

REVISION OF THE FAMILY TAMARICACEAE FROM PAKISTAN. I. THE  
GENERA *MYRICARIA* DESV. AND *REAUMURIA* LINN\*.

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Abstract.

The Genera *Myricaria* Desv. and *Reaumuria* Linn. are represented by five and four taxa, respectively in Pakistan. *M. germania* (L.) Desv. ssp. *pakistanica* Qaiser is described here for the first time. *R. panjurica* Blatt. & Hallb. is reduced to the subspecific rank under *R. alternifolia* (Labill.) Britten (i.e. *R. alternifolia* (Labill.) Britten ssp. *panjurica* (Blatt. & Hallb.) Qaiser stat. nov.).

**Introduction**

There exists no single work which could be used for the identification of various taxa of the genera *Myricaria* and *Reaumuria* Linn. from Pakistan. Jaubert & Spach (1848) published their first review on the genus *Reaumuria* and enumerated nine species. Out of these six were just the variant of the same species i.e. *Reaumuria alternifolia* (Labill.) Britten. Boissier (1867) revised the family for "Flora Orientalis" which included Baluchistan also, in which he recognized 3 and 9 species of *Myricaria* and *Reaumuria* respectively including *R. stocksii* Boiss. a new species from Baluchistan. Dyer's studies (1874) for Flora of British India were only referable to Punjab, Sind and partly to North West Frontier Province and included the genus *Myricaria* only with 3 taxa. Niedenzu (1895) while revising the family in Engler's "Die Natürlichen Pflanzenfamilien", recognized 10 species of *Reaumuria* and 6 species of *Myricaria*. Schiman-Czeika (1964) revised the family for Rechinger's Flora Iranica. The area covered includes some portion of Pakistan also. She recognized 3 species of *Myricaria* (all from Pakistan) and 11 species of *Reaumuria* (only 2 from Pakistan). Bobrov (1966 & 1967) reviewed the genera *Myricaria* and *Reaumuria*. He reduced the number of *Reaumuria* species to 6 from Irano-Turanian region in comparison to 11 species previously recognized by Schiman-Czeika (1964). Recently Stewart (1972) recorded 4 and 6 taxa of *Myricaria* and *Reaumuria* respectively from the area under consideration.

In the present paper an attempt is made to revise the genera *Myricaria* Desv. and *Reaumuria* Linn. from Pakistan. The information about the flowering period of the taxa given in each case is referable to plants from Pakistan and may not be applicable elsewhere.

**1. *Myricaria***

Desv. in Ann. Sci. Nat. ser. 1, 4: 349. 1825.

Lectotype: *Myricaria germanica* (L.) Desv.

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\*Part of the thesis, submitted to the University of Karachi, for the award of Ph.D. degree.

## Key to the species

- |    |   |   |  |
|----|---|---|--|
| 1. | + | Plants prostrate, raceme 1-3 flowered.  | 1. <b>M. prostrata</b>                               |
|    | - | Plants erect, raceme many flowered.   | 2  |
| 2. | + | Racemes lateral, up to 10 cm long. Bracts not acuminate.                              | 3  |
|    | - | Racemes terminal, terminal and lateral both, up to 30 cm long. Bracts long acuminate. | 4  |
| 3. | + | Leaves 3-7 mm long, elliptic, petals 1.5 mm broad.                                    | 4. <b>M. davurica</b>                                |
|    | - | Leaves 7-15 mm long, lanceolate. Petals 3 mm broad.                                   | 3. <b>M. squamosa</b>                                |
| 4. | + | Racemes lax throughout. Sepals usually longer than Petals.                            | 2c. <b>M. germanica</b><br><b>ssp. Pakistanica</b>   |
|    | - | Racemes compact. Sepals shorter than petals.  | 2b. <b>M. germanica</b><br><b>ssp. alopecuroides</b> |

1. **M. prostrata** Hook. f. et Thoms. ex Benth. & Hook. f., Gen. Pl. 1:161.1862. p.p.; Maxim., Fl. Tang. 95.t.31.f. 41-52. 1889.

Lectotype: Western Himalayas, Tibet, Occ. descent from Lanak pass, 13-15000 ft., 13th Sept. 1847 *Thomson*. (K!) selected by Hara, 1972); Iso. (B!, C!).

*M. germanica* (L.) Desv. var. *prostrata* (Hook. f. et Thoms. ex Benth. & Hook. f.) Dyer in Hook. f., Fl. Brit. Ind. 1:250.1874.

*M. hedinii* Paulsen in Hedin. S. Tibet 32:54, pl. 1, f. 3-4. 1922.

Holotype: Northern Tibet, Camp. XXVI, 4946 m, 29th June, 1901 (Flowering) *S. Hedin* (C!).

*Representative specimens*: Kashmir, Lanak Pass, *Strachey* (19/2(K)); *ibid*, *Thomson* 13th September 1847 s.n. (K).

*Distribution*: Western Himalayas, Central Asia, extending to the Western border of Russia and northern border of whole of Tibet.

*Myricaria prostrata* Hook. f. et Thoms. ex Benth. & Hook. f. is a closely related to *M. rosea* W. W. Smith but the latter can readily be distinguished by having densely flowered raceme, linear lanceolate leaves, larger flowers and sub sessile coma, while in *M. prostrata* Hook. f. et Thoms. ex Benth. & Hook. f. racemes are 1-3 flowered, leaves are oblong and linear flowers are smaller and coma's sessile.

2. **M. germanica** (L.) Desv. in Ann. Sci. Nat. Ser. 4:349. 1825.

a. **ssp. germanica**

This type subspecies does not occur in the area under consideration.

b. **ssp. alopecuroides** (Schrenk) Kitam., Fl. Afgh. 227.1960.

Holotype: In sibiriae altaiceae des Soongoro - Kirghisco in ripa fluvi Koksus 14th June. s.n. (LE n.v.), Iso. (K!)

*M. alopecuroides* Schrenk in Fisch. & Mey., Enum. Pl. Nov. 1: 65.1841

*M. bracteata* Royle, Illustr. Bot. Himal. 1: 214, t. 44, f. 2. 1835.

Holotype: Road to Cashmere, *Royle 75* (LIV!)

*M. macrostachya* Kar. & Kir. in Bull. soc. Nat. Mosc. 14(3): 423-1841.

Holotype: In Insula fluvii Naryu Prope Malonary in Skoi redut ad fines Chinensis sub fumen Julli ominon defloratam legimus (LE, n.v.); Iso. (K! G!)

*M. germanica* sensu Dyer in Hook. f. Fl. Brit. Ind. 1: 250.1874; Parker, For. Fl. Punj. Del. Haz. (ed. 3) 26.1956; Schiman-Czeika in Rech. f. Fl. Iran. 4: 16. 1964. p.p.

*M. germanica* (L.) Desv. var. *bracteata* (Royle) Franch. in Ann. Sci. Nat. ser. 6, 16: 293.1883.

*M. germanica* (L.) Desv. var. *alopecuroides* (Schrenk) Maxim., Fl. Tangut. 96.1889.

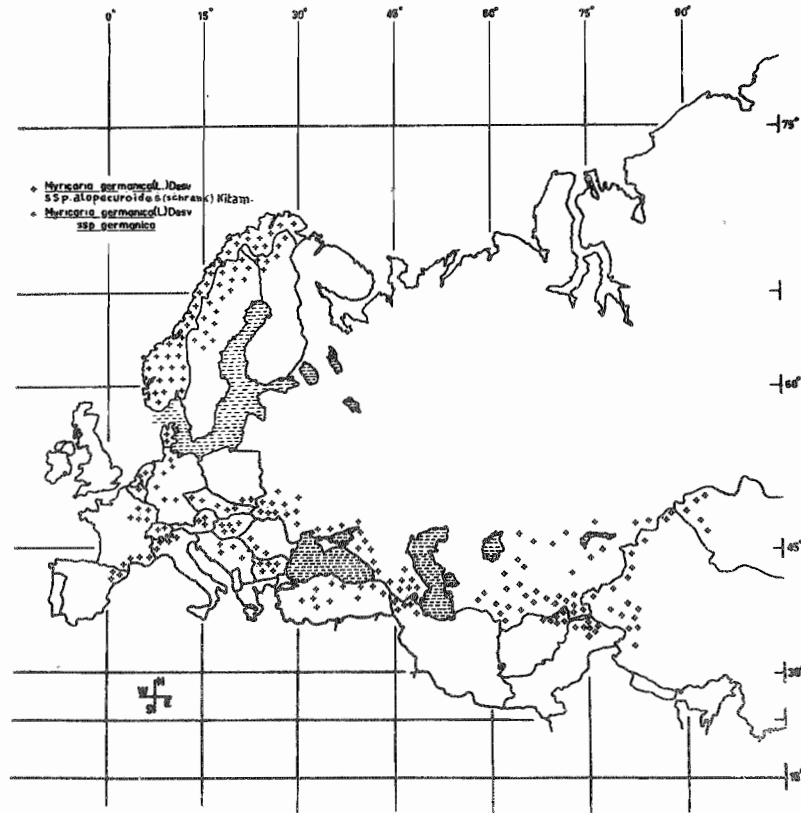
*M. scharti* Vass. in Not. Syst. Ex Herb., Inst., Bot. Acad., Sci., URSS: 21.3-9.1961.

*Representative specimens*: N.W.F.P. Bombrail, fls. pink, by stream. Y. Nasir 5030 (RAW); Chitral Valley, 4600 ft., S. A. Harris 15961 (E. BM); Swat Dist.: Gabral, by stream with *Hippophae*, F. Grohman 6271 (RAW); Hazara ±4800 ft. J.F. Duthie s.n. (K); Gilgit Agency: Nomal, Gilgit, Sultanul Abedin & M. Qaiser 9053-9055 (KUH); Kashmir, Gurikot, Kishenganga valley ±8000 ft.. R.R. Stewart 2086 (RAW); Gund. Kashmir, 6900 ft., H.H. Rich (K).

*Distribution*: India, Pakistan, Afghanistan, China and Eastern Russia.

Royle (1835) described this taxon under the name *M. bracteata* Royle. Schrenk (1841) described it as *M. alopecuroides* Schrenk. Dyer (1874), Parker (1918) and Stewart (1972) treated *M. bracteata* Royle as conspecific with *M. germanica* (L.) Desv. Kitamura (1960) recognized this taxon as *M. germanica* (L.) Desv. ssp. *alopecuroides* (Schrenk) Kitam. while Bobrov (1967) treated *M. germanica* (L.) Desv. and *M. bracteata* Royle as two distinct species. After a careful examination of the types of *M. germanica* (L.) Desv. and *M. bracteata* Royle and large number of specimens from their entire range of distribution it is obvious that both are not conspecific. The latter taxon can easily be distinguished by having 8-20 (-25) long racemes, typical trapezoid denticulate and usually acuminate bracts. In *M. germanica* (L.) Desv. racemes are 6-10 (-15) cm long and bracts are ovate-entire and acute. However, both the taxa intergrade with each other in raceme characters, but the characters of bracts are fairly constant. Looking into the geographical distribution of both the taxa, it is obvious that the denticulate and acuminate bracted forms are confined to the Asian region (Western Himalayas to Eastern Russian through Afghanistan Hindukush and Central Asia), while the populations with entire acute bract are restric-

ted to the European countries (Scandinavian countries, Western and Eastern Europe and Southern parts of Russia; Map 1). The correlation of morphological forms with their geographical distribution is interesting and separates out two subspecies, *ssp. germanica* in the European region and *ssp. alopecuroides* (Schrenk) Kitam. in the Asian region.



Map.1 Geographical distribution of *Myricaria germanica* (L.) Desv. *ssp. germanica* and *ssp. alopecuroides* (Schrenk) Kitam.

2c. *ssp. pakistanica* Qaiser **Subsp. nov.** (Fig. 1. a-i).

Suffrutex erectus. Rami glabri. Folia sessilia, exstipulata, elliptica, integra, 3-7 mm longa, 1-2 mm lata. Racemi laterali, terminali, laxi, 10-40 cm longi, 10-15 mm lati, Bractae inferiorae lanceolatae, acutae, integrae, superiorae triangulatae, acuminatae, denticulatae, 7-11 mm longae, 3-4 mm latae. Pediceli 2-5 mm longi. Sepala c.6 mm longa, c. 1 mm lata, lanceolata, persistens. Petala obovata, 5 mm longa, 2 mm lata, persistens. Stamina 10, connata, anthera obtusa. Carpelum 3 mm longum; ovarium globosum, substipitatum, stigmatum, trilobum, sessilium. Capsula c. 1 cm longa (exclusus stylus).

Holotypus: Khawaja Khela, Swat., *S. Ali* 25997 (RAW).

Distribution: Known from type locality only.

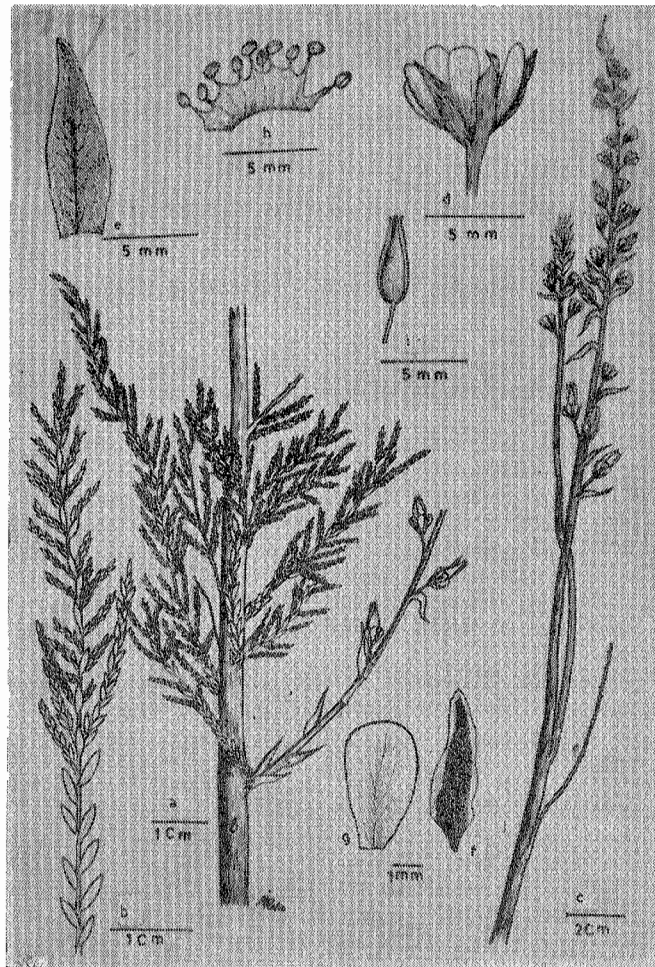


Fig. 1 *Myricaria germanica* ssp. *pakistanica*: a, b, twigs; c, inflorescence; d, flower; e, bract; f, sepal; g, petal; h, androecium; i, capsule.

This interesting taxon can easily be distinguished by having larger sepals (often larger than petals, while in the other two subspecies petals are always larger than the sepals); two type of bracts i.e. the lower ones are lanceolate, acute, entire and upper ones are acuminate and denticulate. The pollen grains of ssp. *alopecuroides* (Schrenk) Kitam. and ssp. *Pakistanica* Qaiser are also different (Qaiser, 1976).

It also resembles to *Myricaria squamosa* Desv. in having somewhat squamate structure at the base of the raceme but differs in having long acuminate bracts and sepals are larger than petals. In *M. squamosa* Desv. bracts are obtuse and sepals are shorter than petals.

3. *M. squamosa* Desv. in Ann. Sci. Nat. Ser. 1,4:350.1825.

Holotype: Habitat Orientalis? *Desvaux* (P!).

*M. dahurica* DC. var. *micropyhlla* Bge., suppl. Fl. Alt. 79.1836.

*M. armena* Boiss, & Huet, Diagn. Ser. 2(2): 58.1856.

Holotype: In valle Kassuklu and flumin *A. Huet Du pavillion* May, 1853 s.n. (G-Boiss!); Iso (K!).

*M. hoffmeisteri* Klotzch in Klotzch & Garcke Die Bot. Ergeben 120 tab. 25. 1852.

Type: Klotzch l. c. tab. 25.

*M. germanica* (L.) Desv. var. *squamosa* (Desv.) Maxim. Fl. Tangut. 96. 1889.

*Representative specimens*: Gilgit Dist.: Naltar valley, *R. R. Stewart* 26463 (RAW); Chitral Dist.: Upper Yarkun valley, *F. Schmid* s.n. 22.7.1954 (RAW); Bombrait  $\pm$  7500 ft. *S.A. Bowes Lyon* 646 (BM); Rosh Gol., N.F. of Trichmir, 12000 ft., *J.D.A. Stainton* 2831 (BM); E. Side of south Barum glacier, Trichmir 10500, S.E. aspect B.K. portes. A4, A16 (K, E); Shokorshal c. 3500 m. *Wendelbo* s.n. 16.6. 1950(K); Swat Dist.: Jabba valley, East of Kolaila *Jaunifer Lamond* 1803(E); Hazara Dist.: Naran, near water *Jafri & Ali* 3437 (K, KUH); *ibid*  $\pm$  7800' collector unknown s.n. June, 1960 (E); *ibid*, *B.L. Burt* and *M. Arshad* 13844(E).

Distribution: Central Asia, Soongaria, Kashgaria Pamir Alai, India (Himalayas and Tibet) and Pakistan (Chitral, Gilgit, Yarkhun, Kagan, Swat etc.).

Fl. per.: July - Aug.

a) In Paris there is only one sheet bearing the following label in Desvaux's hand writing "*Myricaria squamosa* Desv. Desv. Ann. Sci. Nat. Vol. 4. P. 354 and in French following phrase is written Je crois que ce *Myricaria* en fait il set est celm en fruit" (meaning: I believe that this *Myricaria* with the leaves is same as that with fruit). The sheet has three elements 2 flowering twigs, perhaps belonging to the same type collection and third one is sterile with leaves only. This sterile specimen does not definitely belong to *Myricaria*. No doubt Desvaux was of the opinion that this sterile specimen also belong to *Myricaria* (as evident from the French phrase). There seems no discrepancy in the original description and the specimens as far as the character of the leaves are concerned, but the latin diagnosis published is so inadequate and so general that the characters of the elliptic leaves could fit in any taxon. In view of this and my own observations the entire sheet should not be regarded as the holotype, only the flowering twigs should be considered as holotype excluding the sterile specimen which belongs to a different taxon.

b) Bobrov (1966) and Cullen (1966), have treated *M. armena* Boiss. & Huet as conspecific with *M. germanica* (L.) Desv. inspite of its typical short and lateral ra-

comes, squamate at base and non acuminate bracts (in *M. germanica* (L.) Desv., racemes are long terminal, with non squamate base and acuminate bracts). A careful examination of the holotype of *M. armena* Boiss. & Huet reveals that it is conspecific with *M. squamosa* Desv.

c) According to Stafleu (1967) the herbarium of Klotzch located in Berlin, which was destroyed in second World War. Presently no isotype is traceable, therefore plate 25 of Klotzch is designated as lectotype of *M. hoffmeisteri* Klotzch, which is no doubt conspecific with *M. squamosa* Desv. The figure is perfectly drawn in all the respects except the seed which is shown to have a sessile coma, while in the later taxon the seed always bears a stipitate coma.

4. ***Myricaria davurica*** (Willd.) Ehrenb. in *Linnaea* 2: 278.1827.

Holotype: Davuria, *Pallas* (Herb. Willd. No. 6072 B!)

*Tamarix davurica* Willd., *Abh. Akad. Berl.* 85.1816.

*M. dahurica* DC. var. *marophylla* Bge., *Supp. Fl. Alt.* 80.1835.

*M. brevifolia* Turcz., *Bull. Soc. Nat. Mosc.* 13:70.1840.

Isotype: in *Humidis subarenosis, Mongoliae Chinensis* (W!)

*M. longifolia* Ehrenb. var. *davurica* (Willd.) Maxim. *Enum. Pl. Mong.* 113.1889.

*Representative specimens*: Gilgit, Sholkor Shal c. 3500 m s. 16.6.1950 s.n. *Wednelbo* (W).

Distribution: Southern Siberia, Mangolia and Pakistan.

In Willdenow herbarium there are 2 specimens A and B mounted on one sheet and probably both belong to the type collection.

## 2. ***Reaumuria***

*Linn. Syst. Nat. ed. 10:1081. 1759; sp. pl. ed. 6, 276. 1764.*

Type species: *Reaumuria vermiculata* Linn.

*Hololachne* Ehrenb. in *Linnaea* 2:273.1827; *Eichwaldia* Ledeb. in *Eichw., Pl. Casp.-Cauc.* 38.1833.

### Key to the species

- |      |  |                                |
|------|--|--------------------------------|
| 1. + | Leaves in pseudo—fascicles, 3-5 mm long.                                     | 4. <b><i>R. palaestina</i></b> |
| —    | Leaves alternate, (8) 10-25 mm long.   | var. <b><i>acuminata</i></b>   |
|      |  | 2                              |
| 2. + | Leaves subsessile, tapering at base.   | 3                              |
| —    | Leaves sessile never tapering at base.                                       | 1. <b><i>R. stocksii</i></b>   |
| 3. — | Plants subprostrate, herbaceous. Calyx lobes obtuse. Bracts dilated at base. | 2. <b><i>R. floyeryi</i></b>   |
| —    | Plant erect, woody. Calyx lobes acute-acuminate. Bracts not dilated at base. |                                |

4. + Younger branches scabrid-muriculate. Calyx lobes mostly entire, usually shorter than bracts. 3b. **R. alternifolia** ssp. **panjgurica**  
 — All branches glabrous. Calyx lobes usually crenate, almost equalling the bracts. 3a. **R. alternifolia** ssp. **alternifolia**

1. **Reaumuria stocksii** Boiss. Fl. Or. 1: 761.1869.

Holotype: Baluchistan, *stocks* 702 (G-Boiss!).

*R. gabriellae* Bornm. in Beih. Bot. Centr. 59(B): 292.1939.

Holotype: Iter Irano-gadrossiacum *Alfous et agnes Gabriel* 12.4.1937, 128 (B!) Iso (W!).

*Representative specimens*: Makran Dist: Near Hoshab, *M. Qaiser, Asad Raza & Abrar Hussain* 806 (KUH); 14 miles from Hoshab on way to Panjgur, *Sultanul Abedin & Abrar Hussain* 6592 (KUH); 52 miles from Hoshab on way to Panjgur, *Sultanul Abedin & Abrar Hussain* 6609,6616 (KUH); Awaran versus Hoshab 26°-12'N, 62°50'E *K. H. Rechinger* 27698 (W. G.); 10-30 km, S.W. Turbat, 26°00'N, 63°, 06' E versus Gwadar, 25°09'N, 62°21' E, 100-200 m *K. H. Rechinger* 2779 (W); In planitic Balgathar inter Hoshab 26°00'N, 62°, 50' E. et Panjgur, 26°, 58'N, 64° 06' E, 600 m, *K. H. Rechinger* 2801 (W. G.); near Panjgur, South of Balgathar plain, rocky slopes, c. 8 Km from Hoshab, *Jennifer Lamond* 530 (E); 45 miles from Hoshab on way to Panjgur, *Sultanul Abedin & Abrar Hussain* 6606 (KUH); Kharan Dist. 14 miles from Panjgur on way to Nag, *Sultanul Abedin & Abrar Hussain* 6771, 6777 (KUH).

Distribution: South-east Iran and Pakistan.

Fl. Per. Feb. - April.

2. **Reaumuria floveri** S. Moore in J. Bot. 15: 289. 1877.

Holotype: Henjam ad Sinum persicum, *Earnest A. Floyer* July 1844 s.n. (K!).

*Representative specimens* Baluchistan Coast, *Pierce* 11/80 (K).

Distribution: Iraq, Iran, Pakistan.

A very rare species in Pakistan.

3. **Reaumuria alternifolia** (Labill.) Britten in J. Bot. 54: 110.1916. (a) ssp. **alternifolia**  
 Lectotype: Labill., Ic. Pl. Syr. Dec. 2: 17, t. 10.1791.

*Hypericum alternifolium* Labill., l.c.

*R. alternifolia* (Labill.) Grande in Bull. Ort. Bot. Napoli 8: 112. 1926.

*R. hypericoides* Willd., Sp. Pl. 2: 1250. 1799. nomen. illegit.

*R. cvstoides* Adam in Web. & Mohr, Beiter Zur Naturkunde 1:61.1805.

Lectotype: Caucasia, 1783-1803, *C.A. Mussin-Puschkin* (BM!)

*R. linifolia* Salisb. Prad. Lond. t. 18: 1805. nomen. illegit.

*R. vermiculata-angustifolia* M. Bieb., Fl. Taur. Cauc. 2: 18.1808.



*R. billarderi* Jaub. & Spach Ill. Pl. Or. 3: 55.1848.

Holotype: In Persiae desertis, Herb. d' Orient. *Aucher-Eloy* 2643 (P!) Iso. (BM!, G!).

*R. hyrcanica* Jaub. & Spach l.c. 55.

Holotype: Ghilam, Herb. d' Orient. *Aucher-Eloy* 4534 (P!); Iso. (BM!).

*R. tatarica* Jaub. & Spach l.c. 55

Holotype: W. Mar. Casp. Acad. Imp. St. Petersburg. 1836 (P!).

*R. hypericoides* Willd. var. *angustifolia* (M.B.) Trautv. in Acta. Petrop. 4, 138.1875.

*R. desertorum* Hausskn. ex Bornm. in Beih. Bot. Centr. 19(2): 219. 1906.

Holotype: Iter Persico-turicum, Persiae austr. Inter. prov. Kerman in desertis 1900 m. s.m.v. 1892. *J. Bornmuller* 3363 (B!); Iso. (B!, P!).

*R. hypericoides* Willd. var. *cystoides* (Adam) Rgl. & Mlokoss in Cauc.-Crit. 3(9):80.1906.

*R. hypericoides* Willd. var. *cystoides* (Adam) Rgl. & Mlokoss forma *hyrcanica* (Jaub. & Spach) Rgl. & Mlokoss l.c.

*R. korovinii* Lincz., Rast. res. Turkum. SSR, 1: 243. 1935. *nom. nud.*

*R. knsnetzovii* Sosn & Mand. in Bot. J. USSR 34 (3): 285. 1949.

Holotype: Meskhetia Distr. Aspindza in Faucibu ad ripam dextram Fl. Kura a km. a P. Aspin dza versus *P. rustari* 9.7.1946 s.n. (LE n.v.), (Photo. K!, E!).

*Representative specimens:* Quetta Dist.: Sorrange  $\pm 7000$  ft, small tufty bush, fls. red and yellow, *H. Crookshank* 20.6.1952 s.n. (K); 34 miles from Loralai on way to Fort Sandeman, 50 cm tall, fls. light pink, *M. Qaiser & A. Ghafoor* 1539, 1551, 1561 (KUH); Zhob Dist.: Dhanasar, Mount Sulaiman Range between Fort Sandeman and Dera Ismail Khan  $\pm 45$  km,  $\pm 1750$ -1900 m. *K.H. Rechinger* 29924 (W); Sibi Dist.: Near Kach on way to Ziarat, *M. Qaiser & A. Ghafoor* 1400 (KUH).

Distribution: Syria, Israel, Egypt, Iraq, Iran, Turkey, Russia, Afghanistan and Pakistan.

Fl. Per. May - August.

1. Bobrov (1966) stated that the type of *Hypericum alternifolium* Labill. is in Paris, while Stafleu (1967) indicated the presence of the types of Labillardiere in Geneva. The present author failed to find out any authentic material (of Labillardiere) in the above mentioned herbaria and even in Firenze, Kew, British Museum, Edinburgh and Wien. Hence, in the absence of the type material plate 10 of Labillardier's "Icon Plantarum Syriaca" is selected as lectotype.

2. This is a highly variable taxon and its various forms appears fairly different from each other. Unless the specimens from the entire range are studied, one may be easily misled in his taxonomic assessment. Due to its polymorphic nature, it has been described many times under different names as indicated by Bobrov (1966). For the first time it was described as *Hypericum alternifolium* Labill. by Labillardiere (1791). Willdenow (1799) described it as *Reaumuria hypericoides* Willd., citing *Hypericum alternifolium* Labill. as its synonym; thus invalidating his new name. In Willdenow's herbarium, there is no specimen labelled as *R. hypericoides* Willd.,

though there are 2 specimens labelled as *R. cystoides* Adam. As the type locality of *R. hypericoides* Willd. is the same as that of *H. alternifolium* Labill., it is not unlikely that Willdenow based his new species on that of Labillardiere. In 1805 Adam described this taxon under the name *R. cystoides* Adam (Lectotype: Caucasia, 1783-1803, *C. A. Mussin-Puschkin* (BM!)) just on the basis of leaf differences. After the critical study of the large number of specimens from the entire range (Russia, Turkey, Middle East, Iran, Afghanistan and Pakistan) it is obvious that the leaf variation is continuous from Linear-lanceolate to broadly elliptic and even on the type specimen of *R. cystoides* Adam, both types of leaves are present. One cannot draw a line between the two taxa, using the characters of leaves and even the infraspecific categories cannot be recognized as suggested by Bobrov (1966).

Later on Willdenow (1809) also included *R. cystoides* Adam as the synonym of *R. hypericoides* Willd. moreover the latter workers like Britten (1916) and Schiman-Czelika (1964) retained *R. alternifolia* (Labill.) Britten and *R. cystoides* Adam as two distinct species. Britten (1916) included *R. hypericoides* Willd. (p.p.) under *R. billarderi* Jaub. & Spach (which is a superfluous name for *R. alternifolia* (Labill.) Britten) under the synonymy of *R. alternifolia* (Labill.) Britten while under *R. cystoides* Adam, he included *R. hypericoides* Willd. (p.p.) nad *R. linifolia* Salisb. (*R. linifolia* Salisb. is a superfluous name for *R. hypericoides* Willd., which itself is a synonym of *R. alternifolia* (Labill.) Britten). It is surprising to note that workers like Cullen (1967) referred *R. hypericoides* Willd. (p.p.) as synonym of *R. alternifolia* (Labill.) Britten on one hand, while on the other hand *R. cystoides* Adam is also included as its synonym. Furthermore he referred Willdenow's species plantarum (1799) which includes only *Hypericum alternifolium* Labill. in the synonymy.

3. Bobrov (1966) has erroneously included *R. turkestanica* Gorshk. under the synonymy of *R. alternifolia* (Labill.) Britten. which is entirely a different taxon and can readily be distinguished by its large ovate leaves and more denticulate sepals. He also claimed that these are the life forms growing under different environmental conditions. No doubt there is a continuous variation in the size of the leaves, but the shape of the leaves and denticulate nature of sepals are fairly constant and I did not come across any intermediate form bridging the gap between the two.

3b. ssp. **panjgurica** (Blatt. & Hallb.) Qaiser **comb. et stat. nov.**  
Type: Panjgur, *Hortson* (BLAT n.v.).

*Reaumjuria panjgurica* Blatt. and Hallb. in J. Ind. Bot. soc. 1: 87. 1919.

*Representative specimens*: Makran Dist. 18 miles from Panjgur on way to Hoshab, growing on sandy soil, flowers pink. M. Qaiser, Asad Raza & Abrar Hussain 1108, 1108A (KUH); 20-30 km from Panjgur on way to Hoshab Jennifer Lamond 581 (E, KUH); 20-30 km. S. Panjgur 26°, 58'N, 64.06K, Baluchistan K. H. Rechner 30102(W), near Panjgur ± 900 m G. Popov 169 (W); Zarin Park, A. I. Ali S. A. Faruqi and Sultanul Adedin 1108A (KUH); 44 miles from Nag on way to Basima Pat, Sultanul Abedin & Abrar Hussain 6932-6940 (KUH); 20 miles from Hoshab, Hoshab-Panjgur Road S.M.A. Kazmi 1156 (KUH).

Distribution: Probably confined to Baluchistan (In Panjgur and its vicinity).

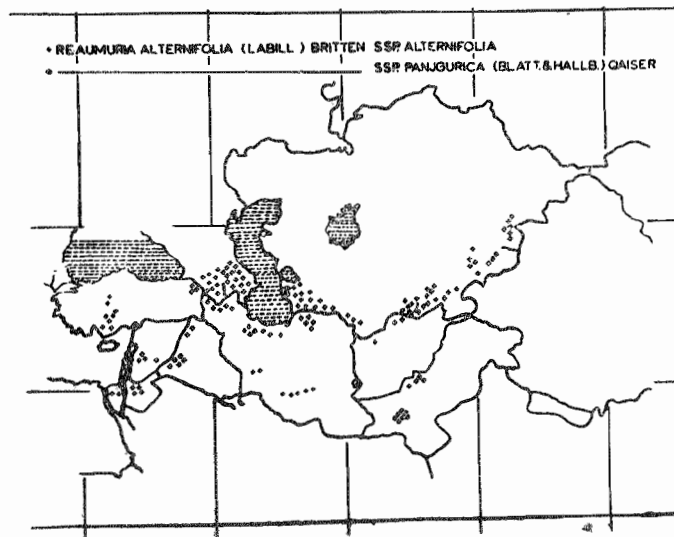
1. This taxon differs from *R. alternifolia* subsp. *alternifolia* in having scabrid-muriculate branches, bracts much longer than the calyx and somewhat oblong to

subulate appendages. In ssp. *alternifolia* the branches are glabrous, bracts shorter or almost equalling the calyx and appendages are somewhat obovate.

2. Unfortunately the type of this taxon is not traceable. According to P.V. Bole (Personal communication) none of the specimens collected by Hoston are available in Blatr Herbarium. It is likely that they were lost or damaged during the thirties after Rev. Blatter's demise, when they were neglected

The author's interpretation of ssp. *panjgurica* (Blatt. & Hallb.) Qaiser is strictly based upon the original description and the specimens studied from the type locality.

3. *Reaumuria alternifolia* (abill.) Britten and *R. pangjurica* Blatt. & Hallb. are considered conspecific by Bobrov (1966). However, a critical study revealed that the two taxa can easily be distinguished from each other. The latter taxon has muriculate scabrid branches and much longer bracts than the calyx and somewhat oblong subulate appendages of the petals. In ssp. *alternifolia* branches are entirely glabrous, bracts almost equaling or shorter than the calyx and obovate appendages of petals. The two taxa integrate to some extent in bract and appendage characters, but in the papillose nature of the branches they are quite distinct. If the variation pattern is analysed geographically it seem that scabrid muriculate form with long bracts is confined to western Baluchistan (in Panjgur and its vicinity), while the type form with glabrous branches and shorter bracts is very widely distributed from Syria, Israel, Egypt, Iraq, Iran, Turkey, Russia, Afghanistan and from Afghanistan it enters in northern Baluchistan (i.e. Quetta, Fort Sandeman, Loralai etc., Map 2). The correlation of morphological forms with their geographical distribution is interesting and separates out 2 subspecies, ssp. *alternifolia* with a very wide distribution and ssp. *panjgurica* (Blatt. & Hallb.) Qaiser, restricted to Western Baluchistan. The two areas are separated by several hundred kilometers.



Map. 2 Geographical distribution of *Reaumuria alternifolia* ssp. *alternifolia* and ssp. *panjgurica*.

### Doubtful Taxon

4. *Reaumuria palaestina* Boiss. Diagn. Ser. 1(1): 10.1842. var. *acuminata* Blatt. & Hallb. in J. Ind. Bot. Soc. 17: 919.

According to Blatter and Hallberg (e.c.) this taxon is "distinct from its type race by its bare twigs, sharp leaves with its petals topping the calyx lobes a little".

Type: 27 miles north of Ornach, 3400 ft, Sept. 1917, *Gorrok* 327 (BLAT n.v.)

The type of this taxon is presently untraceable and in spite of the repeated attempts, I failed to collect this taxon from the type locality. Hence, I have presently retained it as doubtful taxon.

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