

## Five Noteworthy Lichens Collected in the Yatsugatake Mountains, Central Japan

Kozo YOSHIDA<sup>a</sup> and Heinai SHIBUICHI<sup>b</sup>

<sup>a</sup>Saitama Museum of Natural History  
1417-1 Nagatoro, Chichibu, 369-13 JAPAN;

<sup>b</sup>Kumagaya Girls Senior High School  
2-131 Suehiro, Kumagaya, 360 JAPAN

八ヶ岳に産した日本新産または稀産の地衣5種

吉田考造<sup>a</sup>, 四分一平内<sup>b</sup>

<sup>a</sup>埼玉県立自然史博物館 369-13 埼玉県秩父郡長瀨町長瀨 1417-1

<sup>b</sup>埼玉県立熊谷女子高等学校 360 埼玉県熊谷市末広 2-131

(Received on January 18, 1992)

The occurrence of five lichen species, *Cetrelia alaskana* (C. Culb. et W. Culb.) W. Culb. et C. Culb., *Hypotrachyna sinuosa* (Sm.) Hale, *Sticta arctica* Degel., *Sticta limbata* (Sm.) Ach. and *Tuckermanopsis microphyllica* (W. Culb. et C. Culb.) Lai on the Yatsugatake Mountains in central Japan, is reported in this paper. Among them, *C. alaskana* and *S. arctica* are new to Japan. The other three species are very rare in Japan.

We had chances to collect lichens on the Yatsugatake Mts. in summers of 1988 and 1990 under the permission of Suwa and Usuda Forestry Offices and collected about 1500 lichen specimens. The Yatsugatake Mts., which belongs to the Fuji Volcanic Mountains group, have been explored by a number of botanists as well as lichenologists and lichens collected on the mountains have been cited in various monographs and research papers. The results of the study on our collections have revealed that two species, *Cetrelia alaskana* (C. Culb. et W. Culb.) W. Culb. et C. Culb. and *Sticta arctica* Degel., which are both new to Japan, and three rare species, *Hypotrachyna sinuosa* (Sm.) Hale, *Sticta limbata* (Sm.) Ach. and *Tuckermanopsis*

*microphyllica* (W. Culb. et C. Culb.) Lai, occur on the mountains. In the present paper, these five species will be recorded with special references to their characteristics and geographical distributions.

1. ***Cetrelia alaskana*** (C. Culb. et W. Culb.) W. Culb. et C. Culb., Contr. U. S. Nat. Herb. **34**: 492. 1968.

*Cetrelia alaskana* is apparently most closely related to *C. monachorum* (Zahlbr.) W. Culb. et C. Culb., because these two species contain imbricatic acid and its related substances in the medulla (Culberson C. and Culberson W. 1976) and have similar minute, easily overlooked pseudocyphellae on the upper surface. However,

as observed in the specimens cited below, it is clearly distinguished from the latter species by the lack of soralia (Fig. 1). The final identification was made by the comparison with an isotype distributed by Thomson (*Lichenes Arctici*, no. 13, TNS).

*Cetrelia alaskana* has been known to be endemic to the west coast of Alaska on the Bering Sea and Arctic Ocean and grows in the tundra. However, the distribution range is now extended to far south to the Yatsugatake Mts., in central Japan.

Specimens examined. Nagano Pref.: Daidoshin on Mt. Yokodake, Yatsugatake Mts., elevation about 2700 m, on mosses, K. Yoshida 10152 (Saitama Museum of Natural History) and H. Shibuichi 8777 (TNS).

2. *Hypotrachyna sinuosa* (Sm.) Hale, Smiths. *Contr. Bot.* 25: 63. 1975.

Although this species is known to be widely

distributed in tropical montane and cool temperate regions in the world, having been reported from Alaska to Mexico, west Indies, Andean region from Venezuela to Chile, Europe, south-eastern Asia from Japan to Java (Hale 1975), Papua New Guinea (Kurokawa 1979), New Zealand (Galloway 1985) and Nepal (Sharma and Kurokawa 1990), it is apparently very rare in Japan (Yoshida 1988). Even though some specimens already collected by one of the authors (Yoshida) on the Chichibu Mountains being adjacent to this area grew on twigs of trees (*Larix kaempferi*, *Picea jezoensis* var. *hondoensis* and *Sorbus commixta*), the specimen cited below was saxicolous.

Specimen examined. Nagano Pref.: Daidoshin on Mt. Yokodake, Yatsugatake Mts., elevation about 2700 m, on rock, K. Yoshida 10303 (Saitama Museum of Natural History).

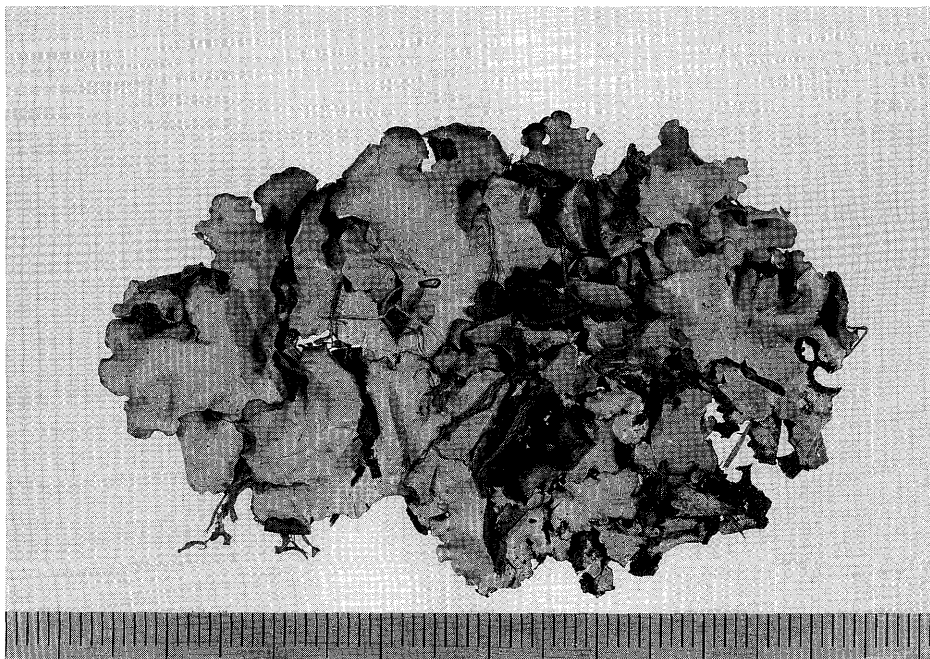


Fig. 1. A part of the specimen of *Cetrelia alaskana* (K. Yoshida 10152).

3. *Sticta arctica* Degel., Medd. Göteborgs Bot. Trädg. 12: 108. 1937.

The main feature of the present species is the foliose dark brown thallus composed of small lobes (to 30 mm long and 12 mm broad) having smooth under surface covered with fine tomenta with scattered cyphellae and rhizines. The species is also characterized by the thallus with no asexual propagules. It shows negative colour reaction with every usual reagent and produces no secondary products in the thallus. A specimen (Fig. 2) collected by one of the authors (Yoshida) in the present area coincides well with the original description of the species given by Degelius (1937), and the final identification was made by the comparison with two exotic specimens, Hale 319 (collected among mosses, Baffin Island, Canada) and Thomson 5516 (collected on hummocks, Cape Sabine, Alaska, U.S.A.), both loaned from S. Another specimen preserved under the name *S. sylvatica* in TNS is also identical with the present species. The

specimen was collected on the same mountain as that of Yoshida 10372 (see below).

Although *Sticta arctica* has been regarded as an Amphi-Beringian species recorded from central northern Siberia, Kamtchatka and North America from Baffin Island in the east to Alaska growing over mosses and on hummocks in both dry and moist types of tundra according to Thomson (1974, 1979), the range is now extended to far south to the Yatsugatake Mts. in central Japan, where tundra is never found.

Specimens examined. Nagano Pref.: Mt. Yokodake, Yatsugatake Mts., M. Togashi and S. Kurokawa (TNS, under *Sticta sylvatica*); Daidoshin on Mt. Yokodake, Yatsugatake Mts., elevation about 2700 m, on mosses, K. Yoshida 10372 (TNS, Saitama Museum of Natural History)

4. *Sticta limbata* (Sm.) Ach., Meth. Lich. 280. 1803.

Since Kurokawa (1969) reported two localities

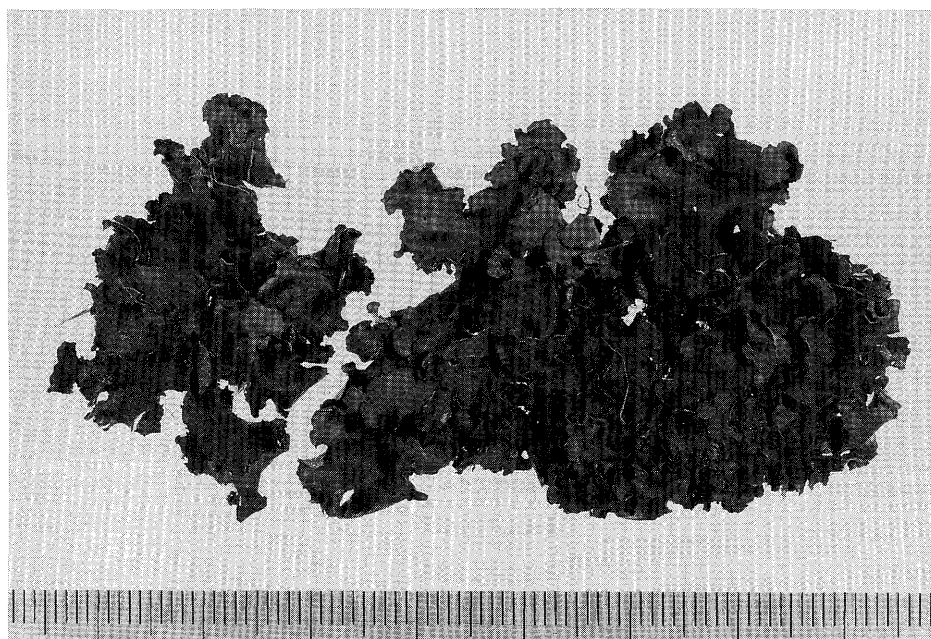


Fig. 2. A part of the specimen of *Sticta arctica* (K. Yoshida 10372).

in Japan (Nemuro in Hokkaido and Mt. Fuji in Honshu) for the present species, no other locality has been added in Japan. A specimen collected on trunks of *Acer* sp., which is mixed with *Abies veitchii*, is quite identical with the present species, being clearly distinguished from the related species such as *S. gracilis* (Müll. Arg.) Zahlbr. and *S. duplombata* (Hue) Vainio, which both are distributed in warm-temperate to tropical regions, by the presence of marginal and submarginal soralia.

Although the present species is rather well known in Europe and North America, this is the third locality of the species in Japan.

Specimen examined. Nagano Pref.: On trail from Minoto-guchi to Akadake-Kosen Lodge, Yatsugatake Mts., elevation about 1900 m, on bark of *Acer* sp., K. Yoshida 9025 (TNS, Saitama Museum of Natural History).

**5. *Tuckermanopsis microphyllica* (W. Culb. et C. Culb.) Lai, Quart. Journ. Taiwan Museum 33: 226. 1980.**

When Culberson W. and Culberson C. (1967) described the present species as *Cetraria microphyllica*, they considered the species to be endemic to Hokkaido in northern Japan. Although Kurokawa and Nakanishi (1971) added another locality in Hokkaido, the species was still considered to be restricted to Hokkaido. However, five specimens collected on the Yatsugatake Mts. can be identified with this species and the present species appears more common in alpine and subalpine regions not only in Hokkaido and also in Honshu in Japan than it has been thought before.

The present species is characterized by the production of microphyllinic acid, a rare substance in lichens, as a major constituent and 4-*O*-demethyl-microphyllinic acid as an accessory substance. It

forms olive-brown foliose thalli composed of rather narrow lobes (2–7 mm wide) similar to those of *T. americana* (Sprengel) Hale and *T. gilva* (Asah.) Lai.

Specimens examined. Nagano Pref.: Daidoshin of Mt. Yokodake, Yatsugatake Mts., elevation about 2550 m, on twigs of *Pinus pumila*, K. Yoshida 8694 (Saitama Museum of Natural History) and H. Shibuichi 8515 (TNS); the same, on bark of *Abies mariesii*, K. Yoshida 8695 (Saitama Museum of Natural History); Mt. Amida-take, Yatsugatake Mts., elevation about 2700 m, on twigs of *Pinus pumila*, K. Yoshida 10144 (Saitama Museum of Natural History); the same, on twigs of *Alnus hirsuta* (?), H. Shibuichi 8815 (TNS).

We express our sincere thanks to Dr. Syo Kurokawa in Toyama and Dr. Hiroyuki Kashiwadani of the National Science Museum, Tokyo, for their helpful suggestions and valuable comments on the manuscript and the loan of specimens. Sincere appreciation is also expressed to Dr. Lundqvist, curator of the Swedish Museum of Natural History (S), for the loan of specimens of *Sticta arctica*.

#### References

- Culberson C. F. and Culberson W. L. 1976. Chemosyndromic variation in lichens. *Syst. Bot.* **1**: 325–339.
- Culberson W. L. and Culberson C. F. 1967. A new taxonomy for the *Cetraria ciliaris* group. *The Bryologist* **70**: 158–166.
- Degelius G. 1937. Lichens from southern Alaska and the Aleutian Islands collected by Dr. E. Hultén. *Medd. Göteborgs Bot. Trädg.* **12**: 105–144.
- Galloway D. J. 1985. *Flora of New Zealand (Lichens)*. 662 pp. P. D. Hasselberg, Government Printer, Wellington.
- Hale M. E., Jr. 1975. A revision of the lichen genus *Hypotrachyna* (Parmeliaceae) in tropical America. *Smiths. Contr. Bot.* **25**: 1–73.
- Kurokawa S. 1969. A note on some rare lichen of Japan. *J. Jpn. Bot.* **44**: 225–229. Pl. 18.
- 1979. Enumeration of species of *Parmelia* in

- Papua New Guinea. In Kurokawa S. (ed.), Studies Crypt. Papua New Guinea 125-148.
- and Nakanishi S. 1971. Lichens of the Hidaka Mountains, Hokkaido. Mem. Nat. Sci. Mus. (Tokyo) 4: 59-70.
- Sharma L. R. and Kurokawa S. 1990. Species of *Anaptychia* and *Parmelia* collected in Nepal. In Watanabe M. and Malla S. M. (eds.), Crypt. of the Himalayas 2: 113-116.
- Thomson J. W. 1979. Lichens of the Alaskan arctic slope. 314 pp. University of Toronto Press, Tront.
- 1984. American arctic lichens (1. The macrolichens). 504 pp. Columbia University Press, New York.
- Yoshida K. 1988. Lichens of Chichibu (5): Preliminary notes on lichens epiphytic on subalpine conifers. Bull. Saitama Mus. Nat. Hist., No. 6: 27-32.

### 要 旨

八ヶ岳連峰は今までも多くの植物学者や地衣学者によって調査され、採集された標本はしばしば論文に引用されている。今回、八ヶ岳の地衣を再び調査した結果、分布上注目すべき5種の地衣を発見したので、ここにその特徴とあわせて報告した。

1. タカネトコブシゴケ (新称) *Cetrelia alaskana* (C. Culb. et W. Culb.) W. Culb. et C. Culb.

本種はアラスカのツンドラに固有と言われていたものであるが、八ヶ岳の横岳大同心付近 (標高約2,700m) のコケ上に着生していたのが確認された。葉体表面の擬盃点小さく、粉芽や針芽もない比較的大型の地衣体で、髓層成分としてインブリカル酸を含んでいる。日本新産である。

2. ニュウガサウメノキゴケ *Hypotrachyna sinuosa* (Sm.) Hale

日本では、広義の *Parmelia* の中でも比較的稀な種として、また、着生も亜高山帯の針葉樹や広葉

樹の枝先上であることが知られていた。今回の調査で、高山のハイマツ帯に位置する横岳大同心付近 (標高約2,700m) の大きな岩の側面に着生していたのが確認された。

3. タカネヨロイゴケ (新称) *Sticta arctica* Degel.

本種の分布は上記の *C. alaskana* 同様、アラスカやカナダの北部に限られていたが、八ヶ岳にも分布していることが確認された。産地は横岳大同心 (標高約2,700m) で、コケ上であった。本種は、イシディアやソレディアなど、無性生殖器官のいずれも無い、焦げ茶色の地衣体で地衣成分が全く無いのが特徴となっている。日本新産である。

4. コフキセンスゴケ *Sticta limbata* (Sm.) Ach.

本種の日本における分布はいままでに北海道、根室の落石と富士山の2ヶ所でしか知られていない。八ヶ岳では、美濃戸より赤岳へ向かう八ヶ岳中腹の針葉樹 (シラビソ) 林に点在するカエデの樹皮に本種が着生していた。この産地は本邦第3番目である。

5. ササクレアワビゴケ *Tuckermanopsis microphyllica* (W. Culb. et C. Culb.) Lai

マイクロフィリン酸という特異な含有成分をもつ、この種は日本特産で、しかも北海道の3ヶ所 (芦別岳、大雪山および日高) でしか報告されていない稀少種である。八ヶ岳では、横岳大同心および阿弥陀岳の高山帯でみられるハイマツと矮小化したオオシラビソやミヤマハンノキの幹や枝上で着生が確認された。本州では初めての記録である。