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New understanding into the relationships of muriform ascospores in the lichen family Trypetheliaceae (Ascomycota: Trypetheliales)

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Abstracts

Trypetheliaceae is a tropical crustose lichen with currently recorded 13 genera worldwide, these include two types of ascospores (muriform and transversely septate). The muriform type occurred in six genera which also showed differences based on morphological characters. Four genera with muriform ascospores have been reported from Thailand; *Bathelium, Campylothelium, Laurera* and *Polymeridium*, in which the ascospores are important for identification to genus level. Nineteen mycobionts were isolated from ascospores and grown on MYA medium for 9 weeks at room temperature (25-30°C). Phylogeny was investigated from a combined data set of the ribosomal internal transcribed spacer (*ITS*) and mitochondrial small subunit (*mtSSU*) regions, while morphological characters and chemical substances were also observed. Phylogenetic analysis distinguished two clades which showed various diversity within the group of muriforms. Clade I included *L. benguelensis* and *L. keralensis* while Clade II was divided into four lineages; lineage A (*L. subdiscreta* and *Laurera* sp.1), lineage B (*P. proponens*), lineage C (*B. madreporiforme*) and lineage D (*L. meristospora, L. megasperma* and *Laurera* sp.2). The molecular data strongly supported each species related to morphological and chemical characters. The relationships among lineages showed high diversity with external characters (morphology and chemistry). *Laurera* was demonstrated to be a polyphyletic genus that related with lineages of *Bathelium* and *Polymeridium.* The results also suggested that the muriforms type within Trypetheliaceae did not relate to molecular data, especially within the genus *Laurera.* Furthermore these genera exhibit high diversity in tropics. More samples and other genes will be investigated in the future to confirm this study.