THE GENUS ARGYROLOBIUM ECKL. & ZEYH. (PAPILIONACEAE) IN W. PAKISTAN

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The genus *Argyrolobium*, named after silvery nature of fruits of some species, consists of about one hundred thirty species (Hutchinson, 1964). It is widely distributed in South Africa, Madagascar, S. Europe, Western Asia and Indo-Pakistan sub-continent.

The genus was placed in the tribe Genistae by Bentham and Hooker (1865) and Baker (1876). Recently Hutchinson (1964) has placed *Argyrolobium* in the tribe Lupineae along with only one genus *Lupinus*, indicating the close relationship of the two genera.

In the present paper an attempt has been made to revise the genus from W. Pakistan. In all only three species and five taxa have been recognised, including one new subspecies, *A. roseum* ssp. *elongatum* Ali. *A. ornithopodioides* Jaub.& Spach has been reduced to the level of subspecies under *A. roseum* (Camb.) Jaub. & Spach. [*i.e. A. roseum* ssp. *ornithopodioides* (Jaub. & Spach) Jafri & Ali] and *A. stenophyllum* Boiss., hitherto known from Afghanistan is being reported for the first time from W. Pakistan also.

The following subdivisions of the area have been recognised: Kashmir, N.W. F. Province, Baluchistan, Punjab and Sind. The information about the flowering period of the taxa refers to plants from W. Pakistan and may not be applicable elsewhere. The recommendations of Lanjouw and Stafleu (1964) have been followed regarding the abbreviated names of the herbaria cited, with the following additions: Karachi University Herbarium (KUH) and Herbarium of Dr. S. M. H. Jafri (HJ).

Argyrolobium Eckl. & Zeyh., Enum.: 184. 1836 (conserved name).

Type: *A. argenteum* (N.J. Jacquin) Eckl. & Zeyh. (*Crotolaria argentea* N. J. Jacquin) type conserved.

Key to species and subspecies.

1. Leaflets obovate — 3
   Leaflets not obovate — 2
2. Leaflets linear lanceolate, plant whitish hoary. — 1. *A. stenophyllum*

	Leaflets oval, plant brownish	2. *A. flaccidum*
3.	Pod c. 3.4-3.5 cm. long	3b. *A. roseum* ssp. *elongatum*
	Pod < 3 cm. long	4
4.	Pod c. 1.9 cm. or less long	3c. *A. roseum* ssp. *ornithopodioides*
	Pod c. 2-3 cm. long	3a. *A. roseum* ssp. *roseum*

Enumeration of taxa

1. *Argyrolobium stenophyllum* Boiss., Fl. Or. 2: 32. 1872.

Holotype: Afghanistan, Griffith 1179 (G-not seen). Type number (K).
Synonymy: Nil.

Description: Perennial herb. Tap root upto 4-5 mm. thick. Stem branched pilose. Leaf stipulate, stipules free lateral, c. 4 mm. long; palmately compound; petiole c. 3-8 mm. long. Leaflets c. 8-23 mm. long, c. 2-3.5 mm. wide, lanceolate, entire, acute, pilose on both sides, sometimes subglabrous above. Inflorescence 1-4 flowered raceme; peduncle upto c. 3 cm. long. Flower pedicellate, pedicel c. 1-2 mm. long; bract linear, c. 2-2.5 mm. long, pilose. Calyx c. 6 mm. long, bilabiate, upper teeth c. 2-2.5 mm., lower teeth c. 1 mm. long. Vexillum c. 5-6 mm. long, c. 3 mm. broad, wing c. 4.5 mm. long, c. 1.5 mm. broad, claw <1 mm. long; keel c. 6 mm. long, c. 2 mm. broad, claw c. 1 mm. long. Stamens monoadelphous, filaments c. 5 mm. long. Ovary sessile, c. 5-6 mm. long, c. 1-1.5 mm. broad, densely pilose, style glabrous, curved, c. 3 mm. long, stigma slightly globular. Fruit c. 2-3 cm. long. 3-5 mm. broad, pilose, hairs brown, 5-8 seeded, dehiscent along both the sutures.

Representative Specimens:

N.W.F. Province: Kohat Pass, c. 2000 ft., 24-25.4.1957, R.R. Stewart 28217 (K; KUH); Waziristan, trans Indus plains to 7000 ft., J.L. Stewart 89/K to K (K).

Punjab: Rawalpindi, dry hillsides, 10.4.1922, R.R. Stewart 7037 (K); Sodhi, 15.4.1904, J.R. Drummond 14853 (K); Dt. Jhelum, in saxosis, c. 2500 ft. sm., intra mt. salinos versus pagum Bangla, Bagh Ali nuncupatum, 28.4.1904, ex Herb. Drummond 14849 (K); in saxosis c. 2000 ft. sm. intra montes salinos versus castellum antiquum Rotas, dit. Jhelum, 24.4.1904, leg. Kabir, ex Herb. Drummond 14850 (K); Salt ranges, March, 1851, Fleming 83 (K); Punjab Jhelum, Aitchison 342 (K); in saxosis c. 2200 ft. s.m. intra montes salinos dit. Shahpur versus pagum Pahl, 16.4.1904, leg. Kabir, ex Herb. Drummond 14852 (K); Attock Dist., Jhalar, 2.4.1949, R. R. Stewart (RAW); Sakesar, 16.9.1954, Lahore students (RAW).

Distribution: W. Pakistan, Punjab, N.W.F. Province; Afghanistan.

Flowering Period: April.

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This is the first record of this species from W. Pakistan. Previously it has been confused with *A. flaccidum* (Royle) Jaub. & Spach., from which it differs in the shape of leaflets, length of petiole and the general appearance. The leaflets in *A. stenophyllum* Boiss. are linear-lanceolate, whereas in *A. flaccidum* (Royle) Jaub. & Spach they are oval. The length of petiole in *A. stenophyllum* Boiss. varies from 3-8 mm., in *A. flaccidum* (Royle) Jaub. & Spach. it is generally 3-4 mm. but sometimes as long as 6 mm. In general appearance the plants of *A. stenophyllum* Boiss. are more whitish and hoary.

2. *Argyrolobium flaccidum* (Royle) Jaub. & Spach in Ann. Sc. Nat. Ser. 2.19: 48. 1843.

Holotype: Mussooree, 1835, Royle (K).

Synonymy:

1. *Cytisus flaccidus* Royle, Ill. Bot. Him. Mount.: 197.1835.

Description: Baker in Hooker f., Fl. Brit. Ind. 2: 63. 1876.

Representative Specimens:

Punjab: Murree, 20.7.1851, A Fleming (K); Murree, Lawrence Road, common at the side of the road, Aug. 1922, E. M. Saunders (K); Murree-Changla Road, June 1915, E. M. Saunders (K).

Distribution: W. Pakistan, Punjab; India, Punjab, Kumaun, Garhwal.

Flowering Period: July-August.

3. *Argyrolobium roseum* (Camb.) Jaub. & Spach in Ann. Sc. Nat. Ser. 2. 19: 51. Jan. 1843.

a. ssp. *roseum*.

Pod 2-3 cm. long.

Holotype: Mirpour, Jacquemont (P-not seen).

Synonymy:

1. *Cytisus roseus* Camb. in Jacquemont Voy. Bot. 4: 35. t. 40. 1835.

2. *Argyrolobium kotschyi* Boiss. Diagn. Pl. Nov. 1 (6): 32. 1845.

Representative Specimens:

Kashmir: Kashmir, Falconer 411 (K); Jamu, 2000-4000 ft., T. Thomson (K); N.W.F. Province: Sillakhana fort of Cherat Hill, c. 2000 ft., 27.3.1908, H.A. Deane (K); Waziristan, Barwand, 4000 ft., 27.4.1895, J. F. Duthie 15706 (K) E. of Peshawar, common on rocky places, pink-red, 24-25.4.1957, R.R. Stewart (K); Balakot, stony ground, plant prostrate, 19.6.1959, Jafri & Ali (HJ).

Punjab: Jhelum, Aitchison (K); Kangra, Sihunto, 3000 ft., 16.10.1874, C.B. Clarke 23656A (K); Pathankote, 1500 ft., 9.9.1874, C.B. Clarke 21989 E. (K); in glareosis etc. c. 1000 ft., s.m., dit. Shahpur ad radices jugi Sakesar, prope pagum

Kiri golewala, Kabir, 15.9.1902, ex. Herb. Drummond 14591 (K); in glareosis c. 3000 ft. s.m. ad montem Tilla Jogianwala, dit. Jhelam, 25.9.1904, Kabir, ex. Herb. Drummond 14847 (K); 15th. mile Dalhousie Road, 2000 ft., 14.2.1917, R. R. Stewart 1160 (K); Nurpur, Kangra Dist., 2000 ft., on steep rapidly eroding sterile red shaly clay, 17.4.1938, R.N. Parker (K); Hazara, Jhelam valley Road, 1900 ft., pink, July 1921, R. R. Stewart 13549 (K); Rawalpindi, prostrate dry hills, leaves rather fleshy, flos. pink, 13.3.1922, R. R. Stewart (K); Rawalpindi Dist., Panjar, prostrate, 15.9.1959, R. R. Stewart 28551 (KUH); Murree hills, Burbhan 6000 ft., prostrate on gravel, 11,12.9.1959, R. R. Stewart (KUH); Murree Road, shady slopes, northern side, 4000-5000 ft., 13.4.1954, R.R. Stewart 27279 (RAW).

Baluchistan: Fort Sandeman, 4500 ft., 16.5.96, J. F. Duthie 18812 (K); Bugti country, W.M. Jeffreys 10(K); 26 (K).

Persia: Persian gulf, Henjaum island, W. Wykeham Perry (K); Persian gulf, Lingah, W. Wykeham Perry (K); Sinus Persicus australis: in apricis arenosis insulae Kischem., 22.2.1893, J. Bornmuller 255 (K).

Afghanistan: Khyber Pass, rocky mountain, 3700 ft., a procumbent herb, corolla pinkish purple, 15.4.1897. H. H. Johnston 146 (K); From Tor-ghar to Chapri, common, closely appressed to the ground, 6.9.1880, J.E.T. Aitchison 545 (K).,

Arabia: Southern Arabia, 1906, Guy Pilgrim (K); Sud-Arabien, 13 May 1881, G. Schweinfurth 43 (K); Aden, Goldnore valley, near sea level, 2.4.94, W. Lunt 283 (K).

Distribution: W. Pakistan, Kashmir, N.W.F. Province, Baluchistan, Punjab, India, Punjab; Persia; Afghanistan; Arabia.

b. ssp. *elongatum* Ali ssp. nov. (Fig. 1).

Legumen 3.4-3.5 cm. longum.

Holotype: Kumaun, Nainital, 7000 ft., R. Strachey and J. E. Winterbottom 2 (K). Paratype: Nainital et Kalapattin, 2500-6500 ft., fl. rubri, 1852, Strachey & Winterbottom (K).

Distribution: Endemic to Kumaun.

c.ssp. *ornithopodioides* (Jaub. & Spach) Jafri & Ali, stat. nov.

Fruit upto 1.9 cm. long.

Holotype: Punjab, Mirpour near Kekki, April 1830, Jacquemont (P-not seen)

Synonymy:

1. *Argyrolobium ornithopodioides* Jaub. & Spach in Ann. Sc. Nat. Ser. 2.19: 52, Jan. 1843.

Representative Specimens:

Sind: 7 miles east of Kotdiji, whitish lime stone hillocks, common, flowers pinkish, 18.10.61, S. M. H. Jafri 3767 (K); Sind, Stocks (K); Boogtie hills, Vicary



Fig. 1. Holotype of *Argyrolobium roseum* ssp. *elongatum* Ali

(K); Sind, N.E. Dalzell 23 (K); Sind, Stocks 631 (K); Karachi, Clifton, sandy and stony mound of shrine, common on slope, plants minute among small pebbles and sand, 20.4.56, S. M. H. Jafri 1404 (HJ); Karachi, Korangi, sandy roadside rare, flowers with standard pale-pink and the other petals dirty white, 11.4.56, S.M.H. Jafri 1457 (HJ); Sind Sehwan hills, 8.12.55, S.W. Qadri (HJ).

Baluchistan: Mach, Bolan Pass, stony and gravelly dry river bed, 3246 ft., flowers white, 6.5.59, S.M.H. Jafri 2828 (HJ); Between Hirok and Duzan, Bolan Pass, 4500 ft., sandy and stony ground, fairly common, plants prostrate, 8.5.59, S. M. H. Jafri 2960 (K; HJ); Fort Sandeman, 10.5.97, Harsukh 20509 (K); near Quetta, c. 5500 ft., 2-10.5. 1957, R. R. Stewart 28011 (K); Quetta, 1.6.1956, W. A. Dick-Peddie 103 (RAW); Baluchistan, 1851, Stocks 631 (K).

Persia: Persian Baluchistan, Inter Kash (Qwash, Vasht) et Iranshahr, 16.5.1948, K.H. & F. Rechinger 3985-b (K).

Arabia: Aden, in sandy flats, March, 1818, W. Perry (K).

Distribution: W. Pakistan, Sind, Baluchistan; Persian Baluchistan; Arabia, Aden.

Flowering Period: April-October.

A. roseum (Camb.) Jaub. & Spach shows remarkable variation in the length of pods and the number of seeds per pod (Tables 1 and 2). There is a definite correlation between these characters and the geographic distribution. The longest pods (3.4-3.5 cm.) are present in Kumaun and the shortest in Sind and Baluchistan. Similarly the number of seeds per fruit varies from 3 to 14. The largest number of seeds per pod is met with in Punjab, where the seeds per pod vary from 8-14; in Kumaun 11 seeds per pod are present, in Sind the number of seeds per pod varies from 6 to 9 and in Baluchistan 3-9 seeded pods are met with. Thus the correlation of the variation pattern with the geographical distribution seems more pronounced in the length of pods than in the number of seeds per fruit. In view of this topoclinal variation, it has been possible to recognise three subspecies as outlined above. Subspecies *elongatum* Ali is present in Kumaun, ssp. *roseum* is met with in Kashmir, Punjab, N.W.F. Province, Baluchistan, Persia, Afghanistan and Arabia; ssp. *ornithopodioides* (Jaub. & Spach) Jafri & Ali is known from Sind, Baluchistan (including Persian Baluchistan) and Arabia. Thus Baluchistan and Arabia are the regions where ssp. *roseum* and ssp. *ornithopodioides* (Jaub. & Spach) Jafri & Ali overlap each other.

Though *A. triganelloides* Jaub. & Spach and *A. arabicum* Jaub. & Spach are reported by Burkill (1909) from Baluchistan, there is reason to believe that the report is based on misidentification, because true *A. triganelloides* Jaub. & Spach is confined to Persia and *A. arabicum* Jaub. & Spach occurs in Arabia.

Excluded Species:

1. *A.arabicum* Jaub. & Spach in Ann. Sc. Nat. Ser. 2. 19: 51. 1843.
2. *A.triganelloides* Jaub. & Spach in Ann. Sc. Nat. Ser. 2. 19: 50. 1843. Reported from Baluchistan by Burkill (1909) but probably based on misidentifications.
3. *A. strigosum* Blatter in J. Ind. Bot. Soc. 9: 205. 1930.
4. *A. mucilagenum* Blatter in J. Bomb. Nat. Hist. Soc. 36: 481. 1933.
5. *A. purpurascens* Blatter in J. Bomb. Nat. Hist. Soc. 36: 480. 1933.

The types of species 3-5 are untraceable hence the correct identity of these taxa could not be determined.

Summary

Three species of *Argyrolobium* Eckl. & Zeyh. are recognised from W. Pakistan including a new record, *A. stenophyllum* Boiss. The variation in the length of pod and the number of seeds per pod is of topoclinal nature in *A. roseum* (Royle) Jaub. & Spach. The following subspecies are recognised in this species: ssp. *roseum*, spp. *ornithopodioides* (Jaub. & Spach) Jafri & Ali and ssp. *elongatum* Ali.

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TABLE 1
NUMBER OF SEEDS PER POD

Taxa	Locality	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
A. roseum ssp. *elongatum*	Kumaun									2					2
A. roseum ssp. *roseum*	Kashmir								1					1	2
	Punjab						1	1	2	1	1		1		7
	N. W. F. P.							3	1						4
	Baluchistan						1								1
	Persia									4					4
	Afghanistan								1						1
	Arabia						2		1						3
A. roseum ssp. *ornithopodioides*	Sind				1	2		1							4
	Baluchistan	3	3	2	1	1		1							11
	Arabia					1									1
	Total	3	3	2	2	4	4	6	6	7	1		1	1	40

TABLE 2

LENGTH OF LONGEST POD PER PLANT (in cms.).

Taxa	Locality	.8—.9	1.0—1.1	1.2—1.3	1.4—1.5	1.6—1.7	1.8—1.9	2.0—2.1	2.2—2.3	2.4—2.5	2.8—2.9	3.0—3.1	3.2—3.3	3.4—3.5	Total
A. roseum ssp. *elongatum*	Kumaun													2	2
A. roseum ssp. *roseum*	Kashmir									1	1				2
	Punjab							2	3	1		1			7
	N. W. F. P.							2	1	1					4
	Baluchistan							1							1
	Persia							1	1	2					4
	Afghanistan									1					1
	Arabia							3							3
A. roseum ssp. *ornithopodioides*	Sind			1		3									4
	Baluchistan	1	1	3	2	2	2								11
	Arabia						1								1
	Total	1	1	4	2	5	3	9	5	6	1	1		2	40

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