

## Taxonomical study of *Chaenotheca* spp. (Lichenized Ascomycota) in Japan with reference to relationship between fungi and algae.

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Lichens are symbiotic organisms consisted of fungal and algal partners. We interested in calicioid, which belong to crustose lichens. Their apothecia looks like a pin, so they are called as pin lichens. In Japan, 10 genus in 4 families have been reported, but further taxonomical revision is needed on this group. We here report some results of morphological, chemical and molecular analyses on the taxonomy of *Chaenotheca* species and relationship between fungi and algae.

We collected 47 specimens of *Chanotheca* in Japan and Sweden. The morphological characteristics (length of apothecium, shape and pruina of capitulum, and color and shape of thallus and ascospore) were examined and their acetone extracts were analyzed by PDA-HPLC to identify their chemical constituents. Total DNA was extracted from residue after acetone treatment. The fungal and algal rDNA ITS region were sequenced, and homology search and phylogenetic analyses were carried out.

Eight species, *Chaenotheca brunneola*, *C. chrysocephala*, *C. ferruginea*, *C. furfuracea*, *C. hygrophila*, *C. phaeocephala*, *C. stemonea*, and *C. trichialis* were recognized. It was difficult to identify each species based on the morphological characteristics, because the range of intraspecific variation was quite wide. The apothecia and ascospore showed little variation among species, so their characteristics were not useful to identification. Chemical analyses showed definite relationships between species and their substances, so lichen substances are important characteristics for identification on this group. Molecular results of fungi indicated that genetic information was significantly characteristic, but *C. hygrophila* and *C. stemonea* were dissimilar to previously registered data and separated into some group on phylogenetic tree. Their algal partners were identified as Trebouxioid, Dictyochloropsis, Stichococcus based on the morphological characteristics. The morphological result are well supported the results of their molecular analyses.

### Reference

Tibell L. & Thor G. 2003. Calicioid lichens and fungi of Japan. J. Hattori Bot. Lab. (94): 205-259.