Preslia, Praha, 48 : 299—305, 1976

Taxonomic observations on *Polygala rhodopea* and related taxa

Taxonomické poznámky k druhu *Polygala rhodopea* a příbuzným taxónům

Jindřich Chrtek and Bohdan Křísa

CHRTEK J. et B. KŘÍSA (1976): Taxonomic observations on *Polygala rhodopea* and related taxa. — Preslia, Praha, 48 : 299—305.

The *Polygala supina* complex is shown to consist of three separate species: *P. supina* SCHREBER growing only in Crimea and Anatolia (and possibly in the Caucasus as well), *P. rhodopea* (VELEN.) JANCHEN (an endemic of the mountains of S. Bulgaria and NE. Greece), and *P. hospita* HEUFFEL, the latter comprising two subspecies: subsp. *hospita* (Banat) and subsp. *bosniaca* (MURBECK) CHRTEK et KŘÍSA (Bosnia and adjacent regions of NW. Yugoslavia).

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While studying the genus *Polygala*, our attention was mainly directed to *P. rhodopea* and its relationships within the section *Polygala*. In 1889 VELENOVSKÝ collected interesting plant material in the vicinity of Stanimaka (= Asenovgrad) in Bulgaria and referred it to *P. hohenackeriana* FISCHER et MEYER (see VELENOVSKÝ 1891). He noticed that this Bulgarian taxon was different from the Caucasian and Iranian *P. hohenackeriana* and the Bulgarian *P. supina* s.l. Later (VELENOVSKÝ 1894) he named the Bulgarian plants *P. hohenackeriana* var. *rhodopea* and retained this classification also in his Flora Bulgarica (1898). JANCHEN (1915) demostrated that this taxon was quite different from *P. hohenackeriana*, and elevated in to the rank of species as *P. rhodopea*. JANCHEN (l.c., p. 180—181) writes: "Von der asiatischen *P. Hohenackeriana*..., unterscheidet sich die balkanische *P. rhodopea* durch schmälere und längere, sehr schwach behaarte oder fast kahle Blätter und vor allem durch bedeutend schmälere, viele stärker grünliche Kelchflügel, welche die Frucht weit überragen". His classification has been adopted by STOJANOV et STEFANOV (1948). Many authors, however, regard this Balkan species as a subspecies of *P. hohenackeriana* (see HAYEK 1925, CULLEN 1965). MCNEILL (1968a, b) treats this taxon as *P. supina* subsp. *rhodopea* and refers it, on the basis of floral morphology, to the subsection *Polygalellae* MCNEILL of the section *Polygala*. (*P. hohenackeriana* is classified as belonging to the subsection *Polygalastrum* TAMAMSHAN of the section *Polygala*.) It is remarkable that the author treats *P. rhodopea* as a subspecies of *P. supina*, though he writes (MCNEILL 1968a : 31) that "... it is quite the most distinctive group within *P. supina*". A study of a plentiful herbarium material reveals that *P. rhodopea* is a distinct taxon, very well characterized by its morphological characters and distribution patterns.

1. *Polygala rhodopea* (VELEN.) JANCHEN, Mitt. Naturw. Ver. Steierm. 51 : 180, 1915

Syn.: *P. hohenackeriana* sensu VELEN., Fl. Bulg. 55, 1891, non FISCHER et MEYER. — *P. h.* var. *rhodopea* VELEN., Sitz.-Ber. Böhm. Ges. Wiss. 37 : 13, 1894 et Fl. Bulg. Supplem. 1 : 34, 1898. —

P. h. subsp. *rhodopea* (VELEN.) HAYEK, Prodr. Fl. Penins. Balcan. 1 : 593, 1925. — *P. supina* SCHREBER subsp. *rhodopea* (VELEN.) MCNEILL, Feddes Repert. 79 : 31, 1968 et Fl. Europaea 2 : 233, 1968.

Densely caespitose perennials. Stems ascending to decumbent, 6—10 cm long, densely leafy, sparsely to densely hairy, with short arcuate trichomes. Middle cauline leaves narrowly-elliptical to oblanceolate, apiculate to mucronate, (8—)10—15(—17) mm long, 2—2.5 mm wide, sparsely hairy, with hairs appressed. Inflorescences (2—)4—8-flowered, mostly secund. Outer sepals hairy, inequal. Inner sepals oblong to narrowly-oblanceolate, 5.9—7.1 mm long, 1.8—2.2 mm wide, conspicuously longer than capsule, with veins not anastomosing or rarely anastomosing, glabrous, predominantly mucronate. Capsule subsessile, obovate-obcordate, 3.5—4.2 mm long, 3.1—3.9 mm wide, glabrous, wing 0,2—0,3 mm wide. Seed 2.2—2.4 mm long, 0.9—1.4 mm wide, appressed-hairy.

Specimens examined: Bulgaria: in rupestribus calidis calcareis supra Stanimaka, 1889, VELENOVSKÝ, holotypus (PRC). — In rupium fissuris ad viam inter Slivno et Rakova, 1893, J. WAGNER (PRC). — Rhodopen Geb., Bačkovo, 1893, STŘÍBRNÝ (PRC). — C. Baenitz, Herbarium Europ., no 7657, in saxosis calcareis prope Bačkovo, 1893, STŘÍBRNÝ (PRC). — Greece: in pascuis collibus pg. Neohori prope Thessalonicam, sine dato, DIMONIE (PRC).

The following characters were examined: leaf size (length : width), character of inflorescences, size of sepals and capsules including the wings. *P. rhodopea* differs from *P. hohenackeriana* in the shape of corolla, narrower leaves, smaller capsules, narrower wing (see the diagrams), size and shape of inner sepals. *P. hohenackeriana* is confined to the Caucasus and Elburz Mts. and the highlands of NW. Iran.

Distribution of *P. hohenackeriana* (specimens examined): Iran: prov. Hamadan, Ganaj Hanieh, 1947, LINDBERG (W); Aq Bulaq, 35°36′ N, 48°27′ E, ca 100 km N Hamadan, 1960, RIOUX et GOLVAN (W, G); 14 km W Takestan, alt. 1380 m, 1960, PABOT (G); 20 km N Khoy, 1960, PABOT (G). — Azerbaijan orient.: in decl. saxosis 20—40 km NE Tabriz, 1971, K. H. RECHINGER (W). — Prov. of Teheran: Karaj, 30 km W of Teheran, alt. 1600 m, 1966, ŽUMER (W); Tajrish, alt. ca 1000 m, 1966, ŽUMER (W); Kuh Eshtehard, Kuh Haljhé-Dar, 1968, TERMÉ (W); In semidesertis lapidosis inter Teheran et Veramin, ca 1000 m, 1948, K. H. et F. RECHINGER (W); Ad pagum Uenak prope Teheran, 1843, T. KOTSCHY (W); Ad radices montis Tuchal supra Evin, 1700 m, 1971, K. H. RECHINGER (W); Foothills of the southern range of Elburz Mts., just above Velenjak and Darakeh, 1972, R. ALAVA (TUR); Ostan 2, entre Teheran et Dilijan, 1956, F. SCHMID (G); Montes Elburz centr., in ditione opp. Keredj, in montibus Halkedar ad Murdabad, ca 1300 m, 1937, K. H. RECHINGER (W). — Prov. Kashan: inter Dehlidjan et Meimeh, ca 1500 m, 1948, K. H. et F. RECHINGER (W).

In their distribution, *P. hohenackeriana* and *P. rhodopea* are true vicariads. *P. stocksiana* appears closely related to *P. hohenackeriana* but is perhaps best treated as a separate species. We can conclude that *P. rhodopea* is an outstanding endemic of the mountain regions of S. Bulgaria and NE. Greece, where it grows on dry, grassy, mostly stony slopes. The related *P. supina* has been circumscribed very broadly (see e.g. BENNETT 1878, CHODAT 1893) or subdivided into several taxa, either specific (e.g. MALY 1911, JANCHEN 1915, STOJANOV et STEFANOV 1948) or subspecific (e.g. GRAEBNER 1915—1916, HAYEK 1925, MCNEILL 1968a, b). In our opinion, the *P. supina* complex may be subdivided into three species (*P. rhodopea*, *P. supina* and *P. hospita*) which differ by several distinct morphological characters.

2. *Polygala supina* SCHREBER, Icon. Descr. Pl. 1 : 19, 1766

Syn.: *P. androchnoides* WILLD., Sp. Pl. 3 (2) : 875, 1802 (? nom. illeg.). — *P. recurvata* ČELAK., Österr. Bot. Zeitschr. 22 : 109, 1872.

Caespitose perennials with numerous ascending to procumbent stems. Stems (6—)10—16 cm long, hairy, with appressed, arcuate trichomes. Leaves ovate to obovate or elliptical, 7—11 mm long, 2.5—4.5 mm wide, obtuse, glabrescent. Inflorescence dense, mostly 8—12(—15)-flowered. Outer sepals glabrous, inequal, inner sepals ovate-elliptical, 5.1—6.5 mm long, (2.7—)2.8—3.9 mm

wide, obtuse to lanceolate, glabrous, with veins distinctly anastomosing. Capsule obovate-obcordate 3.7—4.2 mm long, 2.8—3.2 mm wide, glabrous, wing 0,1—0,3 mm wide. Seeds 2.1—2.4 mm long, ±1 mm wide.

This species was described from N. and NE. Turkey ("in Ponti Armeniae apricis glareosis"). SCHREBER's description (SCHREBER 1766) corresponds to these plants, while the illustration of *P. supina* is somewhat different. We would suggest that the revision of *P. supina* be based on this description rather than on the illustration (see WILLDENOW 1802 : 876, MCNEILL

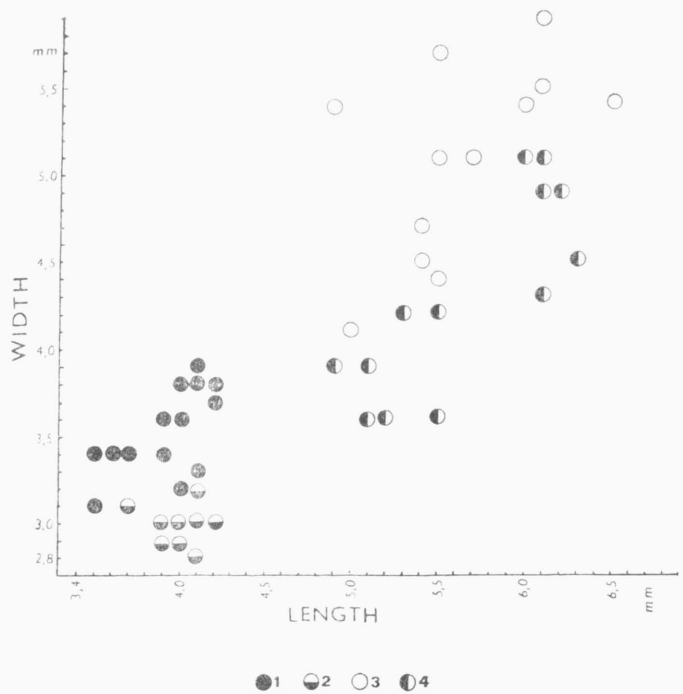

Fig. 1. Scatter diagram showing the relation of capsule length to capsule width in the four taxa: 1, *Polygala rhodopea*; 2, *P. supina*; 3, *P. hohenackeriana*; 4, *P. hospita* subsp. *hospita*.

1968a : 30). The material collected in Turkey seems to be identical with plants from Crimea, from where the plants have seen described as *P. andrachnoides* WILLD. Many authors (e.g. NEVSKIJ et TAMAMŠJAN 1949) maintain that only *P. andrachnoides* occurs in Crimea (see also RUBCOV et al. 1972). We conclude from the herbarium material available that the Crimean specimens are identical with those from N. Turkey, i.e. that they belong to *P. supina*. The taxonomy of the Crimean populations has been dealt with by ČELAKOVSKÝ (1872, 1884). He first described *P. recurvata* from Crimea, but later he identified it with *P. andrachnoides*, arguing that the Crimean plants are not identical with those from N. Turkey. We do not subscribe to MCNEILL's opinion because we have not seen any specimens which would confirm the presence of this species in the central part of the Balkan Peninsula (MCNEILL 1968b). In our opinion, *P. supina* grows only in montane to subalpine belts

of Anatolia and Crimea, predominantly in stony alpine meadows and, at lower altitudes, in light woodlands and thickets. The occurence in the Caucasus is likely; it has been reported in literature but the material was not available to us.

Specimens examined: Turkey: J. BORNMÜLLER, Pl. Exs. Anatoliae orient., Amasia, in regione silvatica, monte Kara-dagh, 800 m, 1889 (PRC). — P. SINTENIS, Iter orientale 1892, Paphlagonia, Wilajet Kastambuli, Tossia, in declivib. mont. Giaurdagh, HAUSSKNECHT (PRC). — U.S.S.R.: Krym, Baidar, Wälder um Baidarthor, 1895, CALLIER (PRC). — A. CALLIER, Iter Tauricum tertium, 1900, Simferopol, in graminosis prope coloniam Neusatz, HALÁCSY (PRC). — Tauria, ad Simferopol, sine dato, HORÁK (PRC).

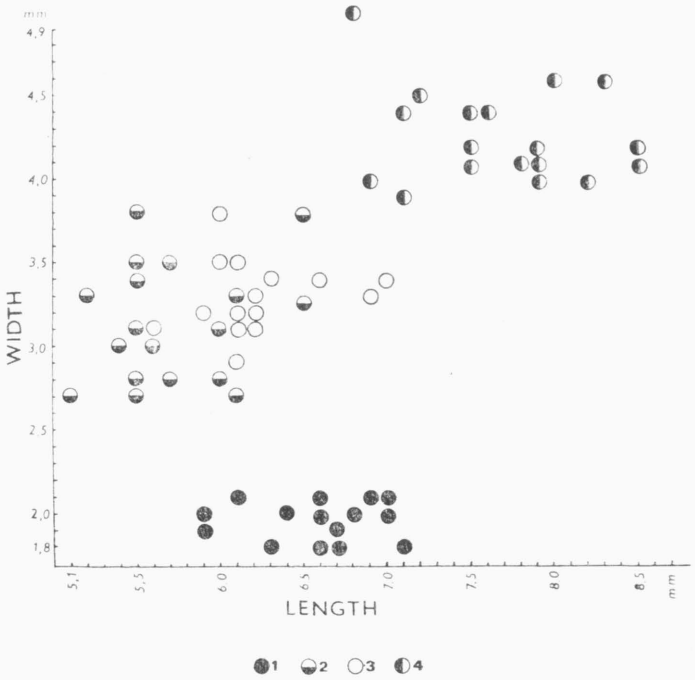

Fig. 2. Scatter diagram showing the relation of inner sepals length to inner sepals width in the four taxa: 1, *P. rhodopea*; 2, *P. supina*; 3, *P. hohenackeriana*; 4, *P. hospita* subsp. *hospita*.

3. *Polygala hospita* HEUFFEL, Flora (Regensb.) 36 : 620, 1853

This species was described from Banat (Romania) and is conspicuous — in comparison with other species of this group — by its robust growth, larger capsules and relatively wide wings. *P. supina* subsp. *bosniaca*, described by MURBECK, appears referable to this taxon, rather than to *P. supina* as proposed by MCNEILL. From *P. supina* it differs by a complex of characters (see the diagrams) and is conspicuous by its habit and especially its inflorescence.

(a) Subsp. *hospita*

Syn.: *P. supina* var. *euryptera* ČELAK., Österr. Bot. Zeitschr., 34 : 208, 242, 1884. — *P. s.* var. *hospita* (HEUFFEL) CHODAT, Mém. Soc. Phys. Hist. Nat., Genève 31 (2) 2 : 483, 1893. — *P. s.* subsp. *hospita* (HEUFFEL) MCNEILL, Feddes Repert., 79 : 30, 1968 et Fl. Europaea 2 : 233, 1968.

Caespitose perennials. Stems ascending, 10—15(—20) cm long, hairy, with arcuate trichomes. Middle cauline leaves elliptical to oblanceolate, acute to apiculate, sparsely appressed-hairy, (9—)10—16(—19) mm long, (3—)5—6(—11) mm wide. Inflorescence with 3—6(—12) flowers. Outer sepals hairy, inequal, inner sepals obovate, acute, (6.9—)7—8.5 mm long, (3.9—)4—5.5 mm wide, not distinctly longer than capsule, with veins anastomosing or rarely not anastomosing, glabrous. Capsule obovato-obcordate, 4.9—6.5 mm long, 3.6—5.2 mm wide, wing 0.4—0.9 mm wide. Seeds 3.1—3.4 mm long, 1.2—1.5 mm wide, shortly appressed-hairy.

Specimens examined: Romania: Banatus, distr. Caras-Severin, in vinetis neglectis et herbidis apricis ad pagum Svinița, solo argilloso, Fl. Romaniae Exs., 1920, BORZA (PRC). — In declivibus apricis collium vitiferorum prope pag. Svinicza ad Danubium inferiorem Banatus, 1870, JANKA (PRC). — Degen, Pl. Banatus Exs., in locis apricis, in vinetis supra pagum Svinitza, 1887, DEGEN (PRC). — Fl. Exs. Austro-Hungarica, Hung. australis, com. Krassó-Szörény, in locis apricis, in vinetis supra pag. Svinitza ad Danubium infer. Hungaria, 1887, DEGEN (PRC). — Turkey: DEGEN, Iter Turcicum 1890, in agri Byzantini collibus aridis frequentissima specimina legi in sylva Belgradensi, 1890, DEGEN (PRC). — Asia minor, in sylvis et locis umbrosis supra Brusa, 1873, PICHLER (PRC).

This taxon occurs in Banat (Romania and possibly Yugoslavia). We saw interesting specimens from Turkey (see above) which approach *P. hospita* in terms of morphology and may well represent an infraspecific taxon of it. Further study is required. CULLEN (1965) reports only *P. supina* as occurring in Turkey.

(b) Subsp. *bosniaca* (MURBECK) CHRTEK et KŘÍSA, comb. nova

Bas.: *P. supina* SCHREBER subsp. *bosniaca* MURBECK, Lunds Univ. Årsskr., 27 : 163, 1891.
Syn.: *P. bosniaca* ADAMOVIC, Allgem. Bot. Zeitschr. 2 : 95, 1896. — *P. murbeckii* DEGEN, Österr. Bot. Zeitschr. 56 : 29, 1906. — *P. supina* var. *euryptera* ČELAK., subvar. *parviflora* ČELAK., Österr. Bot. Zeitschr., 34 : 208, 242, 1884. — *P. s.* (proles *murbeckii*) K. MALÝ, Glasn. Muz. Bosni Herceg. 22 : 690, 1911. — *P. s.* subsp. *murbeckii* (DEGEN) GRAEBNER in ASCHERSON et GRAEBNER, Syn. Mitteleur. Fl. 7:321, 1916. — *P. s.* var. *bosniaca* (MURBECK) HAYEK, Prodr. Fl. Penins. Balcan. 1 : 592, 1925.

This subspecies differes from the type by the following characters: Stems most frequently 8—12 cm long, with smaller leaves 8—10 mm long and 3—4 mm wide. Capsule 4.2—5.2 mm long, 3—4 mm wide, wing 0.3—0.4 mm wide. Seeds ±3.1 mm long.

Specimens examined: Yugoslavia: Bosnien, Zenica, 1883, BREINDL (PRC). — Bosnien, Travnik, 1893, BRANDIS (PRC). — Serbia, Vranja, sine dato, NIČIČ (PRC). — Bosnien, Jansice, 1886, CONRATH (PRC). — Bosnia, in argillosis contra Novi han prope Sarajevo, 1869, KNAPP (PRC).

The variability of this taxon in Bosnia has been appreciated by ČELAKOVSKÝ (1884 : 242); while describing *P. supina* var. *euryptera*, he observed that "Planta Bosniae discerni potest uti subvariet. *parviflora*." MURBECK (1891 : 163) distinguishes the Bosnian plants from *P. supina* as follows: "A planta Schreberi imprimis differt caulibus brevioribus . . ., densius foliatis, foliis multo minoribus . . ., racemis tantum 1—4 floris, alis capsula angustioribus, . . .". ADAMOVIC (1896 : 95) elevated this taxon to the rank of species with the following commentary: "Gehört in die Verwandtschaft der *P. supina* SCHR., scheint aber doch eine gute, selbständige Art zu sein". DEGEN renamed MURBECK's taxon *P. murbeckii* (see HANDEL-MAZZETTI et al., 1906). MALY (1911) named Bosnia plants "proles *murbeckii*", recognizing two varieties: var. *typica* and var. *čelakovskyana*, of which the latter differs by its higher growth. GRAEBNER (1915—1916) classified it as a subspecies and HAYEK (1925) as a variety.

P. hospita subsp. *bosniaca* occurs in stony, grassy sites from the foothills to the submontane belt. Several species have been described from the Caucasus (e.g. *P. pseudohospita* TAMAMSCH., *P. nathadzae* A. KUTHATH. etc.), but to attempt at a taxonomic revision is made here owing to lack of material.

SOUHRN

V článku autoři hodnotí komplex *P. supina*, který rozlišují na tři samostatné druhy. *Polygala supina* SCHREBER je nápadná, kromě jiných znaků, především hustým květenstvím. V Evropě roste pouze na Krymu (dále roste ještě v Turecku a snad i na Kavkaze). *P. rhodopea* (VELEN.) JANCHEN je endemitem horských oblastí jižního Bulharska a severovýchodního Řecka a je morfologicky velmi vyhraněným taxónem. V souvislosti s tímto druhem se autoři zabývali i druhem *P. hohenackeriana* FISCHER et MEYER do kterého byl dříve druh *P. rhodopea* začleňován nebo dokonce s ním ztotožňován. Druh *P. hospita* HEUFFEL rozdělují autoři do dvou subspecií: subsp. *hospita* a subsp. *bosniaca* (MURBECK) CHRTEK et KŘÍSA, které se vyskytují v Banátu a v Bosně. Vybrané diagnostické znaky k jednotlivým taxónům a jejich diferenční hodnoty jsou znázorněny na přiložených diagramech.

REFERENCES

ADAMOVIC L. (1896): Neue Beiträge zur Flora von Serbien. — Allgem. Bot. Zeitschr., Karlsruhe, 2 : 95—96.

BENNETT A. W. (1878): Conspectus Polygalarum Europaearum. — Journ. Bot., London, 16 : 241—246; 266—282.

CHODAT R. (1893): Monographia Polygalacearum. — Mém. Soc. Phys. Hist. Nat., Genève, 31 (2) : 1—500.

CULLEN J. (1965): Polygalaceae. — In: DAVIS P. H. [ed.]: Flora of Turkey and the East Aegean Islands, 1 : 533—539. — Edinburgh.

ČELAKOVSKÝ L. (1872): Phytographische Beiträge. — Österr. Bot. Zeitschr., Wien, 22 : 109—111. — (1884): Ueber Polygala supina Schreb. und P. andrachnoides Willd. — Österr. Bot. Zeitschr., Wien, 34 : 208—211; 237—242.

GRAEBNER P. (1915—1916): Polygalaceae. — In: ASCHERSON P. et P. GRAEBNER, Synopsis der mitteleuropäischen Flora, ed. 1, 7, 1915 : 307—320; 1916 : 321—388. — Leipzig.

HANDEL-MAZZETTI H., J. STADLMANN, E. JANCHEN et F. FALTIS (1906): Beitrag zur Kenntnis der Flora von West-Bosnien. — Österr. Bot. Zeitschr., Wien, 56 : 27—37.

HAYEK A. (1925): Prodromus Florae peninsulae Balcanicae. Vol. 1. — Berlin-Dahlem.

JANCHEN E. (1915): Polygalaceae. — In: FRITSCH K., Neue Beiträge zur Flora der Balkanhalbinsel insbesondere Serbiens, Bosniens und Hercegowina. — Mitt. Naturw. Ver. Steierm., Graz, 51 : 173—215.

MALY K. (1911): Prilozi za floru Bosne i Hercegovine, 2. — Glasn. Muz. Bosni Herceg., Sarajevo, 22 : 685—694 (1910).

MCNEILL J. (1968a): Taxonomic and nomenclatural notes on Polygala in Europe. — Feddes Repert., Berlin, 79 : 23—34.

— (1968b): Polygalaceae. — In: TUTIN et al. [ed.]: Flora Europaea, 2 : 231—236. — Cambridge.

MURBECK S. (1891): Beiträge zur Kenntniss der Flora von Südbosnien und der Hercegovina. — Lunds Univ. Årsskr., Lund, 27 : 1—182.

NEVSKIJ S. A. et S. G. TAMAMŠJAN (1949): Polygalaceae. — In: Flora SSSR 14 : 246—266. — Moskva—Leningrad.

RĂVĂRUD M. (1958): Polygalaceae. — In: Flora RPR 6 : 197—213. — Bucureşti.

RUBCOV N. I. et al. (1972): Opredelitel' vyšších rastenij Kryma. — Leningrad.

SCHREBER J. CH. D. (1766): Icones et descriptiones plantarum. Decas I. — Halae.

STOJANOV N. et B. STEFANOV (1948): Flora na Balgaria. — Sofia.

VELENOVSKÝ J. (1891): Flora Bulgarica. — Pragae.

— (1894): Dritter Nachtrag zur Flora von Bulgarien. — Sitz.-Ber. Böhm. Ges. Wiss., Prag, 37 (1893) : 1—72.
— (1898): Flora Bulgarica, Suppl. 1. — Pragae.
Willdenow C. L. (1802): Caroli a Linné Species plantarum. Ed. 4. Vol. 3/2. — Berolini.

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See also Plates XII.—XIII. in the Appendix.

Výročí 1976

PhDr. Franz Petrak

* 9. 10. 1886 † 9. 10. 1973

Středoškolský profesor a významný evropský mykolog, rodák z Hranic na Moravě. V počátcích své životní dráhy se věnoval floristice, později se však stále více zaměřoval na nižší houby, kde v některých skupinách se stal světovým znalcem. Kromě několika floristických prací uveřejnil přes 500 prací mykologických. V období mezi dvěma světovými válkami tvořily základ jeho skrovného výdělku exsikátové sbírky, které vydával a rozesílal z Hranic na Moravě do nejrůznějších zemí světa. V roce 1940 odešel do Vídně pracovat jako mykolog v botanickém oddělení Přírodovědeckého muzea. V poválečném období má hlavní zásluhu na vydávání mykologického časopisu Sydowia. Z vyšších rostlin rozvíjel především téma své disertační práce a připravoval monografii rodu *Cirsium*. V době svého působení na Moravě poskytoval floristické údaje prof. J. Podpěrovi pro Květenu Moravy a Květenu Hané. Bohatý herbářový materiál je z velké části zachován v botanickém oddělení Národního muzea v Praze. Na počest F. Petraka bylo pojmenováno několik rodů a mnoho druhů hub.

Plate XII. — 1, *Polygala rhodopea* (Velen.) Janchen. Holotype (PRC); 2, *Polygala supina* Schreb. Simferopol, Halácsy (PRC). Photo by J. Klán.

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Plate XIII. — 1, *Polygala hospita* HEUFFEL subsp. bosniaca (MURBECK) CHRTEK et KŘÍSA. Novi han, KNAPP (PRC); 2, *Polygala hospita* subsp. *hospita*. Svinicza, JANKA (PRC). Photo by J. Klán.