

## TWO NEW SPECIES OF SMILAX (SMILACACEAE) FROM TAIWAN<sup>(1)</sup>

TETSUO KOYAMA<sup>(2)</sup>

**Abstract:** Described as new are *Smilax Luei*, from the affinity of *S. nervo-marginata*, and *Smilax nantoensis*, an ally of *S. megalantha*. Both were found during the course of recent plant survey program toward the preparation of the new Flora of Taiwan. New section *Nervo-marginatae* was proposed to accommodate *S. Luei* and its close allies.

1. *Smilax Luei* T. Koyama, spec. nova ex affinitate *Smilacis nervo-marginatae* ac *S. biumbellatae*, a quibus distincte recedit floribus masculis stamina 9 vel 10 gerentibus, tepalis masculis intus longitudinaliter rugosis, et laminis foliorum peltatis (Fig. 1). Sectio *Nervo-marginatae* T. Koyama.

**Descriptio** holotypi: Liana sempervirens; rami subteretes vel parum angulati, inermes, internodiis 5-10 cm longis ca. 2 mm crassis. Folia remotiuscula; laminae lanceolatae, 6-10 cm longae, 1.5-3 cm latae, ad apicem longe acuminatum attenuantes, basi peltatae rotundae vel parum emarginatae, coriaceae, supra glauco-virides, subtus pallide virentes, costis principalibus 5 cum parvis marginalibus gracilioribus; petioli ca. 15 mm longi, subteretes, sub apice 1-2 mm articulati, basi 2-4 mm alii 0.5 mm latis fusciscentibus vaginantes; cirri 5-10 cm longi. Umbellae e nodis 1 vel 2 basilaribus in quoque ramo enatae, pedunculo 20-25 mm longo basi eprophyllato; umbellae masculae 15-20 mm in diametro, 18-25-florae; receptaculi vix incrassati; radii 1.5-2 mm longi. Flores masculi 5-5.5 mm in diametro; tepala exterioria et interioria similia, reflexa, lanceolata, 3.5-3.7 mm longa, 1.2 mm lata, herbacea, virentia et purpureo-suffusa, longitudinaliter rugosa; stamina 9, ca. 2 mm longa, filamenta brevi; antherae 1 mm longae, oblongo-ellipticae, albae.

Liana with dark green stems 1 to 4 m long, 2-6 mm thick below, rather loosely branched above; branches subterete to angular, glaucous-green, unarmed, weakly roughened, the internodes 1.5-12 cm long, 1-2 mm thick. Leaves spaced; blades lance-ovate to lanceolate, (3-) 5-13 cm long, 1-3.5 mm wide, gradually tapering to acuminate apex, rounded to shallowly emarginate at base, peltate with the point of attachment of petiole at 2-3 mm above the very base of the blade, coriaceous, deeply glaucous-green on upper surface, pale-green beneath, the main costas 5 including a marginal pair forming thickened nerved margins, all costas divided at the point of attachment of the petiole and prominently convex on both surfaces, the transverse veinlets oblique, forming dense and prominent reticulations; petioles 10-17 mm long, jointed at 1-2 mm below apex, subterete, 0.3-0.6 mm thick, the sheathing base 2-4 mm long, obtuse on back, the wings herbaceous, ca. 0.5 mm wide, pale and eventually becoming brownish; tendrils slender, 3-10 cm long. Umbels 1 or 2 to a branch, borne at the lowest 1 or 2 nodes; peduncles 15-25 mm long, slender, arising from axils of scaly bracts without prophylls; bracts ovate to lance-ovate, acute, 3-7 mm long,

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(2) The New York Botanical Garden, New York, 10458, U. S. A.



Figure 1. *Smilax Luei* T. Koyama, from type materials. A, portion of branch with staminate umbel. B, portion of branch with pistillate umbel. C, base of leaf blade showing the point of attachment of its petiole. D, staminate flower. E, stamen. F, pistillate flower. G, outer tepal of pistillate flower. H, inner tepal of pistillate flower. J, pistil with staminodes. Scales for floral parts=1mm. Drawn by Haruto Fukuda.

membranous, pale-brownish. Staminate umbels globose, 15–20 mm across, subdensely 15- to 25-flowered; receptacles not markedly enlarged; bracteoles ovate, obtuse, 0.8 mm long; rays 5–8 mm long. Pistillate umbels 3–6 mm across, 10- to 15-flowered; rays 1–2 mm long. Staminate flowers 4.5–5.5 mm in diameter; outer and inner tepals alike, reflexed at anthesis, lanceolate to lance-ovate, 3.2–3.7 mm long, 1–1.2 mm wide, gradually tapering above to subacute apex, thickly herbaceous, greenish-purple on both surfaces, longitudinally wrinkled on inner surface with several ridges; stamens 9 (rarely 10), 1.7–2 mm long, the oblong-elliptic whitish anthers 1–1.1 mm long, on a short flattened filament. Pistillate flowers 1.8–2 mm across, dark green; tepals thickly membranous, incurved at obtuse apex, minutely verruculose on outer surface, the outer 3 elliptic 1.5–1.7 (–2) mm long by 1 mm wide, the inner 3 elliptic-oblong 1.1–1.3 (–1.5) mm long by 0.7 mm wide; ovary ovoid-globose, 1 mm long, the stigmas 3, sessile, ca. 0.5 mm long; staminodia 6 or 5, needle-like, 0.3–0.5 mm long. Berries globose, 5–7 mm across, maturing black, 1-(rarely 2-) seeded.

Climber at margin of subtropical evergreen forests. Endemic to central Taiwan.

NANTOU: Lienhuachih, ca. 6 km NNW of Sun Moon Lake, ca. 650 m. *T. Koyama T. C. Huang & C. M. Lü 7559* [♂ fl.] (Type at NY, isotype at TAI); ditto, *T. Koyama et al. 7560* [♀ fl.] (Paratype at NY).

This new species is striking in its peltate leaves, as well as in its staminate flowers, which as a normal condition bear 9 or 10 stamens. Characters of this particular combination has not previously been observed in any species of the genus. In spite of the fact that a staminate flower bears 9 stamens, *S. luei* has shown no close taxonomic relationships with the species the section *Pleiosmilax*, but its coriaceous leaf blades with characteristically thickened nerved margins and the details of stamens and perianth demonstrate that its true affinity should be sought in *S. nervo-marginata* of the Ryukyus, in *S. biumbellata* of Upper Burma and the adjoining southern China, or in *S. ovato-lanceolata* of Malasia. The specific epithet, *Luei*, was given in honor of Mr. Chin-ming Lü of the Taiwan Forest Research Institute, whose help and attention enabled me to study this highly interesting species.

The characters that are common among the four species mentioned above include the relatively thick narrow leaf blades, which bear conspicuously thickened nerved margins, the petioles which are jointed below the apices, and the usually purple-tinged perianth segments, which are spreading or reflexed at anthesis. With these peculiar characteristics *S. luei* and its allied species cannot be properly placed in any of the sections so far proposed in the genus. The section *Coilanthus*, which is definitely the nearest one, deviates from this group in the incurved-saccate perianth segments. The section *Vaginatae*, the second closest is different in the shrubby habit and the leaf petioles that are jointed at the very apex, hence they are sheathing for their total length. For this reason, the section *Nervo-marginatae* is hereby proposed to accommodate *S. luei* and its four allied species.

**Smilax** sect. *Nervo-marginatae* T. Koyama, sect. nova differt a sectione *Coilanthus* tepalis planis ad anthesem divergentibus vel reflexis, et a sectione *Vaginatae* petioliis sub apice articulatis.

Lianae; foliorum laminae plerumque angustae, plus minus coriaceae, conspicue nervo-marginatae, costis nervis lateralibusque prominentibus; petioli sub apice

articulati, alis angustissimis vaginantes. Umbellae e nodis 1 vel 2 in quoque ramo enatae, pedunculo basi eprophyllato; flores plerumque virentes et purpureo-suffusi; tepala plana, ad anthesem divergentia vel reflexa. Species typica: *Smilax nervosa marginata* Hayata ex Insulis Ryukyusibus. Tantum pertinent *S. luei* T. Koyama (Taiwan), *S. ovato-lanceolata* T. Koyama (Malesia), *S. biumbellata* T. Koyama (Burma septemtrinalis et China australis), et *S. microphylla* C. H. Wright (China et India borealis).

**2. *Smilax nantoensis*** T. Koyama, spec. nova. Differt a *Smilax megalantha* floribus masculis et foemineis multo minoribus, tepalis masculis 4.5-5 vs. 6-7 mm longis, tepalis foemineis 2.5-3 vs. 5-6 mm longis, et caulibus ramisque haud aculeatis, receptaculis nullo tempore elongatis (Fig. 2). Sectio *China* T. Koyama.

Descriptio holotypi: Liana sempervirens; rami 10-30 cm longi, nunquam aculeati, internodiis 2-5 cm longis 1-2 mm latis laevis teretibus. Folia subdense disposita; laminae ovatae vel ovato-ellipticae, 4-8 cm longae, 2-3.5 cm latae, apice acutae, basin versus abrupte contractae, tenuiuscule coriaceae, virentes et saepe parte inferiore rufo-tinctae, subtus glaucae, costis principalibus 3 subgracilibus; petioli 7-15 mm longi, prope apicem articulati, fere apicem versus alis ca. 1 mm latis vaginantes; cirri 7-10 cm longi. Umbella e quoque ramo solitaria, e nodo infimo nascens; pedunculus 1 cm longus, eprophyllatus. Umbellae masculae 3 cm latae, 7-10-florae; receptaculi non incrassati nec elongati; radii 15 mm longi. Flores masculi campanulati; tepala exteriora oblongo-elliptica, 5 mm longa, 1.5 mm lata, apice rotunda; tepala interiora 4 mm longa, 1.25 mm lata, apice obtusa; stamina 6, filamentis elongatis tepala fere aequantia; antherae albae, latiuscule ellipticae, 1 mm longae.

Evergreen liana; stems scandent to climbing, 80-200 cm tall, 3-5 mm thick below, unarmed throughout, much branched above; branches 8-40 cm long, straightish, the internodes 1.5-5 cm long, 1-2 mm thick, terete, unarmed. Leaves rather congested; blades ovate-elliptic or occasionally narrowly elliptic, 3-10 cm long, broadest at ca. 1/3 above the base, 1.5-4 cm wide, gradually narrowed to acute apex, suddenly contracted at obtuse or rounded base, thinly coriaceous, deeply green, occasionally tinged with red toward base, glaucous beneath, the main costae 3 excluding slender and weak marginal pair, all divided to base, slender but conspicuous on upper surface, slender and ridged on lower surface, lateral veinlets divergent, rather inconspicuous on upper surface, forming weak and loose reticulation; petioles 7-15 (rarely up to 20) mm long, 1.2-1.5 mm wide including wings, weakly laterally flattened with acute back, jointed nearly at apex and hence sheathing nearly to apex with glaucous pale wings 0.5-1 mm wide; tendrils 5-10 cm long. Umbels of both sexes as a rule only one on each flowering branch, arising from axil of the lowest leaf (which is sometimes reduced to an ovate bract); peduncles 5-10 mm long, not prophyllate; receptacles neither thickened nor markedly elongated; bracteoles 0.3-0.5 mm long. Staminate umbels 3- to 10-flowered, 2-3 cm wide; rays 10-15 mm long. Pistillate umbels 3- to 6-flowered; rays 3-6 mm long. Staminate flowers: tepals patent, the outer 3 oblong to oblong-elliptic, 4.5-5 mm long, 1.3-1.5 mm wide, obtuse or rounded at apex, the inner 3 narrowly oblong, 3.5-4 mm long, 1-1.5 mm wide, obtuse at apex; stamens 6, the filaments linear, 3-3.5 mm long, the elliptic white anthers 1 mm long. Pistillate flowers: tepals patent, the outer 3 elliptic to broadly elliptic, rounded to apex, 2.5-3 mm long, 1-1.7 mm wide, the inner 3 ovate-oblong, 2-2.5 mm long, 1 mm wide; ovary ovoid, 1.5-2 mm long, 1-1.25 mm wide, stigmas 3, 1-1.5 mm long, recurved



Figure 2. *Smilax nantoensis* T. Koyama, from type materials. A, branch with staminate umbels. B, portion of branch with pistillate umbel. C, staminate flower. D, outer tepal of staminate flower. E, inner tepal of staminate flower. F, pistillate flower. G, outer tepal of pistillate flower. H, inner tepal of pistillate flower. Scales for floral parts—1 mm. Drawn by Haruto Fukuda.

at the half way; staminodia 3, needlelike, 1-1.5 mm long. Berries 6-8 mm across, maturing red.

Margins of evergreen forests and grassy forest openings on low mountains. Endemic to central Taiwan.

NANTOU: Lienhuachih, ca. 6 km NNW of Sun Moon Lake, 800-850 m alt., *T. Koyama*, *T. C. Huang* & *C. M. Lü* 7586 [fl. ♂] (TAI, holotype), the same locality, *T. Koyama et al.* 7618 [fl. ♀] (TAI, paratype).

Closely resembling *S. megalantha* of central China in the foliage, this species differs from it in its unarmed terete stems, much smaller flowers of both sexes, as well as in its receptacles of umbels, which are in no sense elongated at all. Actual measurements of outer tepals in both species showed that the staminate tepals of the new species are 1 to 1.5 mm shorter than those of *S. megalantha*, while the pistillate tepals of the former are 2.5 to 3 mm shorter than those of the latter. In *S. megalantha* the receptacles of umbels, especially those of pistillate ones, are markedly elongated to the extent that the inflorescence becomes racemose. Such elongation of receptacles has never been observed in *S. nantoensis*.

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