Sciuro-hypnum sichuanicum
(Brachytheciaceae, Bryophyta), an interesting new record for Japanese bryophyte flora

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Abstract – Sciuro-hypnum sichuanicum Ignatov & Hedenäs, a rare species previously recorded in China, has been newly reported in the Japanese Alps. A description of the species based on Japanese samples, some ecological and conservational notes, as well as a comparison table among this species and some similar species of the same genus have also been provided.

Distribution / ecology / East Asia / moss / Mount Ontake

INTRODUCTION

Sciuro-hypnum (Hampe) Hampe is a widespread moss genus distributed mainly in temperate and boreal regions. Since Ignatov and Huttunen (2002) published the circumscription and nomenclature of this genus within Brachytheciaceae, a significant number of studies have been carried out (Ignatov & Milyutina, 2007; Draper & Hedenäs, 2009; Orgaz et al., 2011) even though our knowledge about Sciuro-hypnum has increased during recent years, the distribution of some species remains understood. In Japan, the circumscription of this genus has not been properly studied yet and the number of species is still doubtful. Sciuro-hypnum sichuanicum Ignatov & Hedenäs was recently described by Hedenäs et al. (2012) as a new species based on morphological and molecular analyses of some samples collected by T. Koponen in Sichuan province in China. Until now, this species is only known for Sichuan and Yunnan provinces in China (Hedenäs et al., 2012).

During a revision of genus Sciuro-hypnum in Japan, we found two specimens previously identified as S. reflexum (Starke) Ignatov & Huttunen, which we regard as misidentifications of S. sichuanicum. Consequently, this paper

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presents the new records for Japan as well as a description of the species based on Japanese samples. In addition, a comparison table has been provided among *S. sichuanicum* and some *Sciuro-hypnum* species with which *S. sichuanicum* could be easily confused.

**MATERIAL AND METHODS**

The present study is based on a revision of more than 100 specimens deposited in HIRO, NY and NICH, and the study of the type material of the species, deposited in H. Under “specimens studied”, only the specimens corresponding to *S. sichuanicum* are listed. Microscopic examinations and measurements were taken with a Nikon Optiphot-2 light microscope, while microphotographs were obtained with a Nikon Dxm1200 digital camera mounted on that microscope.

**RESULTS**


**Type:** China, NW Sichuan, Minshan Range, Songpan Co., Huanlong Temple. Upper oroboreal *Betula utilis-Larix-Sorbus-Rhododendron watsonii* forest, 1km NW of the main temple, alt. 2250 m, 32°43´N, 103º50´E, 11/9/1991, Koponen 45490 (Holotype: H!).

**Plants** medium-sized, pale green to yellow-green. **Stems** prostrate, 25-40 mm long, pinnately branched. **Branches** straight, 1-6 mm long. **Axillary hairs** with 1 brownish basal cell and 1 upper hyaline cell. **Pseudoparaphyllia** somewhat ovate-triangular, 0.4-0.6 × 0.35-0.40 mm. **Stem leaves** erect when dry, broadly ovate-triangular, generally straight, 1.5-2.2(-2.5) × 0.75-1 mm, not plicate, somewhat concave, abruptly narrowed into acuminate, reflexed apex of 600-950 µm long; **margins** denticulate to almost entire, plane, rarely recurved in basal part of the leaf; **leaf base** broadly and long decurrent, with decurrencies of (350-)400-800 µm long. **Costa** single, to 0.95-1 way up leaf, smooth. **Median and upper laminal cells** linear, 60-80(-90) × 7-10 µm, smooth; **alar cells** broadly rectangular, 16-40 × 8-20(-24) µm, somewhat inflated, thin-walled, forming more or less defined group, triangular, ascending along leaf margins, not reaching the costa, not excavated. **Branch leaves** ovate-lanceolate, 0.9-1.6 × 0.5-0.8 mm; **margins** serrulate; leaf base decurrent, decurrencies shorter than in stem leaves, other characters similar to stem leaves. **Sporophytes** not found in Japanese samples.

**Specimens studied:** JAPAN Honshu, Chubu, Nagano Prefecture, Mount Ontake, Sannoike, 2650 m, 27/8/1953, Nakajima s.n. (NICH 156454); Honshu, Chubu, Nagano Prefecture, Mount Ontake, 2700 m, 26/8/1953, Nagano 4635 (NICH).

**Ecology:** The samples were collected from Mount Ontake, a volcano in Central Honshu Island. This mountain, with 3067 m high, is the second highest volcano in Japan after Mount Fuji. Both samples were collected under a *Pinus pumila* (Pall.) Regel, at high altitude (2650 and 2700 m) between the limit of
Sciuro-hypnum sichuanicum new to Japan

subalpine and alpine vegetation areas. The dominant vegetation is the subalpine
coniferous forest, dominated by the trees *Picea jezoensis* (Siebold & Zucc.) Carr.
and *Abies* spp. and with some shrubs as *Pinus pumila*, *Vaccinium spp.* or *Ilex
rugosa* F. Schmidt (Ando & Sasaki, 1958; Franklin et al., 1979).

**DISCUSSION**

Although available Japanese samples are sterile, the identification of this
species is not difficult. *Sciuro-hypnum sichuanicum* is characterised by broadly
ovate-triangular leaves that narrow abruptly into a long acuminate apex, and leaf
bases, with long and broad decurrencies that are longer than 400 µm. *S. reflexum*,
known from Asia, Europe and North America (Orgaz et al., 2011; Ros et al.,
2013), is morphologically very similar to *S. sichuanicum*, but it is commonly a
slender plant, with usually shorter leaf apex and shorter and narrower
decurrencies than in *S. sichuanicum* (Figs 3-6). Another similar species which
*S. sichuanicum* could be confused with is *Sciuro-hypnum uncinifolium* (Broth. &
Paris) Ochyra & arnowiec, reported for China, Japan, Russia, and North America
(Alaska) (Ignatov & Milyutina, 2007), but the latter has laminal cells shorter than
60 µm and alar cells reaching the costa (Fig. 7). The Asian *Sciuro-hypnum brotheri*
(Paris) Ignatov & Huttunen (Ignatov & Milyutina, 2007) has also broadly ovate-
lanceolate leaves, but could be easily distinguish by its shorter costa, reaching
0.5-0.7 of leaf length, and the absence of decurrencies (Fig. 1). Table 1 sums up
diagnostic characters of *S. sichuanicum* compared with other similar *Sciuro-
hypnum* species.

1 = 0.5 mm; 2, 4 = 150 µm; 3 = 0.7 mm; 5 = 0.4 mm; 6 = 200 µm; 7 = 80 µm; 8 = 0.3 mm.
The samples were collected from active volcano that in September 2014 furiously erupted. Populations have not been searched for after eruption and therefore current state of the species in Japan remains uncertain. Another field trip to try to find this species again may be planned in order to study if the eruption destroyed the populations of this plant. Additional conservation actions might be taken out if the plants are still living there.

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