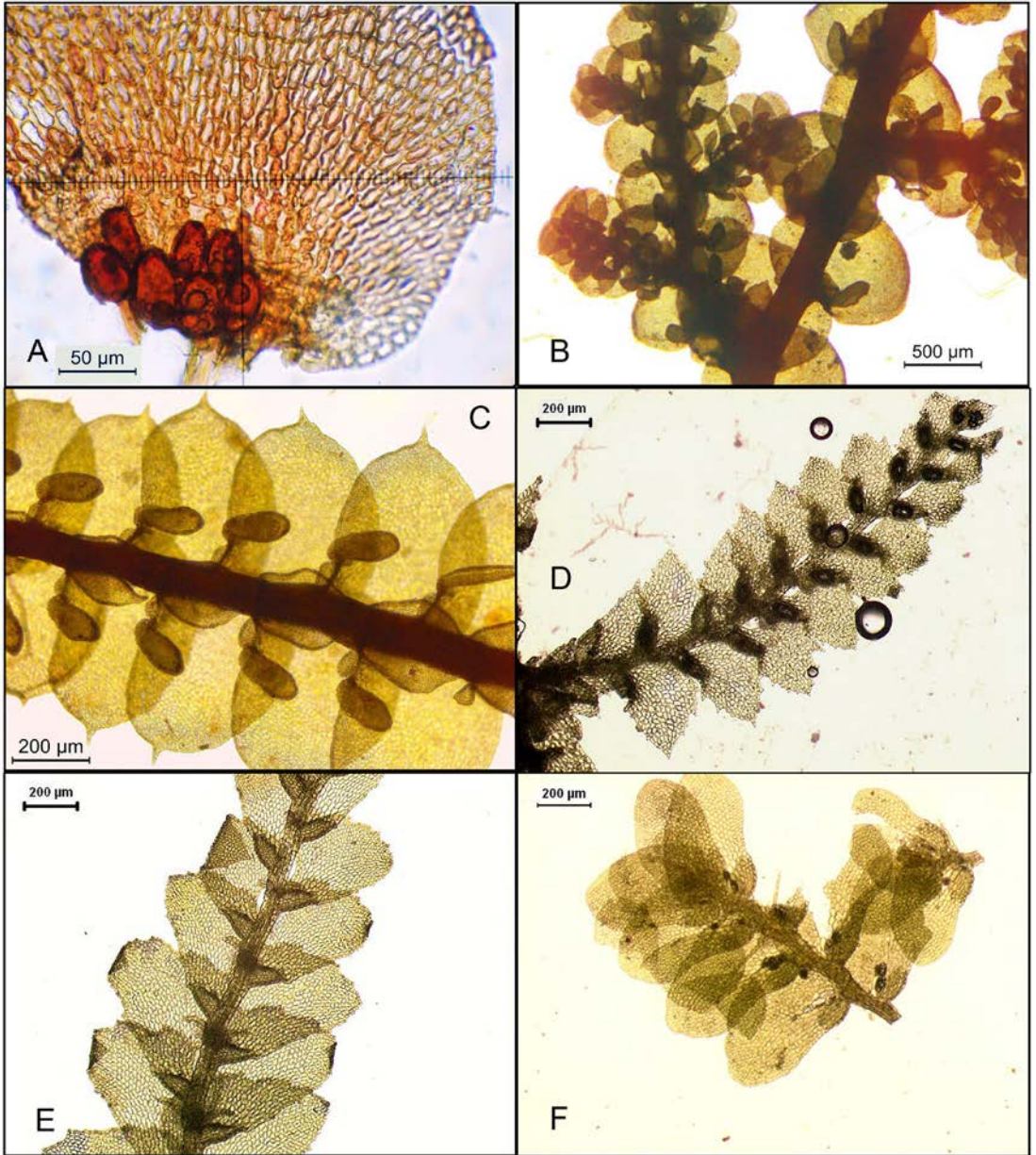


Fig. 1. A & C – *Frullania trichodes* Mitt., B – *Frullania subocellata* S. Hatt., D – *Drepanolejeunea fissicornua* Steph., E – *Drepanolejeunea levicornua* Steph., F – *Drepanolejeunea spicata* (Steph.) Grolle. Microphotos by T. Pócs (A) and K.-T. Yong (B–F).

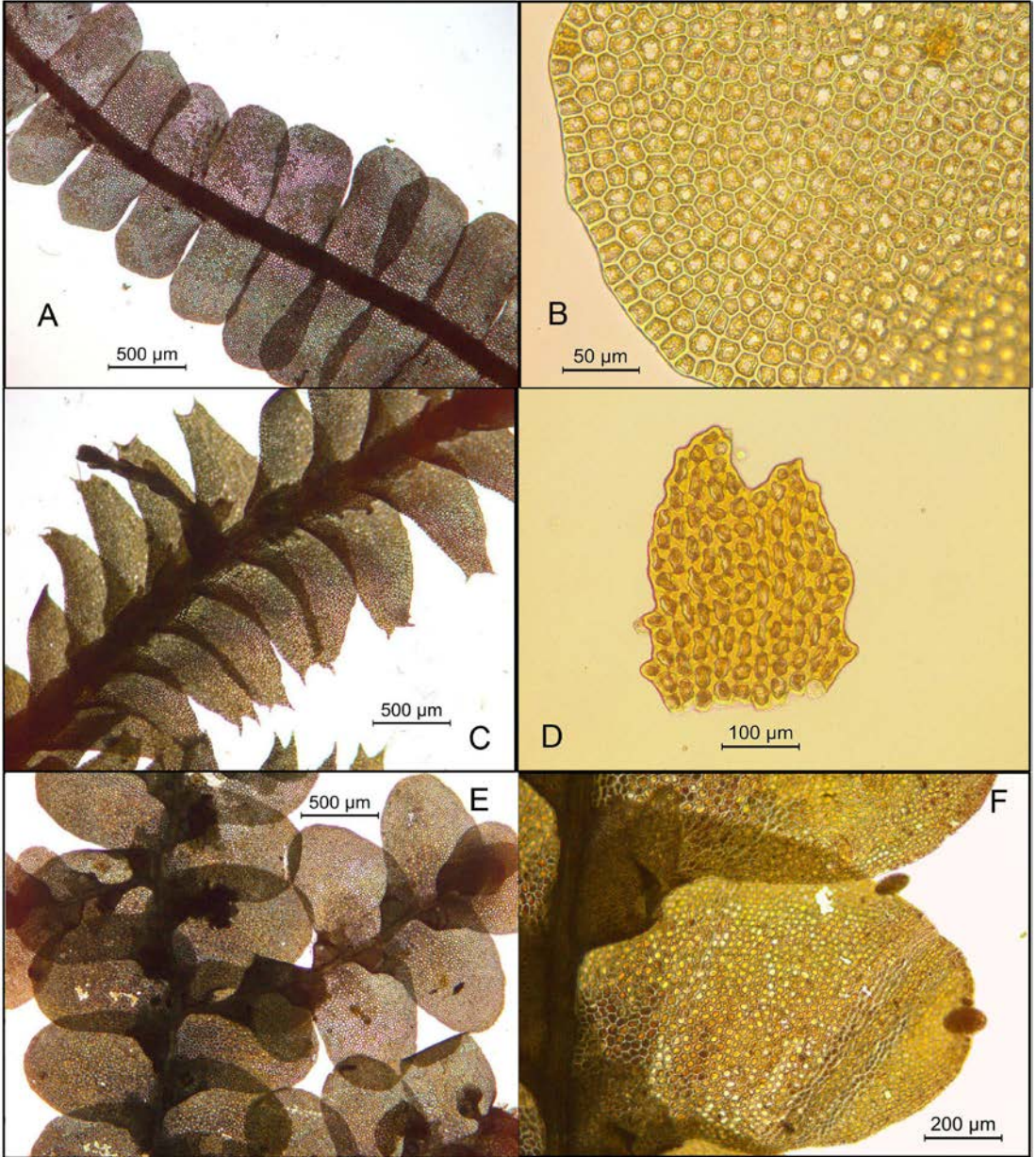


Fig. 2. A & B – *Chiloscyphus integerrimus* Schiffn., C & D – *Bazzania bilobata* Kitag. E & F – *Radula assamica* Steph. Microphotos by K.-T. Yong.

***Frullania trichodes* Mitt.** Fig. 1A, C

F. vethii Sande Lac.

SPECIMENS EXAMINED: PAHANG, Genting Highland, along the road to Gohtong Jaya, roadside vegetation, 830 m, *Cheah & Yong 4*, 22 July 2006.

DISTRIBUTION. New for peninsular Malaysia, known from Sarawak and Sabah. Widespread Indomalayan–Pacific species (Chuah-Petiot 2011; Hattori & Piippo 1986).

GEOCALYCEAE

***Chiloscyphus integerrimus* Schiffn.**

Figs 2A, B & 3

SPECIMENS EXAMINED: SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 99*, 1 Dec. 2006.

DISTRIBUTION. New for Malaysia, previously known only from Java (Schiffner 1900).

LEJEUNEACEAE

***Cololejeunea hillebrandii* (Aust.) Steph.**

SPECIMENS EXAMINED: SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 109c*, 1 Dec. 2006.

DISTRIBUTION. New for Selangor state, in Malaysia known from Penang, Perak and Pahang states. Pantropical (Pócs & Piippo 2011).

***Drepanolejeunea fissicornua* Steph.** Fig. 1D

SPECIMENS EXAMINED: SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 106*, 1 Dec. 2006.

DISTRIBUTION. New for peninsular Malaysia, known from Mt. Kinabalu in Sabah state, and from Sumatra and Java in Indonesia (Mizutani 1990).

***Drepanolejeunea levicornua* Steph.** Fig. 1E

SPECIMENS EXAMINED: SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 100*, 1 Dec. 2006.

DISTRIBUTION: New for Selangor state, known from Pahang in Malaysia, from Sulawesi, Kalimantan and Seram in Indonesia, and from Papua New Guinea (Mizutani 1990).

***Drepanolejeunea pentadactyla* (Mont.) Steph.**

SPECIMENS EXAMINED: SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 109b*, 1 Dec. 2006.

DISTRIBUTION: New for Selangor state, in Malaysia known from Kedah, Malacca, Johore, Pahang, Sabah and Sarawak (Chuah-Petiot 2011; Lee *et al.* 2013). Widespread Indomalaysian–Pacific species (Zhu & So 2001; Dey & Singh 2012).

***Drepanolejeunea spicata* (Steph.) Grolle**

SPECIMENS EXAMINED: PAHANG, Genting Highland, along the road to Gohtong Jaya, roadside vegetation, 820 m, *Cheah & Yong 61*, 9 Sept. 2006.

DISTRIBUTION. New for peninsular Malaysia, known from Sarawak and Sabah states (Chuah-Petiot 2011), outside Malaysia from Eastern Himalaya and Sumatra through Thailand, Cambodia, Laos, Vietnam to southern China and the Ryukyu Islands in Japan (Grolle & Zhu 2000).

***Drepanolejeunea tricornua* Herz.**

SPECIMENS EXAMINED: PAHANG, Genting Highland, along the road to Gohtong Jaya, roadside vegetation, 820 m, *Cheah & Yong 54, 57b*, 9 Sept. 2006; SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 107*, 1 Dec. 2006.

DISTRIBUTION. New for peninsular Malaysia. Known from Sarawak and Sabah states in Malaysia and from Java, Seram and Papua New Guinea (Mizutani 1990).

***Lejeunea dimorpha* Kodama.**

SPECIMENS EXAMINED: SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 103*, 1 Dec. 2006.

DISTRIBUTION. New for Selangor state, known from Kelantan, Pahang and Sabah states, outside Malaysia from Kalimantan and Papua New Guinea (Lee 2013).

***Lejeunea micholitzii* Mizut.**

SPECIMENS EXAMINED: SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, *Cheah & Yong 104*, 1 Dec. 2006.

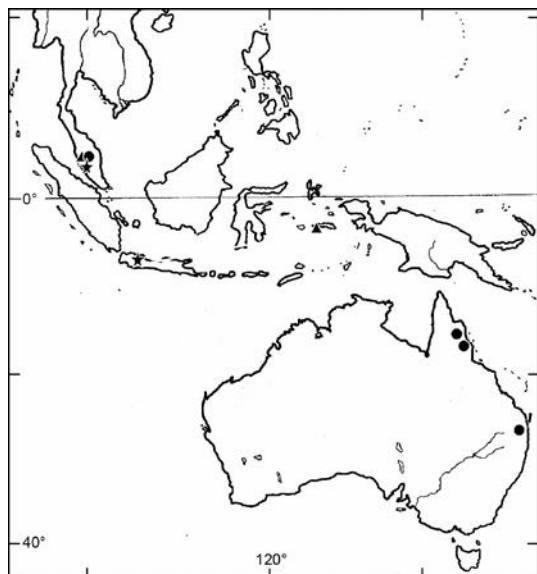


Fig. 3. Distribution of some disjunct species. ▲ – *Frullania subocellata* S. Hatt., ★ – *Chiloscypus integerrimus* Schiffn., ● – *Telaranea quadriseta* (Steph.) J. Engel & G. L. Merrill. Drawn by T. Pócs.

DISTRIBUTION. New for Selangor state, known from Kelantan, Pulau Langkawi, Negeri Sembilan, Pahang and Sabah, outside Malaysia from Java, Sumatra, Philippines, New Guinea and Fiji Islands (Lee 2013; Grolle & Piippo 1984; Hürliermann 1993).

LEPIDOZIACEAE

Bazzania assamica (Steph.) S. Hatt.

Bazzania tridens (Reinw. *et al.*) Trev. var. *assamica* Pócs

SPECIMENS EXAMINED: PAHANG, Genting Highland, along the road to Gohtong Jaya, roadside vegetation, 820 m, Cheah & Yong 42c, 9 Sept. 2006.

DISTRIBUTION. New for Malaysia, known from Eastern Himalaya, Myanmar and Vietnam (Pócs 1969).

NOTE. According to Sharma and Srivastava (1993), *B. assamica* is an independent species distributed from Himalaya to Vietnam, while *B. tridens* is a very widespread Indomalayan element.

Bazzania bilobata Kitag.

Figs 2C, D

SPECIMENS EXAMINED: PAHANG, Cameron Highland, Brinchang, along the trail to Mount Irau, 1800 m. Cheah & Yong 6a, 26 Aug. 2006.

DISTRIBUTION. New for Malaysia, previously known from its type locality in northern Thailand (Kitagawa 1967) and from southern China (Guangxi: Zhu & So 2003; Fujian, Guangdong and Jiangxi: Zhou *et al.* 2012).

Telaranea quadriseta (Steph.) J. Engel & G. L. Merrill

Fig. 3

SPECIMENS EXAMINED: PAHANG, Genting Highland, along the road to Gohtong Jaya, roadside vegetation, 820 m, Cheah & Yong 42b, 9 Sept. 2006.

DISTRIBUTION. New for Malaysia, previously known only from tropical and subtropical Australia: Queensland and New South Wales (Engel & Merrill 2004).

RADULACEAE

Radula assamica Steph.

Fig. 2E, F

SPECIMENS EXAMINED: PAHANG, Genting Highland, along the road to Gohtong Jaya, roadside vegetation, 820 m, Cheah & Yong 42b, 9 Sept. 2006; SELANGOR, Ulu Selangor, Fraser's Hill, 1220 m, Cheah & Yong 66 & 101, 9 Sept. and 1 Dec. 2006.

DISTRIBUTION. New for Malaysia. A Himalayan–Indochinese species known from Sri Lanka and India: Assam through Myanmar and Thailand to Vietnam and southern China (Yamada 1979). *Radula assamica* can therefore be considered a typical Himalayan–Indochinese subendemic element.

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