

モリイチゴとその近縁種の分類学的再検討

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Naohiro NARUHASHI* and Tomoko IWATA** : Taxonomic Reevaluation of *Fragaria nipponica* MAKINO and Allied Species

鳴橋直弘*・岩田智子** : モリイチゴとその近縁種の分類学的再検討

Fragaria nipponica was applied to the plant that occurs in Honshu by MAKINO(1912), but later on two allied species, i.e., *F. yakusimensis* from Isl. Yakushima and *F. yezoensis* from Hokkaido, were described by MASAMUNE (1931) and HARA (1944), respectively. However, the taxonomic status of these three taxa is still controversial, since their delimitations are based on the characters such as plant size and hairiness on the pedicel. These characters are quite variable, and evidently susceptible to environmental conditions of the habitats. Indeed, KITAMURA and MURATA (1961) regarded *F. yezoensis* as a variety of *F. nipponica*, but OHWI (1965) and MOMIYAMA (1982) considered it a distinct species. MASAMUNE (1955) treated *F. yakusimensis* as a variety of *F. nipponica*, but OHWI (1965), OKUYAMA (1982) and MOMIYAMA (1982) recognized it identical with *F. nipponica*. Very recently, YAHARA *et al.* (1987), however, treated it again as a local variety of *F. nipponica*.

The diagnostic character distinguishing *F. yezoensis* from *F. nipponica* is the hairiness on the pedicel, namely hairs are patent in *F. yezoensis*, whereas appressed or ascending in *F. nipponica*. The character discriminating *F. yakusimensis* from *F. nipponica* is its plant size, i.e., *F. yakusimensis* is exceedingly dwarf as compared with *F. nipponica*.

The taxonomic characters mentioned above, however, have a wide range of variation depending upon the environmental conditions. Therefore, we re-examined to characters critically based on the many specimens preserved in the herbaria, and attempted to re-evaluate their taxonomic status.

Materials and Methods

Observations and measurements were based upon 230 specimens (flowering and fruiting) of *F. nipponica*, *F. yakusimensis* and *F. yezoensis* from different collection sites, preserved in the following herbaria :

Faculty of Agriculture, Hokkaido University, Sapporo (SAPT) ;

Botanical Garden, Faculty of Agriculture, Hokkaido University, Sapporo ;

Kushiro Municipal Museum, Kushiro ;

Faculty of Science, Tohoku University, Sendai (TUS) ;

Yamagata Prefectural Museum, Yamagata ;

Faculty of Education, Ibaraki University, Mito ;

Tsukuba University, Tsukuba ;

University of Tokyo, Tokyo (TI) ;

National Science Museum, Tokyo (TNS) ;

Makino Herbarium, Tokyo Metropolitan University, Tokyo (MAK) ;

Kanagawa Prefectural Museum, Yokohama ;

Faculty of Liberal Arts, Shinshu University, Matsumoto (SHIN) ;

Faculty of Science, Shizuoka University, Shizuoka ;

Faculty of Education, Gifu University, Gifu ;

Faculty of Science, Kanazawa University, Kanazawa, (KANA) ;

Faculty of Science, Kyoto University, Kyoto (KYO) ;

Osaka Museum of Natural History, Osaka ;

Yamaguchi Prefectural University, Yamaguchi ;

Faculty of Agriculture, Kagoshima University, Kagoshima (KAG) ;

The Harvard University Herbaria, Harvard

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University, U.S.A. (A, GH).

The characters examined and measured are as follows.

1. Number of flowers per inflorescence (not per individual but per rhizome), showed as **NF** in Fig. 1.
2. Length of pedicel in first flower (maximum if many inflorescences), as **LP**
3. Number of leaves per plant, as **NL**
4. Length of petiole (of maximum leaf), as **LPet**
5. Length of leaf blade (of maximum leaf blade in plant), as **BL**
6. Width of leaf blade, as **BW**
7. Ratio of length to width in leaf blade, as **BL/BW**
8. Number of serrations of half margin of maximum terminal leaflet, as **NS**
9. Number of double serrations of half margin of maximum terminal leaflet, as **NDS**
10. Hairs on pedicel (observed in the stage of bud, flower and fruit)
11. Density of hairs on pedicel (observed in the stage of bud, flower and fruit)

Results

[A] Plant size

The results of the measurements are shown in Fig. 1. As illustrated in this diagram, characters examined in the present study showed wide variations; for instance, the length of pedicels was 1-25 cm in the plants of Hokkaido, 2-23 cm in Honshu, and 2-8 cm in Isl. Yakushima. Figure 2 shows the relationship between the latitude of localities and the length of the leaf blade, which shows wide variations. More or less similar trends of variation were noted in length of the pedicel, petiole, leaf blade, and leaf width. The number of flowers, leaves, serrations and double serrations showed no relationships to the plant size.

The elevational distribution of *Fragaria nipponica s.lato* is shown in Fig. 3. In Hokkaido the plants of *Fragaria* are distributed mainly in the lowlands (grassy meadows developed along the seacoast), ranging from 50 to 200m in elevation and rarely occur in mountainous region above 1000m alt. In Honshu, the habitat is mountain to subalpine, ranging from 1000 to 2500m alt. It is also known from Isl. Cheju and

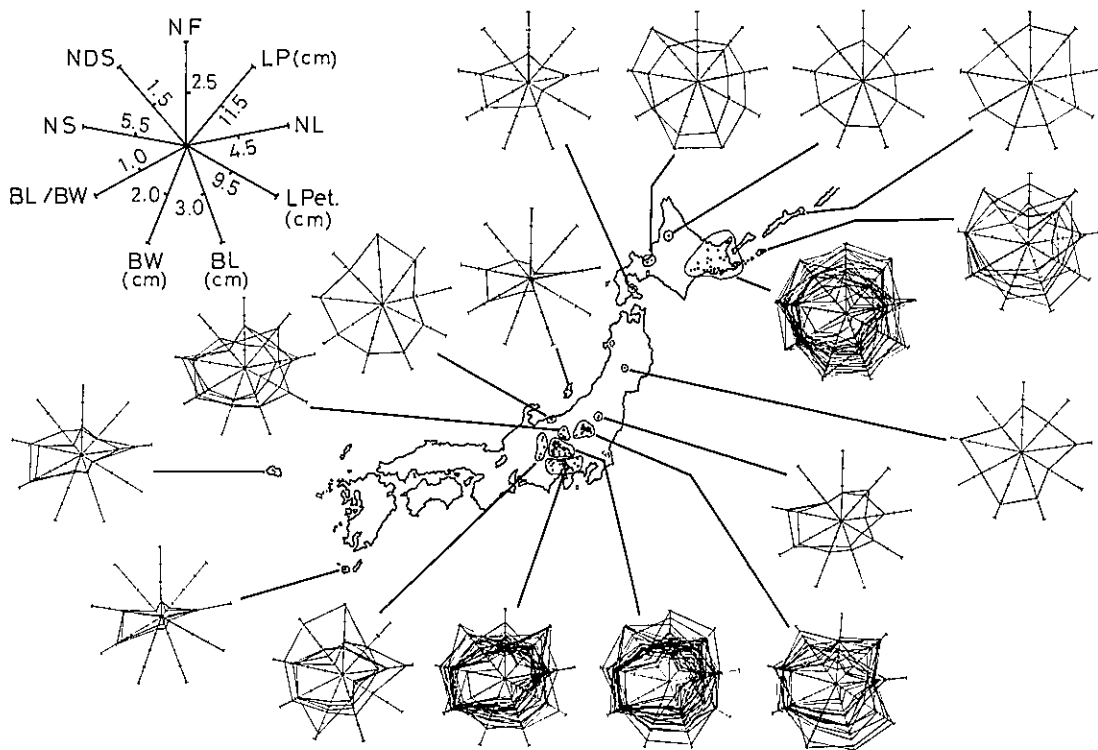


Fig. 1. Polygraphs showing the variations on the mean value of the nine characters based on grouping distribution area. For sign of character, see the text.

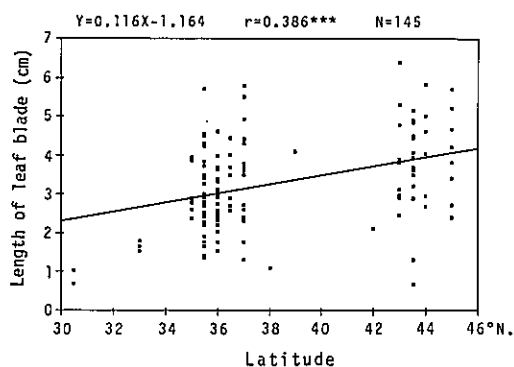


Fig. 2. Relationships between the latitude of sampling sites and the length of leaf blade.

Isl. Yakushima.

The relationship between the length of the leaf blade and elevation of the collecting sites is shown in Fig. 4. This figure shows only a weak relationship, and the plants with larger leaflets (exceeding 5cm) are distributed in the lower elevation.

[B] Hairiness on the pedicel

Photomicrographs of pedicel hairs are shown in Fig. 5.

Until now it has been believed that all the plants from Hokkaido have horizontally spreading, thus patent hairs, and those from Honshu have obliquely ascending hairs. Our results, however, revealed that the hairiness on the pedicel is quite variable, and plants from Hokkaido often have obliquely ascending hairs, while those from Honshu had patent hairs. It seems that the hairiness condition varies depending on the growth stage, namely dense, obliquely ascending hairs in the early stage of sprouting, but in later flowering and fruiting stages, it becomes sparse and patent.

The results of the present observations are mapped (Fig. 6).

Discussion

Mass collections were made from local populations on Mt. Fuji. The mean length of the leaf blade (BL) varied considerably, from 1.11 cm at Omote nigome, 1600 m in elevation, to 3.15 cm at Taroubou, 1300m in elevation on Mt. Fuji, in spite of the short distance between these two populations. This somewhat broad variation may be explained due to environmental constraints of

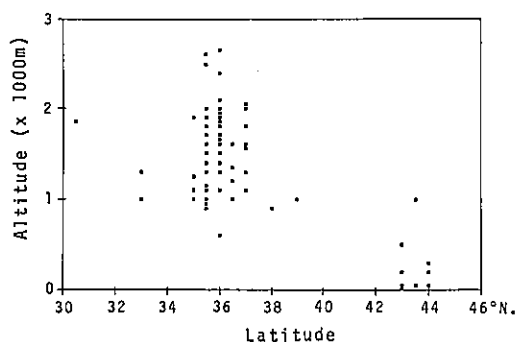


Fig. 3. Elevational distribution of *F. nipponica s. lato*.

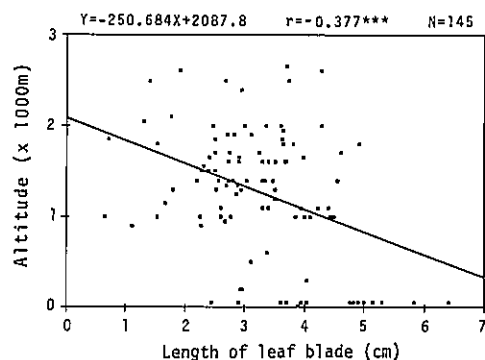


Fig. 4. Relationships between the length of leaf blade and elevation of the sampling sites.

each site, e.g., light, moisture, soil, and other biotic factors.

The plant size of *F. nipponica s.str.* and two allied species is, as demonstrated in Fig. 1, considerably variable, although plants from Isl. Yakushima showed the smallest size. However, the plants from Isl. Yakushima can not always be distinguished clearly from those of Honshu, because there are many intermediate size forms, e.g., as those from Isl. Cheju and even Hokkaido. The occurrence of characteristic dwarf forms in many other plants besides *Fragaria* from Isl. Yakushima has been reported (HATUSIMA, 1987). Since we could find no clear difference except for plant size between those from Isl. Yakushima and other localities, we think it is better to include them in *F. nipponica*, and not distinguish them as a different taxon, var. *yakusimensis*.

As to the hairiness, there are many interconnecting forms between the two extreme types, and thus this character is also continuous among the various localities in Japan. Therefore, *F. yezoensis* is not clearly distinguishable from *F.*

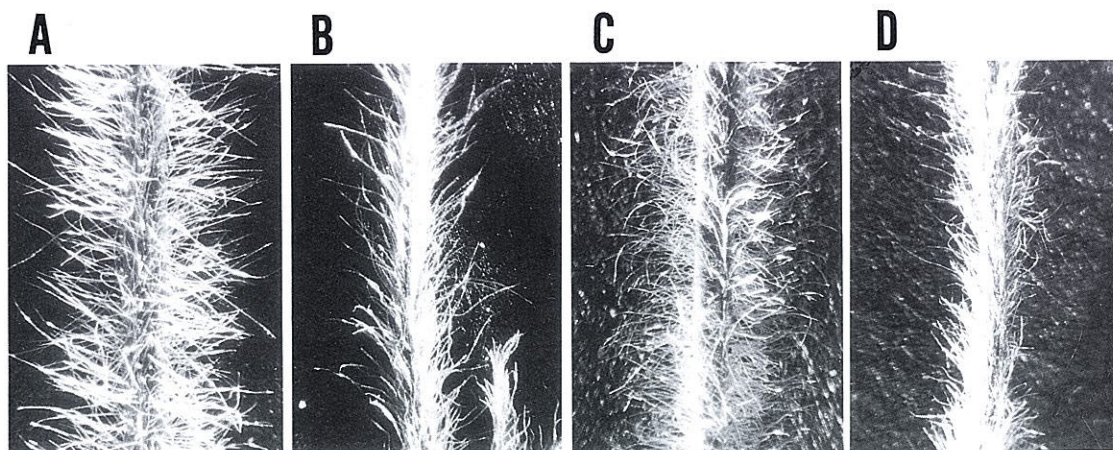


Fig. 5 Hairs on the pedicel (X c. 13).

A : Harutoriko, Kushiro-shi, Hokkaido, H.SHINSHO May 28, 1985 ; B : Mt. Azusayama, Minami-saku-gun, Nagano-ken, M. HOTTA 12170 ; C : Mt. Fuji Ichi-go-me, Shizuoka-ken, A. YAMAMOTO May 26, 1974 ; D : Mt. Shari-dake, Shari-gun, Hokkaido, K. MIMORO 1536

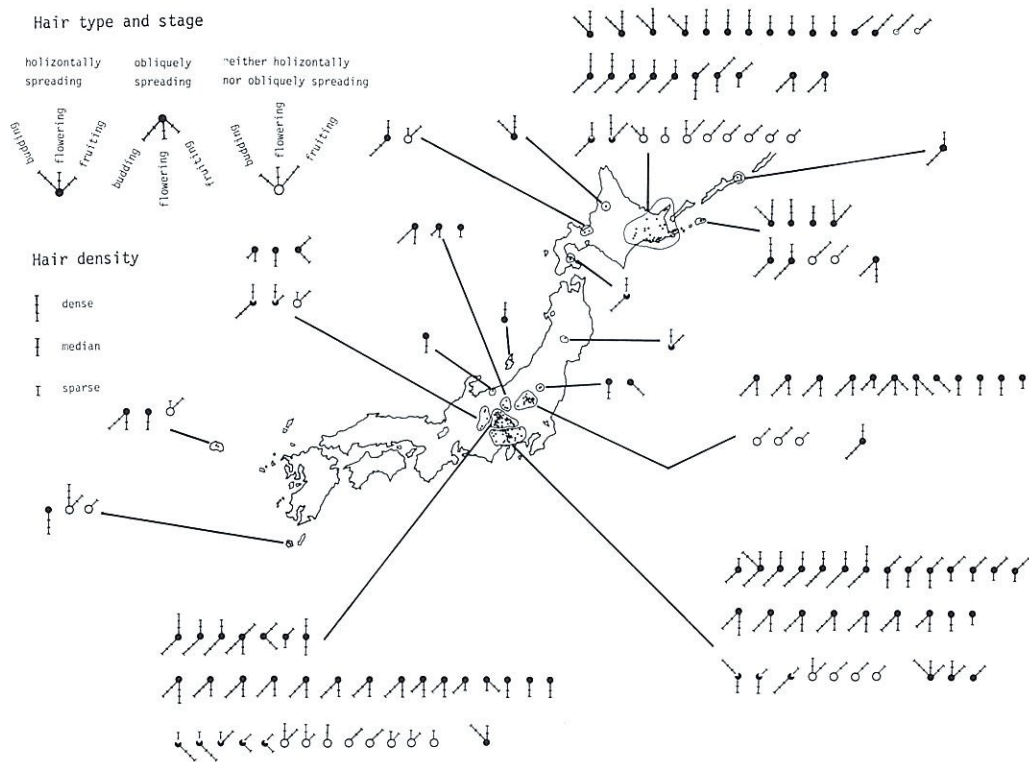


Fig. 6. Figure on the map illustrating the condition and the density of hairs on pedicel.

nipponica.

IWATSUBO and NARUHASHI (unpublished) recently examined the karyomorphology of *F. iinumae*, *F. nipponica*, *F. yakusimensis*, *F. yezoensis* and *F. vesca*, and found no difference between *F. nipponica*, *F. yakusimensis* and *F. yezoensis*, while there are clear differences between *F. iinumae* and

F. vesca. These results also support our opinion.

Taxonomic treatment

Fragaria nipponica MAKINO in Bot. Mag. Tokyo 26 : 282 (1912)

Japanese name : Mori-ichigo (shirobanano-hebiichigo)

Type specimen: Japan, central and northern, alpine mountain, unknown (not seen).

Synonym: *F. yakusimensis* MASAMUNE in J. Soc. Trop. Agr., Taiwan 3: 115 (1931)≡*F. nipponica* MAKINO var. *yakusimensis* (MASAMUNE) MASAMUNE in Sci. Rep. Kanazawa Univ. 3: 115 (1955). Type: Isl. Yakushima, MASAMUNE Jun. 1928, unknown (not seen).

F. yezoensis HARA in Journ. Jap. Bot. 20: 118 (1944)≡*F. nipponica* MAKINO var. *yezoensis* (HARA) KITAMURA in Acta Phytotax. Geobot. 20: 119 (1962). Type: Hokkaido, Nemuro, in promontorio Nosap, H.HARA Aug. 15, 1931 (TI) — syn. nov.

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摘要

モリイチゴ (*Fragaria nipponica* MAKINO, 別名シロバナノヘビイチゴ) は本州産の植物について牧野によって記載発表された。その後、屋久島からヤクシマシロバナノヘビイチゴ (*F. yakusimensis* MASAMUNE)が、北海道からエゾノクサイチゴ (*F. yezoensis* HARA)が発表され、それら3種の分類学的関係について多くの研究者によって論じられて来た。

しかし、今だ一致した意見が出ていないので、これら3種について、従来の分類学的指標形質を中心に再検討を行った。

材料として、19カ所のハーバリウムの花期、または果実期の標本で、産地の異なる230点を使用し、観察及び、計測を行った。取り扱った形質は、花序当たり花数 (NF)、花柄長 (LP)、葉数 (NL)、葉柄長 (LPet)、葉身長 (BL)、葉身幅 (BW)、葉身長/葉身幅 (BL/BW)、鋸歯数 (NS)、二重鋸歯数 (NDS)、小花梗の毛の状態、及び、小花梗の毛の密度である。

植物体の大小という点では、屋久島産は小さく、北海道産は大きいという傾向が見られたが、本州や北海道では変異の幅が大きく、屋久島のものほどの小型の個体も存在した。新潟県佐渡の集団28個体と、その近くの糸魚川市雨飾山の集団21個体を比べると、葉身長では雨飾山 3.52 ± 0.78 cm、佐渡 2.62 ± 0.82 cm で佐渡は小さくなっている。また、済州島や屋久島が他と比べて小さいことは、他の植物に見られるような島矮小化現象と考えられる(初島, 1987)。

北海道産は小花梗に開出毛を持ち、本州産は斜上毛を持つとされてきたが、図6に示したごとく、北海道でも斜上毛が、本州でも開出毛が観察された。ノゴウイチゴとエゾヘビイチゴは染色体の核型

として差があるが、モリイチゴ、ヤクシマシロバナヘビイチゴ、エゾクサイチゴの3者には差が認められないというデータ（岩坪・鳴橋 投稿中）もあり、以上の結果から、モリイチゴは、屋久島、済州島、

本州、北海道、エトロフ島を分布域とし、変種や亜種を持たないが、非常に変異の大きい種と考えたほうが良いと思われる。

(Received May 13, 1988)

○ コガネマンサク（里見信生）N. SATOMI : A New Form of *Hamamelis japonica* var. *obtusata*

本年（1988）4月10日、石川県輪島市在住の自然愛好の方々と、曾々木の岩倉山（357 m）に行った。

ここには、冬期の季節風が岩をけづってつくった千体仏の奇勝があり、近年観光地として知られるようになった。登山路には、マルバマンサク *Hamamelis japonica* var. *obtusata* が多く、早春訪れるならば、花卉が通常の淡黄色のものに混じり、帯赤色のアカバナマンサク f. *incarnata* OHWI の株が多数みられ、加えて、花卉の上半が淡黄色、下半が帯赤色のニシキマンサク f. *flavopurpurascens* (MAKINO) REHD.がある。また、マルバマンサクとニシキマンサク、ニシキマンサクとアカバナマンサクとの間に位置する花色のものもあり、これほど花色が多彩なところを、私は知らない。いわば、マルバマンサクの花色の変異を見るには絶好の場所と思われる。

昭和57年（1982）3月7日、道路に接して生育する株について、マルバマンサク・マルバマンサクとニシキマンサクの中間品・ニシキマンサク・ニシキマンサクとアカバナマンサクの中間品・アカバナマンサクをそれぞれ数えてみたが、下表のような結果を得た。

	マルバマンサク	マルバマンサクとニシキマンサクの中間	ニシキマンサク	ニシキマンサクとアカバナマンサクの中間	アカバナマンサク	計
株数(本)	12	2	17	7	5	43
出現率(%)	28	4	40	16	12	100

ここに報告する新品種は、これらの変異の系列の中でも著しい花色をしめすもので、マルバマンサクの花色が極端に濃く、黄金色である。観賞価値の高いものと思われるので、私は、石川県林業試験場に御協力いただき、増殖することを考えている。

マンサクの名の起源は、“先づ咲く”であるという。これは、春早く、他の植物に先んじて花を咲かせるからであるが、“万作”に通じる名を持つこの種の中で、本品種の花色から、秋の田に黄金色の稲穂が重く垂れ下り、人々は、“豊年じゃ万作じゃ”とよるこび祝う有様が連想される。



1 マルバマンサク *Hamamelis japonica* var. *obtusata*.

2 コガネマンサク *H. j.* var. *o.* form. *auriflora*.

Hamamelis japonica SIEB. et ZUCC.

var. *obtusata* MATSUM. Ind. Pl. Jap. 2-2: 194 (1912)

form. *auriflora* SATOMI f. nov.

Flores auri.

Nom. Jap. Kogane-mansaku (nov.)

Hab. Mt. Iwakura, Machino-machi, Wajima, Ishikawa Pref. (leg. N. SATOMI, Apr. 10, 1988 — Holotypus in KANA no. 127596)

(Received Sept. 7, 1988)

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