

Distribution of the *Thelypteris japonica* Complex (Thelypteridaceae) in Japan

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Abstract The distribution of the four taxa, *Thelypteris japonica* forma *japonica*, *T. japonica* forma *formosa*, *T. musashiensis* and *T. japonica* × *T. musashiensis*, was reassessed by observation of spore morphology of 1984 herbarium specimens deposited in the National Museum of Nature and Science. As a result of frequent changes of identification especially between *T. japonica* forma *formosa* and *T. musashiensis*, the range of each taxon has been drastically updated. The hybrid was recorded in 32 prefectures in total, including newly added 25 prefectures.

Key words : distribution, hybrid, spore, *Thelypteris*.

The *Thelypteris japonica* complex (Thelypteridaceae) is common understory ferns ranging throughout Japan except in the Ryukyu Islands. Japanese members of the complex were circumscribed by Nakato *et al.* (2004) based on cytological and morphological characters, and two species, one forma and one interspecific hybrid are presently accepted (Fig. 1). Nakato *et al.* (2004) examined 77 specimens, and indicated the approximate geographical and altitudinal distribution of the taxa. Takahashi and Hori (2008) complemented the distribution data of the taxa with detailed distribution records in Gifu Prefecture where no species was recorded by Nakato *et al.* (2004) by observation of spores and gross morphology on 157 herbarium specimens. However, a complete picture of the distribution of the complex in Japan has not yet been provided by previous studies.

In this study, we reidentified voucher specimens deposited in the herbarium of National Museum of Nature and Science (TNS) for the distribution maps created by Kurata and Nakaike (1983) which are probably the largest collections

in terms of geographical coverage. The most reliable distinguishing character for the species of the complex is spore morphology as demonstrated by Nakato *et al.* (2004) (Fig. 2), and therefore sterile specimens and/or specimens with only immature spores are difficult to identify.

Materials and Methods

We examined spores of all the specimens of the complex deposited in TNS. All the specimens were geocoded manually based on place-names in their labels. For specimens with castaneous stipes most of which have been identified as *T. japonica*, spores were preliminary observed with a microscope in 99.5% ethanol. Specimens producing only irregular spores were identified as the hybrid (*T. japonica* × *T. musashiensis*) and those producing normal-shaped spores with membraneous ornamentation were identified as *T. japonica* forma *japonica*. Permanent mounts of spores were prepared with Bioleit (Oken-shoji Co.) and deposited in TNS only for the hybrid.

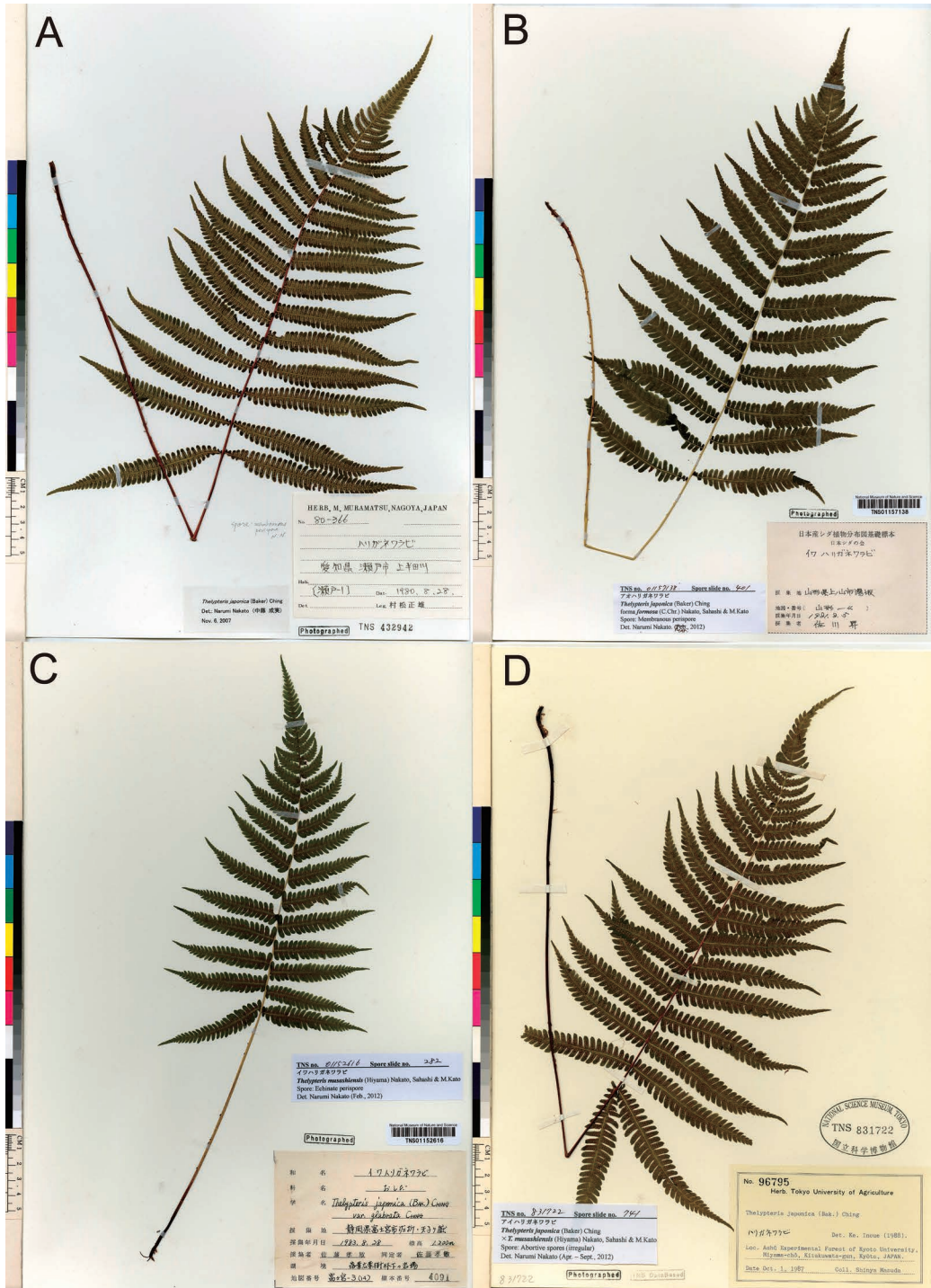


Fig. 1. Specimens of the *Thelypteris japonica* complex in Japan. A. *Thelypteris japonica* forma *japonica* (TNS-VS-432942, Aichi Pref., Seto-shi, M. Muramatsu 80366); B. *T. japonica* forma *formosa* (TNS-VS-115718, Yamagata Pref., Kaminoyama-shi, N. Sagawa s.n.); C. *T. musashiensis* (TNS-VS-1152616, Shizuoka Pref., Fujinomiya-shi, T. Sato 4091); D. *T. japonica* × *T. musashiensis*, the castaneous stipe form (TNS-VS-831722, Kyoto Pref., Kitakuwada-gun, Miyama-cho, S. Masuda s.n.).

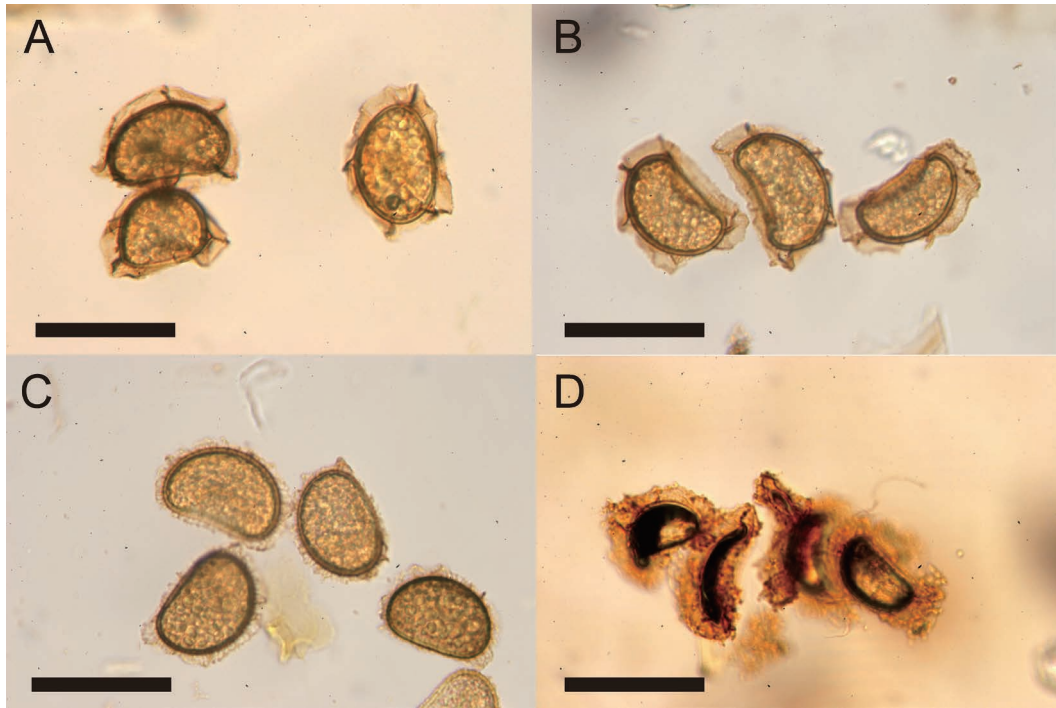


Fig. 2. Spores of the *Thelypteris japonica* complex in Japan (scale bars = 50 μ m). A. spores with membraneous ornamentation produced by *T. japonica* forma *japonica* (TNS-VS-397231, Yamaguchi Pref., Iwakuni-shi, *A. Minami* 16677); B. spores with membraneous ornamentation produced by *T. japonica* forma *formosa* (TNS-VS-438920, Fukushima Pref., Onuma-gun, Showa-mura, *Z. Kaneda* s.n.); C. spores with echinate ornamentation produced by *T. musashiensis* (TNS-VS-1159828, Oita Pref., Naoiri-gun, Kuju-machi, *M. Arakane* s.n.); D. irregular-shaped spores of *T. japonica* \times *T. musashiensis* (TNS-VS-438936, Fukushima Pref., Kitakata-shi, *Z. Kaneda* 6517).

For specimens with stramineous stipes (stramineous at least in the upper half of the stipes) which have been identified as *T. japonica* var. *musashiensis* (*T. musashiensis*), var. *glabrata*, f. *viridescens* and forma *formosa*, those producing only irregular spores were identified as the hybrid and those producing normal-shaped spores were separated into two taxa depending on the morphology of the spore ornamentation (membraneous for *T. japonica* forma *formosa* and echinate for *T. musashiensis*). Specimens, even with abundant irregular spores, were not identified as the hybrid when a few regular spores were mixed with the irregular ones. All the spores collected from specimens with stramineous stipes were mounted with Bioleite and the permanent mounts were deposited in TNS.

Results and Discussion

Among ca. 2500 specimens examined, mature spores were observed in 1984 specimens. As a result, 1193 specimens (60.1%) were identified as *T. japonica* forma *japonica*, 275 (13.9%) as *T. japonica* forma *formosa*, 344 (17.3%) as *T. musashiensis* and 172 (8.7%) as the *T. japonica* \times *T. musashiensis* (Appendix 1). It is notable that the hybrid consists of individuals with castaneous stipes (120, 69.8% of the hybrid) and those with stramineous stipes (52, 30.2%).

Thelypteris japonica forma *japonica* is the most widespread and most common taxon in the complex, ranging throughout Japan except in Hokkaido and Okinawa Prefectures (Fig. 3A). *Thelypteris japonica* forma *formosa* is also widespread, extending to the southern part of Hok-

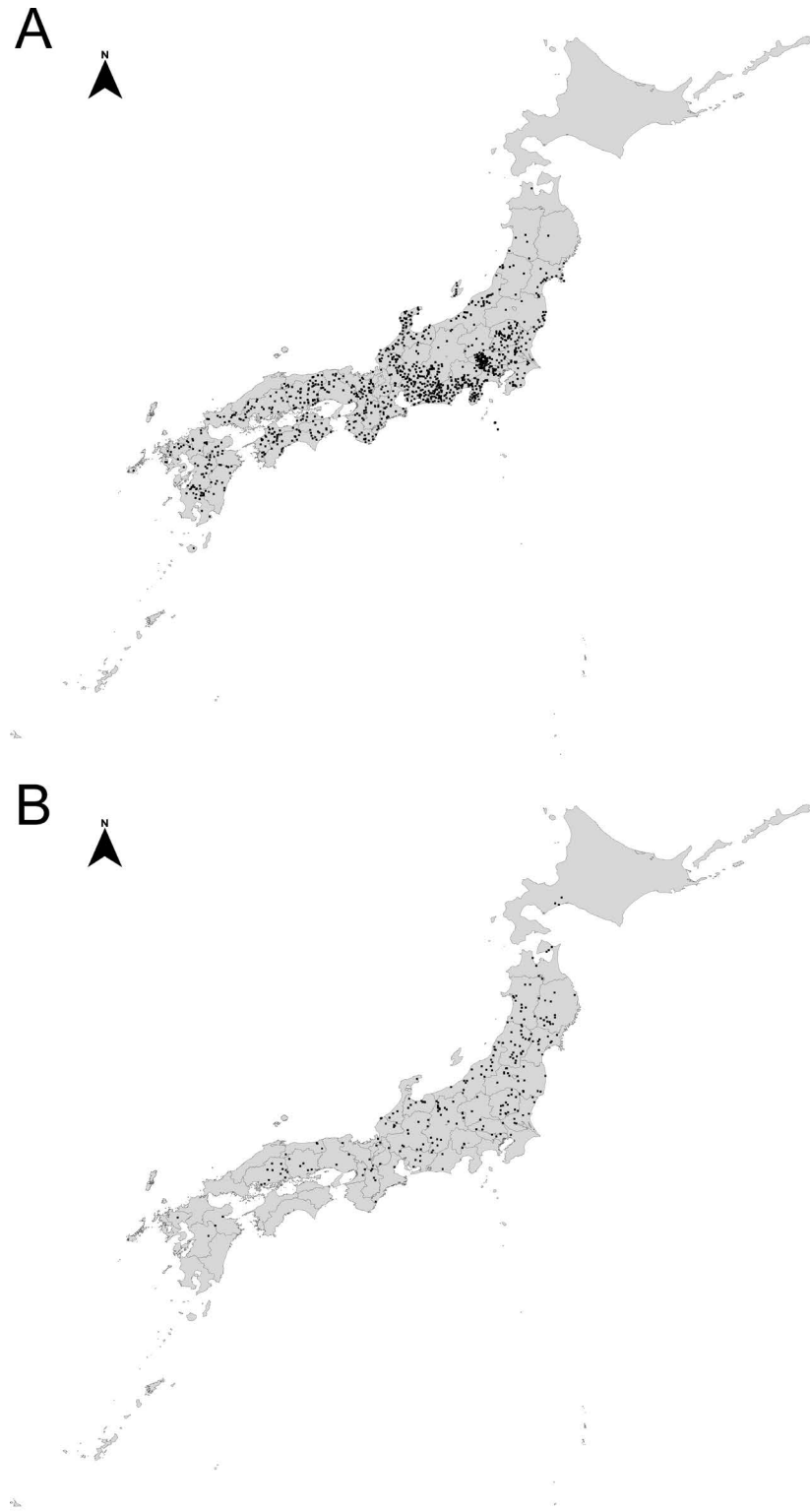


Fig. 3. Distribution maps of the *Thelypteris japonica* complex in Japan based on the specimens examined by the present study. A. *Thelypteris japonica* forma *japonica*; B. *T. japonica* forma *formosa*.

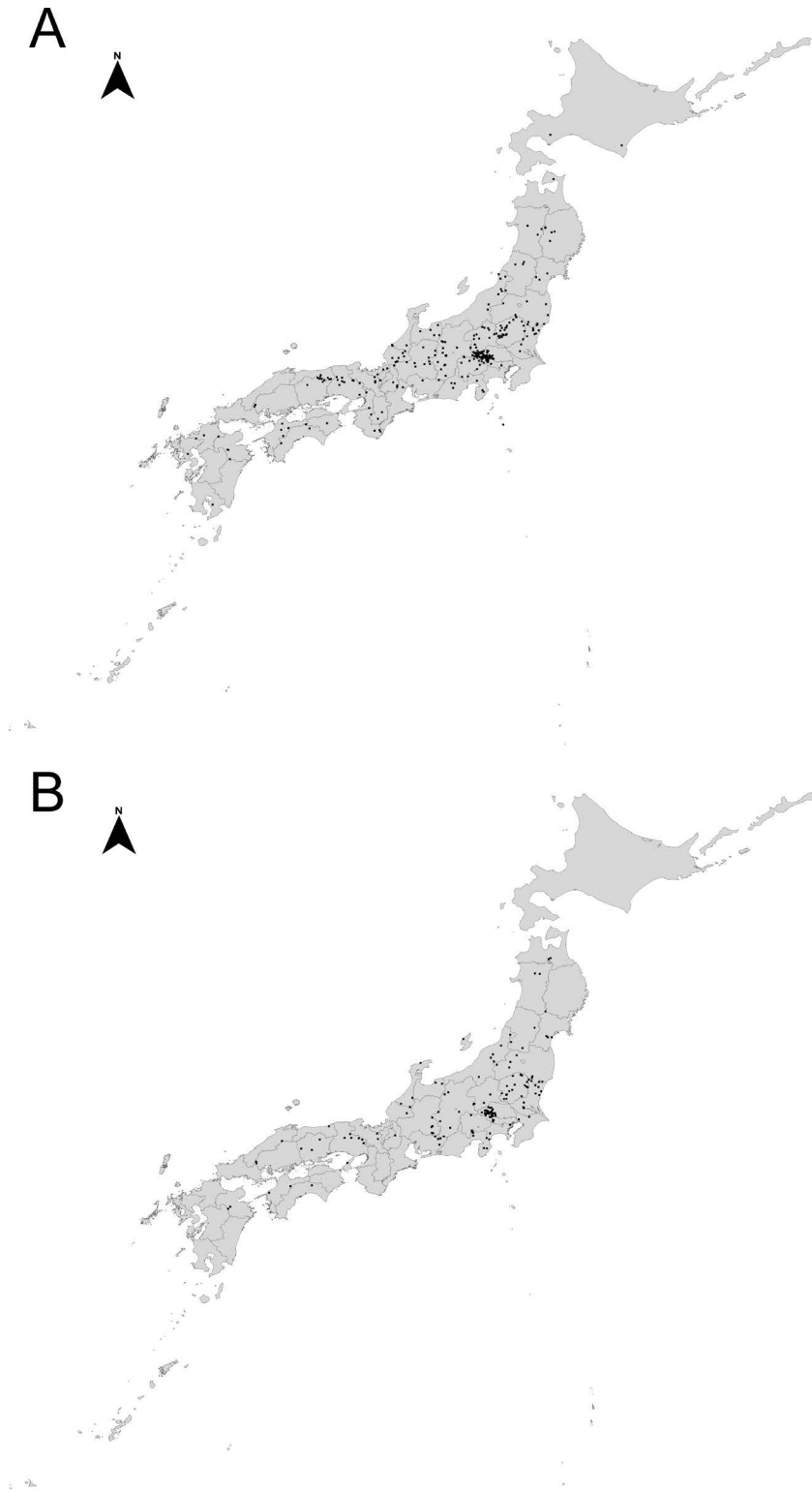


Fig. 4. Distribution maps of the *Thelypteris japonica* complex in Japan based on the specimens examined by the present study. A. *T. musashiensis*; B. *T. japonica* × *T. musashiensis*.

kaido, but less common than the type forma (Fig. 3B). *Thelypteris musashiensis* prefers rocky habitats at rather high altitudes (Nakato *et al.*, 2004), and tends to be distributed in inland areas from southern Hokkaido to Kyushu; it has not yet been found in 8 prefectures, i.e. Chiba, Kanagawa, Shimane, Yamaguchi, Kagawa, Nagasaki, Kumamoto and Okinawa (Fig. 4A). The hybrid (*T. japonica* × *T. musashiensis*) has been found in most of the prefectures where distributions of *T. japonica* s.l. and *T. musashiensis* overlap, but not yet been found in Hokkaido, Mie, Osaka, Nara, Wakayama, Tokushima, Fukuoka, Saga, Kumamoto, Miyazaki and Kagoshima Prefectures (Fig. 4B). It is also notable that the hybrid occurs in Chiba, Kanagawa and Shimane Prefectures where one of the parents, *T. musashiensis* has not yet been recorded. Takahashi and Hori (2008) already pointed out that hybrids were often recorded in the localities lacking one or both of their parents, and our present results frequently showed a similar phenomenon when localities smaller than prefectures were taken into account. Although insufficient sampling is probably a cause of this phenomenon, some of the localities of the hybrid are apparently not preferred by *T. musashiensis* (e.g. TNS-VS-517192, Tokyo, Ikegami — located in the city center of Tokyo, almost at sea level). Variation in stipe color of the hybrid is presumably due to the stipe color of one of the parents (i.e. *T. japonica* forma *japonica* vs. forma *formosa*). The hybrid with stramineous stipes has been collected in the northeastern half of Honshu so far, which seems to be influenced by the distribution of *T. japonica* forma *formosa*.

Acknowledgments

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Appendix 1. Specimens identified based on spore morphology. Municipal-level locality information is provided for *Thelypteris japonica* forma *japonica*, and locality details are provided for the remaining taxa.

Thelypteris japonica (Baker) Ching forma *japonica* [Harigane-warabi]

Honshu - Aomori Pref.: Higashitsugaru-gun, Kanita-machi, 1977-8-22, *N. Saitoh s.n.* (TNS-VS-344145); **Iwate Pref.:** Shiwa-gun, Tonan-mura, 1980-9-15, *Y. Nakajima s.n.* (TNS-VS-440259); **Miyagi Pref.:** Sendai-shi, 1912-9-28, *E. Iishiba s.n.* (TNS-VS-254666), 1980-9-23, *M. Takeichi s.n.* (TNS-VS-575758); Ishinomaki-shi, 1972-10-15, *Y. Ueno 8550* (TNS-VS-575754); Shiogama-shi, 1977-8-22, *M. Takeichi s.n.* (TNS-VS-575762); Shibata-gun, Shibata-machi, 1980-10-11, *K. Shoji s.n.* (TNS-VS-575751); Igu-gun, Marumori-machi, 1980-8-10, *K. Okazaki s.n.* (TNS-VS-576835), 1980-7-22, *K. Okazaki s.n.* (TNS-VS-576834), 1981-8-23, *K. Matsunaga s.n.* (TNS-VS-1156160); Miyagi-gun, Matsushima-machi, 1976-8-19, *W. Takahashi s.n.* (TNS-VS-576832); Rifu-cho, 1980-10-26, *M. Takeichi s.n.* (TNS-VS-575756); Shida-gun, Matsuyama-machi, 1977-?-?, *M. Takeichi s.n.* (TNS-VS-575761); Tamatsukuri-gun, Iwadeyama-machi, 1972-10-1, *W. Takahashi s.n.* (TNS-VS-576833); Mono-gun, Yamoto-cho, 1977-10-15, *M. Takeichi s.n.* (TNS-VS-575763); Oshika-gun, Onagawa-cho, 1981-9-23, *M. Takeichi s.n.* (TNS-VS-575767); Inai-cho, 1967-10-22, *M. Kikuchi s.n.* (TNS-VS-177138); Oshika-cho, 1979-11-4, *K. Matsunaga s.n.* (TNS-VS-1156161); Motoyoshi-gun, Shizugawa-cho, 1980-9-19, *M. Takeichi s.n.* (TNS-VS-575760); Motoyoshi-cho, 1980-7-26, *Z. Kaneda s.n.* (TNS-VS-575759); **Akita Pref.:** Akita-shi, 1978-9-5, *J. Takada s.n.* (TNS-VS-420027); Omagari-shi, 1980-10-10, *J. Takada s.n.* (TNS-VS-420029); Yuri-gun, Kisakata-machi, 1980-9-28, *J. Takada s.n.* (TNS-VS-420026); Senboku-gun, Kyowamachi, 1976-10-5, *J. Takada s.n.* (TNS-VS-420028); Ogachi-gun, Ogachi-machi, 1981-9-26, *J. Takada s.n.* (TNS-VS-420111); **Yamagata Pref.:** Yonezawa-shi, 1980-8-28, *Z. Sato 326* (TNS-VS-437984); Tsuruoka-shi, 1958-10-9, *S. Kato s.n.* (TNS-VS-437817), 1981-8-6, *A. Yamamoto s.n.* (TNS-VS-437980), 1970-8-14, *S. Kato s.n.* (TNS-VS-437612); Murayama-shi, 1980-8-24, *N. Sagawa s.n.* (TNS-VS-437982); Mogami-gun, Tozawamura, 1964-9-12, *S. Kato s.n.* (TNS-VS-437819); Higashitagawa-gun, Haguro-machi, 1980-10-1, *T. Nakaïke s.n.* (TNS-VS-437981); Nishitagawa-gun, Tagawa-mura, 1892-9-11, *T. Nagasawa s.n.* (TNS-VS-54786), 1903-8-24, *T. Nagasawa s.n.* (TNS-VS-517186,

517188); **Fukushima Pref.**: Iwaki-shi, 1976-8-8, *H. Ito s.n.* (TNS-VS-1092657), 1973-10-16, *Y. Yuzawa s.n.* (TNS-VS-438917), 1975-9-28, *Y. Yuzawa s.n.* (TNS-VS-438919), 1976-7-3, *Y. Yuzawa s.n.* (TNS-VS-438918), 1980-10-26, *S. Saito s.n.* (TNS-VS-438939), 1976-8-9, *T. Nakaïke s.n.* (TNS-VS-435492), 1984-11-14, *M. Origasa s.n.* (TNS-VS-1157005), 1975-9-28, *Z. Kaneda s.n.* (TNS-VS-1172237); Shinobu-gun, Tsuchiyu-mura, 1933-8-21, *H. Koidzumi 100833* (TNS-VS-912107); Onuma-gun, Aizutakadamachi, 1980-9-21, *A. Baba s.n.* (TNS-VS-439165); Higashishirakawa-gun, Tanagura-machi, 1977-10-20, *Z. Kaneda 3503* (TNS-VS-1172238); Futaba-gun, Naraha-machi, 1975-10-20, *Z. Kaneda s.n.* (TNS-VS-438933), 1969-9-15, *Y. Yuzawa s.n.* (TNS-VS-1172236); Tomioka-machi, 1980-12-2, *Z. Kaneda 6512* (TNS-VS-438935), 1980-12-3, *Z. Kaneda 6505* (TNS-VS-438934); **Ibaraki Pref.**: Mito-shi, 1979-8-23, *M. Yasu s.n.* (TNS-VS-422597); Ishioka-shi, 1974-10-10, *H. Fujita s.n.* (TNS-VS-422809); Ryugasaki-shi, 1975-8-27, *Y. Nakazaki & N. Wada s.n.* (TNS-VS-422586); Hitachiota-shi, 1980-9-7, *M. Yasu s.n.* (TNS-VS-422594); Kitaibaraki-shi, 1974-10-5, *N. Wada 1051* (TNS-VS-595307), 1975-11-18, *T. Waku 4295* (TNS-VS-595305); Kasama-shi, 1975-8-8, *H. Fujita s.n.* (TNS-VS-422811); Toride-shi, 1975-8-27, *M. Yasu s.n.* (TNS-VS-422805), 1975-8-22, *H. Fujita s.n.* (TNS-VS-422808); Tsukuba-shi, 1995-11-11, *N. Nakato 2009* (TNS-VS-1168523), 1995-11-11, *N. Nakato 2014* (TNS-VS-1168524), 1997-9-22, *S. Fujimoto s.n.* (TNS-VS-9508642a/b); Higashiibaraki-gun, Ibaraki-machi, 1974-10-5, *M. Yasu s.n.* (TNS-VS-422588); Nishiibaraki-gun, Iwama-machi, 1958-10-31, *E. Sugiyama s.n.* (TNS-VS-1042044); Naka-gun, Ogawa-mura, 1974-11-8, *H. Fujita s.n.* (TNS-VS-422589); Kuji-gun, Satomi-mura, 1979-9-5, *M. Yasu s.n.* (TNS-VS-422580); Daigo-machi, 1970-10-18, *Y. Nakazaki s.n.* (TNS-VS-422585), 1977-10-30, *M. Yasu s.n.* (TNS-VS-422815); Kashima-gun, Kashima-machi, 1974-11-30, *M. Yasu s.n.* (TNS-VS-422807); Niihari-gun, Yasato-machi, 1973-10-31, *M. Yasu s.n.* (TNS-VS-422574), 1979-10-25, *M. Yasu s.n.* (TNS-VS-422582); Tsukuba-gun, Tsukuba-machi, 1980-12-18, *T. Nakamura & A. Nakamura s.n.* (TNS-VS-422802), 1980-11-20, *T. Nakamura & A. Nakamura s.n.* (TNS-VS-422801); Makabe-gun, Makabe-machi, 1998-8-18, *A. Satoh TKB0021* (TNS-VS-9508621a/b); Yuuki-gun, Yachiyo-machi, 1975-8-22, *Y. Nakazaki & O. Shimizu s.n.* (TNS-VS-422587); Sashima-gun, Goka-mura, 1975-8-31, *N. Wada s.n.* (TNS-VS-422599); **Tochigi Pref.**: Utsunomiya-shi, 1987-8-5, *F. Matsumura s.n.* (TNS-VS-799751), 1981-9-5, *M. Usui s.n.* (TNS-VS-427387), 1981-8-29, *M. Usui s.n.* (TNS-VS-427385), 1980-8-28, *M. Usui s.n.* (TNS-VS-422709), 1980-9-28, *M. Usui s.n.* (TNS-VS-422711); Ashikaga-shi, 1980-11-3, *M. Usui s.n.* (TNS-VS-422698), 1980-10-27, *M. Usui s.n.* (TNS-VS-422699); Tochigi-shi, 1980-10-24, *M. Usui s.n.* (TNS-VS-422718); Kanuma-shi, 1980-10-23, *K. Satoh s.n.* (TNS-VS-799737), 1980-10-9, *M. Usui s.n.* (TNS-VS-422712), 1980-9-1, *M. Usui s.n.* (TNS-VS-422714), 1980-10-29, *M. Usui s.n.* (TNS-VS-422700); Nikko-shi, 1987-8-9, *T. Kamiyama s.n.* (TNS-VS-799743), 1987-8-9, *T. Kamiyama s.n.* (TNS-VS-799742), 1956-9-10, *M. Ishihara s.n.* (TNS-VS-132660), 1980-10-22, *M. Usui s.n.* (TNS-VS-422707); Imaichi-shi, 1987-8-20, *T. Kamiyama*

s.n. (TNS-VS-799754), 1987-9-28, *T. Kamiyama s.n.* (TNS-VS-799741), 1987-7-26, *T. Kamiyama s.n.* (TNS-VS-799753), 1987-8-17, *T. Kamiyama s.n.* (TNS-VS-799740), 1980-9-17, *M. Usui s.n.* (TNS-VS-422705), 1980-9-17, *M. Usui s.n.* (TNS-VS-422706); Oyama-shi, 1980-9-12, *M. Usui s.n.* (TNS-VS-422713); Otawara-shi, 1957-9-22, *K. Ogawa s.n.* (TNS-VS-1042048); Kuroiso-shi, 1981-9-15, *T. Waku s.n.* (TNS-VS-431947), 1987-9-12, *S. Ishiguro s.n.* (TNS-VS-1157006); Kawachi-gun, Minamikawachi-machi, 1979-10-20, *M. Usui s.n.* (TNS-VS-422717); Kamikawachi-mura, 1981-10-2, *S. Waku s.n.* (TNS-VS-438798); Kawachi-machi, 1987-9-13, *H. Ogawa s.n.* (TNS-VS-799755), 1987-10-4, *H. Ogawa s.n.* (TNS-VS-799744); Kamitsuga-gun, Nishikata-mura, 1981-9-8, *M. Usui s.n.* (TNS-VS-427386); Haga-gun, Mashiko-machi, 1979-9-20, *M. Usui s.n.* (TNS-VS-422716); Motegi-machi, 1987-9-13, *M. Yoshikawa 1521* (TNS-VS-799746), 1980-10-2, *M. Usui s.n.* (TNS-VS-422708); Shimotsuga-gun, Fujioka-machi, 1981-8-17, *M. Usui s.n.* (TNS-VS-518255); Shioya-gun, Shioya-machi, 1980-9-8, *T. Tashiro s.n.* (TNS-VS-422694); Ujiie-machi, 1987-9-13, *H. Ogawa s.n.* (TNS-VS-799739); Kitsuregawa-machi, 1981-9-2, *M. Usui s.n.* (TNS-VS-427390), 1987-10-28, *S. Waku s.n.* (TNS-VS-1160528); Nasu-gun, Karasuyama-machi, 1977-8-28, *T. Waku 7418* (TNS-VS-422690); Bato-machi, 1981-9-16, *M. Usui s.n.* (TNS-VS-427389); Kurobane-machi, 1981-9-30, *S. Waku s.n.* (TNS-VS-438797); Nasu-machi, 1968-8-22, *H. Ito s.n.* (TNS-VS-1092234), 1980-10-15, *M. Usui s.n.* (TNS-VS-422703), 1981-8-16, *T. Tashiro s.n.* (TNS-VS-427392), 1980-8-13, *M. Usui s.n.* (TNS-VS-422704); Nishinasuno-machi, 1987-10-8, *T. Yamamura s.n.* (TNS-VS-799756), 1988-11-13, *T. Yamamura s.n.* (TNS-VS-799738), 1968-8-22, *H. Ito s.n.* (TNS-VS-1042053), 1979-9-8, *H. Kato s.n.* (TNS-VS-422688); **Gunma Pref.**: Ota-shi, 1973-10-23, *S. Suto s.n.* (TNS-VS-435554); Seta-gun, Ogo-machi, 1980-11-4, *T. Waku 10466* (TNS-VS-435551); Gunma-gun, Haruna-machi, 1980-6-23, *S. Suto s.n.* (TNS-VS-435553); Kitagunma-gun, Onogami-mura, 1985-10-2, *S. Waku s.n.* (TNS-VS-1166304); Tanogun, Onishi-machi, 1979-9-17, *S. Suto s.n.* (TNS-VS-435552); Kanra-gun, Shimonita-machi, 1956-9-9, *T. Satomi 16* (TNS-VS-1042065); Usui-gun, Matsuida-machi, 1986-8-3, *S. Ishiguro s.n.* (TNS-VS-1156206); Ora-gun, Chiyoda-mura, 1957-11-0, *T. Matsuzawa s.n.* (TNS-VS-1042047); Tataru-mura, 1954-8-22, *T. Wakana 27* (TNS-VS-1042124); **Saitama Pref.**: Urawa-shi, 1947-9-25, *T. Kawasaki 6767* (TNS-VS-675379), 1980-7-12, *T. Waku 10032* (TNS-VS-514508); Omiya-shi, 1980-9-5, *T. Waku 10243* (TNS-VS-514507); Chichibu-shi, 1994-10-25, *T. Iwata 40606* (TNS-VS-1133844), 1995-10-1, *T. Iwata 42159* (TNS-VS-1133835), 2000-8-10, *T. Iwata 61054* (TNS-VS-1133820), 1987-11-17, *T. Iwata 8334* (TNS-VS-1133723), 1989-10-29, *T. Iwata 9712* (TNS-VS-1133871), 1991-8-25, *T. Iwata 10515* (TNS-VS-1133860), 1991-9-15, *T. Iwata 10566* (TNS-VS-1133859), 1991-10-6, *T. Iwata 10660* (TNS-VS-1133858), 1983-9-15, *T. Iwata 2088* (TNS-VS-1133788), 1983-9-15, *T. Iwata 2094* (TNS-VS-1133787), 1983-10-28, *T. Iwata 2338* (TNS-VS-1133782), 1983-10-28, *T. Iwata 2339* (TNS-VS-1133781), 1964-8-18, *T. Iwata 289* (TNS-VS-1133810), 1981-8-25, *S. Kobayashi s.n.*

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Kasuya s.n.* (TNS-VS-424239), 1980-8-18, *T. Kawana s.n.* (TNS-VS-427514), 1980-8-20, *Y. Kasuya s.n.* (TNS-VS-936021); Yotsukaido-shi, 1983-12-12, *J. Haginiwa JH014529* (TNS-VS-964529), 1983-12-12, *J. Haginiwa JH014530* (TNS-VS-964530); Higashikatsushika-gun, Sekiyado-machi, 1981-10-11, *Y. Kimizuka s.n.* (TNS-VS-560437); Katori-gun, Kurimoto-machi, 1976-9-19, *Y. Koike 283* (TNS-VS-424247); Chosei-gun, Chosei-mura, 1966-8-15, *M. Furuse 44360* (TNS-VS-773906); Awa-gun, Amatsukominato-machi, 1951-11-0, *H. Ito s.n.* (TNS-VS-1042120); Tokyo Pref.: Tokyo-shi, 1932-10-0, *K. Hiyama 457* (TNS-VS-1166299); Bunkyo-ku, 1980-7-12, *Y. Kimizuka s.n.* (TNS-VS-423948); Kitatoshima-gun, Iwabuchi-machi, 1929-7-?, *Y. Jotani 16* (TNS-VS-831884), 1897-8-17, *K. Watanabe s.n.* (TNS-VS-63268); Hachioji-shi, 2008-8-11, *S. Fujimoto 080811-2* (TNS-VS-776368), 1970-9-29, *H. Miyazaki 1679* (TNS-VS-831717), 1969-10-6, *S. Serizawa 11274* (TNS-VS-311877); Ome-shi, 1985-9-29, *T. 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Uchikawa* s.n. (TNS-VS-89863); Kitakanbara-gun, Sasakami-mura, 1963-11-7, *F. Konta* 3405 (TNS-VS-929610), 1963-11-7, *F. Konta* 3426 (TNS-VS-929600), 1978-11-14, *M. Saito* 2391 (TNS-VS-543168), 1986-10-21, *M. Saito* s.n. (TNS-VS-1157042, 1166312), 1978-11-14, *M. Saito* s.n. (TNS-VS-1172239); Toyoura-machi, 1987-9-4, *M. Saito* s.n. (TNS-VS-1156201); Nakakanbara-gun, Muramatsu-machi, 1962-8-29, *F. Konta* 911 (TNS-VS-929589), 1948-10-?, *T. Uchikawa* 41 (TNS-VS-89864), 1978-9-7, *M. Saito* 2554 (TNS-VS-543169), 1979-10-15, *T. Takahashi* s.n. (TNS-VS-543179), 1983-8-30, *M. Saito* s.n. (TNS-VS-1156157), 1967-8-30, *S. Iwano* s.n. (TNS-VS-1172235), 1978-9-23, *M. Saito* 2177 (TNS-VS-1172234), 1978-9-23, *M. Saito* 2181 (TNS-VS-1172233); Nishikanbara-gun, Yahiko-mura, 1978-8-3, *M. Saito* 2089 (TNS-VS-543166); Bunsui-machi, 1987-10-22, *M. Saito* s.n. (TNS-VS-1156125); Minamikanbara-gun, Shitada-mura, 1979-8-27, *M. Saito* 3192 (TNS-VS-543173); Sakae-machi, 1987-10-23, *M. 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Nakato* 1991 (TNS-VS-1168525); Akadomari-mura, 1984-8-9, *M. Saito* s.n. (TNS-VS-1157037); **Toyama Pref.:** Toyama-shi, 1978-7-6, *T. Ohshima* s.n. (TNS-VS-528751); Takaoka-shi, 1977-8-9, *T. Ohshima* s.n. (TNS-VS-528748); Uozu-shi, 1981-8-20, *T. Ohshima* s.n. (TNS-VS-528744), 1977-9-23, *T. Ohshima* s.n. (TNS-VS-528746); Kurobe-shi, 1978-8-10, *T. Ohshima* s.n. (TNS-VS-528752); Tonami-shi, 1976-8-21, *T. Ohshima* s.n. (TNS-VS-528755); Oyabe-shi, 1979-8-9, *T. Ohshima* s.n. (TNS-VS-528753); Kaminiikawa-gun, Oyama-machi, 1983-8-13, *T. Ohshima* s.n. (TNS-VS-1156187); Nakaniikawa-gun, Kamiichi-machi, 1978-10-8, *T. Ohshima* s.n. (TNS-VS-528704); Tateyama-mura, 1929-8-31, *Z. Tashiro* s.n. (TNS-VS-35380); Tateyama-machi, 1976-10-20, *T. Ohshima* s.n. (TNS-VS-528745); Shimoniikawa-gun, Asahi-machi, 1981-9-15, *T. Ohshima* s.n. (TNS-VS-528743), 1982-11-6, *T. Ohshima* s.n. (TNS-VS-1156181); Nei-gun, Yatsuo-machi, 1980-7-8, *T. Ohshima* s.n. (TNS-VS-528756); Yamada-mura, 1978-10-7, *T. Ohshima* s.n. (TNS-VS-528749); Higashitonami-gun, Kamitaira-mura, 1983-8-6, *T. Ohshima* s.n. (TNS-VS-1156183); Nishitonami-gun, Fukuoka-machi, 1988-8-21, *T. Ohshima* s.n. (TNS-VS-1157007); **Ishikawa Pref.:** Kanazawa-shi, 1973-9-9, *M. Honda* s.n. (TNS-VS-424527), 1975-8-20, *M. Honda* s.n. (TNS-VS-424528), 1976-10-10, *M. Honda* s.n. (TNS-VS-424515); Nanao-shi, 1979-8-11, *S. Komaki* s.n. (TNS-VS-424523), 1978-11-3, *S. Komaki* s.n. (TNS-VS-424513); Komatsu-shi, 1980-8-18, *M. Honda* s.n. (TNS-VS-424533), 1980-8-9, *M. Honda* s.n. (TNS-VS-424532), 1979-8-11, *K. Yoneyama* s.n. (TNS-VS-424525); Wajima-shi, 1975-10-5, *S. Komaki* s.n. (TNS-VS-424535), 1977-10-11, *S. Komaki* s.n.

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Komaki s.n.* (TNS-VS-424543); Kashima-gun, Tatsuruhama-machi, 1978-9-12, *S. Komaki s.n.* (TNS-VS-424505), 1977-9-17, *S. Nakada s.n.* (TNS-VS-424519); Nakajima-machi, 1978-9-3, *S. Komaki s.n.* (TNS-VS-424518), 1978-10-24, *S. Komaki s.n.* (TNS-VS-424512); Kashima-machi, 1969-11-19, *S. Komaki s.n.* (TNS-VS-424539), 1977-10-12, *S. Nakada s.n.* (TNS-VS-424524); Notojima-machi, 1978-9-27, *S. Komaki s.n.* (TNS-VS-424521); Fugeshi-gun, Anamizu-machi, 1977-10-10, *S. Komaki s.n.* (TNS-VS-424503), 1975-11-8, *S. Komaki s.n.* (TNS-VS-424542), 1969-11-10, *S. Komaki s.n.* (TNS-VS-424502); Noto-machi, 1977-10-10, *S. Komaki s.n.* (TNS-VS-424545); Yanagida-mura, 1976-10-12, *S. Komaki s.n.* (TNS-VS-424546); Suzu-gun, Uchiura-machi, 1968-10-18, *S. Komaki s.n.* (TNS-VS-424538); **Fukui Pref.:** Fukui-shi, 1977-6-4, *Y. Saito s.n.* (TNS-VS-1166214), 1987-7-26, *Y. Saito s.n.* (TNS-VS-1156134); Tsuruga-shi, 1976-7-18, *S. Watanabe s.n.* (TNS-VS-1166202); Takafu-shi, 1978-9-13, *S. Watanabe s.n.* (TNS-VS-1166200), 1984-8-19, *Y. Saito s.n.* (TNS-VS-1156993); Ono-shi, 1979-8-13, *S. Watanabe s.n.* (TNS-VS-1166197), 1971-10-3, *Y. Saito s.n.* (TNS-VS-1166209), 1979-8-31, *S. Watanabe s.n.* (TNS-VS-1166196), 1974-11-9, *Y. Saito s.n.* (TNS-VS-1166190), 1975-8-9, *Y. Saito s.n.* (TNS-VS-1166213), 1975-7-28, *Y. Saito s.n.* (TNS-VS-1166225), 1975-8-3, *Y. Saito s.n.* (TNS-VS-1166226); Katsuyama-shi, 1978-8-29, *Y. Saito s.n.* (TNS-VS-1166210), 1978-10-8, *Y. Saito s.n.* (TNS-VS-1166211), 1974-10-?, *Y. Saito s.n.* (TNS-VS-1166191); Sabae-shi, 1961-9-5, *S. Watanabe s.n.* (TNS-VS-1166199); Yoshida-gun, Eiheiji-cho, 1979-8-5, *S. Watanabe s.n.* (TNS-VS-1166195); Ono-gun, Izumi-mura, 1979-8-8, *S. Watanabe s.n.* (TNS-VS-1166203); Sakai-gun, Mikuni-cho, 1992-11-3, *S. Watanabe s.n.* (TNS-VS-1156207); Kanazu-cho, 1980-8-24, *Y. Saito s.n.* (TNS-VS-1166192); Imadate-gun, Ikeda-cho, 1963-8-13, *S. Watanabe s.n.* (TNS-VS-1166201), 1964-7-28, *S. 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Tsutsumi s.n.* (TNS-VS-574313); Shimojo-mura, 1930-9-20, *M. Furuse s.n.* (TNS-VS-909807); Urugi-mura, 1981-10-12, *H. Tsutsumi s.n.* (TNS-VS-574312); Tenryu-mura, 1981-11-16, *H. Tsutsumi s.n.* (TNS-VS-1157069), 1974-7-27, *K. Otsuka 1857* (TNS-VS-1157064), 1968-10-10, *Y. Hara s.n.* (TNS-VS-1157068); Yasuoka-mura, 1981-7-25, *H. Tsutsumi s.n.* (TNS-VS-574307), 1981-10-14, *H. Tsutsumi s.n.* (TNS-VS-574324); Kiso-gun, Agematsu-machi, 1981-10-31, *H. Tsutsumi s.n.* (TNS-VS-574290), 1980-8-25, *T. Nakaikae s.n.* (TNS-VS-1157071), 1981-8-26, *H. Tsutsumi s.n.* (TNS-VS-574304); Nagiso-machi, 1976-7-30, *K. Otsuka 5483* (TNS-VS-431605), 1976-7-31, *T. Nakaikae s.n.* (TNS-VS-1157070), 1981-10-19, *H. Tsutsumi s.n.* (TNS-VS-574300), 1981-8-24, *H. Tsutsumi s.n.* (TNS-VS-574308); Hiyoshi-mura, 1981-10-30, *H. Tsutsumi s.n.* (TNS-VS-574292); Okuwa-mura, 1973-7-28, *H. Miyazaki 2819* (TNS-VS-831863), 1980-11-4, *K. Otsuka 7634* (TNS-VS-431604), 1981-8-24, *H. Tsutsumi s.n.* (TNS-VS-574309), 1980-11-3, *M. Fukuhara 8318* (TNS-VS-1157073), 1974-8-1, *K. Otsuka 2017* (TNS-VS-1157076), 1980-8-25, *T. Nakaikae s.n.* (TNS-VS-1157079), 1981-8-25, *H. Tsutsumi s.n.* (TNS-VS-574306, 574310); Yamaguchi-mura, 1981-10-19, *H. Tsutsumi s.n.* (TNS-VS-574299), 1954-8-15, *H. Okuhara s.n.* (TNS-VS-1157110), 1967-10-26, *H. Okuhara s.n.* (TNS-VS-1157111), 1981-8-29, *H. Tsutsumi s.n.* (TNS-VS-574302); Minamiazumi-gun, Horigane-mura, 1981-9-11, *H. Tsutsumi s.n.* (TNS-VS-574311); Kamiminochi-gun, Shinano-machi, 1981-9-25, *H. Tsutsumi s.n.* (TNS-VS-574297), 1981-9-25, *H. Tsutsumi s.n.* (TNS-VS-574296); **Gifu Pref.:** Gifu-shi, 1957-10-31, *K. Inami s.n.* (TNS-VS-285244), 1967-9-13, *S. Serizawa 4731* (TNS-VS-1042057), 1976-9-4, *Y.*

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Miyazawa* 142 (TNS-VS-929627), 1979-8-30, *M. Nakagawa* s.n. (TNS-VS-508988), 1983-9-18, *T. Sato* 4454 (TNS-VS-1156113), 1983-8-22, *T. Sato* 3939 (TNS-VS-1156114), 1983-9-24, *T. Sato* 4701 (TNS-VS-1156116), 1982-10-16, *M. Nakagawa* s.n. (TNS-VS-1156165), 1984-9-16, *T. Sato* 6153 (TNS-VS-1157035), 1980-9-23, *T. Sugino* s.n. (TNS-VS-1166236); Ito-shi, 1981-7-26, *T. Shimakawa* s.n. (TNS-VS-509169); Fuji-shi, 1983-8-22, *T. Sato* 3796 (TNS-VS-929622), 1983-7-24, *T. Sato* 3474 (TNS-VS-929582), 1983-9-15, *T. Sato* 4364 (TNS-VS-1156162); Iwata-shi, 1962-11-4, *K. Satake* s.n. (TNS-VS-311833, 311845, 318001); Kakegawa-shi, 1980-10-26, *T. Sato* s.n. (TNS-VS-509167), 1981-10-11, *T. Sugino* s.n. (TNS-VS-509292), 1977-6-4, *H. Kobayashi* s.n. (TNS-VS-1166237); Fujieda-shi, 1981-7-29, *T. Sugino* s.n. (TNS-VS-509123), 1981-8-6, *T. Sugino* s.n. (TNS-VS-509121); Gotenba-shi, 1975-10-26, *T. Nakaike* s.n. (TNS-VS-335679); Fukuroi-shi, 1980-9-23, *T. Sato* s.n. 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(TNS-VS-437412); Kitamuro-gun, Kiinagashima-cho, 1972-8-24, *Y. Higuchi* s.n. (TNS-VS-437405); Minamimuro-gun, Mihama-cho, 1967-8-11, *K. Hanajiri* s.n. (TNS-VS-437424); **Shiga Pref.**: Otsu-shi, 1908-8-0, *I. Sono* s.n. (TNS-VS-17586); Shiga-gun, Shiga-cho, 1977-9-24, *T. Waku* 7640 (TNS-VS-533923), 1932-11-13, *Y. Sonoda* s.n. (TNS-VS-268409); Gamo-gun, Hino-cho, 1981-8-16, *T. Shiraiwa* 10267 (TNS-VS-435453), 1982-10-29, *T. Tatebe* s.n. (TNS-VS-1156209); Ryuo-cho, 1979-9-14, *Y. Kimizuka* s.n. (TNS-VS-533922); Kanzaki-gun, Gokasho-cho, 1977-10-21, *A. Muranaga* s.n. (TNS-VS-533920); Echi-gun, Hatasho-cho, 1977-10-22, *A. Muranaga* s.n. (TNS-VS-533921); Takashima-gun, Kutsumi-mura, 1981-9-13, *T. Tatebe* s.n. (TNS-VS-533919), 1982-10-25, *K. Nakamura* & *al.* s.n. (TNS-VS-1156217); **Kyoto Pref.**: Kyoto-shi, 1955-11-3, *M. Tagawa* 7157 (TNS-VS-132766); Sakyo-ku, 1982-10-25, *F. Miyamoto* 7581 (TNS-VS-831727), 1951-9-24, *T. Kodama* s.n. (TNS-VS-1042039), 1982-10-25, *E. Fukushi* s.n. (TNS-VS-1156214), 1963-9-19, *F. Konta* 2746 (TNS-VS-929611), 1963-8-18, *K. Iwatsuki* 5590 (TNS-VS-248677); Higashiyama-ku, 1965-9-5, *F. Konta* 5313 (TNS-VS-929591); Ukyo-ku, 1981-9-9, *Y. Kimizuka* s.n. (TNS-VS-1157091); Kameoka-shi, 1991-9-26, *S. Tsugaru* 15396 (TNS-VS-575493), 1991-8-17, *T. Takahashi* 2104 (TNS-VS-594806), 1973-9-21, *K. Mimoro* & *S. Tsugaru* 904 (TNS-VS-337605), 1991-9-17, *S. Tsugaru* 15332 (TNS-VS-571255); Tsuzuki-gun, Yawata-cho, 1932-11-6, *H. Yamamoto* s.n. (TNS-VS-227978); Tanabe-cho, 1975-9-28, *Z. Tsujimoto* 2236 (TNS-VS-423315); Kitakuwada-gun, Keihoku-cho, 1981-8-15, *N. Yoshikawa* 8923 (TNS-VS-1157093); Miyama-cho, 1981-8-15, *N. Yoshikawa* 8979 (TNS-VS-1157090), 1981-8-15, *N. Yoshikawa* 8952 (TNS-VS-1157089); Hosono-mura, 1935-10-20, *Y. Araki* 13815 (TNS-VS-194864); Funai-gun, Mizuho-cho, 1983-8-8, *T. Nakaike* s.n. (TNS-VS-1157023, 1157025); Amata-gun, Fukuchiyama-cho, 1928-9-27, *Y. Araki* 6167 (TNS-VS-196020); Otagi-gun, Shizuichino-mura, 1933-9-17, *H. Yamamoto* 1899 (TNS-VS-227977); **Osaka Pref.**: Suita-shi, 1981-9-16, *A. Komaki* s.n. (TNS-VS-1166266); Takatsuki-shi, 1981-10-11, *A. Komaki* s.n. (TNS-VS-1166264), 1981-9-18, *A. Komaki* s.n. (TNS-VS-1166263); Kaizuka-shi, 1978-10-22, *H. Manago* s.n. (TNS-VS-549171); Toyono-gun, Toyono-cho, 1978-11-2, *T. Shiraiwa* 9188 (TNS-VS-1166267), 1978-11-12, *T. Shiraiwa* 9210 (TNS-VS-1166221); Nose-cho, 1981-9-27, *A. Komaki* s.n. (TNS-VS-1166262); Minoo-mura, 1932-10-31, *H. Yamamoto* 1877 (TNS-VS-227967); Minamikawachi-gun, Chihayaakasaka-mura, 1976-8-16, *Y. Inoue* s.n. (TNS-VS-1166265); **Hyogo Pref.**: Kobe-shi, 1979-9-15, *T. Shiraiwa* 9892 (TNS-VS-509264), 1977-12-3, *T. Shiraiwa* 7649 (TNS-VS-563791); Sumoto-shi, 1980-8-15, *K. Mune* 326 (TNS-VS-563481); Toyooka-shi, 1981-7-29, *Y. Hayashi* s.n. (TNS-VS-563478); Kawanishi-shi, 1981-9-27, *A. Komaki* s.n. (TNS-VS-576886); Sanda-shi, 1977-11-20, *T. Shiraiwa* 7605 (TNS-VS-563473); Kawabe-gun, Inagawa-cho, 2001-10-14, *K. Ushijima* 21355 (TNS-VS-756413); Taka-gun, Kurodasho-cho, 1980-11-9, *M. Inada* 40782 (TNS-VS-563776); Sayo-gun, Sayo-cho, 1978-8-29, *T. Shiraiwa* 8693 (TNS-VS-509261); Nanko-cho, 1963-8-2, *H. Ito* s.n. (TNS-VS-1045387); Shiso-gun, Yamasaki-cho, 1977-11-3, *T. Shiraiwa* 7581 (TNS-VS-563783), 1978-11-19, *T. Shiraiwa* 8949 (TNS-VS-509263); Yasutomi-cho, 1978-9-23, *T. Shiraiwa* 8796 (TNS-VS-509262); Kinosaki-gun, Hidaka-cho, 1973-10-18, *Y. Hayashi* s.n. (TNS-VS-1042052), 1978-8-10, *Y. Hayashi* s.n. (TNS-VS-576887); Izushi-gun, Tanto-cho, 1981-8-19, *Y. Hayashi*

- s.n. (TNS-VS-563476); Mikata-gun, Mikata-cho, 1977-9-15, *T. Shiraiwa 7337* (TNS-VS-563781); Yabu-gun, Yabu-cho, 1978-8-30, *Y. Hayashi s.n.* (TNS-VS-576889); Oya-cho, 1981-9-1, *Y. Hayashi s.n.* (TNS-VS-563480); Asago-gun, Ikuno-cho, 1981-9-14, *Y. Hayashi s.n.* (TNS-VS-563472); Wadayama-cho, 1977-8-4, *Y. Hayashi s.n.* (TNS-VS-576890); Taki-gun, Sasayama-cho, 1954-10-24, *T. Kodama s.n.* (TNS-VS-129840); **Nara Pref.:** Nara-shi, 1937-8-20, *Y. Matsumura s.n.* (TNS-VS-66718), 1975-7-5, *Z. Tsujimoto 738* (TNS-VS-423314), 1979-9-16, *Z. Tsujimoto 5203* (TNS-VS-423331); Yamatokoriyama-shi, 1979-10-15, *Z. Tsujimoto 5235* (TNS-VS-423333); Sakurai-shi, 1979-8-19, *A. Komaki s.n.* (TNS-VS-1166189); Gojo-shi, 1977-10-30, *Z. Tsujimoto 3788* (TNS-VS-423332); Gose-shi, 1975-9-22, *K. Mimoro, S. Tsugaru & K. Mizoguchi s.n.* (TNS-VS-371109); Yamabe-gun, Tsuge-mura, 1951-8-7, *T. Kodama s.n.* (TNS-VS-247334); Uda-gun, Muro-mura, 1979-8-24, *Z. Tsujimoto s.n.* (TNS-VS-423316); Kitakat-suragi-gun, Taima-cho, 1981-6-7, *Z. Tsujimoto 5773* (TNS-VS-573810); Yoshino-gun, Yoshino-cho, 1902-10-15, *J. Nikai 1605* (TNS-VS-254664); Nosegawa-mura, 1979-9-23, *O. Yanagawa s.n.* (TNS-VS-573812); Totsukawa-mura, 1976-10-24, *Z. Tsujimoto 3622* (TNS-VS-423317); **Wakayama Pref.:** Hashimoto-shi, 1978-10-29, *H. Manago s.n.* (TNS-VS-549150); Shingu-shi, 1976-10-22, *A. Nakajima s.n.* (TNS-VS-549158); Kaiso-gun, Shimotsu-cho, 1976-8-31, *H. Manago s.n.* (TNS-VS-549137); Naga-gun, Uchida-cho, 1981-11-3, *Sh. Yamamoto s.n.* (TNS-VS-431504); Ito-gun, Katsuragi-cho, 1974-6-2, *H. Manago s.n.* (TNS-VS-549147); Koya-cho, 1942-10-19, *Y. Satake & S. Okuyama 24953* (TNS-VS-294052), 1979-8-5, *M. Matsuoka s.n.* (TNS-VS-1053154), 1950-8-25, *T. Kodama s.n.* (TNS-VS-129843), 1952-10-19, *K. Seto 3290* (TNS-VS-130347), 1973-8-25, *H. Manago s.n.* (TNS-VS-549146); Arita-gun, Yuasa-cho, 1977-10-10, *H. Manago s.n.* (TNS-VS-549157); Shimizu-cho, 1977-10-9, *H. Manago s.n.* (TNS-VS-549140), 1971-10-24, *H. Manago s.n.* (TNS-VS-549138); Hidaka-gun, Nakatsu-mura, 1974-5-3, *H. Manago s.n.* (TNS-VS-549152); Inami-cho, 1976-11-28, *H. Manago s.n.* (TNS-VS-549161); Nishimuro-gun, Shirahama-cho, 1977-8-31, *H. Manago s.n.* (TNS-VS-549129); Nakahechi-cho, 1977-7-17, *H. Manago s.n.* (TNS-VS-549163); Oto-mura, 1973-9-11, *H. Manago s.n.* (TNS-VS-549164), 1967-9-7, *H. Manago s.n.* (TNS-VS-549162); Susami-cho, 1974-8-10, *H. Manago s.n.* (TNS-VS-549132, 549133); Kushimoto-cho, 1977-12-3, *H. Manago s.n.* (TNS-VS-549127); Higashimuro-gun, Nachikatsuura-cho, 1980-8-2, *K. Ohora s.n.* (TNS-VS-549172); Kozagawa-cho, 1956-10-16, *H. Ito s.n.* (TNS-VS-1042128), 1979-9-24, *H. Manago s.n.* (TNS-VS-549134); Kumanogawa-cho, 1973-8-13, *H. Manago s.n.* (TNS-VS-549166); Nachi-cho, 1942-10-13, *Y. Satake & S. Okuyama 24952* (TNS-VS-294051); **Tottori Pref.:** Tottori-shi, 1980-9-23, *A. Tanaka 28254* (TNS-VS-433508), 1981-9-23, *A. Tanaka s.n.* (TNS-VS-433516); Iwami-gun, Kokufu-cho, 1981-10-25, *A. Tanaka s.n.* (TNS-VS-433514), 1981-8-15, *A. Tanaka s.n.* (TNS-VS-433504); Yazu-gun, Wakasa-cho, 1955-9-12, *Y. Ikoma & M. Kawamoto 32* (TNS-VS-1042112); Mochigase-cho, 1981-10-18, *M. Iwanaga s.n.* (TNS-VS-433509); Saji-son, 1955-9-6, *Y. Ikoma & M. Kawamoto 62* (TNS-VS-1042051); Chizu-cho, 1981-9-23, *M. Iwanaga s.n.* (TNS-VS-433510), 1981-9-20, *K. Yasuhara s.n.* (TNS-VS-433511); Hino-gun, Nichinan-cho, 1980-9-15, *M. Aoto s.n.* (TNS-VS-433507), 1981-9-22, *M. Aoto s.n.* (TNS-VS-433515), 1980-10-21, *M. Aoto s.n.* (TNS-VS-433505); Hino-cho, 1981-8-14, *M. Aoto s.n.* (TNS-VS-433513); **Shimane Pref.:** Kanoashi-gun, Kakinoki-mura, 1958-9-2, *S. Okuyama & H. Utsumi 11788* (TNS-VS-258853), 1958-9-1, *S. Okuyama & H. Utsumi 11794* (TNS-VS-258838); **Okayama Pref.:** Okayama-shi, 1981-10-14, *H. Kobatake s.n.* (TNS-VS-503146), 1980-9-2, *H. Kobatake s.n.* (TNS-VS-423258), 1980-12-10, *H. Kobatake s.n.* (TNS-VS-423243), 1983-10-20, *H. Kobatake s.n.* (TNS-VS-1156982), 1980-10-22, *H. Kobatake s.n.* (TNS-VS-1172267); Kurashiki-shi, 1981-8-10, *H. Kobatake s.n.* (TNS-VS-503144); Tsuyama-shi, 1980-11-6, *H. Kobatake s.n.* (TNS-VS-423239), 1981-8-14, *T. Saito s.n.* (TNS-VS-1172273); Kasaoka-shi, 1982-11-23, *K. Yasuhara s.n.* (TNS-VS-1157029); Soja-shi, 1981-11-14, *H. Kobatake s.n.* (TNS-VS-503138); Takahashi-shi, 1977-7-27, *T. Watanabe s.n.* (TNS-VS-1172264); Niimi-shi, 1982-9-5, *T. Saito s.n.* (TNS-VS-1157031); Bizen-shi, 1980-11-30, *H. Kobatake s.n.* (TNS-VS-423242), 1981-10-22, *H. Kobatake s.n.* (TNS-VS-503142), 1987-8-4, *T. Saito s.n.* (TNS-VS-1172274); Akaiwa-gun, Seto-cho, 1956-8-19, *I. Okubo 9* (TNS-VS-1042125); Kumayama-cho, 1981-8-4, *T. Saito s.n.* (TNS-VS-503137); Wake-gun, Hinase-cho, 1980-9-15, *T. Saito s.n.* (TNS-VS-423259); Yoshinaga-cho, 1980-9-21, *T. Saito s.n.* (TNS-VS-423245), 1977-10-16, *T. Saito s.n.* (TNS-VS-423249), 1978-9-24, *T. Saito s.n.* (TNS-VS-1172266); Wake-cho, 1983-8-28, *H. Kobatake s.n.* (TNS-VS-1156225); Oku-gun, Ushimado-cho, 1980-11-17, *H. Kobatake s.n.* (TNS-VS-423244); Oku-cho, 1989-11-26, *H. Kobatake s.n.* (TNS-VS-1156178); Asakuchi-gun, Konko-cho, 1984-8-16, *H. Kobatake s.n.* (TNS-VS-1156168); Kamogata-cho, 1957-12-2, *I. Akazawa 39* (TNS-VS-1042049); Satoshicho, 1980-11-3, *K. Yasuhara s.n.* (TNS-VS-423241); Jobo-gun, Kayo-cho, 1980-10-27, *H. Kobatake s.n.* (TNS-VS-423263); Takahashi-cho, 1905-10-?, *Z. Yoshino s.n.* (TNS-VS-517187); Kawakami-gun, Nariwa-cho, 1975-9-10, *T. Watanabe s.n.* (TNS-VS-334509), 1978-8-22, *T. Saito s.n.* (TNS-VS-1172263); Atetsu-gun, Osa-cho, 1961-8-18, *T. Watanabe s.n.* (TNS-VS-423253); Tessei-cho, 1976-8-6, *T. Watanabe s.n.* (TNS-VS-1172265); Maniwa-gun, Ochiai-cho, 1974-8-25, *T. Saito s.n.* (TNS-VS-423250), 1981-11-5, *H. Kobatake s.n.* (TNS-VS-1156179), 1989-11-5, *H. Kobatake s.n.* (TNS-VS-1156180); Kuse-cho, 1984-11-2, *H. Kobatake s.n.* (TNS-VS-1157020), 1984-11-2, *H. Kobatake s.n.* (TNS-VS-1157021); Tomata-gun, Aba-son, 1980-8-21, *K. Takayama s.n.* (TNS-VS-423256); Kagamino-cho, 1981-8-14, *T. Saito s.n.* (TNS-VS-503145); Katsuta-gun, Shoboku-cho, 1984-11-5, *H. Kobatake s.n.* (TNS-VS-1157019, 1157022); Aida-gun, Nishiwakura-son, 1984-8-24, *H. Kobatake s.n.* (TNS-VS-1156167); Mimasaka-cho, 1982-9-16, *H. Kobatake s.n.* (TNS-VS-1157010); Kume-gun, Kumenan-cho, 1981-11-12, *H. Kobatake s.n.* (TNS-VS-503140); **Hiroshima Pref.:** Hiroshima-shi, 1978-10-19, *M. Matsumura s.n.* (TNS-VS-547831); Kure-shi, 1977-11-3, *T. Takeda 10901* (TNS-VS-547854); Takehara-shi, 1990-8-17, *M. Matsumura s.n.* (TNS-VS-1156139); Mihara-shi, 1977-12-11, *T. Takeda 10963* (TNS-

- VS-1165528); Fukuyama-shi, 1973-10-4, *T. Takeda 1071* (TNS-VS-1165538); Higashiroshima-shi, 1977-11-19, *T. Takeda 10955* (TNS-VS-1165529); Aki-gun, Kamagari-cho, 1995-8-24, *M. Matsumura s.n.* (TNS-VS-1157039); Saeki-gun, Yuki-cho, 1974-9-10, *T. Takeda s.n.* (TNS-VS-1165540), 1976-10-10, *M. Matsumura s.n.* (TNS-VS-547833); Saeki-cho, 1978-7-24, *M. Matsumura s.n.* (TNS-VS-547830); Yoshiwa-mura, 1989-9-17, *M. Matsumura s.n.* (TNS-VS-1156990); Asa-gun, Asa-cho, 1969-11-2, *H. Okada 312* (TNS-VS-1053174), 1969-11-5, *H. Okada 395* (TNS-VS-1053175); Yamagata-gun, Tsutsuga-son, 1977-10-22, *T. Takeda 10736* (TNS-VS-547851); Togochi-cho, 1974-9-25, *T. Takeda 2858* (TNS-VS-1165533); Geihoku-cho, 1977-8-6, *T. Takeda 10151* (TNS-VS-547852); Oasa-cho, 1976-8-8, *T. Takeda 7721* (TNS-VS-547846); Toyohira-cho, 1976-8-8, *T. Takeda 7749* (TNS-VS-1165535); Kamo-gun, Daiwa-cho, 1977-10-31, *T. Takeda 10874* (TNS-VS-547858); Kochi-cho, 1978-11-16, *T. Takeda 13371* (TNS-VS-547862), 1977-10-12, *T. Takeda 10575* (TNS-VS-547848); Jinseki-gun, Jinseki-cho, 1973-10-23, *T. Takeda 1202* (TNS-VS-1165534); Futami-gun, Kisa-cho, 1973-8-31, *T. Takeda 286* (TNS-VS-547860); Miwa-cho, 1975-9-15, *T. Takeda 4672* (TNS-VS-547853); Hiba-gun, Hiwa-cho, 1993-9-25, *M. Matsumura s.n.* (TNS-VS-1156176); **Yamaguchi Pref.:** Tokuyama-shi, 1980-10-12, *A. Minami 17337* (TNS-VS-424218); Hofu-shi, 1991-11-5, *H. Masaki s.n.* (TNS-VS-1156136), 1991-11-3, *H. Masaki s.n.* (TNS-VS-1156138), 1991-10-15, *H. Masaki s.n.* (TNS-VS-1156140); Iwakuni-shi, 1980-9-21, *A. Minami 16677* (TNS-VS-397231); Kuga-gun, Shuto-cho, 1969-10-6, *H. Masaki 16997* (TNS-VS-262904); Miwa-cho, 1956-10-28, *M. Wada 4287* (TNS-VS-251199), 1980-10-30, *A. Minami 17732* (TNS-VS-424217); Tsuno-gun, Kano-cho, 1980-9-23, *A. Minami 16766* (TNS-VS-397215); Saba-gun, Tokuji-cho, 1980-9-23, *A. Minami 16799* (TNS-VS-397206); Yasaka-mura, 1920-9-20, *J. Nikai s.n.* (TNS-VS-254665), 1920-9-20, *J. Nikai 2811* (TNS-VS-50385); Toyora-gun, Toyora-cho, 1982-10-10, *G. Imada 6373* (TNS-VS-569259); Toyotashimo-mura, 1919-8-23, *J. Nikai s.n.* (TNS-VS-254663); Mine-gun, Mito-cho, 1981-9-13, *S. Miyake s.n.* (TNS-VS-424048); Shuho-cho, 1975-8-30, *S. Miyake s.n.* (TNS-VS-732958); Abu-gun, Asahi-son, 1981-8-2, *S. Miyake s.n.* (TNS-VS-424047).
- Shikoku - Tokushima Pref.:** Anan-shi, 1961-8-14, *C. Abe 17752* (TNS-VS-596025); Naka-gun, Kaminaka-cho, 1965-8-16, *H. Ito s.n.* (TNS-VS-1045391), 1965-8-18, *H. Ito s.n.* (TNS-VS-1045380); Kito-son, 1980-8-16, *T. Nakayama s.n.* (TNS-VS-596020); Kamodani-son, 1955-8-3, *T. Inobe 40* (TNS-VS-1042040); Kaifu-gun, Yuki-cho, 1970-11-29, *C. Abe 43427* (TNS-VS-596027); Hiwasa-cho, 1960-8-23, *C. Abe 17751* (TNS-VS-596026); Mugi-cho, 1979-9-23, *T. Nakayama s.n.* (TNS-VS-596018); Kainan-cho, 1959-8-18, *C. Abe 17757* (TNS-VS-596029); Shishikui-cho, 1977-8-3, *T. Nakayama s.n.* (TNS-VS-596017); Oe-gun, Kamojima-cho, 1962-8-30, *C. Abe 17756* (TNS-VS-596021); Kawata-son, 1911-8-27, *J. Nikai 2104* (TNS-VS-50384); Mima-gun, Waki-machi, 1963-8-3, *C. Abe 17755* (TNS-VS-596022); Miyoshi-gun, Sammyo-son, 1956-8-21, *T. Inobe 97* (TNS-VS-1042041); Higashiyayama-son, 1954-7-20, *H. Inoue 1721* (TNS-VS-1042136); **Kagawa Pref.:** Takamatsu-shi, 1980-7-6, *S. Mitani s.n.* (TNS-VS-527149); Marugame-shi, 1980-7-13, *S. Mitani s.n.* (TNS-VS-527148); Kanonji-shi, 1969-10-22, *Y. Maki 3* (TNS-VS-257032); Okawa-gun, Shirotori-cho, 1980-10-19, *S. Mitani s.n.* (TNS-VS-511283); Nagao-cho, 1974-12-1, *S. Mitani s.n.* (TNS-VS-527147); Ayauta-gun, Ryonan-cho, 1976-9-16, *S. Mitani s.n.* (TNS-VS-527142); Nakatado-gun, Kotonami-cho, 1976-10-16, *S. Mitani s.n.* (TNS-VS-527144); Kotohira-cho, 1974-11-17, *S. Mitani s.n.* (TNS-VS-527141); Mitoyo-gun, Takase-cho, 1976-11-21, *S. Mitani s.n.* (TNS-VS-527143); **Ehime Pref.:** Matsuyama-shi, 1979-10-21, *H. Ishikawa s.n.* (TNS-VS-1166275), 1979-11-1, *H. Ishikawa s.n.* (TNS-VS-1166278); Uwajima-shi, 1978-8-16, *C. Aoki s.n.* (TNS-VS-1166290), 1987-9-20, *M. Hyodo s.n.* (TNS-VS-1156198); Niihama-shi, 1959-11-5, *H. Ishikawa 49* (TNS-VS-1042127), 1959-11-1, *H. Ishikawa 75* (TNS-VS-1042121); Ozu-shi, 1978-7-18, *H. Ishikawa s.n.* (TNS-VS-1166279), 1979-8-31, *H. Ishikawa s.n.* (TNS-VS-1166272), 1978-6-13, *H. Ishikawa s.n.* (TNS-VS-1166277); Iyomishima-shi, 1987-10-7, *M. Hyodo s.n.* (TNS-VS-1156197); Iyo-shi, 1981-11-3, *H. Ishikawa s.n.* (TNS-VS-1166286); Hojo-shi, 1980-9-30, *H. Ishikawa s.n.* (TNS-VS-1166270); Uma-gun, Doi-mura, 1953-8-4, *H. Inoue 1050* (TNS-VS-1042119); Ochi-gun, Tamagawa-cho, 1978-10-10, *H. Ishikawa s.n.* (TNS-VS-1166273); Onsen-gun, Shigenobu-cho, 1980-9-15, *H. Ishikawa s.n.* (TNS-VS-1166274); Kawauchi-cho, 1981-10-25, *M. Hyodo s.n.* (TNS-VS-1166292), 1979-10-5, *H. Ishikawa s.n.* (TNS-VS-1166276); Kamiukena-gun, Omogo-mura, 1965-9-28, *S. Masuda 4504* (TNS-VS-831696), 1953-8-17, *H. Inoue 1445* (TNS-VS-1042114), 1953-8-17, *H. Inoue 1443* (TNS-VS-1042131); Mikawa-mura, 1981-7-13, *H. Ishikawa s.n.* (TNS-VS-1166284), 1979-11-5, *H. Ishikawa s.n.* (TNS-VS-1166285); Yanadani-mura, 1981-9-15, *H. Ishikawa s.n.* (TNS-VS-1166271), 1979-8-14, *H. Ishikawa s.n.* (TNS-VS-1166283), 1981-9-12, *M. Hyodo s.n.* (TNS-VS-1166294); Oda-cho, 1978-10-15, *H. Ishikawa s.n.* (TNS-VS-1166281); Iyo-gun, Nakayama-cho, 1981-11-7, *M. Hyodo s.n.* (TNS-VS-1166291); Higashiuwa-gun, Nomura-cho, 1980-11-9, *M. Hyodo s.n.* (TNS-VS-1166288); Shirokawa-cho, 1981-9-15, *C. Aoki s.n.* (TNS-VS-1166289); Kitauwa-gun, Matsuno-cho, 1983-11-27, *M. Hyodo s.n.* (TNS-VS-1156208); Hiyoshi-mura, 1982-10-10, *M. Hyodo s.n.* (TNS-VS-1156132); Tsushima-cho, 1981-10-6, *M. Hyodo s.n.* (TNS-VS-1166293); Nii-gun, Ofuki-mura, 1953-8-5, *H. Inoue 1388* (TNS-VS-1042043); **Kochi Pref.:** Kochi-shi, 1975-11-23, *Y. Koukami s.n.* (TNS-VS-938069); Nankoku-shi, 1981-8-17, *K. Yamaoka & Y. Yamamoto s.n.* (TNS-VS-503760), 1981-8-17, *K. Yamaoka & Y. Yamamoto s.n.* (TNS-VS-503756); Aki-gun, Umaji-mura, 1955-8-23, *S. Iwano s.n.* (TNS-VS-938070); Kami-gun, Tosayamada-cho, 1974-10-18, *T. Nakaie s.n.* (TNS-VS-423544); Makiyama-mura, 1954-8-24, *H. Inoue 2097* (TNS-VS-1042117), 1954-8-24, *H. Inoue 2096* (TNS-VS-1042123); Nagaoka-gun, Otoyo-cho, 1981-9-15, *K. Yamaoka 19605* (TNS-VS-503761), 1978-10-21, *K. Yamaoka s.n.* (TNS-VS-938079); Gomen-cho, 1913-8-26, *Z. Tashiro s.n.* (TNS-VS-23346); Hongawa-mura, 1950-9-2, *S. Okuyama 11437* (TNS-VS-279146); Takaoka-gun, Nakatosa-cho, 1979-9-?, *T. Miyazaki s.n.* (TNS-VS-938160);

Ochi-cho, 1974-10-25, *T. Nakaike s.n.* (TNS-VS-333285), 1949-8-13, *H. Inoue 310* (TNS-VS-1042132); Niida-mura, coll. date unknown, *H. Inoue 475* (TNS-VS-1042122); Kubokawa-cho, 2002-9-15, *K. Yamaoka & N. Nakato 2480* (TNS-VS-1168487), 2002-9-15, *K. Yamaoka & N. Nakato 2478* (TNS-VS-1168486), 2002-9-15, *K. Yamaoka & N. Nakato 2479* (TNS-VS-1168485); Higashitsuno-mura, 1978-9-24, *K. Yamaoka s.n.* (TNS-VS-938072); Hata-gun, Saga-cho, 1993-10-19, *T. Miyazaki 2022* (TNS-VS-1156175); Nishitosa-mura, 1981-8-22, *Y. Akasawa, T. Miyazaki & Y. Yamamoto s.n.* (TNS-VS-938076).

Kyushu - Fukuoka Pref.: Kitakyushu-shi, 1976-9-23, *S. Kobayashi 6534* (TNS-VS-431748); Yahatahigashi-ku, 1977-8-15, *K. Miura 177* (TNS-VS-428991); Fukuoka-shi, 1966-9-15, *S. Tsutsui 2919* (TNS-VS-428993); Kurume-shi, 1969-8-22, *S. Kobayashi 2376* (TNS-VS-429000); Chikushi-gun, Nakagawa-machi, 1973-8-19, *S. Tsutsui 9550* (TNS-VS-428995); Kasuya-gun, 1947-10-17, *S. Toyama 408* (TNS-VS-1042068); Umi-machi, 1967-9-17, *S. Tsutsui 4605* (TNS-VS-428992); Yame-gun, Hoshino-mura, 1976-8-9, *S. Tsutsui 13139* (TNS-VS-428998); Tagawa-gun, Soeda-machi, 1967-7-25, *H. Ito s.n.* (TNS-VS-1045375), 1952-10-29, *J. Ouchi 4* (TNS-VS-1042063), 1952-8-7, *J. Ouchi 59* (TNS-VS-1042079); **Saga Pref.:** Tosu-shi, 1975-9-14, *Y. Kuranari s.n.* (TNS-VS-579330); Saga-gun, Fuji-cho, 1980-7-26, *M. Sadamatsu s.n.* (TNS-VS-579333); Kanzaki-gun, Mitsuse-mura, 1981-11-8, *H. Inoue s.n.* (TNS-VS-425079); Ogi-gun, Ogi-machi, 1977-6-25, *T. Baba s.n.* (TNS-VS-579336); Higashimatsuura-gun, Nanayama-mura, 1978-9-21, *M. Koike s.n.* (TNS-VS-579334); Ochi-cho, 1975-8-17, *Y. Tanno s.n.* (TNS-VS-579335); Nishimatsuura-gun, Arita-machi, 1944-10-23, *S. Toyama s.n.* (TNS-VS-100268); Nishiarita-cho, 1975-8-24, *Y. Tanno s.n.* (TNS-VS-579715); Fujitsu-gun, Tara-cho, 1961-8-14, *B. Matsubayashi s.n.* (TNS-VS-1166217); **Nagasaki Pref.:** Nishisonogi-gun, Kinkai-cho, 1981-11-19, *B. Matsubayashi s.n.* (TNS-VS-579384), 1981-8-20, *B. Matsubayashi s.n.* (TNS-VS-579383); Higashisonogi-gun, Hasami-cho, 1976-7-30, *F. Ueno s.n.* (TNS-VS-579388); Minamitakaki-gun, Obama-cho, 1961-10-15, *B. Matsubayashi s.n.* (TNS-VS-579386); Minamimatsuura-gun, Ohama-cho, 1934-8-4, *T. Baba s.n.* (TNS-VS-423524); **Kumamoto Pref.:** Kumamoto-shi, 1973-10-10, *N. Beppu s.n.* (TNS-VS-550092); Hitoyoshi-shi, 1968-11-5, *H. Ito s.n.* (TNS-VS-1045607, 1045631), 1964-7-11, *H. Ito s.n.* (TNS-VS-1045692); Minamata-shi, 1962-10-7, *T. Yamanaka s.n.* (TNS-VS-779514), 1960-10-25, *M. Kido s.n.* (TNS-VS-550103), 1960-10-23, *M. Kido 3473* (TNS-VS-550084), 1962-11-18, *M. Kido s.n.* (TNS-VS-1172269); Tamana-gun, Gyokuto-machi, 1981-10-10, *Y. Ishizaka s.n.* (TNS-VS-533580); Aso-gun, Ichinomiya-machi, 1972-8-23, *N. Beppu s.n.* (TNS-VS-550093); Aso-machi, 1976-11-21, *N. Beppu s.n.* (TNS-VS-550098); Minamioguni-machi, 1977-7-23, *N. Beppu s.n.* (TNS-VS-550095); Oguni-machi, 1977-8-14, *N. Beppu s.n.* (TNS-VS-550075); Haku-sui-mura, 1978-8-12, *N. Beppu s.n.* (TNS-VS-550100); Kuginomura, 1978-8-12, *N. Beppu s.n.* (TNS-VS-550073); Choyo-mura, 1977-8-25, *Y. Ishizaka s.n.* (TNS-VS-1172271); Kamimashiki-gun, Mifune-machi, 1976-12-5, *N. Beppu s.n.* (TNS-VS-550102); Yabemachi, 1978-8-27, *N. Beppu s.n.* (TNS-VS-550101); Seiwa-son,

1977-11-7, *Y. Ishizaka s.n.* (TNS-VS-1172272); Yatsushiro-gun, Izumi-mura, 1974-10-10, *N. Beppu s.n.* (TNS-VS-550091), 1973-8-18, *N. Beppu s.n.* (TNS-VS-550089, 580175); Ashikita-gun, Ashikita-machi, 1978-12-29, *N. Beppu s.n.* (TNS-VS-550082); Kuma-gun, Mizukami-mura, coll. date unknown, *S. Hattori s.n.* (TNS-VS-784684), 1978-8-1, *T. Nakamura s.n.* (TNS-VS-1016993, 1016994); Itsuki-mura, 1981-8-15, *N. Beppu s.n.* (TNS-VS-550086); **Oita Pref.:** Beppu-shi, 1960-9-25, *M. Arakane s.n.* (TNS-VS-437313); Usa-shi, 1976-9-4, *M. Arakane s.n.* (TNS-VS-437311); Oita-gun, Shonai-cho, 1960-7-29, *M. Arakane s.n.* (TNS-VS-437319), 1959-11-8, *M. Hadano s.n.* (TNS-VS-437325); Minamiamabe-gun, Ume-machi, 1963-1-6, *Y. Takaoka s.n.* (TNS-VS-437310), 1959-8-3, *M. Hadano s.n.* (TNS-VS-437324); Ono-gun, Ogata-machi, 1975-8-3, *M. Arakane s.n.* (TNS-VS-437322), 1955-8-?, *M. Hadano s.n.* (TNS-VS-437308, 1157098); Naoiri-gun, Kuju-machi, 1968-8-9, *K. Shono 1072* (TNS-VS-286022); Kusu-gun, Kokonoe-machi, 1955-8-?, *M. Hadano s.n.* (TNS-VS-1157096); Kusu-machi, 1973-9-24, *M. Arakane s.n.* (TNS-VS-437312); Hita-gun, Kamitsue-mura, 1978-8-3, *N. Beppu s.n.* (TNS-VS-435065); Shimoge-gun, Yamakuni-machi, 1984-8-19, *T. Yamanaka s.n.* (TNS-VS-734111), 1977-8-26, *Y. Takaoka s.n.* (TNS-VS-437315); Usa-gun, Innai-machi, 1960-8-20, *M. Arakane s.n.* (TNS-VS-437320), 1960-8-26, *M. Hadano s.n.* (TNS-VS-437306); **Miyazaki Pref.:** Miyakonojo-shi, 1926-8-0, *A. Noguchi s.n.* (TNS-VS-666824); Nobeoka-shi, 1981-8-24, *S. Tsutsui 21405* (TNS-VS-588348); Kobayashi-shi, 1976-8-15, *T. Minamitani 23561* (TNS-VS-427808); Saito-shi, 1959-8-27, *I. Taki s.n.* (TNS-VS-588346); Ebino-shi, 1979-7-22, *T. Minamitani 31841* (TNS-VS-427816), 1979-10-20, *T. Minamitani 31832* (TNS-VS-427815), 1979-7-15, *T. Minamitani 31743* (TNS-VS-427817); Nishimorokata-gun, Nojiri-cho, 1977-7-29, *T. Minamitani 26957* (TNS-VS-427812); Kobayashi-machi, 1918-7-24, *collector unknown s.n.* (TNS-VS-33211); Koyu-gun, Takanabe-cho, 1980-12-27, *K. Nakamura s.n.* (TNS-VS-588347); Shintomi-cho, 1973-9-23, *T. Minamitani 9331* (TNS-VS-427805); Tsuno-cho, 1977-10-16, *T. Minamitani 28437* (TNS-VS-427810); Higashiusuki-gun, Nango-son, 1967-5-6, *T. Minamitani 1277* (TNS-VS-427803); Kitagawa-cho, 1986-8-9, *A. Minami & U. Fujiyama 51575* (TNS-VS-1166301); **Kagoshima Pref.:** Kanoya-shi, 1980-10-10, *K. Takesako s.n.* (TNS-VS-434213); Izumi-shi, 1963-8-18, *T. Yamanaka s.n.* (TNS-VS-735651), 1974-8-31, *M. Kido s.n.* (TNS-VS-433985); Okuchi-shi, 1960-11-4, *T. Yamanaka s.n.* (TNS-VS-734241), 1960-9-4, *T. Yamanaka s.n.* (TNS-VS-511389, 734321), 1981-10-4, *T. Yamanaka s.n.* (TNS-VS-741296), 1963-8-16, *T. Yamanaka s.n.* (TNS-VS-1112895); Isa-gun, Hishikari-cho, 1980-9-28, *K. Takesako s.n.* (TNS-VS-434212); Aira-gun, Mizobe-cho, 1980-10-5, *K. Takesako s.n.* (TNS-VS-434215); Kurino-cho, 1980-9-27, *K. Takesako s.n.* (TNS-VS-434209); Makizono-cho, 1966-8-9, *T. Yamanaka s.n.* (TNS-VS-1112247), 1979-8-11, *K. Takesako s.n.* (TNS-VS-434208), 1980-10-4, *K. Takesako s.n.* (TNS-VS-434214); Kimotsuki-gun, Uchinora-cho, 1974-7-20, *K. Takesako s.n.* (TNS-VS-434216); Kumage-gun, Kamiyaku-cho, 1964-7-29, *M. Kawabata s.n.* (TNS-VS-939698).

Thelypteris japonica (Baker) Ching forma *formosa* (C. Chr.) Nakato, Sahashi et M. Kato [Ao-harigane-warabi]

Hokkaido - Hokkaido Pref.: Tomakomai-shi, Nishiki-onuma, 1981-9-20, *M. Ishizuka s.n.* (TNS-VS-545559); Chitose-shi, Monbetsu-gawa, 1984-10-8, *M. Ishizuka s.n.* (TNS-VS-1157052); Shiraoi-gun, Shiraoi-cho, Shadai-gawa, 1982-10-19, *M. Ishizuka s.n.* (TNS-VS-1157054).

Honshu - Aomori Pref.: Aomori-shi, Goshi-zawa, 1984-9-4, *N. Saitoh s.n.* (TNS-VS-1156142); Mutsu-shi, Kabayama, 1980-9-15, *T. Sudo s.n.* (TNS-VS-570344); Usori-gawa, 1980-9-14, *E. Fukushi s.n.* (TNS-VS-570343); Higashitsugaru-gun, Yomogita-mura, Seh-eji, 1983-8-28, *N. Saitoh s.n.* (TNS-VS-1152598); Shimokita-gun, Kawauchi-machi, Tozawa, 1980-9-14, *E. Fukushi s.n.* (TNS-VS-570292); **Iwate Pref.:** Morioka-shi, 1975-9-15, *K. Sato s.n.* (TNS-VS-440277); Mizusawa-shi, Ofukasawa, 1978-9-3, *M. Suzuki s.n.* (TNS-VS-440275); Esashi-shi, Hitokabe, 1983-10-8, *C. Komizunai s.n.* (TNS-VS-1152578); Iwate-gun, Shizukuishi-cho, Nyuto-san, 1977-9-25, *Y. Takano s.n.* (TNS-VS-440268); Iwate-machi, Yashiki, 1980-8-9, *E. Fukushi s.n.* (TNS-VS-440283); Takizawa-mura, Koiwai Farm, 1945-9-?, *Y. Jotani s.n.* (TNS-VS-831871); Waga-gun, Towa-cho, Tase, 1977-7-19, *K. Inoue s.n.* (TNS-VS-440516); Waga-cho, Geto Spa, 1977-10-6, *Y. Takano s.n.* (TNS-VS-440266); Isawa-gun, Kanegasaki-cho, Rokuhara, 1977-8-17, *M. Suzuki s.n.* (TNS-VS-440273); Hosono, 1980-9-22, *M. Suzuki s.n.* (TNS-VS-440271); Maesawa-cho, Seibo, 1980-9-15, *M. Suzuki s.n.* (TNS-VS-440276); Isawa-cho, Keshozaka, 1980-8-12, *M. Suzuki s.n.* (TNS-VS-440274); Koromogawa-mura, Minamimata, 1980-8-12, *M. Suzuki s.n.* (TNS-VS-440272); Higashi-iwai-gun, Higashiyama-cho, Natsuyama, 1980-7-23, *M. Suzuki s.n.* (TNS-VS-440269); Shimohei-gun, Tanohata-mura, Matsumae-zawa, 1980-8-9, *E. Fukushi s.n.* (TNS-VS-440282); **Miyagi Pref.:** Sendai-shi, Hachiman, 1980-10-27, *M. Takeichi s.n.* (TNS-VS-1172251); Natori-shi, Kitagama, 1981-9-30, *K. Shoji s.n.* (TNS-VS-576831); Kurokawa-gun, Taiwa-cho, Tamagaikae, 1981-8-30, *K. Matsunaga s.n.* (TNS-VS-1172248); Kami-gun, Nakanida-machi, Jou, 1981-9-6, *W. Takahashi s.n.* (TNS-VS-1172252); Onoda-machi, Suge-numa, 1976-9-15, *W. Takahashi s.n.* (TNS-VS-1172246); Nabekoshi Pass, 1976-8-29, *W. Takahashi s.n.* (TNS-VS-1172244); Shikama-cho, Ojo-ji, 1982-9-5, *M. Takeichi s.n.* (TNS-VS-1157033); Tome-gun, Hasama-cho, Tatebayashi, alt. 20m, 1975-8-15, *Y. Ueno 13855* (TNS-VS-1172249); Mono-gun, Kanan-cho, Wabuchi-yama, 1975-8-24, *Y. Ueno 19014* (TNS-VS-1172247); Asahiyama, 1971-10-29, *Y. Ueno 5896* (TNS-VS-1160529); Motoyoshi-gun, Shizugawa-cho, Sodehama, 1980-9-20, *M. Takeichi s.n.* (TNS-VS-1172250); **Akita Pref.:** Akita-shi, Kana-ashi, 1977-10-5, *J. Takada s.n.* (TNS-VS-419804); Tegatayama, 1981-10-19, *S. Okita s.n.* (TNS-VS-419786); Kazuno-shi, Towada-kogen, 1975-9-28, *J. Takada s.n.* (TNS-VS-419803); Kazuno-gun, Kosaka-machi, Ginzan, 1976-8-25, *J. Takada s.n.* (TNS-VS-419805); Kitaakita-gun, Takanosu-machi, Kakarido, 1981-10-18, *M. Hatakeyama s.n.* (TNS-VS-419789); Hinai-machi, Takko-mori, 1976-10-11, *T. Kikuchi s.n.* (TNS-VS-419790); Minamiakita-gun, Showa-machi, Motoki-yama, 1981-10-25, *S. Okita s.n.* (TNS-VS-419787); Ikawa-machi, Manaita-yama, 1978-8-20,

Y. Takahashi s.n. (TNS-VS-419802); Yuri-gun, Nikaho-machi, Toshi, 1978-9-23, *J. Takada s.n.* (TNS-VS-419859); Chokai-machi, Koshiki-yama, 1981-9-27, *T. Kikuchi s.n.* (TNS-VS-419792); Senboku-gun, Kamioka-machi, Hogaku-zawa, 1980-10-10, *J. Takada s.n.* (TNS-VS-419794); Nishisenboku-machi, Teramura, 1980-9-25, *J. Takada s.n.* (TNS-VS-419809); Kyowamachi, Sakai, 1977-10-9, *J. Takada s.n.* (TNS-VS-419860); Nangai-mura, Yatate Pass, 1937-10-22, *G. Koie s.n.* (TNS-VS-88735); Hiraka-gun, Sannai-mura, Kurosawa, 1976-9-13, *T. Nakaike s.n.* (TNS-VS-420025); Ogachi-gun, Ugo-machi, Tazawa, 1978-9-17, *J. Fujiwara s.n.* (TNS-VS-419795); **Yamagata Pref.:** Yamagata-shi, Chitose-yama, 1953-9-21, *I. Igura s.n.* (TNS-VS-1042064); Hirashimizu, 1976-10-16, *N. Sagawa s.n.* (TNS-VS-437941); Yonezawa-shi, Torimachi, 1980-8-28, *Z. Sato s.n.* (TNS-VS-437960); Asagawa, 1980-8-28, *Z. Sato s.n.* (TNS-VS-); Shinjo-shi, Torigoe, 1977-9-17, *N. Sagawa s.n.* (TNS-VS-437939); Sagae-shi, Nagaoka-yama, 1981-8-6, *N. Sagawa s.n.* (TNS-VS-437972); Kaminoyama-shi, Yusaka, 1981-8-5, *N. Sagawa s.n.* (TNS-VS-1157138); Iwa-kannon, 1980-8-28, *N. Sagawa s.n.* (TNS-VS-437955); Obanazawa-shi, Tokura-ko, 1980-8-24, *N. Sagawa s.n.* (TNS-VS-437942); Ginzan, 1981-9-29, *N. Sagawa s.n.* (TNS-VS-437979); Nanyo-shi, Nakagawa, 1980-9-7, *N. Sagawa s.n.* (TNS-VS-437956); Higashimurayama-gun, Chitosemura, Chitose-yama, 1931-8-9, *S. Okuyama 3710* (TNS-VS-663626); Nishimurayama-gun, Nishikawa-machi, Ubasawagoya, 1981-10-2, *N. Sagawa s.n.* (TNS-VS-437971); Naganuma, 1981-8-9, *N. Sagawa s.n.* (TNS-VS-437973); Kitamurayama-gun, Oishida-machi, Ashizawa, 1977-10-5, *N. Sagawa s.n.* (TNS-VS-437940); Mogami-gun, Mogami-machi, Nabekura, 1981-10-20, *N. Sagawa s.n.* (TNS-VS-437975); Mamurogawa-machi, Showa, 1963-8-23, *S. Kato s.n.* (TNS-VS-437614); Tashiro, 1981-10-27, *N. Sagawa s.n.* (TNS-VS-437976); Higashiokitama-gun, Kawanishi-machi, Inukawa, 1981-9-8, *N. Sagawa s.n.* (TNS-VS-437966); Nishiokitama-gun, Shirataka-machi, Ayukai, 1980-9-21, *N. Sagawa s.n.* (TNS-VS-437957); Narita, 1980-9-21, *N. Sagawa s.n.* (TNS-VS-437958); Iide-machi, Hagyu, 1981-9-8, *N. Sagawa s.n.* (TNS-VS-437963); Higashitagawa-gun, Asahi-mura, Otori, 1980-10-2, *T. Nakaike s.n.* (TNS-VS-437954); Akumi-gun, Yuza-machi, Onoso, 1973-10-8, *S. Kato s.n.* (TNS-VS-437613); Matsuyama-machi, 1975-9-6, *S. Kato s.n.* (TNS-VS-437620); **Fukushima Pref.:** Fukushima-shi, Machiniasaka, Shida, 1976-10-10, *Z. Kaneda 2574* (TNS-VS-438923); Aizuwakamatsu-shi, Iimori-yama, 1977-10-22, *Z. Kaneda 3555* (TNS-VS-438925); Koriyama-shi, Myoken-zan, 1977-11-10, *Z. Kaneda 3714* (TNS-VS-439167); Yatagawa, 1977-10-2, *Z. Kaneda 3364* (TNS-VS-438922); Iwaki-shi, Taira, Kamiarakawa, alt. 80m, 1977-8-11, *Y. Yuzawa s.n.* (TNS-VS-438914); Uchigo-koyamachi, alt. 250m, 1972-10-9, *Y. Yuzawa s.n.* (TNS-VS-439539); Kitakata-shi, Maki, 1976-10-11, *Z. Kaneda s.n.* (TNS-VS-438926); Yama-gun, Atsushio-cho, Sakurayashiki, 1981-9-8, *Z. Kaneda 6982* (TNS-VS-439168); Atsushio, 1977-10-6, *Z. Kaneda 3424* (TNS-VS-438941); Shiokawa-machi, Baba-shinden, 1980-9-14, *S. Saito s.n.* (TNS-VS-1172241); Inawashiro-machi, Numagami, 1975-11-4, *Z. Kaneda s.n.* (TNS-VS-438927); Kawanuma-gun, Aizubange-

- machi, Toderu, 1977-9-1, *Z. Kaneda 3330* (TNS-VS-438924); Onuma-gun, Showa-mura, 1979-9-10, *Z. Kaneda s.n.* (TNS-VS-438920); Higashishirakawa-gun, Tanagura-machi, Tennouchi, 1983-10-8, *H. Kobayashi s.n.* (TNS-VS-1159876); Tsutsukowake Shrine, 1980-10-6, *A. Baba s.n.* (TNS-VS-439537); Nakanozawa, 1980-10-7, *A. Baba s.n.* (TNS-VS-439536); Futaba-gun, Namie-machi, Kitasawa, alt. 25 m, 1975-8-21, *Y. Yuzawa s.n.* (TNS-VS-438921); **Ibaraki Pref.**: Tsuchiura-shi, Shishitsuka, 1975-8-22, *M. Yasu & N. Wada s.n.* (TNS-VS-422804); Katsuta-shi, Kanaage, 1975-8-24, *M. Yasu s.n.* (TNS-VS-422812); Takahagi-shi, Takahagi, 1974-9-11, *M. Yasu s.n.* (TNS-VS-422575); Kitabaraki-shi, Hanakawa-cho, 1972-9-15, *N. Wada 1164* (TNS-VS-596378); Tsukuba-shi, Amakubo, Tsukuba Botanical Garden, 2000-9-1, *S. Matsumoto, H. Ebata & H. Uemura 12-13* (TNS-VS-9512072); Higashiibaraki-gun, Uchihara-machi, Shimizunuma, 1975-8-20, *M. Yasu s.n.* (TNS-VS-422813); Nishiibaraki-gun, Nanakai-mura, Keisoku-zan, 1977-9-10, *M. Yasu s.n.* (TNS-VS-422579, 423407); Tsukuba-gun, Tsukuba-machi, Tsukuba-san, 1970-9-6, *M. Yasu s.n.* (TNS-VS-423409); Sashima-gun, Goka-mura, Egawa, 1980-11-2, *Y. Kimizuka s.n.* (TNS-VS-596379); **Tochigi Pref.**: Utsunomiya-shi, Kogashi-yama, 1979-9-28, *T. Sato s.n.* (TNS-VS-1172245); Kanuma-shi, Kawabake-yama, 1977-9-10, *T. Waku 7468* (TNS-VS-570761); Oyama-shi, 1987-11-6, *M. Ono s.n.* (TNS-VS-1023725, 1023727); Kawachi-gun, Kaminokawa-machi, coll. date unknown, *Y. Jotani 197* (TNS-VS-831877), 1930-?-?, *Y. Jotani 179* (TNS-VS-831878); Minamikawachi-machi, Nishitsubo-yama, 1979-10-20, *M. Usui s.n.* (TNS-VS-422691); Kamikawachi-mura, Miyayamada, 1981-10-2, *S. Waku s.n.* (TNS-VS-438799); Kawachi-machi, Kamitahara, alt. 160 m, 1987-9-13, *H. Ogawa s.n.* (TNS-VS-799735); Kamitsuga-gun, Nishikata-mura, Manago, 1981-9-7, *M. Usui s.n.* (TNS-VS-427401); Haga-gun, Mashiko-machi, Kitahara, alt. 120 m, 1987-8-2, *Y. Sugita s.n.* (TNS-VS-799731); Shimotsuga-gun, Kokubunji-machi, Koganei, 1979-10-20, *M. Usui s.n.* (TNS-VS-1172277); Tomiyama-mura, Ohira-san, 1937-9-23, *Y. Jotani 15008* (TNS-VS-831879); Nasu-gun, Kurobane-machi, Kitano-gami, 1981-9-10, *M. Usui s.n.* (TNS-VS-427397); Nasu-machi, Nasu Imperial Villa, 1966-9-5, *H. Ito s.n.* (TNS-VS-1045368); Kuroiso-machi, Kutsukake, 1969-9-1, *T. Waku 1169* (TNS-VS-422689); Nishinasuno-machi, Senbonmatsu, 1967-9-7, *H. Ito s.n.* (TNS-VS-1045378, 1045381); **Gunma Pref.**: Gunma-gun, Haruna-machi, Haruna-san, 1968-7-19, *Y. Jotani 1191* (TNS-VS-831880); Kanra-gun, Shimonita-machi, Kozu Farm, 1955-8-7, *T. Satomi s.n.* (TNS-VS-1042087); Tone-gun, Minakami-machi, Okununobiki-zawa, 1985-9-23, *S. Ishiguro s.n.* (TNS-VS-1153084); **Saitama Pref.**: Iruma-gun, Naguri-mura, Hitomi, 1985-10-13, *S. Ishiguro s.n.* (TNS-VS-464003); Chichibu-gun, Otaki-mura, Taiyoji, 1988-10-15, *T. Iwata 9054* (TNS-VS-1025581); *ibid.*, 1988-10-15, *T. Iwata 9055* (TNS-VS-1025582); Higashichichibu-mura, Dodaira-san, 1983-9-25, *T. Iwata 2112* (TNS-VS-1133786); Kodama-gun, Kamikawa-mura, Niisato, 1980-10-12, *S. Kojima s.n.* (TNS-VS-514484); **Chiba Pref.**: Higashikatsushika-gun, Kamagaya-machi, 1961-8-6, *H. Ohba & M. Ohsawa s.n.* (TNS-VS-147806); **Tokyo Pref.**: Kita-
- toshima-gun, Shi-mura, 1929-9-23, *F. Maekawa 1212* (TNS-VS-831867); Musashino-shi, Gotenyama, 1980-9-27, *H. Endo s.n.* (TNS-VS-423916); Kitatama-gun, Yamato-mura, Shimizu, 1937-9-26, *F. Maekawa s.n.* (TNS-VS-831866); **Niigata Pref.**: Kashiwazaki-shi, Hirai, 1985-10-10, *I. Ohzu s.n.* (TNS-VS-1153097); Shibata-shi, Sugatani, 1978-10-1, *M. Saito 2379* (TNS-VS-543148), *ibid.*, 1978-10-1, *M. Saito 2385* (TNS-VS-543192); Nioji Shrine, 1962-10-28, *F. Konta 280* (TNS-VS-929631); Niitsu-shi, Akibayama, 1952-8-1, *M. Saito 2062* (TNS-VS-543147); Joetsu-shi, Atagokokubu, 1962-11-18, *T. Kuramata s.n.* (TNS-VS-543193); Nakakanbara-gun, Muramatsu-machi, Takaishi, 1978-9-23, *M. Saito 2187* (TNS-VS-1172253); Nishikanbara-gun, Yahiko-mura, Yu Shrine, 1978-8-3, *M. Saito 2085* (TNS-VS-543161); Minami-kanbara-gun, Shitada-mura, Yagihana, 1979-8-27, *M. Saito 3194* (TNS-VS-543151); Komyo-zan, 1979-8-28, *M. Saito 3168* (TNS-VS-543160); Higashikanbara-gun, Tsugawa-machi, 1978-9-23, *M. Saito 2233* (TNS-VS-543142); Mikawa-mura, Tsunagi, 1981-10-29, *M. Saito 3696* (TNS-VS-436143); Santo-gun, Koshiji-machi, Tsukayama Pass, 1985-10-21, *I. Ohzu s.n.* (TNS-VS-1153098, 1153099); Koshi-gun, Yamadori-mura, Hachibuse, 1909-10-3, *M. Nakamura s.n.* (TNS-VS-89889); Kariwa-gun, Oguni-machi, Hachioji, 1966-10-30, *S. Iwano s.n.* (TNS-VS-543171); Higashikubiki-gun, Matsunoyama-machi, Usagiguchi, 1981-10-11, *M. Saito 3704* (TNS-VS-436142); Iwafune-gun, Arakawa-machi, Hanadate, 1982-10-5, *T. Nakaie s.n.* (TNS-VS-433610); Asahimura, Shinbo-dake, 1987-9-27, *M. Saito s.n.* (TNS-VS-1152603); Sarusawa, 1987-9-27, *M. Saito s.n.* (TNS-VS-1152604); Nakano, 1976-11-8, *M. Saito 3344* (TNS-VS-543149); Sanpoku-machi, Odai, 1982-10-4, *T. Nakaie s.n.* (TNS-VS-433608, 433609); **Toyama Pref.**: Toyama-shi, Kureha-yama, 1979-7-17, *T. Ohshima s.n.* (TNS-VS-543547); Uozu-shi, Toradani, 1977-8-3, *T. Ohshima s.n.* (TNS-VS-543545); Himi-shi, Oura, 1977-8-29, *T. Ohshima s.n.* (TNS-VS-343999); Namerikawa-shi, Minowa, 1976-10-6, *S. Matsumoto 761006-44* (TNS-VS-9506763); Hongo, 1976-10-6, *S. Matsumoto 761006-63* (TNS-VS-9506782); Gyoden Park, 1982-9-11, *T. Ohshima s.n.* (TNS-VS-1156184); Tonami-shi, Seridani, 1976-8-21, *T. Ohshima s.n.* (TNS-VS-343915); Higashitonami-gun, Inami-machi, Tojoji, 1982-10-10, *T. Ohshima s.n.* (TNS-VS-1156182); **Ishikawa Pref.**: Suzu-shi, Hojuji Temple, 1969-9-8, *S. Komaki s.n.* (TNS-VS-424537); Enuma-gun, Higashitaniokumura, Taki - Aratani, 1953-9-27, *S. Yoshimaru 1* (TNS-VS-1042109); Nomi-gun, Kaneno-mura, Gokoji, 1953-11-3, *S. Yoshimaru s.n.* (TNS-VS-1042089); Ishikawa-gun, Tsurugi-machi, Okushishiku, 1974-9-23, *M. Honda s.n.* (TNS-VS-424526); **Fukui Pref.**: Fukui-shi, Shigetate, 1984-6-29, *Y. Yoshimura s.n.* (TNS-VS-1152599); Tsuruga-shi, Iwagomori-yama, 1964-9-20, *S. Watanabe s.n.* (TNS-VS-1159835); Ono-shi, Tsukahara, 1977-9-15, *Y. Saito s.n.* (TNS-VS-1159796); Katsuyama-shi, Heisenji, 1977-10-23, *N. Saito 7* (TNS-VS-415179); Oyatani, 1975-8-24, *Y. Saito s.n.* (TNS-VS-384610); Toritate-yama, 1967-8-9, *S. Watanabe s.n.* (TNS-VS-1159798); Sakai-gun, Mikuni-cho, Jingaoka, alt. 30 m, 1992-11-8, *S. Watanabe 36725* (TNS-VS-1152602); Hamaji, 1978-8-, *Y. Saito s.n.* (TNS-VS-1159833); **Yamanashi Pref.**: Nishiyatsushiro-gun, Kamikuishiki-mura, Aokigahara, alt. 1000 m, 1967-8-

- 17, *F. Konta & H. Takahashi 643* (TNS-VS-929605); Shojiko, 1981-8-31, *F. Miyamoto 11* (TNS-VS-831730a/b, 831732a/b); **Nagano Pref.**: Nagano-shi, Hikage, alt. 750m, 1981-10-7, *H. Tsutsumi s.n.* (TNS-VS-574420); Iida-shi, Tenryukyo, 1974-11-1, *K. Otsuka 2334* (TNS-VS-1157062); Matsukawa, alt. 1050m, 1980-8-3, *H. Tsutsumi s.n.* (TNS-VS-1159827); Komagane-shi, Kochi, alt. 650m, 1981-10-13, *H. Tsutsumi s.n.* (TNS-VS-574418); Omachi-shi, Otari, alt. 680m, 1981-9-8, *H. Tsutsumi s.n.* (TNS-VS-574427); Kizaki-ko, alt. 800m, 1981-9-7, *H. Tsutsumi s.n.* (TNS-VS-574439); Takagari-yama, 1981-8-30, *T. Waku s.n.* (TNS-VS-1157075); Iyari, 1980-8-21, *F. Miyamoto 6710* (TNS-VS-831767); *ibid.*, 1980-8-21, *F. Miyamoto 6709* (TNS-VS-831768); *ibid.*, 1980-8-21, *F. Miyamoto 6711* (TNS-VS-831769); *ibid.*, 1980-8-21, *F. Miyamoto 6708* (TNS-VS-831770); *ibid.*, 1951-9-8, *T. Nakamura 15* (TNS-VS-831761); *ibid.*, 1951-9-8, *T. Nakamura 26* (TNS-VS-831761); *ibid.*, 1951-9-8, *T. Nakamura 27* (TNS-VS-831680); Koshoku-shi, Obasute, alt. 750m, 1981-10-7, *H. Tsutsumi s.n.* (TNS-VS-574419); Saku-shi, Yoseishi-yama, alt. 1250m, 1981-9-22, *H. Tsutsumi s.n.* (TNS-VS-574440); Minamisaku-gun, Yachiho-mura, Yachiho Lake, alt. 1050m, 1981-9-21, *H. Tsutsumi s.n.* (TNS-VS-574435); Kitasaku-gun, Karuizawa-machi, Mine-no-chaya, alt. 1300m, 1981-9-24, *H. Tsutsumi s.n.* (TNS-VS-574442); Yagasaki, 1980-8-19, *T. Nakaïke s.n.* (TNS-VS-1159817); Chiisagata-gun, Wada-mura, Wada Pass, 1980-10-4, *K. Otsuka 7368* (TNS-VS-431618); Shimoina-gun, Seinaiji-mura, Kamiseinaiji, 1980-11-1, *B. Sasaki s.n.* (TNS-VS-431608); Urugi-mura, Iwakura, alt. 800m, 1981-10-12, *H. Tsutsumi s.n.* (TNS-VS-574444); Chausu-yama, 1980-10-10, *K. Otsuka 7440* (TNS-VS-1159822); Kiso-gun, Okuwa-mura, Shimozaigo, 1980-8-25, *T. Nakaïke s.n.* (TNS-VS-1159814); Kitaazumi-gun, Hokujo-mura, Sarukura, 1953-8-14, *T. Nakamura s.n.* (TNS-VS-831742); Shirouma-dake, 1953-8-29, *T. Nakamura 698* (TNS-VS-831741); Shimoina-gun, Oshima-mura, Sakurayama, 1955-10-9, *M. Muramatsu 1304* (TNS-VS-127296); Kitaazumi-gun, Miasa-mura, Minami-mura, alt. 840m, 1981-9-6, *H. Tsutsumi s.n.* (TNS-VS-574422); Hakuba-mura, Sanosaka, alt. 800m, 1981-9-4, *H. Tsutsumi s.n.* (TNS-VS-574421); Happo, 1980-8-23, *Z. Kaneda s.n.* (TNS-VS-431613); Kamiminochi-gun, Toyono-machi, Okura, alt. 500m, 1981-9-25, *H. Tsutsumi s.n.* (TNS-VS-574443); Shimominochi-gun, Sakae-mura, Mori, alt. 300m, 1981-10-1, *H. Tsutsumi s.n.* (TNS-VS-574437); **Gifu Pref.**: Gifu-shi, Kinka-zan, 1938-8-15, *Y. Jotani s.n.* (TNS-VS-831681); *ibid.*, 1935-9-19, *T. Nomura s.n.* (TNS-VS-1017515); Takayama-shi, Shiroyama Park, 1987-9-18, *A. Yamamoto s.n.* (TNS-VS-1157085); Mizunami-shi, Sue, 1976-9-16, *Y. Yamamoto s.n.* (TNS-VS-1159803); Ena-shi, Agi-gawa, 1981-10-11, *Y. Yamamoto s.n.* (TNS-VS-435839); Toki-shi, Nakagiri - Ohira, 1985-7-29, *T. Ogiyama s.n.* (TNS-VS-1159851); Kakamigahara-shi, Nakanagatsuka, 1979-10-23, *Y. Yamamoto s.n.* (TNS-VS-1159809); Gujo-gun, Hachiman-cho, Nishibora - Kajika, 1978-9-19, *Y. Yamamoto s.n.* (TNS-VS-1157117); Shirotori-cho, Tohibora, 1980-9-21, *Y. Yamamoto s.n.* (TNS-VS-435838); Ono-gun, Takane-mura, Hiwada, 1988-9-4, *H. Miyazaki 7647* (TNS-VS-831751); *ibid.*, 1988-9-4, *H. Miyazaki 7648* (TNS-VS-831750); Yoshiki-gun, Kamitakara-mura, Hirayu, 1973-8-10, *H. Ishikawa 388* (TNS-VS-1045384); **Shizuoka Pref.**: Fujinomiya-shi, Inokasira, 1981-10-10, *M. Nakagawa s.n.* (TNS-VS-1152333); Fukuroi-shi, Yamamoto, 1984-9-23, *T. Sugino s.n.* (TNS-VS-458072); Iwata-gun, Misakubo-cho, Kogane-sawa, 1977-10-23, *T. Sugino s.n.* (TNS-VS-591599); **Aichi Pref.**: Okazaki-shi, Iwazu-cho, 1980-9-7, *K. Inukai 3770* (TNS-VS-432930); Nakashima-gun, Sobue-cho, Sobue, 1983-9-26, *K. Inukai 6338* (TNS-VS-1156981); Hazu-gun, Hazu-cho, Nishihazu, 1980-7-25, *M. Muramatsu s.n.* (TNS-VS-432970); Nukata-gun, Nukata-cho, Natsuyasu, alt. 250m, 1990-7-28, *Y. Fukuoka 970* (TNS-VS-683758); Higashikamo-gun, Asuke-cho, Korankei, 1971-9-24, *M. Fukuhara 3723* (TNS-VS-432916); **Mie Pref.**: Age-gun, Kawage-cho, Ueno, 1980-8-5, *S. Yamauchi s.n.* (TNS-VS-437420); Minamimuro-gun, Kiho-cho, Tashiro, 2004-6-15, *S. Fujimoto s.n.* (TNS-VS-764365); **Shiga Pref.**: Koka-gun, Konan-cho, Iwao-yama, 1981-9-2, *S. Yamauchi s.n.* (TNS-VS-533925); Sakata-gun, Santo-cho, Manganji, 1982-10-23, *M. Mase s.n.* (TNS-VS-1152559); Ika-gun, Nishiazai-cho, Yamakado, 1977-10-18, *T. Waku 7871* (TNS-VS-558889); Takashima-gun, Imazu-cho, Sanamidara, 1979-11-3, *T. Tatebe s.n.* (TNS-VS-558891); **Kyoto Pref.**: Kyoto-shi Sakyo-ku, Daimonji-yama, 1979-8-29, *N. Yoshikawa 76560* (TNS-VS-594321); Soraku-gun, Kamo-cho, Tono, 1977-7-17, *Z. Tsujimoto s.n.* (TNS-VS-594322); Wazuka-cho, Jubu-san, alt. 300-600m, 1978-9-17, *S. Tsugaru 5128* (TNS-VS-489993); Amata-gun, Miwa-cho, Miharu Pass, 1983-8-8, *T. Nakaïke s.n.* (TNS-VS-1157024); **Osaka Pref.**: Shionawate-shi, Muroike, 1982-8-16, *A. Komaki s.n.* (TNS-VS-1156220); Minamikawachi-gun, Furuichi-machi, Ankan-tenno-ryo, 1950-8-17, *T. Koyama 2* (TNS-VS-1042106); **Hyogo Pref.**: Kasai-gun, Shimozato-mura, Hokke-san, 1952-10-27, *T. Kodama 3644* (TNS-VS-129845); *ibid.*, alt. 150m, 1952-10-27, *T. Kodama 3659* (TNS-VS-129844); Izushi-gun, Tanto-cho, Mushu, 1981-8-19, *Y. Hayashi s.n.* (TNS-VS-563475); **Nara Pref.**: Nara-shi, Kasuga-yama, 1951-11-4, *M. Tagawa 4217* (TNS-VS-311232); Uda-gun, Oda-cho, 1950-10-15, *T. Kodama 1241* (TNS-VS-129839); Yoshino-gun, Higashiyoshino-mura, Myojindake, 1982-8-22, *Z. Tsujimoto s.n.* (TNS-VS-1156219); **Tottori Pref.**: Tottori-shi, Kyusho-zan, 1980-10-12, *A. Tanaka s.n.* (TNS-VS-433501); Bogaki, 1981-10-24, *A. Tanaka s.n.* (TNS-VS-433499); Yazu-gun, Wakasa-cho, Wakasa, 1976-8-17, *A. Tanaka 23146* (TNS-VS-424991); Hino-gun, Nichinan-cho, Shoyama, 1981-9-22, *M. Aoto s.n.* (TNS-VS-433122); **Okayama Pref.**: Okayama-shi, Yoshii, 1984-8-1, *H. Kobatake s.n.* (TNS-VS-1152625); Shinogose, 1980-10-22, *H. Kobatake s.n.* (TNS-VS-423262); Niimi-shi, Yatani, 1942-9-27, *T. Watanabe s.n.* (TNS-VS-423261); Mitsu-gun, Kamogawa-cho, Hongu-zan, 1981-10-18, *T. Saito s.n.* (TNS-VS-503836); Jobo-gun, Kayo-cho, Yoshikawa, 1980-10-27, *H. Kobatake s.n.* (TNS-VS-1172276); **Hiroshima Pref.**: Kure-shi, Haigamine, 1977-10-19, *T. Takeda 10672* (TNS-VS-545891); Takehara-shi, Tamari, 1977-10-16, *T. Takeda 10619* (TNS-VS-545905); Fukuyama-shi, Nanadani, 1975-10-14, *T. Takeda 4946* (TNS-VS-547864); Kaya, 1974-8-19, *T. Takeda 2384* (TNS-VS-545893); Fuchu-shi, Kusa, 1976-11-9, *T. Takeda 8587* (TNS-VS-545904); Miyoshi-shi, Kamikawatachi, 1975-9-20, *T.*

Takeda 4746 (TNS-VS-545889); Toyota-gun, Yasuura-cho, Ichibara, 1976-9-15, *T. Takeda 8100* (TNS-VS-547847); Jinseki-gun, Jinseki-cho, Taishakukyo, 1972-9-25, *T. Takeda 293* (TNS-VS-545888); Sanwa-cho, Age, 1975-9-15, *T. Takeda 4684* (TNS-VS-545897); Tokiyasu, 1977-11-11, *T. Takeda 10938* (TNS-VS-545903); Futami-gun, Kisa-cho, Okada-yama, 1973-8-31, *T. Takeda 286* (TNS-VS-1152799); Hiba-gun, Kuchiwa-cho, 1975-8-24, *T. Takeda 4361* (TNS-VS-545902).

Kyushu - Saga Pref.: Taku-shi, Kitataku-machi, 1964-8-?, *Y. Inoue s.n.* (TNS-VS-579337); **Kumamoto Pref.:** Kamimashiki-gun, Yabe-machi, Yamaguchi, 1978-8-27, *N. Beppu s.n.* (TNS-VS-550076); **Oita Pref.:** Beppu-shi, Myoban Spa, 1977-9-18, *Y. Takaoka s.n.* (TNS-VS-1159829); Noiri-gun, Kuju-machi, Akagawa, 1963-8-18, *Y. Takaoka s.n.* (TNS-VS-420030).

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Hokkaido - Hokkaido Pref.: Hiroo-gun, Hiroo-cho, Rakko-dale, 1984-8-11, *Y. Goda s.n.* (TNS-VS-1152564); Usu-gun, Otakimura, Kitayuzawa, 1972-9-15, *M. Hara s.n.* (TNS-VS-545560).

Honshu - Aomori Pref.: Mutsu-shi, Arakawa-dake, alt. 750 m, 1980-9-15, *M. Neichi s.n.* (TNS-VS-570348); **Iwate Pref.:** Morioka-shi, Izari-sawa, 1979-9-24, *Y. Nakajima s.n.* (TNS-VS-440270); Iwate Park, 1980-8-14, *E. Fukushi s.n.* (TNS-VS-935895); Hanamaki-shi, Shitodaira, 1966-7-9, *K. Inoue s.n.* (TNS-VS-440278); Iwate-gun, Shizukuishi-cho, Taigakura, 1977-9-16, *S. Tamakawa s.n.* (TNS-VS-440264); Takinoue Spa, 1981-8-21, *K. Inoue s.n.* (TNS-VS-1156213); Taigakura, 1977-9-15, *T. Waku 7513* (TNS-VS-935894); **Miyagi Pref.:** Natori-gun, Akiu-machi, Okunikkawa, 1980-9-20, *N. Sagawa s.n.* (TNS-VS-575764); Sakaino, 1981-8-20, *K. Shoji s.n.* (TNS-VS-576840); Miyagi-gun, Miyagi-machi, Okunikkawa, 1976-10-11, *W. Takahashi s.n.* (TNS-VS-1172231); Kurokawa-gun, Taiwa-cho, Ochiai-aikawa, 1976-10-2, *W. Takahashi s.n.* (TNS-VS-1172223); **Akita Pref.:** Kitaakita-gun, Kamikoani-mura, Haginari, 1976-10-15, *J. Takada s.n.* (TNS-VS-419808); Senboku-gun, Tazawako-machi, Tazawako-kogen, 1973-8-11, *J. Takada s.n.* (TNS-VS-419806); 1976-9-10, *T. Nakaike s.n.* (TNS-VS-419785); **Yamagata Pref.:** Mogami-gun, Sakegawa-mura, Dakigaeri Valley, 1981-9-15, *N. Sagawa s.n.* (TNS-VS-437978); Tozawa-mura, Shinjo Spa, 1980-9-13, *S. Kato s.n.* (TNS-VS-437625); Nishiokitama-gun, Oguni-machi, Nukumidaira, 1979-9-24, *M. Saito 3* (TNS-VS-543152); Chojahara - Nukumidaira, 1969-8-27, *S. Serizawa 10813* (TNS-VS-1042037); Higashitagawa-gun, Haguro-machi, Toge, 1980-10-1, *T. Nakaike s.n.* (TNS-VS-437953); **Fukushima Pref.:** Iwaki-shi, Obama-machi, 1984-11-12, *M. Origasa s.n.* (TNS-VS-1152593); Ohisamachi, 1984-11-12, *K. Nishimaki s.n.* (TNS-VS-1152596); Tabito-machi, alt. 400 m, 1972-9-17, *Y. Yuzawa s.n.* (TNS-VS-439160); Adachi-gun, Otama-mura, Endo-taki, 1977-8-23, *Z. Kaneda s.n.* (TNS-VS-439535); Yama-gun, Nishiaizu-machi, Oyamazumi Shrine, 1980-9-23, *Z. Kaneda 6099* (TNS-VS-1172255); Nishishirakawa-gun, Nishigo-mura, Kasshi-yama, 1984-8-21, *A. Yamamoto s.n.* (TNS-VS-1152566); Higashishirakawa-gun, Yamatsuri-machi, Yamatsuri-yama, 1980-10-6, *A. Baba s.n.*

(TNS-VS-439527); Chikatsu-mura, Yamamoto-fudo, 1975-8-26, *Z. Kaneda s.n.* (TNS-VS-1172256); Futaba-gun, Namie-machi, Sekimori, 1979-8-23, *Y. Kanno s.n.* (TNS-VS-439541); **Ibaraki Pref.:** Hitachi-shi, Takasuzu-yama, 1970-8-28, *M. Yasu s.n.* (TNS-VS-422578); Hitachiota-shi, Takasuzu-yama, 1969-9-15, *M. Yasu s.n.* (TNS-VS-423404); Takahagi-shi, Hananuki Valley, 1973-8-17, *M. Yasu s.n.* (TNS-VS-423405); Kitaibaraki-shi, Hanazono-yama, 1971-9-15, *M. Yasu s.n.* (TNS-VS-423399); Higashiibaraki-gun, Katsura-mura, Gozen-yama, 1971-9-12, *M. Yasu s.n.* (TNS-VS-423401); Kuji-gun, Satomi-mura, Yokokawa, 1971-9-19, *M. Yasu s.n.* (TNS-VS-423403); Kozuma Farm, 1971-9-24, *M. Yasu s.n.* (TNS-VS-423402); Niuhari-gun, Sakura-mura, Tennodai, 1978-10-12, *M. Michikawa 10010* (TNS-VS-1080164); Makabe-gun, Makabe-machi, Kaba-san, 1975-9-28, *M. Yasu s.n.* (TNS-VS-423400); **Tochigi Pref.:** Kanuma-shi, Futamata-yama, 1980-9-1, *M. Usui s.n.* (TNS-VS-570767); Ozaku-san, 1979-9-24, *H. Kobayashi s.n.* (TNS-VS-570765); Kawabake-yama, coll. date unknown, *F. Maekawa 80216* (TNS-VS-831864); Ozaku-san, 1981-10-12, *M. Usui s.n.* (TNS-VS-427402); Nikko-shi, Takino-o, 1980-10-22, *M. Usui s.n.* (TNS-VS-427399); Hoso-o, alt. 1250 m, 1987-8-7, *S. Nemoto s.n.* (TNS-VS-799764); Uwano, alt. 520 m, 1987-8-9, *T. Kamiyama s.n.* (TNS-VS-799767); Imaichi-shi, Tokawa River, alt. 500 m, 1987-8-6, *T. Kamiyama s.n.* (TNS-VS-799769); Kuroiso-shi, Momura-yama, 1967-9-30, *T. Waku 336* (TNS-VS-570764); *ibid.*, 1987-9-13, *S. Ishiguro s.n.* (TNS-VS-1152588); Kamitsuga-gun, Awano-machi, Ode-yama, 1957-9-8, *K. Ogawa s.n.* (TNS-VS-1042094); Kaminagano, 1978-8-27, *T. Waku 8993* (TNS-VS-1172226); Iriawano, 1957-9-8, *K. Ogawa s.n.* (TNS-VS-1172225); Ashio-machi, Mochigase, 1957-8-19, *K. Ogawa s.n.* (TNS-VS-570756); Haga-gun, Motegi-machi, Yaki-mori-yama, 1982-9-15, *T. Tashiro s.n.* (TNS-VS-1152580); Shioya-gun, Shiobara-machi, Fuji-san, 1977-8-15, *T. Waku 7285* (TNS-VS-570760); Kuriyama-mura, Nokado, 1982-9-5, *T. Tashiro s.n.* (TNS-VS-1157012); Fujihara-machi, Ryuo-kyo, 1984-9-15, *M. Usui s.n.* (TNS-VS-1152565); Kosagoe, 1981-9-29, *M. Usui s.n.* (TNS-VS-427398); Nasu-gun, Bato-machi, Torinoko-san, 1982-8-24, *H. Kato s.n.* (TNS-VS-1152590); Kurobane-machi, Uganji Temple, 1967-9-6, *H. Ito s.n.* (TNS-VS-1045685); Nasu-machi, Kita Spa, 1965-8-29, *H. Ito s.n.* (TNS-VS-1045367); Nigato-gawa, alt. 620 m, 1985-8-27, *H. Ogura s.n.* (TNS-VS-799770); Ashino, 1968-8-22, *H. Ito s.n.* (TNS-VS-1042034); Aso-gun, Tanuma-machi, Oto, 1981-9-23, *T. Waku s.n.* (TNS-VS-431951); Horai-san, 1963-10-6, *K. Ogawa s.n.* (TNS-VS-1172228); **Gunma Pref.:** Kiryu-shi, Nemoto-yama, 1973-11-3, *S. Suto s.n.* (TNS-VS-435558); Setagun, Miyagi-mura, Chuji Spa, 1971-10-11, *S. Suto s.n.* (TNS-VS-435559); Azuma-mura, Sori - Otaki, 1987-9-24, *S. Waku s.n.* (TNS-VS-1153090); Gunma-gun, Haruna-machi, 1977-9-8, *H. Suzuki s.n.* (TNS-VS-435556); Kurabuchi-mura, Tsukinami, 1987-8-20, *Y. Terao s.n.* (TNS-VS-1156194); Tano-gun, Nakasato-mura, Tofukuji-gawa, 1984-8-29, *T. Iwata 3372* (TNS-VS-1025521); Ueno-mura, Suwa-yama, 1985-10-20, *T. Iwata 5741* (TNS-VS-1025496); Tenmaru-yama, 1984-10-10, *T. Iwata 3595* (TNS-VS-1025517); *ibid.*, 1984-10-10, *T. Iwata 3613* (TNS-VS-1025518); Hamadaira, 1965-8-11, *T.*

- Satomi s.n.* (TNS-VS-1045369); Kanra-gun, Myogi-machi, Myogisan, 1973-5-19, *S. Suto s.n.* (TNS-VS-435561); Shimonita-machi, 1986-10-18, *M. Ono s.n.* (TNS-VS-831860); Usui-gun, Matsuida-machi, Myogi-san, 1951-10-13, *N. Adachi s.n.* (TNS-VS-92803); Agatsuma-gun, Nakanajo-machi, Yamada, 1985-9-19, *S. Waku s.n.* (TNS-VS-1159877); Agatsuma-machi, Agatsuma Valley, 1972-10-10, *S. Suto s.n.* (TNS-VS-435560); Tone-gun, Kawaba-mura, Maehotaka, 1975-8-21, *S. Kurata s.n.* (TNS-VS-333438); Akakura, 1985-9-6, *S. Waku s.n.* (TNS-VS-1153086); Minakami-machi, Yubiso-gawa, 1980-10-22, *T. Waku 10367* (TNS-VS-435562); Okura-zawa, 1981-10-18, *T. Waku s.n.* (TNS-VS-435557); **Saitama Pref.**: Chichibu-shi, Urayama, Baramo-sawa, 1993-10-31, *T. Iwata 11430* (TNS-VS-1025558); Shiratono-sawa, 1994-8-11, *T. Iwata 38863* (TNS-VS-1025551); Sobatsubu-yama, 1987-9-1, *T. Iwata 8074* (TNS-VS-1025590); Hirogawara-dani, 1987-9-1, *T. Iwata 8058* (TNS-VS-1025591); *ibid.*, 1987-9-1, *T. Iwata 8076* (TNS-VS-1025592); Urayama, 1981-9-17, *T. Iwata s.n.* (TNS-VS-1025537); Okubo-dani, 1973-9-30, *T. Iwata s.n.* (TNS-VS-1025541); Ohira-yama, 1969-8-21, *T. Iwata 290* (TNS-VS-1025544); Hanno-shi, Tenran, 2001-9-19, *T. Iwata 64020* (TNS-VS-1025469); Higshiagano - Ogami-yama, 1975-9-28, *T. Nakaike s.n.* (TNS-VS-332968); Agano - Koburi Pass - Kasasugi Pass - Kuroyama-santaki Falls, 2001-9-30, *A. Yamamoto s.n.* (TNS-VS-9512773); Karibasaka Pass, 1984-11-17, *T. Iwata 3931* (TNS-VS-1025512); *ibid.*, 1984-11-17, *T. Iwata 3930* (TNS-VS-1025513); Kusumi, 1981-11-1, *S. Kobayashi s.n.* (TNS-VS-425190); Iruma-gun, Ogose-machi, Otakatori-yama, 1997-5-23, *T. Iwata 49601* (TNS-VS-1025476); Kasasugi Pass, 1984-8-21, *T. Iwata 3282* (TNS-VS-1025522); *ibid.*, 1984-8-21, *T. Iwata 3283* (TNS-VS-1025523); Naguri-mura, Yamanaka, 1989-9-1, *T. Iwata 9484* (TNS-VS-1025574); *ibid.*, 1989-9-1, *T. Iwata 9418* (TNS-VS-1025575); *ibid.*, 1989-9-1, *T. 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Iwata 11222* (TNS-VS-1025565); Shiraisazu Pass, 1995-9-8, *T. Iwata 41872* (TNS-VS-1025478); Hinata, 1997-8-30, *T. Iwata 51521* (TNS-VS-1025475); Otaki-mura, Wanakura-yama, 1992-9-14, *T. Iwata 11038* (TNS-VS-1025567); Mameyaki-sawa, 1993-6-6, *T. Iwata 11106* (TNS-VS-1025566); Tochimoto, 1993-9-11, *T. Iwata 11233* (TNS-VS-1025560); *ibid.*, 1993-9-11, *T. Iwata 11234* (TNS-VS-1025561); *ibid.*, 1993-9-11, *T. Iwata 11236* (TNS-VS-1025562); Hakuta-san, 1994-7-24, *T. Iwata 37908* (TNS-VS-1025554); Matanosawa, 1994-7-25, *T. Iwata 37987* (TNS-VS-1025553); Irigawa, 1994-7-26, *T. Iwata 38297* (TNS-VS-1025552); Owakazawa, 1995-7-13, *T. Iwata 41484* (TNS-VS-1025480); Nanten-yama, 1995-8-7, *T. Iwata 41633* (TNS-VS-1025479); Akaiwa Pass, 2002-7-9, *T. Iwata 65777* (TNS-VS-1025468); Ochigawa, 1981-8-26, *S. Kobayashi s.n.* (TNS-VS-514477); Ochigawa-nishitani, 1996-7-27, *T. Iwata 44816* (TNS-VS-1025477); *ibid.*, 2002-7-26, *T. 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7079 (TNS-VS-831749); *ibid.*, 1986-8-30, *H. Miyazaki 7075* (TNS-VS-831752); *ibid.*, 1986-8-30, *H. Miyazaki 7077* (TNS-VS-831748); Mie Pref.: Yokkaichi-shi, Nishisakabe-cho, Oike, 1983-10-29, *K. Kada 10552* (TNS-VS-454284); **Shiga Pref.**: Otsu-shi, Hira-san, 1966-10-16, *H. Ito s.n.* (TNS-VS-1045371, 1045373); Shiga-gun, Shiga-cho, Uchimi-yama, 1975-8-20, *T. Yahara 4054* (TNS-VS-364353); Koka-gun, Tsuchiyama-cho, Inaga-tani, 1981-8-17, *T. Shiraiwa 10283* (TNS-VS-1159830); Kanzaki-gun, Eigenji-cho, Echi-gawa, 1979-9-24, *S. Yamauchi s.n.* (TNS-VS-558883); Echi-gun, Koto-cho, Gion, Oshitate-yama, 1980-9-15, *T. Tatebe s.n.* (TNS-VS-558892); **Kyoto Pref.**: Kitakuwada-gun, Miyama-cho, Ashu Experimental Forest of Kyoto University, 1987-10-1, *S. Masuda s.n.* (TNS-VS-831724); Kurodamura, Uodani Pass, 1952-9-23, *T. Kodama 2041* (TNS-VS-129837); Haiya, 1951-9-23, *T. Kodama s.n.* (TNS-VS-247418); **Osaka Pref.**: Toyono-gun, Minoo-mura, Minoo, 1913-9-?, *U. Faurie 307* (TNS-VS-194774); Minamikawachi-gun, Nagano-cho, Iwawaki-san, 1950-7-27, *M. Tagawa 3437* (TNS-VS-311233); *ibid.*, 1950-7-27, *T. Kodama 634* (TNS-VS-247431); **Hyogo Pref.**: Kobe-shi Higashinada-ku, Rokko-san, 1979-11-3, *T. Shiraiwa 9919* (TNS-VS-509259); Shikama-gun, Yumesaki-cho, Seppiko-san, 1978-9-11, *K. Kobayashi s.n.* (TNS-VS-831693); Shiso-gun, Ichinomiyama-cho, Mizotani, 1977-9-15, *T. Shiraiwa 7328* (TNS-VS-563484); Yabu-gun, Yabu-cho, Mochikochi, 1972-8-13, *T. Shiraiwa 2719* (TNS-VS-563488); Oya-cho, Yokoyuki, 1968-8-12, *T. Shiraiwa 1313* (TNS-VS-563482); Asago-gun, Ikuno-cho, Kami-ikuno, 1977-8-15, *T. Shiraiwa 7176* (TNS-VS-563486); Tochiwara, 1977-9-23, *T. Shiraiwa 7399* (TNS-VS-563485); Hikami-gun, Hikami-cho, Kora, 1976-9-23, *T. Shiraiwa 5863* (TNS-VS-563483); Ichijima-cho, Nago-ike - Godai-san, alt. 120-400m, 1997-11-16, *N. Kurosaki 21299* (TNS-VS-697399); Taki-gun, Sasayama-cho, Koganegadake, 1954-10-24, *M. Inada 3494* (TNS-VS-563489); *ibid.*, 1954-10-24, *T. Kodama s.n.* (TNS-VS-129842); **Nara Pref.**: [detailed locality unknown], 1913-9-?, *U. Faurie 308* (TNS-VS-194773); Yoshino-gun, Tenkawa-mura, Sanjo-ga-tsuiji, 1981-8-23, *Z. Tsujimoto s.n.* (TNS-VS-1159799, 1159831); Totsukawa-mura, Okusato, 1976-10-24, *Z. Tsujimoto s.n.* (TNS-VS-423335); **Wakayama Pref.**: Ito-gun, Koya-cho, Otaki, 1978-8-12, *H. Manago s.n.* (TNS-VS-549123); Higashimuro-gun, Nachikatsuura-cho, Okumotori, 1978-11-5, *K. Ohora s.n.* (TNS-VS-549124); Kozagawa-cho, 1977-11-3, *K. Ohora s.n.* (TNS-VS-549125); Nachi-cho, Nachi-san, 1942-10-13, *Y. Satake 24954* (TNS-VS-294053); **Tottori Pref.**: Yazu-gun, Kawahara-cho, Somagoya, 1981-8-12, *A. Tanaka s.n.* (TNS-VS-433502); Saji-gun, Yodo, 1979-10-14, *A. Tanaka s.n.* (TNS-VS-424989); Chizu-cho, Okinoyama, 1958-7-27, *A. Tanaka 785* (TNS-VS-424990); Ashizu, 1980-10-26, *A. Tanaka 28440* (TNS-VS-433121); Nagi-san, 1981-9-20, *K. Yasuhara s.n.* (TNS-VS-433500); **Okayama Pref.**: Maniwa-gun, Katsuyama-cho, Taniyama, 1984-9-16, *H. Kobatake s.n.* (TNS-VS-1152567); Tomata-gun, Kamo-cho, Kurami, 1976-9-8, *T. Saito s.n.* (TNS-VS-1172275, 1172229); *ibid.*, 1975-9-19, *T. Saito s.n.* (TNS-VS-1172224); Kamisabara-son, Endo, 1979-9-16, *T. Saito s.n.* (TNS-VS-1172227); Aba-son, Osugi, 1980-8-21, *K. Takayama s.n.*

(TNS-VS-423236); Katsuta-gun, Nagi-cho, Takiyama, 1979-8-18, *K. Takayama s.n.* (TNS-VS-423235); Aida-gun, Nishiwakura-son, Wakasugi Pass, 1977-9-25, *T. Saito s.n.* (TNS-VS-1172230); **Hiroshima Pref.**: Saeki-gun, Saeki-cho, Iiyama, 1971-10-10, *T. Tamaru 392* (TNS-VS-545899); Yoshiwa-mura, Nakatsuya, 1978-8-29, *T. Tamaru 4363* (TNS-VS-545898).

Shikoku - Tokushima Pref.: Myozai-gun, Kamiyama-cho, 1948-8-15, *T. Inobe 48* (TNS-VS-1042090); **Ehime Pref.**: Niihama-shi, Sasagamine, 1963-8-15, *H. Ishikawa 384* (TNS-VS-1045383); Ochi-gun, Tamagawa-cho, Kiji, Shiratsue, 1981-10-29, *H. Ishikawa s.n.* (TNS-VS-1152326); Kamiukena-gun, Kuma-cho, Saragamine, 1980-10-25, *H. Ishikawa s.n.* (TNS-VS-1152327); Omogo-mura, Ishizuchi-san, 1965-9-29, *S. Masuda 4617* (TNS-VS-831740); Yanadani-mura, Kamikiji, 1990-10-14, *M. Hyodo s.n.* (TNS-VS-1152621); Kitauwa-gun, Hiyoshi-mura, Jizo-yama, 1982-10-10, *M. Hyodo s.n.* (TNS-VS-1152558); **Kochi Pref.**: Nagaoka-gun, Nishitoyonaga-mura, Kajigamori, coll. date unknown, *H. Inoue 148* (TNS-VS-1042096).

Kyushu - Fukuoka Pref.: Fukuoka-shi, Nishi-ku, Ryoshiiwa-yama, alt. 820m, 1967-10-15, *S. Tsutsui 4983* (TNS-VS-431738); Buzen-shi, Inugadake, alt. 1000m, 1969-9-15, *S. Tsutsui 6710* (TNS-VS-431735); Kasuya-gun, Umi-machi, Goura-tani, alt. 580m, 1972-7-30, *S. Tsutsui 8612* (TNS-VS-431739); **Saga Pref.**: Kashima-shi, Kyogadake, 1981-11-3, *Y. Kuranari s.n.* (TNS-VS-425080); **Oita Pref.**: Oita-gun, Shonai-cho, Kuro-dake, 1960-7-30, *M. Hadano s.n.* (TNS-VS-420031); Naoiri-gun, Kuju-machi, Hiji-dake, 1978-8-26, *M. Arakane s.n.* (TNS-VS-1159828); Kuro-dake, 1968-8-9, *K. Shono 1048* (TNS-VS-285997); *ibid.*, 1968-8-30, *K. Shono 1053* (TNS-VS-286002); *ibid.*, 1968-9-8, *K. Shono 1061* (TNS-VS-286010); *ibid.*, 1968-9-8, *K. Shono 1070* (TNS-VS-286020); *ibid.*, 1968-9-8, *K. Shono 1071* (TNS-VS-286021); **Miyazaki Pref.**: Nishiusuki-gun, Takachiho-cho, Sobo-san, 1972-8-16, *T. Minamitani 7656* (TNS-VS-427819); **Kagoshima Pref.**: Kanoya-shi, Ontake, 1980-10-10, *K. Takesako s.n.* (TNS-VS-434207).

Thelypteris japonica (Baker) Ching \times *T. musashiensis* (Hiyama) Nakato, Sahashi et M.Kato [Ai-harigane-warabi]

*Specimens with stramineous stipes.

Honshu - Aomori Pref.: Kamikita-gun, Towadako-machi, Ouse, 1981-10-13, *M. Neichi s.n.* (TNS-VS-436671*); Goshogawaratai, alt. 800m, 1979-10-27, *M. Neichi s.n.* (TNS-VS-570290*); **Iwate Pref.**: Ichinoseki-shi, Sukawa Spa, 1979-10-11, *Y. Nakajima s.n.* (TNS-VS-440279*); **Miyagi Pref.**: Sendai-shi, Moniwa, Taihaku-san, 1979-10-20, *K. Shoji s.n.* (TNS-VS-575750*); Ido-hama, 1979-9-22, *K. Shoji s.n.* (TNS-VS-1160530*); Natori-shi, Takedatekumanodo, 1981-10-31, *K. Matsunaga 4462* (TNS-VS-1152618*); **Akita Pref.**: Kitaakita-gun, Takanosu-machi, Yosuketai, 1980-9-12, *M. Hatakeyama s.n.* (TNS-VS-419749*); Ryugamori, 1962-8-5, *M. Hatakeyama s.n.* (TNS-VS-1172243); **Yamagata Pref.**: Yonezawa-shi, Nadera-yama, 1991-9-22, *Z. Sato 1831* (TNS-VS-1157036*); Murayama-shi, Koshiki-dake, 1974-9-8, *S. Kato s.n.* (TNS-VS-437623*); Nishiokitama-gun, Oguni-machi, Jushiga-mori, 1969-9-10, *S. Kato s.n.* (TNS-VS-437818);

- Fukushima Pref.:** Kitakata-shi, Hirabayashi, 1980-11-19, *Z. Kaneda 6517* (TNS-VS-438936*); Minamiaizu-gun, Tadami-machi, 1980-9-4, *Z. Kaneda s.n.* (TNS-VS-438928); Kawanuma-gun, Yanaizu-machi, Yanaizu, 1980-10-11, *A. Baba s.n.* (TNS-VS-439538*); Onuma-gun, Showa-mura, Yanohara, 1981-10-12, *A. Baba s.n.* (TNS-VS-427599*); Higashishirakawa-gun, Tanagura-machi, Tsutsukowake Shrine, 1980-10-6, *Z. Kaneda 6163* (TNS-VS-439164*); Yamamoto-fudo Valley, 1975-8-26, *Z. Kaneda s.n.* (TNS-VS-438932); Yamatsuri-machi, Kamimyoga, 1980-10-6, *Z. Kaneda 6179* (TNS-VS-1172242); **Ibaraki Pref.:** Hitachi-shi, Narusawa-cho, 1973-9-16, *N. Wada 1053* (TNS-VS-595306); Takahagi-shi, Yanagisawa, 1972-8-16, *M. Yasu s.n.* (TNS-VS-422596*); Kitaibaraki-shi, Hanazono-yama, 1966-8-22, *H. Fujita s.n.* (TNS-VS-422600); Tsukuba-shi, Kurakake, 1988-7-14, *S. Matsumoto s.n.* (TNS-VS-763917); Naka-gun, Tokai-mura, Shirakata, 1973-11-18, *M. Yasu s.n.* (TNS-VS-422584*); Miwa-mura, Torinoko-yama, alt. 350 m, 1985-8-25, *H. Kubota s.n.* (TNS-VS-799566); Kuji-gun, Kanasago-mura, Nakano, 1973-8-20, *M. Yasu s.n.* (TNS-VS-422573); Satomi-mura, Inohana Pass, 1972-9-17, *N. Wada 1048* (TNS-VS-595342); Daigo-machi, Yamizo-san, 1958-6-0, *T. Matsumoto s.n.* (TNS-VS-1042045); Taga-gun, Juuomachi, Tatsuware-yama, 1980-10-12, *M. Yasu s.n.* (TNS-VS-422593); Niihari-gun, Sakura-mura, University of Tsukuba, Matsumi, 1978-11-2, *M. Michikawa 10043* (TNS-VS-1080197); Makabe-gun, Makabe-machi, Yubukuro Pass, alt. 150 m, 1998-8-18, *A. Satoh TKB0017* (TNS-VS-9508616*); **Tochigi Pref.:** Tochigi-shi, Izuru-yama, 1979-10-10, *M. Usui s.n.* (TNS-VS-422697); Sano-shi, Akami-cho, 1981-10-15, *M. Usui s.n.* (TNS-VS-1160531*); Karasawa-yama, 1980-10-5, *M. Usui s.n.* (TNS-VS-570769*); Kanuma-shi, Futamata-yama, 1978-9-23, *H. Kobayashi s.n.* (TNS-VS-1172261); Nikko-shi, Konosu-yama, 1981-9-21, *M. Usui s.n.* (TNS-VS-427391); *ibid.*, 1979-10-26, *M. Usui s.n.* (TNS-VS-570770*); Moka-shi, Nemoto-yama, alt. 100 m, 1987-8-2, *Y. Sugita s.n.* (TNS-VS-799749); Kawachi-gun, Shiroyama-mura, Kogashi-yama, 1941-10-12, *Y. Jotani s.n.* (TNS-VS-831874*); Kamitsuga-gun, Awano-machi, Shimonagano, 1978-10-14, *T. Waku 9058* (TNS-VS-1172257); Shioya-gun, Shiobara-machi, Hiruga-dake, 1961-8-5, *T. Tashiro s.n.* (TNS-VS-422702); Shioya-machi, Tamanyu, 1980-8-8, *T. Tashiro s.n.* (TNS-VS-422692); *ibid.*, 1982-9-19, *T. Tashiro s.n.* (TNS-VS-1152581*); Nasu-gun, Bato-machi, Minamidaira, 1981-9-16, *M. Usui s.n.* (TNS-VS-427388); Yamata, 1984-10-26, *M. Usui s.n.* (TNS-VS-1152587); Kurobane-machi, Uganji, 1967-9-6, *H. Ito s.n.* (TNS-VS-1045392, 1045393, 1045394, 1045395, 1045684); Nasu-machi, Tarasawa, 1964-8-22, *H. Ito s.n.* (TNS-VS-1045682*); Takakuhei, alt. 540 m, 1985-8-27, *H. Ogura s.n.* (TNS-VS-799757); Nasu Imperial Villa, 1963-8-28, *H. Ito s.n.* (TNS-VS-1045683); Aso-gun, Tanuma-machi, Narabu-san, alt. 520 m, 1987-9-14, *T. Noguchi & Y. Tamura s.n.* (TNS-VS-799747); **Gunma Pref.:** Setagun, Fujimi-mura, Akagi-san, 1957-8-31, *T. Matsuzawa s.n.* (TNS-VS-1042086*); Kanra-gun, Shimonita-machi, Arafune-yama, 1956-9-9, *T. Satomi 17* (TNS-VS-1042082*); *ibid.*, 1956-9-9, *T. Satomi s.n.* (TNS-VS-1042088*); *ibid.*, 1955-9-4, *T. Satomi s.n.* (TNS-VS-1042097*); Kanra-machi, Ueno, 1987-10-10, *S. Kojima s.n.* (TNS-VS-1156191); **Saitama Pref.:** Chichibu-shi, Urayama, Dainichido, 1996-9-21, *T. Iwata 46921* (TNS-VS-1133832); Urayama, Kawamata, 1981-8-25, *S. Kobayashi s.n.* (TNS-VS-514479*); Hanno-shi, Atera, Nagasawa, 1975-10-10, *T. Nakaike s.n.* (TNS-VS-333387); Higashiagano - Ogami-yama, 1975-9-28, *T. Nakaike s.n.* (TNS-VS-324823); Iruma-gun, Nagurimura, Shirayazawa, 1964-10-25, *H. Ito s.n.* (TNS-VS-1045694); Anazawa, alt. 320 m, 2002-9-1, *N. Nakato 2468* (TNS-VS-1168505); Fujidana-yama, 1985-10-13, *S. Ishiguro s.n.* (TNS-VS-464002); Agano-mura, Agano, 1953-9-0, *H. Inoue s.n.* (TNS-VS-1042092*); Izugatake, 1934-10-17, *S. Okuyama 102175* (TNS-VS-1166297); Chichibu-gun, Yokoze-machi, Maruyama, 1994-10-21, *T. Iwata 40488* (TNS-VS-1025548*); Ubugawa, 1987-8-23, *T. Iwata 7957* (TNS-VS-1133717); Yokoze-mura, Bukozan, 1952-8-0, *H. Ito s.n.* (TNS-VS-1042134); Minanomachi, Kamafuse Pass, 1987-10-18, *T. Iwata 8241* (TNS-VS-1133720*); Otaki, 1987-10-18, *T. Iwata 8245* (TNS-VS-1133721); Shimotano, 1981-11-4, *S. Kobayashi s.n.* (TNS-VS-425194*, 1172258); Ogano-machi, Nunosawa, 1983-12-4, *T. Iwata 2400* (TNS-VS-1133780); Nagaru, 1991-10-27, *T. Iwata 10697* (TNS-VS-1133856); *ibid.*, 1991-10-27, *T. Iwata 10698* (TNS-VS-1133857); Futtoyama, 1990-9-24, *T. Iwata 10004* (TNS-VS-1133866); Kamihara, 1981-8-25, *S. Kobayashi s.n.* (TNS-VS-514516); Ryokami-mura, 1994-10-8, *T. Iwata 40267* (TNS-VS-1133843); Azumaya-san, 1990-9-30, *T. Iwata 10018* (TNS-VS-1133865); Otaki-mura, Taiyoji Temple, 1987-11-6, *T. Iwata 8275* (TNS-VS-1133722); Tochimoto, 1993-9-11, *T. Iwata 11232* (TNS-VS-1133849); *ibid.*, 1993-9-11, *T. Iwata 11240* (TNS-VS-1133851); Myohogatake, 1988-10-15, *T. Iwata 9063* (TNS-VS-1133898); Arakawa-mura, Kawauradani, 1984-9-15, *T. Iwata 3489* (TNS-VS-1133772); *ibid.*, 1984-9-15, *T. Iwata 3490* (TNS-VS-1133771); *ibid.*, 1987-8-9, *T. Iwata 7867* (TNS-VS-1133725); Otofujii-yama, 1990-11-19, *T. Iwata 10166* (TNS-VS-1133862); Yadake, 1989-10-1, *T. Iwata 9659* (TNS-VS-1133872); Anyagawa, 1981-11-4, *S. Kobayashi s.n.* (TNS-VS-1172259); Higashichichibu-mura, Hagidaira, 1985-11-1, *T. Iwata 5771* (TNS-VS-1133750); **Chiba Pref.:** Ichikawa-shi, Kashiwai-machi, 1979-10-14, *K. Nakamura s.n.* (TNS-VS-424240); Narita-shi, Kamifukuda, 1978-9-29, *I. Ueda s.n.* (TNS-VS-424244); **Tokyo Pref.:** Ota-ku, Ikegami, 1886-9-?, *K. Shirai s.n.* (TNS-VS-517192); Hachioji-shi, Imakuma Shrine, alt. 300–400 m, 1974-9-22, *T. Nakaike s.n.* (TNS-VS-335120); Kamiange, 1953-9-6, *Y. Tokashiki s.n.* (TNS-VS-543245*); Ome-shi, 1981-8-31, *H. Endo s.n.* (TNS-VS-435238*); Nishitama-gun, Itsukaichi-machi, Bonbori-gawa, 1978-9-17, *T. Yoshizawa s.n.* (TNS-VS-831890); Okutama-machi, the foot of Bonoore-yama, alt. 440 m, 2003-9-29, *N. Nakato 2546* (TNS-VS-1168504); Atago-yama, alt. 440 m, 2003-7-30, *N. Nakato 2526* (TNS-VS-1168503*); Okumotori-dani, 1980-9-23, *H. Endo s.n.* (TNS-VS-423943); Koizawa, 1967-11-5, *H. Ito s.n.* (TNS-VS-1045688); Nariki-mura, Takamizu-san, 1933-9-18, *S. Okuyama 100863* (TNS-VS-1166298); **Kanagawa Pref.:** Minamiashigara-shi, Kano, 1977-5-22, *H. Kobayashi s.n.* (TNS-VS-441338); **Niigata Pref.:** Shibata-shi, Miyayorikami, 1946-10-

- 3, *T. Uchikawa s.n.* (TNS-VS-543162); Sugatani, alt. 180m, 1962-10-21, *collector unknown s.n.* (TNS-VS-929607); Nakakanbara-gun, Muramatsu-machi, Atago-yama, alt. 50m, 1962-8-29, *F. Konta 910* (TNS-VS-929606); Minamikanbara-gun, Shitada-mura, Komyo-zan, 1979-8-28, *M. Saito 3158* (TNS-VS-543163); Nakauonuma-gun, Nakasato-mura, Atema-yama, 1986-10-8, *M. Ono s.n.* (TNS-VS-831858); Iwafune-gun, Asahi-mura, Saruta Dam, 1986-10-18, *M. Saito s.n.* (TNS-VS-1157044); Sado-gun, Aikawa-machi, Funayama, 1979-10-16, *M. Saito 3245* (TNS-VS-543159*); **Toyama Pref.**: Kurobe-shi, Oyama, 1978-8-10, *T. Ohshima s.n.* (TNS-VS-543549*); Shimoniikawa-gun, Unazuki-machi, Kitamata - Iburi-yama - Asahi-goya, 1969-8-27, *N. Satomi & R. Mochizuki s.n.* (TNS-VS-256057*); **Ishikawa Pref.**: Kanazawa-shi, Daimon-zan, 1975-10-10, *M. Honda s.n.* (TNS-VS-424504*); Wajima-shi, Nishide, 1973-10-4, *S. Komaki s.n.* (TNS-VS-424536*); Enuma-gun, Yamanaka-machi, 1931-10-20, *N. Hiratsuka 114* (TNS-VS-513158); Ishikawa-gun, Shiramine-mura, Ichinose, 1979-9-15, *K. Yoneyama s.n.* (TNS-VS-424517); **Fukui Pref.**: Ono-gun, Izumi-mura, Shimoyama, Otaru, 1967-10-1, *Y. Saito s.n.* (TNS-VS-1166188); **Yamanashi Pref.**: Kitakoma-gun, Sutama-cho, Masutomi, 1963-8-11, *K. Akiyama s.n.* (TNS-VS-573506*); **Nagano Pref.**: Omachi-shi, Iyari, 1980-8-21, *F. Miyamoto 6707* (TNS-VS-831765*); *ibid.*, 1980-8-21, *F. Miyamoto 6712* (TNS-VS-831766*); *ibid.*, 1980-8-24, *T. Nakaike s.n.* (TNS-VS-1159818*); Kuzu Spa, alt. 1000m, 1981-9-8, *H. Tsutsumi s.n.* (TNS-VS-574425*); Saku-shi, Kabutoiwa-yama, 1980-9-28, *K. Nakayama 34* (TNS-VS-401536*); Suwa-gun, Miyagawa-mura, 1952-9-5, *S. Gomi 11* (TNS-VS-1042070); Shimoina-gun, Takagi-mura, Shimoujinori, alt. 600m, 1981-10-20, *H. Tsutsumi s.n.* (TNS-VS-574298); Kiso-gun, Kaida-mura, Sekiya, alt. 1300m, 1981-8-27, *H. Tsutsumi s.n.* (TNS-VS-574441*); Okuwa-mura, Adera Valley, 1980-8-25, *T. Nakaike s.n.* (TNS-VS-1157078); **Gifu Pref.**: Ena-shi, Kasagi-yama, 1984-9-30, *H. Miyazaki 6607* (TNS-VS-831714); Ena-gun, Kashimo-mura, Higashihondani, coll. date unknown, *Y. Yamamoto s.n.* (TNS-VS-435837*); Hirukawa-mura, Nakagiri, 1978-11-25, *Y. Yamamoto s.n.* (TNS-VS-1157147); Yamaoka-cho, Hara, Nakada, 1981-9-27, *T. Ogiyama s.n.* (TNS-VS-545768); Akechi-cho, Sugidaira, 1977-10-16, *Y. Yamamoto s.n.* (TNS-VS-435762*); **Shizuoka Pref.**: Atami-shi, Izumi, 1980-11-8, *A. Suzuki s.n.* (TNS-VS-509163*); Mishima-shi, Yamanaka-shinden, 1979-8-19, *A. Suzuki s.n.* (TNS-VS-591592*); Fujinomiya-shi, Asagiri-kogen, alt. 860m, 1985-10-2, *T. Sato 8619* (TNS-VS-929581), *ibid.*, 1985-10-2, *T. Sato 8620* (TNS-VS-929580); *ibid.*, alt. 170m, 1983-9-18, *T. Sato 4579* (TNS-VS-929576); Inokashira, 1961-9-2, *J. Sugimoto s.n.* (TNS-VS-247757); Fumoto, alt. 800m, 1974-8-29, *F. Konta 10474* (TNS-VS-637704); Egasha, alt. 170m, 1983-9-18, *T. 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