

Studia taxonomica ad taxa sectionis *Stipa* in regione mediterranea atque submediterranea occurrentia

Taxonomická studie kavylů sekce *Stipa* mediteránní a submediteránní zóny

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MARTINOVSKÝ J. O.¹⁾ et B. MORALDO²⁾ (1980): Studia taxonomica ad taxa sectionis *Stipa* in regione mediterranea atque submediterranea occurrentia. [Taxonomic study of section *Stipa* in mediterranean and submediterranean regions.] — Preslia, Praha, 52 : 13–34.

A survey is given of taxonomy, geographical distribution, ecology and phytocoenology of *Stipa* sect. *Stipa* in the mediterranean and sub-mediterranean regions. Three new subspecies are described: *S. dasyvaginata* MARTINOVSKÝ subsp. *apenninicola* MARTINOVSKÝ et MORALDO, *S. austroitalica* MARTINOVSKÝ subsp. *theresia* MARTINOVSKÝ et MORALDO and *S. pennata* L. emend. STEVEN subsp. *dvorakii* MARTINOVSKÝ et MORALDO. New localities of *S. epilosa* MARTINOVSKÝ and *S. austroitalica* MARTINOVSKÝ are reported. There is also a key to species occurring in the Apennine and Balkan Peninsulas and adjacent parts of Central Europe. Phytogeographical notes are provided.

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PRAEFATIO

Frequentia taxorum divisionis *Spermatophyta* in regione mediterranea ac submediterranea per plures condiciones confecta est. Imprimis per magnam verticalem nec non horizontalem dissipationem huius territorii eiusque substratum petrographicum. Propter geographicam ac climatis positionem in oriente regionum elementa continentalia, in occidente elementa oceanica praeferuntur. Eximiam significationem in florae nec non vegetationis formando mutationes climatis in duabus postremis periodis geologicis confecerunt, quando regiones haec non solum refugium florae ad meridiem migrantis factae sunt, sed flora etiam stimulum ad evolutionem sub novis conditionibus accepit.

Disputatio sequens eventum novissimorum studiorum taxorum sectionis *Stipa* et praecipue seriei *Pulcherrimae* continet.¹⁾ Haec taxa in territorio copiose occurrunt, quam-ob-rem ad studia taxonomica ac chorologica apta sunt et conclusiones florogeneticas adiuvare possunt.

Materia disputationis in quatuor capita comprehensa est:

I. Taxa novissime cognita, II. Localitates novae taxorum iam prius cognitorum, III. Adumbratio oecologica et phytocoenologica, IV. Clavis analytica

¹⁾ Territorii partem orientalem (Asiam Minorem et omnino regionem circa Pontum) et occidentalem (peninsulam Hispanicam) omittimus, nam novissimo tempore *Stipae* horum locorum accuratius exploratae sunt (MARTINOVSKÝ 1970, KLOKOV 1975, SCHOLZ 1975).

Tab. 1.

<i>S. pulcherrima</i>	<i>S. dasyvaginata</i> subsp. <i>dasyvaginata</i>	<i>S. dasyvaginata</i> subsp. <i>apenninica</i>
	Altitudo culmi in cm	
80—100(120)	60—80	80—90
	Vagina	
glabra, nitens	folii infimi basalis nec non culmei infra ligulam brevissime puberula	sicut ad subsp. <i>dasyvaginatam</i>
Indumentum ac longitudo ligularum		
Ligulae glabrae vel solum per marginem breviter ciliatae, ad folia basalia 2—3 mm, ad folia culmea 5(7) mm longae	Ligulae per dorsum sparse ac adpresse pilosae, per marginem longius ciliatae, ad folia basalia ± 1 mm, ad folia culmea ± 3 mm longae	Indumentum ligularum sicut ad subsp. <i>dasyvaginatam</i> , ad folia basalia 1—1,5 mm, ad folia culmea usque 5 mm
Laminae per faciem abaxialem		
$\pm$ tuberculatae, subscabrae usque scabrae (fig. 19; tab. II-2)	copiose tuberculatae, scabrae usque scaberrimae	sicut ad subsp. <i>dasyvaginatam</i> (fig. 1; tab. I-3 et I-4)
Indumentum culmi		
Culmus sub nodis glaber	Culmus sub nodis per longum spatium adpresse pilis setiformibus 0,2—0,4 mm longis ornatus, inferius tuberculatus usque glaber	sicut ad subsp. <i>dasyvaginatam</i>
Glumae		
glabrae, per marginem eciliatae	sicut ad <i>S. pulcherrimam</i>	per marginem ciliis usque 1,5 mm longis adpresse ac sparse instructae
Lemma		
(18)20—24(25) mm. Linea ventralis insertionem aristae assequens sed eam non caudiculae instar superans	(19)21,5—22,5(23) mm. Linea ventralis insertionem aristae assequens et eam pilis 0,4 usque 0,6 mm longis caudiculae instar superans	(17)19—24(25) mm. Linea ventralis insertionem aristae assequens et eam pilis usque 1(2) mm longis caudiculae instar superans
Longitudo aristae		
(250)300—350(390) mm	(230)250—280(300) mm	(200)220—300(320) mm
Area		
Per magnam partem areae seriei (fig. 8, no. 1)	In Hispania australi et in Africa boreooccidentali (fig. 11, no. 1)	In Italia media (fig. 11, no. 2)

ad determinandum specierum et subspecierum sectionis *Stipa* in peninsula Apennina et Balcanica atque in territoriis adiacentibus Europae centralis crescentium, V. Adnotationes phytogeographicae.

I. TAXA NOVISSIMO TEMPORE COGNITA

Stipa dasyvaginata MARTINOVSKÝ subsp. *apenninicola* MARTINOVSKÝ et MORALDO, subsp. nova

Stipa dasyvaginata a M. Winkler in monte Dornago in Sierra Nevada collecta, serius etiam in aliis locis Hispaniae australis et in montibus Africae boreooccidentalis inventa, a MARTINOVSKÝ (1970) descripta et denominata est. Planta multis notis *S. pulcherrimam* commemorat. Novissimo tempore MORALDO specimina *Stipae* invenit, quae copiose in Montibus Simbruinis et in Monte Polveraccio in Montibus Picentinis crescit et sine dubio etiam in aliis locis Italiae mediae occurrit. Planta notis oecologicis atque morphologicis partim ad *S. pulcherrimam* sed ex parte maiore ad *S. dasyvaginatam* spectat et sine dubio taxon intraspecificum huius speciei repraesentat atque porro *S. dasyvaginata* subsp. *apenninicola* denominabitur.

Notae diacriticae *S. pulcherrimae*, *S. dasyvaginatae* subsp. *dasyvaginatae* et *S. dasyvaginatae* subsp. *apenninicolae* tabula comparativa (tab. 1) affert.

Descriptio: Caespites robusti, culmi nonnumquam cum panicula sine fructibus 90 cm assequentes. Vaginae infimorum foliorum basaliū nec non culmeorum in parte superiore breviter ac dense puberulae. Laminae, praecipue foliorum basaliū infimorum, tuberculis obtectae, scabrae usque scaberrimae, plerumque ca 60 cm assequentes, apicibus acutis et per faciem abaxialem tuberculis conicis ornatae. Latera costarum papillis densis, 0,2 mm longis, instructa (fig. 1a). Laminae tempestate humida late apertae, tempestate arrida conduplicatae. Ligulae foliorum basaliū 1,5–2,5 mm longae, per marginem ac dorsum pilosae, culmeorum 4–5(7) mm longae, simili modo pilosae. Culmus plerumque quattuor internodiis formatus, sub inflorescentia nec non sub nodis adpresse setis densis, inferius in tubercula transeuntibus instructus. Panicula 5–8 spiculis formata. Glumae usque 80 mm longae, in parte media per marginem pilis setiformibus, sparsis, subadpressis praeditae. Lemma (17)19–23,5(25) mm longum. Linea pilosa ventralis (in quam ambae lineae marginales conflunt) pilis usque 2 mm longis, caudiculae instar conglomeratis, insertionem aristae superant (tab. I–3). Arista (210)240–300(320) mm longa. Columna breviter tuberculata, subscabra, inter genicula non-numquam aculeis brevibus usque setiformibus tecta.

Herba habitat in altitudine 700–1800 m supra maris elevationem in expositione australi et contiguīs praecipue solo calcareo crescit, exeunte Maio florere incipit ac ineunte Julio fructificat.

Typus cum scheda: Rupi e xerogramineti sopra e sotto in Santuario della Trinità 1250 usque 1500 m al Monte Autore del gruppo dei M. Simbruini. B. MORALDO, M. CARLEVARIS e M. MEUTI; Giugno 1977 in NAP conservata.

Isotypi in collectione typorum Instituti botanici Universitatis Carolinae Praegae (PRC) et Florentiae (FI) depositi.

Adnotatio taxonomica: Taxon ad seriem *Pulcherrimae*, subseriem *Eriocaules* attribuendum est. Ab omnibus huius subseriei taxis caudicula pilosa sub aristae insertionem et glumis per marginem sparse ciliatis atque area distat. A *S. pulcherrima* vaginis breviter pilosis, internodiis sub nodis adpresse setaceis, inferius tuberculatis, infimo glabris, ligulis copiosissime pilis longioribus per marginem ac tergum tectis abhorret. A *S. pennata* L. emend. STEVEN statura validiore, laminis scabris, in tempestate humida apertis, lemmatibus ac aristis longioribus distinguitur. A *S. mayeri* glumis per faciem dorsalem glabris, a *S. dasyvaginata* margine ciliatis, caudicula insigniter longiore et area distat.

Area (specimina collecta vel visa):

Abruzzi. Barisciano (AQ.), 940 m, PACIFICO 1972 (AQ!). S. Giuliano, sine collectoris nomine, 1970 (AQ!). Tremonti, 450 m, LORITO 1969 (AQ!). Villavallelonga, GRANDE 1914 (NAP!). Monti le Morricane, ORSINI sine anno (NAP!). Monti di Castel di Sangro, CAPUTO 1976 (NAP!). M. Sirente, xerogramineti in località La Spagnoletta, 1600 m, MORALDO e DIAMANTI 1978 (NAP!). Ovindoli, rupi tra i 900 ed i 1300 m, MORALDO e DIAMANTI 1978 (NAP!). Gioia dei Marsi, rupi e xerogramineti, 800—1000 m, MORALDO e MEUTI (NAP!). Parco Nazionale d'Abruzzo: gramineti da Gioia Vecchio al Passo del Diavolo, 1300—1600 m, MORALDO e MEUTI 1978 (NAP!).

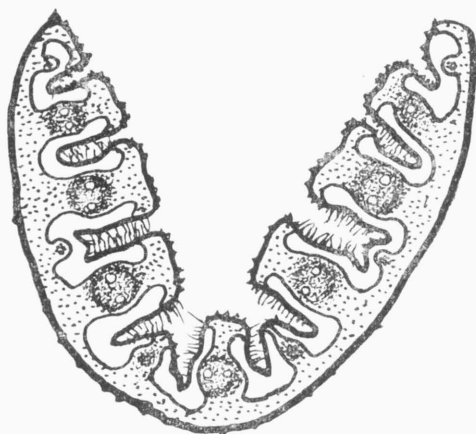


Fig. 1a. — *Stipa dasyvaginata* subsp. *apenninicola*: sectio transversa per laminam folii basalis.

Lazio. Monti di Fiamignano, GRANDE 1909 (NAP!). M. Simbruini: falde sud — occidentali del M. Autore nella lecceta sopra Subiaco, 700—850 m, MORALDO, CARLEVARIS e MEUTI 1977 (NAP!); ibid.: rupi sopra e sotto il Santuario della Trinità, 1250—1500 m, MORALDO et al. 1977 (locus classicus NAP!); ibid.: rupi e pietraie sopra Vallepietra: 1000—1300 m, MORALDO et al. 1977 (NAP!); ibid.: xerogramineti e rupi fino a 1650 m sul M. Autore, MORALDO et al. (NAP!); ibid.: sorgenti dell' Aniene e negli xerogramineti rupestri sopra Filettino, MORALDO et al. 1977 (NAP!); ibid.: Filettino, salendo verso Sera S. Antonio, 800—1400 m, MORALDO et al. 1977 (NAP!); ibid.: M. Viperella verso Campo Staffi a 1820 m, MORALDO et al. 1977 (NAP!).

Campania. M. Picentini: pendici orientali del M. Polveracchio, xerogramineti in località „Raia della Volpe“, 1500—1600 m, MORALDO, CAPUTO e LA VALVA 1977 (NAP!); ibidem Monte della Croce, xerogramineti a Est de 1000 m alla veta, MORALDO e DEROMEDI 1976 (NAP!), M. Alburno: Polla, xerogramineti sopra l'abitato 800—1200 m, MORALDO, CARLEVARIS e DEROMEDI 1978 (NAP!); ibidem: M. Carmelo sopra S. Arsenio 1100—1300 m, LA VALVA e VIOLANTE 1978 (NAP!).

Calabria. Campotenese, GUSSONE 1837 (NAP!). Salendo da Campotenese a Cozzo Vardo negli xerogramineti, 1200—1500 m, MORALDO e LA VALVA 1978 (NAP!). M. Pollino: Coppola di Paola, rupi e xerobrometi tra la fagetta, 1400—1600 m; MORALDO e LA VALVA 1978 (NAP!); rupi e xerobrometi dal Belvedere a Timpone della Capanna, 1500—1600 m, MORALDO e LA VALVA 1978 (NAP!); Ibid., serra del Prete 1600 m, MORALDO e LA VALVA 1978 (NAP!). Monte la Mula, rupi a sud della vatta 1600 m, MORALDO e LA VALVA 1978 (NAP!).

Adnotationes ad aream: Post investigationem insuper commemoratarum localitatum nec non speciminum in herbariis NAP et AQ a MORALDO revisis hoc tempore saltem subsp. *apenninicola* non nisi in centralibus ac Australibus Apenninis occurrere apparet, sed in his montibus amlior esse

videtur, quam adhuc notum est. Distributio geographica fig. 1b et fig. 11 no 2.²⁾)

Stipa pennata L. emend. STEVEN subsp. ***dvorakii*** MARTINOVSKÝ et MORALDO, subsp. nova

Stipa pennata L. emend. STEVEN admodum taxon polymorphum est, nonnullas subspecies continens, *S. pulcherrimae* ac *S. dasyvaginatae* proxima, sed statura graciliore, laminis in facie abaxiali glabris atque levibus, rarius in parte infima subscabris distat. Hoc loco subspecies nova — *dvorakii* — in peninsula Balcanica inventa, describitur. Notae diacriticae a ceteris subspeciebus in clave analytica enumerantur.



Fig. 1b. — *Stipa dasyvaginata* subsp. *apenninicola*: distributio in Apennino.

Descriptio: Planta caespitosa, perennis, statura robustiore, cum fructibus usque 60 cm alta, vaginis, praecipue foliorum anni praecedentis, breviter puberulis. Ligulae foliorum basaliū 1–2 mm longae, margine longius ciliato, per tergum adpresse pilosae, foliorum culmeorum 5 mm longae. Laminae in facie abaxiali glabrae, leves, effigurationes costales in facie adaxiali papillis partim piliformibus ad latera omnium costarum nec non per vertices costarum mediarum, partim tuberculis brevibus ac conicis per vertices costarum externarum ornatae (fig. 2; tab. I–2). Panicula 6–8 spiculis formata. Lemma (19)21–22(23) mm longum, linea pilosa ventralis insertionem aristae assequens et eam caudicula usque 2 mm longa superans

²⁾ Specimina revisa pro parte maxima ut *S. pennata* L., *S. pennata mediterranea* TRIN. et RUPE. a collectoribus determinata sunt.

(tab. I—1). Arista 250—280 mm longa. Glumae pilis setiformibus, adpressis, 0,2—0,4 mm longis sparse praeditae.

Stationes: clivi sicci substrato calcareo.

Locus classicus: Galičica (Macedonia) in altitudine cca 1600 m.

Area: adhuc non bene nota; localitas typi in Jugoslavia, mons Galičica (fig. 11) sub saltu.

Typus 15. 6. 1976 a J. Dvořák collectus in herbario typorum instituti botanici Universitatis Carolinae Pragae sub no 493 depositus.

Affinitas: Herba in seriem *Pulcherrimae*, subseriem *Eriocaulae* attribuenda est. Pilositate foliorum subsp. *kiemii* affinis, sed distat lemmatibus longioribus, caudicula insignius formata, statura robustiore ac area.

Etymologia: Subspecies ad honorem J. Dvořák, botanici moravici industrii, collectoris huius subspeciei denominatur.

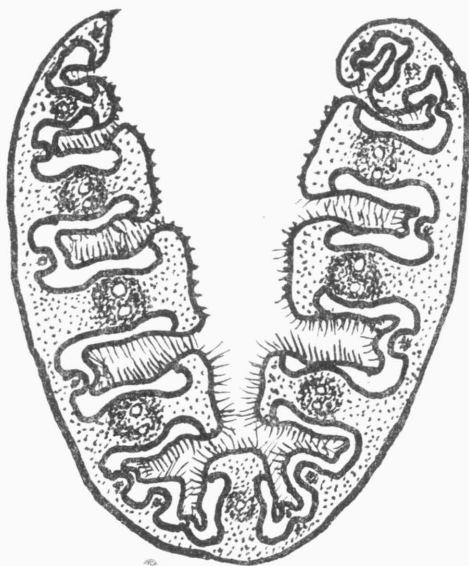


Fig. 2. — *Stipa pennata* subsp. *dvorakii*: sectio transversa per laminam folii basalis.

Stipa austroitalica MARTINOVSKÝ subsp. *theresiaae* MARTINOVSKÝ et MORALDO, subsp. nova

Descriptio: Herba statura humili, 10—30 cm alta. Culmus sub nodis paulum pilosus. Vaginae infra ligulam puberulae. Ligulae foliorum basaliū 0,5 mm, foliorum culmeorum 1 mm longae, ciliis usque 1,5 mm per marginem ornatae. Laminae foliorum basaliū glabrae - ac leves, in facie adaxiali crebre pilosae (tab. II—1), pilositate *S. austroitalicam* MARTINOVSKÝ subsp. *austroitalicam* commemorantes. Glumae 40—60 cm longae, lemma (12)13—15(15,5) mm assequens. Linea ventralis plerumque insertionem aristae caudicula ca 1 mm longa superans. Arista (160)180—190(210) mm longa.

Typus in NAP cum scheda sequente depositus est: Gariga mediterranea, esposta a SW, tra i 200 ed i 700 m presso Frascineto (Cosenza). B. MORALDO e D. SAVINO; 2 giugno 1977.

Isotypi in collectione typorum PRC et FI depositi.

Finis areae adhuc non exploratus, localitas ad Frascineto in Calabria (fig. 10—4).

Affinitas: Taxon *S. austroitalicae* subsp. *austroitalicae* affinis sed notis in tab. 2 adlatis differt.

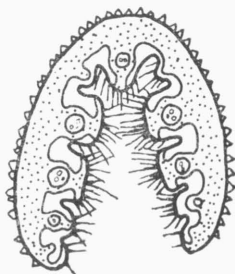
Anotatio taxonomica: Affinitas ad *S. siciliensem* MARTINOVSKÝ (1965) exploranda est.

Notae	<i>S. austroitalica</i> subsp. <i>austroitalica</i>	<i>S. austroitalica</i> subsp. <i>theresia</i>
Longitudo culmi	15–60 cm	10–30 cm
Longitudo ligulae	0,5–3 mm	0,5–1 mm
Longitudo lemnatis	(16)17–19(19,5) mm	(12)13–15(16,5) mm
Longitudo aristae	(210)260–290(320) mm	(160)180–190(210) mm
Linea ventralis	insertionem aristae assequens	insertionem aristae vix assequens vel sub ea usque $\pm$ 4 mm desinens

II. LOCALITATES NOVAE TAXORUM IAM PRIUS COGNITORUM

Stipa epilosa MARTINOVSKÝ

Species haec e serie *Pulcherrimae* e subserie *Epilosae* principio secundum specimen a J. Bornmüller in montibus Bulghar-Dagh in Asia Minore collectum descripta est (MARTINOVSKÝ 1967 : 273). Serius in multis locis peninsulae Balcanicae explorata est et novissimo tempore in Alpibus ac in Pyrenaeis collecta vel in collectionibus vetustioribus detecta est (Cottische Alpen leg. MATLESISC det. MARTINOVSKÝ, Entraque et Creppo di Triora in Alpibus Maritimis leg. et det. MORALDO et RILLA, Bormio in Alpibus Raeticis leg. LEVRIER 1871, det. MORALDO (NAP), Gavernie in Pyrenaeis leg. PITART et det. MARTINOVSKÝ (BP). Species nunc igitur ex his rebus publicis nota est: Bulgaria, Gallia, Graecia, Italia, Jugoslavia, Romania, Turcia (in parte asiatica et verosimiliter etiam in parte europaea occurit).

Fig. 3. — *Stipa iberica*: sectio transversa per laminam folii basalıs.

Adnotatio taxonomica: *S. epilosa* *Stipae pennatae* L. emend. STEVEN proxima, sed differt indumento effigurationum costalium, quae per latera papillis piliformibus carrent et ibidem tuberculis conicis ornatae sunt (cf. fig. 4, 20, 21; tab. I–5). Ab omnibus adhuc notis subspeciebus *Stipae crassiculmis* laminis in facie abaxiali glabris ac levibus distat (cf. fig. 4 et 25).

Stipa austroitalica MARTINOVSKÝ

Herba adhuc in Italia media (Basilicata, Apulia) atque in Sicilia nota est. MARTINOVSKÝ (Webbia, Firenze 20 : 711–736, 1965) sententiam attulit,



Fig. 4. — *Stipa epilosa*: sectio transversa per laminam folii basalis.

eam verosimiliter etiam in Calabria occurrere, quod MORALDO affirmavit (Cassano, Cerchiaria, Castrovillari ad M. Pollino 600—900 m).

Stipa endotricha MARTINOVSKÝ

Species solum e nonnullis localitatibus Graeciae mediae atque australis nota (MARTINOVSKÝ, Preslia 44 : 12—13, 1972). Herba *S. pennatae* L. emend.

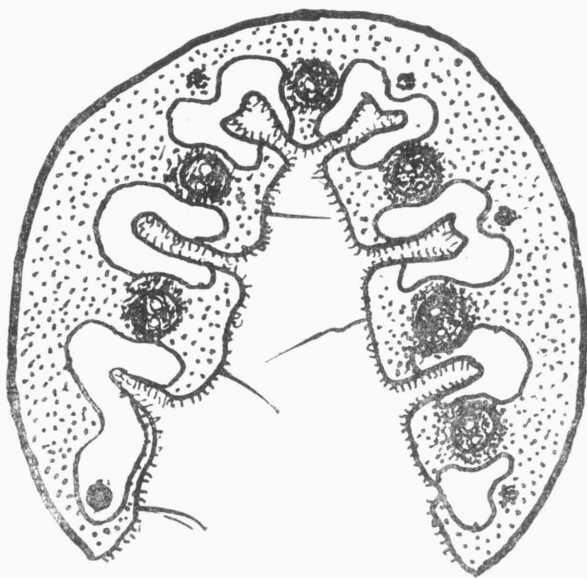


Fig. 5. — *Stipa endotricha*: sectio transversa per laminam folii basalis.

STEVEN affinis, sed indumento faciei adaxialis laminarum distat, quo vertices effigurationum costalium hic illic pilis setiformibus 0,08—0,2 mm longis ornati, latera costarum papillis minutissimis, rectis, acuminatis oblecta (fig. 5).

Tempore novissimo Moraldo in M. Gargano specimina *Stipae* cum verticibus costarum sparsim pilosis (igitur sicut ad *S. endotricham*) sed cum lateribus costarum papillis setiformibus (sicut ad *Stipam pennatam*) invenit. Item Martinovský in materiali herbario (W 21348) specimen a Ronnigero in Alpibus Maritimis collectum invenit, quod indumento faciei adaxialis *S. endotricham* commemorat. In rebus ambabus ante dignationem taxonomicam finitam studia sequentia optanda.

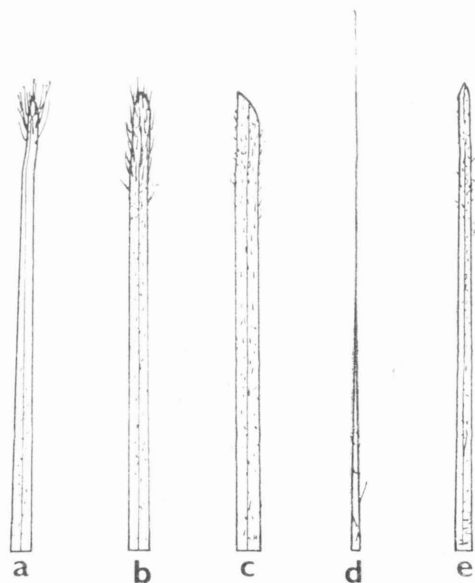


Fig. 6. — Apices foliorum taxorum: *Stipae joannis* — a, *S. styriacae* — b, *S. pulcherrimae* — c, *S. tirsae* — d, *S. austroitalicae* — e.

III. ADUMBRATIO OECOLOGICA ET PHYTOCOENOLOGICA SUBSERIERUM SERIEI *PULCHERRIMAE* IN REGIONE MEDITERRANEA AC SUBMEDITERRANEA OCCURRENTIUM

In Europa australi taxa seriei *Pulcherrimae* e magna parte ultra limen arborum ascendunt, rarius in loca aperta silvarum, ubi solum strato tenui saxa obtegit, penetrant. In Europa centrali in gradum collinum descendunt. In omnibus paene localitatibus habitationes expositione calida, substrato calcareo (saxa calcarea, calcifero-schistacea, dolomitica, declivitates margaceae) vel basico saltem (saxa basaltica, diabasica, serpentinica) eligunt; substrata acida omnino vitant.

Subseries *Eriocaulales*

Taxa subseriei huius in steppis montanis in altitudine inter 600—1600 m s. m. in substrato calcareo et sub expositione australi crescunt. Trans hoc limen raro ascendunt, sicut supra Campo Steffi in M. Viperella in Montibus Simbruinis, ubi altitudinem 1820 m assequuntur, quo in arida prata elementa *Seslerietalium* et *Brometalium* penetrant.

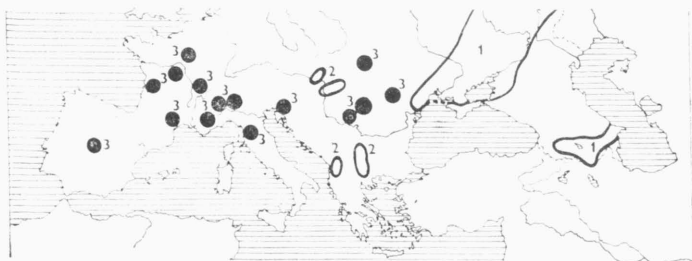


Fig. 7. — *Stipa tirsia*: area continua — 1, aggregatio localitatum — 2, localitates singulae — 3.

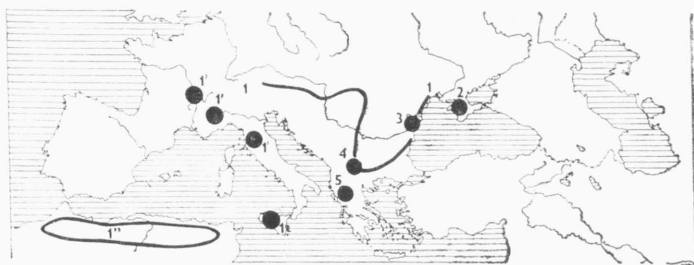


Fig. 8. — *Stipa pulcherrima*: areae in Europa media limes australis — 1, exclavae — 1', localitas dubia — 1?, expansio verosimilis in Africa boreooccidentali — 1''; *S. syreistschikovi* — 2; *S. ucrainicae* exclava maxime occidentalis — 3; *S. mayeri* — 4; *S. rechingeri* — 5.

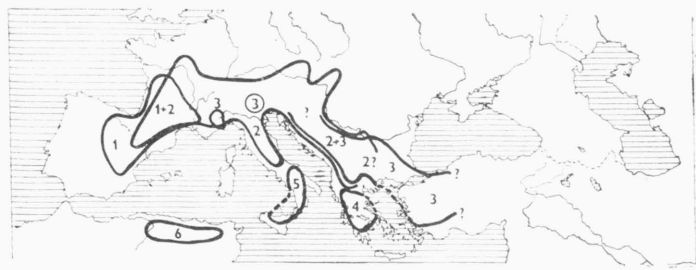


Fig. 9. — *Stipa iberica* — 1; *S. pennata* — 2; *S. epilosa* — 3; *S. endotricha* — 4; *S. austroitalica* — 5; *S. atlantica* — 6.

In locis superioribus, praecipue in saxis species e *Seslerione apenninae* (*Sesleria apennina*, *Sesleria nitida*, *Carex macrolepis*, *Linum flavum*, *Acinos alpinum* et *Hedraianthus graminifolius*) praevalent, dum in partibus inferioribus species e *Bromione erecti* (*Bromus erectus*, *Brachypodium pinnatum*, *Festuca glauca* s. l., *Anthyllis vulneraria*, *Helianthemum* sp.) praedominant. Nonnullae species praecipue montanorum mediterraneorum pratorum paene semper adsunt (*Cytisus subspinescens*, *Euphorbia myrsinites*, *Asphodeline lutea*, *Scabiosa crenata*, *Thymus striatus*).



Fig. 10. — *S. joannis* — areae limes australis — 1; *S. borysthena* — 2; *S. styriaca* — 3; *S. austroitalica* subsp. *theresiae* — 4.

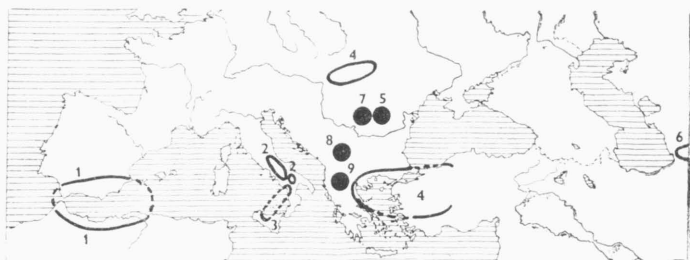


Fig. 11. — *Stipa dasyvaginata* subsp. *dasyvaginata* — 1; *Stipa dasyvaginata* subsp. *apennincola* — 2; *Stipa crassiculmis* subsp. *picentina* — 3; *Stipa crassiculmis* subsp. *euroanatolica* — 4; *Stipa crassiculmis* subsp. *heterotricha* — 5; *Stipa crassiculmis* subsp. *crassiculmis* — 6; *Stipa danubialis* — 7; *Stipa novakii* — 8; *Stipa pennata* subsp. *dvorakii* — 9.

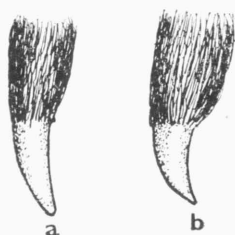


Fig. 12. — Callus specierum: *S. borysthena* — a; *S. joannis* — b.

Subseries *Epilosae*

In Apenninis taxa huius subseriei easdem stationes sicut taxa subseriei praecedentis occupant, dum in Alpibus ab 900 ad 1700 m cum *Festuca glauca*, *Koeleria vallesiana*, *Oxytropis pilosa*, *Melica ciliata*, *Artemisia camphorata* occurrunt.

Haec populatio loca post degradationem *Fagetum* occupans, paulo vulgata est.

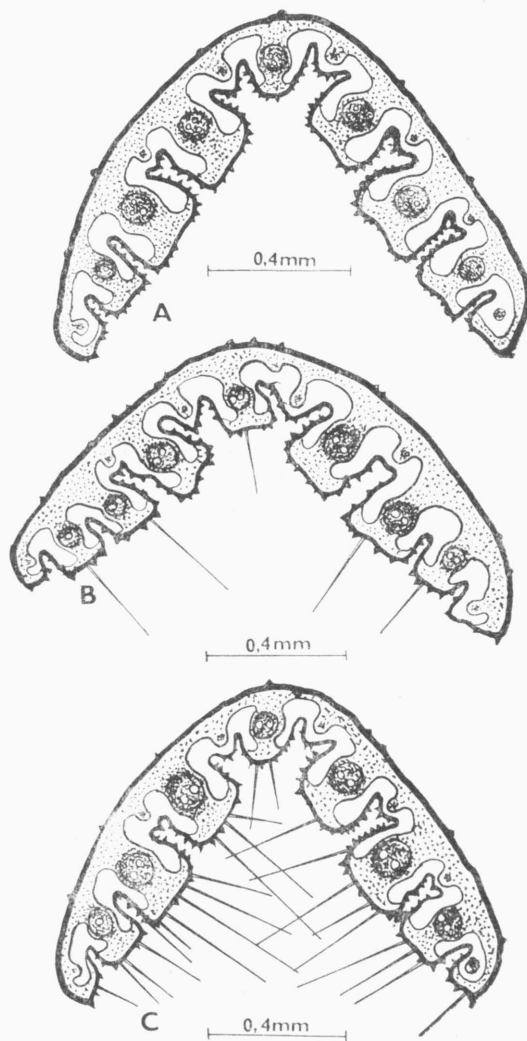


Fig. 13. — Sectiones transversae per laminas foliorum basalem: *S. joannis* subsp. *joannis* — A, *S. joannis* var. *subpuberulae* — B, *S. joannis* subsp. *puberulae* — C.

Subseries *Atlanticae*

Species huius subseriei e supra generaliter dictis excipiendae sunt. Taxa solum in exclusive typica vegetatione mediterranea crescunt. In Gargano, in Apulia nec non in Calabria a maris litore (per scopulos „Punta Rossa“ prope Mattinata) usque $\pm$ ad 700 m s. m. ascendunt.

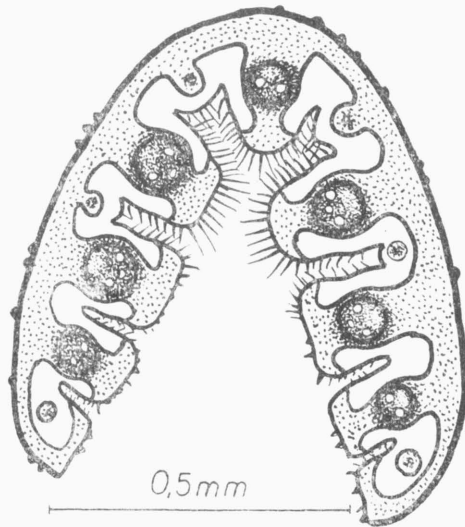


Fig. 14. — *Stipa pennata* subsp. *kiemii*: sectio transversa per laminam folii basalis.

Ut relictum in saxis calcareis in *Quercione ilicis* una cum *Daphne sericea*, *Pistacia lentisco*, *Smilace aspera*, *Phyllirea media* et etiam in *Olea-ceratonione* et nonnumquam cum *Opuntia ficus-indica* invenitur.

Sed praesentia harum *Stiparum* magni momenti fit, ubi arboretum mediterraneum per dumetum rarius (*Thymus capitatus*, *Euphorbia spinosa* et *Ruta graveolens*) oppressum et *Stipae* in aridis graminosis associationibus in *Thero-Brachypodietis* cum *Stipa capensi*, *Lino stricto*, *Aegilope geniculata*, *Trifolio stellato*, *Andropogine hirta* praevalent.

IV. CLAVIS ANALYTICA AD DETERMINANDUM SPECIERUM SECTIONIS *STIPA* IN PENINSULA APENNINA ET BALCANICA NEC NON IN REGIONIBUS ADIACENTIBUS EUROPAE CENTRALIS OCCURRENTIUM

Territorium continet imprimis Europae regionem mediterraneam atque submediterraneam cum rebus publicis sequentibus: Albania (Al), Austria (Au), Bulgaria (Bu), Czechosloviae pars slovaca (Cz), Graecia (Gr), Helvetia (He), Hungaria (Hu), Italia (It), Jugoslavia (Ju), Romania (Ro), Rossiae pars Ucraina Transcarpatica (Ros), Turciae pars europaea (Tu).

1a Laminae apice setiformiter prolongato (fig. 6d); ligulae exiguae, quae oculis vix cerni possunt, folia basalia conspicue longa, filiformia: *S. tirsia* STEVEN Bull. Soc. Natur. Moscou 3): 1 15, 1857, emend. ČELAKOVSKÝ Oosterr. Bot. Z. 34: 319, 1884; syn.: *S. cerariorum*

- PANČIĆ 1874. — *S. stenophylla* (CZERN. ex LINDEM.) TRAUTV. 1884. — *S. longifolia* BORR. (1886). (Cf. MARTINOVSKÝ et SKALICKÝ 1869)) 2
- b Laminae apice setiformiter non prolongato (fig. 6a—c, e) 3
- 2a Linea pilosa centralis lemmatis insertionem aristae assequens: subsp. *albanica* MARTINOVSKÝ, Preslia, 44 : 21—22, 1972; Al.
- b Linea pilosa ventralis lemmatis usque 4 mm sub aristae insertionem desinens: subsp. *tirsa*; Au Bu Cz Gr? Hu It Ju Ro Tu? (fig. 7).

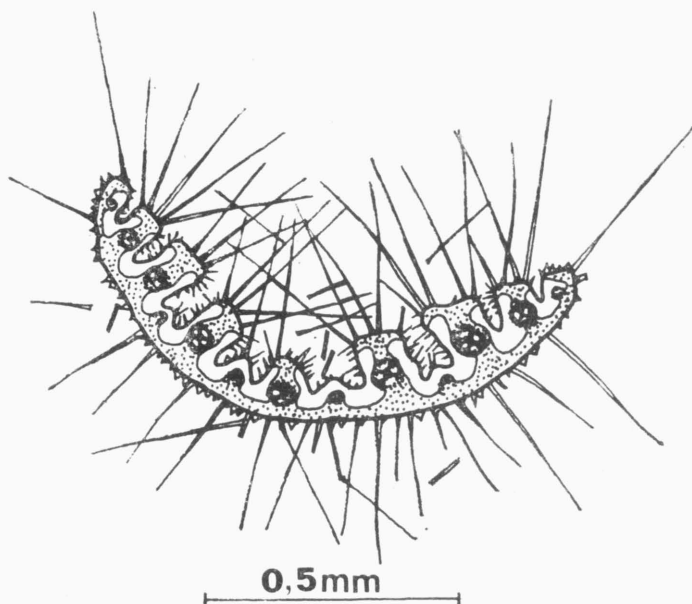


Fig. 15. — *S. dasyphylla*: sectio transversa per laminam folii basalıs.

- 3a Linea ventralis 2—4 mm sub aristae insertionem desinens 4
- b Linea ventralis insertionem aristae $\pm$ assequens vel eam caudiculae instar superans (tab. I—1 et 3) 11
- 4a Columna aristae pilosa: *S. danubialis* DIHORU et ROMAN Rev. Roum. Biol. sér. bot. 14 : 21 usque 27, 1969; Ro (fig. 11, no. 7). (Planta verosimiliter endemica).
Adnotatio: Ad finem orientalem territorii nostri in peninsula Taurica (Krym) alia species cum columna pilosa occurrit: *S. syreistschikovii* SMIRNOV (fig. 8, no 2).
- b Columna aristae glabra vel solum tuberculata 5
- 5a Laminae per utramque faciem pilosae: *S. ucrainica* SMIRNOV Feddes Repert. Sp. Nov. 26 : 374—375, 1926; Ro (Dobrogea) (fig. 8 no 3).
- b Laminae per faciem abaxialem glabrae et solum cacumina laminarum in iuventute penicilliformiter pilosa, serius residuis pilorum ornata vel omnino depilosa 6
- 6a Vaginae foliorum culmeorum in parte superiore tuberculis conicis minutissimis munitae, quam ob rem ibidem scabrae; lemma procerius quam ad species sequentes, callus paene rectus (fig. 12a); herba solum in sabuletis alcalinis crescens: *S. borysthenica* KLOKOV (Vyzn. rosl. URSR) ex Prokudin Fl. Kryma 1(4) : 25, 1951; syn.: *S. sabulosa* (PACZ.) SLJUŠSARENKO; Au Bu Cz Hu Ju Ro (fig. 10 no 2).
- b Vaginae foliorum culmeorum per totam longitudinem leves; lemma crassius quam ad speciem praecedentem, callus unguiformiter curvatus (fig. 12b) 7
- 7a Laminae per faciem adaxialem glabrae (fig. 13a) 8
- b Laminae per faciem adaxialem pilosae (fig. 13b, c) 10

- 8a Vaginae foliorum basalium dense puberulae; cacumina laminarum per longius spatium pilosa (fig. 6b). Caespites robusti, lemmatibus usque 21 mm, aristis usque 440 mm longis. Herba loca subarida requirens, in Alpibus Styriacis et Carniolicis crescens: *S. styriaca* MARTINOVSKÝ Österr. Bot. Z. 118 : 179, 1977; Au (species verosimiliter endemica) (fig. 10 no 3).
- b Vaginae foliorum basalium glabrae vel sparse ac breviter puberulae; cacumina laminarum per breve spatium pilis penicilli instar agglomeratis (fig. 6a) ornata, lemmatibus $\pm$ 16(20) mm, aristis 200—350 mm longis: *S. joannis* ČELAKOVSKÝ Österr. Bot. Z. 34 : 313, 1884 (fig. 10 no 1) 9

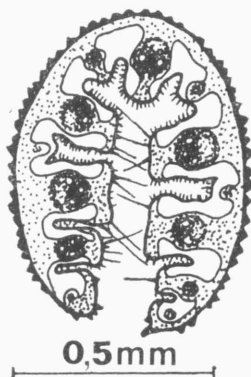


Fig. 16. — *Stipa rechingeri*: sectio transversa per laminam folii basal.

- 9a Lemma (13,5)15—17(18) mm, arista (220)300—330(360) mm: *S. joannis* subsp. *joannis* ČELAKOVSKÝ l.c.; Al Au Bu Cz Gr He Hu It Ju Ro Rs Tu.
- b Lemma (17,5)18—19,5(20,0) mm, arista (190)230—300(325) mm: *S. joannis* subsp. *balcanica* MARTINOVSKÝ Österr. Bot. Z. 118 : 180—181, 1970; subspecies per insulam Balcanicam vulgata, fines areae adhuc non exploratae.
- 10a Vaginae dense puberulae, facies adaxialis copiose pilosa (fig. 13c); herba locos substrato serpentinico praefrens: *S. joannis* subsp. *puberula* (PODP. et SUZA) MARTINOVSKÝ Preslia 18 : 187, 1976; Au Ju.
- b Vaginae glabrae, facies adaxialis laminarum hic illic sparse pilosa (fig. 13b); forma verosimiliter per totam aream speciei dispersa: *S. joannis* f. *subpuberula* PODP. et SUZA Spisy Přírod. Fak. Masaryk. Univ. Brno 2 : 1—35, 1922.
- 11a Laminae per utramque faciem molliter pilosae (fig. 15): *S. dasyphylla* (CZERN. ex LINDEM.) TRAUTV. Tr. Petersb. Bot. Sada 9 : 350, 1884; Bu? Cz Ge Hu Rs.
- b Laminae per utramque faciem glabrae (fig. 19—25) vel solum per faciem adaxialem pilosae (fig. 3, 5, 16—18) 12
- 12a Effigurationes costales in facie adaxiali foliorum basalium saltem et ad nonnulla taxa foliorum omnium apice piloso (fig. 16—18; tab. II—1 et 5) 13
- b Effigurationes costales foliorum omnium per vertices epilosa (fig. 19—25) 17
- 13a Effigurationes foliorum culmeorum per vertices glabrae, foliorum basalium ibidem pilosae, latera costarum foliorum omnium papillis minutissimis (non piliformibus) ornata (fig. 17). Herba adhuc solum in Carpatibus detecta et verosimiliter endemica: *S. crassiculmis* subsp. *heterotricha* DIHORU et ROMAN Rev. Roum. Biol. — Biol. Végét. 22, 1 : 21—25 Bucarest, 1977; Ro (fig. 11 no 5).
- b Effigurationes costales foliorum omnium per vertices pilosae (fig. 3, 5, 16, 18). 14
- 14a Vertices costarum sparse pilosi, latera costarum papillis minutissimis ornata (fig. 5, 16), caudicula plerumque deest 15
- b Vertices costarum copiose pilosi, latera costarum papillis piliformibus ornata (fig. 3 et 18), caudicula plerumque formata 16

- 15a Facies abaxialis laminarum glabra et levis (fig. 5, tab. II—5). Internodia infra nodos per longius spatium pilosa, lemma (18)19—21(21,5) mm, arista (24)25—27(30) cm. Margines lemmatis sub arista in duas appendices non protracti: *S. endotricha* MARTINOVSKÝ Preslia 44 : 12—13, 1972; Gr (media et australis) (fig. 9 no 4).
- b Facies abaxialis laminarum tuberculata, scabra usque scaberima (fig. 16). Internodia infra nodos per breve spatium pilosa, lemma (16)17—18(18,5) mm, arista (17)19—21(23) cm longa, margines lemmatis sub arista plerumque in duas appendices protracti; herba solo serpentinico in saxosis declivibus montium crescens: *S. rechingeri* MARTINOVSKÝ, Preslia 44 : 7—12, 1972; Gr (media) (fig. 8 no 5).

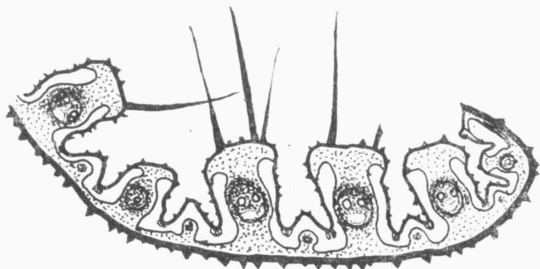


Fig. 17. — *Stipa crassiculmis* subsp. *heterotricha*: dimidia pars sectionis transversae per laminam folii basalis.

Adnotatio taxonomica: Trans finem territorii ex Hispania in Galliam austroorientalem *Stipa iberica* MARTINOVSKÝ (fig. 3) invadet, quae nonnullis notis *S. rechingeri* commemorat. (Accuratam comparisonem harum specierum cf. MARTINOVSKÝ 1966, 1972.)

- 16a Statura robustior usque 60 cm assequens; sectio transversa folii basalis fig. 18; ligulae foliorum culmeorum usque ± 3 mm, lemma (16)17—19(19,5) mm, arista (210)260 usque 290(320) mm: *S. austroitalica* MARTINOVSKÝ subsp. *austroitalica*, Webbia, Firenze, 20 : 721 usque 724; It (Monte Gargano, Basilicata, Apulia, Calabria, Sicilia) (fig. 9 no 5).

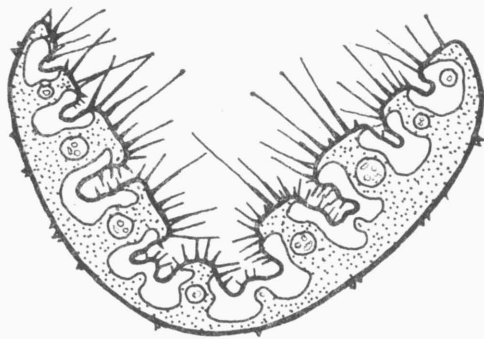


Fig. 18. — *Stipa austroitalica*: sectio transversa per laminam folii basalis.

- b Statura conspicue gracilior, culmus 10—30 cm; sectio transversa folii basalis tab. II—1; ligula foliorum culmeorum ± 1 mm; lemma (12)13—15(16,5) mm, arista (160)180 usque 190(210) mm: *S. austroitalica* MARTINOVSKÝ subsp. *theresiaae* MARTINOVSKÝ et MORALDO; It (australis: Calabria, Sicilia?) (fig. 10 no 4).

Adnotatio taxonomica: MARTINOVSKÝ (Webbia 1965) *S. siciliensem* „ad interim“ e Sicilia descripsit. Herba nonnullis notis ad subsp. *theresiaae* spectat; affinitas horum taxorum porro subsequenda est.

- 17a Effigurationes costales per latera papillis piliformibus 0,04—0,06 mm longis dense praeditae (fig. 1 et 19—22; tab. II—2—4) 18
- b Effigurationes costales per latera omnino glabrae vel papillis minutissimis obtuse conicis, 0,01—0,015 mm longis ornatae (fig. 23—25; tab. I—5) 24

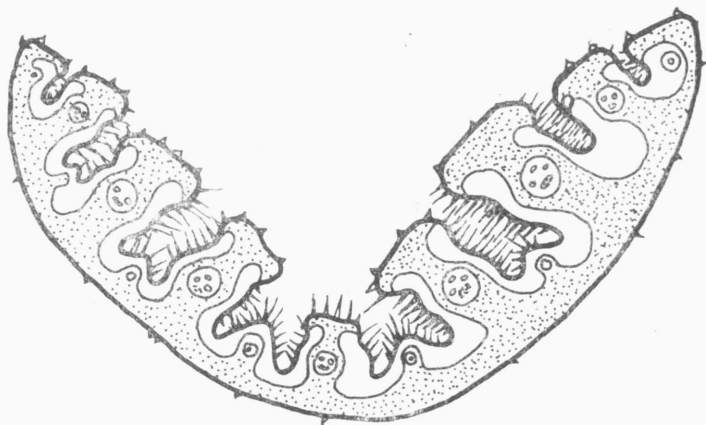


Fig. 19. — *Stipa pulcherrima*: sectio transversa per laminam folii basalis.

- 18a Vaginae semper glabrae, nitentes; laminae in facie abaxiali tuberculatae, scabrae, in tempestate humida $\pm$ apertae. Culmus sub nodis $\pm$ glaber vel per breve spatium sparse pilosus. Lemma (21)22—25(25,5) mm longum; sectio transversa per laminam folii basalis fig. 19; tab. II—2: *S. pulcherrima* C. Koch, Linnaea 21 : 440, 1848; Au Ba Cz Hu It Ju Ro Rs Tu? (fig. 8 no 1).
- b Vaginae infra ligulam saltem puberulae, non nitentes; culmus sub nodis per longius spatium adpresse pilosus. Lemma (13)16—22(24) mm longum 19
- 19a Laminae in facie abaxiali sine tuberculis, leves, sectio transversa per laminas foliorum basaliū fig. 20—21, tab. II—3 et 4): *S. pennata* L. emend. STEVEN 20
- b Laminae in facie abaxiali tuberculatae, scabrae usque scaberrimae (fig. 23—25) 23
- 20a Vertices omnium costarum ad folia basalia solum tuberculis conicis tecti (fig. 20—21) . 21
- b Vertices costarum interni paris et non-numquam etiam paris sequentis ad folia basalia papillis piliformibus (non pilis!) ornati (fig. 2; tab. I—2) 22



Fig. 20. — *Stipa pennata* subsp. *austriaca*: sectio transversa per laminam folii basalis.

- 21a Lemma (13)15–16(18) mm, arista (165)215–236(273) mm; laminae tenues (fig. 20; tab. II–4); caespites graciliores; area: Alpium pars austroorientalis, in Carpatibus Slovakiæ occidentalis et in nonnullis montibus Hungariae: *S. pennata* emend. STEVEN subsp. *austriaca* MARTINOVSKÝ et SKALICKÝ Preslia 41 : 331, 1969; Au Cz Hu It.
- b Lemma (17)18–19(20) mm, arista (185)260–280(295) mm; laminae in sectione transversa crassiores (fig. 21); caespites validiores quam ad speciem praecedentem. Subspecies paene per totam aream speciei in substrato calcareo praecipue dolomitico divulgata: *S. pennata* emend. STEVEN subsp. *eriocaulis* (BORB.) MARTINOVSKÝ et SKALICKÝ Preslia 41 : 331, 1969; Au Cz He Hu It Ju Gr Ro?

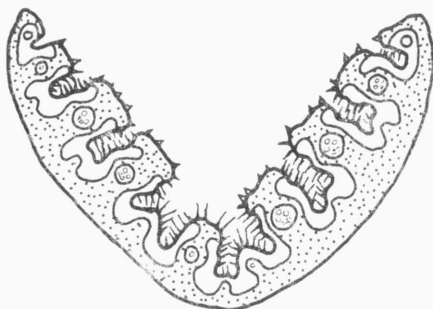


Fig. 21. — *Stipa pennata* subsp. *eriocaulis*: sectio transversa per laminam folii basalis.

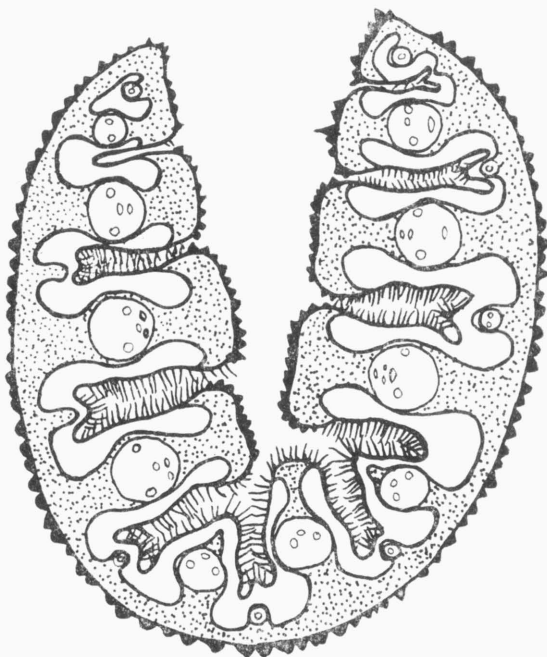


Fig. 22. — *S. mayeri*: sectio transversa per laminam folii basalis.

- 22a Linea ventralis pilosa caudicula usque 2 mm longa insertionem aristae superans (tab. I—1); glumae per carinam pilis setiformibus 0,2—0,4 mm longis, adpressis sparse instructae: *S. pennata* emend. STEVEN subsp. *dvorakii* MARTINOVSKÝ et MORALDO; Ju (Macedonia), (fig. 11 no 9).
- b Linea ventralis insertionem aristae vix assequens vel sub ea desinens: *S. pennata* emend. STEVEN subsp. *kiemii* MARTINOVSKÝ Preslia 44 : 13—14, 1972 (Fig. 14); It (M. Gargano), Ju (Lussin).



Fig. 23. — *Stipa novakii*: sectio transversa per laminam folii basalis,

- 23a Glumae per dorsum dense ac adpresse pilosae; vagina molliter ac copiose puberula, laminae dense tuberculatae, scaberrimae (fig. 22); lemma (17)18—19(19,5) mm, arista (230)240 usque 270(285) mm: *S. mayeri* MARTINOVSKÝ Acta Bot. Croat. 30 : 141—146, 1971. Ju (Serbia) (fig. 8 no 4).

- b Glumae per marginem sparse ac adpresse ciliatae, vaginae foliorum basaliū ac inferiorum culmeorum in parte superiore $\pm$ dense atque breviter puberulae; laminae tuberculis humilioribus obtectae, scabrae (fig. 1; tab. I—3 et 4); lemma (17)19—23,5(25) mm, arista (200)220—300(320) mm: *S. dasyvaginata* MARTINOVSKÝ subsp. *apenninicola* MARTINOVSKÝ et MORALDO; It (fig. 11 no 2).

Adnotatio taxonomica: Taxon hoc *S. dasyvaginata* MARTINOVSKÝ subsp. *dasyvaginata*, quae in peninsula Pyrenaeica et in Africa boreooccidentali occurrit, valde affinis, sed distat glumis ciliis marginatis, caudicula insignius formata ac area (fig. 11 no 1 et 2; tab. I—3 et 4).

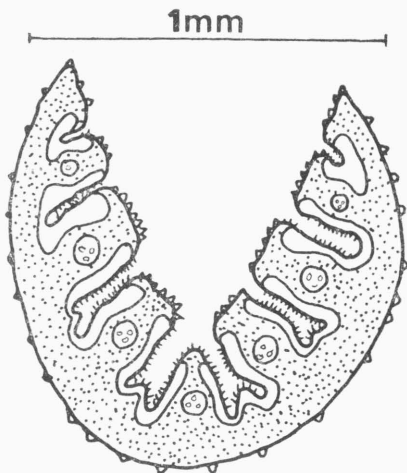


Fig. 24. — *Stipa crassiculmis* subsp. *picentina*: sectio transversa per laminam folii basalis.

- 24a *Latera costarum tuberculis egentia* (fig. 23); lemma (14)14,5–15(15,5) mm; arista (110)130 usque 150(160) mm: *S. novakii* MARTINOVSKÝ Feddes. Repert. 73/3 : 147, 1966; Ju (Serbia in rupibus serpentinicis) (fig. 11 no 8).
- b *Latera costarum tuberculis minutis ornata* (fig. 4 et 24–25; tab. I–5). Lemma atque arista insigniter longiores quam apud speciem praecedentem 25
- 25a Facies abaxialis laminarum glabra ac levis (fig. 4; tab. I–5), lemma (18)19–20(21) mm arista (260)280–300(315) mm: *S. epilosa* MARTINOVSKÝ Preslia 39 : 273, 1962; Bu It Ju Gr Ro (fig. 9 no 3).
- b Facies abaxialis laminarum tuberculata, scaberrima: *S. crassiculmis* P. SMIRNOV 26

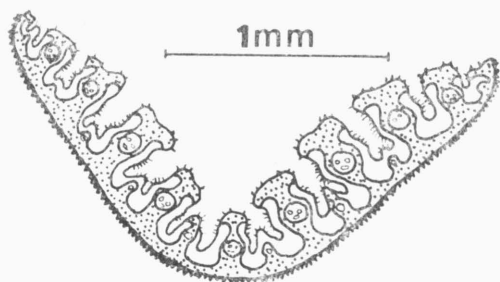


Fig. 25. — *Stipa crassiculmis* subsp. *euroanatolica*: sectio transversa per laminam folii basalis.

- 26a Planta robusta, vagina folii supremi culmei usque 12 mm lata spathiformiter paniculam in parte inferiore amplectans. Vaginae solum infra ligulam $\pm$ dense pilosae; laminae in statu conduplicato junceae; lemma 21–26 mm longum; sectio transversa folii basalis fig. 25; planta in media parte peninsulae Balcanicae et partim in Europa centrali crescens: *S. crassiculmis* SMIRNOV subsp. *euroanatolica* MARTINOVSKÝ Bot. Jb.-r, Stuttgart 87 : 383–398, 1967; Bu Ju Ro? Tu? (fig. 11 no 4).
- b Planta statura graciliore, vagina folii supremi paniculam spathiformiter non amplectans; vaginae $\pm$ continue puberulae; sectio transversa per laminam folii basalis fig. 24; lemma 19–23 mm longum: *S. crassiculmis* SMIRNOV subsp. *picentina* MARTINOVSKÝ, MORALDO et CAPUTO Delpinoa 16–17 : 185–191, 1974–1975; It (fig. 11 no 3).

Adnotatio taxonomica: *S. crassiculmis* P. SMIRNOV subsp. *crassiculmis* in montibus Kopet-Dagh in Asia Media descripta est (SMIRNOV; Feddes Reppert. Spec. Nov. 22 : 375, 1926. (Fig. 11 no 6).

V. ADNOTATIONES PHYTOGEOGRAPHICAE

Taxa sectionis *Stipa* in territorio supra electo crescentia secundum arearum proprietates in duas turmas phytogeographicas dividere possumus:

1. Taxa, quae solum infra fines territorii crescunt, vel inde trans fines in locas vicinas penetrant. Ad hanc turmam species sequentes cum taxis infra-specificis pertinent: *S. pulcherrima*, *S. crassiculmis*, *S. dasyvaginata*, *S. pennata*, *S. epilosa*, *S. endotricha*, *S. austroitalica*, *S. rechingeri*, *S. novakii*. Omnes haec species seriei *Pulcherrimae* attribuenda sunt. Communis distributio nec non accumulatio taxorum demonstrant hanc turmam originem ac centrum suae evolutionis in hoc territorio possidere. Ut taxa endemica *S. crassiculmis* subsp. *heterotricha* atque *S. bavarica* MARTINOVSKÝ et SCHOLZ (1967) designanda sunt.

2. Taxa, quae in territorium e regionibus orientalibus invaderunt, partim in montibus Asiae Centralis, partim in steppis euroasiaticis centrum evolutionis et non ad seriem *Pulcherrimae* attribuenda sunt. Sicut exempla species sequentes nominandae sunt: *S. joannis*, *S. borysthénica*, *S. tirsá*, *S. dasyphylla*, *S. ucráinica*, quae inaequaliter penitus occidentem penetraverunt: *S. ucráinica* solum in Romaniam orientalem (Dobrogia), *S. dasyphylla* et *S. borysthénica* in Europam mediam, *S. joannis* in Helvetiam et Galliam orientalem, *S. tirsá* usque ad litora Oceani Atlantici; numerus specierum nec non localitatum earum versus occidentem gradatim minuitur.

SOUHRN

Práce pojednává o submediteránních a mediteránních kavylech sekce *Stipa* se zvláštním zřetelem k taxonům poloostrovů Balkánského a Apeninského a přilehlých oblastí středoevropských. Nově jsou popsány tři poddruhy: *S. dasyvaginata* subsp. *apenninicola* MARTINOVSKÝ et MORALDO ze střední Itálie, *S. austroitalica* subsp. *theresiae* MARTINOVSKÝ et MORALDO z jižní Itálie a *S. pennata* subsp. *dvorakii* z Jugoslávie. Uvedeny jsou nově zjištěné lokality *S. epilosa* MARTINOVSKÝ z Alp a Pyrenejí a *S. austroitalica* z Calabrie. Připojen jest jednak klíč taxonů uvedené sekce, jednak stručné poznámky ekologické, fytoecologické a fytogeografické.

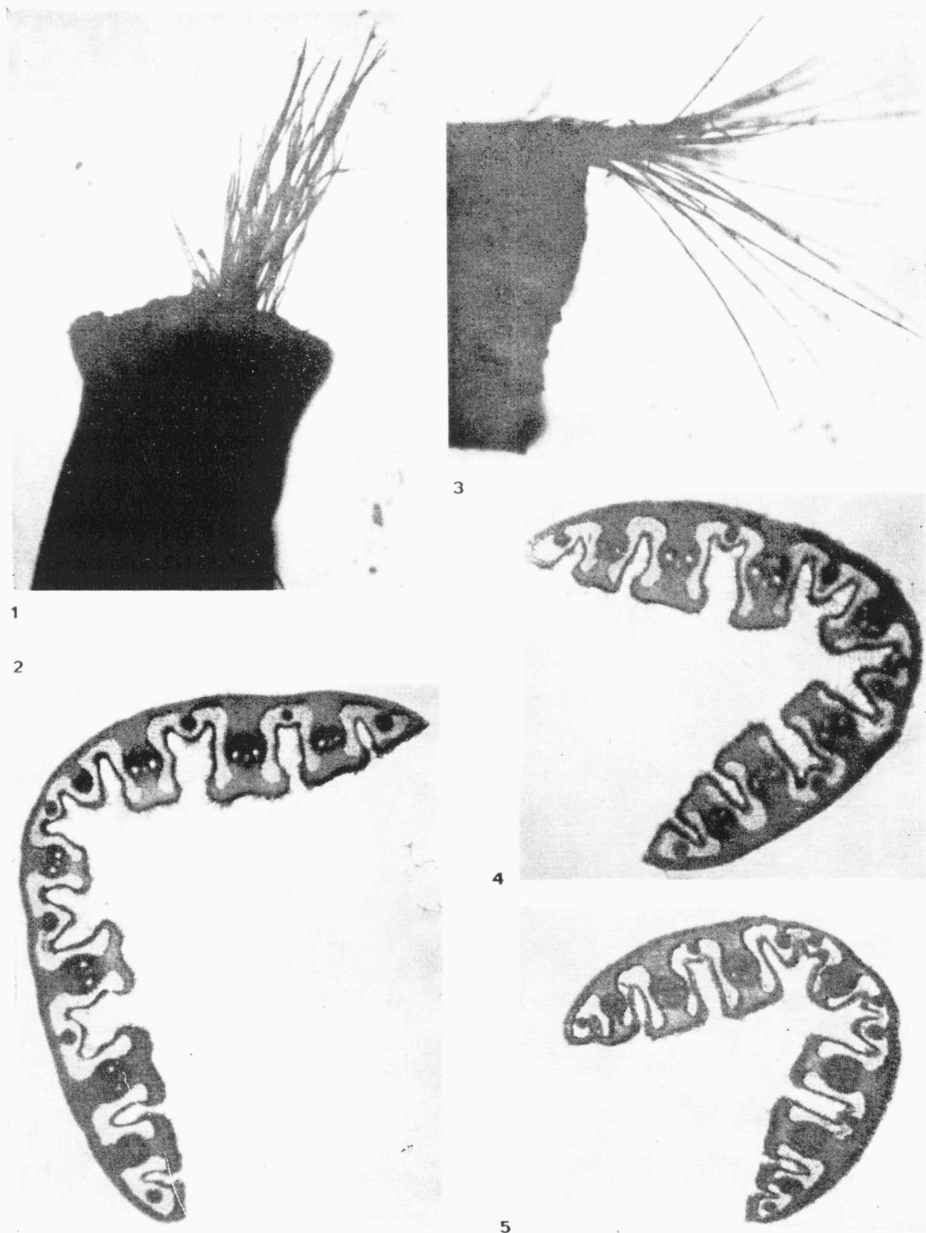
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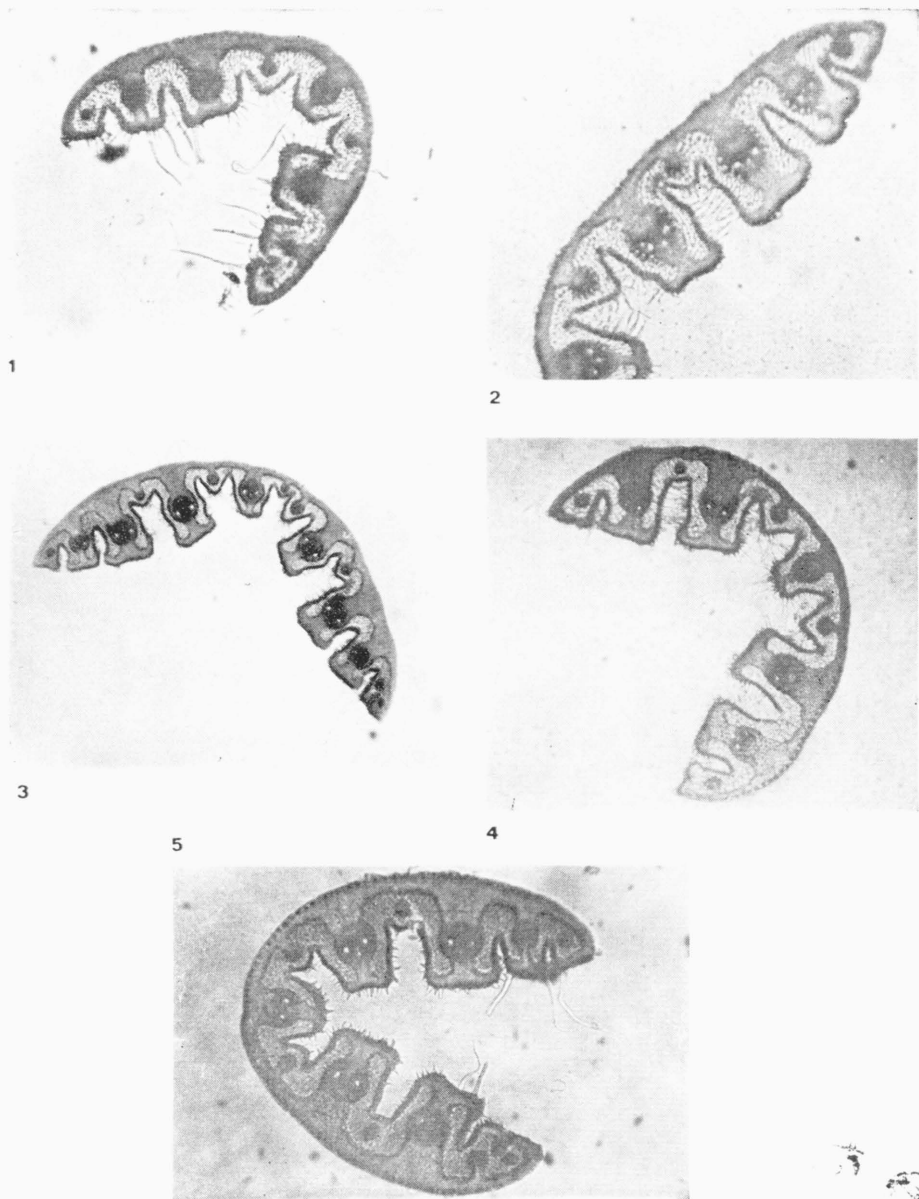
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Tab. I. — II. in Appendice.



Tab. I. — 1. *Stipa pennata* subsp. *dvorakii*: apex lemmatis cum caudicula. — 2. *Stipa pennata* subsp. *dvorakii*: sectio transversa per laminam folii basalis. — 3. *Stipa dasyvaginata* subsp. *apenninica*: apex lemmatis cum caudicula. — 4. *Stipa dasyvaginata* subsp. *apenninica*: sectio transversa per laminam folii basalis. — 5. *Stipa epilosa*: sectio transversa per laminam folii basalis.



Tab. II. — 1. *Stipa austroitalica* subsp. *theresia*: sectio transversa per laminam folii basalis. — 2. *Stipa pulcherrima*: sectio transversa per laminam folii basalis. — 3. *Stipa pennata* subsp. *ericaulis*: sectio transversa per laminam folii basalis. — 4. *Stipa pennata* subsp. *austriaca*: sectio transversa per laminam folii basalis. — 5. *Stipa endotricha*: sectio transversa per laminam folii basalis.