

KAZIMIERZ BROWICZ

A supplement to the monograph of the genus *Colutea* L.

Since the publication of the monograph of the genus *Colutea* L. in 1963 two new species have been discovered in Asia and described in the years 1963/64. The first one, *C. karakoramensis* Kitamura comes from western Pakistan and the other, *C. porphyrogramma* Rech. f. from northern Iran. Apart from that I have had the opportunity of seeing during that time new herbarium specimens, collected mainly in the period from 1960 to 1965, which were not covered by the monograph.

These two new species and the new herbarium materials have not affected my basic concept of systematic division and evolution of the genus *Colutea*, they do however constitute valuable additions to the monograph particularly as regards the geographic distribution. As a result it seemed appropriate for the author to bring these new data together and publish it in the form of the following listing, to discuss it and to enter appropriate corrections to the distribution maps and to the keys for the identification of species. These additions are presented in the sequence of the paging of my monograph (in the *Monographiae Botanicae*, Warszawa, 14:1—136, 1963).

Section 1. *Colutea*

Subsection 1. *Arborescentes* Browicz

3. *Colutea cilicica* Boiss. et Bal.

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Turkey: Prov. Zonguldak, 30 km südl. Durek. Steiler mit Buschwerk bewachsenen Hang and der westseite Koacacay, 3. 7. 1959 c. fr., J. Kühne 3143 (E.); Prov. Kastamonu: distr. Kastamonu. Road Kastamonu — Ilgaz. N. slope, alt. 1100 m, 14. 8. 1960 c. fl. et fr., Khan, Prance, Ratcliffe 633 (E.); Eskisehir, 15. 5. 1961 c. fl., W. Kayacik (E.); Prov. Bilecik: Bilecik to Pararyeri, 500 m, N. side of pass, 2. 7. 1962, Davis, Coode, D. 36469 (E.); Prov. Kütahya: Eskisehir to Kütahya, 15 km from Kütahya, 800—900 m, canyon in weatherd metamorphic rock, 22. 6. 1962 c. fl., Dudley 39096b (E.).

In 1963 G. B. D o n t c h e v (Nauczni trudowe na Wiszija Lesotechničeskij Institut, Sofia, 11:37) in an article entitled "*Colutea cilicica* Boiss. et Bal. sur le littorale de mer Noire Bulgarie" writes that in Bul-

garia along the whole coast of the Black Sea as far north as Balchik *C. cilicica* can be found together with *C. arborescens* though more rarely than the latter species. The author of that paper considers that *C. cilicica* differs from *C. arborescens* primarily in the flower morphology

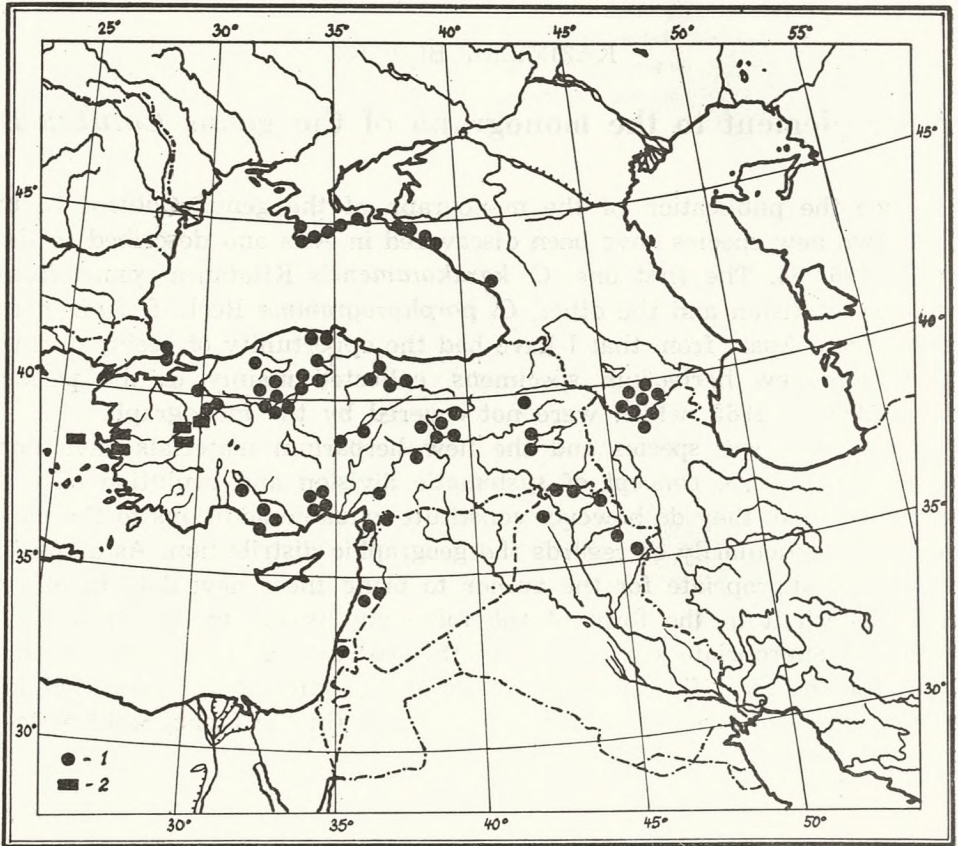


Fig. 1. Distribution of *C. cilicica* (1) and *C. davisiana* (2)

having longer keels than wings. This character, as I was able to show in my monograph on the basis of very rich herbarium materials (page 52—53) is insufficient, since this type of phenomenon takes place also in *C. arborescens*. The character wing length has to be correlated with another character, namely with the presence of a distinct spur in the place where the wing bends. Only these two characters taken together permit the identification of *C. cilicica*.

I have had opportunity to see several herbarium sheets of *Colutea* from the Bulgarian Black Sea coast and in June 1962 I have been collecting it personally in the vicinity of Varna and the Zlati Pjaski. All undoubtedly belonged to *C. arborescens*. Unfortunately I have not seen the herbarium specimens on which Dontehev has based his study, howe-

ver on the basis of my observations made so far, in my opinion, already expressed in the monograph, *C. cilicica* occurs on the Balkan peninsula only in Turkey and possibly also in Greece (fig. 1, 1).

5. *Colutea davisiana* Browicz

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Turkey: Prov. Kütahya, 15 km from Kütahya; 800—900 m, canyon in weathered metamorphic rock, 22. 6. 1962 c. fl., Dudley, 39096a (E.); Prov. Kütahya: Gediz, 850 m; steep chalky slopes, 3. 7. 1962 c. fl., Davis. Coode, D. 36607 (E.).

These two specimens indicate that this species endemic for Turkey has a somewhat greater range of distribution. The stands of Dudley and of Davis and Coode are situated much to the north of the stands reported by B. Balansa (type) in Usak (fig. 1, 2).

7. *Colutea armena* Boiss. et H. de Pavill.

to p. 62

Turkey: Prov. Artvin, stony slopes, 400 m, 28. 4. 1960 c. fl., Stainton, 8291 (E.).

This herbarium specimen does not introduce anything new since in the Artvin province other stands of *C. armena* have already been known.

Subsection 4. *Graciles* Browicz

10. *Colutea istria* Mill.

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According to the information provided by Mr. J. B. Gillett from Kew he has found this shrub in May 1963 in southern Jordania: Jebel Rum, 29°35' N, 35°25' E. It is a very interesting stand located further south than any of the *C. istria* stands reported to date. It supports my theory about the probable migration of the genus *Colutea* from to south northwards along the belt of mountains on the shores of the Red Sea.

Section 3. *Rostrata* Browicz

Subsection 2. *Centralasiaticae* Browicz

19. *Colutea buhsei* (Boiss.) Shap.

to p. 94

Iran: Mazandaran: Chalus River Gorge, n. slope of Elburz Mts., 72 Km. S. of Chalus, shrub savanna, 2000 m, 25. 7. 1964 c. fr., Martin L. Grant, 16, 4, 67 (W.); Khorasan, inter Bonjur 37°28' N, 57°20' E et Tappeh-ye Moraveh 37°52' N, 55°40' E. 1000 m, in regione silvarum casp. 25. 7. 1965 c. fr., K. H. Rechinger 32569 (W.).

Both the herbarium specimens were collected in the region of northern Iran, within the limits of the range of *C. buhsei* as known to date, thus it is not necessary to introduce any additions to the map of the distribution (fig. 2, 1).

22. *Colutea paulsenii* Freyn

to p. 104

Afghanistan: In valle Andarab, substr. loss, 1100 m, 1. 7. 1965 c. fl. et fr., K. H. Rechinger, 31792 (W.); Prov. Bamian: Darrah Siakar, about 15 kms. south of Doab, wet ground at river side c. 1500 m 21. 5. 1962 c. fl. I. Hedge P. Wendelbo 3395 (BG.); Prov. Qataghan. Mirza Atbili pass S. E. of Samangan steep soil slopes c. 1350 m. 10. 6. 1962 c. fr., I. Hedge, P. Wendelbo, 4011 (BG.); Prov. Paravan, Panjshir valley; between Dasht-e-Revat and Darrak, Khauvak, dry slopes, c. 2300 m, 20. 7. 1962 c. fr., I. Hedge, P. Wendelbo 5319 (BG.); Prov. Qataghan; between Dushi and Doab, dry stony slopes, s. 950 m, 11. 6. 1962 c. fr., I. Hedge, P. Wendelbo, 4091 (BG. E.); Prov. Mayman: Darrh Zang near Belceragh, cervices of rocks, c. 1400 m, 29. 5. 1962 c. fl., I. Hedge, P. Wendelbo, 3750 (BG, E.); Prov. Baghlan: Mittelers Andarab-Tal, zwischen Banu and Kishnabad, 1450 m, 11. 6. 1965 c. fr., D. Podlech, 11310 (M.); Prov. Baghlan: Mittelers Andarab-Tal, bei der Einmündung des Taganak-Tales, 1900 m, 5. 6. 1965 c. fl., D. Podlech, 11124 (M.).

The specimens of I. Hedge and P. Wendelbo, collected at the time of flowering, represent a large flowered form (f. *grandiflora* Browicz). The sites from which the new material was collected are considerably to the West of the range of *C. paulsenii* as known to date. However the specimen from Mayman, which comes from a most western locality, has some features resembling *C. buhsei*. It has large, broad

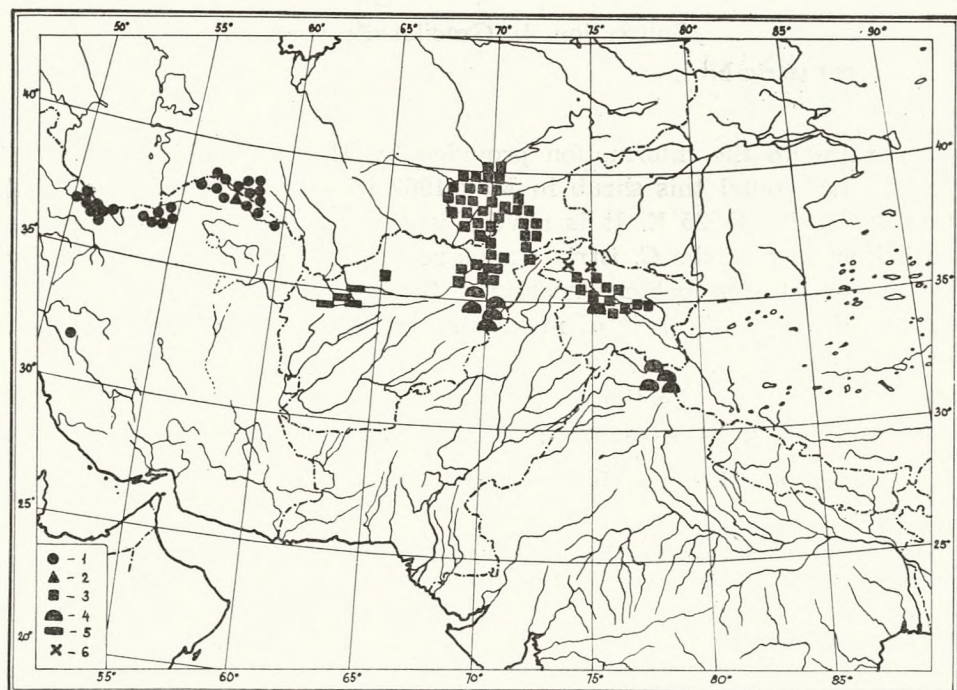


Fig. 2. Distribution of species of subsection *Centralasiaticae*, section *Rostrata*: 2 — *C. buhsei*; 2 — *gifana*; 3 — *C. paulsenii*; 4 — *C. nepalensis*; 5 — *C. afghana*; 6 — *C. karakoramensis*

leaflets and relatively short calyx teeth. The wing is rounded on the bend and with no signs of a spur which is so characteristic of *C. buhsei*.

Since these new stands distinctly extend the range of *C. paulsenii* in the westernly direction a new map of distribution of the species has been prepared (fig. 2, 3).



Fig. 51. *Colutea karakoramensis* Kitamura: 1 Standard, 2 Wing, 3 Keel, 4 Flower without Petals, 5 Leaflets, 6 Stipules. (Karakoram: Dusso).

Fig. 3. Illustration of *C. karakoramensis* (Kitamura, 1964)

Colutea karakoramensis Kitamura

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Acta Phytotax. Geobot. 19:98 (1963); Kitamura. Flowering Plants of West Pakistan (Results of the Kyoto Univ. Sc. Expedition to the Karakoram and Hindu-kush, 1955, vol. III) 91, f. 51 (1964).

Branched shrub. Young shoots appressed white pilose, older ones gray or rich brown. Stipules small, oblong-triangular, white pilose. Leaves 3.5—6 (8) cm, long, with 3—4 (5) pairs of leaflets. Rachis and petioles white, appressed pilose. Leaflets retuse at apex, sparingly pilose or glabrate above, white appressed pilose beneath, rigid, short petiolulated. Inflorescences 2—6 flowered, in blossoming 2—3 cm, in bearing 2.9—5 cm long. Bracts small, 1—1.5 mm long. Flowers golden-yellow, 15 mm long. Pedicels up to 7 mm long. Calyx broadly campanulate, white appressed pilose, 6 mm wide, with triangular teeth up to 1 mm long. Keel truncate at apex, undistinctly rostrate (beak 0.2 mm broad). Wings linear-oblong, obtuse at apex, 14.5 mm long and 2 mm broad, longer than keel. Standard 17 mm long (together with a 4 mm long stipe), roundish, retuse at the top. Legume 5.5 cm long and 2.5 cm wide, dehiscent at the top, white appressed pilose (fig. 3).

Distribution: West Pakistan: Karakoram (fig. 2, 6).

Pakistan: Dusso 23. 6. 1958 c. fl. et fr., M. Wakisaka (KYO — *typus*); Dusso, 29. 8. 1958 c. fr., G. Iwatsubo (KYO.); Between Imit and Iskuman, 5. 10. 1956, K. Honda (KYO.) — non vidi.

Discussion: Unfortunately I have not seen herbarium specimens of this species thus I can only judge it by the Latin diagnosis (see the translation of it given above) published by S. Kitamura and by a drawing of it (fig. 3). On this basis it is difficult to decide into which section *C. karakoramensis* should be included. Kitamura when comparing the species with *C. nepalensis* and *C. paulsenii* points out that it differs from the two in having and indistinctly beaked keel or having a completely beakless keel (*Carina obsolete rostratis vel erostris*). The presence of a beak (among other characters) undoubtedly permits the inclusion of *C. karakoramensis* into section *Rostrata*, however the illustration presented by the author partially contradicts this, since on the drawing the keel is shown without a beak (fig. 3). On the other hand in the drawing of the whole flower (upper part of the figure) the beak on the keel, though small is none the less distinctly visible.

Kitamura had at his disposal only one herbarium specimen of *C. karakoramensis* collected in bloom, thus it is not unlikely that both the size of the flowers and the shape of the keel can be only accidental (for example poor development of the shrub, injuries etc.). All the other characters demonstrate clearly a very close relation between Kitamura's species and *C. paulsenii*, particularly with its small flowered forms. Leaflets of *C. paulsenii* are very variable, both as regards the size and shape, and such dimensions as in *C. karakoramensis* do not belong to unusual ones for *C. paulsenii*. Also the wings in *C. paulsenii* can be longer than the keel and the beak on the keel is small. It is also worth pointing out that the stands of *C. karakoramensis* (fig. 2, 6) are located within the range of distribution of *C. paulsenii* and particularly of the

variety *C. paulsenii* var. *mesantha* (Shap. ex Ali) Browicz, which variety is also characterised by elongate fruits similar in shape to those which Kitamura has presented in his illustration.

Not having the herbarium materials and in view of the unclear question of the shape of the keel's tip in *C. karakoramensis* I cannot defi-

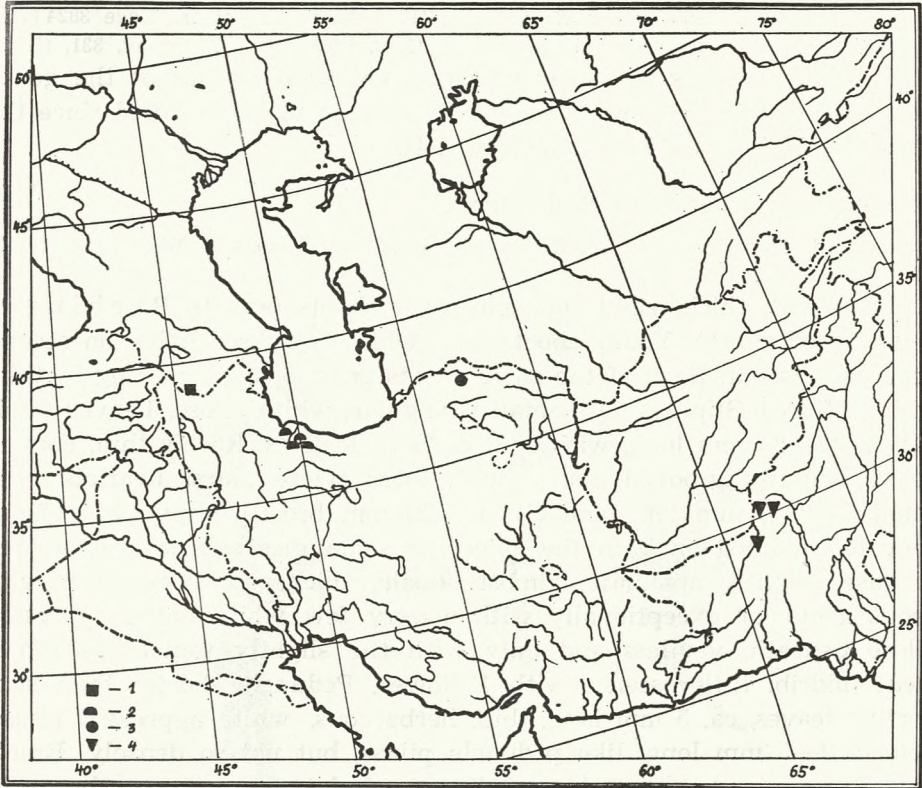


Fig. 4. Distribution of species of section *Armata*: 1 — *C. komarovii*; 2 — *C. uniflora*; 3 — *C. porphyrogramma*; 4 — *C. armata*

nately consider this species as identical with *C. paulsenii*. It appears that even the three specimens cited by Kitamura would be insufficient to make a definite decision. Only further collections could clarify this point. These collections would have to be rich since as I have pointed out in my monograph (page 105) *C. paulsenii* is a very variable species.

23. *Colutea nepalensis* Sims.

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E. Afganistan: In declivibus meridionalibus jugi Salang N. Charikar, 35°02'N, 69°11'E, substr. silic. 1900—2000 m, 25. 6. 1965 c. fl. et fr., K. H. Rechinger, 31333 (W.).

A new stand situated in a most northerly locality in comparison with the stands of *C. nepalensis* (fig. 2, 4) known to date.

Section 4. *Armata* Browicz

Syn. *Dictyocarpa* Rech. f. Anzeiger d. math.-naturw. Kl. d. Österr. Akad. d. Wissensch. Wien, Nr. 13:401 (1964).

25. *Colutea armata* Hemsl. et L a c e

to p. 113

West Pakistan, Baluchistan: Wam, 7000', 19. 5. 1888 c. fl. et fr., Lace 3824 (W.); Ziarat, 3000', High mountains above Quetta, 15. 6. 1963 c. fr., G. Popov, 331, (BM.).

C. armata belongs to the most rarely collected species of the genus *Colutea*. Popov's 1963 specimen is the first one to be collected since the days of J. H. L a c e, 1888—1889 (fig. 4, 4).

Colutea porphyrogramma Rechinger f.

Anzeiger d. math.-naturw. Kl. d. Österr. Akad. d. Wissensch. Wien., Nr. 13:400 (1964).

Shrub with thick, rigid and spinescent shoots (acc. to R e c h i n g e r — unarmed shrub). Young shoots with white appressed hairs, on second year glabrescent. Bark of the older shoots gray, opaque, peeling in thin, whitish fibres. Stipules very small triangular, white pilose. Leaves fasciculate, 12—20 mm long, with 2 (3) pairs of leaflets. Rachis thin, convex below, slightly grooved above, with loose white hairs. Leaflets very small 2—3 (4) mm long and (1) 1.5 (2) mm broad, elliptic to oblong-ovate, rounded on both the apices or sometimes subcuneate-rounded at base, slightly apiculate, almost sessile, thickened, gray-green, glabrous above or exceptionally with a very few white hairs, appressed pilose beneath, veinless and only with the slightly sometimes prominent midrib. Inflorescence with 1 flower. Peduncle shorter than supporting leaves, ca. 5 mm long, thin, herbaceous, white appressed pilose. Pedicel 3—5 mm long, like peduncle pilose, but not so densely. Bracts 1 (2.5) mm long, oblong-lanceolate to subulate, almost membraneous white pilose. Calyx broadly campanulate, 5—6 mm long, gray-green, sometimes blackish at base, loosely white pilose. Pedicel and calyx, especially on the top of teeth, sometimes with single black brown hairs. Calyx teeth densely white pilose inside, recurvate, lower ones subulate and as long as tube, when superior triangular-subulate, slightly shorter than tube. Incissions between teeth acute. Corolla 8—11 mm long. Keel with claw longer than calyx. Blade of keel broadly-semilunar, 4 mm broad, distinctly auriculate at base, visibly rostrate, in lower part pallid, in the upper dark purple. Beak rounded at the apex. Standard broadly orbiculate, often broadest transversely, strongly reflexed, in dry state dull pink or fleshy-coloured, very graceful dark-purple veined, with two yellow spots in the centre near base. Wigns shoretr than keel, falcate but not geniculate, without spur, auriculate at base, acute at apex, coloured like keel. Ovary with stipe twice longer than calyx, many ovulated, glabrous except white hairs along the dorsal suture.

Style bearded inside towards the top. Stigma large, surrounded with hairs. Legume \pm 2.6 cm long and \pm 1.7 cm broad, thin-papery, graceful dark-purple reticulate. Seeds undescribed. (acc. to diagnosis of K. H. Rechinger, with some supplements (fig. 5).



Phot. K. Jakusz

Fig. 5. *Colutea porphyrogramma* — holotype (Naturhistorisches Museum, Wien)

Specimens examined: Iran: Prov. Gorgan: Inter Maraveh Tappeh to Bonjurd, 12. 5. 1950 c., fl. et fr., Sharif, 2568—E (W.) — typus); Khorasan: Sepid inter Bonjurd 37°28' N, 57°20' E, et Tappeh-ye Moraveh 37°52' N, 55°40' E, calc., 1350 m, 25. 7. 1965 c. fr., K. H. Rechinger, 32554 (W.).

Discussion: Rechinger has formed for this species a new monotypic section — *Dictyocarpa* Rech. f. This section has been formed because the new species was characteristic in the following respects. It had unarmed shoots, a very original colour of the flowers, beaked keels, recurvate teeth of the calyx and the purple venation of the legumes. However on detailed examination of the herbarium specimens it was found that in this new species spinescent shoots do in fact occur and of the same type as in other species of the section *Armata* (particularly in *C. armata*). As regards other morphological characters, which associate *C. porphyrogramma* with the section *Armata* there are several, namely: a) very short leaves arranged in fascicles, b) leaflets very small, 2 rarely 3 pairs in number, c) the pubescent leaf axis hardening and remaining on the shoot for a longer time while the leaflets have fallen off, d) flowers small, single, d) the keel is beaked.

C. porphyrogramma shows the greatest affinity to the Pakistan *C. armata* which it resembles also in the almost identical colour of the keel and the wings, and in the venation of the fruits which however is much more prominent. Among the differentiating characters one could mention the glabrous ovaries and fruit, in which respect *C. porphyrogramma* resembles *C. komarovii*. It is differentiated from all species of the *Armata* section in having recurvate calyx teeth, which however cannot be a sufficient reason to maintain the independent section *Dictyocarpa*. Thus on the basis of the characters discussed above it seems to me that *C. porphyrogramma* should be included in section *Armata* and the term *Dictyocarpa* considered as a synonym for that section.

It appears that *C. porphyrogramma*, similarly as other species of section *Armata*, is limited in its occurrence to only a very small range of distribution. Stands of these species are to be found along the belt of mountains extending from southern Caucasus (*C. komarovii*) through north Iran (*C. uniflora* — Prov. Gilan), and Afghanistan, till central W. Pakistan (*C. armata*). The range of this new species considerably reduces the distance which so far has been separating the ranges of *C. uniflora* and *C. armata* (fig. 4).

In view of the enlargement of section *Armata* by one species, the key to the identification of species in that section has to be supplemented.

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Key to the species of the section *Armata*

- | | |
|---|--------------------------|
| 1. Fruit glabrous. Leaflets up to 5.5 mm long at the most | 2 |
| Fruit pubescent. Leaflets often larger | 3 |
| 2. Calyx teeth straight. Leaflets pilose on both side | |
| | <i>C. komarovii</i> |
| Calyx teeth recurvate. Leaflets glabrous or almost glabrous above | <i>C. porphyrogramma</i> |

3. Leaves up to 6 cm and flowers to 15 mm long. Shrubs weakly spinescent *C. uniflora*
 Leaves up to 2.5 cm, and flowers to 10 mm long Shrubs strongly spinescent *C. armata*

Thus the genus *Colutea* contains now 27 species or possibly 28 if the taxonomic rank of *C. karakoramensis* be confirmed in the future.

KAZIMIERZ BROWICZ

Uzupełnienia do monografii rodzaju Colutea L.

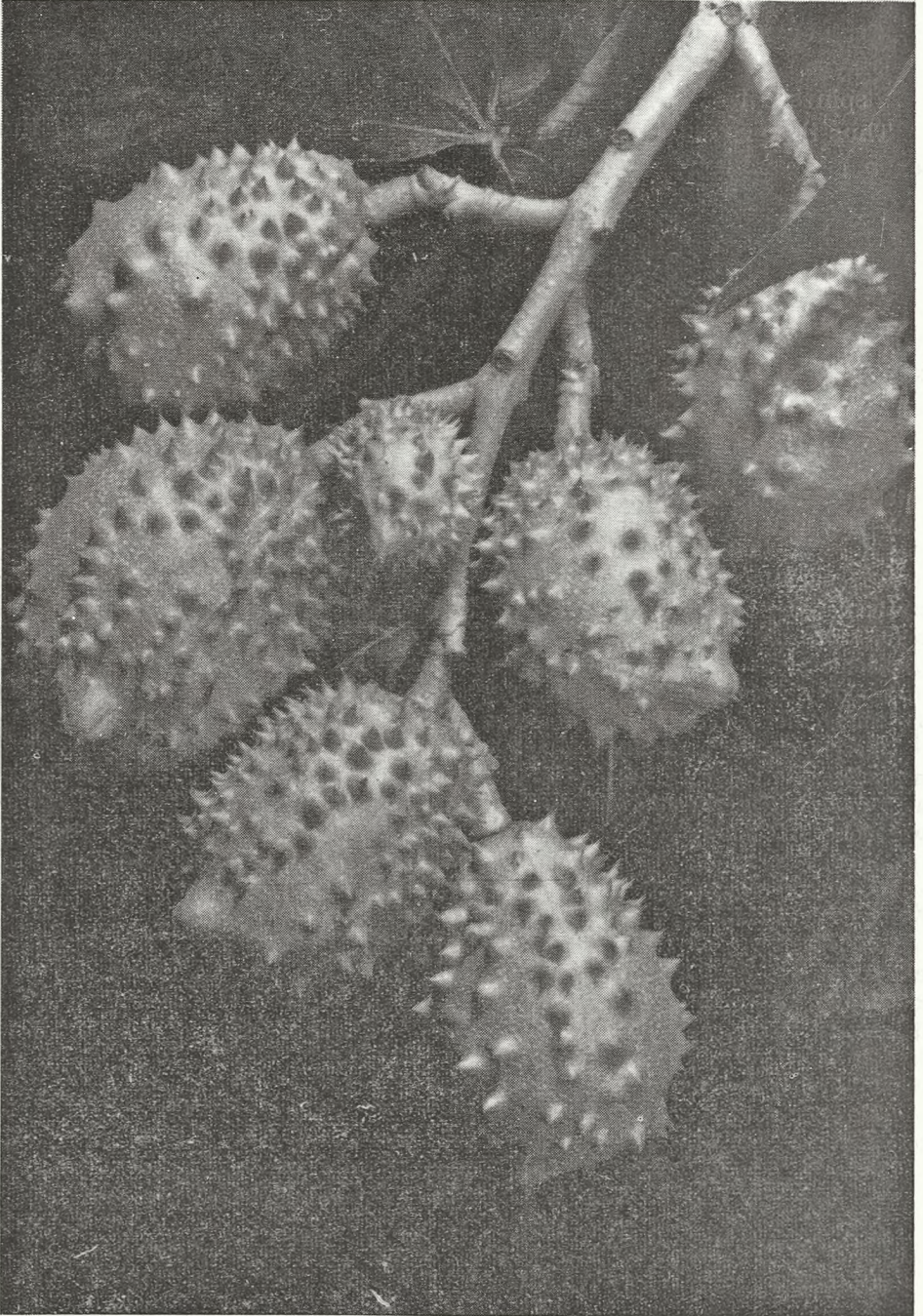
Streszczenie

Od czasu ukazania się w roku 1963 monografii rodzaju *Colutea* L. (*Monographiae Botanicae*, 14:1—136, Warszawa) zostały odkryte w Azji i opisane w latach 1963—1964 dwa nowe gatunki; pierwszy z nich *C. karakoramensis* Kitamura pochodzi z zachodniego Pakistanu, a drugi *C. porphyrogramma* Rech. f. z północnego Iranu. Niezależnie od tego autor miał możliwość obejrzenia w tym czasie dalszych, nowych okazów zielnikowych, zebranych głównie w okresie od 1960—1965 roku, które nie zostały monografią objęte. Materiały te przedyskutowano, a odpowiednio poprawki naniesiono na mapy zasięgów. Niemniej te dwa nowe gatunki oraz okazy zielnikowe nie wpłynęły na zmianę zasadniczej koncepcji podziału systematycznego rodzaju *Colutea*, jak również jego ewolucji.

Okazało się, że endemiczny dla Turcji gatunek, *C. davisiana*, ma większy niż przypuszczano dotąd zasięg, że *C. istria* sięga w Jordanii nieco dalej na południe, a *C. paulsenii* w Afganistanie znacznie dalej na zachód. Autor nie widział typowego okazu *C. karakoramensis*, ale opierając się na łacińskiej diagnozie tego gatunku oraz dokładnej ilustracji opublikowanej w 1964 roku, dochodzi do wniosku, że *C. karakoramensis* jest najprawdopodobniej identyczna z drobnokwiatową formą *C. paulsenii*.

Najciekawszym okazał się nowy gatunek z północnego Iranu, dla którego Re-chinger utworzył nawet osobną sekcję *Dictyocarpa*. W oparciu o typowy okaz zielnikowy autor uważa, że cechy morfologiczne *C. porphyrogramma* odpowiadają w zupełności cechom sekcji *Armata*: cierniste pędy, drobne, pojedynczo stojące kwiaty, charakterystyczny dziobek na końcu łódeczki, małe liście z 2—3 parami drobnych listków.

Tak więc rodzaj *Colutea* liczy obecnie 27 gatunków, względnie 28, o ile wartość systematyczna *C. karakoramensis* zostanie w przyszłości potwierdzona.



Fot. K. Jakusz

Aesculus glabra Willd.