

Systematic Studies of Asian *Aconitum* (*Ranunculaceae*) XIII. Species of Bhutan Including a New Scandent Species

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Bhutanese species of *Aconitum* (*Ranunculaceae*) are taxonomically revised and enumerated based on herbarium and field examinations. Lectotypification is made for several species. *Aconitum bhutanobulbilliferum*, a new scandent species of subgenus *Aconitum* is here described from the Gasa Distr., central Bhutan. *A. bhutanobulbilliferum* is distinguished from *A. bulbilliferum* Hand.-Mazz. by having smaller flowers, linear or narrowly spatulate bracteoles situated below the middle of pedicels, shorter nectary spurs and larger nectary labia. *A. bulleyanum* Diels and *A. gammiei* Stapf, other scandent species with glabrous pedicels from E Himalaya, are clearly different from *A. bhutanobulbilliferum* by the absence of bulbifery. *Aconitum bhutanobulbilliferum* is also distributed in Tibet and Assam. Two poorly known species, *A. chloranthum* Hand.-Mazz. and *A. palmatum* D. Don, are also shown with color illustrations.

(Continued from J. Jpn. Bot. 82: 41–44, 2007)

Key words: *Aconitum bhutanobulbilliferum*, *Aconitum chloranthum*, *Aconitum palmatum*, Bhutan, Himalaya, new species, scandent species.

In the course of a revisional work of *Aconitum* (*Ranunculaceae*) I had opportunities to make field examinations in Bhutan (1997, 2007, 2008). I also observe herbarium specimens preserved at the major Herbaria (BM, E, K, KUN, KYO, LE, MAK, MHA, MW, NS, PE, TAI, TI, TNS, etc.). Based on the field and herbarium examinations *Aconitum* from Bhutan is here taxonomically revised.

In September 1997 I encountered a scandent *Aconitum* of subgenus *Aconitum* along the margin of subfrigid coniferous forest in central Bhutan. This aconite is enumerated in Volume 1 Part 1 of Flora of Bhutan (1984)

where it is identified as *Aconitum bulbilliferum* Hand.-Mazz. Actually the Bhutanese aconites are quite similar to *A. bulbilliferum* in having a scandent habit, bulbifery and glabrous pedicels. However, the type locality (Huili, Sichuan Prov., SW China) of *A. bulbilliferum* is far from the Bhutan mountains and no materials of *A. bulbilliferum* have been collected in China and the adjacent regions except for the type locality. It was possible that the Bhutanese plants represent another entity. Examining the type specimens of *Aconitum bulbilliferum* preserved at WU it has been clarified that the Bhutanese plants do belong to an undescribed species. The

result was reported in Kadota (1999) in detail. Consequently I will describe the Bhutan aconite as a new species, *Aconitum bhutanobulbilliferum* Kadota.

Enumeration of species

Specimens examined designated as (Serbithang *) are kept in the National Herbarium, the National Biodiversity Center, Serbithang, Thimphu, Bhutan.

Genus **Aconitum** Tourn. ex L., Syst. Nat. (1735).

Subgenus **Lycocotnum** (DC.) Peterm., Deutsch. Fl. 15 (1846).

Sect. **Alatospermum** Tamura in Sci. Rep. Osaka Univ. (15): 30 (1966) – Lauener & Tamura in Notes Roy. Bot. Gard. Edinb. **37**: 117 (1978).

1. **Aconitum novoluridum** Munz in Gentes Herb. **6**: 472 (1945) – Mukerjee in Bull. Bot. Surv. Ind. **3**: 101 (1961) – Tamura in Acta Phytotax. Geobot. **19**: 74 (1962) – Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 29 (1963) – Lauener & Tamura in Notes Roy. Bot. Gard. Edinb. **37**: 117 (1978) – W. T. Wang in Acta Phytotax. Sin. **12** Addit. **1**: 59 (1965); Fl. Reipub. Pop. Sin. **27**: 158, pl. 24, fig. 5, pl. 25, figs. 5–6 (1979) – H. Hara, Enum. Fl. Pl. Nepal **2**: 10 (1979) – Grierson & Long, Fl. Bhutan **1**(2): 317 (1984).

TYPE: SIKKIM. Tankra Pass, alt. 14000 ft, regio alpina, 22 Aug. 1894, J. D. Hooker s.n. (K–holotype !). PARATYPE: SIKKIM. Chola Pass, 7 Nov. 1849, J. D. Hooker s.n. (K !).

Aconitum luridum auct. non Salisb. (1796): Hook. f. & Thomson, Fl. Ind. **1**: 55 (1855); Fl. Brit. Ind. **1**: 28 (1872) – Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 138, pl. 94 (1905).

Distribution: Bhutan, Sikkim, Tibet and Nepal.

Specimens examined: **BHUTAN**. Chumolari, alt. 16000 ft, 1912, R. Lepcha 508 (K); Me La, alt. 14–15000 ft, open grassy hillside, stony ground, purple, white at base, 24 Aug. 1934, Ludlow & Sherriff 881 (E); Shingbe (Me La), alt. 12500 ft, rocky soil in open valley, amongst

other tall herbs, flowers blue purple, 23 Aug. 1949, Ludlow, Sherriff & Hicks 21076 (BM, E); Mangde Chu, near Phage La, alt. 14500 ft, on cliffs, perianth red-brown, 27 Aug. 1949, Ludlow, Sherriff & Hicks 17209 (BM, E). Zaradingthang, 22 Aug. 1973, S. Tsherina & R. Nawang 219 (Serbithang*).

SIKKIM. Jnglipokri, 13000 ft, Aug. 1888, King's collector s.n. (K); Darjeeling, Singalila Range, Sandakphu, alt. 12000 ft, 16 Sept. 1900, C. G. Rogers s.n. (K); Phalut, Sandakphu, 20 Sept. 1900, C. G. Rogers s.n. (P 201895); Changu, alt. 13000 ft, 10 Aug. 1910, W. W. Smith 4205 (K); Chumdoo Choolee, Phulloot, 18 Sept. 1884, King's collector s.n. (K) Chowbhanyan, 27°17' N, 88°05' E, alt. 11000 ft, 1 Sept. 1919, Cave s.n. (E); Tosa, alt. 12–13000 ft, 2 Aug. 1910, W. W. Smith 4058 (E); Thangshing, alt. 13000 ft, boulders and peaty soil, Potentilla scrub, woody rootstock giving rise to perennial herb to 3 ft, fl hood mauve, other petals with green tinge, stamen blue grey, 19 Sept. 1983, AGSES 586 (E); Darjeeling, Reg. No. 14616 (E, K). Sikkim Himalaya, 1892, G. A. Gammie s.n. (K). Sikkim, alt. 14000 ft, no date, J. D. Hooker 1162 (P 201896). Sikkim, alt. 12000 ft., 18 Aug. 1913, R. E. Cooper 519 (Serbithang*).

NEPAL. Neepokri, alt. 12000 ft, Aug. 1888, King's collector s.n. (K); Tamur Valley, Kambachen, E. of Walungchung, alt. 14000 ft, on open slopes, corolla and filaments purplish red, 30 July 1956, Stainton 1152 (BM, E); Bhut Pokri, alt. 16000–17000 ft, fls. dark blue red, L. Dhwoj 555 (E).

TIBET. Phari to Gautsa, alt. 14300–12000 ft, 16 Aug. 1938, B. J. Gould 1513 (K); Kongbo, Nyima La, 29°37' N, 94°47' E, alt. 14500 ft, amongst huge boulders in Rhododendron scrub, perianth segments and short blunt spur chocolate, filaments green at expanded base, dark purple above, anthers dark purple, carpels dark green, stigmas lighter, 4 July 1938, Ludlow, Sherriff & Taylor 5111 (BM, E); Kongbo, Nyima La, alt. 12500 ft, in conifer forest, dark purplish perianth, paler at base, 27 Aug. 1947, Ludlow, Sherriff & Elliot 14460 (P 201894); Kongbo, Tsangpo Valley, Tsela Dzong, 29°20' N, 94°20' E, alt. 12000 ft, 4–6 ft, perianth dull pale purplish wine colour, almost white at base and tinged brown at tips of segments, on rocky steep slopes on edge of Abies forest, 29 July 1938, Ludlow, Sherriff & Taylor 5990 (BM, E); Kongbo, Kulu Phu Chu, near Paka, 29°15' N, 94°25' E, alt. 13000 ft, forming big clumps, 3 ft high on open rocky hillside, perianth velvety dull brownish wine red, anthers dark blue violet, Ludlow, Sherriff & Taylor 5994 (BM, E).

A subscapose perennial growing in and along the margin of mountain woods. Pedicels golden-villose. Nectaries glabrous; blades 3 mm long; spurs saccate, 1 mm long, not coiled; labia 1 mm long, emarginate. Carpels 3, glabrous or villose. Stamens glabrous; filaments

dentate. Follicles 12–13 mm long, 4 mm wide, slightly oblique; seeds 3 mm long, 2 mm wide, trigonous, slightly rugose, not lamellate.

Sect. **Lycotinum**: Lauener & Tamura in Notes Roy. Bot. Gard. Edinb. **37**: 117 (1978).

2. **Aconitum chloranthum** Hand.-Mazz. in Sitzsanz. Akad. Wiss. Wien Meth.-Nat. Kl. **60**: 134 (1923) – *Aconitum jucundum* Diels var. *chloranthum* (Hand.-Mazz.) Hand. Mazz., Symb. Sin. **7**: 282 (1931) – Fletch. & Lauener in Notes Roy. Bot. Gard. Edinb. **20**: 193 (1949) – H. Hara, Fl. E. Himal. **3**: 35 (1975) – *Aconitum scaposum* Franch. var. *chloranthum* (Hand.-Mazz.) Lauener & Tamura in Notes Roy. Bot. Gard. Edinb. **37**: 121 (1978) – L. Q. Li & Kadota, Fl. China **6**: 162 (2001), pro syn. *A. scaposum* var. *hupehanum*. [Fig. 1, A–B]

TYPE: CHINA. Yunnan bor.-occid.; inter fluvios Djinscha-djiang (“Yangtse”) et Landsang-djiang (Mekong) ad viam Djitsung–Kaktang, alt. 3125 m, fl. virides, 30 Aug. 1915, H. Handel-Mazzetti 7909 (WU–holotype !; K, P 130906–isotypes !).

Aconitum vaginatum Pritz. var. *xanthanthum* Hand.-Mazz. in Acta Hort. Gothob. **13**: 77 (1939), p.p. PARATYPE (Lauener 1975, annotated at herb. K): CHINA: W. Sichuan, Wasen, Wen Chuan Hsien, alt. 8–10000 ft, 20 July and Aug. 1908, E. H. Wilson 1032 (K !). The lectotype (CHINA: W. Sichuan, E. H. Wilson 1033, K !), should be ascribed to *A. crassiflorum* Hand.-Mazz.

Specimens examined: **BHUTAN**. Gasa Distr., Koina – Bari-la, alt. 3450 m, 21 Aug. 2007, Y. Kadota 073521 (Serbithang*); Bari-la – Gasa, alt. 3485 m, 22 Aug. 2007, Y. Kadota 073525–073527, 073540 (Serbithang*).

A scapose perennial growing in and along the margin of mountain woods. Flowers dull-yellow. Pedicels villose with a mixture of long patent hairs and short patent hairs (Fig. 1B).

3. **Aconitum scaposum** Franch. in J. de Bot. (Morot) **8**: 277 (1894) – Grierson & Long, Fl. Bhutan **1**(2): 318 (1984) – L. Q. Li &

Kadota, Fl. China **6**: 161 (2001). [Fig. 1, C]

TYPE: CHINA. W. Sichuan, Tchen-kéou-tin Distr., alt. 2400 m, July no year, Farges 116 (P 130898–holotype !; K, LE, P 130897, 130899–130904–isotype !), p. p. majore. A single specimen (P 130905) of the specimens Farges 116 should be attributed to *A. sinomontanum*. The specimens, Henry 6501 A (P 130907), Henry 6547 A (LE, P 130908–130909), are characterized by having strigose pedicels and are attributed to *A. cavaleriei*.

Aconitum aggregatifolium W. T. Wang in Acta Phytotax. Sin. 12 Add. **1**: 60 (1965) – *Aconitum cavaleriei* H. Lév. & Vaniot var. *aggregatifolium* (W. T. Wang) W. T. Wang, Fl. Reipub. Pop. Sin. **27**: 165 (1979). **TYPE**: CHINA. Szechuan [Sichuan], Ching-chuan, Motien-ling, alt. 2200 m, F. T. Wang 22468 (PE–holotype !).

Aconitum jucundum Diels in Notes Roy. Bot. Gard. Edinb. **5**: 266 (1912) – H. Hara, Enum. Fl. Pl. Nepal **2**: 9 (1979). **TYPE**: CHINA. Yunnan, plant of 2–3 ft, flowers rose-purple, open mountain meadows on the eastern flank of the Tali Range, Lat. 24°40'N, alt. 9–11000 ft, Aug. 1906, G. Forrest 4369 (E–holotype !).

Aconitum lycotinum L. var. *ranunculoides* (Turcz.) Finet & Gagnep. in Bull. Soc. Bot. Fr. **51**: 502 (1904), p. p.

Aconitum scaposum Franch. var. *hupehanum* Rapaics in Növ. Közl. **6**: 168 (1907) – *Aconitum hupehanum* (Rapaics) Hand.-Mazz., in sched. herb. P. **LECTOTYPE** (here designated): CHINA. Su-tchuen oriental, District de Tchen-kéou-tin, alt. 2000 m, Sept., Farges 7 (P 130894 !; K !, P 130895–96–isotype !)

Aconitum scaposum Franch. var. *patentipilum* W. T. Wang in Acta Phytotax. Sin. 12 Addit. **1**: 60 (1965). **TYPE**: CHINA. Shensi, Yang-hsien, H. W. Kung 3563 (PE–holotype !).

Aconitum vaginatum Pritz. in Bot. Jahrb. **29**: 328 (1900) – Hand.-Mazz. in Acta Hort. Gothob. **13**: 77 (1939) – *Aconitum scaposum* Franch. var. *vaginatum* (Pritz.) Rapaics in Növ. Közl. **6**: 108 (1907) – W. T. Wang in

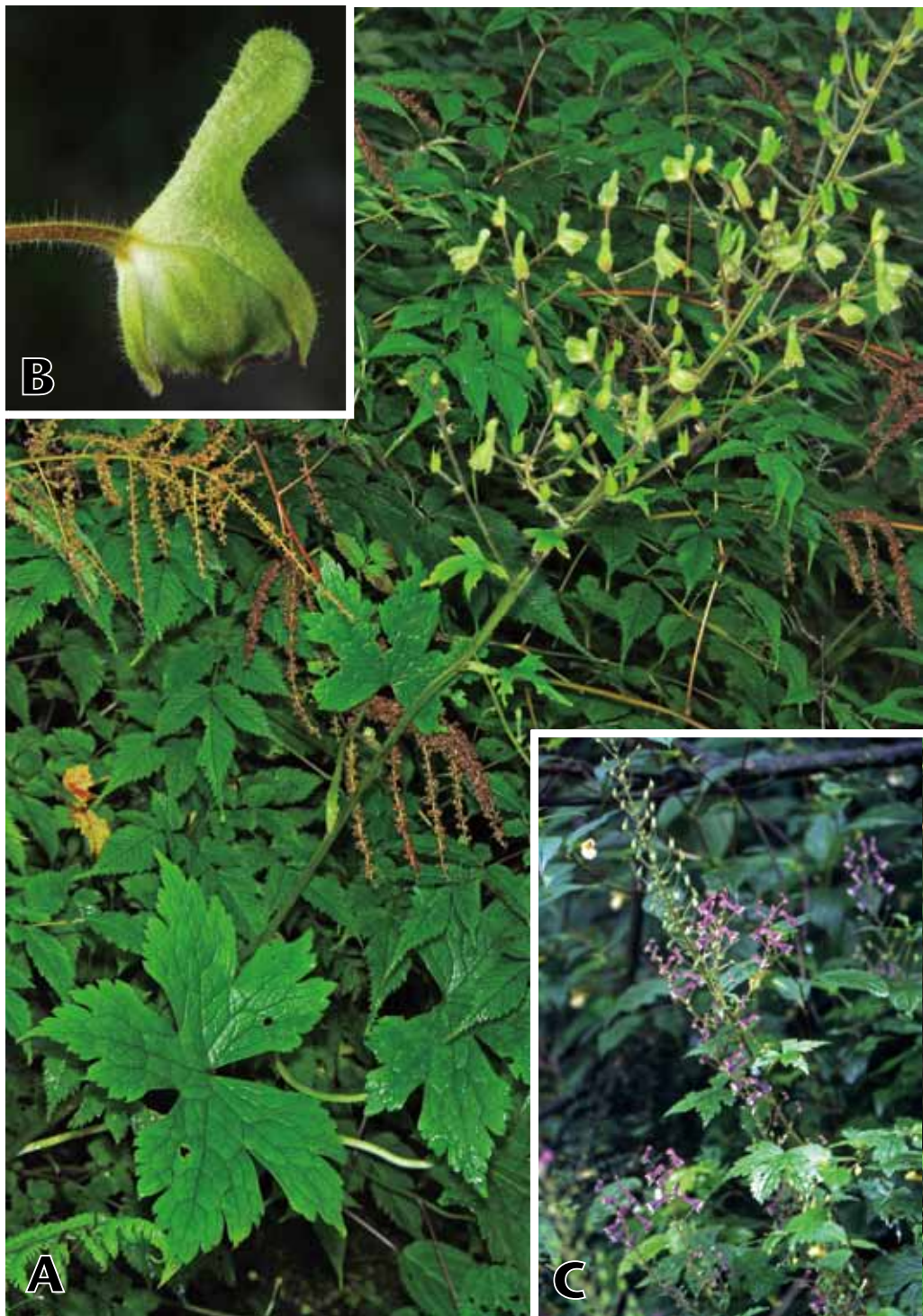


Fig. 1. Habit of *Aconitum chloranthum* Hand.-Mazz. (A–B) and *A. scaposum* Franch. (C). A–B. BHUTAN: Gasa Distr., Koina – Bari-la, alt. 3450 m, 21 Aug. 2007. C. CHINA: Sichuan Prov., Mt. Gongkashan, the 2nd camp, 26 Aug. 1996.

Acta Phytotax. Sin. 12 Addit. 1: 60 (1965); Fl. Reipubl. Pop. Sin. 27: 164 (1979). LECTOTYPE (Lauener and Tamura 1978): CHINA. Yunnan, Bock & von Rosthorn 905 (Oslo–n.v.).

A scapose perennial growing in and along the margin of mountain woods. Flowers pink to purplish pink (Fgi. 1C) or sometimes deep purple or white. Pedicels villose with patent hairs.

Subgenus **Tangutica** (W. T. Wang) Kadota in J. Jpn. Bot. 76: 184 (2001).

Sect. **Fletcherum** Tamura emend. Kadota in J. Jpn. Bot. 76: 184 (2001).

4. **Aconitum fletcherianum** G. Taylor in J. Roy. Hort. Soc. London 77: 242 (1952) – Tamura in Sci. Rep. Osaka Univ. (15): 30 (1966) – Lauener & Tamura in Notes Roy. Bot. Gard. Edinb. 37: 117 (1979) – W. T. Wang, Fl. Reipubl. Popul. Sin. 27: 179 (1979) – Grierson & Long, Fl. Bhutan 1(2): 316 (1984), ut '*fletcherianum*' – Sharma, Fl. Ind. 1: 13 (1993) – Kadota in J. Jpn. Bot. 76: 184, fig. 4, C (2001).

TYPE: BHUTAN. Pangotang, Tsampa, alt. 14500 ft., 12 September 1949, F. Ludlow, G. Sherriff & J. H. Hicks 19734 (E–holotype !; BM, CAL 165, Serbithang*–isotypes).

Distribution: Bhutan and Tibet.

Specimens examined: BHUTAN. Saga La, Upper Mangde Chu, 15500 ft, always amidst grass on rocks and cliffs, bright blue purple perianth, with 2 white lips on the lateral segments, F. Ludlow, G. Sherriff & J. H. Hicks 16846 (BM, CAL 164, Serbithang*).

A scapose perennial growing in alpine meadows. Pedicels strigose with curved hairs. Nectary spurs less developed in a degenerated condition.

Subgenus **Aconitum**

Sect. **Aconitum**

5. **Aconitum funiculare** Stapf in Kew Bull. 1917: 24 (1917) – Long & Greason, Fl. Bhutan 1(2): 320 (1984).

TYPE: BHUTAN. Karo, 15 Nov. 1914, R. E. Cooper 3586 (K–holotype !). “The plant was

raised at Kew from seed collected by Mr. R. E. Cooper for Bees, Limited”.

Aconitum ferox auct. non Wall. ex Sér.: Long & Greason, Fl. Bhutan 1(2): 319 (1984).

Distribution: Bhutan, Sikkim and E Nepal. This species is first reported from Nepal.

Specimens examined: BHUTAN. Chemele La, alt. 11000 ft, 15 Sept. 1915, R. E. Cooper 4803 (K); between Simkarap and Goni Cava, alt. 2865 m (9400 ft), 27 Sept. 1971, R. Bedi 1198 (CAL 611371, K); Pele La, alt. 2600 m, 5 Oct. 1953, S. Nakao 622 (K, KYO); Pele La, alt. 2600 m, Y. Kadota s.n. (TNS); Clavelje Tonpa, 11000 ft, herb under *Picea* forest, R. E. Cooper 4803 (BM, E); Tho Cu La, alt. 10700 ft, 8 Aug. 1971, R. Bhedi 1043 (K); Thimphu Chu, Kenchho, N. of Dotanang, alt. 8–10000 ft, open forest, oak etc., 6 Oct. 1979, G. A. Dunbar 113 (E); Thimphu Distr., summit of Dochong La, 27°29'N, 89°45'E, alt. 3080 m, on bank partly cleared *Tsuga* forest, erect herb, sepals and petals purple with darker veins, visited by bumble bees, 1 Sept. 1984, Sinclair & Long 4760 (E); Dochu la, 3100 m, 28 Aug. 1965, G. Sen Gupta 1716 (CAL 611406–611407); Paro Chu, Sharna Sampa, open scrub near riverside, flowers pale bluish mauve with darker veins, alt. 10000 ft, 10 Oct. 1985, Lang 11 (E); Thimphu Distr., Dechecholing – Punakha path, alt. 3200 m, growing in forest, 30 Aug. 1987, Bigger 2984 (E). Haa Distr., Chele La Pass, alt. 3700 m, 6 July 1992 (sterile), occasional weed of “pasture” (dominated by *Rumex nepalensis*), not yet flowering but known to be purple and hooded, seriously toxic to cattle, Dzongkha name ‘shodu’, extract of root used to tip arrows with poison, Chris Parker 7278 (Serbithang*). Sinkarap, alt. 2865 m, 21 Aug. 1971 (fl. bud), Ramesh Bedi 810 (CAL 611353, Serbithang*). Doti Nang, alt. 2610 m, 28 Oct. 1071, Ramesh Bedi 1198 (Serbithang*). Thimphu, Dechecholing – Punakha path, growing in forest, alt. 3200 m, 30 Aug. 1987, Bigger 2984 (E, Serbithang*). Doti Nang, alt. 2610 m, 27 Oct. 1971, Ramesh Bedi 1133 (CAL 611366, K, Serbithang*). Thimphu Distr., in disturbed bushy ground recently cleared from damp broad leaved forest just above the summit of the Doche La, alt. 3200 m, erect perennial 0.5–1.5 m, flowers pale blue, 30 Aug. 1987, J. R. I. Wood 5773 (Serbithang*). On way to Thangthangkha (Jhomuleni), herb growing along the foot path, alt. 2650 m, 17 Sept. 1993, RP & SW RD 4935 (Serbithang*).

SIKKIM. Sandakphu to Tongla, 13 May 1956, D. Chatterjee 98 (CAL).

E NEPAL. Ilam Distr., Hile – Chhintapu, alt. 9200 ft., on open place, common, 50 cm high, fls. violet, 7 Oct. 1977, P. Pradhan & al. 335 (KATH).

A subscapose pseudoannual growing in mountain woods. Tubers narrowly cylindrical. Pedicels villose with patent hairs. Nectary labia

obovate, emarginate. Carpels 3. Seeds rugose, winged, not lamellate.

6. *Aconitum naviculare* Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 154, pl. 101 (1905) – H. Hara, Enum. Fl. Pl. Nepal **2**: 10 (1979) – W. T. Wang, Fl. Reipubl. Popul. Sin. **27**: 186, pl. 34, 3–4 (1979) – Grierson & Long, Fl. Bhutan **1**(2): 317 (1984) – Polunin & Stainton, Fl. Himal. suppl. 1, pl. 1 (1988) – Yoshida, Himal. Pl. Illust. 595 (2005) – *Aconitum ferox* Wall. ex Sér. var. *naviculare* Brühl in Ann. Roy. Bot. Gard. Calc. **5**: 111, pl. 3, figs. 2–14 (1886).

LECTOTYPE (here designated): **CHINA**. TIBET: Chumbi, Kung-met, no date, King's collector 306 (CAL 7591 !). **SYNTYPE**: **CHINA**. TIBET: Chumbi, Kung-met, no date, King's collector 307 (CAL !, K !).

Aconitum bhutanicum Kadota in H. Ohba & S. B. Malla, Himal. Pl. **1**: 211 (1988). **TYPE**: **BHUTAN**. Nishioka s.n. (TI–holotype !).

Aconitum creagromorphum Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 12 (1963). **TYPE**: **CHINA**. TIBET: Kongbo, Lang La, alt. 4570 m, in alpine zone growing on turf, 18 Oct. 1947, Ludlow, Sherriff & Elliot 13334 (BM–holotype !; E–isotype !).

Aconitum hookeri auct. non (Brühl) Stapf: Grierson & Long, Fl. Bhutan **1**(2): 317 (1984).

Aconitum naviculare Stapf var. *leiocarpum* Tamura in Acta Phytotax. Geobot. **23**: 28 (1968) – H. Hara, Enum. Fl. Pl. Nepal **2**: 10 (1979). **TYPE**: **NEPAL**. NW from Tsarka, alt. 4230 m, 9 September 1958, O. Namikawa 396 (KYO–holotype !). **PARATYPE**: **NEPAL**. Camp Nishioka, 21 Aug. 1958, O. Namikawa 627 (KYO !); Pankyein, alt. 4800 m, 5 Sept. 1958, K. Nishioka 597 (KYO !); Gyamha, alt. 4450 m, 9 Sept. 1958, K. Nishioka 296 (KYO !).

Distribution: Bhutan, Tibet and Nepal.

Specimens examined: **BHUTAN**. Mangde Chu, Passu Sepu, alt. 14500 ft, in amongst shrubbery, perianth greenish white, veined purple, red purple at the apical margin of all segments [up to 40 cm], 4 Sept. 1949, Ludlow, Sherriff & Hicks 17226 (BM, CAL 166, P). Upper Mo Chu Distr., S slope of Shingche La, 28°04'N 89°37'E,

damp ground amongst boulders on streamside, small herb with tuberous roots, flowers pale blue with darker veins, alt. 4620 m, 23 Sept. 1984, Sinclair & Long 5279 (Serbithang*); foot of glacier in valley, SW of Lingshi Dzong, 27°55'N 89°25'E, amongst boulders on moraine, erect herb, flower pale blue, alt. 4130 m, 29 Sept. 1984, Sinclair & Long 5430 (Serbithang*). Cekha, alt. 3763 m, 23 Sept. 1971, Ramesh Bedi 1241 (Serbithang*). Tolegang, Tsampa, alt. 14500–15000 ft., 10 Sept. 1949, up to 6 ins. high, perianth deep blue violet, striated darker, in open scree, on cliff ledges and on very steep grassy banks, Ludlow, Sherriff & Hicks 19727 (BM, Serbithang*). Passu Sepu, Mangde Chu, 14500 ft, in amongst shrubbery, perianth greenish white, veined purple, red purple at the apical margin of all segments, 4 Sept. 1949, Ludlow, Sherriff & Hicks 17226 (CAL 166, BM). Bhutan, no precise loc., Oct. 1935, Ramesh Bedi 1016 (CAL 611375). Bhutan, Oct. 1935, H. E. J. Anderson & H. P. Naskar 1039 (CAL 611398).

SE TIBET. Kongbo, Lang La, alt. 15000 ft, in the alpine zone, growing in turf, calyx maroon, 18 Oct. 1947, Ludlow, Sherriff & Elliot 13334 (E).

A scapose pseudoannual growing in alpine meadows. Pedicels villose with patent hairs.

Note: *Aconitum hookeri* Stapf [in Ann. Roy. Bot. Gard. Calc. **5**: 147 (1896)] was reported from Bhutan by Grierson and Long (1984). However, the record should be attributed to *A. naviculare* as mentioned above.

The specimens Anderson & Naskar (CAL 611394, 611404) from Bhutan (without precise locality) are significantly different from *A. hookeri* by having pedicels strigose with curved hairs. Discussion on *A. hookeri* and its allied species will be presented elsewhere.

7. *Aconitum palmatum* D. Don, Prodr. Fl. Nepal. 196 (1825) – Hook. f. & Thomson, Fl. Brit. Ind. **1**: 28 (1872) – Royle, Illust. Himal. Bot. **57** (1834) – *Aconitum ferox* Wall. ex Sér. subsp. *palmatum* (D. Don) Brühl in Ann. Roy. Bot. Gard. Calc. **5**: 111, pl. 111, figs. 9–13, 24–25, 31 (1896). [Fig. 2]

LECTOTYPE (here designated): **NEPAL**. Gossain Than, Wallich 4723A (K !; CAL, E, P 201395–isotype !).

Caltha bisma Buch.-Ham. in Edinb. J. Sci. **1**: 251 (1824) – *Nirbisia bisma* (Buch.-Ham.) G. Don, Gen. Syst. **1**: 63 (1831) – *Aconitum bisma*

(Buch.-Ham.) Rapaics in Növényt. Közlem. **6**: 164 (1907), p. p. – Fletch. & Lauener in Notes Roy. Bot. Gard. Edin. **20**: 197, pl. 166, fig. 1 (1950) – H. Hara, Fl. E. Himal. **86** (1966); Enum. Fl. Pl. Nepal **2**: 9 (1979) – Grierson & Long, Fl. Bhutan **1**(2): 320 (1984) – Rau, Fl. Ind. **1**: 7 (1993), p. p. excl. pls. Garhwal. TYPE: NEPAL. anno 1810, Buchan-Hamilton s.n. (n.v.).

Distribution: Bhutan, Sikkim, China (Tibet) and Nepal.

Specimens examined: **BHUTAN**. Longpekha 11000 ft, 18 Aug. B. J. Gould 1546 (K); central Bhutan, Tang Chu, 8 Aug. 1937, Ludlow & Sherriff 3543 (BM); Punakha, Tilajong, alt. 8500 ft, 17 Aug. 1914, R. E. Cooper 2669 (E). Simkarap, alt. 2867 m, 22 Sept. 1971, Ramesh Bedi 1232 (Serbithang*). Gasa Distr., Koina – Bari-la, alt. 3485 m, 22 Aug. 2007, Y. Kadota 073528–073530, 073535 (Serbithang*).

SIKKIM. Tongloo & Phalut, Oct. 1857, T. Thomson s.n. (K); Darjeeling. Tongloo Range, Reg. No. 13939 (E); Tongloo, alt. 8–10000 ft, 3 Aug. 1862, T. Anderson 343 (E, P 201388); Sandaklam, Sept. 1898, C. G. Rogers s.n. (P 201394). Sikkim, 10000 ft, J. D. Hooker s.n. (P 201391–92).

TIBET. Yatung, 25°51' N 88°35' E, 1897, H. E. Hobson s.n. (K); Goop, 3 miles from Phari, 19 Aug. 1878, Dungboo s.n. (K).

NEPAL. Chilmiley Lekh, 12000 ft, 17 June 1914, L. Dhoj 74 (K).

A leafy pseudoannual growing in mountain woods. Pedicels glabrous or more or less covered with smooth-surfaced short, patent hairs (Kadota 2003). Nectary spurs erect, long-saccate; blades cylindrical (Fig. 2B).

8. *Aconitum ludlowii* Exell in J. Bot. (London) **64**: 218 (1926) – W. T. Wang, Fl. Reipubl. Pop. Sin. **27**: 321, pl. 76, figs. 12–13 (1979) – L. Q. Li & Kadota, Fl. China **6**: 221 (2001).

LECTOTYPE (here designated): **CHINA**. TIBET: Sowgon, near Gyantse, 13500 ft, grows in abundance, to a height of 3–4+1/2 by water courses, calyx purplish green, 10 July 1924, F. Ludlow 30 (BM !; isotype–BM !).

Aconitum parapolyanthum Lauener in Notes Roy. Bot. Gard. Edin. **25**: 13, figs. 11,

21 (1963) – Grierson & Long, Fl. Bhutan **1**(2): 318 (1984). TYPE: **BHUTAN**. between Me La and Cho La, alt. 12000 ft, stony ground, among small shrubs, perianth pale blue violet, 25 Aug. 1949, Ludlow, Sherriff & Hicks 21432 (BM–holotype!; E–isotype!).

Distribution: Bhutan and Tibet.

Specimens examined: **BHUTAN**. Phage La, Mengde Chu, alt. 14000 ft., perianth palish purple, sometimes with a reddish tinge, in amongst boulder scree, 26 Aug. 1949, Ludlow, Sherriff & Hicks 17203 (BM, Serbithang*).

A leafy pseudoannual growing in alpine meadows. Inflorescence narrowly, spike-like racemose. Pedicels ascending at an acute angle, villose with patent hairs.

9. *Aconitum spicatum* (Brühl) Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 165, pls. 106–107 (1905) – Banerjee in J. Bombay Nat. Hist. Soc. **51**: 414 (1953); in Rec. Bot. Surv. Ind. **19**: 18 (1966) – Mulerjee in Bull. Bot. Surv. Ind. **3**: 101 (1962) – Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 24 (1963), **26**: 10 (1964) – H. Hara, Fl. E. Himal. **86** (1966); Enum. Fl. Pl. Nepal **2**: 11 (1979) – W. T. Wang, Fl. Reipubl. Pop. Sin. **27**: 219, pl. 38, fig. 6–8, pl. 45, fig. 8 (1979) – Grierson & Long, Fl. Bhutan **1**(2): 320 (1984) – Polunin & Stainton, Fl. Himal.: **6**, pl. 3 (1984) – Rau, Fl. Ind. **1**: 22 (1993) – Yoshida, Himal. Pl. Illust. **596** (2005) – *Aconitum ferox* Wall. ex Sér. var. *spicata* Brühl in Ann. Roy. Bot. Gard. Calc. **5**: 110 (1895).

LECTOTYPE (here designated): **CHINA**. TIBET: 1882, King's collector s.n. (CAL 7717 !).

Aconitum balangrense Lauener in Notes Roy. Bot. Gard. Edinb. **26**: 4 (1964). TYPE: **NEPAL**. near Balangra Pass, alt. 3960 m, *Rhododendron* and *Betula* slopes, flowers dull purple outside, greenish purple inside corolla, stamens with dark purplish anthers, 22 July 1952, Polunin, Sykes & Williams 2545 (BM–holotype !).

Aconitum balfourii Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 160, pl. 105 (1904) – Banerjee in J. Bombay Nat. Hist. Soc. **51**: 414 (1953) – H. Hara, Enum. Fl. Pl. Nepal **2**: 9 (1979) – Rau, Fl.



Fig. 2. *Aconitum palmatum* D. Don. A. Habit. B. Nectary. C. Flower. A–C. BHUTAN: Gasa Distr., Gasa, alt. 3150 m, 21 Aug. 2007.

Ind. **1**: 5 (1993) – Yoshida, Himal. Pl. Illust. 597 (2005). LECTOTYPE (L. B. Chaudhary and Rao 1998, p. 530): INDIA. Kumaon, Pass above Ralam, 13500 ft, 26 Aug. 1848, R. Strachey & J. E. Winterbottom 3 (CAL !; K, LE-isotype !). Strachey & Winterbottom 3 at P (201527) is noted to be collected from Shatool Pass, Simla Hills, the different locality from the type.

Aconitum deltoideum Lauener in Notes Roy. Bot. Gard. Edinb. **32**: 411 (1973) – H. Hara, Enum. Fl. Pl. Nepal **2**: 9 (1979). TYPE: NEPAL. Milke Danda, 27°15' N, 87°30' E, 9500 ft, height 5 ft, among shrubs, flowers rich purple, 8 Sept. 1967, Williams & Stainton 8414 (BM-holotype !; K-isotype !).

Aconitum falconeri Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 163, pl. 105 (1905), p. p. minnora – Rau, Fl. Ind. **1**: 10, fig. 3 (1993), sub *A. falconeri* var. *latilobum* Stapf. LECTOTYPE (L. B. Chaudhary & Rao 1998, p. 531): INDIA. Tehri Garhwal, Gulmar Pass, alt. 12–13000 ft, 22 Aug. 1883, J. F. Duthie 725 (CAL !; DD, E-isotype). PARATYPE: NW INDIA. Herb. Royle (K !): Garhwal, Herb. Falconer 68 (K !, CAL !); Garhwal, Kedar Kanta, Bowaneeah, Falconer 69 (K !, CAL 7571 !). The specimens cited as paratype have strigose pedicels and they should be ascribed to *A. heterophylloides*.

Aconitum falconeri Stapf var. *latilobum* Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 164 (1905). TYPE: INDIA. Bashahr, Nagli, Watt's coll. reg. no. 15039 (CAL).

Aconitum ferox auct. non Wall. ex Sér.: Hook. f. & Thomson, FL. Brit. Ind. **1**: 28 (1872), p.p.

Aconitum lethale Griffith in Notul. **4**: 732 (1899). TYPE: INDIA. East Bengal, Herb. Griffith, Kew Distribution No. 49 (K !).

Aconitum laciniatum var. *fractiflexum* Lauener in J. Jpn. Bot. **50**(8): 242 (1975). TYPE: NEPAL. Chhintapu, 27°06' N 87°55' E, alt. 2500 m, fl. blue, Dobremez 1250 (BM-holotype !).

Aconitum tamuranum Lauener in Notes Roy. Bot. Gard. Edin. **26**: 3, figs. 2A, 3A (1964). TYPE: NEPAL. Thakurji Lekh, S. of Jumla,

13000 ft, on open slopes, perianth dark blue with darker veins, 20 July 1952, Polunin, Sykes & Williams 4798 (BM-holotype !). PARATYPE: NEPAL. Chakure Lagna, 13000 ft, growing on grassy slopes, amongst mixed herbaceous species, flowers pale blue, tips of sepals yellowish, sepals veined with darker blue, 13 Aug. 1952, Polunin, Sykes & Williams 423 (BM !).

Aconitum patulum Tamura in Acta Phytotax. Geobot. **19**: 74 (1962) – Grierson & Long, Fl. Bhutan **1**(2): 319 (1984). TYPE: BHUTAN. Shukuna Mountain, alt. 3000 m, 3 August 1958, S. Nakao 573 (KYO-holotype !).

Distribution: Bhutan, Sikkim, Tibet, Nepal and N India.

Specimens examined: **BHUTAN**. NE Bhutan, Me La, 14000 ft, open grassy hillside, 6 Oct. 1934, fr., Ludlow & Sherriff 1042 (BM). Upper Mo Chu Distr., hillside of Laya, 28°07' N 89°44', under large Juniper amongst cultivation, erect herb 90 cm with stout rootstock, flowers bluish-purple, alt. 3900 m, 19 Sept. 1984, Sinclair & Long 5135 (Serbithang*). Sinkarap, alt. 2865 m, 21 Aug. 1971, Ramesh Bedi 813 (Serbithang*, 2 sheets). Cekha (Chukha), alt. 3763 m, 22 Aug. 1971, Ramesh Bedi 846 (Serbithang*). Chi La, 4200 m, 20 Aug. 1963, N. P. Balakrishnan 1291 (CAL 611379). Bhutan, no precise locality nor date, Ramesh Bedi 813 (CAL 611367). Gasa Distr., Laya – Koina, alt. 3150 m, 20 Aug. 2007, Y. Kadota 073508–509 (Serbithang*).

SIKKIM. 10–14000 ft, Hooker f. & Thomson 169 (P 201525); Phalut, 11–12000 ft, Oct. 1857, Thomson s.n. (P 201522); Shikkim, 1400 ft, no date, T. Anderson 1864 (P 201523); Sandaklam, Sept. 1898, C. G. Rogers s.n. (P 130945).

NEPAL. Gossainthan, Wallich 4721B (P 201528); Baraha Pokhri ridge, 13000 ft, open grassy places, flowers dark blue-purple, 19 Sept. 1950, D. G. Lowndes 1530 (BM); immediately S. of Khumjung, 27°49' N 86°43' E, alt. 3800 m, fls. blue-violet, 4 Oct. 1974, R. H. De Haas 2950 (BM); Gosainkund, 28°06' N 86°28' E, 20 Sept. 1974, in alpine shrubberies, height 3 ft, flowers pale mauve, Stainton 7224 (BM); Sherman Thang, 1927, C. Wigram s.n. (K); Kali Kandaki Tal (Nilgiri), alt. 3500 m, 6 Sept. 1967, H. J. Lange 63 (K). Deoli Patan, SE of Jumla, alt. 10500 ft, growing on open slopes, among shrubs, height up to 5 ft, perianth dull purple, O. Polunin, W. R. Sykes & L. H. J. Williams 3158 (BM, P 130944). Simla Hills, Shatool Pass, no date, R. Strachey & J. E. Winterbottom 3 (P 201527).

INDIA. Gurhwal, Herb. Falconer 69 (P 201524).

A leafy, erect pseudoannual growing in

alpine and/or subalpine meadows. Pedicels ascending at an obtuse angle or divaricate, villose with patent hairs.

10. ***Aconitum heterophylloides*** (Brühl) Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 171, pl. 110 (1905) – H. Hara, Enum. Fl. Pl. Nepal **2**: 10 (1979) – Grierson & Long, Fl. Bhutan **1**(2): 318 (1984) – Rau, Fl. Ind. **1**: 14 (1993) – Yoshida, Himal. Pl. Illust. 597 (2005) – *Aconitum ferox* Wall. ex Sér. var. *heterophyllodes* Brühl in Ann. Roy. Bot. Gard. Calc. **5**: 110 (1896).

LECTOTYPE (here designated): SIKKIM. Singalela Range, 10000 ft, 7 Oct. 1870, C. B. Clarke 13507/E (CAL 7662 !; isotype–CAL 7663 !, 7664 !).

Aconitum deinorrhizum Stapf in Ann. Roy. Bot. Gard. Edin. **10**: 158, pl. 103 (1905) – Mukerjee in Bull. Bot. Surv. Ind. **3**: 100 (1962) – H. Hara, Enum. Fl. Pl. Nepal **2**: 9 (1979) – Grierson & Long, Fl. Bhutan **1**(2): 320 (1984) – Rau, Fl. Ind. **1**: 8, fig. 2 (1993). **LECTOTYPE** (here designated): INDIA. Bashahr, Jani Kanda, coll. Minniken, Watt's Reg. No. 13999 (K !; K–isotype !).

Aconitum laciniatum (Brühl) Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 168, pl. 108 (1905) – Banerji in J. Bombay Nat. Hist. Soc. **55**: 250 (1958); in Rec. Bot. Surv. Ind. **19**: 8 (1966) – Mukerjee in Bull. Bot. Surv. Ind. **3**: 100 (1962) – Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 24 (1963) – H. Hara, Fl. E. Himal. 86 (1966); Fl. E. Himal. **2**: 27 (1971); Enum. Fl. Pl. Nepal **2**: 10 (1979) – Grierson & Long, Fl. Bhutan **1**(2): 319 (1984) – Rau, Fl. Ind. **1**: 17 (1993) – Yoshida, Himal. Pl. Illust. 595 (2005) – *Aconitum ferox* Wall. ex Sér. var. *laciniatum* Brühl in Ann. Roy. Bot. Gard. Calc. **5**: 110 (1896). **LECTOTYPE** (here designated): INDIA. SIKKIM: Cho-la, 5 Aug. 1877, King's collector 4483 (CAL 7631 !). PARATYPE: INDIA. SIKKIM: To-ko-la, 23 Aug. 1878, fl. dark red, King's collector 317 (CAL 7629 !).

Aconitum ferox Wall. ex Sér. subsp. *ferox* var. *leucanthum* Brühl in Ann. Roy. Bot. Gard.

Calc. **5**: 110 (1896), p.p. – *Aconitum leucanthum* (Brühl) Stapf in Ann. Roy. Bot. Gard. Calc. **10**: 173, pl. 111 (1905), non Rehb. (1819) – *Aconitum heterophylloides* (Brühl) Stapf var. *leucanthum* (Brühl) Lauener in Notes Roy. Bot. Gard. Edinb. **26**: 331 (1965) – H. Hara, Enum. Fl. Pl. Nepal **2**: 10 (1979). **LECTOTYPE** (Lauener 1965): SIKKIM: Tenschang 13000 ft, July 1888, King's collector s.n. (CAL 7697 !; isotypes–K !, E !). **PARATYPES**: INDIA. SIKKIM; Jonglipokri, 13000 ft, Sept. 1888, King's collector s.n. (CAL 7696, K); Jongli, June 1887, [flowers] white, King's collector s.n. (CAL 7693).

Aconitum kalobikhoma Brühl 'var. *laciniata*' Brühl in sched., herb. CAL.

Aconitum laciniatum (Brühl) Stapf var. *fractiflexum* Lauener in Notes Roy. Bot. Gard. Edinb. **50**: 242 (1975). **TYPE**: NEPAL; Chhintapu, 2800 m, 27°06'N 87°55'E, 29 Sept. J. F. Dobremez 1250 (BM–holotype !).

Aconitum longipetiolatum Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 11, figs. 1G, 2G (1963), p.p. **TYPE**: CHINA. TIBET: Tsari, Sur La 4720 m, open rocky hillsides, beside dwarf Juniper, 15 Aug. 1936, Ludlow & Sherriff 2049 (BM–holotype !).

Aconitum nepalense Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 24, figs. 3B, 4J (1963). **TYPE**: NEPAL. Chuwar, alt. 21000 ft, flowers blue, 14 Aug. 1932, K. N. Sharma 422 (BM–holotype !; E–isotype !).

Distribution: Bhutan, Sikkim and Nepal.

Specimens examined: **BHUTAN**. Ju La, Dhur Chu, alt. 14500 ft., perianth white, on open rocky hillside, among *Meconopsis panicularata*, *rhododendrons* etc., 20 July 1949, Ludlow, Sherriff & Hicks 19468 (BM, Serbithang*). Paro Distr., in a rocky gully on moist stony ground near Lanama Tso, erect perennial, flowers greenish yellow, alt. 4200 m, 4 Aug. 1991, J. R. I. Wood 7413 (Serbithang*). Ha [Haa] Distr., Chelai La, alt. 12500 ft, fairly common in fir forest, up to 4'6", perianth deep purple, 13 Aug. 1949, Ludlow, Sherriff & Hicks 19609 (BM, Serbithang*). Upper Mo Chu Distr., E bank of Tharizam Chu 28°01'N 89°35'E, amongst boulders and scrub on open hillside, tall erect herb, flowers bluish purple, alt. 4120 m, 24 Sept. 1984, Sinclair

& Long 5292 (Serbithang). Tho cù La, alt. 3265 m, no date, fr., Ramesh Bedi 1043 (CAL 611372, Serbithang*).

A leafy, erect pseudoannual growing in alpine and/or subalpine meadows. Pedicels ascending at an obtuse angle or divaricate, strigose with curved hairs. Flowers usually bluish purple or frequently white.

11. *Aconitum bhutanobulbilliferum*

Kadota, sp. nov. [Figs. 3–4]

Aconitum bulbilliferum auct. non Hand.-Mazz.: Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 28 (1963) – Grierson & Long, Fl. Bhutan **1**(2): 316 (1984).

Affine *Aconitum bulbillifero*, sed floribus minoribus, bracteolis linearibus vel spatulatis, calcaribus nectariorum brevioribus, labellis nectariorum magnis differt.

TYPE: BHUTAN. Gasa Distr., Koina – Bari-la, alt. 3485 m, along *Abies–Rhododendron* woods, 21 August 2007, Y. Kadota 073533 (Herb. Serbithang–holotype; Herb. Serbithang, TNS 740283–isotype; Fig. 4).

A scandent pseudo-annual, up to 4 m long. Tuber obovoid, ca. 5 cm long, ca. 3 cm in diameter; rhizomes absent. Stem stout, strongly twining, 5–8 mm in diameter in the distal part, sparingly strigose with rough-surfaced curved hairs throughout the surface, much branched with many divaricate branches, axillarily bulbiferous; bulbils dark brown, 3–5 mm long, easily falling off. Leaves subcoriaceous, pentagonal in outline, 9.5–14 cm wide, 9–11 cm long, medially trilobed to 5–7 mm from the base, strigose with rough-surfaced curved hairs (especially on veins) on both sides, shallowly to deeply cordate at the base; middle lobes rhombic, acuminate to somewhat caudate, 3–5 cm wide, 4.5–8 cm long, shallowly pinnatilobate; lateral lobes unequal-sided, fan-shaped, 5.5–8.5 cm wide, 3.5–5.5 cm long; laciniae triangular-ovate, obtuse, 4–7 mm wide; petioles 2.5–6.5 cm long, more or less strigose with rough-surfaced curved hairs throughout the surface and additionally covered with smooth-surfaced patent hairs particularly in

the proximal part. Inflorescence indeterminate loose racemose, 5–15 cm long, 3–15-flowered, bracteate; bracts foliaceous but smaller, medially trilobed, more or less strigose with curved hairs on both sides. Pedicels intensely arched, 2–4 cm long, slightly longer than or shorter than flowers, glabrous, bi-bracteate; bracteoles linear to narrowly spatulate, less than 0.5 mm wide, 4–6 mm long, simple and entire, situated below the middle of the pedicels. Flowers reddish black, ca. 3 cm long, glabrous; helmets conical with downward projecting beaks ca. 5 mm long and with concave lower margin, 12–14 mm high, 14–16 mm wide, 17–19 mm tall; lateral sepals roundish, 11–13 mm wide and long, villose with short and long (pollen-collecting), straight and ascending smooth-surfaced hairs on the adaxial side; lower sepals elliptic or broadly linear, 3–5 mm wide, 10–15 mm long. Nectaries glabrous; blades slightly inflated, ca. 2 mm wide, ca. 5 mm long; labia ligulate with irregular margin, 3–4 mm long, emarginate, reflexed at the apex; claws gently incurved, 9–13 mm long; spurs thick, less than 10 mm long, coiled to 360°. Stamens glabrous, provided with small staminal teeth. Carpels 5, glabrous. Seeds unknown.

Distribution: Bhutan, India (Assam) and Tibet.

Other specimens examined: **BHUTAN**. Dhur Valley near Bumthang, alt. 3350 m, amongst boulders in conifer forest, perianth dark purplish black, 22 July 1949, Ludlow, Sherriff & Hicks 16924 (BM); Pangotang, Tsampa, alt. 3960 m, up to 4'6" high, perianth shiny—the very deepest purple red, almost black, only one seen in flower, on bank open fir forest, 13 Sept. 1949, Ludlow, Sherriff & Hicks 19737 (BM); Waitan, Tsampa 13000 ft., perianth dark shiny purplish red, probably the same as No. 19737, here very common, fls. mostly ober, and seed not ripe but in the axils of each leaf, all the way up to the stem, there are small bulbils, from 1/3 inch to rather over 1/4 inch, usually one, but often 2, 3, or 4 in each axil, these easily fall out, but not all do, and two of last years' scapes with this specimen, each showing a young plant growing from the bulbill which has remained, the bulbills inside are deep purple red, among shrub and juniper steep hillside, 19 Sept. 1949, Ludlow, Sherriff & Hicks 19752 (BM, E); Gasa Distr., Koina, alt. 3370 m, a climber hanging down from *Abies–Rhododendron* woods, fls. reddish purple to black, 5 Sept.

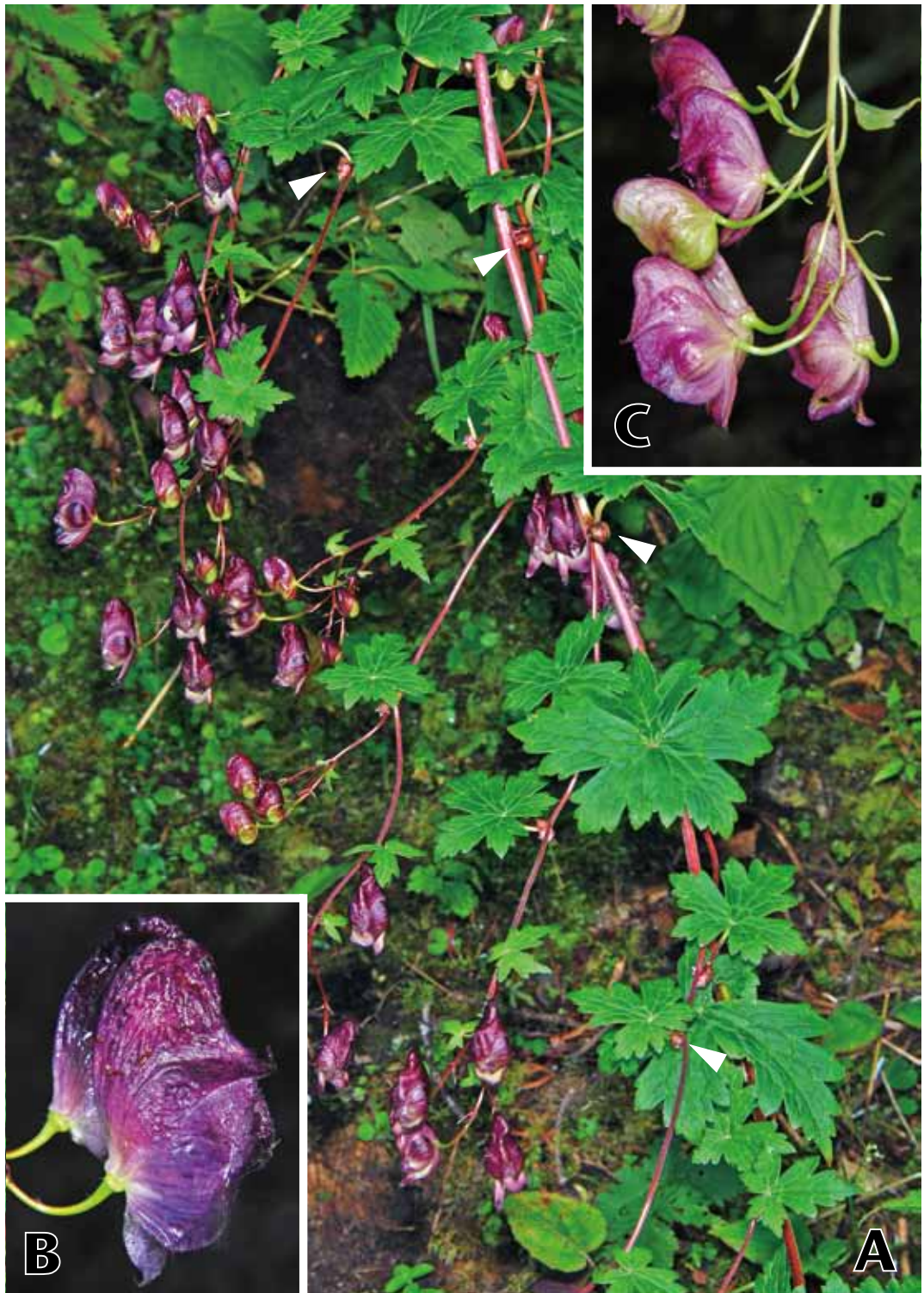


Fig. 3. *Aconitum bhutanobulbilliferum* Kadota. A. Habit. Arrowhead indicates bulbill. B. Flower. C. Part of inflorescence. A–C. BHUTAN: Gasa Distr., Koina – Bari La, alt. 3160 m, 21 Aug. 2007.

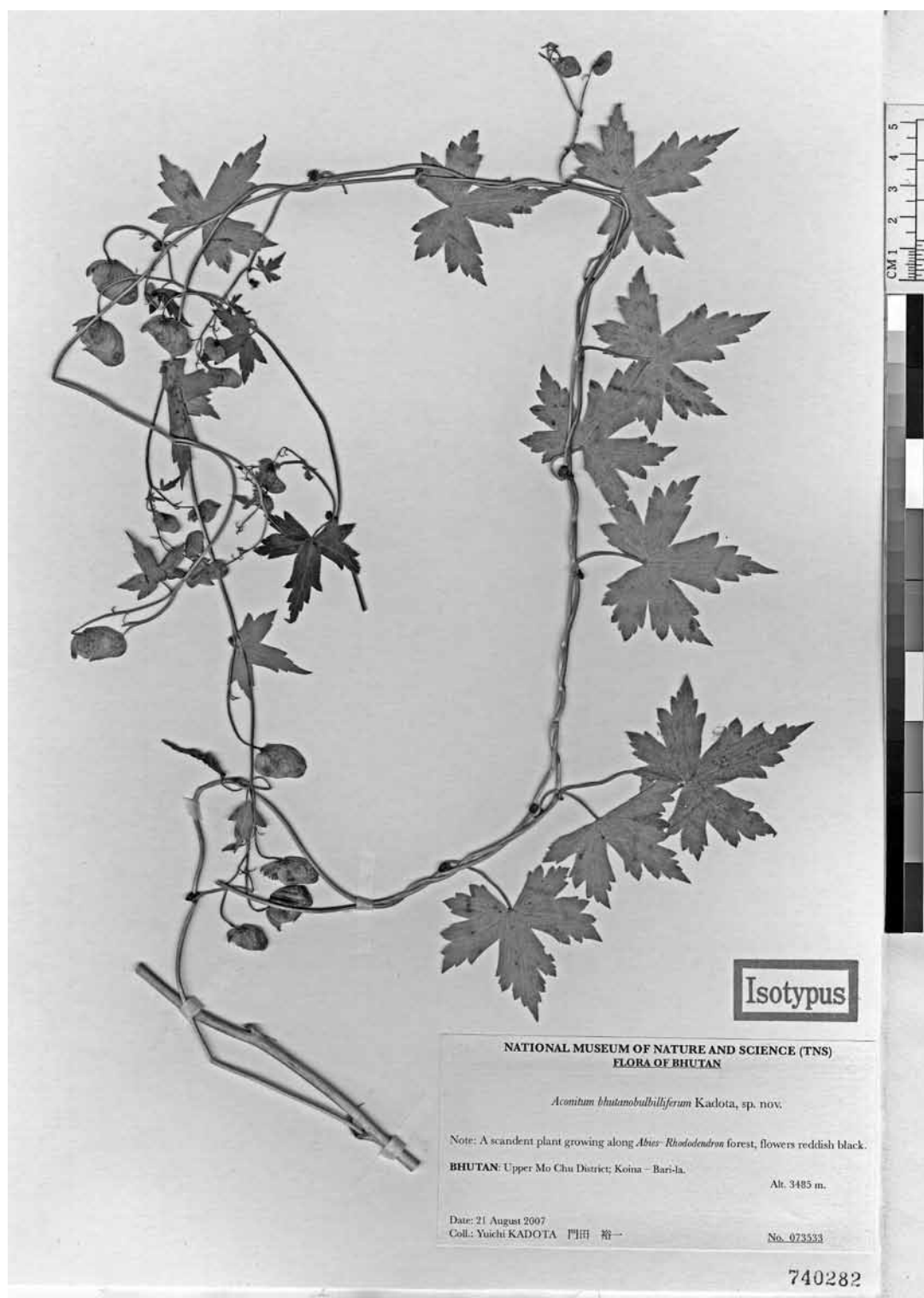


Fig. 4. Isotype of *Aconitum bhutanobulbilliferum* Kadota (BHUTAN: Gasa Distr, Koina – Bari-la, alt. 3485 m, along *Abies*–*Rhododendron* woods, 21 Aug. 2007, Y. Kadota 073533, TNS 740282).

1997, Y. Kadota 970039 (TNS); Laya – Koina, alt. 3100 m, 20 Aug. 2007, Y. Kadota 073505–073505 (Serbithang*); Koina – Bari-la, alt. 3485 m, along *Abies–Rhododendron* woods, 21 Aug. 2007, Y. Kadota 073533 (Serbithang*).

SSAM. Chigkhu 8800 ft., 5 June 1935, N. L. Bor 6778 (K).

TIBET. Migyitun, Tsari, alt. 2890 m, perianth rich very deep wine purple, filaments the same, anthers a little paler, 26 Aug. 1936, Lufflow & Sherriff 2510 (BM, E); Migyitun, Tsari Chu, lat. 28°40' N, long. 93°38' E, alt. 3050 m, 23 Oct. 1938, Ludlow, Sherriff & Taylor 6628 (BM, E). Tibet–Bhutan Frontier in Chumbi Valley 8000ft., 30 Sept. 1950, reddish purple, crawling over bushes in dense forest, Ludlow & Sherriff 21504 (BM, E).

Aconitum bhutanobulbilliferum (Kadota 1999, figs. 2, 3a, 4; Figs. 3–4) is distinguished from *A. bulbilliferum* (Kadota 1999, figs. 1, 3b; Fig. 5) by the following attributes: 1) smaller flowers (especially in the size of helmets), 2) linear to narrowly spatulate bracteoles situated below the pedicels, 3) absence of long pollen-collecting hairs on the adaxial side of lateral sepals, 4) shorter nectary spurs, 5) larger nectary labia, 6) presence of smooth-surfaced patent hairs on petioles, and 7) dark reddish purple (rather black) flowers. *Aconitum bulleyanum* Diels (Kadota 1999, fig. 6) is similar to *A. bhutanobulbilliferum* plants in having scandent habit, medially trilobed leaves and glabrous pedicels. However, the former is clearly discriminated from the latter for the absence of axillary bulbils.

12. *Aconitum gammiei* Stapf in Kew Bull. Mis. Inf. **1907**: 56 (1907) – H. Hara, Enum. Fl. Pl. Nepal **2**: 10 (1979) – Rau, Fl. Ind. **1**: 13 (1993) – Polunin & Stainton, Fl. Himal.: 5 (1984); Fl. Himal. Suppl. 1, pl. 1 (1988) – Yoshida, Himal. Pl. Illust. 596 (2005).

TYPE: INDIA. SIKKIM: Chola Range – Chamanaka, 12500 ft, 27 Sept. 1892, G. A. Gammie 1310 (holotype–K !).

Aconitum dissectum D. Don, Prodr. Fl. Nepal. 197 (1825) – Wall., Cat. 167, no. 4724 (1831) – Royle, Illust. Bot. Himal. 56 (1834) – Mukerjee in Bull. Bot. Surv. Ind. **3**: 100 (1962) – *Aconitum napellus* L. var. *rigidum* Hook. f. &

Thomson, Fl. Brit. Ind. **1**: 29 (1872) – *Aconitum wallichianum* Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 30 (1963); Notes Roy. Bot. Gard. Edinb. **26**: 10 (1964). TYPE: NEPAL. Wallich no. 4724 (holotype–K !; CAL–isotype !).

Aconitum parabrachypodum Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 7 (1963), p. p. PARATYPE: CHINA. TIBET: Natu La, 13500 ft, growing in *Rhododendron* shrubbery in the alpine zone, handsome, sometimes prostrate and creeping, 1 Sept. 1950, Ludlow, Sherriff & Hicks 21505 (BM !).

Specimens examined: **BHUTAN.** Dhur Chu, alt. 13500 ft, up to 3 ft, does not stand upright, but bending over, flowers intense rich blue violet, little seen, among rhododendrons on open banks, 4 Oct. 1949, Ludlow, Sherriff & Hicks 19813 (E); Pang La, alt. 12500 ft, open rocky hillside, [flowers] deep blue violet, 21 Sept. 1949, Ludlow, Sherriff & Hicks 21460 (E).

SIKKIM. Shaitau pokri, Kapup, alt. 12500 ft, scrambling habit on sandy spit along lake shore, 3 Sept. 1913, R. E. Cooper 767 (E).

NEPAL. Yangri Danda ridge, 28°05'N 85°34', alt. 4200 m, fl. bud more or less dark brown/black, fl. white or bluish white, on dorsal side blue/violet, ca. 75 cm tall, in thickets, 9 Sept. 1974, R. H. De Haas 2726 (BM); Bheding, alt. 12000–13000 ft, flowers greenish yellow, 1930, L. Dhwoj 266 (E); Gosainkund, alt. 4100 m, landes a *Rhododendron anthopogon*, fl. blue pale, A. Maire 482 (E). Nepal, flowers yellowish blue, 1927, C. Wigram 119, 179 (E).

A scandent pseudoannual growing along the margin of mountain woods. Leaves ternate with deeply dissected lobes and narrowly lanceolate laciniae. Pedicels glabrous. Helmets conical with roundish top with short projecting beaks.

13. *Aconitum nakaoui* Tamura in Acta Phytotax. Geobot. **19**: 73 (1962) – Grierson & Long, Fl. Bhutan **1**(2): 319 (1984). TYPE: BHUTAN. Munakhachu La, alt. 4400 m, 24 September 1958, S. Nakao 353 (KYO–holotype !).

Aconitum parabrachypodum Lauener in Notes Roy. Bot. Gard. Edinb. **25**: 7 (1963), p.p. TYPE: INDIA. Assam, Orka La, 3900–4200 m, on boulder screes, 28 Sept. 1938, F. Kingdon Ward 14306 (BM–holotype !).



Fig. 5. Holotype of *Aconitum bulbilliferum* Hand.-Mazz. (CHINA: Sichuan Prov., Huili, alt. 3600 m, 17 September 1914, H. Handel-Mazzetti 5202, WU). Left corner inset indicates trilobed, foliaceous bracteoles (Kadota 1999; fig. 1).

Specimens examined: **BHUTAN**. Phage La, Mengde Chu, alt. 14000 ft., perianth palish purple, sometimes with a reddish tinge, in amongst boulder scree, 26 Aug. 1949, Ludlow, Sherriff & Hicks 17203 (BM, Serbithang*; both paratypes of *A. parabrachypodum* Lauener).

NEPAL. Above Tseram, 27°33'N 87°57'E, alt. 4000 m, in rocky places and on boulders by stream in woodland, sprawling perennial, flowers deep blue mauve and pale blue mauve (two color forms), 16 Sept. 1989, KEKE 703 (E, K, KATH).

A scandent pseudoannual growing along the margin of mountain woods. Leaves ternate with deeply dissected lobes and narrowly laneolate laciniae. Pedicels strigose with curved hairs. Helmets conical with roundish top with short projecting beaks.

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門田裕一：アジア産トリカブト属植物（キンボウゲ科）の分類学的研究 XIII. ブータン中部からのつる性 1 新種を含むブータン産の種

ブータンから記録されているトリカブト属植物（キンボウゲ科）を分類学的にまとめ、レイジンソウ亜属に 3 種、Tangutica 亜属に 1 種、トリカブト亜属に 9 種を認めた。このうち、いくつかの種についてレクトタイプ選定を行った。

ブータン中部のガサ地区から見いだされたつる性のトリカブト亜属植物は新種、*Aconitum bhutanobulbilliferum* Kadota として記載した。この種はつる性に加えて、花梗が無毛で、葉腋にムカゴをつけるという性質にもとづいて、これまで中国四川省から記載された *A. bulbilliferum* Hand.-Mazz. と誤認されてきたが、それとは次の点で区別できる：①花がより小さく、②小苞は線形ないし狭匙形で花梗の下部につき、③花卉の距はより短く、④花卉の唇部がより大きい。また、⑤花は赤みが強い紅紫色で、個体によっては黒

色に近いものもあり、トリカブト属では類を見ない花色となる。さらに、⑥側萼片の向軸側には長い集粉毛があることでも異なっている。本種はブータンの他、シッキムやチベット東南部にも分布する。つる性で無毛の花梗をもつトリカブトには、ヒマラヤ東部に分布する *A. bulleyanum* Diels と *A. gammiei* Stapf があるが、これらは葉腋にムカゴを付けない点で容易に区別できる。

上記の 13 種のうち、これまでに画像が提示されることがなかった、*A. palmatum* D. Don と *A. chloranthum* Hand.-Mazz. を図示した。*A. chloranthum* は中国西南部とブータンに分布し、淡紅紫色の花をつける *A. scaposum* Franch. と混同されることが多い。しかし、両種は花色ばかりではなく、上萼片や花卉の形が異なる別種である。

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