

**STUDIES IN THE FAMILY GENTIANACEAE:
THE GENUS *ALOITIS* RAFIN. FROM PAKISTAN AND KASHMIR**

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Abstract

The genus *Aloitis* Rafin. is recognized from Pakistan. Six new combinations are proposed: *A. falconeri* (Clarke) Omer, Qaiser & Ali; *A. maddeni* (Clarke) Omer, Qaiser & Ali; *A. moorcroftiana* (Wall. ex G. Don) Omer, Qaiser & Ali; *A. umbellata* (M. Bieb.) Omer, Qaiser & Ali; *A. holosteoids* (Pritchard) Omer, Qaiser & Ali and *A. stoliczkai* (Clarke) Omer, Qaiser & Ali.

Introduction

The genus *Aloitis* Rafin., was described by Rafinesque-Schmaltz (1837) on the basis of pentamerous flowers, mucronate corolla, with 5 dorsifixed or versatile stamens, stipitate ovary and short style. The genus has long been considered as congeneric with *Gentiana* L. However, Löve & Löve (1986) resurrected the genus *Aloitis* Rafin. The genus *Aloitis* Rafin. differs from *Gentiana* L. (s. str.) on the basis of non-plicate flowers and epipetalous nectaries. This genus can also readily be distinguished from the related genera i.e., *Gentianella* Moench (1794) and *Gentianopsis* Ma (1951) on the basis of unequal calyx lobes which are not distichously arranged, pentamerous flowers, paired nectaries at the base of each corolla-lobe and naked corolla-throat.

During the detailed studies of the genus *Gentiana* L., (s.1.) from Pakistan, certain taxa were encountered which were earlier placed either under *Gentiana* L., (s.1.) or *Gentianella* Moench (s.1.). But a critical examination revealed that these taxa could not be placed under either of the genera. These taxa are being accommodated in the genus *Aloitis* Rafin., resulting in six new combinations. A key to the species is also given. In each case, alongwith the synonymy, information about the specimens studied, the type specimens, distribution and flowering period is also presented.

ALOITIS

Rafin., Fl. tellur. 3: 21. 1837.

Erect, annual-perennial glabrous herbs. Leaves basal as well as cauline; basal forming rosette; cauline opposite, loosely arranged, sessile. Inflorescence axillary – terminal, 2-3 flowered cymes. Flowers zygomorphic, long-pedicellate, pentamerous. Calyx cylindrical – campanulate, 5-lobed, lobes irregularly unequal, never distichous. Corolla 5-lobed,

campanulate, variously coloured: pink, purple, blue or white; plicae or subsidiary lobes of the corolla absent, naked inside (without any fimbriae or ciliae), margin of lobes entire. Stamens alternating and corresponding with the petals. Anthers versatile, filaments adnate to the corolla-tube in the middle or below. Nectaries epipetalous at the base of the corolla-tube, double the number of petals. Ovary superior, unilocular with numerous ovules and parietal placentation with a distinct gynophore; stigmas 2, prominent, sessile or subsessile. Capsule stipitate, \pm exserted. Seeds elliptic – oval, striately reticulated or with subsmooth surface.

A genus of 8-10 species, distributed in the high and cold mountains of Europe, Asia and America.

Key to the species:

- | | |
|--|----------------------------|
| 1. +Calyx-tube longer than the lobes. | 1. <i>A. falconeri</i> |
| –Calyx-tube shorter than the lobes. | 2 |
| 2. +Largest calyx-lobe \pm equal to the length of corolla-tube. | 3 |
| –All calyx-lobes \pm smaller than the corolla tube. | 4 |
| 3. +Plants not exceeding 5(-7) cm in height. Basal leaves 0.3-0.5 x 0.1-0.3 cm, spatulate, ovate or lanceolate. Inflorescence not umbellate. | 5. <i>A. holosteoides</i> |
| –Plants more than 8 cm in height. Basal leaves 0.8-2.5 x 0.5-1.2 cm, obovate – oblanceolate. Inflorescence umbellate cymes. | 4. <i>A. umbellata</i> |
| 4. +Stigma strictly sessile. Calyx-lobes equal in length but unequal in breadth. | 3. <i>A. moorcroftiana</i> |
| –Stigma subsessile; style \pm prominent; calyx-lobes unequal in all respects. | 5 |
| 5. +Corolla-lobes distinctly mucronate; pink in colour; stamens reaching the corolla-lobes sinuses. Margin of calyx lobes scabrid. | 6. <i>A. stoliczkai</i> |

—Corolla-lobes obtuse, blue in colour; stamens
exserted. Margin of calyx lobes not scabrid.

2. *A. maddenii*

1. *Aloitis falconeri* (Clarke) Omer, Qaiser & Ali, Comb. nov. (Fig.1, A-F).

Gentiana falconeri Clarke in J. Linn. Soc. 14: 433. 1875; *Gentiana moorcroftiana* Wall. ex G. Don var. *falconeri* (Clarke) Clarke in Hook., f., Fl. Brit. Ind. 4: 108. 1883; Stewart in Nasir & Ali (eds.) Ann. Cat. Vasc. Pl. Pak. Kashm. 556. 1972.

Type: In coll. *Falconer* Prope Puddum Himalayae boreali - occidentalis ad 12000 ped. alt., *Stoliczka* (CAL).

Specimens examined: Kashmir: Zanskar, 1931, *Walter Koelz* A-42, A-46 (NY); Zanskar, Seni, alt. ca. 12000 ft., flrs. purple-blue, 19-21 July, 1933, *W. Koelz* 5804 (NY); Purig, 25-27 July, 1933, *Walter Koelz* 5987 (NY; RAW).

Distribution: Kashmir (Himalaya).

Fl. Per.: July-August.

2. *Aloitis maddenii* (Clarke) Omer, Qaiser & Ali, Comb. nov.

Gentiana moorcroftiana Wall. ex G. Don var. *maddenii* Clarke in Hook. f., Fl. Brit. Ind. 4: 108. 1883; Stewart, l.c. 557; *Gentianella maddenii* (Clarke) Airy Shaw in Hook., Ic. Pl. 35: t. 3431, 1943.

Syntypes: Kumaon, alt. 10-12000 ft., *ibid.* *Madden* (K); *Davidson* (K!); Tibet, alt. 15000 ft., (Piti?), *Strachey & Winterbottom* (K).

Specimens examined: Ladakh 10-12000 ped., *T. Thomson* s.n. (O); Kashmir: Sonamarg, ± 10000', Sept. 1931, *R.R. Stewart* 12922 (NY); Gurais valley, 8000', 27.9.1893, *J. F. Duthie* 14098 (O); Near Gurais, 8-9000', 27.8.1892, *J.F. Duthie* (O); Shishnag, upper Lidder Vy., ± 12000', 31.8.1925, *R.R. Stewart* 8391 (NA); Muzaffarabad, Ganga Choti, ± 9000', 23.10.1963, *Jan Mohd.* 96 (RAW); *ibid.*, 17.9.1952, *Rashid Khan* s.n. (RAW); Dras, Ladak Road, 10000', 29.8.1940, *R.R. Stewart* 21164 (NA); Locality not known, *J.L. Stewart* s.n. (E); *ibid.*, *J.L. Stewart* s.n. (E).

Distribution: Himalaya (Kashmir-Nepal).

Fl. Per.: August - October.

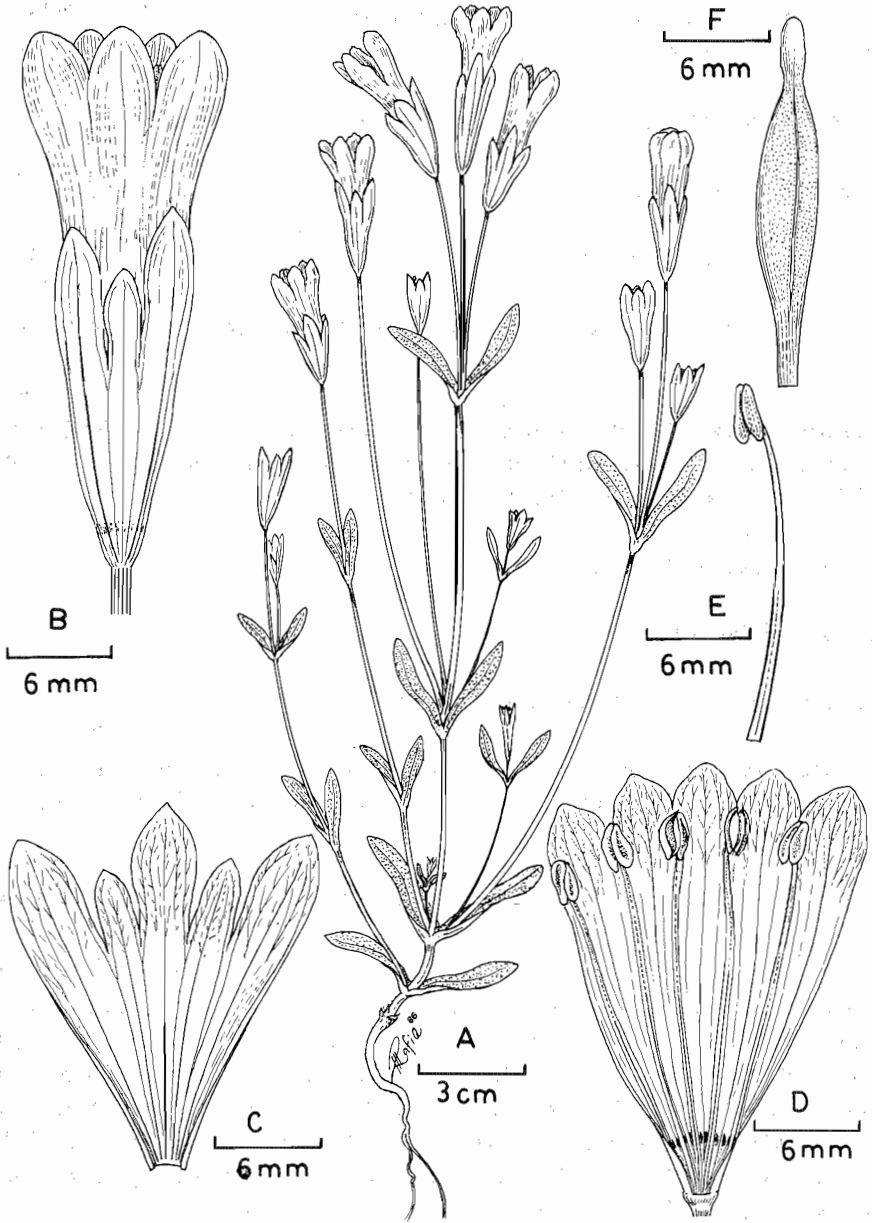


Fig. 1. *Aloitis falconeri*: A, Habit; B, Flower; C, Calyx; D, Corolla; E, Stamen; F, Ovary.

3. *Aloitis moorcroftiana* (Wall. ex G. Don) Omer, Qaiser & Ali, Comb. nov.

Gentiana moorcroftiana Wall. ex G. Don, Gen. Syst. 4: 182. 1837; Stewart, l.c. 556;
Gentianella moorcroftiana (Wall. ex G. Don) Airy Shaw in Hook., Ic. P1. 35: t. 3431. 1943.

Type: In itinere versus Ladak, Tibet, *Moorcroft* Wall. Cat. no. 4390, (K-W; IDC. 7394-11).

Specimens examined: Kashmir: Lilam Patu rages et champs, 3000 m., 18-25.8.1953, *F. Schmid* 628 (E); Ladak, Kangi Nulla below Kangi, 12500', in river bed, flrs, purplish blue, throat whitish, 5.9.1931, *Walter Koelz* 2812 (E, NY); Ladak, 10-12000 ped, *T. Thomson* s.n. (NY); Kangi La, Ladak, 1931, *Walter Koelz* A-31 (NY); Dras, Ladak Road, 10000 ft. 29.8.1940, *R.R. Stewart* 21164 (NY); Sind valley, 8-9000 ft., 19.8.1893, *J.F. Duthie* 13653 (K); Sonamarg, by the river, 8-9000 ft., 17.8.1893, *J.F. Duthie* 13599 (K); Locality not known, *Dr. J.L. Stewart* s.n. (E); Sonamarg \pm 9000', 1.9.1917, *R.R. Stewart* 3550 1/2 (NY).

Distribution: Afghanistan, Pakistan and Kashmir, India and Nepal.

F1. Per.: July-September. Fr. Per.: August-September.

A variable species in habit, general branching pattern, and type of inflorescence branching. In these characters it resembles *A. maddenii* from which it can be separated on the basis of corolla-size (less than 2.0 cm broad on expansion).

4. *Aloitis umbellata* (M. Bieb.) Omer, Qaiser & Ali, Comb. nov. (Fig. 2, A-F).

Gentiana umbellata M. Bieb., F1, Taur.-Cauc. 3: 188. 1819; *Gentianella umbellata* (M. Bieb.) Holub in Folia Phytotax. Geobot. 2: 118. 1967.

Type: Habitat in ditionis Caucasi kubensis alpestribus circa Chinalup (LE).

Specimens examined: Chitral: Vedinkot, W. of Baroghil Pass, 10000 ft., in *Populus* thickets on damp ground, 22.7.1958, *J.D.A. Stainton* 2967 (E); Baltistan: Shyok watershed, \pm 9000', 16.8.1940, *R.R. Stewart* s.n. (RAW); Thalle La, 10000 ft, pale blue, 13.8.1940, *R.R. Stewart* 20627 (RAW).

Distribution: Central Asia, Iran and Pakistan.

F1. Per.: July-August.

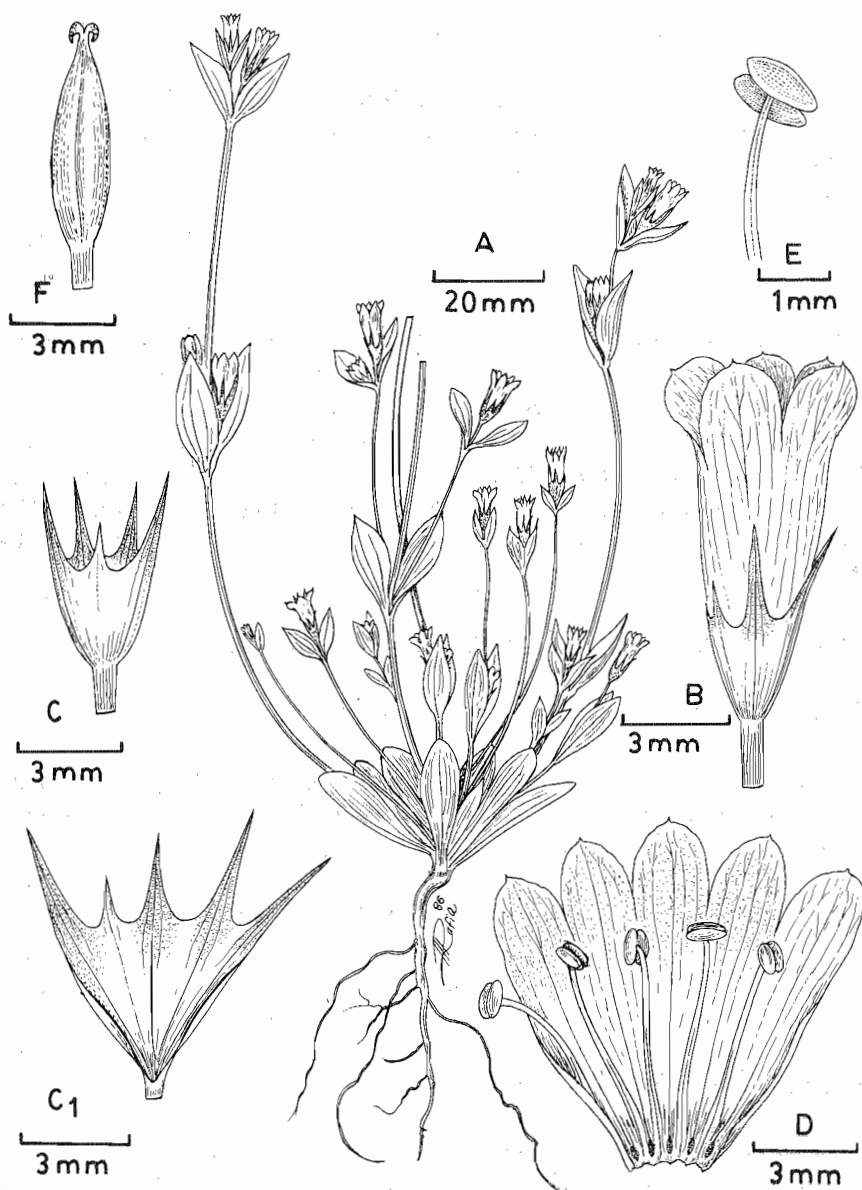


Fig. 2. *Aloïis umbellata*: A, Habit; B, Flower; C&C1, Calyx; D, Corolla; E, Stamen; F, Ovary.

Closely allied to *A. aurea* (L.) Löve et Löve and *A. stoliczkai* (Clarke) Omer, Qaiser & Ali from which it differs on the basis of obtuse-rounded bases of basal leaves, dissimilar scabrid calyx-teeth and obtuse sinuses. Whereas in *A. stoliczkai* (Clarke) Omer, Qaiser & Ali, the apices of basal leaves are acute, calyx-teeth are almost similar, densely scabrid and sinuses are acute. The corolla in *A. aurea* (L.) Löve et Löve is 6-8 mm long; whereas it is 8-11 mm long in *A. umbellata* (M. Bieb.) Omer, Qaiser & Ali.

5. *Aloitis holosteoides* (Pritchard) Omer, Qaiser & Ali, Comb. nov.

Gentiana aurea L. var. *holosteoides* Schott & Kotschy ex Clarke in Hook. f., Fl. Brit. Ind. 4: 109. 1883; *Gentianella holosteoides* Pritchard in Notes R.B.G. Edinb. 35: 310. 1977; id. in Davis, Fl. Turk. 6: 193. 1978.

Type: Turkey, Nigde, in humidis fontium prope Bulgar Magara, substrato dioritico, 2438 m, 8.1853, *Kotschy* 285 (Holo K; Iso. WU).

Specimens examined: Baltistan, Thalle La, 10000', pale blue, 13.8.1940, *R.R. Stewart* 20627 (p.p.) (RAW).

Distribution: Turkey and Pakistan.

The distribution of this taxon is rather strange, known from Turkey and Pakistan only. Is it really a case of disjunct distribution or hitherto not collected from Iran and Afghanistan?

Fl. Per.: August.

6. *Aloitis stoliczkai* (Clarke) Omer, Qaiser & Ali, Comb. nov.

Gentiana stoliczkai Clarke in J. Linn. Soc. Bot. 14: 433. 1875; Schm.-Czeika in Rech. f., Fl. Ir. 41: 21. 1967; Stewart, l.c. 558; *Gentianella stoliczkai* (Clarke) Holub in Folia Geobot. Phytotax. 8(2): 171. 1973.

Type: In Himalaya boreali-occidentali ad 14000 ped. alt., *Stoliczka* (CAL.).

Specimens examined: Chitral: Zandrangram, about 20 miles from Nushko on way to Trichmir mountain, c. 10 cm, flr. pinkish white, 20.8.1981, *Kamal A. Malik* & *S. Nazimuddin* 1610 (KUH); Godai, Gilgit Road, ± 9000', pale blue, 24.8.1939, *R.R. & I.D. Stewart* 18935 (NA); Kashmir: Matayam, Ladak, 10500', August 1928, *R.R. Stewart* 9953a (NA).

Distribution: Central Asia, Afghanistan, China and Pakistan (Himalaya & Karakorum).

F1. Per.: August.

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