Taiwania, 56(3): 210-217, 2011

A New Genus of Himalayan Caprifoliaceae

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(Manuscript received 28 October 2010; accepted 1 April 2011)

ABSTRACT: A group of Sino-Himalayan species characterized by actinomorphic corolla, without (honey-storing) lateral saccate gibbosity, 5 nectaries, anthers as long as or longer than included filaments and flat or carinate leaf vernation, is separated from *Lonicera* L. and described here as a new genus, *Devendraea* Pusalkar under the family Caprifoliaceae.

KEY WORDS: Caprifoliaceae, *Devendraea*, Himalaya, *Lonicera*, new genus.

INTRODUCTION

Lonicera L. (Caprifoliaceae), with about 180 species distributed in the north temperate regions (Mabberley, 2008), represents an assemblage of diverse morpho-taxonomical characterization. Following an excellent revision by Rehder (1903), more than a century ago, the genus was traditionally divided in to two subgenera, viz., *Chamaecerasus* (L.) Rehder and *Periclymenum* (L.) Rehder, and former subgenus is further divided into four sections, viz., *Isoxylosteum* Rehder, *Isika* (Adans.) Rehder, *Coeloxylosteum* Rehder and *Nintoa* (Sweet) Rehder. These divisions are primarily based on combination of characters, e.g., corolla type (actinomorphic/zygomorphic), leaf vernation (flat/revolute), pith (solid/hollow), stamen insertion (at throat/in tube), ovary (hence fruit) and bracteole fusion, nectaries, habit, etc. Study of large number of herbarium material of the genus collected in Himalaya and housed in DD, BSD, CAL herbaria, field observations and literature consultation (Clarke, 1880; Rehder, 1903; Bamber, 1916; Osmaston, 1927; van Steenis, 1946; Kitamura, 1955; Pojarkova, 1955; Wendelbo, 1965; Rüdenberg and Green, 1966; Hara, 1966, 1971, 1975, 1979; Hsu, 1983; Polunin and Stainton, 1984; Akther, 1986; Stainton, 1988; Hsu and Wang, 1988; Press et al., 2000; Meyer, 2001; Theis et al., 2008) concluded that within the genus, a distinct and continuous line of evolution is visible in floral characters with four distinct groups. Terminal group-1 represents actinomorphic corolla, with equal or subequal lobes, corolla tube straight without saccate gibbosity, included stamens with filaments shorter to as long as anthers, inserted at the middle of the corolla tube, e.g. *L. myrtillus* Hook.f. & Thomson (Fig. 1 C-D). Mid Group-1 represented by species with zygomorphic corolla, corolla lobes equal/subequal, corolla tube base with lateral saccate gibbosity (making corolla zygomorphic) and exserted stamens with filaments longer than anthers, inserted at the throat/mouth of corolla tube, e.g., *L. semenovii* Regel. Next in line is Mid Group-2 with species showing inconspicuously bilabiate corolla (unequal corolla lobes with slightly larger lower lip), straight or curved corolla tube with saccate gibbosity at the base and long exserted filaments, much longer than anthers, inserted at throat/mouth of corolla tube, e.g., *L. microphylla* Willd. Terminal group-2 shows species with typical bilabiate (upper lip 4-lobed, lower simple, undivided), zygomorphic corolla with unequal upper and lower lip, curved corolla tube with saccate gibbosity at the base and long exserted filaments much longer than anthers, inserted at or near throat/mouth of corolla tube, representing another end of evolution line, e.g., *Lonicera hypoleuca* Decne (Fig. 1 E-F). Besides these characters, Terminal Group-1 is also distinguished by mostly sub spinescent shrubby habit, flat/carinate leaf vernation, 5 nectaries and anthers as long as to longer than included filament, usually inserted in the middle of corolla tube (except sect. *Spinosae*) as against non sub-spinescent shrubs and climbers with revolute leaf vernation, 3 nectaries and anthers smaller than long exserted filaments, usually inserted at the throat of corolla tube, in rest of the three groups. It is thus clear that based on floral evolution, the genus can be naturally divided into two groups, viz., species with actinomorphic/sub-actinomorphic (corolla lobes equal or sub-equal) flowers and species with zygomorphic flowers. Thus within the genus clear transition from actinomorphic to zygomorphic corolla is visible. The group of species with actinomorphic corolla, thus represents primitive stock, from which advanced line with zygomorphic corolla is believed to be evolved. It is thus concluded that since the name *Lonicera* is applied to group of species with zygomorphic corolla (type species: *L. caprifolium* L.), primitive stock with actinomorphic corolla, from which zygomorphic *Lonicera* group was evolved needs a distinct identity at genus rank.

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Fig. 1. A, B: *Devendraea rupicola* (Hook.f. & Thomson) Pusalkar. C, D: *Devendraea myrtillus* (Hook.f. & Thomson) Pusalkar var. *depressa* (Rehder) Pusalkar. E, F: *Lonicera hypoleuca* Decne.

It is further important to note that this group of species (with actinomorphic flowers) is restricted to Sino-Himalayan region, with one species extended up to Central Asia, thus indicating geographical isolation of this (primitive) evoluation clade in response to geo-climatic conditions of the region. Numerical taxonomical studies by Hsu (1983), were followed by recent nuclear and chloroplast sequence-based phylogenetic studies (Theis & al., 2008). This study revealed that this small terminal group of Sino-Himalayan species with actinomorphic flowers form a distinct clade in the combined majority rule consensus phylogenetical tree/ phylogram obtained from the Bayesian analysis and the strict consensus tree formed by the Parsimony analysis based on sequences of nrDNA (ITS), and cpDNA (rpoB-trnC spacer, atpB-rbcL spacer, trnS-trnG spacer, petN-psbM spacer, and psbM-trnD spacer), thus clearly supporting distinct identity of this group of species forming a distinct evolutionary group.

Thus, considering evolutionary significance of this diagnostic character of the floral evolution (zygomorphic vs. actinomorphic corolla), strong supplementary diagnostic character set of this group, further evolutionary diversification (visible within this group), which is possible only from stabilized base

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stock (used below as distinguishing characters at sectional rank), geographic separation, supported by phylogenetical/molecular evidences, this group of species within *Lonicera* with flat/carinate leaf vernation, actinomorphic flowers, with equal/subequal corolla lobes, corolla tube straight, without lateral saccate gibbosity, stamens usually inserted at the middle of corolla tube and included within straight corolla tube, and anthers as long as or longer than filament, deserves to be recognized as a genus distinct from *Lonicera*. The same is separated and described here as a new genus, christened *Devendraea* Pusalkar. Within the newly described genus, though section *Spinosae* has exserted stamens inserted at throat/mouth of corolla (character of *Lonicera*), but due to characters like actinomorphic corolla, corolla tube with usually 5 nectaries and without lateral saccate gibbosity, it is included in *Devendraea*. Thus section *Spinosae* represents end of evolutionary transition from actinomorphic to zygomorphic corolla, with strong affinity towards *Devendraea*.

Though, the new genus is primarily based on *Lonicera* section *Isoxylosteum* Rehder (Rehder, 1903), but two reasons have necessitated to drop the sectional epithet at genus rank, viz., changed circumscription of this group (here called *Devendraea*) in the present context, current species characterization, rank placement of constituent taxa, higher weightage to newly selected characters or selection of new key characters, lower weightage to previously selected characters, modification in previously selected characters (filament length, filament insertion point, pubescence on inner surface of corolla tube) and secondly, retention of the name *Isoxylosteum* is rather misleading as diagnostic characters of this proposed new genus are not similar to protologue characters of *Xylosteum* Mill., as otherwise implied by retaining that name.

Key to Genera

1a. Flowers zygomorphic; corolla tube base with lateral saccate gibbosity; anthers smaller than long, exserted filaments; nectaries 3; leaf vernation revolute …….….. *Lonicera*

1b. Flowers actinomorphic; corolla tube base not gibbous; anthers longer than or as long as included filaments; nectaries 5; leaf vernation flat or carinate ……..... *Devendraea*

Devendraea Pusalkar, *gen. nov*. (Caprifoliaceae)

Fig. 1 A-D

Lonicerae L. (Caprifoliaceae) *affinis, sed folia in gemmam plana vel carinata, corollis actinomorphis vel sub-actinomorphis, lobis corollarum aequis vel sub-aequis; tubis corollarum basaliter aequis, lateraliter statum staccato-gibbosorum carentibus, nectaria 5 differt*. (*Typus* (designated here): *Devendraea myrtillus* (Hook.f. & Thomson) Pusalkar = *Lonicera myrtillus* Hook.f. & Thomson)

Dwarf to medium-sized, compact, bushy, sub spinescent to non spinescent shrubs; stem erect or procumbent, often with peeling bark; branches stout, erect, spreading, procumbent, often sub spinescent, interlacing, sometimes weak, hanging (*D. alberti*). Leaves simple, opposite and/or in whorl of three; vernation flat or carinate; petiole much smaller than lamina; lamina linear, oblong, lanceolate, elliptic, obovate to oblanceolate, base cuneate, rounded to tapering, margins entire, flat to revolute, apex acute, obtuse to acuminate, surfaces glabrous, glaucous, villose- pubescent to glandular. Flowers pentamerous or tetramerous, white to purplish pink, erect, spreading or nodding, in axillary pairs on current year's branchlets, sub-sessile to long-peduncled; peduncle minute to small, erect, spreading or nodding, arising from 1-all leaf axiles of a node (flowering nodes with 1-3 axillary pairs/ with 2-6 flowers), glabrous to pubescent. Bracts usually foliaceus, sometimes reduced, linear, narrow oblong to elliptic; pedicel absent; bracteoles usually connate forming cupula, sometimes distinct or partly connate in lower half or connate on anterior side. Flowers actinomorphic (with equal to sub-equal corolla lobes), sessile, white, pink, purple, rosy. Calyx tube ovoid to sub-globose, 5-toothed; teeth triangular to ovate, glabrous to pubescent. Corolla regular, tubular-campanulate; tube equally broad throughout or slightly narrowed towards the base, broadened upwards, longer than lobes, (4-)5-lobed, outer surface glabrous, scabrous to hairy or glandular, inner surface hairy throughout or above stamen insertion point, often densely hairy at the throat with 5 nectaries at the base, rarely 4; corolla tube base equal, without lateral saccate gibbosity, lobes erect, patent to spreading at 90^{o} to tube, sometimes recurved (*D. angustifolia*), 1/2-1/6 as long as tube. Stamens 5, rarely 4, usually inserted at or below the middle of corolla tube, included (except in sect. *Spinosae*, where it inserted at the mouth of corolla tube and exserted from tube); filaments as long as (sect. Spinosae) or shorter than anthers. Ovaries of paired flowers partly or fully connate; each ovary 2-3-loculed; each cell with 2-3 ovules; style half as long as corolla tube, included or slightly longer than corolla tube, exserted; stigma capitate. Berries distinct or connate, red, orange, white or bluish-black, glabrous or with glaucous bloom, with persistent sepal crown.

Etymology: The genus is named as a token of respect for the teacher of the author and Director-in-Charge of the Botanical survey of India, Dr. Devendra Kumar Singh.

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SYNOPSIS

A genus of 8 lignaeous species distributed in the Sino-Himalayan region with one species extended to the central Asian mountains.

Key to the sections of genus *Devendraea*

1a. Stamens inserted at the mouth of corolla tube, exserted ……..…. ……...……..... Sect. 4. *Spinosae*
1b. Stamens inserted at or below the middle of corolla tube, included within tube ……..….. 2
2a. Flowers erect or patent; ovaries and fruits (of paired flowers) distinct or fused only at the base …….. Sect. 3. *Rupicolae*
2b. Flowers nodding; ovary and fruits of paired flowers wholly connate ……..… 3
3a. Ovary 3-loculed; style as long as corolla tube ……. …….. Sect. 2. *Tomentellae*
3b. Ovary 2-loculed; style half as long as corolla tube ……..…… …….. Sect. 1. *Devendraea*

Section 1: ***Devendraea*** Pusalkar, *sect. nov.*

Flores nutantes; stylus tubo corollae in longitudinem dimidius; ovarium et fructus (geminato-florum) connatus; ovarium 2-loculatum.

Flowers nodding; style half as long as corolla tube; ovary and fruits (of paired flowers) wholly connate; ovary 2-loculed.

Type species: *Devendraea myrtillus* (Hook.f. & Thomson) Pusalkar

Lonicera myrtillus Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 168. 1858.

A section comprising six taxa, including two species, three varieties and one hybrid species, distributed in Sino-Himalayan region.

Key to the species of section *Devendraea*

1a. Leaves less than 12 mm long, less than 8 mm broad; peduncle minute, 1 – 5 mm long, shorter than to as long as petiole of subtending foliaceous bract ……..…… 1. *D. myrtillus*
1b. Leaves more than 15 mm long, more than 10 mm broad; peduncle nodding, 10 – 40 mm long, much longer than petiole of subtending foliaceous bract ……..……... 2. *D. angustifolia*

1. ***Devendraea myrtillus*** (Hook.f. & Thomson) Pusalkar, *comb. nov*.

Lonicera myrtillus Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 168. 1858. *L. parvifolia* var. *myrtillus* (Hook.f. & Thomson) C.B. Clarke in Hook.f., Fl. Brit. India 3: 13. 1880.

Following four varieties are recognized:

1a. Leaves and bracts similar (bracts leaf-like) ……..……. 2
1b. Leaves and bracts of different shape (bracts reduced, linear to narrowly oblong or elliptic) ……..…….. 3
2a. Leaves broadly oblong to oblong-elliptic or sub orbicular-oblong; inner surface of corolla tube scabrid ……..……. 1.1 var. *depressa*
2b. Leaves and bracts broadly ovate, sub-orbicular-ovate to ovate-cordate; inner surface of corolla tube hairy ……..…. ……...……... 1.2 var. *cyclophylla*
3a. Leaves and outer corolla surface hirsute …..… 1.3 var. *minutifolia*
3b. Leaves and outer corolla surface glabrous …..… 1.4 var. *myrtillus*

1.1 ***Devendraea myrtillus*** (Hook.f. & Thomson) Pusalkar var. ***depressa*** (Rehder) Pusalkar, *comb. nov*. Fig. 1 C-D

Lonicera myrtillus var. *depressa* Rehder in Sargent, Trees & Shrubs 1: 87. 1903 & in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. Lonicera): 44. 1903. *L. parvifolia* Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 168. 1858, non Hayne, 1822; non Edgew., (1846) 1851. *Caprifolium parvifolium* (Hook.f & Thomson) Kuntze, Revis. Gen. Pl. 1: 274. 1891. *L. depressa* Royle, Ill. Bot. Himal Mts.: 236. 1839, *nom. nud*.

Description: C.B. Clarke in Hook.f., Fl. Brit. India 3: 13. 1880; Buser in Boissier, Fl. Orient. Suppl.: 276. 1888 (under *L. myrtillus*); Rehder (l.c.); Osmaston, Forest Fl. Kumaon: 282. 1927 (as *L. parvifolia*); P.W. Meyer in Grierson & Long (L.S. Springate, ed.), Fl. Bhutan 2(3): 1346. 2001 (under *L. myrtillus*).

Icon: Dippel, Handb.Laubholzk. 1: 254, f. 166. 1889.

Photo: Fig. 1 C-D.

Additional citations: H. Hara, Enum. Flow. Pl. Nepal 2: 196. 1979 (under *L. myrtillus*).

Distribution: Himalaya (Bhutan, China, India (Himachal Pradesh to Sikkim), Nepal).

1.2 ***Devendraea myrtillus*** (Hook.f. & Thomson) Pusalkar var. ***cyclophylla*** (Rehder) Pusalkar, *comb. nov.*

Lonicera myrtillus Hook.f. & Thomson var. *cyclophylla* Rehder in J. Arnold Arbor. 22: 579. 1941; Hsu & Wang, Fl. Republ. Sin. 72: 156. 1988.

Description: Rehder (l.c.), Hsu & Wang (l.c.).

Icon: Hsu & Wang, Fl. Republ. Sin. 72: 157, Pt. 38, f. 9-10. 1988.

Distribution: Himalaya (China).

1.3 ***Devendraea myrtillus*** (Hook.f. & Thomson) Pusalkar var. ***minutifolia*** (Kitam.) Pusalkar, *comb. nov*.

Lonicera minutifolia Kitam. in Acta Phyt. Geobot. 15: 133. 1954 & in H. Kihara (ed.), Fauna Fl. Nepal Himalaya: 232-233. 1855.

Description: Kitam. (l.c.).

Icon: Kitam. in H. Kihara (ed.), Fauna Fl. Nepal Himalaya: f. 63 a-g. 1855.

Distribution: Himalaya (China (Xizang), Nepal).

1.4 ***Devendraea myrtillus*** (Hook.f. & Thomson) Pusalkar var. ***myrtillus***

Description: C.B. Clarke in Hook.f., Fl. Brit. India 3: 13. 1880; Polunin & Stainton, Flow. Himalaya: 168.

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1984; Akhter in Nasir & Ali (eds.), Fl. Pakistan 174: 22. 1986 (excl. var. *depressa*); Hsu & Wang, Fl. Republ. Sin. 72: 155. 1988.

Icon: Dippel, Handb. Laubholzk. 1: 254, f. 166. 1889; Rehder in Sarg., Trees & Shrubs 1: 87, Pt. 44. 1903; Schneid., Ill. Handb. Laubholzk. 2: 684, f. 436 d-e. 1911; Polunin & Stainton, Flow. Himalaya: 472, f. 2. 1984; Akhter in Nasir & Ali (eds.), Fl. Pakistan 174: f. 6 A-B. 1986.

Additional citations: Rehder, in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. Lonicera): 44. 1903; H. Hara, Enum. Flow. Pl. Nepal 2: 196. 1979 (excl. syns.); Hsu & Wang (l.c.).

Distribution: Himalaya (Bhutan, China, India (Jammu & Kashmir to Sikkim), Myanmar, Nepal, Pakistan).

2. ***Devendraea angustifolia*** (Wall. ex DC.) Pusalkar, *comb. nov*.

Lonicera angustifolia Wall. ex DC., Prodr. 4: 337. 1830. *Caprifolium angustifolium* (Wall. ex DC.) Kuntze, Revis. Gen. Pl. 1: 274. 1891.

Description: C.B. Clarke in Hook.f., Fl. Brit. India 3: 13. 1880; Collet, Fl. Siml.: 224. 1902; Bamber, Pl. Punjab: 56. 1916; Osmaston, Forest Fl. Kumaon: 279. 1927; Polunin & Stainton, Flow. Himalaya: 167. 1984; Hsu & Wang, Fl. Republ. Sin. 72: 156. 1988; P.W. Meyer in Grierson & Long (L.S. Springate, ed.), Fl. Bhutan 2(3): 1347. 2001.

Icon: Morren, Belg. Hort. 8: 262. f. 71. 1858; Dippel, Handb. Laubholzk. 1: 254, f. 167. 1889.

Photo: Stainton, Flow. Himalaya suppl.: Pt. 45, no. 204. 1988.

Additional citations: Reher, in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. Lonicera): 45. 1903; H. Hara, Fl. E. Himalaya 1: 318. 1966 & 2: 125. 1971; H. Hara, Enum. Flow. Pl. Nepal 2: 195. 1979; Hsu & Wang (l.c.).

Distribution: Himalaya (Bhutan, China (Xizang), India (Jammu & Kashmir to Sikkim, Assam), Nepal).

* ***Devendraea myrtilloides*** (Perpus) Pusalkar, *comb. nov*.

Lonicera myrtilloides Perpus, Mitt. Deutsch. Dendrol. Ges. 16: 255, t. 9. 1908 & in Fedde. Repert. 7: 361. 1909.

The type based on cultivated material is now lost and the name is mostly applied to specimens with characters indermediate between *D. angustifolia* and *D. myrtillus* (Meyer, 2001). The species is suggested as a possible hybrid between two species (Rüdenberg and Green, 1966; Meyer, 2001).

Description: Perpus (l.c.).

Icon: Perpus (l.c.); Schneider, Ill. Handb. Laubholzk. 2: 684, f. 436 a-c & f. 437 b-c. 1911.

Additional citations: H. Hara, Fl. E. Himalaya 2: 125. 1971 & 3: 106. 1975; H. Hara, Enum. Flow. Pl. Nepal 2: 196. 1979.

Distribution: Himalaya (India (Sikkim), Nepal).

Section 2: ***Tomentellae*** Pusalkar, *sect. nov.*

Flores nutantes; stylus tubo corollae aequalis; ovarium et fructus (geminato-florum) omnino connatus; ovarium 3-loculatum.

Flowers nodding; style as long as corolla tube; ovary and fruits (of paired flowers) wholly connate; ovary 3-loculed.

Type species: *Devendraea tomentella* (Hook.f. & Thomson) Pusalkar

Lonicera tomentella Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 167. 1858.

A section represented by two taxa including one species and one variety distributed in the Eastern Himalayan region of China, Nepal and Bhutan.

1. ***Devendraea tomentella*** (Hook.f. & Thomson) Pusalkar, *comb. nov.*

Lonicera tomentella Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 167. 1858. C*aprifolium tomentellum* (Hook.f. & Thomson) Kuntze, Revis. Gen. Pl. 1: 274. 1891.

Following two varieties are recognized:

1a. Leaves glabrous above or hairy on midvein, villose beneath …..… ……..……..……..……. 1.1 var. *tomentella*

1b. Leaves glaucous above, glabrous beneath …. 1.2 var. *tsarongensis*

1.1 ***Devendraea tomentella*** (Hook.f. & Thomson) Pusalkar var. ***tomentella***

Description: C.B. Clarke in Hook.f., Fl. Brit. India 3: 12. 1880; Hsu & Wang, Fl. Republ. Sin. 72: 156-158. 1988; Stainton, Flow. Himalaya Suppl.: 27. 1988; P.W. Meyer in Grierson & Long (L.S. Springate, ed.), Fl. Bhutan 2(3): 1347. 2001.

Icon: Hook.f., Bot. Mag.: 106, f. 6486. 1910.

Photo: Stainton, Flow. Himalaya suppl.: Pt. 45. no. 208. 1988.

Additional citations: H. Hara, Enum. Flow. Pl. Nepal 2: 197. 1979; Hsu & Wang, Fl. Reipubl. Sin. 72: 156. 1988.

Distribution: Himalaya (Bhutan, China, India (Sikkim), Nepal).

1.2 ***Devendraea tomentella*** (Hook.f. & Thomson) Pusalkar var. ***tsarongensis*** (W.W. Sm.) Pusalkar, *comb. nov.*

Lonicera tomentella Hook.f. & Thomson var. *tsarongensis*

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W.W. Sm. in Not. Roy. Bot. Gard. Edinburgh 8: 168. 1921; Hand.-Mazz., Symb. Sin. 7: 1043. 1936; Hsu & Wang, Fl. Republ. Sin. 72: 158. 1988; P.W. Meyer in Grierson & Long (L.S. Springate, ed.), Fl. Bhutan 2(3): 1347. 2001.

Description: W.W. Smith (l.c.); Hsu & Wang (l.c.); P.W. Meyer (l.c.).

Additional citations: Hsu & Wang (l.c.); P.W. Meyer (l.c.).

Distribution: Himalaya (Bhutan, China).

Section 3: ***Rupicolae*** Pusalkar, *sect. nov.*

Flores erectus vel patens; staminibus inclusus, medio corollae insurtus; stylus tubo corollae in longitudinem dimidius; ovarium et fructus (geminato-florum) distinctus vel basaliter connatus.

Flowers erect or patent; stamens inserted at or below the middle of corolla tube, included within tube; style half as long as corolla tube; ovaries and fruits (of paired flowers) distinct or fused only at the base.

Type species*: Devendraea rupicola* (Hook.f. & Thomson) Pusalkar

Lonicera rupicola Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 168. 1858.

A section represented by three taxa including two species and one variety distributed in Sino-Himalayan region.

Key to the species of section *Rupicolae*

1a. Very small shrubs, up to 5 cm high; calyx lobes broadly ovate, obtuse; leaves 5 – 8 mm long ……..…..1. *D. minuta*
1b. Medium-sized shrubs, 30 – 80 cm high, with rigid, subspinescent branches; calyx lanceolate or ovate-lanceolate, acute; leaves 10 – 30 mm long ……...…… 2. *L. rupicola*

1. ***Devendraea minuta*** (Batalin) Pusalkar, *comb. nov*.

Lonicera minuta Batalin in Acta Hort. Petrop. (Trudy Imp. S.-Peterburgsk. Bot. Sada) 13: 170. 1892.

Description: Batalin (l.c.); Wolf, Gartenfl. 42: 331. 1893; Hsu & Wang, Fl. Republ. Sin.: 161. 1988.

Icon: Rehder, in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. Lonicera): 47, Pt. 5. 1903.

Additional citations: Rehder (l.c.).

Distribution: Himalaya (China (Xizang)).

2. ***Devendraea rupicola*** (Hook.f. & Thomson) Pusalkar, *comb. nov*.

Lonicera rupicola Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 168. 1858. *Caprifolium rupicolum* (Hook.f. & Thomson) Kuntze, Revis. Gen. Pl. 1: 274. 1891. *L. thibetica* Bureau & Franch. in Morot. Journ. de. Bot. 5: 48. 1891.

Following two varieties are recognized:

1a. Leaves broadly oblong, oblong-ovate to sub-orbicular-ovate, apex rounded ……..…. 2.1 var. *syringantha*
1b. Leaves elliptic to oblong-elliptic, apex acute ….. 2.2 var. *rupicola*

2.1 ***Devendraea rupicola*** (Hook.f. & Thomson) Pusalkar var. ***rupicola*** Fig. 1 A-B

Description: C.B. Clarke in Hook.f., Fl. Brit. India 3: 13. 1880; Osmaston, Forest Fl. Kumaon: 283. 1927; Polunin & Stainton, Flow. Himalaya: 166. 1984; Hsu & Wang, Fl. Republ. Sin. 72: 158. 1988; P.W. Meyer in Grierson & Long (L.S. Springate, ed.), Fl. Bhutan 2(3): 1347. 2001.

Icon: Hsu & Wang, Fl. Reipubl. Sin. 72: 160, Pt. 39. f. 1-6. 1988.

Photo: Fig. 1, A, B; Polunin & Stainton, Flow. Himalaya: Pt. 53, no. 587. 1984.

Additional citations: Reher, in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. Lonicera): 46. 1903; H. Hara, Enum. Fl. Pl. Nepal 2: 196. 1979.

Distribution: Himalaya (Bhutan, China (Xizang), India (Uttarakhand, Sikkim), Nepal).

2.2 ***Devendraea rupicola*** (Hook.f. & Thomson) Pusalkar var. ***syringantha*** (Maxim.) Pusalkar, *comb. nov*.

Lonicera syringantha Maxim. in Bull. Acad. Sci. St.-Petersbourg 24: 49. 1878 & in Mel. Biol. 10: 77. 1878. *L. syringantha* var. *minor* Maxim. l.c. *Caprifolium syringanthum* (Maxim.) Kuntze, Revis. Gen. Pl. 1: 274. 1891. *L. syringantha* var. *wolfii* Rehder, in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. Lonicera): 47. 1903. *L. rupicola* Hook.f. & Thomson var. *syringantha* (Maxim.) Zabel in Beiss. & al., Handb. Laubholzk. 462. 1903.

Description: Maximovicz (l.c.); Hsu & Wang, Fl. Republ. Sin.: 159. 1988.

Icon: Wolf, Gartenfl. 41: 564, f. 115–116. 1892; C.H. Wight in Bot. Mag. t. 7989. 1904; Schneider, Ill. Handb. Laubholzk. 2: 685, f. 436 m, 437 g. 1911; Hsu & Wang (l.c.), Pt. 39, f. 7.

Additional citations: Rehder (l.c.), p. 46; Hsu & Wang (l.c.); H. Hara, Fl. E. Himalaya 2: 126. 1979.

Distribution: Himalaya (China (Xizang, Kansu)).

Section 4: ***Spinosae*** (Rehder) Pusalkar, *comb*. et *stat. nov*.

Lonicera L. sub-section *Spinosae* Rehder in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. Lonicera): 48. 1903.

Flowers erect; stamens inserted at or near the mouth of corolla tube, exserted; style as long as or slightly longer than corolla tube, partly exserted from tube; ovary and fruits (of paired flowers) distinct or connate only at the base.

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Type species: *Devendraea spinosa* (Jacquem. ex Decne.) Pusalkar

Xylosteum spinosum Jacquem ex Decne. in Jacquemont, Voy. Inde. 4(Bot.): 78, t. 86. 1835–(ante) June 1842.

A section comprising two species, viz., Sino-Himalayan endemic *D. spinosa* and Central Asian endemic *D. alberti*.

Key to the species of section *Spinosae*

1a. Shrub with weak, hanging, non-spinescent branches; corolla lobes oblong ……. 1. *D. alberti*
1b. Shrub with sub spinescent, stiff, interlacing (not hanging) branches; corolla lobes ovate …….. 2. *D. spinosa*

1. ***Devendraea alberti*** (Regel) Pusalkar, *comb. nov*.

Lonicera alberti Regel in Trudy Imp. St.-Peterburgsk. Bot. Sada 7, 2: 550. 1880. *L. spinosa* var. *alberti* (Regel) Zabel in Ruempler, Ill. Gartenbau-Lex.: 3468. 1901.

Description: Regel (l.c.); Pojarkova in Schischkin, Fl. USSR 23: 570. 1955 (Engl. Transl. 2000); Hsu & Wang, Fl. Republ. Sin. 72: 162. 1988.

Icon: Regel, Gartenfl. 30: 387, Pt. 1065. 1881; Dippel, Handb. Laubholzk 1: 255, f. 168. 1889; Hook.f. in Curtis, Bot. Mag.: 121, Pt. 7394. 1895; Schneider, Ill. Handb. Laubholzk 2: 886. t. 1. f. 1-2. 1911.

Additional Citations: Rehder (l.c.); Pojarkova (l.c.).

Distribution: Central Asia (China (Tienshan, Xingjiang), Russia (Dzungar-Alatau, Pamir-Alai,), Turkestan).

2. ***Devendraea spinosa*** (Jacquem. ex Decne.) Pusalkar, *comb. nov*.

Xylosteum spinosum Jacquem ex Decne. in Jacquemont, Voy. Inde 4(Bot.): 78, t. 86. 1835 – (ante) June 1842. *Lonicera spinosa* (Jacquem ex Decne.) Walp., Repert Bot. Syst. 2(3): 449. 1843. *Lonicera linearis* Royle ex Hook.f. & Thomson in J. Proc. Linn. Soc., Bot. 2: 168. 1858. *Caprifolium spinosum* (Jacquem. ex Decne.) Kuntze, Revis. Gen. Pl. 1: 274. 1891.

Description: Jacquemont (l.c.); C.B. Clarke in Hook.f., Fl. Brit. India 3: 13. 1880; Bamber, Pl. Punjab: 56. 1916; Osmaston, Forest Fl. Kumaon: 281. 1927; Wendelbo in Rechinger (eds.), Fl. Iran. 10: 7. 1965; Polunin & Stainton, Flow. Himalaya: 166. 1984; Hsu & Wang, Fl. Republ. Sin. 72: 161. 1988; P.W. Meyer in Grierson & Long (L.S. Springate, ed.), Fl. Bhutan 2(3): 1348. 2001.

Icon: Jacquemont (l.c.), t. 86.

Photo: Polunin & Stainton, Flow. Himalaya: Pt. 53, no. 588. 1984.

Additional citations: Rehder in Ann. Rep. Missouri Bot. Gard. (Synops. Gen. *Lonicera*): 48. 1903; Hara & Williams, Enum. Flow. Pl. Nepal 2: 196. 1979; Hsu & Wang (l.c.).

Distribution: Himalaya (Afghanistan, China, India (Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim), Nepal, Pakistan).

Note: *D. myrtillus* is selected here as the type species for the following reasons: (1) *D. myrtillus* with floral characters, viz., nodding flowers and style half as long as corolla seems to be the primitive condition, strictly dependant on insect visitors for pollination, as stigma is neither exserted/exposed nor coming in contact with self-stamens due to nodding condition (sect. *Devendraea*), thus representing the base group; (2) one line of evolution by developing elongated/exserted style with exposed stigma (in sect. *Tomentellae*) seems to have increased chances of cross-fertilization; (3) similarly, by evolution through another line, by making flowers erect (in sect. *Rupicolae*) an option of self fertilization seems to have secured; (4) finally, to achieve the best possibility of cross fertilization, this second line probably lead to acquire characters like elongated style with exserted stigma and elongated filaments with exserted anthers and with further deepening of corolla lobes, filaments acquired the position at corolla tube mouth as in sect. *Spinosae*.

Zygomorphic condition with characters like development of inconspicuously bilabiate corolla (with slightly larger lower lip) subsequently leading to typical bilabiate corolla (with 4-lobed upper lip and undivided lower lip), development of saccate gibbosity for honey storage (more conspicuously developed in species with horizontally nodding flowers with bilabiate corolla), and long exserted anthers and style are seems to be developments in the latter phase of evolution, proposed here to be treated under *Lonicera* proper (*sensu stricto*).

ACKNOWLEDGEMENT

The author is grateful to Dr. M. Sanjappa ex-Director, Botanical Survey of India for providing facilities, to Dr. V.P. Prasad, Indian Botanic Liaison Officer, Royal Botanic Garden, Kew, UK, for generous help with relevant literatures and specimen/type details at K and BM herbaria. Help and guidance rendered by Dr. D.K. Singh, Director-in-Charge, Botanical Survey of India, is expressed by naming the new genus after him. Author is also thankful to the Head of Office, Northern Regional Centre, BSI, Dehradun for encouragement.

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喜馬拉雅區域的忍冬科（Caprifoliaceae）新屬

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(收稿日期：2010 年 10 月 28 日；接受日期：2011 年 4 月 1 日)

摘要：一群分布於中國-喜馬拉雅區域的忍冬科（Caprifoliaceae）物種，因具有輻射對稱的花冠、5 個蜜腺、等長或較長的花絲，以及平坦或隆起的葉芽，但無（儲存蜜的）側囊狀突起等特徵，可以與忍冬屬（*Lonicera*）植物區別，從該屬分出而成為新屬 – *Devendraea* Pusalkar。本文描述此新屬。

關鍵詞：忍冬科、*Devendraea*、喜馬拉雅、忍冬屬、新屬。

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