Contributions to the Knowledge of the Systematics of *Morus* in Japan. VII.

Morus in Cultivation. V.

By

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With 5 Text-figures.

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Key to the varieties and forms of *Morus bombycis* found in cultivation.*

1. Upper surface of the leaf rather smooth and has a strong lustre, apex subulate or long attenuate or caudate. Cystolith of mesophyll is papillate and obtuse, and deeply placed in tissue *M. Mizuho* Hotta. 2
- Upper surface of the leaf more or less scabrous or smooth and not lustrous, apex acuminate or abruptly acuminate. Cystolith of mesophyll is rather acute at apex *M. bombycis* Koidz. 6
2. Leaf is simple or more or less lobate, and the segments are normal
var. *typica* Hotta. 3
- Leaf is irregularly lobate, lobes are usually narrow, and very anormal, margin dentato-serrulate var. *Showa* Hotta.
3. Base of the leaf rather deeply cordate 4
- Base of the leaf truncate or shallowly cordate 5
4. Margin of the leaf is irregularly arguto serrate or dentato-serrate
var. *typica*, f. *normalis* Hotta.
- Margin of the leaf is crenato-dentate f. *Miyano-hara* Hotta.
5. Base of the leaf truncate, the veins of the upper surface are pubescent
f. *Baba* Hotta.
- Base of the leaf truncate or shallowly cordate, leaf oblong-ovate ... f. *Okara* Hotta.
6. Upper surface of the leaf asperate or scabrous 7
- Upper surface of the leaf rather scabrous or smooth 8
7. Upper surface of the leaf asperate, apex acuminate, and its base subtricuspidate
var. *Takaiwase* Hotta.
- Upper surface of the leaf asperate or scabrous, teeth irregular large dentato-serrate var. *grossedentata* Hotta.
8. Teeth of the leaf crenato-dentate or argutidentate 9
- Teeth of the leaf dentate-serrate rarely obtuse 10
9. Teeth of the leaf crenato-dentate, apex caudate or long acuminate
var. *crenatodentata* Hotta.
- Teeth of the leaf argutidentate var. *argutidentata* Hotta.
10. Branches dwarfing, and bark is rather grey var. *humilis* Koidz.
- Branches erect, and bark is brown or greyish-brown var. *typica* Hotta. 11

* The varieties and forms other than *M. bombycis* Koidz., f. *dissecta* Nakai reported in previous papers are excluded in this paper.

11. Apex of the leaf acuminate or abruptly acuminate, base deeply or shallowly cordate 12
 Apex of the leaf linearcaudate, base truncate f. *Otsu* HOTTA.
 12. Leaf lobate or not lobate. In the former case the lobe is cut to about half-way between the margin and midrib var. *typica*, f. *normalis* HOTTA.
 Leaf is pinnatisect or bipinnatifid and segments are narrow f. *dissecta* NAKAI.

***Dolichostylae* KOIDZUMI.**

Imp. Sericult. Exp. Stat., II, 1, p. 3 (1923).

(1) ***Morus Mizuho* HOTTA, sp. nov.**

Morus bombycis KOIDZ. $\times$ *Morus latifolia* POIRET.

Arbor; cortice cinerascente vel hepatica. Juventus fere glabra; lenticellis bruneis, rotundis vel ellipticis vel ovatis irregulariter dispersis. Gemmae fere longitriangulares acutae, perulis 4-5 rarissime 6, acutis utrinque glabriusculis coriaceis. Folia ovata vel elliptica vel ovato-elliptica raro cordata, non lobata raro lobata, apice subulato vel longi-attenuato vel caudato; margine irregulariter arguti- vel dentato-serrata raro obtusa; apice leviter incurvo; basi profunde vel aperte cordata. Lamina fere 25-30 cm. longa, 15-20 cm. lata, nervis axillaribus 6-7; cystolitho obtuso papillatoque raro globulari vel apice acuto, profunde in textum inserto (Fig. 1), petiolo pro lamina breve circ. 4-6 cm. longo,

Fig. 1.

Cystolith of a leaf of
M. Mizuho HOTTA.
 Zeis C $\times$ Leiz Periplan 8
 ($\times 180$).

Fig. 2. *M. Mizuho* HOTTA.

Fig. 3. *M. Mizuho* HOTTA,
 f. *Okara* HOTTA.

glabro, rarissime sulco petioli pubescente, sed non conspicuo. Stipulae lineari-lanceolatae caducae. Amenta mascula circ. 15-25 mm. longa; 5-6 floribus remotis, pedicellis pilosis filiformibus circ. 7-12 mm. longis. Amenta feminea ex lateribus depressa ellipsoidea vel raro globosa, 15-23 mm. longa,

pauci- vel pluri-florifera; rachibus fere pubescentibus. Tepala perianthii masculi 4 lanceolato-oblonga obtusa extus supra leviter ciliolata, circ. 2 mm. longa, staminibus 4 filamentosis tepala superantibus. Tepala feminei perianthii ovario approximata. Ovarium ovatum circ. 1.5 mm. longum. Stylus fere brevis 0.3–0.6 mm., stigmatibus 2 eum sessilibus, intus densissime puberulis. Spicae fructiferae circ. 3–7 mm. longae.

Nom. Jap. *Mizuho-guwa* (nov.): *Kinbashyo*, *Kyohei*, *Marumori* et *Teikoku*.

Hab. Japonia: in hortis culta.

Remarks. The bark is rather grey or greenish-brown or greyish-green, leaves are ovate or elliptical or ovate-elliptical, apex is subulate or long attenuate or caudate, margin is usually irregularly argutiserrate or dentato-serrate rarely crenato-dentate, upper surface is smooth, and have a lustre. Cystolith of mesophyll is obtuse and papillate rarely globular and more or less acute at apex, and deeply placed in the tissue (Fig. 1). Style is rather short, 0.3–0.6 mm. and stigma has small papillate hairs on the inside.

As to its morphology, the female flower is rather similar that of *Morus bombycis* KOIDZ. and the leaf rather *Morus latifolia* POIRET.

Hoshino, *Kasai*, *Kimurawase* and *Tamanaminizufuso* are closely related to this species.

Kyohei was elected by T. KONNO in Tozawa village of Adachi district, Prov. Iwashiro. *Marumori-guwa* was originated Marumorimachi, Igu district, Prov. Iwaki, Kasai perhaps originally of Kasama, Hamana district, Prov. Totomi.

var. **Showa** HOTTA, var. nov.

Lobis folii irregulariter lobatis valde anormalibus; margine denato-serrulata. Petiolus 2.5–3 cm. longus.

Now. Jap. *Showa*.

Hab. Japonia: in hortis culta.

Remarks. Leaf is irregularly lobate, and very anormal; margin is denato-serrulate. Petiole is 2.5–3 cm. in length.

This variety was elected in Yaita of Shioya district, Prov. Shimotsuke.

form. **Miyanohara** HOTTA, f. nov.

Apex folii fere longi-acuminatus, margine fere crenato-dentata.

Nom. Jap. *Miyanohara* (No. 1–2.)

Hab. Japonia: in hortis culta.

Remarks. Apex of the leaf is rather long acuminate, margin rather dentato-serrate.

form. **Baba** HOTTA, f. nov.

Folium supra paulum scabrum, venis fere pubescentibus, basi truncata.

Nom. Jap. *Baba*.

Hab. Japonia: in hortis culta.

Remarks. Upper surface of the leaf slightly scabrous, and the veins are rather pubescent, base is truncate.

Baba was originated, Prov. Yechigo.

form. **Okara** HOTTA, f. nov.

Folium oblongum vel oblongo-ovatum; basi truncata vel aperte cordata.

Nom. Jap. *Okara-guwa*.

Hab. Japonia: in hortis culta.

Remarks. Leaf is oblong or oblong-ovate, base is truncate or shallowly cordate.

(2) **Morus bombycis** KOIDZUMI.

Morus bombycis KOIDZUMI, Bot. Mag. (Tokyo), XXIX, p. 313 (1915).

Nom. Jap. Yamaguwa: *Banto* (Shirakibanto), *Hanakuwa*, *Haranojio* (*Kochijimi*), *Haruiro-guwa*, *Hata-guwa*, *Hayakuwa*, *Heizaburowase*, *Hidakuwa* (*Isekuwa*), *Higan*, *Horakuso*, *Ichijiokobore* (*Kobore-guwa*), *Idani*, *Ishikushirazu*, *Iwanebanto*, *Iwata-guwa*, *Jushima* (*Ikita-jushima*, *Jushima-yotsume*, *Yaye-guwa*, *Yotsume*), *Jyoshunezumigayeshi*, *Kairyoawoichi*, *Kanaya* (*Iwase*), *Kano*, *Kinbuki-guwa*, *Kinjiowase*, *Kinshibori*, *Kishidawase*, *Kiuzayemonkobore*, *Kosaka* (*Magoyemon*).

var. **Takaiwase** HOTTA, var. nov.

Folium lobatum vel non lobatum supra asperatum, apice acuminato, subtricuspidato, venis supra insigniter pubescentibus, margine fere duplo-dentato-serrata, apice brevi-aristulato, basi truncata vel cordata. Petiolus circ. 2–2.5 cm. longus.

Now Jap. *Takaiwase*.

Hab. Japonia: in hortis culta.

Remarks. Leaf is lobate or not lobate, upper surface is asperate, apex is acuminate and its base subtricuspidate, and on the veins with dense white hairs, margin are more or less doubly dentatoserrate, its apex has shortly aristulate, base is truncate or cordate. Petiole is 2–2.5 cm in length.

var. **grossedentata** HOTTA, var. nov.

Folium cordatum vel ovatum, supra asperatum vel scabrum, apice longiacuminato subtricuspidato, margine irregulariter grossedentata, apice leviter incurvo.

Nom. Jap. *Sumon*. *Sumonwase*.

Hab. Japonia: in hortis culta.

Remarks. Leaf is cordate or ovate, upper surface is asperate or scabrous, apex is long acuminate and subtricuspidata, margin is very irre-

Fig. 4. *M. bombycis* Koidz.,
var. *grossedentata* HOTTA.

Fig. 5. *M. bombycis* Koidz.,
var. *argutidentata* HOTTA.

gularly dentato-serrate.

var. **crenatodentata** HOTTA, var. nov.

Folium cordatum vel ovato-ellipticum, apice fere caudato vel longiacuminato; margine crenato-dentata, apice brevistaristulato. Petiolus circ. 3–3.5 cm. longus.

Nom. Jap. *Nakamurawase*.

Hab. Japonia: in hortis culta.

Remarks. Leaf is cordate or ovato-elliptical, apex is rather caudate or long acuminate, margin is crenato-dentate, its apex is shortly aristulate.

Nakamurawase seems to have originated in Prov. Yechigo.

var. **argutidentata** HOTTA, var. nov.

Folium cordatum vel elliptico-ovatum; margine argutidentata, apice longe attenuato vel fere longiacuminato, basi truncata vel aperte cordata.

Nom. Jap. *Arakawa*.

Hab. Japonia: in hortis culta.

Remarks. Leaf is cordate or elliptical-ovate, margin argutidentate, apex is long attenuate or rather long acuminate, base is truncate or shallow cordate.

var. **humilis** KOIDZUMI, Bull. Imp. Sericult. Exp. Stat., III, 1, p. 33 (1917) & VI, 3, p. 92 (1921) & II, 1, p. 12 (1932).

Syn. *Morus humilis* KOIDZUMI, Bot. Mag. (Tokyo), XXXI, p. 37 (1917)—MAKINO et NEMOTO, Fl. Jap., p. 219 (1931).

Morus japonica AUDUB., var. *pubescens* YENDO, Traité sur la Cult. du Mûr. au Jap. p. 17 (1927) nom. seminud., pro parte.

Ramulus humilis numerosus, cortice cinerea; foliis ovatis vel oblongis,

sensim breviacuminatis.

Nom. Jap. *Fushimagari-guwa* (*Fushimagariichibei*).

Remarks. *Fushimagari-guwa* was originated Prov. Kozuke. *Kuro-ofushimagari* is closely related to this variety.

form. **Otsu** HOTTA, var. nov.

Folium ovatum vel ovato-ellipticum, apice lineari-caudato, basi truncata.

Nom. Jap. *Otsu*.

Hab. Japonia: in hortis culta.

Remarks. Branch is light blackish-brown. Leaf is ovata or ovato-elliptical, its apex is linearicaudate, base is truncate.

form. **dissecta** NAKAI, Fl. Syl. Korea., XIX, p. 101 t. 29 B (1932)—HOTTA, Trans. Sapporo Nat. Hist. Soc., XIV, 3, p. 203 (1936).

Syn. *Morus alba* var. *stylosa* form *dissecta* NAKAI, Veget. Isl. Quelpaert, p. 39, no. 5176 (1914), nom. nud.

Folium pinnatifidum vel bipinnatifidum, lobis angustis.

Nom. Jap. *Hosoba-yamaguwa*.

Distr. Yezo, Honshu, Korea.

Remarks. *Narusawawase* is closely related to this variety.

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533⁽⁷⁾** **Galium spurium** LINNAEUS, Sp. Pl. ed. 1, I, p. 106 (1753).

var. **echinospermum HAYEK, Fl. Steierm. II, p. 393 (1912).

Syn. *Galium infestum* WALDSTEIN et KITAIBEL, Fl. Rar. Hung. III, p. 224, t. 202 (1812).

Galium Vaillantii DC., Fl. Franc. IV, p. 263 (1815).

Galium strigosum THUNBERG in Nova Acta Soc. Sci. Upsal. VII, p. 141 (1815).—NAKAI in Bot. Mag. Tokyo XXVIII, p. [30] (1914).

Galium agreste a. *echinospermum* WALLROTH, Sched. Crit. Fl. Halen.