Göran THOR[a], Kwang Hee MOON[b] and Leif TIBELL[c]: **New Findings of Calicioid Lichens and Fungi in Korea**

韓国産粉化地衣類及び菌類の新所見（G. トール[a]，K.-H. ムン[b]，L. ティベル[c]）

Summary: During a field trip to the Sorak Mountains (38°N, 128°E) in the eastern part of the Korean Peninsula in 2006 numerous lichens were collected. Four calicioid lichens and fungi; *Calicium abietinum*, *C. chlorosporum*, *Chaenotheca stemonea* and *Sphinctrina leucopoda* were found. All of these but *C. abietinum* were new to Korea. In a publication from 2005 five calicioid lichens were reported from Korea. One species, *Cyphelium lucidum*, which was not included in this publication has, however, been mentioned in literature. Including the four species mentioned above, a total of nine calicioid species are therefore now known to occur in Korea.

During a field trip to Cheju Island, Korea, in 2001, calicioid lichens and fungi were sought for. In spite of this, only *Calicium lenticulare* was found (Thor et al. 2005). During a field trip to the Sorak Mountains (38°N, 128°E) in the eastern part of the Korean Peninsula 18–23 October 2006 numerous lichens were collected. All visited localities were situated within the Mt. Sorak National Park and visited habitats included mainly oldgrowth forests on steep mountain slopes dominated by deciduous trees such as *Acer* (*A. ginnala*, *A. mono*, *A. palmatum*), *Betula* (*B. costata*, *B. ermanii*), *Carpinus laxiflora*, *Fraxinus mandschurica*, *Quercus* (*Q. mongolica*, *Q. serrata*), *Tilia mandshurica* and *Zelkova serrata*. Rarely also, e.g., *Alnus japonica*, *Prunus sargentii* and *Salix hultenii* were observed. Coniferous trees including *Abies* (*A. firma*, *A. koreana*, *A. holophylla*), *Pinus* (*P. densiflora*, *P. koraiensis*, *P. pumila*, *P. thunbergii*) and *Thuja sieboldii* were scattered in the forests. Two days were spent along trails in the mountains, passing the highest mountain, Mt. Dachong (1708 m) above the timber line, but forests down to an altitude of 380–420 m were also visited. The climate is somewhat continental with warm summers (up to 36°C) and cold winters (down to –17 °C). The annual precipitation is 1300 mm and the mountains are snow-covered from November to April (Moon 1999).

Calicioid lichens and fungi were carefully sought for. In spite of this only four collections were made, one specimen each of *Calicium abietinum*, *C. chlorosporum*, *Chaenotheca stemonea* and *Sphinctrina leucopoda*. All but *C. abietinum* were new to Korea. One additional calicioid species, *Cyphelium lucidum* (Vězda 1988), which was not included in an earlier review of calicioid lichens and fungi from Korea (Thor et al. 2005) has, however, been mentioned in literature. Thor et al. (2005) reported five calicioid lichens from Korea. Including the additional four species mentioned above, a total of nine calicioid species are now known from Korea. Thor et al. (2005) reported that calicioid species were rare on Cheju Island south of the Korean Peninsula. In the Sorak Mountains the calicioid species were few and occurred sparsely, which further supports previous observations that calicioid lichens and fungi are rare in Korea. On each locality only one species was found and mosaics where several calicioid species occur together were never observed. In areas with many calicioid species, such mosaics are common (e.g., Tibell 2006). Additional species will, however, certainly be found in Korea. The calicioid flora of other mountains on the Korean Peninsula south, west and north of the Sorak Mountains as well as that of the mountains in adjacent parts of China

— is still unknown. As Mt. Halla and the Sorak Mountains are among the highest mountains on the Korean Peninsula they should, however, be expected to be among the most species rich with regard to calicioid lichens. It is notable that no members of widespread calicioid genera such as *Bunodophoron*, *Chaenothecopsis*, *Mycocalicium* and *Sphaerophorus* have so far been reported from Korea. Below all calicioid species found in Korea are listed. The material collected in 2006 is deposited in herbarium NIBR (AK) with duplicates in UPS.

Calicium abietinum Pers.

First reported from Korea by Moon (1999) and included in Thor et al. (2005). One additional collection is reported here.

Specimen examined. **Korea**. Gangwon Province, Yangyang-gun, Ser-myun, Osaeck-ri, Sorak-san National Park, the southern part of the massif Sorak Mts., the south slope of Mt. Dachong, along the trail from the shelter c. 500 m WNW of the top of Mt. Dachong to the village at the Hangyeryong Pass, c. 3–5 km SW of the shelter, on *Quercus mongolica/serrata* snag, alt. 1400–1350 m, 38°06.45–28´N, 128°26.00–25.10´E, 20 October 2006, G. Thor 20628 (NIBR, UPS).

Calicium chlorosporum F. Wilson

Characterized by the faint yellow pruina on the surface of the mazaedium, the usually brown pruina on the lower side of the capitulum and the spiral ornamentation of the spores (Tibell and Thor 2003). *Calicium trabinellum* also has a yellow pruinose mazaedium, but it has an immersed thallus, smaller apothecia and an irregularly crackled spore surface. *Calicium chlorosporum* is recorded from Australasia, southernmost North America, Brazil, India, Nepal and Japan (Tibell and Thor 2003, Tibell 2006). New to Korea.

Specimen examined. **Korea**. Gangwon Province, Inje-gun, Buk-myun, Yongdae-ri, Sorak-san National Park, the inner part of the massif Sorak Mts., along the road in the Backdam Valley from the Backdam (Paekdam) temple towards the village Yongdae-ri, from where the road crosses the river c. 1.5 km NW of the Backdam (Paekdam) temple to 3.5 km NW of the Backdam (Paekdam) temple, on *Zelkova* sp., alt. 380–420 m, 38°10.25–11.00´N, 128°22.30–22.00´E, 22 October 2006, G. Thor 20859 (NIBR, UPS).

Calicium lencticulare Ach.

First reported from Korea by Thor et al. (2005).

Chaenotheca chrysocephala (Turner ex Ach.) Th. Fr.

First reported from Korea by Moon (1999). An additional collection is included in Thor et al. (2005).

Chaenotheca laevigata Nádv. coll.

First reported from Korea by Thor et al. (2005).

Chaenotheca stemonea (Ach.) Müll. Arg.

Characterized by the thin, farinose, Pd+ yellowish-red thallus, the almost spherical capitula, the hyphal web on the lower side of the excipulum, the catenulate asci, the small, globose spores and the association with *Stichococcus* (Tibell and Thor 2003). *Chaenotheca stemonea* is a widely distributed species occurring in cool temperate to temperate areas of Eurasia, North America, South America and Australasia (Tibell and Thor 2003). New to Korea.

Specimen examined. **Korea**. Gangwon Province, Yangyang-gun, Ser-myun, Osaeck-ri, Sorak-san National Park, the southern part of the massif Sorak Mts., the south slope of Mt. Dachong, along the trail from the shelter c. 500 m WNW of the top of Mt. Dachong to the village at the Hangyeryong Pass, c. 500–1000 m N of the village at the Hangyeryong Pass, deciduous forest with scattered coniferous trees and siliceous rocky outcrops, in hollow at base of *Quercus mongolica/serrata*, alt. 1350–1200 m, 38°06.28–10´N, 128°25.10–24.45´E, 20 October 2006, G. Thor 20640 (NIBR, UPS).

Cyphelium lucidum (Th. Fr.) Th. Fr.

Characterized by its verrucose to subareolate, bright yellow thallus and the

sessile apothecia. When sterile the thallus may well be mistaken for that of *Chaenotheca chrysocephala*, which similarly contains vulpinic acid (Tibell 2007). *Cyphelium lucidum* is reported from Europe and North America, from the Ural Mountains to the Far East of Russia as well as from Bhutan and China (Tibell 2007). First reported from Korea by Vězda (1988), but not included in Thor et al. (2005). The collection in UPS was checked by GT.

Specimen examined. **Korea**. Ryanggang (= Yanggang-Do) Prov., montes Paekdusan, prope urbem Samjiyon, ad corticem arboris (*Larix gmelinii* var. *olgensis*), alt. 1500 m, 29 June 1988, L. Lökös (UPS, Vězda, Lich. sel. Exs. 2256).

Microcalicium disseminatum (Ach.) Vain.

First reported from Korea by Thor et al. (2005) (as *M. subpedicellatum*).

Sphinctrina leucopoda Nyl.

A variable species with respect to size and colour of the stalk. Sometimes hard to distinguish from *S. turbinata*, but differing in having stalked ascomata and an excipulum reacting K–. Upper part of excipulum consisting of 4–6 layers of isodiametric to irregular cells that are 4–7 µm in diameter and the lower part of sclerotized, isodiametric cells forming a 5–7 µm thick cover of 1–2 layers of periclinally arranged hyphae with rectangular cells. *Sphinctrina turbinata* have non-stalked ascomata and a red, K+ intensified pigment in the excipulum, which is formed by periclinally arranged, branched hyphae (Tibell and Thor 2003). *Sphinctrina leucopoda* has a wide distribution and is recorded from Europe, North America, Australasia, South America and Japan (Tibell and Thor 2003). New to Korea.

Specimen examined. **Korea**. Gangwon Province, Yangyang-gun, Ser-myun, Osaeck-ri, Sorak-san National Park, the southern part of the massif Sorak Mts., the south slope of Mt. Dachong, along the trail from the shelter c. 500 m WNW of the top of Mt. Dachong to the village at the Hangyeryong Pass, c. 3–5 km SW of the shelter, deciduous forest with scattered coniferous trees and siliceous rocky outcrops, on the thallus of *Pertusaria* sp. on exposed dead *Betula* sp., alt. 1400–1350 m, 38°06.45–28´N, 128°26.00–25.10´E, 20 October 2006, G. Thor 20555 (NIBR, UPS).

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2006年に行った韓国江原道雪岳山の地衣類調査で得られた資料を精査した結果，粉化地衣類3種（*Calicium abietinum*, *C. chlorosporum*, *Chaenotheca stemonea*）と地衣寄生菌1種（*Sphinctrina leucopoda*）と同定されたので報告する．*C. abietinum* 以外は全て韓国新産である．

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