

## Pistil Morphology of *Vicia amurensis* (Leguminosae) and its Allied Species

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*Vicia amurensis* Oettingen is found to be clearly distinguished from its allied species by its terete style against dorsally compressed in *V. japonica* A. Gray, *V. pseudo-orobus* Fisch. et Mey. and *V. amoena* Fisch. and laterally compressed in *V. cracca* L. On the basis of this feature, *V. amurensis* and *V. japonica* are newly found in the Boso Peninsula, central Japan.

*Vicia amurensis* Oettingen, *V. japonica* A. Gray, *V. pseudo-orobus* Fisch. et Mey., *V. amoena* Fisch. and *V. cracca* L. are similar to each other and they have sometimes been confused.

Style characters are thought to be important for infrageneric systematics of *Vicia* (Gunn and Kluge 1976, Kupicha 1976). Kupicha placed *V. cracca*, with laterally compressed styles, in sect. *Cracca* and the other four species, having dorsally compressed styles, in sect. *Vicilla*. Also, the ovaries of *Vicia* species are known to be such four types as glabrous, pubescent, pubescent and bearing minute nectariferous glands, or bearing minute nectariferous glands (Gunn and Kluge 1976).

Pistils after anthesis were fixed in FAA and styles were cut at the middle region with a razor to observe the transverse plane. They were then dehydrated with an ethanol series. After replacing the ethanol with isoamyl acetate, the materials were dried in a critical point drier. And they were sputter-coated with platinum palladium (Pt-Pd) and observed with Hitachi S-800 SEM.

Transverse planes of the specimens examined are shown in Fig. 1. The shape in *Vicia amurensis* was found to be terete (Fig. 1A). The shape in *V. cracca* was laterally compressed (Fig. 1B) and those in other species were dorsally compressed (Fig. 1-C, D, E). Ovary surfaces of the specimens are shown in Fig. 2. As the results, that of *V. amoena* were found to be covered with minute nectariferous glands (Fig. 2-A, B) and those of other species were glabrous (Fig. 2-C, D, E).

Based on pistil morphology, keys to these five species are as follows:

1. Style laterally compressed ..... *Vicia cracca*
1. Style terete ..... *V. amurensis*
1. Style dorsally compressed ..... 2
2. Ovary surface covered with glands .... *V. amoena*
2. Ovary surface glabrous .....  
..... *V. japonica*, *V. pseudo-orobus*

*Vicia japonica* can be distinguished by pubescent leaves from almost glabrous *V. pseudo-orobus*.

*Vicia amurensis* is distributed in Amur, Ussuri, East China and Japan. It is discontinuously distributed

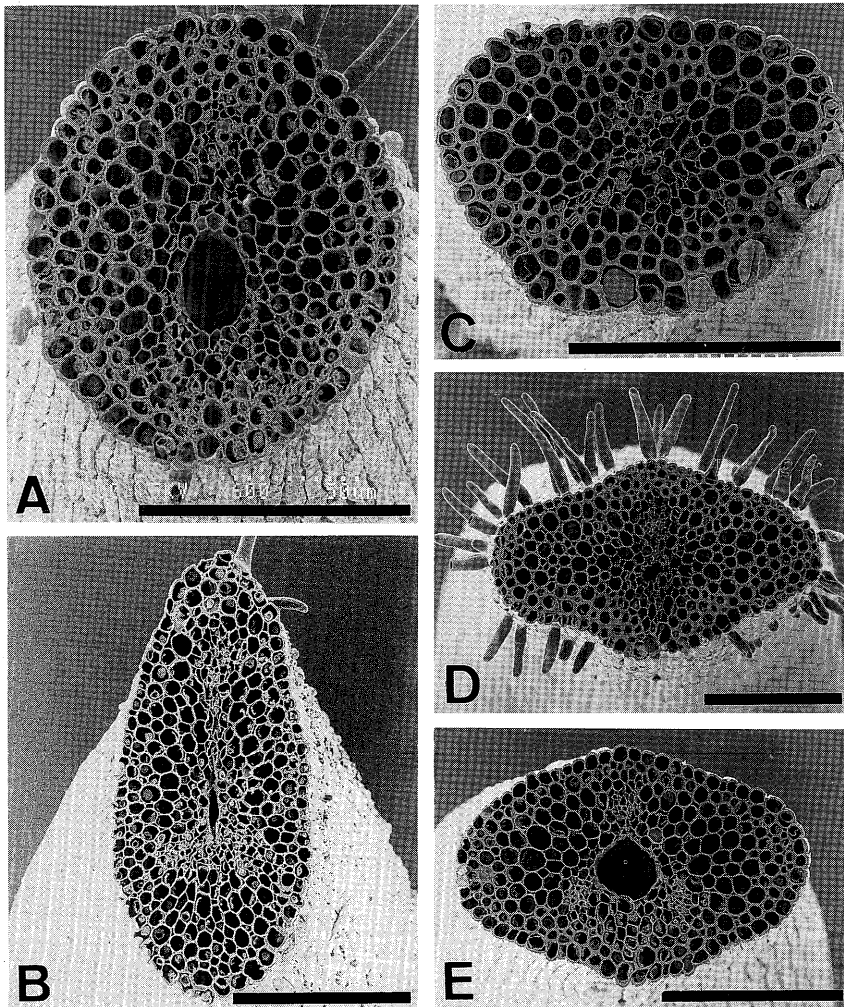


Fig. 1. Transverse planes of styles. A: *Vicia amurensis* Oettingen, Y. Endo 2872 (CBM). B: *V. cracca* L., K. Oono 1990 June 15 (CBM). C: *V. amoena* Fisch., Y. Endo 2918 (CBM). D: *V. japonica* A. Gray, Y. Tateishi 1947 (TI). E: *V. pseudo-orobus* Fisch. et Mey., Y. Endo 2427 (CBM). The lower surface indicates the adaxial surface of the style. Scale bars indicate 0.1mm.

in Japan, i.e. Akita Prefecture in northern Honshu, the Chubu District in central Honshu and the Satsuma Peninsula in southern Kyushu (Ohashi 1982). Recently Hamaguchi (1988) added a new distribution from Kanagawa Pref., central Honshu. In the Boso Peninsula, central Honshu, *Vicia amurensis* was not reported (Biological Society of Chiba Pref. 1958, Nishida et al. 1975, Ito et al. 1986, Kasuya et al. 1991) since the first record of Hiyaama (1947) at Katsura.

On the basis of the key characters, specimens in CBM, KANA, MAK, TI, TNS, TUS and TUSG were re-examined. *V. amurensis*, collected at Katsura, was detected as shown in the attached list. The species was found in a field study on slope near the seashore (see list).

*Vicia japonica* is known to be distributed in Sakhalin, southern Kuril, Hokkaido, Honshu (east of the Kinki District), and Korea (Ohashi 1982). In the

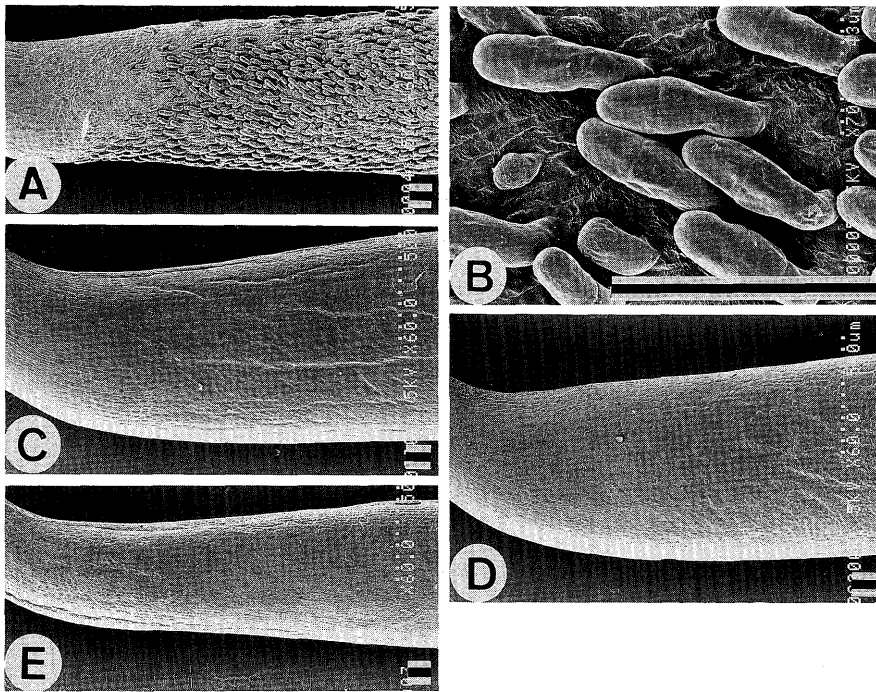
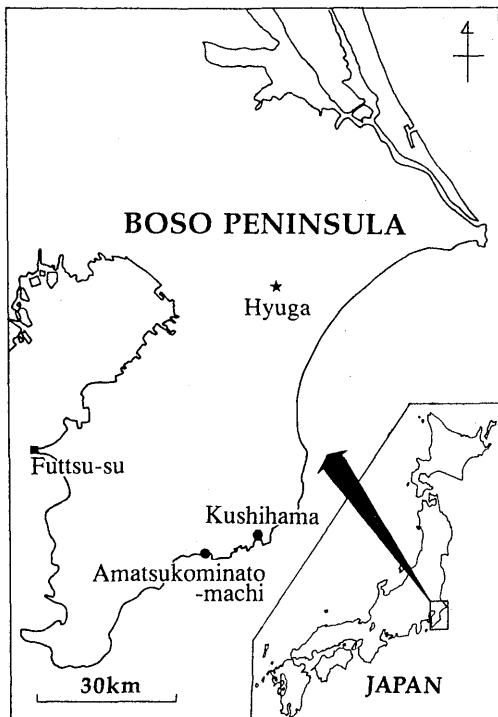


Fig. 2. Surfaces of ovaries. A–B: *Vicia amoena* Fisch., Y. Endo 2918 (CBM). C: *V. amurensis* Oettingen, Y. Endo 2872 (CBM). D: *V. japonica* A. Gray, Y. Tateishi 1947 (TI). E: *V. pseudo-orobus* Fisch. et Mey., Y. Endo 2427 (CBM). The left side indicates the apical direction of the ovary. Scale bars indicate 0.1mm.



Boso Peninsula, at Hyuga of Sanbu-machi and Katsuura-shi, *V. japonica* was reported by the Biological Society of Chiba Prefecture (1958). But I could not find any endorsement specimen. The species may not be distributed in such an inland locality as Hyuga (Fig. 3) because *V. japonica* usually grows on sandy seashores. Only reliable specimen is from Futtsu-su (Fig. 3), a new record (see list).

I am grateful to Prof. H. Ohashi of Tohoku University for his critical reading of this paper and continuous encouragement. I would like to thank the curators of the herbaria of the Faculty of Science, Kanazawa University (KANA), Makino Herbarium, Tokyo

Fig. 3. The distribution map of *Vicia amurensis* Oettingen (●) and *V. japonica* A. Gray (■) in Boso Peninsula, central Japan.

Metropolitan University (MAK), The University Museum, University of Tokyo (TI), Botany Department, National Science Museum (TNS), Biological Institute, Faculty of Science, Tohoku University (TUS) and Botanical Garden, Tohoku University (TUSG).

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#### Specimens examined

##### *Vicia amurensis* Oettingen

Japan, Chiba Prefecture, Katsuura-shi: S. Asano 1952 July 26 (TNS); S. Asano 1953 Aug. 3 (TNS); R. Moriki 1918 July 11 (MAK); T. Wakana 7149, 1951 Aug. 1 (KANA); T. Wakana 3156, 5449 and 11725, 1951 Aug. 1 (CBM). Katsuura-shi, Kushihama: T. Wakana 7149, 1951 Aug. 1 (CBM); T. Wakana 7313, 1956 Apr. 26 (CBM); Y. Endo 2872, 1992 Sep. 3 (CBM). Awa-gun, Amatsukominato-machi: Y. Endo 2873, 1992 Sep. 3 (CBM).

##### *V. japonica* A. Gray

Japan, Chiba Prefecture, Futtsu-shi, Futtsu-su: T. Wakana 3281, 1951 June 24 (CBM).

#### 遠藤泰彦: ノハラクサフジと類似種の雌ずいの形態

ノハラクサフジと類似種との識別形質を、新たに発見した。ノハラクサフジの花柱はほぼ円柱であるが、ヒロハクサフジ、オオバクサフジ、ツルフジバカマでは背腹方向に扁平であり、クサフジでは左右に扁平である。この特徴をもとに、これ

#### References

- Biological Society of Chiba Prefecture. 1958. The third part, the list of the flora. *In*: Biological flora of Chiba Pref. (in Japanese). Biological Society of Chiba Pref., Chiba.
- Gunn C. R. and Kluge J. 1976. Androecium and pistil characters for tribe Viciae (Fabaceae). *Taxon* **25** (5/6): 563–575.
- Hamaguchi T. 1988. Leguminosae. *In*: Flora-Kanagawa Association (ed.), Flora of Kanagawa 1988, Japan (in Japanese): 800–845. Kanagawa Prefectural Museum, Kanagawa.
- Hiyama K. 1947. The third series of notes on wild plants (Zokuzoku-yagai-shokubutsuki) (in Japanese). *Yaso* **16**: 2–4.
- Ito I. et al. 1986. The handbook of plants of Chiba Prefecture (Chiba-ken shokubutsu Handbook) (Biological Society of Chiba Pref. ed.) (in Japanese). 217pp. Biological Society of Chiba Pref., Chiba.
- Kasuya H., Iwase T. and Yashiro K. 1991. The list of the flora of Chiba Prefecture in 1991 and the improvement of its database with personal computer (in Japanese). *Kiyosumi* **13**: 13–28.
- Kupicha F. K. 1976. The infrageneric structure of *Vicia*. *Notes Roy. Bot. Gard. Edinb.* **34**: 287–326.
- Nishida M. et al. 1975. The fifth part, the list of the flora of Chiba Prefecture. *In*: Biological Society of Chiba Pref. (ed.), Flora and vegetation of Chiba Pref. (in Japanese): 349–533. Inoue, Tokyo.
- Ohashi H. 1982. [12] *Vicia* L. *In*: Satake Y. et al. (eds.), Wild flowers of Japan, Herbaceous plants **II** (in Japanese). Heibonsha Publ. Co. Ltd., Tokyo.

らの種の分布を再検討した結果、房総半島において、ノハラクサフジが南部に分布すること、また、ヒロハクサフジが富津市に分布することが明らかとなった。