

A. PRAMANIK* & K. THOTHATHRI*: **Notes on the taxonomy, distribution and ecology of *Lespedeza juncea* complex with special reference to India**

A. プラマニク*・K. トタトリ*: インドを中心とする
カラメドハギ群の分類と分布

Lespedeza juncea (L.f.) Pers. and its near allies have long been reported to occur in India but varied opinions have been expressed from time to time concerning their status and distribution. A comprehensive field and herbarium study, undertaken by the authors has helped to solve the above subject.

Plants belonging to this complex occur mostly in high altitude. Perhaps because of difficulties in collection of some of the members during the proper phenological season, they have often been either neglected or collected in fragmentary parts. At least two taxa of this complex were described either without flower or fruit, thus resulting in wrong evaluation of their identity as well as distribution.

Taxonomy, distribution and ecology of five taxa of *Lespedeza juncea* complex, namely, *L. juncea* (L.f.) Pers., *L. sericea* (Thunb.) Miq., *L. variegata* Camb., *L. kanoariensis* Camb. and *L. juncea* var. *subsessilis* Miq. based on field observations as well as herbarium studies have been made taking into consideration the different views and interpretations of earlier workers on this group.

Taxonomy The complex is characterised by having diffuse, procumbent or erect stem. Flowers of two types, like perfect although hardly maturing into fruits and fertile but usually lacking stamens and petals; the latter either on the same few-flowered peduncles or in sessile glomerule. Calyx shortly bilabiate, the upper segments mostly united at the base. Corolla violet and purple, longer than the calyx. Pods mostly produced by the apetalous flowers which are small and usually overlooked until the formation of pods. Ovary surrounded by calyx and or the rudiments of petals and filaments. This persistent character differentiates this group from allied genera such as *Stylosanthes*, *Chapmannia*, etc. characterised by naked ovary.

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Of the complex, *L. juncea* (L.f.) Pers. shows much elasticity in its morphological characters within a short range. In general appearance it resembles strikingly any of the other members in its immature, and sometimes in mature forms as well. Thus, the pertinent question is whether to treat the complex as a single species containing several well-defined varieties and forms or to treat the members of the complex as distinct species. Our studies have confirmed the former view.

In the present treatment little reliance is placed on the degree of union of the calyx-teeth as compared to that of the respective bracteole-length, clinging nature of calyx-teeth to the pods, articulations of calyx-teeth, texture of leaflets, general habit of the plants, etc.

The mean character differences of *L. sericea* (Thunb.) Miq. from *L. juncea* (L.f.) Pers. in habit, shape of leaflets, inflorescences, hairiness of calyx, etc. tend to treat the former as a variety of the latter. *L. variegata* Camb. and *L. kanaoriensis* Camb. are two different taxa having distinct affinity to *L. juncea* but when originally described pods in the former and flowers in the latter were unknown. These created doubts and confusion among workers. Sometimes *L. kanaoriensis* is considered as a variety of *L. sericea* under series *Juncea* Max. and *L. variegata* treated as a distinct species under series *Lespedezaria* T. & Gr. (Maximowicz 1873). Some consider them conspecific (Baker 1876, Ali 1966) and still others treat the former as a variety (Ali 1966), forma (Ohashi 1975) and even the both as synonyms of *L. juncea* (Baker 1876). In fact, Maximowicz's *L. variegata* is a gathering of typical *L. variegata* Camb. and a new unnamed taxon having similarities with *L. juncea* but differs in qualitative characters like shape and texture of leaflets, comparative length of calyx-pod, etc., whereas the true *variegata* is closely allied to *L. sericea* with few such differences which would be clearly seen in the key given below. The new plant can be considered as a forma of *L. juncea* with name *L. juncea* f. *pseudovariegata*. Prain who examined Maximowicz's *L. variegata* comments '... taste Maxim. Lespedez. 48' on the specimen Falconer 442 identified by Maximowicz as *L. variegata* Camb. He was also in doubt about the identity of true *variegata* as he found some specimens of *L. juncea* var. *subsessilis* Miq. probably unknown to him having some characters in common with *L. variegata* Camb. He made few comments also on these herbarium sheets with a hope to rename them as *L. sericea* var. *gracilis* MSS.=*L. variegata* Camb. in part. Incidentally, he described a new

variety *L. sericea* var. *longipetiolata* which in fact is true *L. variegata* Camb. A.K. Schindler, however, identified all such confusing sheets as *L. variegata* Camb. without going into the details of the problem.

In the present study overcoming all such confusions and seeing the degree of affinities among the different taxa of the complex, suitable status for each of the above taxa is reassessed as follows:

Lespedeza juncea (L.f.) Pers., Syn. Pl. 2: 318 (1807).

Hedysarum junceum L.f., Decas Prima, Pl. Hort. Upsl. 1: t. 4 (1762) et Linn., Sp. Pl. ed. 2: 1063 (1763).

Type: Linnaeus f., Decas Prima Pl. t. 4. 1762.

forma **kanaoriensis** (Camb.) Pramanik et Thoth., stat. nov.

L. kanaoriensis Camb. in Jacquem. Voy. 4(BOT): 42. t. 51 (1844).

L. sericea var. *kanaoriensis* (Camb.) Maxim. in Act. Hort. Petrop. 2: 368 (1873).

L. juncea sensu Bak. in Hk.f.'s Fl. Brit. Ind. 2: 142 (1876) in part.

Type: In herbosis montium provinciae Kanaor. Jacquemont (P).

forma **pseudovariegata** Pramanik et Thoth., forma nov.

Lespedeza variegata sensu Maxim. (non Camb.) in Act. Hort. Petrop. 2: 374 (1873) in part.

Formae typicae proxime affinis, a qua differt foliolis coriaceis oblongo-obovatis, subobtusis, dentibus calycis setaceis, bracteolis quam calycis connatis basibus longioribus, uterque sessilibus obreniformibus, leguminibusque pedunculatis elliptico-apiculatis.

Type: Kashmir: Falconer no. 442 (Holotype-CAL; Isotype-K).

var. **sericea** (Thunb.) Forbes & Hemsl. in Journ. Linn. Soc. Bot. 23: 181 (1887).

Hedysarum sericeum Thunb., Fl. Jap.: 287 (1784) non Mill. 1768 nec. Vahl 1791.

Lespedeza sericea (Thunb.) Miq., Ann. Mus. Ludg.-Bat. 3: 49 (1867).

L. juncea ssp. *sericea* (Thunb.) Steen, Nova. Guin. 6: 280 (1955).

Type: Iaponice: In Kosido, prope Nagasaki (Herb. Uppsala-G)

forma **variegata** (Camb.) Ohashi in Fl. E. Him. 3: 66 (1975).

Lespedeza variegata Camb. in Jacq. Voy. 4(BOT): 42. t. 50 (1844).

L. variegata sensu Maxim. in Act. Hort. Petrop. 2: 374 (1873) in part.

L. sericea (Thunb.) Miq. var. *longipetiolata* Prain in Journ. Asiat. Soc. Beng.

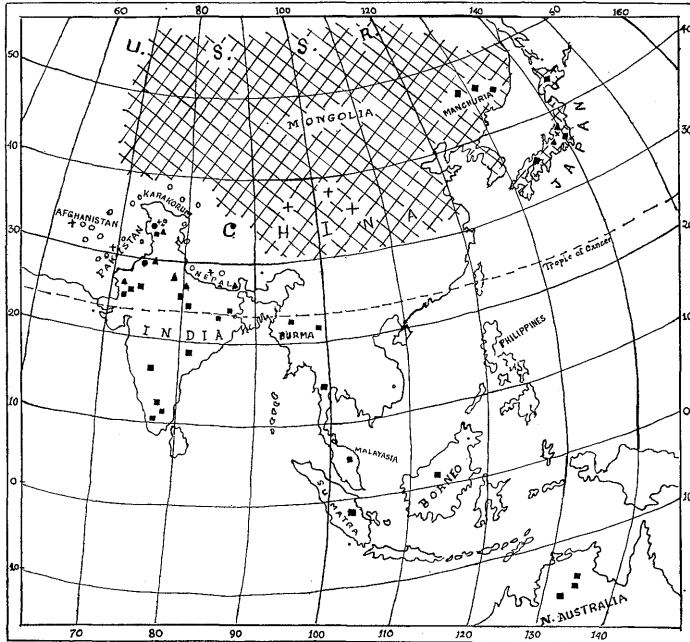


Fig. 1. Distribution of *Lеспедеза juncea* complex. ▣: *L. juncea*. ●: *L. juncea* f. *kanaoriensis*. ○: *L. juncea* f. *pseudovariegata*. ■: *L. juncea* var. *sericea*. +: *L. juncea* var. *sericea* f. *variegata*. ▲: *L. juncea* var. *sericea* f. *subsilis*.

66(2) : 374 (1897).

L. juncea sensu Bak. (non Pers.) in Hk. f.'s Fl. Brit. Ind. 2: 142 (1876) in part.

L. juncea var. *variegata* (Camb.) Ali in Biologia 12(2) : 41 (1966).

Type: In siccis supra pagum Bandhapour in regno Cachemir. Jacquemont (P).

forma **subsessilis** (Miq.) Pramanik et Thoth., stat. nov.

Lеспедеза juncea var. *subsessilis* Miq. in Ann. Mus. Bot. Lugd.-Bat. 3: 49 (1867).

L. sericea var. *latifolia* Maxim. in Act. Hort. Petrop. 2: 369 (1873).

L. serpens Nakai in Lesp. of Jap. & Korea: 75 (1927).

L. latissima Nakai in Lesp. of Jap. & Korea 76 (1927).

Type: Korea: Oldham no. 534 (K ?).

A workable key to the complex is given below :

- A. Slender herb, 30-60 cm high; branches up to 30 cm long, erecto-patent; leaves distant, long-petioled; odd leaflets with distinct, long rachis, oblanceolate-elliptic, subacute, 3-4 times as long as broad, narrowed gradually in the lower half; lower leaflets larger, membranous and rust-coloured, upper ones sub-coriaceous, small, green to grey-coloured; flowers sessile or in shortly peduncled corymbose racemes in the leaf-axils; bracteoles smaller than connate calyx-base, calyx-teeth in fruit broad trinangular, lax pubescent, ridged, 3-nerved, curved inwards to the pods; pods oblong, as long as the calyx-teeth *L. juncea* var. *juncea*
- B. Calyx-teeth broad triangular, incurved, 3-ridged nerved, sparse pubescent. *L. juncea* f. *juncea*
- B B. Calyx-teeth linear-setaceous, straight, single ridged nerved with two obscure side nerves, persistent pubescent.
- C. Leaflets apex obtuse, membranous. Bracteoles shorter than connate calyx-base. Calyx-teeth 3/4 the pod-length, subtended. Pods pedunculate, round with attenuate base *L. juncea* f. *kanaoriensis*
- C C. Leaflets apex sub-obtuse, more rigid. Bracteoles longer than connate calyx-base. Sessile axillary pods obreniform; pedunculate pods elliptic-apiculate, equalling the spreading calyx-teeth
..... *L. juncea* f. *pseudovariegata*
- A A. Undershrub, 60-100 cm high, erect; leaves crowded, short-petioled; leaflets sessile, linear, truncate or emarginate, 4-6 times as long as broad, narrowed downwards gradually from broad apex, rigidly coriaceous; flowers congested, sessile or on short pedicels in the leaf-axils; bracteoles longer than connate calyx-base; calyx-teeth in fruit densely pubescent, obscurely nerved straight, spreading, as long as half or less than pod-length; pods round
..... *L. juncea* var. *sericea*
- D. Stem-base shrubby, above diffused, short-branched (up to 15 cm long); leaves distant, long-petioled; leaflets obovate-obtuse, occasionally retuse, membranous, glabrous above
..... *L. juncea* var. *sericea* f. *variegata*
- D D. Prostrate or suberect, small herb; leaflets small, triangular, retuse, white, spreading villous pubescent throughout; flowers and pods very small *L. juncea* var. *sericea* f. *subsessilis*

Distribution and ecology In general all members of the complex occur in the eastern part of the Old World with the only exception of var. *sericea* also found in the New World, as cultivated. *Lespedeza juncea* is mesophytic, medium tall and is typical inhabitant of high altitude (up to 3000 m) in temperate regions like Siberia, Dahuria, Amur of U.S.S.R. It is also reported from China, Mongolia and Japan where the ecological conditions are similar. Originally *L. juncea* was described from Siberia and Tatarin with doubts about its occurrence in India. Baker, however, tried to establish its Indian distribution by reducing two allied species (*L. variegata* Camb. and *L. kanaoriensis* Camb.). In fact, typical *L. juncea* (L.f.) Pers. does not occur in India and its distribution is more or less limited within the eastern parts of the Old World approximately between 54°00 and 33°00 north latitude and between 75°00 and 140°00 east longitude.

L. juncea f. *kanaoriensis* prefers humidity and high altitude and is confined to Kashmir-Himalaya up to 1680 m. It extends further southward up to Punjab where plants have narrow elliptic leaflets. *L. juncea* f. *pseudovariiegata*, originally reported from Kashmir occurs in northern Himalaya (Kashmir to Nepal) and western Himalaya of Pakistan (Oghi) reaching up to 2416 m.

L. juncea var. *sericea* is the only representative of the group occurring in both temperate and tropical climates. It is found in mountains, ascending up to 2666 m where they are bushy with stiff stems. In the tropics it is confined to the high table land ascending to ca 2100 m. In the eastern parts of the Old World, the distribution pattern ranges from Afghanistan in the west to Ryukyu of Japan in the east and from Manchuria at 46°N as far as Northern Australia at 20°S. Within these limits the plant covers mostly Afghanistan, Malaysia, Philippines and N. Australia. Recently in the New World this perennial plant is introduced in North America for soil erosion. In India the plant is distributed in Rajasthan, Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh, Assam, Meghalaya, Arunachal Pradesh, West Bengal, Bihar and Tamil Nadu. However, its prostrate, weak, small, herbaceous form, *L. juncea* var. *sericea* f. *subsessilis*, occurs only in temperate situations like Kashmir, Punjab, Himachal Pradesh, Nepal and Japan up to 2666 m. Forma *variegata*, however, shows no apparent difference in ecology from that of *L. juncea* f. *pseudovariiegata* having its type locality in Kashmir and with an extended distribution in east and west Asia (China, Pakistan and Afghanistan).

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広義のカラメドハギについて研究し、それに含まれると見られる狭義の *Lespedeza juncea* と、*L. juncea* var. *subsessilis*, *L. sericea*, *L. variegata*, *L. kanaoriensis* の5タクサについて、標本及び野外での観察から整理し、2変種4品種にまとめ、それぞれの分布について論じた。

□Hara, H. & H. Ohba: **Catalogue of the type specimens preserved in the Herbarium, Department of Botany, The University Museum, The University of Tokyo. Pt. 2. Caprifoliaceae and Adoxaceae.** 46 pp., 180 pls. 1983. 東京大学総合研究資料館植物部門. 非売品. この頃タイプ標本の所在をはっきりさせる業績がでていますが、これもその一つである。本書ではABC順に学名、出典、タイプの種類、標本の産地、採集者名と年月日を掲げ、あとに一括して標本の写真と一部の拡大がページ大にのせてある。地味ではあるが基本的なこのような出版は、今後ともぜひ出してもらいたいものである。(前川文夫)