

Yoshihito OHMURA^{a,*}, Hiroaki KINDAICHI^b and Kozo YOSHIDA^c: **Materials for the Distribution of Lichens in Japan (21) *Toninia tristis* subsp. *fujikawae***

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Summary: A new locality of *Toninia tristis* (Th. Fr.) Th. Fr. subsp. *fujikawae* (M. Satô) Timdal, an endangered endemic lichen growing on calcareous rocks in Japan, is reported from Nippara of Okutama in Tokyo Metropolis. Meanwhile, it has been lost from Meshimoriyama on Mt. Buko in Saitama Prefecture due to extensive mining of limestone. Additional specimens collected from known localities and neighboring sites decades after the first collection suggest that many populations appear to be stable except in habitats subject to destructive practices such as limestone mining.

Toninia tristis (Th. Fr.) Th. Fr. subsp. *fujikawae* (M. Satô) Timdal (*Ramalinaceae*, lichenized *Ascomycota*), which grows on calcareous rocks, is an endangered endemic taxon in Japan (Ministry of the Environment 2015). It is characterized by the bullate squamulose thallus with lecideoid apothecia, greenish epithecium, simple ellipsoid spores (8–12 × 3.5–5 μm), and chemistry revealed by thin layer chromatography (TLC) to be “chemotype 7” (Timdal 1992).

During the course of floristic studies of Japanese lichens based on our field investigations and the examination of herbarium specimens housed in the National Museum of Nature and Science (TNS) and the Saitama Museum of Natural History (abbreviated as SMNH in the present paper), the occurrence of *T. tristis* subsp. *fujikawae* in Nippara of Tokyo Metropolis and several localities of Saitama Prefecture has been confirmed (Table 1, Fig. 1).

At Nippara, more than 30 colonies, 2–5 cm in diameter, were found on calcareous rocks around the top of Inamura-iwa Mountain on 24 Sept. 2015. This species was also collected at Nippara on 13 Sept. 1955, confirming the stability of the habitat for 60 years in this area. However, the collection site for an unreported specimen in TNS, collected from Meshimoriyama on Mt. Buko in Saitama Prefecture on 19 July 1970, has unfortunately been completely lost due to extensive mining of limestone. Such habitat losses for this species by limestone mining are also known in Gunma and Kochi Prefectures (Harada and Anzai 2003, Ministry of Environment 2015).

Additional specimens collected from known localities or neighbouring sites after decades of their first collection suggest that most sites seem to be stable as in Nippara (Table 1). Therefore, artificial habitat destruction, such as extensive mining of limestone, is considered to be the most critical factor regarding the future of *T. tristis* subsp. *fujikawae*.

Specimens examined: **JAPAN.** Honshu. Saitama Pref., Azusa-shiroiwa, en route from Mikuni Pass to Jumonji Pass, Ohtaki-mura, Chichibu-gun, on calcareous rock, ca. 1850 m elev., 9 Dec. 1996, H. Kashiwadani 41757 (TNS), Mt. Futago-yama, Ogano-machi, Chichibu-gun, on calcareous rock, 1160 m elev., 15 Dec. 1953, I. Nagano s.n. (SMNH); Mt. Futago-yama (Nishi-dake), Ogano-machi, Chichibu-gun, on calcareous rock, 1150 m elev., 23 Nov. 1995, K. Yoshida 11933, 11934 (SMNH), Mt. Hakuseki, Ogano-machi, Chichibu-gun, on rock (limestone), 980 m elev., 8 Sept. 2004, K. Yoshida 13767 (SMNH), *ibid.*, on calcareous rock, ca. 850 m elev., 28 Oct. 2011, K. Yoshida s.n. (Herb. Y. Ohmura 8909) (TNS), on trail from Jumonji Pass to Mt. Hakutai-san (Mt. Akazawa-dake), Chichibu-

Table 1. Collection data for *Toninia tristis* subsp. *fujikawae* in Japan. Locality numbers are identical to those in Fig. 1

| Locality (× = habitat disappeared due to limestone mining) | Collection year | Additional specimens (Herbarium) | Reference |
|--|---|--|--|
| 1 Iwate Pref., Iwaizumi-cho, Akka | 1986 | – | Harada and Anzai (2003) |
| 2 Iwate Pref., Iwaizumi-cho, Shimoiwaizumi | 1967 | – | Yoshida (1979) |
| 3 Gunma Pref., Mt. Myogi (Mt. Kinkei) | 1986 | – | Harada and Anzai (2003) |
| 4 Gunma Pref., Mt. Kano (×) | 1978 | – | Yoshida (1979) |
| 5 Saitama Pref., Mt. Futago-yama | 1953, 1980, 1984, 1995 | I. Nagano s.n.; K. Yoshida 11933, 11934 (SMNH) | Yoshida (1986) |
| 6 Saitama Pref., Mt. Hakuseki | 2004, 2011 | K. Yoshida 13767 (SMNH); Y. Ohmura 8909 (TNS) | |
| 7 Saitama Pref., Azusa-shiroiwa | 1984, 1996 | H. Kashiwadani 41757 (TNS) | Yoshida (1986) |
| 8 Saitama Pref., Mt. Akazawa-dake | 1988 | K. Yoshida 8602 (SMNH) | |
| 9 Saitama Pref., Mt. Buko, Meshimori-yama (×) | 1970 | M. Togashi s.n. (TNS) | |
| 10 Yamanashi Pref., Mt. Kumotori | 1990 | K. Yoshida 10065, 10066 (SMNH) | Yoshida (1990) |
| 11 Tokyo Metropolis, Okutama, Nippara | 1955, 2015 | M. Togashi s.n. (TNS); Y. Ohmura 10988, 10989 (TNS) | |
| 12 Nagano Pref. Shiraiwa-dake | 1973 | – | Yoshida (1979) |
| 13 Nagano Pref., Todai | 1935, 1950, 2002 | H. Shibuichi 10108, 10111 (TNS); N. Takaki 9783; K. Yoshida 13686 (SMNH) | Sato (1936) |
| 14 Hiroshima Pref., Taishaku-kyo Gorge | 1979 | – | Miyawaki (1980) |
| 15 Kochi Pref., Mt. Ishidate | 1957, 1982 | – | Yoshimura (1960), Harada and Anzai (2003) |
| 16 Kochi Pref., Mt. Torigata (×) | Not indicated (prior to publication in 1964) | – | Yamanaka (1964) |
| 17 Miyazaki Pref., Shiiba-son, Mt. Shiraiwa | 1999 (existence was also confirmed at the locality in 2016) | – | Miyazaki Prefecture (2000) (Detail locality information was provided by S. Kurogi pers. comm.) |

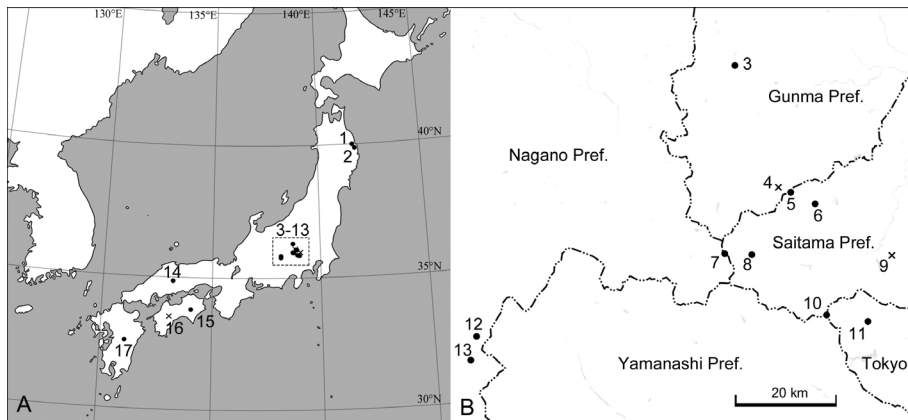


Fig. 1. Distribution map of *Toninia tristis* subsp. *fujikawae*, an endemic taxon in Japan. ● = existing localities and × = former localities, the habitat having disappeared due to extensive mining of limestone. Detail information of localities (1–17) are indicated in Table 1. A. Whole map. B. Close-up map for the locality numbers 3–13.

gun, on calcareous rock, 1815 m elev., 23 June 1988, K. Yoshida 8602 (SMNH), Meshimori-yama, Mt. Buko, on calcareous rock, ca. 1100 m elev., 19 July 1970, M. Togashi s.n. (TNS); Tokyo Pref., Inamura-iwa, Nippara, Okutamamachi, Nishitama-gun, on calcareous rock, ca. 800 m elev., 24 Sept. 2015, Y. Ohmura 10988, 10989 (TNS), Nippara, Nishi-Tama-gun, on calcareous rock, 13 Sept. 1955, M. Togashi s.n. (TNS); Yamanashi Pref., Mt. Kumotori, Kita-Tsuru-gun, on calcareous rock, 1950 m elev., 2 Aug. 1990, K. Yoshida 10065, 10066 (SMNH); Nagano Pref., Todai, Hase-mura, Kami-Ina-gun, on limestone, 1230 m elev., 15 Oct. 2002, K. Yoshida 13686 (SMNH), H. Shibuichi 10108 (TNS), *ibid.*, on limestone, 1240 m elev., 15 Oct. 2002, H. Shibuichi 10111 (TNS), *ibid.*, on calcareous rock, 13 Aug. 1950, N. Takaki 9783 (TNS).

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大村嘉人^a, 金田一弘明^b, 吉田考造^c: 地衣類分布資料 (21) フジカワゴケ

環境省絶滅危惧 IA 類にランクされているフジカワゴケ *Toninia tristis* (Th. Fr.) Th. Fr. subsp. *fujikawae* (M. Satô) Timdal (カラタチゴケ科フジカワゴケ属) が東京都奥多摩町日原に産することが現地調査および標本調査から分かったので報告する。一方、埼玉県武甲山のかつて飯盛山といわれた地点でも本種が採集されていることが国立科学博物館所蔵の標本調査から分かった。しかし、その採集場所は石灰岩採掘により現在では完全に

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消失している。既報告の採集場所やその周辺で数十年後にも生育が多く地点で確認されていることから、石灰岩採掘など人為的な生育地破壊がなければ、個体群は安定して維持されているようである。

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