

Hiroshi HARA*: **New or noteworthy flowering plants
from Eastern Himalaya (1)**

原 寛*: 東部ヒマラヤ植物新知見** (1)

In the course of preparing a detailed account of the Indo-Japanese Botanical Expedition to eastern India in 1960, it became necessary to propose the following new names. The present study is mostly based on the specimens collected during the Expedition, and also on the material gathered before or after the Expedition around Darjeeling and Gangtok from April to June. The descriptions were generally prepared from the fresh material.

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1) ***Arisaema ostiolatum*** Hara, sp. nov. (♀ *Wallichiana*)

Paradioica. Bulbus depresso globosus 1.5—4 cm in diametro saepe lateraliter bulbuliger. Cataphylla tenue membranacea 3—8 cm longa. Folium 1 interdum 2, ternatum; petiolus fere e basi pedunculo separatus 10—25 cm longus viridescens immaculatus; foliola rotundato-, ovato- vel oblongo-rhomboida subsessilia apice longe acuminata margine ± undulata, mediana 5—10 cm longa 2.5—6.5 cm lata, lateralia obliqua 5—10 cm longa 2—5.5 cm lata. Pedunculus folio brevior 5—13 cm altus 2—4 cm crassus viridescens immaculatus. Spatha incurvata praeter caudam 5—8 cm longa; tubus paullo latere compressus 3—5 cm longus 8—12 mm in diametro longitudinaliter atropurpureo- et albido-striatus immaculatus; lamina forte incurvata, ventro tantum in parte inferiore aperta, orificio rotundato 8—10 mm in diametro margine angustissime recurvato ubi viridescens; dorso concava viridescens vel fusco-purpurea longitudinaliter albo-nervata intus longitudinaliter lamellata, lamellis viridescens vel albidis ad 2 mm latis; supra orificium dilatata lobis lateralibus

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semirotondis ca. 5 mm longis saepe fusco-purpureo-maculatis inter se clausa; apice subito longe caudata; cauda 3-4.5 cm longa descendens viridescens interdum margine fusco-purpurea. Spadix 1-2 cm longa sublaxiflora; floris ♀ ovaria oblongo-ovata; flores ♂ stipitati 3-5-andri, thecis rima lunata dehiscentibus; appendix stipite tenue

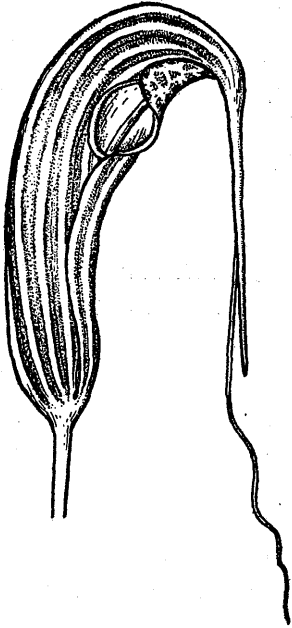


Fig. 1. Spathe of *Arisaema ostiolatum* Hara. $\times 1$.

ca. 5 mm longo suffulta, supra stipitem abrupte incrassata 3-5 mm in diametro albida, tum in flagellum tenue longe attenuata; flagellum laeve, inferiore ascendens 1-1.5 mm crassum viridescens, superiore filiforme spatha longe exsertum dependens viridescens vel fusco-purpureum.

Typus. Himalaya orientalis: in prato prope Phalut, alt. ca. 3500 m, montium Singalila (H. K. M. T. & T.,¹⁾ no. 654, Jun 5, 1960 in TI; isotypus in B. Sahni Inst. Palaeobot. Lucknow).

The new species belongs to the *Arisaema costatum* group, and is very striking in having the cap-shaped limb of spathe with a small roundish aperture only in the lower part on the ventral side, and with overlapping lateral lobes above the aperture. The specimens from Olakthang 14000 ft. (King, Jun. 1888) identified by Engler as *A. propinquum*, and Jongri (King's coll. 1887) cited by Chatterjee under *A. sikkimense* seem to be this species. However, the type (C.B. Clarke 34968A) of *A. sikkimense*, of which

photograph I have examined by the courtesy of the director of Royal Botanic Gardens at Kew, is near to *A. costatum*, as treated below.

2) ***Arisaema costatum*** (Wallich) Martius ex Schott in Melet. Bot. 17 (1832).

Arum costatum Wallich, Tent. Fl. Nep. 28, t. 19 (1824).

Arisaema Wallichianum Hook. f., Fl. Brit. Ind. 6: 500 (1893), p.p.

var. **sikkimense** (Stapf ex Chatterjee) Hara, stat. nov.

Arisaema sikkimense Stapf [in Bot. Mag. sub t. 9058, in adnota (1925), nom.] ex Chatterjee in Bull. Bot. Soc. Bengal 3: 18 (1949); 8: 135, f. V (1955), e typo.

f. **propinquum** (Schott) Hara, stat. nov.

1) Hiroshi Hara, Hiroo Kanai, Gen Murata, Makoto Togashi, and Takasi Tuyama.

Arisaema propinquum Schott in Oester. Bot. Wochenbl. 7: 333 (1857).

Arisaema costatum is very variable in the Himalayas, and we have noticed various forms of this group also in the Singalila range. *A. sikkimense* Stapf was named to a small subalpine form, and the characters used to distinguish it from *A. costatum* seem to be insufficient to separate it as an independent species. We have observed typical small plants of *A. sikkimense* and also much larger plants resembling typical *A. costatum* together with interconnecting ones between the two. The plants with two leaves collected in the same district are referable to *A. propinquum*, but agree well with *A. sikkimense* in other important characters except for its size, and it is highly probable that *A. propinquum* is a wellgrown individual of *A. sikkimense*. *A. utile* Hooker f. is also very closely related to *A. costatum*.

3) ***Arisaema biflagellatum*** Hara, sp. nov. (♀ Wallichiana)

Paradioica. Bulbus depresso globosus. Folium 1 raro 2, 3-foliolatum, petiolo 10–30 cm longo pallide viride immaculato; foliola mediana elliptica basi cuneata subsessilia apice longe acuminata 7–15 cm longa 2.5–5 cm lata; lateralia mediana saepe majora obliqua basi oblique rotundata 6–20 cm longa 2–8 cm lata. Pedunculus folio brevior 6–20 cm altus pallide viridis immaculatus. Spatha uniforme flavescenti-viridis vel leviter longitudinaliter albo-striata; fauce margine leviter recurvata; tubus 3–5 cm longus 13–18 mm in diametro; lamina ovato-lanceolata incurvata 4–7 cm longa basi 1.5–2.5 cm lata ad apicem longissime caudato-attenuata; cauda flagellata 8–16 cm longa nutans. Spadix 1–2.2 cm longa; ♀ densiflora, ♂ laxiflora, flores ♂ stipitati, 3–4-andri, thecis rima lunata dehiscentibus; appendix breviter stipitata, supra stipitem obclavato-incrassata ubi erecta 2.5–3 cm longa basi 3–5 mm crassa albida, deinde recurvata in flagellum sensim longe attenuata; flagellum laeve viridescens 10–25 cm longum superiore filiforme longe exsertum dependens.

Typus. Himalaya orientalis: infra Sandakphu, alt. ca. 3500 m, montium Singalila (H. K. M. T. & T., Jun. 7, 1960 in TI).

This species resembles *Arisaema intermedium* Blume of Western Himalaya, but is characterized in having a yellowish green spathe which is tapering into a very long flagellate tail of 8–16 cm long in a similar way to the appendix of spadix.

4) ***Chrysosplenium singalilense*** Hara, sp. nov. (Ser. Lanuginosa)

Planta gracillima. Rhizoma breviter repens. Innovationes primo filiformes tenuissimi repentes puberuli, foliis alternis minutissimis ca. 1 mm longis; demum ascendentes foliis majoribus ad apicem subconferti. Caulis florifer gracilis 2–7 cm altus parce pubescens. Folia basilaria depresso ovata vel rotundato-ovata 2.5–5 (7)

mm longa 3-6 (8) mm lata basi truncata vel subrotundata utrinque 1-2 (3)-crenata supra parce pubescentia, pilis vulgo quam 1 mm brevioribus tenuibus, petiolis 3-5 mm longis parce pubescentibus. Folia caulina 2-3, basilaria similia, depresso ovata vel flabellato-ovata 2-4 mm longa 2-5 mm lata, petiolis 2-6 mm longis puberulis. Cyma laxa (1) 2-6-flora parcellis pilosa. Folia bracteata depresso-ovata 2-5 mm longa ac lata utrinque 1-2-crenata. Flores virides 3-4 mm in diametro. Sepala patentia ovata 1-1.6 mm longa. Stamina 8 sepalo subduplo breviora 0.5-0.7 mm longa; antherae rotundatae filamentum subulato breviora. Discus latus leviter 8-lobatus. Styli 0.4-0.5 mm longi. Ovarium inferius. Capsula semi-inferius, lobis divergentibus. Semina ca. 20 in capsula, ovalia castanea ca. 0.6 mm longa 0.4 mm lata sub microscope minutissime papillosa.

Typus. Himalaya orient. : in petris humidis muscosis secundum rivulum prope Phalut, ca. 3500 m, mont. Singalila (H.K.M.T. & T. no.764 p.p., Jun., 1960 in TI).

This tiny species is closely allied to *Chr. microspermum* Franchet of central China, but differs from it in having pubescent stems and leaves, and larger flowers and seeds. It is also distinguished from a small individual of *Chr. lanuginosum* Hooker f. et Thomson by much smaller basal leaves with fewer crenae, and much sparse thin hairs. As compared with *Chr. filipes* Komarov of Altai and Sajan, the species has pubescent stems and leaves, larger flowers, and longer styles. It is interesting that this species shows somewhat intermediate characters between *Chr. microspermum* and *Chr. lanuginosum*, and I have become of opinion that Ser. *Microsperma* should be united with Ser. *Lanuginosa*.

5) **Monotropastrum humile** (D. Don) Hara, comb. nov.

Monotropa humilis D. Don, Prodr. Fl. Nepal. 151 (1825).

M. nepalensis Wallich, Cat. no. 7252 (1832), nom. nud., saltem pro parte.

M. uniflora L. sensu Clarke in Fl. Brit. Ind. 3: 476 (1882), pro parte.

Monotropastrum macrocarpum H. Andres in Notizbl. Bot. Gart. 12: 698 (1935), quoad pl. Sikkim.

Monotropastrum Clarkei H. Andres in Bot. Jahrb. 76: 105 (1953), cum descr. germ. tantum.

We have fortunately found a population of *Monotropastrum* in forests of Tiger Hill near Darjeeling at about 2480 m high on June 23, 1960. Whole plants are snow white when fresh, except for the dull bluish stigma and ochraceous anthers, and the lower half of them are buried in the earth and fallen leaves. This saprophyte is variable by individual even in the same population especially in size, its

stems being 8–15 cm high and 3–7 mm thick, its scaly leaves 3–7 mm wide, its flowers 12–20 mm long, its petals 12–18 mm long 6–12 mm broad, its pistils 10–14 mm long, its ovaries 3–10 mm in diameter, and its stigma-disk 3.5–7 mm in diameter. A slender individual has narrow oblong scaly leaves, smaller flower, and narrowly flask-shaped ovary, while a stout individual has broader leaves, larger flower, and subglobose ovary. The petals are pubescent inside, the filaments hirsute, and the anthers very minutely papillose.

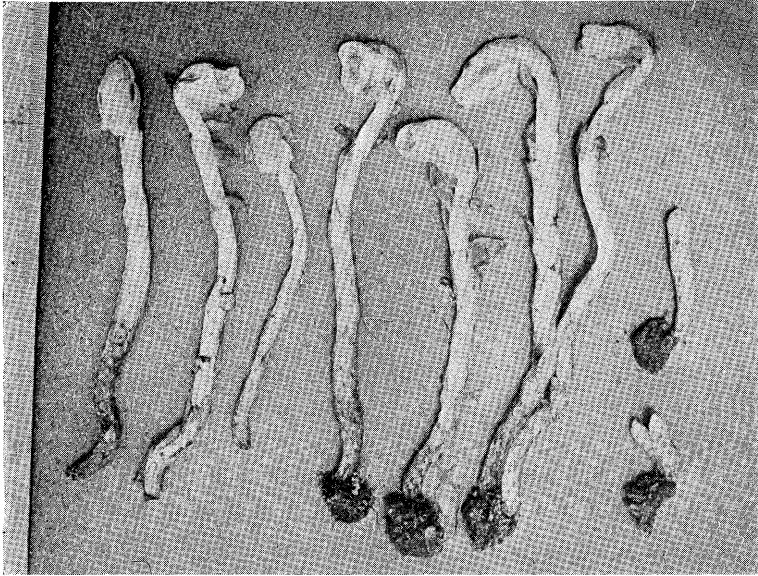


Fig. 2. Fresh specimens of *Monotropastrum humile* (D Don) Hara, collected on Tiger Hill near Darjeeling. $\times 1/2$. (Photo by T. Tuyama).

These plants closely resemble *Monotropastrum globosum* H. Andres ex Hara of Japan in essential characters, and the quite similar variations in scaly leaves, flowers, and ovaries have also been observed in *M. globosum* as illustrated by me in Icon. Pl. Asia. Or. 4 (1): t. 109 (1941), and its slender form had once been named as var. *tripetalum*. The Himalayan plants, however, differ from the Japanese in having petals of thinner texture which tend to be obovate, slightly narrowed to the base and less distinctly saccate at the base, and filaments less densely hirsute with thinner (20–30 μ thick) hairs. The mycorrhiza is thinner and less compact, as compared with that of *M. globosum*. In *M. globosum*, its petals are thicker, broad and distinctly saccate at the base; its filaments densely villose with thicker (30–50 μ

thick) hairs; its anthers more distinctly papillose, and its mycorrhiza thick, coarse and compact.

Recently I have examined authentic specimens of *Monotropastrum Clarkei* H. Andres, and photographs of the Wallich specimen of *Monotropa* and Cathcart's drawing by the courtesy of the director of Royal Botanic Gardens, Kew. The specimen labelled as '*Monotropa napalensis* Wall. Via ad Goss. Than, Julio 1821, fl.' in Wallich's hand in the Wallich herbarium at Kew seems to be an isotype of *M. humilis* D. Don.¹⁾ Its stems are slender ranging from 5 to 11 cm high, its scaly leaves narrow and oblong, and its ovaries narrowly flask-shaped. It agrees with a slender individual of our plants collected on Tiger Hill, and also with the specimen having narrow ovary, labelled as 'Tonglo, Sikkim 6-8000 ft. J. D. Hooker' at Kew and identified by Andres as *M. ampullaceum*. It is noteworthy that a part of the same collection from Tonglo at Kew with more globose ovary was designated by Andres as the type of *Monotropastrum Clarkei* together with the Cathcart's drawing. The specimens well match stouter individuals of our specimens from Tiger Hill. As the shape of ovary is variable by individual and also by the degree of maturity as explained above, both slender and robust forms with narrow and globose ovary respectively cannot be separated even as a form, and all these plants from Sikkim and Nepal surely belong to one and the same species, *Monotropastrum humile*. The specimens from Tsushima Is. and SW. Sachalin referred by Andres in 1953 to *M. Clarkei* are apparently identical with *M. globosum* of Japan. *M. globosum*, however, may be considered as a geographical race of *M. humile* of the Himalayas in a wide sense, after a careful study on variations in *Monotropastrum* of China.

東京大学インド植物調査隊はインド、サーニ古植物学研究所と共同で、1960年3月から約4ヶ月間東部ヒマラヤのシッキムおよびダージリン地方で植物調査研究を行い、原寛、津山尚、富樫誠、村田源、金井弘夫の5名が参加した。その報告がまとまる前に、研究中に分った主に新名を要する種子植物について、ここに断片的に発表することにした。第1報ではテンナンショウ属の2新種をふくむ *Arisaema costatum* 群、ネコノメソウ属の1新種、およびマルミノギンリョウソウ属について報告する。特に *Monotropastrum* は日本産に非常に近く同じような変異が見られることは興味があり、支那中西部産のものがよく判ると或は大きく同一種とする見解がでるかも知れない。

1) Mr. W.T. Stearn has kindly confirmed for me that there is no Wallich specimen of *Monotropa* in British Museum of Natural History, London.