**Electronic Supplementary Material for**

**Recent origin and diversification accompanied by repeated host shifts of thallus-mining flies (Diptera: Agromyzidae) on liverworts and hornworts**

Supplementary Figures

Figure S1. ML tree of 186 *Phytoliriomyza* samples based on the concatenated 28S and COI gene sequences. The numerals at the nodes are ML bootstrap support values. The phylogeny was divided into three parts as shown on the left. Tips display sample numbers and species names, colored black and red are miners of tracheophytes and bryophytes, respectively. Major clades grouped by the host-plant genus are highlighted.

Figure S2. Map of the Japanese archipelago showing the locality records of 23 species of micropterigid moths (A) and 15 species of *Phytoliriomyza* flies (B), both are associated with *Conocephalum*. Photos in (A) show larvae of micropterigid moths. Photos in (B) feature key morphological character, including the epandria of male genitalia, for four *Phytoliriomyza* species. (a) *Phytoliriomyza luna* (b) *P. luteola*, (c) *P. alpicola*, (d) *P. lanternaria*. The locality data of micropterigid moths are derived from [20, 21].

**Geographic range of *Conocephalum*-feeding *Phytoliriomyza***

Figure S2 shows the geographic ranges of the micropterigid moths and *Phytoliriomyza* flies that feed on *Conocephalum* liverworts, as inferred from their sampling locations in Japan. The distribution of *Conocephalum*-feeding micropterigid moths, based on previous studies [20, 21], is shown for comparison.

The *Phytoliriomyza* species using the same host plant were differentiated based on distinct morphological characteristics, especially the size and arrangement of tubercle-like setae on male genitalia. Although multiple species were frequently collected from the same site, many species exhibit local distribution. For example, species such as *Phytoliriomyza* *luna*, *P. nigroflava,* and *P. alpicola*, were mainly recorded from localities in Hokkaido and high-elevation sites in central Japan, while others, such as *P. brunofasciata* (in Eastern Japan), *P. ugetsu* (in Western Japan), *P. caliginosa,* and *P. pallidofasciata* (in Southern Japan), are region-specific. Some species had a very restricted range, such as *P. chichibuensis*, *P. helva*, *P. lanternaria*, and *P. suetsugui*. The species sampled from a wide range of the Japanese archipelago include *P. conocephali* (found in Hokkaido, Honshu, Shikoku, Kyushu), *P. bifasciata* (found in Hokkaido, Honshu, Shikoku, Kyushu), and *P. luteola* (Hokkaido, Honshu, Shikoku).