Preslia, Praha, 51 : 333—339, 1979

Notes on the taxonomy and cytology of the genus *Luzula* in the West Caucasus

Poznámky k taxonomii a cytologii rodu *Luzula* v západním Kavkazu

Jan Kirschner and Bohdan Křísa

Kirschner J.[1]) et B. Křísa[2]) (1979): Notes on the taxonomy and cytology of the genus *Luzula* in the West Caucasus. — Preslia, Praha, 51 : 333—339.

The material of the West-Caucasian taxa of the genus *Luzula* DC. was collected on excursions undertaken in 1976—1977; it comes from the Teberdinskij Goszapovednik reserve in the region of the West Caucasus, from the basin of the river Kubáň, approximately 100 km south of Čerkessk (Tscherkessk) in the Russian S.F.S.R. The following taxa have been examined taxonomically and, in some cases, cytologically as well: subgenus *Luzula*: *L. pseudosudetica* (V. Krecz.) V. Krecz. (2n = 24), *L. pallescens* Sw. (2n = 12), *L. multiflora* (Retz.) Lej. s.l. (2n = 24, 36), *L. campestris* (L.) DC., *L. spicata* agg. (from this aggregate a new species *L. stilbocarpa* Kirschner et Křísa has been described); subgenus *Pterodes* (Griseb.) Buch.: *L. pilosa* (L.) Willd. and *L. forsteri* (Sm.) DC. s.l.

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Subgen. *Luzula*

1. *L. pseudosudetica* (V. Krecz.) V. Krecz.

Syn.: *L. multiflora* (Retz.) Lej. subsp. *pseudosudetica* V. Krecz.; *L. sudetica* auct. fl. caucas.

This taxon was first mentioned in Miščenko's work (Miščenko, Fl. Caucas. crit. 2 : 25, 1906) as *L. campestris* (L.) DC. var. *sudetica* Miscz. non Čelak. Krečetovič (1928) treats this taxon as a subspecies: subsp. *pseudosudetica* of the species *L. multiflora*. Grossgejm (1928) mistakes it for the species *L. sudetica* and, lastly, Krečetovič V. in Krečetovič et Gončarov in Fl. USSR, 3 : 571—572, 1935 names it *L. pseudosudetica*. This species grows in the alpine zone of the whole Caucasus and Ciscaucasia in the communities of short grass alpine meadows and in loose grassy covers of scree, together with *Anemone speciosa* Ad., *Festuca supina* Schur s.l., *Primula amoena* M. B., *Coeloglossum viride* (L.) Hartm., *Campanula tridens* Rupr., *Sibbaldia semiglabra* C.A.M., most frequently at altitudes of 2200—3300 m. In the literature, occurrence in Turkey has been registered, too. Morphological characters have been analyzed on a relatively extensive material from eight localities within the height span of 1550—2500 m; in some characters, we consider it necessary to expand the description of the species (cf. Krečetovič et Gončarov l.c.). It concerns the following characteristics: plants 5—35 cm in height; leaf margins sparsely ciliate and densely haired at the mouth of the sheath; laminae channelled and, at the apex, obtuse, with a slight rounded swelling (this character is important especially with respect to infrageneric division). The inflorescence is composed of at most ten subsessile or sessile clusters;

the outer as well as inner perianth-segments with conspicuously long aristate apices are only slightly longer than capsules the dimensions of which vary between (1.6—)1.7—1.8(—1.9) mm; seeds ovoid, approximately 0.6 mm wide with an appendage up to 0.1 mm in length. The complex of these characters shows a considerably distinctive nature of this species that cannot be classed with the closest relatives of the *L. campestris* (ser. *Eu-campestres* in KREČETOVIČ et GONČAROV 1935 : 571).

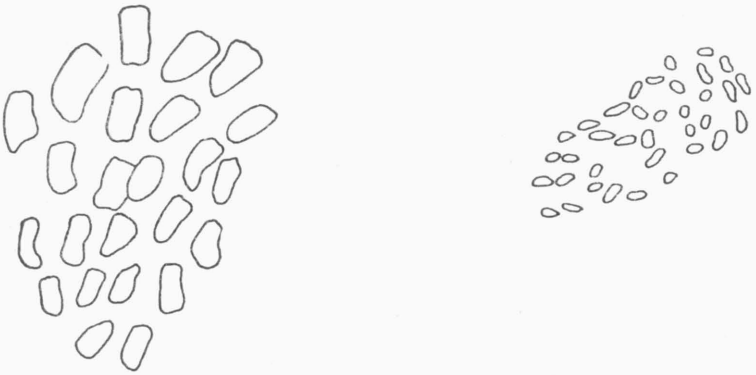

Fig. 1. — Left: *L. pseudosudetica* (V. KRECZ.) V. KRECZ. 2n = 24. — Right: L. *multiflora* (RETZ.) LEJ. s.l. 2n = 36.

Karyological data: No chromosome number has been reported in the literature, and only further cytological examination can eliminate the possibility of endonuclear polyploidy (cf. NORDENSKIÖLD 1951).

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik, Dombaj: prope viam inter Dombaj et glaciem concretam Alibek in moraena, alt. ca 2000 m s.m., 12. 7. 1977, leg. J. KIRSCHNER et M. MESTENHAUSEROVÁ (PRC).

Chromosome number: 2n = 24 (Fig. 1).

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik, Teberda: in prato montano decl. orient. montia Ulu-Chatipara ca 3151 m s.m., alt. ca 2200 m s.m., 19.7. 1977, leg. M. ŠOURKOVÁ et al. (PRC).

Chromosome number: 2n = 24.

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik, Dombaj: in decl. inter casam Sev. Prijut et lacum Kluchorskoje ozero, alt. ca 2200—2500 m s.m., 14. 7. 1977, leg. J. KIRSCHNER et M. MESTENHAUSEROVÁ (PRC).

Chromosome number: 2n = 24.

Note: We found this species also in the region of the East Caucasus, at the sources of Geok-Čaj in the southern slopes of Babadag, at an altitude of 2000 m.

2. *L. pallescens* SW.

In the whole area, this species is characterized by its high homogeneity, which fact is undoubtedly connected with diploid cytotype. The chromosome number 2n = 36 stated in NORONHA-WAGNER (1949) could be due to misidentification of the material (cf. NORDENSKIÖLD l.c.). Most frequently this species grows in disturbed (secondary) habitats, with sandy, gravelly or stony

substrate predominating, in initial stages of the development of vegetation (e.g. denuded road-sides, gravelly alluvial deposits, wood-clearings).

Karyological data:

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik, Dombaj: in prato subalpino apud viam a loco Ruskaja Poljana dicto ad cataractam Čučchurskij vodopad, alt. ca 1900 m s.m., 18. 7. 1977, leg. M. Šourková et al. (PRC).

Chromosome number: 2n = 12.

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik, Dombaj: in declivo inter casam Sev. Prijut et lacum Kluchorskoje ozero, ca 2200—2500 m s.m., 14. 7. 1977, leg. J. Kirschner, M. Šourková et al. (PRC).

Chromosome number: 2n = 12.

3. *L. multiflora* (Retz.) Lej. s.l.

L. multiflora subsp. *multiflora* represents a relatively abundant taxon in the area investigated; it is characterized by a wide ecological tolerance and morphological diversity. In the territory, hexaploid populations predominate (especially at higher altitudes), but tetraploid populations occur here as well.

Karyological data:

Tetraploid populations

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik: in insulula in fl. Teberda ca 1 km supra opp. Teberda, 11. 7. 1977, leg. J. Kirschner (PRC).

Chromosome number: 2n = 24.

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik: in ripa sinistra fl. Teberda, ca 4 km ab opp. Teberda, alt. ca 1350 m s.m. in paludosis aute ostium rivi Ulu-Chatipara, 13. 7. 1977, leg. M. Šourková et al. (PRC).

Chromosome number: 2n = 24.

Hexaploid populations

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik, Dombaj: in decl. inter casam Sev. Prijut et lacum Kluchorskoje ozero, ca 2000—2500 m s.m., 14. 7. 1977, leg. J. Kirschner et M. Mestenhauserová (PRC).

Chromosome number: 2n = 36 (Fig. 1).

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik: in prato subalpino decl. orient. montis Ulu-Chatipara 3151 m s.m., ca 2200—2350 m s.m., 19. 7. 1977, leg. M. Šourková et al. (PRC).

Chromosome number: 2n = 36.

Notes: In the whole area of *L. multiflora* subsp. *multiflora*, it is very difficult (and sometimes even impossible) to distinguish morphologically the various cytotypes distributed in a mosaic pattern; therefore, the two ploidy levels are not taxonomically evaluated here.

Among Caucasian populations we have found comparatively conspicuous plants that differred from the populations examined above by their habitat and ecological preferences. The plants grow as high as 70 cm and their inflorescence consists of a small number of often conglomerated clusters; the perianth-segments are approx. 4.0 mm long, anthers about as long as filaments (0.6—0.8 mm); the capsule is, as a rule, 3.5 mm in length, the seeds with appendage up to 2.0 mm long. The population was found in a mixed wood in the Djamagat creek valley, at an altitude of 1500—1600 m on humus substratum. Because of the lack of material, the taxonomic problem cannot be solved satisfactorily, but it is possible that this type is related to *L. multiflora* subsp. *caucasica* Krecz. 1928.

4. *L. campestris* (L.) DC.

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik: in Fageto humido ad ripam sinistram fl. Teberda ad pagum Teberda vergens, ca 1350 m s.m., 19. 7. 1976, leg. V. ŠŤASTNÁ (PRC).

This locality is situated on the SE. extremity of the area of the species. As is obvious, the examination of the chromosome numbers and the taxonomic position of Caucasian populations usually classed with diploid species *L. campestris* (L.) DC. s. str., leaves still much to be desired (cf. KIRSCHNER 1979).

5. *L. spicata* agg.

In Europe, this taxonomic complex falls into several taxa in the rank of species or subspecies. Individual taxa are well definable and their common characters can be found in the shape of inflorescence (sect. *Alpinae* CHRTEK et KŘÍSA). In Europe, two groups of taxa can be distinguished within this section: 1) the Nordic-Alpine-Carpathian group found in Fennoscandia and in the mountains of Central Europe — *L. spicata* (L.) DC. subsp. *spicata*, *L. s.* subsp. *mutabilis* CHRTEK et KŘÍSA; 2) the Oreo-Mediterranean group that extends from the Pyrenean Peninsula to Asia Minor. The chromosome numbers in the latter group were determined only rarely and further verification is required. From North Africa a count of 2n = 12 was reported by QUÉZEL (1957). An unverified count of 2n = 18 came from the Central Caucasus (cf. SOKOLOVSKAJA et STRELKOVA 1948).

If the taxa from the Oreo-Mediterranean group are to be treated for as separate species, it is necessary to distinguish the following: *L. hispanica* CHRTEK et KŘÍSA (Pyrenees and mountainous regions of Spain), *L. italica* PARL. (in the mountains of Corsica and Sardinia as a Cyrno-Sardinian endemic, cf. GAMISANS in Candollea 29 : 43, 1974), *L. bulgarica* CHRTEK et KŘÍSA (Italy, Yugoslavia, Bulgaria, Turkey), *L. pindica* (HAUSSKN.) CHRTEK et KŘÍSA (Italy, Yugoslavia, Bulgaria, Greece). In TUTIN T. G. et al. [ed.], Fl. Europaea, vol. 5, Stage 3, MS., plants from Corse are put together with the species *L. bulgarica* under the name of *L. italica*. On the basis of the whole set of their morphological characters, the Caucasian populations of this complex belong to the Oreo-Mediterranean group the marked diacritical feature of which is the anther-filament length ratio (most frequently, the anthers are 2—3 times as long as the filaments). Considering our investigation, we cannot eliminate the presence of *L. spicata* s. str. in the Caucasus. We have examined collections of the complex *L. spicata* (L.) DC. s. latiss. from the Dombaj-Teberda part of the West Caucasus and we have arrived at the conclusion that these populations are as clean-cut as to be evaluated as a separate species:

Luzula ***stilbocarpa*** KIRSCHNER et KŘÍSA, sp. nova

Plantae perennes, caespitosae, rhizomate brevi, sine stolonibus. Caules basi vaginis emortuis dilatatis obtecti, erecti, sub inflorescentia paulo nutantes, 20—30(—45) cm alti. Folia basalia linnearia, saepissime canaliculata, 1.0—2.0 mm lata, ad margines disperse ciliata, vaginis intus ad basin densissime longe ciliato-barbatae. Folia caulina plana usque paulo canaliculata, 1.5—2.5 mm lata, vaginarum oribus dense ciliatis. Inflorescentiae nutantes, capitulis multifloris sessilibus usque brevissime pedunculatis, rare remotis compositae. Bractea infima inflorescentia aequilonga vel brevior. Prophylla eximie magna, flores plus minusve aequantia vel superantia, margine laciniata, ciliata, basi pallide castanea, apice membranacea, ferruginee carinata, in

aristam producta. Tepala plus minusve aequilonga, breviter aristata, obscure castanea usque castaneo-brunnea, apicem versus membranaceo-marginata, saepissime 2.0—2.5 mm longa. Antherae (exsiccatae) (0.5—)0.7—0.9(—1.0) mm longae, filamentis plerumque 2—3× longiores. Capsularum segmenta subsphaeroidea, brevissime mucronata, (1.8—)1.9—2.1(—2.3) mm longa,

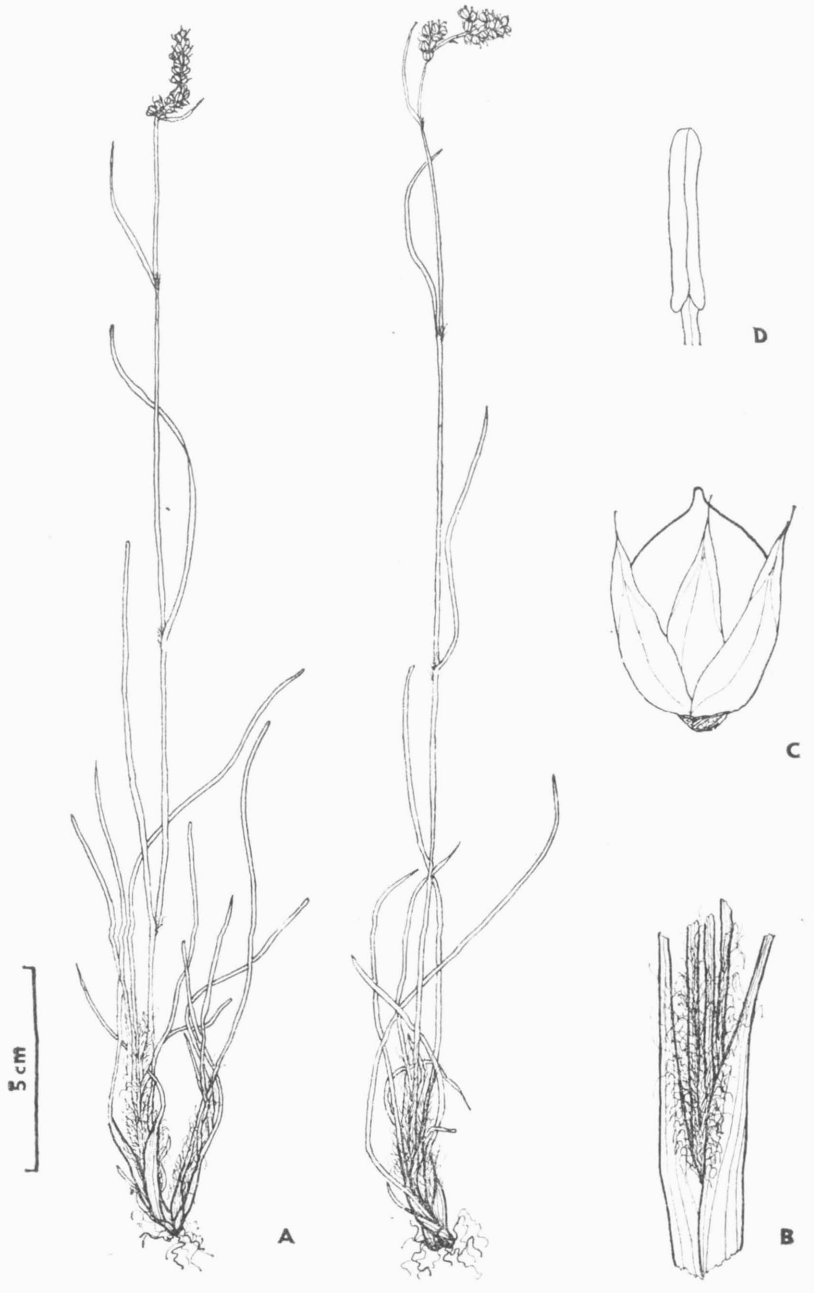

Fig. 2. — *L. stilbocarpa* KIRSCHNER et KŘÍSA. A — type specimen; B — basal part of stem; C — capsule with perianth-segments; D — stamen.

nitida, ferrugineo-brunnea; fructus perigonium aequans vel paulo superans. Semina late ovoidea, pallide castanea, (0.9—)1.0—1.1(—1.2) mm longa, (0.5—)0.6—0.7(—0.8) mm lata, carunculis plerumque 0.1 mm longis.

Typus: URSS: Caucasus occidentalis: reservatio Teberdinskij goszapovednik, Dombaj: in declivo inter casam Severnyj Prijut et lacum Kluchorskoje ozero, locis arenosis ad marginem viae, alt. ca 2000—2500 m s.m., 14. 7. 1977, leg. J. KIRSCHNER, M. ŠOURKOVÁ et al. In herbario Universitatis Carolinae Pragensis (PRC) conservatur (Fig. 2).

Affinitas: A ceteris speciebus ex grege oreo-mediterranea affinibus *Luzula stilbocarpa* capsulis et seminibus minoribus, foliis angustioribus necnon eorum vaginis intus ad basin densissime longe ciliato-barbatis differt.

Habitat: Locis glareosis lapidosisque cum vegetatione sparsa zonae alpinae regionis caucasicae, saepissime in altitudine 2000 usque 3000 m s.m.

Etymologia: Secundum capsulam nitidam haec species denominata est.

Note: It is probable that *L. stilbocarpa* does not represent the most eastern taxon of the section *Alpinae*, although the taxonomic position of the related populations in the mountains of Central Asia and the Himalaya cannot be safely stated.

Subgen. *Pterodes* (GRISEB.) BUCH.

6. *L. pilosa* (L.) WILLD.

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik: ad viam in decl. orient. montis Ulu-Chatipara 3151 m s.m., in Pineto (*Pinus hamata*), alt. ca 1750—1950 m s.m., 19. 7. 1977, leg. M. ŠOURKOVÁ et al. (PRC).

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik: valle Djamagat, ca 1550 m s.m., 0.5 km sub fonte aquae mineralis „Narzan", in nemore ad ripam rivi, 9. 7. 1977, leg. J. TĚŠÍNSKÝ et J. KIRSCHNER (PRC).

7. *L. forsteri* (SM.) DC. s.l.

URSS: Cauc. occ.: reserv. Teberdinskij goszapovednik: Teberda, in ripa sin. fl. Teberda, ca 1 km situ austr. a ponte trans fluvium, alt. ca 1330 m s.m., 18. 7. 1977, leg. J. KIRSCHNER (PRC).

Note: Plants from the Caucasus differ from almost all European populations by the following morphological characters: anthers 0.4—0.7 mm long, filaments approx. 1.0 mm long; the appendage of seeds 0.6—0.8 mm long. The European populations have, as a rule, anthers up to 2.0 mm in length, approx. 3—4 times as long as filaments, and seeds with a short appendage (approx. 0.5 mm long). MONTSERRAT-RECODER in An. Inst. Bot. Cavanilles 21 : 421—429, 1963 examined in detail *L. forsteri* in the Pyrenean Peninsula, where, apart from other types, a remarkable population denoted as *L. forsteri* subsp. *cantabrica* MONTS.-REC. 1963 occurs. In its characters this population roughly corresponds to the Caucasian collection. On the basis of our material, we cannot make any conclusions concerning the taxonomic position of the Caucasian populations. The case is obviously that of morphological convergency, since, in individual regions of the Mediterranean, *L. forsteri* probably consists of several morphologically and geographically separable taxa; the more can these assumptions hold for the geographically rather distant Caucasian part of the area.

SOUHRN

Autoři v článku hodnotí taxonomicky a cytologicky druhy rodu *Luzula* DC. sebrané na území Teberdinské rezervace v západním Kavkazu jižně města Čerkessk v RFSSR. Zjištěné chromozomální počty se týkají těchto taxonů: *L. pseudosudetica* (2n = 24, první údaj), *L. pallescens* (2n =

= 12) a *L. multiflora* s.l. (2n = 24, 36). Dále uvádějí druhy *L. campestris*, *L. pilosa*, *L. forsteri* a z agregátního druhu *L. spicata* popisují nový druh *L. stilbocarpa*, který hodnotí s dalšími příbuznými druhy tohoto agregátu na území Evropy.

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Received February 21, 1979