Stapfia	80	381-393	5.7.2002

New *Allium* taxa from Middle Asia and Iran

R.M. FRITSCH, F.O. KHASSANOV & F. MATIN

A b s t r a c t : FRITSCH R.M., KHASSANOV F.O. & F. MATIN (2002): New *Allium* taxa from Middle Asia and Iran. — Stapfia **80**: 381-393.

Allium cisferganense R. M. FRITSCH (sect. *Oreiprason*) from the Fergan mountain range, *A. orunbaii* F.O. KHASS. et R. M. FRITSCH (sect. *Minuta*) and *A. arkitense* R. M. FRITSCH (sect. *Acmopetala*) from the Chatkal mountain range, *A. sochense* R.M. FRITSCH et U. TURAKULOV (sect. *Regeloprason*) from the Turkestan mountain range, *A. petri* F.O. KHASS. et R.M. FRITSCH (sect. *Longivaginata*) from the Bakhtiar mountain range, and *A. pseudobodeanum* R.M. FRITSCH et MATIN (sect. *Acanthoprason*) from the Alborz mountain range are newly described. Their taxonomic affiliations and relationships are discussed.

Z u s a m m e n f a s s u n g : FRITSCH R.M., F.O. KHASSANOV & F. MATIN (2002): Neue *Allium*-Taxa aus Mittelasien und dem Iran. — Stapfia **80**: 381-393.

Aus Mittelasien werden *Allium cisferganense* R.M. FRITSCH (sect. *Oreiprason*) aus dem Fergan-Gebirge, *A. orunbaii* F.O. KHASS. et R. M. FRITSCH (sect. *Minuta*) und *A. arkitense* R.M. FRITSCH (sect. *Acmopetala*) aus dem Chatkal-Gebirge, sowie *A. sochense* R.M. FRITSCH et U. TURAKULOV (sect. *Regeloprason*) aus dem Turkestan-Gebirge beschrieben. Weitere neubeschriebene Arten des Irans sind *A. petri* F.O. KHASS. et R.M. FRITSCH (sect. *Longivaginata*) aus dem Bakhtiar-Gebirge und *A. pseudobodeanum* R.M. FRITSCH et MATIN (sect. *Acanthoprason*) aus dem Elburs-Gebirge. Ihre verwandtschaftlichen Beziehungen und die taxonomische Einordnung werden diskutiert.

K e y w o r d s : *Allium*, taxonomy, description, distribution, Middle Asia, Southwest Asia.

Introduction

Allium is an extremely polymorphous and taxonomically complicated genus (about 750 species classified into more than 50 subgenera, sections and subsections; GREGORY et al. 1998) with a main centre of diversity in the mountainous areas of south-western and Middle Asia. Here widely distributed taxa as well as local endemics occur. All of them are ephemeroids which show a forced development completing their yearly life cycle from the opening the leaf bud to seed shedding in three to four months only. The duration of flowering lasts about one week, sometimes even less.

Commonly best known are conspicuous taxa (by leaf or flower colour, stature, etc.) which are most easily recognised and can be found in many herbaria. Contrary to this, small and otherwise inconspicuous plants are frequently overlooked by collectors and are thus missing in many collections.

The low number of recognisable characters in dried *Allium* specimens presents another difficulty in *Allium* taxonomy. Plants collected and dried in a developmental stage when specific characters are either not yet developed or when flowers, leaves etc. have already withered, remained undetermined or were assigned to superficially similar species. Thus, many rare or undescribed taxa among such dry specimens remained scientifically unrecognised. Only when such taxa are studied in the living stage, their specific characters can be ascertained, and sometimes these plants may be recognised as new to science.

Fundamental knowledge on *Allium* diversity in Middle Asia and Iran was presented in the regional floras of VVEDENSKY (1971) and WENDELBO (1971) thirty years ago. Additional species and subspecies were described in a large number of papers in later years. They were treated in detail in the conspectus of the Middle Asian species (KHASSANOV 1997) but for Iranian species only the earlier paper of MATIN (1978) and a most recent contribution of SEISUMS (2000) are available.

During joint research missions of the authors in Middle Asia and Iran a few formerly unrecognised *Allium* taxa have come to our knowledge. Most of these taxa have also been studied under cultivation at Gatersleben (Germany) and shall be described below. This recent contribution supplements earlier taxonomic papers on the diversity of Iranian and Middle Asian *Allium* taxa (MATIN 1978; MATIN 1989; MATIN 1991; KHASSANOV & FRITSCH 1994; FRITSCH et al. 1998, FRITSCH 2000, FRITSCH et al. 2001).

Results and Discussion

1. New taxa from Middle Asia

Allium cisferganense R.M. FRITSCH, species nova (Plate 1A)

(subg. *Rhizirideum* (G. DON ex KOCH) WENDELBO sect. *Oreiprason* HERMANN)

T y p e : Ex culturae in horto Gaterslebensis No. TAX5682, leg. 02. 08. 2000 (GAT) [ex Kyrgyzstan: Fergan-Gebirge ca. 30 km NÖ Uzgen, Gneis-Hänge am Fluß Zerger, Nordhang im Rosengebüsch, ca. 1450 m NN, leg. 20. 05. 1997 R.M. FRITSCH No. 1614].

Bulbi elongati usque 2 cm diametro et 4-5 cm longi, aggregati, rhizomati subperpendiculari insidenti, tunicis papyraceis rufo-violascentis. Scapus 50-70 cm longus, 4-6 mm diametro, teres, glaber, viridis, usque ab medium scabris vaginis foliorum involutis. Folia in numero circa 7, linearia obtusa plana subcaniculata, 15-25 cm longa 4-6 mm lata subhorizontaliter declinata. Spatha bipartita, valva parva basi late-triangulata rostrata 1 cm longa, valva magna basi suborbicularis rostro applanato 6-8 cm longo. Inflorescentia orbiculata densissima pluriflora minus flores in statu florendi. Pedicelli erecti virides 8-12 mm longi. Flores parvi cupuliformes. Tepala erecta, externa ovata concava cymbiformia 2.5-3 mm longa 1.8-2 mm lata, interna longiora minus concava elliptica 4 usque 4.5 mm longa circa 2 mm lata, omnia inconspicua viride-rubescentia nervus medius latus intensiore badio-tinctus, post anthesin adpressa capsulam intensiore rubescentia. Filamenta longe exserta 8-9 mm longa, basi connata, interna basi brevissime triangulato-dilatata apice subulata externa usque basi subulata, albida apice roseo-subsuffusa. Anthera circa 1.8 mm

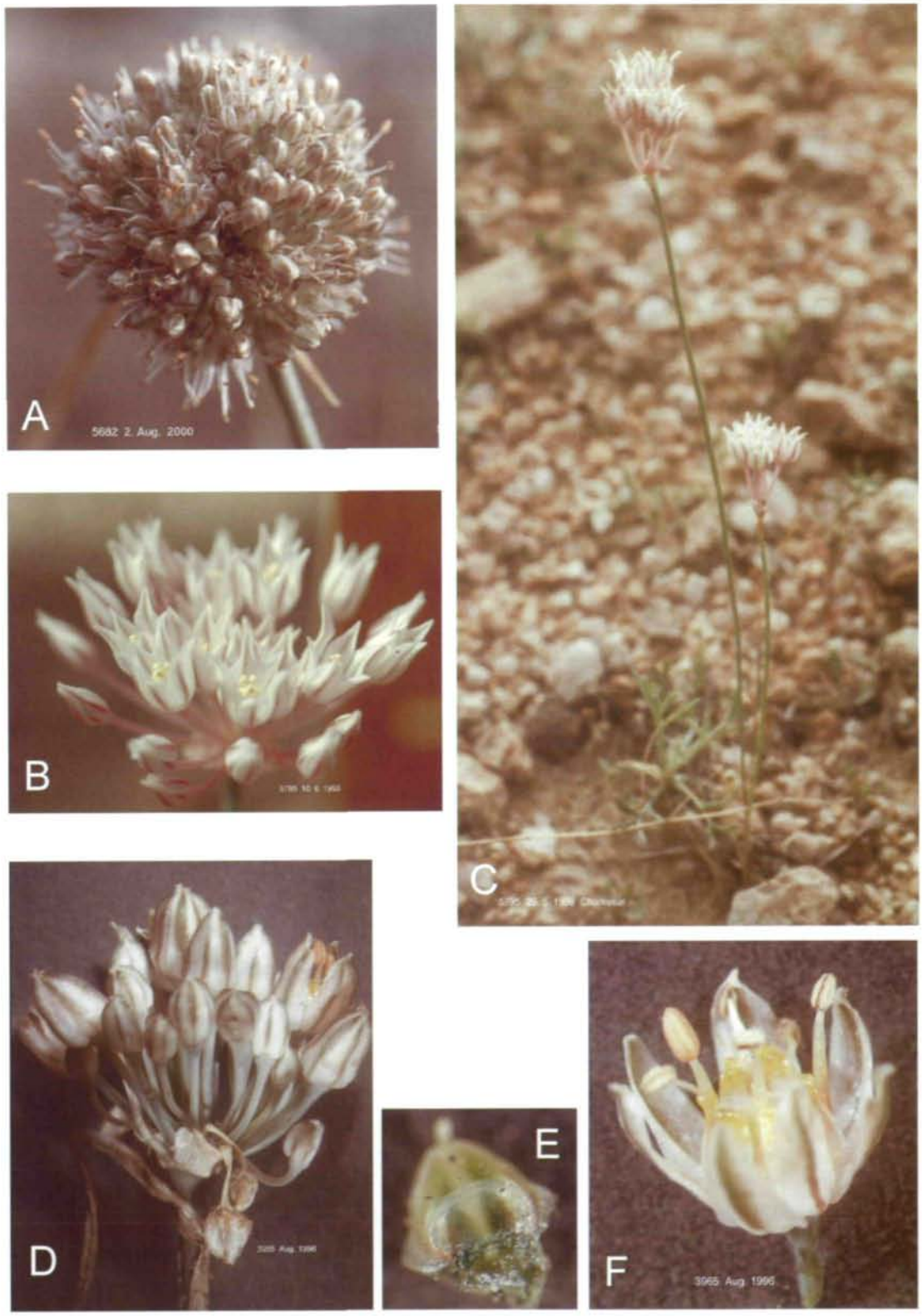

Plate 1. **A**: Inflorescence of *Allium cisferganense*; **B**: Inflorescence, and **C**: Flowering plants of *Allium orunbaii* at type location; **D**: Inflorescence, **E**: Ovary, and **F**: Flower of *Allium petri*.

longa lutea violaceo-suffusa. Ovarium orbiculatum circa 2 mm diametro, minute papillosum viride-roseo suffusum. Stylum anguste conicum circa 4 mm longum album stigmate punctiforme. Capsula orbiculata 3-4 mm diametro.

Ab *Allio hymenorrhizo* differt bulbis magnis foliis subhorizontaliter (non erecte) declinatis antheses serotina floribus coloratis et amplitudinis, ab *Allio tianschanico* floribus coloratis et inflorescentiis densissimis.

Habitat in montibus Ferganensis (Asia Media).

Bulbs several, clustered on a short rhizome, elongated, c. 2 cm in diameter and 4-5 cm long, with papery brownish-violet tunics. Scape 50-70 cm long, 4-6 mm in diameter, terete, smooth, green, lower half covered by slightly scabrid leaf sheaths. Leaves about 7, blades linear with blunt tip, flat, slightly channelled, 15-25 cm long, 4-6 mm wide, stiffly sidewards directed. Spathe bipartite, the smaller with broadly-triangular base and ca. 1 cm long beak, the larger with nearly orbicular base and 6-8 cm long flat beak. Inflorescence orbicular, very dense, many-flowered, with only a few flowers opened at the same time and thus very long-lasting bloom. Pedicels 8-12 mm long, straight but soft, green. Flowers small, cup-shaped. Tepals erect, very inconspicuously greenish-reddish, the rather broad midvein green with brown flush, after bloom adpressed to the capsule and more reddish. Outer tepals ovate, concave, cymbiform, 2.5-3 mm long, 1.8-2 mm wide, inner tepals longer, less concave, elliptic, 4-4.5 mm long, c. 2 mm wide. Filaments long exserted, 8-9 mm long, basally connate into a very shallow ring and the inner ones very short triangularly widened, above subulate, white, slightly pinkish flushed. Anthers c. 1.8 mm long, yellow, violet flushed. Pollen yellowish. Ovary orbicular, c. 2 mm in diameter, finely papillose, greenish-pinkish flushed. Style narrowly-conical, c. 4 mm long, white, with dot-like stigma. Capsule orbicular, 3-4 mm in diameter.

This new species keyed out under *A. hymenorrhizum* LEDEB. or *A. tianschanicum* RUPR. when dry specimens were determined. All these taxa show a similar habit as living plants, but the new species is easily discernible from *A. hymenorrhizum* by the much larger bulbs, sideward (not straight upward) directed leaf blades, the long-beaked spathe, a much later bloom, and smaller and inconspicuously greenish-reddish flowers with darker midvein. *Allium cisferganense* differs from *A. tianschanicum* by relatively longer leaf sheaths, greenish (not yellow) flower colour, and an orbicular and extremely dense flower head (and not a semi-orbicular and loose umbel). These easily recognisable differences remained completely stable during several years of cultivation at Gatersleben. Whereas *A. tianschanicum* occupies dry stony and rocky slopes, the new species grows in more humid locations among shrub roses and tall perennial herbs.

The long leaf sheaths covering about the lower half of the scape of *A. cisferganense* exclude *A. globosum* REDOUTE as possible relative. Additionally, our data suggest that the widely distributed *A. hymenorrhizum* alliance is apparently taxonomically more complex than the poor differences of dry specimens suggest. A thorough study of the whole alliance based on living plants would be highly welcome.

Allium orunbaii F.O. KHASS. et R.M. FRITSCH species nova (Plate 1B, C)

(subgen. *Allium* section *Minuta* F.O. KHASS.).

T y p u s : Tien-Shan Occidentalis, Montes Kuramensis, prope pagum Charkesar, h=700 m, 25. 05. 1998 leg. R.M. FRITSCH et KHASSANOV No. 1676 (TASH; isotypus GAT).

Bulbus solitarius ovatus 5-7 mm diametro, tunicis externis subcoriaceis atro-brunneis, longitudinaliter vel obscure reticulato-nervosis. Scapus cylindricus 10-15 cm altus. Folia in numero 2-3 filiformia laevia 0,5-1 mm lata saepe scapo breviora. Spatha scariosa inflorescentia sesqui brevior, breviter rostrata, persistentia. Inflorescentia hemisphaerica pauciflora. Pedicelli subaequilongi 5-15 mm longi basi ebracteolati. Flores campanulati. Tepala 3-4 mm longa, subaequilonga lanceolata acuminata, basi umbilicata rosea nervis violascentibus percursis, apice longitudinaliter plicata et recurva. Filamenta simplicia tepalis duplo breviora, ad 1/4 inter se et cum perigonio connata, externa triangularia, interna late triangularia externibus duplo latioribus. Stylus inclusus. Capsula perigonio duplo brevior.

Ab *Allio anisotepalo* tepalis subaequilongis, ab *A. minuto* et *A. parvulo* floribus roseis differt.

Habitat in montibus Kuramensis (Asia Media, Tien-Shan Occidentalis). Species in honorem Prof. Dr. Orunbaj KHASSANOV Tashkentensis denominata est.

Bulbs ovate, 5-7 mm long and wide. The nearly coriaceous, blackish-brown outer tunics disintegrate lengthwise into fibres or somewhat net-like. Scape cylindrical, 10-15 cm long, Leaves 2-3, thread-like 0.5-1 mm thick, shorter than scape. Spathe scarious, one-third shorter than pedicels, shortly beaked, persistent. Inflorescence semiglobose, few-flowered. Pedicels somewhat differing in length, 5-15 mm long, without basal bracts. Flower campanulate, tepals 3-4 mm long, of almost equal length, lanceolate, acuminate, base umbilicate, pink with violet midvein, the tip lengthwise folded and recurved. Filaments triangular, half as long as tepals, the basal quarter united with themselves and the tepals. Inner filaments basally twice as wide than the outer ones. Style not exserted. Capsule half as long as tepals.

This unspectacular and minute species grows in an area not much visited by botanists up to now. It may well have been not recognised earlier because the small pink flowers do not contrast with the reddish granitic gravely soil of its type location. Ecologically *A. orunbaii* is well separated from the closely related *A. minutum* VVED. and *A. parvulum* VVED. which occupy gypseous-saline soils and dry loamy slopes.

Allium arkitense R. M. FRITSCH, species nova (Plate 2A, B)

(subgenus *Melanocrommyum* (WEBB et BERTH.) ROUY sect. *Acmopetala* R.M. FRITSCH)

T y p u s : Ex culturae in horto Gaterslebensis No. TAX5692, leg. 12. Mai 2000 (GAT) [Ex Kirgizstan: Chatkal-Gebirge, Sarychilek-Tal bei Arkit, krautreiche SO-exponierte Hänge, ca. 1300-1500 m NN, 28. 05. 1997 leg. R.M. FRITSCH No. 1625]

Bulbus solitarius applanato-ovatus, 15-20 mm longus 12-20 mm latus, tunicis externis albidis papyraceis (deinde nigrescentis friabilibus). Scapus teres glaber 40-60(90) cm altus 4-6 mm diametro, viridis impolitus. Folia in numero 1-2(3), 20-40 cm longa 1,5-2,5 cm lata, angustissime lanceolata oblique substricto declinata, canaliculata, supra laevia, infra non profunde late-striata, breviter cuspidata, apice cucullata, margine albescenti scabro, cinereo-viridia, glauca. Spatha membranacea,

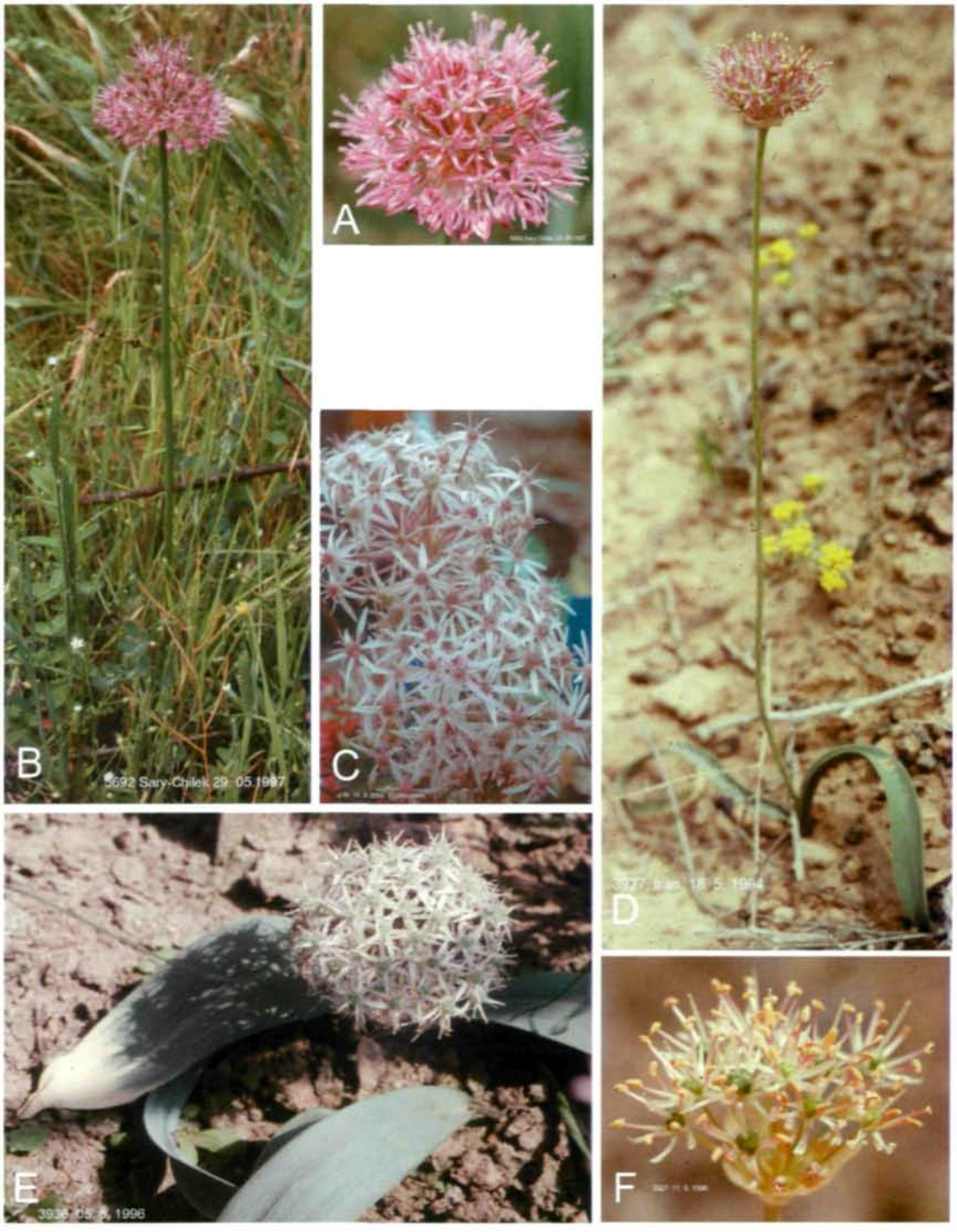

Plate 2. **A**: Inflorescence, and **B**: Flowering plant of *Allium arkitense* at type location; **C**: Inflorescences, and **E**: Flowering plants of *Allium pseudobodeanum* under cultivation; **D**: Flowering plant of *Allium assadii* c. 60 km S Delijan, and **F**: Inflorescence of this plant under cultivation.

bivalvis, nervis brunnescentiis. Inflorescentia initio semiglobosa deinde applanato-globosa multiflora subdensa, 4-7 cm diametro. Pedicelli subequilongi stricti rigidi, brunneo-virides politi. Flores stellati. Tepala anguste lanceolato-triangularia, 5-6 mm longa circa 1 mm lata, initio stricta deinde subreflexa, apice obtusiuscula, roseo-kermesina nervo inconspicuo. Filamenta tepalis sublongiora, subulata, roseo-subviolacea, basi breviter triangulato-dilatata albescentia. Antherae elongatae subviolaceae. Ovarium breve stipitatum, subapplanato-globosum triangulatum, tuberculatum, 2,5-3 mm longum 2-3 mm diametro, viride impolitum violaceo-suffusum. Stylus elongato-conicus, 4-6 mm longus, roseo-kermesinus. Stigma indivisa albescentia. Capsula fusiformia triangulata, 3-4 mm longa et diametro.

Differt ab *A. alaico* VVED. scapo et foliis glabres, ab *A. zergerico* habito graciliore tepalis coloris non-flavescentis.

Habitat in decliviis graminiis montibus Chatkalensis (Asia Media, Tien Shan Occidentalis).

Bulbs depressed-ovate, 1.5-2 cm long, 12-20 mm wide, with strong papery initially whitish tunics which later become brownish-black and crumpled. Scape cylindrical, erect, 40-60(90) cm long, 4-6 mm in diameter, smooth, dull green. Leaves 1-2(3), 20-40 cm long, 1.5-2.5 cm wide, narrowly lanceolate, nearly straight but obliquely sidewards directed, channelled, upper side smooth, below with shallow and wide ribs, shortly cuspidate with cucullate tip, greyish-green, glaucous, margins whitish scabrous. Spathe membranous, split in two valves, with brownish veins. Inflorescence initially semi-globose or depressed-globose, many-flowered, rather dense, 4-7 cm in diameter. Pedicels of nearly equal length, straight, wire-like, brownish-green, shining. Flowers star-like. Tepals narrowly lanceolate-triangular, 5-6 mm long and c. 1 mm wide, initially sidewards directed later somewhat recurved, tip blunt, pinkish-carmine with inconspicuous midvein. Filaments somewhat longer than tepals, basally free but shortly triangularly widened, whitish, above subulate and pinkish-carmine. Anthers elongated, greyish-violet. Ovary shortly stalked, slightly depressed-globose, triangular, tuberculate, 2.5-3 mm long and 2-3 mm in diameter, dull green with violet flush. Style narrowly conical, 4-6 mm long, pinkish-carmine. Stigma undivided and not thickened, whitish. Capsule broadly spindle-shaped, 3-4 mm long and in diameter.

Other material seen: Arkit (several dry specimens without labels, herbarium of Dr. G. LAZ'KOV, Bishkek).

This taxon belongs to a group of rather tall but slender species known from the eastern part of the Fergan depression all of which share rather narrow, glaucous leaves, narrowly lanceolate, relatively long tepals, and semi-globose to depressed-globose, rather dense inflorescences. *Allium alaicum* VVED. has been described already in 1934. It is characterised by pinkish-violet flowers and a moderately dense indumentum of long and often curled hairs at leaves and scape. Contrary to this, *A. arkitense* is completely hairless, and differs by pinkish-carmine (Plate 2A) and not yellowish-violet flowers from the third member of this group, *A. zergericum* F.O. KHASS. et R.M. FRITSCH described only in 1994. These taxa are only known from very restricted areas, and more studies about their variability as well as their relations to other taxa would be highly welcome.

Allium sochense R.M. FRITSCH et U. TURAKULOV, species nova

(subgenus *Melanocrommyum* (WEBB et BERTH.) ROUY sect. *Regeloprason* WENDELBO subsect. *Odoratae* R.M. FRITSCH)

Typus: Monti Alajici, sistema influentiis fluvii Sochensis, in decliviis schistoso-lapidosis monti Sandal, in regione Juniperi, 26. VI. 1994 leg. I. TURAKULOV (TASH, Isotypus GAT)

Bulbus ovoideo-globosus, 6-12 mm diametro, tunicis chartaceis nigrescentibus. Scapus 20-35 cm altus, circa 2.5 mm diametro, erectus vel subflexuosus, levis, in sicco remoto-striatus. Folia una (dua), anguste linearia, canaliculata, oblique erecta, apice retrorsa saepe spiraliter contorta, margine dentato, supra levia, infra profunde pauce-striata, 10-15 cm longa, 1-2.5 mm lata, probaliter impolita viridia glauca. Spatha membranacea, bipartita, brunnescentia intensiore nervata. Inflorescentia fasciculata deinde semiglobosa, pauciflora. Pedicelli subequilongi recti, 5-8 mm longi, brunnescenti viride, politi. Flores anguste campanulati. Tepala 8-11 mm longa subobtusa, basi 1/3 connatis, parte liberae externorum oblonga prope sesqui latiora lanceolatis internis, roseo-violacea nervis percoloratis. Filamenta 3/5 longitudinis tepalorum, basi circa 4 mm longitudinis connata inter se et cum perigonium, pars libera externorum triangulare dilatatae circa 3 mm longa internorum subulata 2 mm longa basi subdilatata. Antherae ca. 1.5 mm longae ovatae luteae apicis connectivis productis. Ovarium ovatum tricostatum circa 3 mm longum 2 mm diametro, subtile tuberculatum, sine stipulum, tumulis nectariis punctiformes. Stylus elongatus non excedens tepalis, stigma indivisa.

Ab speciebus affinibus *A. winkleriano* foliis filiformis canaliculatis (non loratis planis) capsulis ovoideis (non subglobosis), ab *A. chodshabakirganico* atque coloris tepalorum roseo-violaceis (non luteis) differt.

Bulbs ovoid-globose, 6-12 mm wide, with firm paper-like blackish tunics. Scape 20-35 cm long, c. 2.5 mm in diameter, erect or flexuous, cylindrical, smooth, distantly ribbed when dry. Leaves 1(2), narrowly linear, canaliculate, obliquely erect, upper part hanging down and often spirally curved, with dentate margin, upper surface apparently smooth, lower surface with a few prominent finely toothed ribs,10-15 cm long, 1-2.5 mm wide, probably dull green, glaucous. Spathe membranous, divided into 2 parts, brownish with darker nerves. Inflorescence fasciculate, finally semiglobose, few-flowered. Pedicels of nearly equal length, straight, 5-8 mm long, brownish-green, shining. Flowers narrowly campanulate. Tepals 8-10(11) mm long, pinkish-violet with darker midvein, connate base about 1/3 of whole length, free part of the outer tepals narrowly oblong and almost 1.5 times broader than that of the lanceolate inner tepals, rather obtuse. Filaments about 3/5 as long as tepals, basally c. 4 mm connate with another and with tepals, free part of the inner filaments triangular widened, ca. 3 mm long, that of the outer filaments subulate 2 mm long with slightly widened base. Anthers c. 1.5 mm long, yellow, ovate, tipped by connective. Ovary ovate, three-edged, c. 3 mm long and 2 mm wide, with finely tuberculate surface, not stalked, nectary tube rising as a small porus. Style elongated but not exceeding tepals, stigma undivided.

The thread-like narrow leaves of this species are an unique feature in sect. *Regeloprason* and had never been reported for any taxon of this section (FRITSCH 2000). At its type location in Kyrgyzstan (Alai range, drainage of river Soch, stony slate slopes of Mt. Sandal, Juniperus belt) it grows at open steppe slopes in the *Elytrigia-Artemisia* association. It clearly belongs to subsect. *Odoratae* in having pedicels which do not elongate after bloom, and thin bulb tunics. Unfortunately, this new species could not be studied in the living stage. Only type and isotype sheets of *A. sochense* were seen, and nothing was mentioned about odour in the accompanying provisional description. The new species is most similar to small specimens of *A. winklerianum* REGEL which differ by much broader leaf blades and subglobose capsules. The likewise rather small plants of the related *A. chodshabakirganicum* GAFFAROV et I. TURAKULOV have yellow flowers, narrow outer tepals, and broader leaf blades.

2. New taxa from Iran

Allium petri F.O. KHASS. et R.M. FRITSCH, species nova (Plate 1D-F)

(subgen. *Allium* sect. *Longivaginata* (KAMELIN) F.O. KHASS.)

T y p u s : Ex culturae in horto Gaterslebensis, No. TAX 3965 , leg. 19. 07. 1996 (GAT). [Ex Iran: Bakhtiar-Berge, Chelgerd, zwischen Kalksteinblöcken neben dem Fahrweg am Hang oberhalb des Kuhrange-Flusses, 2400-2600 m, 16. 05. 1994 leg. R.M. FRITSCH No. 1066]

Bulbus solitarius ovoideus 15-20 mm longus, 10-15 mm diametro, tunicis externis striatis fusco-rubescentibus. Scapus teres glaber in sicco striatus, 30 cm altus, usque ad apicem scabridis vaginis foliorum involutis. Folia tertia, 2-3 mm lata, 5-7 cm longa semicylindrica scabrida. Spatha circa 7 mm longa, bivalvis. Inflorescentia hemisphaerica multiflora. Pedicelli aequilongi circa 10 mm longi basi bracteolati. Flores cylindrico-campanulati. Tepala elliptico-oblonga acuta circa 4 mm longa albido-rosea nervo viride-rufescenti. Filamenta circa 4 mm longa, externa simplicia straminea basi rosea, interna tepalis latiora, 2 mm lata, basi solum in medio rubra supra duas incrassatis obtusis citrinis dentibus. Antherae badiae. Ovarium late ellipsoideum apice ecornutum basi roseo-striatum, tumulis nectariis transversale dilatatis. Stylus 1 mm longus albidus. Capsula ignota.

Ab *Allio longivaginato* filamentiis et perigoniis coloratis, ovariis ecornutis differt.

Habitat in Persia septentrionale-occidentali in montibus Bakhtiaricis.

Species in honorem botanico mirificissimo et eminenti Per WENDELBO Gothoburgensis denominata est.

Bulbs ovate, 15-20 mm long and 10-15 mm wide, with striped reddish-brown outer tunics. Scape cylindrical smooth, only in dry state ribbed, c. 30 cm long, over the whole length covered by scabrid leaf sheathes. Spathe c. 7 mm long, two-valved. Inflorescence semi-globose, with many flowers. Pedicels of equal length, c. 1 cm long, with basal bracts. Flowers narrowly campanulate, whitish-pink with greenish-brown midvein. Tepals elongated elliptical, c. 4 mm long. Filaments c. 4 mm long, the outer ones simple, yellowish with pinkish base, the inner ones wider than tepals ca. 2 mm wide, their base only in the median part red with two thickened blunt yellow teeth above. Anthers brown. Ovary broadly ellipsoid with undivided tip and pinkish striped base. Ends of the nectary tubes strongly widened. Style c. 1 mm long, white.

This species is unique in the whole genus because of the cushion-like broadened and thickened filament appendages (Plate 1F). This taxon is only known from the type specimen, which has been cultivated at Gatersleben since 1994. According to its general habit *Allium petri* doubtless belongs to subg. *Allium* section *Longivaginata* sharing leaves extending to the inflorescence, tripartite inner filaments, and widely expanded mounds of nectaries (Plate 1E) with *A. longivaginatum* WENDELBO.

Allium pseudobodeanum R.M. FRITSCH et MATIN, species nova (Plate 2C, E)

(subgenus *Melanocrommyum* (WEBB et BERTH.) ROUY sect. *Acanthoprason* WENDELBO)

Allium bodeanum sensu WENDELBO in RECHINGER, Fl. Iranica 76 (1971) 76, p. p., WENDELBO, Tulips Irises Iran (1977) 22, 23 fig. 15.

T y p e : Iran, Mazandaran: Nadgafdar, 50 km from Firuzkuh, Machmed-Kuh, 2150-2750 m, 29. V. 1980 leg. TERMEH, DANESHPADJU & ZHARANI (IRAN)

Bulbus applanato-globosus, 3-4 cm diametro 2.5-3 cm longus, tunicis coriaceis friabilibus. Scapus cylindricus subflexuosus, 5-15(20) cm longus 5-8 mm diametro, glaber viridis basi rubescens suffusus. Folia una (dua), anguste lanceolata basi angustata, (15)20-30 cm longa 2.5-4(6) cm lata, initio erecta deinde recurvata ultimus procumbentia, supra levia infra non profunde late-striata margine levi, venetia glauca. Spatha subtiliter membranacea profunde 2-4-partita, valvis ovatis acutis brunnescentibus atro-nervatis. Inflorescentia initio fasciculata deinde semi-globosa usque globosa, densiuscula. Pedicelli subincrassati recti, 2-4.5 cm longi (illi florum ultimorum longissimi), impoliti, rubro-brunnescentes vel apice viridescentes. Tepala anguste lanceolata apice rotundatis (8)10 – 12 mm longa basi circa 2 mm latis breve connatis, margine longitudinaliter convolutis initio stricte radiata deinde oblique radiata post anthesin oblique erecta et marginis perfecte convolutis, nervis percoloratis vel viridibus subsucculentis, post anthesin infuscata roseo-lilacea. Filamenta 4/5 longitudinis vel subequantia tepala, subsucculenta, basi circa 1 mm longitudinis connata et triangulare dilatata albescentia, apice dilatata violacea. Antherae elongatae circa 2-2.5 mm longae 2 mm latae violaceae. Ovarium applanato-globosum usque brevi pyriforme, profunde 6-sulcatum circa 2.5 mm longa et diametro, breve stipitatum subglabrum impolitum dilute viride. Stylus anguste conicus 6 mm longus lilaceus. Stigma indivisa. Capsulae et semina ignotae.

Differt ab *Allio elburzensi* floribus applanato-stellatis (non infundibulo-stellatis) et coloratis, formae tepalis et longitudine filamentis.

Habitat in montibus Elburzensis (et orientalibus?).

Bulb suppressed-globose, 3-4 cm in diameter and 2.5-3 cm long, outer tunics brownish, crumbling. Scape cylindrical slightly bent, 5-15(20) cm long, 5-8 mm in diameter, completely smooth; green basally reddish flushed. Leaves 1-2, narrowly lanceolate basally narrowed, (15)20-30 cm long, 2.5-4(6) cm broad, initially stiffly erect later recurved and finally laxly adpressed to soil, smooth above but with broad flat ribs below, margin completely smooth; blue-green, glaucous. Spathe finely membranous, deeply divided into 2-4 ovate acute parts, brownish with darker veins. Inflorescence initially fasciculate, later semiglobose to globose, very dense. Pedicels thickish, straight, 2-4.5 cm long (those of the last flowers are longest); dull or mat, reddish-brown or upper part greenish. Tepals narrowly lanceolate with slightly rounded tip, (8)10-12 mm long, basally c. 2 mm wide and shortly united, margin rolled longitudinally, initially straight later obliquely sideways directed, after bloom completely longitudinally enrolled and obliquely forward directed; (rose-) lilac with slightly darker or greenish, somewhat thickened midvein, after bloom brownish. Filaments 4/5 to nearly as long as tepals, somewhat fleshy, basally for c. 1 mm united and triangular widened, above subulate; violet, basally white. Anthers elongated, c. 2-2.5 mm long and 2 mm wide, violet. Ovary depressed-globose to shortly pear-shaped, deeply 6-lobed, c. 2.5 mm in diameter and length, shortly stalked, nearly smooth; faintly dull green. Style narrowly conical, 6-8 mm long, lilac. Stigma undivided. Capsule and seeds not seen.

Other material seen: Iran, Karaj valley, steep limestone slopes near the lower end of village Asara, c. 1850-2000 m, 15. 7. 1994 leg. R. FRITSCH No. 1088 (under cultivation at Gatersleben: TAX3932); Iran, Karaj valley, East-facing limestone slopes near the lower end of village Polekhab, c. 1800 m, 15. 7. 1994 leg. R.M. FRITSCH No. 1106 (under cultivation at Gatersleben: TAX3936). Perhaps the plants from Elburz or Mashad mentioned by WENDELBO (1971: 77) under *A. ellisii* may also belong to *A. pseudobodeanum*.

REGEL (1875) described *A. bodeanum* to have a c. 20 cm long scape and 8-12 mm wide leaves with finely toothed-scabrid margins based solely on the type specimen. However, re-study of this type specimen resulted in the conclusion that the scape was in a very early flowering stage. It would have reached a length of 25-30 cm in full bloom, and belongs to the identical taxon well known as *A. cristophii* TRAUTV. (FRITSCH 1999). However, WENDELBO (1971) has apparently followed VVEDENSKY

(1932) by applying the name *A. bodeanum* to stocky plants with 10-20 cm long scape and up to 3 cm wide leaves. Later, WENDELBO (1977) further changed his descriptions by mentioning 10-15 cm plant height and 3-5 cm or more wide leaves for the plants he classified under *A. bodeanum*. The figure accompanying this amended description shows a plant clearly different from *A. cristophii* and not corresponding to the protologue of *A. bodeanum*. The resulting nomenclatural tangle has been solved by conserving the name *Allium cristophii* for the plant at the type sheet of *A. bodeanum* and rejection of the binomen *A. bodeanum* (BRUMMITT 2001).

Unfortunately, no other valid scientific name for the plant meant by WENDELBO (1977) could be traced. Therefore this remarkable and highly decorative taxon is here described as a new species. We share WENDELBO's interpretation that it is closely related to *A. elburzense* from which it differs by flat-starlike and lilac (not funnel-starlike and purple) flowers, by lanceolate (not linear) tepals and by filaments nearly (not 3/5 to 2/3) as long as the tepals (see also Plate 2C). The flower head of *A. pseudobodeanum* is also much denser if compared with the less closely related *A. akaka* and *A. haemanthoides* which also differ by much shorter and differently shaped tepals and filaments. All these species look very similar in the vegetative stage.

3. Taxonomic notes about other Iranian taxa of subg. *Melanocrommyum*

Allium assadii SEISUMS was recently described from Central Iran (Prov. Markazi). We were able to study living specimens (Plate 2D, F) in the field as well as under cultivation. According to our observations, the bulb may reach 35 mm in diameter, and the leaves are rather fleshy, smooth above and with a few sharp but shallow ribs beneath, dark green and glaucous. The bases of filaments are long-triangular widened and much paler than the purple and subulate upper parts. Contrary to its closest relative *A. brachyscapum* VVED. which grows at stony slopes in the montane belt, *A. assadii* has been collected in the desert area near the main road c. 60 km S Delijan, Prov. Esfahan [voucher specimen: Ex culturae in horto Gaterslebensis No. TAX3927, leg. 01. Juni 1995, GAT].

WENDELBO (1971) mentioned three collections from western and southern Iran to belong to *A. brachyscapum* VVED. known formerly solely from Kopetdag. Only that from southernmost location (Baluchistan, 30 km from Khash to Iranshar, 1700 m, leg. PAZOUKI & HASHEMI 8062-E) could be studied which corresponds closely to several collections of rather low plants from Kopetdag seen at LE and ASH. Thus the area of distribution of this species was remarkably expanded.

WENDELBO (1969) included *A. brachyscapum* in sect. *Megaloprason* although it looked rather aberrant. *Alium assadii* also does not show the main characters given for this section in the strict sense by FRITSCH (1993). We regard the flower characters better to fit subsect. *Inornatae* R.M. FRITSCH of sect. *Acmopetala* (KHASSANOV & FRITSCH, 1994) of which *A. brachyscapum* and *A. assadii* represent the southernmost members.

The emendated interpretation of *A. kazerouni* PARSA given by SEISUMS (2000) and the characterisation of *A. baktiaricum* sensu R.M. FRITSCH (1996) refer indeed in wide parts to the identical taxon. Most recently, under cultivation well developed plants collected near Farsan showed up to 11 mm long tepals which corresponds well

to the data proposed by SEISUMS (2000) for *A. bakhtiaricum*. Concerning the allegation that BODE did not touch the area of current Bakhtiar Province, we would like to point out that BODE must have returned from Shushtar area to Tehran. A possible way would have been along the Karun river valley through the current Baktiar Mountains to Esfahan.

SEISUMS (2000) included plants from W Iran and NO Iraq in *A. hollandicum* R.M. FRITSCH although these were taller (scape up to 1 m long) and differed also by smooth scapes (lower part not ribbed), narrower greyish-green leaves, and only 1.8-2 mm (not 2.2-2.5 mm) wide tepals. We doubt that all this material really belongs to one taxon, and a comparison of living plants will be essential.

The distribution area presented by SEISUMS (2000) for *A. altissimum* REGEL includes five disjunct areas in Kazakhstan, Kirgizstan, Uzbekistan, Afghanistan, Turkmenistan, and Iran, but the occurrence in Tajikistan was not mentioned by him. Because the name *A. altissimum* is based on plants from the area around Baljuan, Tajikistan, this exclusion of the nomenclatural type demonstrates that he understood another taxon under this name for which he did neither mention the key characters nor the differences to *A. stipitatum* REGEL which he refers to in the text. Thus the question whether true *A. altissimum* REGEL really occurs in Iran remains unsolved.

Acknowledgements

The authors are extremely indebted to the directors and the staff of the Plant Pests and Diseases Research Institute Tehran (support of the Deutsche Forschungsgemeinschaft, grant Fr 1044/1-1, for this visit is gratefully acknowledged), the Institute of Botany of the Uzbek Academy of Sciences, Tashkent, and the Institute of Botany and Botanical Garden of the Turkmen Academy of Sciences, Ashgabat, for generous support of joint scientific missions and working facilities in their herbaria. We want especially to thank Prof. Dr. I. Turakulov of Khodzhent State University (Tajikistan) for sending specimens, the technical staff of the IPK Gatersleben for careful cultivation of the plants, and Prof. K. Bachmann (IPK Gatersleben) for improving the English.

References

BRUMMITT R.K. (2001): Report of the Committee for Spermatophyta: 51. — Taxon **50**: 559-568.

FRITSCH R. (1993): Taxonomic and nomenclatural remarks on *Allium* L. subgen. *Melanocrommyum* (Webb & Berth.) Rouy sect. *Megaloprason* WENDELBO. — Candollea **48**: 417-430.

FRITSCH R.M. (1996): The Iranian species of *Allium* subg. *Melanocrommyum* sect. *Megaloprason* (Alliaceae). — Nord. J. Bot. **16**: 9-17.

FRITSCH R.M. (1999): (1421) Proposal to conserve the name *Allium cristophii*, preferably with the spelling *A. christophii*, against *Allium bodeanum* (Liliaceae). — Taxon **48**: 577-579.

FRITSCH R.M. (2000): Taxonomic revision of *Allium* L. sect. *Regeloprason* WENDELBO in Middle Asia. — In: ASHURMETOV O., KHASSANOV F. & Y. SALIEVA (eds.) Plant life in South-West and Central Asia (5th International symposium, Tashkent '98). Chinor ENK, Tashkent pp. 62-74.

FRITSCH R.M., KHASSANOV F.O. & N.W. FRIESEN (1998): New taxa, new combinations, and taxonomic remarks on *Allium* L. from Fergan depression, Middle Asia. — Linzer biol. Beitr. **30**: 281-292, 843.

FRITSCH R.M., MATIN F. & M. KLAAS (2001): *Allium vavilovii* M. POPOV et VVED. and a new Iranian species are the closest among the known relatives of the common onion *A. cepa* L. (Alliaceae). — Genet. Resour. Crop Evol. **48**: 401-408.

GREGORY M., FRITSCH R.M., Friesen N.W., KHASSANOV F.O. & D.W. MCNEAL (1998): Nomenclator Alliorum: *Allium* names and synonyms – a world guide. — Royal Bot. Gardens, Kew 83 pp.

KHASSANOV F.O. ("1996" 1997): Conspectus of the wild growing *Allium* species of Middle Asia. — In: ÖZTÜRK M., SEÇMEN Ö. & G. GÖRK (eds.) Plant life in Southwest and Central Asia. EGE Univ. Press, Izmir, pp. 141-159.

KHASSANOV F. O. & R.M. FRITSCH (1994): New taxa in *Allium* L. subg. *Melanocrommyum* (WEBB et BERTH.) ROUY from Central Asia. — Linzer biol. Beitr. **26**: 965-990.

MATIN F. ("1976" 1978): Study of the family Alliaceae in Iran. — Inst. Rech. Entomol. Phytopathol. Evidence Dep. Bot.: 1-74.

MATIN F. (1989): Two new species of *Allium* (Alliaceae) from Iran. — Iranian J. Bot. **4**: 165-170.

MATIN F. (1991): *Allium dictyoscordum*, a new record from Iran. — Iranian J. Bot. **5**: 7-8.

REGEL E. (1875): Alliorum adhuc cognitorum monographia. — Acta Horti Petropolitani **3**: 1-266.

SEISUMS A. (2000): Notes on *Allium* L. subgen. *Melanocrommyum* (WEBB & BERTH.) ROUY in Iran. — Iranian J. Bot. **8**: 223-232.

VVEDENSKY A. I. (1932): XVII. Liliaceae – Lileinye. 5. *Allium* L. – luk. In: FEDTSCHENKO B.A. & M.G. POPOV (eds.) Flora Turkmenii. — Akad. Nauk SSSR i Bot. Inst. Turkmensk. SSR, Leningrad, pp. 270-296.

VVEDENSKY A.I. (1971): Rod 151, (7) *Allium* L. – Luk zhua (kaz.) piez (tadzh.). — In: VVEDENSKY A.I. & S.S. KOVALEVSKAYA (eds.) Opredelitel rastenij Srednej Azii. Kriticheskij konspekt flory; 2. Izd. "FAN" Uzb. SSR, Tashkent, pp. 39-89, incl. "Appendix. Descriptiones plantarum novarum in tomo II Conspectus Florae Asiae Mediae commematorum": 311-328.

WENDELBO P. (1969): New subgenera, sections and species of *Allium*. — Bot. Notiser **122**: 25-37.

WENDELBO P. (1971): Alliaceae. — In: RECHINGER K.H. (ed.) Flora Iranica, Vol. 76 Akademische Druck- und Verlagsanstalt, Graz, Austria, 100 pp.

WENDELBO P. (1977): *Allium*. In: WENDELBO P. (ed.) Tulips and irises of Iran and their relatives. — Bot. Inst. Iran -- Ariamehr Bot. Garden, Tehran, Iran, pp. 18-25.

Addresses of the authors:

Dr. Reinhard M. FRITSCH
Institut für Pflanzengenetik und
Kulturpflanzenforschung (IPK)
Corrensstr. 3, D-06466 Gatersleben, Germany

Dr. Furkat O. KHASSANOV
Scientific Centre "Botanika" of Uzbek Adcademy of Sciences
F. Khojaev Str. 32, Tashkent
700143, Republic of Uzbekistan

Farideh MATIN
Plant Pests and Diseases Research Institute
P. O. Box 1452, Tehran 19395
Islamic Republic of Iran