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MONOGRAPH

The genus *Iris* L. s. l. (Iridaceae) in the Mountains of Central Asia biodiversity hotspot

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ABSTRACT

The novel, phylogeny-based classification of *Iris* s.l. in the Mountains of Central Asia biodiversity hotspot has been developed. Fifty seven species are accepted and classified into 14 sections. The majority of accepted species (38) belong to the juno irises, which have a centre of their diversity in Central Asia and are represented by 2 sections; the largest *I.* sect. *Juno* is subdivided into 10 species groups, whereas *I.* sect. *Physocaulon* is subdivided into 2 subsections, each with 2 aggregates. The analysis of the geographical pattern of species richness revealed two areas of exceptionally high *Iris* species richness: Tian-Shan (14 species) and Hissar Mts. (21 species). A morphological description, sample photograph, geographical distribution, ecological data, point distribution maps, list of specimens and photographs examined, synonymy and nomenclatural type are provided for each species. A new identification key is compiled, based on morphology and phylogenetic relationships. *Iris alberti* Regel is reported for the first time from Uzbekistan. Four new combinations, *Iris* sect. *Sclerosiphon* (Nevski) Sennikov & F.O.Khass., *I.* subsect. *Drepanophyllae* (Rodion.) Sennikov, *I.* subsect. *Rosenbachianae* (Rodion.) Sennikov and *I. parvula* (Vved.) Sennikov, are established. The name *I. kopetdagensis* Vved. is validated with a type and description in English. *Iris suworowii* Regel is restored as the priority name for *I. lineata* Foster. *Iris popovii* Vved. is treated as a synonym of *I. baldshuanica* O.Fedtsch. & B.Fedtsch., *I. pskemensis* Rukšāns as a synonym of *I. kolpakowskiana* Regel, *I. hoogiana* Dykes as a synonym of *I. darwasica* Regel, and *Iridodictyum kopetdaghense* Kurbanov is reduced to a synonym of *Iris reticulata* M.Bieb. *Iris almaatensis* Pavlov is removed from synonyms of *I. subdecolorata* Vved. and considered a yellow form of *I. kuschakewiczii* B.Fedtsch. The nomenclature of *I.* sect. *Regelia* (Foster) Foster, *I. parvula* (Vved.) Sennikov and *I. sogdiana* Bunge is corrected. The names *I.* sect. *Regelia* (Foster) Foster, *I. alberti* Regel, *I. bloudowii* Ledeb., *I. halophila* Pall., *I. hoogiana* Dykes, *I. lineata* Foster, *I. regelii* Maxim. ex Regel, *I. scariosa* Willd. ex Link, *I. sogdiana* Bunge, *I. stolonifera* Maxim., *I. suworowii* Regel, *I. tenuifolia* Pall., *I. tenuifolia* var. *thianschanica* Maxim. ex Regel and *I. vaga* Foster are lectotypified, whereas *I. suworowii* is also epitypified.

Key words: Central Asia, identification key, *Iris*, *Juno*, typification

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Introduction

Iris L., the largest genus in Iridaceae Juss., is a temperate group of perennial herbs comprising approximately 270 species mainly distributed in Eurasia, North America and North Africa (Mathew 1989, 2000; Crespo et al. 2015). The characteristic features of *Iris* are the basal fan of typically unifacial leaves; the colorful perianth of three horizontal tepals and three upright petals that are basally fused into a tube; the style branches that are fused at the base, petaloid distally and extend beyond the small flap-like, transverse stigma as a bifid crest; and three stamens that are opposite to the tepals and petaloid style (Mathew 1989). The most popular subgeneric classification of *Iris* was developed by Mathew (1981, 1989), which was mainly based on Lawrence (1953) and Rodionenko (1961, 1987). Using subterranean storage organs and occurrence of a beard on the outer perianth segments as the major taxonomic characters, Mathew (1989) subdivided the genus into six subgenera: *Iris*, *Limniris* (Tausch) Spach, *Nepalensis* (Dykes) G.H.M.Lawr., *Xiphium* (Mill.) Spach, *Scorpiris* Spach, and *Hermodactyloides* Spach. This classification, however, is nowadays disputed as not supported by the molecular data (Wilson 2006; Mavrodiev et al. 2014). The updated version of this classification, based on a comprehensive biomorphological study of living plants, was proposed by Rodionenko (2009); this classification still requires corrections based on the latest molecular phylogenetic studies.

Molecular phylogenetic studies have been carried out at the family level (Goldblatt & Manning 2008; Reeves et al. 2001), at the genus level (Tillie et al. 2000; Wilson 2004, 2006, 2011; Mavrodiev et al. 2014) and at the subgenus or section level (Wilson 2009, 2017; Ikinci et al. 2011; Wilson et al. 2016). So far, the phylogenetic studies have not been comprehensive enough to resolve all taxonomic issues. The generic circumscription of *Iris* s.l. has also been debated; there are two conflicting views proposing *Iris* as a single inclusive genus (Mathew 1989; Rodionenko 2009; Ikinci et al. 2011; Tojibaev et al. 2021) or splitting it into as many as 25 narrowly defined genera, including several in Central Asia (Crespo et al. 2015, 2018).

The Central Asian *Iris* species have been studied since the time of early botanical explorers in 1870s, when these species were brought to and started to be cultivated in European botanical gardens (Sennikov et al. 2022a, 2022b). The first attempts to summarise botanical knowledge about Central Asia *Iris* species were made by O.A. Fedtschenko and B.A. Fedtschenko (Fedtschenko & Fedtschenko 1905; O.Fedtschenko 1909; B.Fedtschenko 1915). Further monographic revisions were provided by Vvedensky (1935b, 1941, 1963, 1971), Fedtschenko (1935), Poliakov (1958), Pavlov & Poliakov (1958) and Tscherneva (1971).

The biology and taxonomy of *Iris* representatives in the USSR flora was studied by G.I. Rodionenko, who followed Vvedensky in the species circumscription. In 1961, Rodionenko published the famous book «The genus *Iris* L.: Questions of Morphology, Biology, Evolution and Taxonomy» (1961, translated into English in 1984). He critically revised the classification of the genus *Iris* s.l. according to the structural features of pollen, seeds and flower buds, and provided a key to supraspecific taxa. The most modern milestone in Central Asia, fundamental for all subsequent revisions, was the treatments for Conspectus Florae Asiae Mediae (Tscherneva 1971; Vvedensky 1971).

The latest taxonomic revision of the genus *Iris* for the flora of Central Asia was published by Khassanov & Rakhimova (2012). This treatment provided an updated checklist without morphological descriptions but with nomenclatural information, type citations and country-level distributions. It included three subfamilies: *Iris*, *Scorpiris* and *Hermodactyloides*, four sections (*Limniris*, *Hexapogon*, *Juno* and *Physocaulon*), two subsections and 54 species. A similar update was published separately for Uzbekistan (Rakhimova & Khassanov 2012).

More recently, Boltenkov (2016, 2019) provided nomenclatural actions (typifications

and some clarifications) for the Central Asian species of juno irises. This work was entirely concentrated on formal nomenclature and included no taxonomic assessments (Sennikov et al. 2022a).

Over the past ten years, the intensity of botanical research has increased significantly, which is largely due to the Flora of Uzbekistan project (Sennikov et al. 2016) and the ongoing inventory in Kyrgyzstan (Lazkov & Sultanova 2014). Between 2012 and 2022, seven new species of *Iris* were described from Central Asia, which is more than 13% of all the species of *Iris* recorded up to 2012 (Khassanov et al. 2013, 2014; Lazkov & Naumenko 2014; Tojibaev & Turginov 2014; Tojibaev et al. 2015; Sennikov et al. 2022b). New records and taxonomic clarifications were published in particular groups (Lazkov & Sennikov 2017; Sennikov et al. 2022a,b). As a result of ongoing field research, many new herbarium specimens and species occurrence data has become available. Moreover, we georeferenced many specimens kept in the Tashkent (TASH), Moscow (MW), Bishkek (FRU) and St. Petersburg (LE) herbaria: the results have been partly published (Karimov 2016; Tojibaev et al. 2021).

All these activities motivated our efforts toward an updated checklist of the genus *Iris* in the Central Asian Botanical Province, as defined by Kamelin (1973) but excluding some northern parts of Kazakhstan. The taxonomic basis of the present publication has been updated based on the latest phylogenetic studies of the family (Ikinci et al. 2011; Mavrodiev et al. 2014). The present taxonomy significantly expands on previous data due to the added species, morphological descriptions, updated distributions, a new identification key, data on phenology and habitats, and digital illustrations made by the authors (E. Ortikov). The most distinctive new feature is the inclusion GIS maps of species distributions and full citation of all critically examined herbarium specimens from Central Asia.

As this study was focused on a taxonomic overview, some of the identifications may beprovisional and the distributions (point maps) may be slightly incomplete. A complete inventory and verification of herbarium collections and observations is the next step of the ongoing research project.

Material and methods

Study area

Due to its geographical location, Central Asia forms the core of the Eurasian continent, which stretches at mid-latitudes from the Caspian Sea and the Volga River in the west to Northwest China in the east. Central Asia covers almost 4×10^6 km^2 and encompasses five countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. Deserts cover more than 95% of the total territory of Turkmenistan and more than a half of Uzbekistan and Kazakhstan (Lioubimtseva et al. 2005).

Climate

The Central Asian region, located in the interior of the Eurasian continent and far from the oceans, is one of the largest arid and semi-arid regions in the world (Yu et al. 2019). It has a typical continental climate and can be divided into two climatic subregions: northern (mainly Kazakhstan) and southern (other four countries) (Petrov 1976; Lyubimtseva et al. 2005). In northern and eastern Kazakhstan, a temperate climate prevails with a more wet climate (350—650 mm), cold (the temperature can drop to -57°C) and long (up to 6 months) winters, and short, often hot (up to +42°C) summers (Lubimtseva & Cole 2005). Although the climate varies greatly throughout the southern subregion, winters are mild to cool with average temperatures ranging from -3°C to 20°C and summers are warm to hot with average temperatures ranging from 20°C to 40° C. The maximum precipitation falls in the spring months (March-April), which creates favorable conditions for the development of ephemeral vegetation.

In summer, the amount of precipitation decreases sharply, and most of the territory of Tajikistan, Uzbekistan and Turkmenistan have less than 150 mm of annual rainfall. However, in the mountainous areas annual precipitation is higher (500—550 mm in the highlands of the Pamir-Alay and Tian-Shan mountain systems, reaching 800 mm in some wet gorges above 1600 m).

Phytogeography

Mountains of Central Asia is one of 35 global biodiversity hotspots (Mittermeier et al. 2011). As defined in the biodiversity analysis, this hotspot corresponds to the Tian-Shan and Pamir-Alay mountain systems and to the the study area of our work.

The phytogeography of the Mountains of Central Asia biodiversity hotspot was founded by Kamelin (1973), who subdivided this territory into 14 floristic districts, which were characterised by the features of endemism and had a number of specific connections formed by common taxa of various taxonomic level, from groups of species to genera and families. Recently, the endemism of the Tian-Shan Mountains as part of the Mountains of Central Asia biodiversity hotspot was assessed by Tojibaev et al. (2021), who found a high level of species endemism in the Western and Northern Tian-Shan, thus establishing the framework for more detailed analyses.

Data analysis

In this study, we evaluated over 1660 specimens of *Iris* (including digital images) deposited in the following herbaria: TASH, FRU, LE and MW, and used the data from www.gbif.org and www.plantarium.ru. The total number of records used in this study exceeds 2500.

In addition to herbarium specimens and documented observations, taxonomic revisions were used to verify country-level distributions. We used the data published for Kazakhstan (Poliakov 1958; Pavlov & Poliakov 1958; Tscherneva 1971; Vvedensky 1971; Lazkov & Sennikov 2017; Ivaschenko 2019), Kyrgyzstan (Lazkov & Sultanova 2014; Lazkov et al. 2014; Lazkov & Naumenko 2015; Lazkov & Sennikov 2017), Tajikistan (Vvedensky 1963; Sennikov et al. 2021), Turkmenistan (Nikitin & Geldykhanov 1988) and Uzbekistan (Tscherneva 1971; Vvedensky 1971; Khassanov & Rakhimova 2012; Khassanov et al. 2013, 2014; Tojibaev & Turginov 2014; Tojibaev et al. 2015; Sennikov et al. 2021).

Results

Our territorial scope was restricted by the botanical mountainous Central Asia Biodiversity Hotspot (Mittermeier et al. 2011), or botanical province as defined by Kamelin (1973) and reflected in *Manual of vascular plants of Central Asia* (Tscherneva 1971; Vvedensky 1971). This implies that the northernmost and easternmost parts of Kazakhstan are not covered; some species of *Iris* are therefore excluded, notably some typical Boreal Eurasian species (*I. humilis* Georgi, *I. pseudacorus* L., *I. pumila* L., *I. sibirica* L.) and some Siberian species restricted to the Altay Mts. (*I. ludwigii* Maxim., *I. tigridia* Bunge).

Synopsis of the genus *Iris* in Central Asia

Iris L., Sp. Pl. 1: 38 (1753). Type: *Iris germanica* L. (lectotype designated by Britton & Brown (1913: 536), affirmed by Hitchcock in Sprague et al. (1929: 118)).

1. ***Iris*** sect. ***Sclerosiphon*** (Nevski) Sennikov & F.O.Khass., **comb. nov.** — *Sclerosiphon* Nevski in Trudy Bot. Inst. Akad. Nauk SSSR, ser. 1, 4: 331 (1937).
Type: *Iris songarica* Schrenk.

1. ***Iris songarica*** Schrenk in Fischer & C.A.Meyer, Enum. Pl. Nov. 1: 3 (1841) — *Joniris songarica* (Schrenk) Klatt in Bot. Zeitung (Berlin) 30: 502 (1872) — *Sclerosiphon songaricum* (Schrenk) Nevski in Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4: 331 (1937). Type: Kazakhstan. “Ad fl. Ajagus”, 30.05.1840, *A. Schrenk* (lectotype LE 01017907, designated by

Boltenkov & Schröder in Phytotaxa 387(4): 290 (2019); isolectotypes LE 0050105, 0050106, 0050107, 01017906).

Description: Plants 40–80 cm tall; rhizome slender, forming tussocks, covered by dense tufts of spiral vestiges of the preceding year's leaves; stem branched, terete, firm, 40–80 cm long; leaves up to 25 cm long and 3–6 mm wide, extending to 80 cm long and 10 mm wide, firm, longitudinal veins prominent; spathe valves tightly clasping the bud, pale green, upper margin distinctly coriaceous, apex lanceolate; peduncles 1–4, well developed, each bearing 2 or 3 flowers, rarely 3–5; pedicels ca. 1 cm long; perianth tube 4–6 cm long, falls elliptic, with a constriction between the lamina and the claw, claw elongate-ovate, with reddish-purple spots on pale azure ground, lamina azure with pale margins; standards oblanceolate, with reddish-purple spots on white or faintly purple ground; style branches slightly narrower than than the claws of standards; style crests narrow, overlapping; stigmas 2-lobed, with 2 triangular teeth; filaments purple; anthers reddish; capsule oblong; seeds cylindric, dark brown, test rugose (Figs. 1, 2).

Flowering: April–May.

Ecology: Clayey desert steppes.

Distribution: Iran, Afghanistan, Pakistan, China (Xinjiang, Tibet), Mongolia, Central Asia (Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan) (Fig. 3).

Material examined: Uzbekistan—Steppe near the railway station Kermine, 29.04.1912, *Androsov*; Nurata district, sandy hill near Uch-Bash, 27.04.1913, *Korovin*; Nurata district, Hosh-Bandy-Chu on slopes of the shale mountains, 02.05.1913, *Korovin*; Nurata district, near village Kyzyl-Chali, 28.04.1913, *Korovin*; Nurata district, Kermine station, mountains Kara-Karga, 22.04.1913, *Korovin*; Bukhara distr., near Zekra well, 14.04.1913, *Teplov*; Bukhara distr., near Balty-buy well, 28.04.1913, *Teplov*; Bukhara distr., near Adym well, 26.04.1913, *Teplov*; Bukhara distr., near Khushab-Kara-Bulak well, 21.04.1915, *Kultiasov*; Samarkand region, near Dargom, 05.06.1920, *Gomolitsky*; Samarkand region, near Dargome river, 31.05.1921, *Popov*; Zindon-tau mountains near Musa-Kok village, 06.05.1925, *Popov*; Katta-Kurgan. 30.05.1927, *Alexandrova*; Zarafshan district, foothills of the Zerabulak mountains, 30.10.1928, *Moskvin*; Zarafshan Range, from Jush to Akhchop, 30.07.1928, *Yakimova*, *Moskvin*; Kashkadarya distr., near Tengy-Harama, foothills, 20.05.1928; Bukhara region, station Karaul bazaar, 03.05.1929, *Petrova*; near Kermine, 05.06.1931, *Nikanorov*, *Yakimova*, *Moskvin*; near Gava village, 14.07.1931, *Knorring*; Karakalpak Kyzylkum, Kol-Kuduk, 13.04.1934, *Muravlyansky*; near Kenimech, 10.07.1934, *Tyshenko*; Kenimeh desert, 19.06.1935, *Tarasevich, Klimovskaya*; Kanimekh desert, Lake Shor-Kul, 08.05.1935, *Pugasova*; Kashkadarya distr., between Guzar and Kurgan-tash, 03.09.1935, *Lepeshkin*; Bukhara distr., Karnap desert, near Muborak station, 17.07.1936, *Arkhireev*; Ajakagytma, 02.05.1937, *Botschantzev*; Nurata mountains, Karakcha-tau, near Yukary-Kariya village, 06.07.1937, *Demurina*; Zerabulak station, 26.04.1941, Fayziev; Ustyurt, the ruins of the Aman fortress, 10.07.1948, *Momotov*; Nurata region, Kyzylcha village, 07.05.1951, *Novikova*; Samarkand region, Nurata district, near Kzylcha village, 07.05.1951, *Novikova*; Gyzhduvan region, Mashy-Kuduk village, 14.06.1956, *Li*, *Momotov*; near Kamashy, 03.07.1956, *Pyataeva*; Bek-Budi city, near Charagyl village, 14.06.1956, *Li, Momotov*; Kenimekhchul, 06.06.1956, *Li*; Central Kyzylkum, near well Ak-Baital, 04.1959, *Gringov*; Zerabulak-Zyaetin mts., foothills between Zyaetdin and Kermine, 28.04.1962, *Pyataeva*; near Kushrabad, Yangy-Turmush village, 20.04.1963; near Nurata town, 24.05.1964, *Pryakhin*; Kenimekh desert, between villages 40 years of October and Khoja-kazgan, 15.05.1964, *Ivanova*; Bukhara region, lower part of Kashkakadarya river, near Chaida-raz village, 16.05.1964, *Kayumov*; Samarkand region, around Nurata district, 24.05.1964, *Galkine*; Katta-Kurgan region, Kashkadarya distr., Nishan steppe, Tumbaz-kuduk, 1964, *Petrova*; Samarkand region, around Nurata district, 24.05.1964, *Lekyarkil*; Kermine station, 27.04.1965, *Pryakhin*; Bukhara distr., near Kyzyltepa village, 14.05.1967, *students*; Nurata,

Uzunkuduk village, 28.05.1968, *Khaydarov*; Ustyurt, desert Sim, 07.1971, *Khalmuratov*; Western city Navoi, 15.05.1972, *Pimenov*, *Baranova*; Kyzylkum, Tamdynsky district, near Jarakuduk well, 04.1975, *Ivanova*, *Deberdieva*; Kyzyl-Kum desert, 29.04.2021, *Ortikov* (TASH); Karaulbazar station, 04.04.1934, Karaulbazar, 04.06.1934, *Volkov*; between Chust and Gavasay, 25.05.1952, *Arifkhanova*; between Konimekh and Kukcha, 27.04.1975, *Pimenov*, *Baranova*; Bukantau mountains between Kulkuduk and Joskuduk, 23.04.1987, *Pimenov*, *Vasilieva*; *Vilsov* (MW); Nurata valley, 04.05.2013, *Beshko*; Nuratau, Mijigan village, 08.04.2013, *Beshko*; Kara-Karga pass, 04.05.2013, *Beshko*; Nuratau, near Koytash village, 06.04.2019, *Beshko*; Bukhara region, "Jeyran" eco-center, 04.22.2019, *Gaziev*; Kyzyl-Kum desert, 04.27.2021, *Mardonov* (www.plantarium.ru); Navoiy, Konimekh; between Chust and Gava (www.gbif.org).

Kazakhstan—Chu-Ili mountains, Kan-Tau city, 12.06.1914, *Titov*; station Arys, 25.05.1923, *Mokeyeva*; Aris-Kum, near Bel-Kuvuk well, 13.04.1929, *Lipschitz*; Karsakaspian region, to the shores of Sarysu, 21.04.1929, *Pavlov*; Koylybai mountains, 26.05.1930, *Astapova*, *Samsel*; Karachakat mountains, 07.06.1931, *Serova*; Aktobe region, Mugodzhar mountains, 18.06.1934, *Samsel*; Near station Akyrtobe, 21.05.1931, *Astanova*; Karachokat station, 07.06.1931, *Serova*; North-western Karatau, in the Aksumbe foothills, 04.05.1934, *Kultiyasov*; Kainar-Tashtau region, the bank of Kainar-Kul, 01.05.1934, *Mikhensin*; North East Karatau, hill Kyzyl-Naiza, 19.05.1936, *Chilikina*; Mountains KaraTau, mountain Kur-Shabakit, 16.05.1936, *Chilikina*; Northern Karatau mountain, hill Kyzyl-Naiza, 19.05.1936, *Chilikina*; Chu-Ili mountains, station Chu, 23.05.1948, *Pavlov*; between Chu and Lugovaya, 25.05.1948, *Pavlov*; Chu-Ili mountains, near station Espe, 11.05.1951, *Pavlov*; near the town of Arys step, 19.05.1958, *Gubanov*; Aksuat, Emon river, 25.07.1963, *Cherkesov*; Sagisevsky district, Aktolagay, 08.07.1963, *Cherkesov*; Aktobe region, mountain Temar, 05.07.1964, *Cherkesov*; South Zharkamys, 04.05.1967, *Cherkasev*; South Zharkamys, 04.05.1967, *Cherkesov*; Mangyshlak, North Aktau, near village Shair, 22.07.1973, *Cherkasova*; Chimkent region Alimtau mountains, 21.05.1989, *Klyuykov* (MW); Mangistau region, Karynzharyk desert, 15.05.2009, *Gorbunov*; Zhambyl region, around Karatau city, 07.05.2011, *Pirogov*; Aktobe region, Chelkar (Shalkar) district, Mount Kosmuryn, 04.25.2011, *Pirogov*; Dzhungarskiy Alatau, Koktal village, 05.05.2012, *Kolbintsev*; Dzhungarskiy Alatau, Ucharal town, 19.05 2013, *Kolbintsev*; Kapchagay 26.04.2013, *Epiktetov*; Arysk district, Zadarya steppe, 03.05.2013, *Davkaev*; Sholak, reservoir Kapchagay, 05.22.2013, *Epiktetov*; Syrdarya Karatau, Kuyuk pass, 10.05.2015, *Davkaev*; Kyzylkum desert, 30.04.2015, *Davkaev*; Chu-Ili mountains, 07.05.2016. *Epiktetov*; Syrdarya Karatau, Zakaratau plain the coast of the lake. Ashchikol, 16.05.2018, *Kolbintsev*; Talas District, Zakaratau Plain, Kyzyltau cliff slope, 05.05.2019, *Kolbintsev*; Balkhash district, between Bakanas and Karoy villages, 20.05.2019, *Waldschmit*; Zhambyl region, foothills of Small Karatau, Lake Nurly, 05.05.2020, *Belousov*; Syrdarya Karatau, southern foot of the Ulkunburultau mountains, 16.05.2021, *Kolbintsev* (www.plantarium.ru); Jambyl, Betpak-Dala, (www.gbif.org).

Kyrgyzstan—Fergana Valley, south of Mailisay village, 12.04.1931, *Knorring*; Shekaftar, 05.06.2019, *Lazkov* (www.plantarium.ru); Naryn, Djiddasay, Mailisay (www.gbif.org).

Turkmenistan—Sandy hills Kushka, 23.06.1925, *Androsov*; Gaudan, 40 km south of Ashgabat, 25.05.1962, *Gubanov*; Badkhyz reserve of Kepel, 05.05.1977, *Arsenova*, *Krasnova*; Sandy hills Kushka, 01.05.1977, *Orelov*; Gaudan, 29.05.1898, *Litvinov* (MW); between Annau and Gyaurs (www.gbif.org).

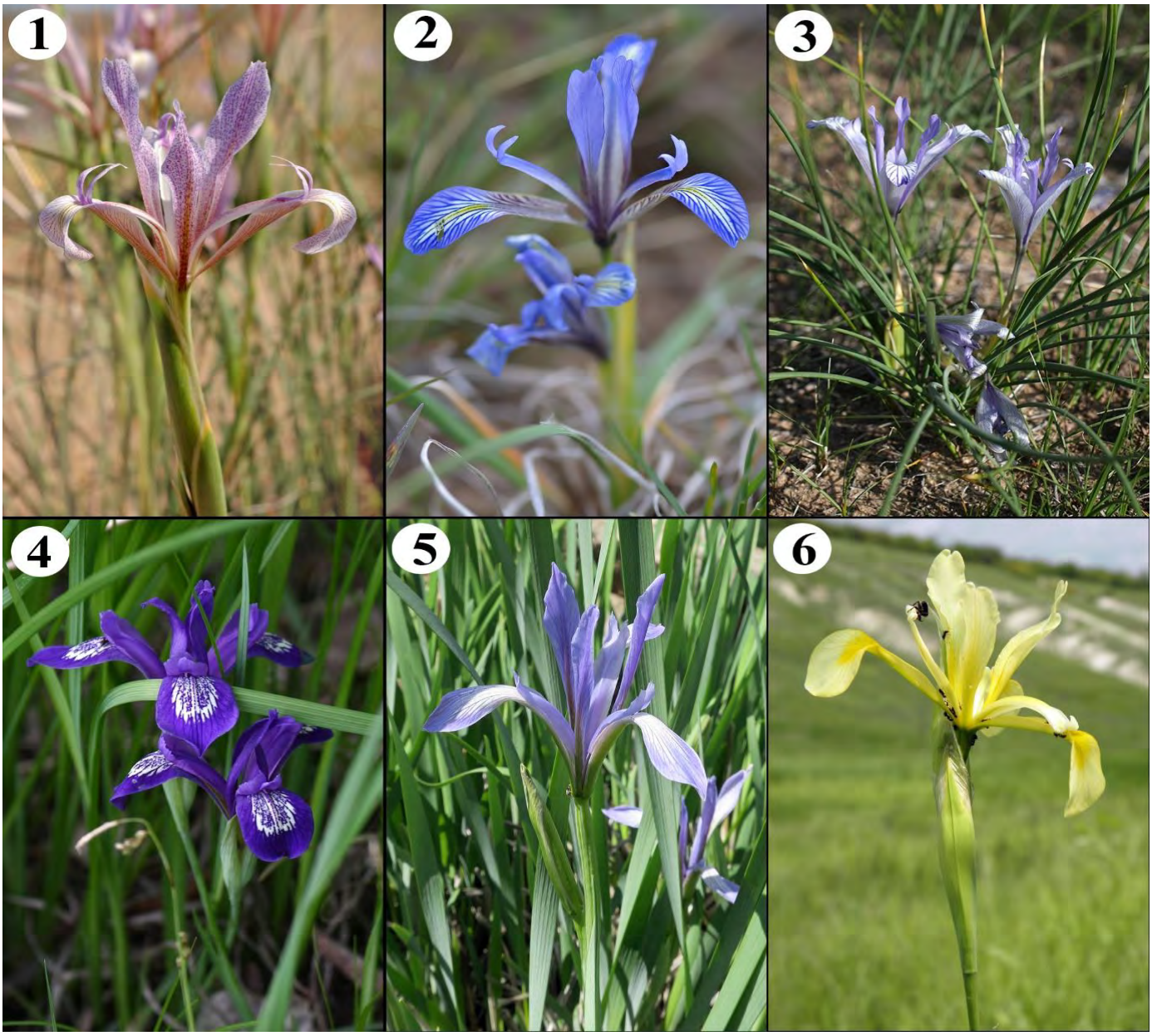


Fig. 1. Species of *I.* sect. *Sclerosiphon*: 1. *I. songarica*; *I.* sect. *Tenuifoliae*: 2. *I. loczyi*, 3. *I tenuifolia*; *I.* sect. *Ioniris*: 4. *I. ruthenica*; *I.* sect. *Haloiris*: 5. *I. lactea*; *I.* sect. *Xyridion*: 6. *I. spuria*.

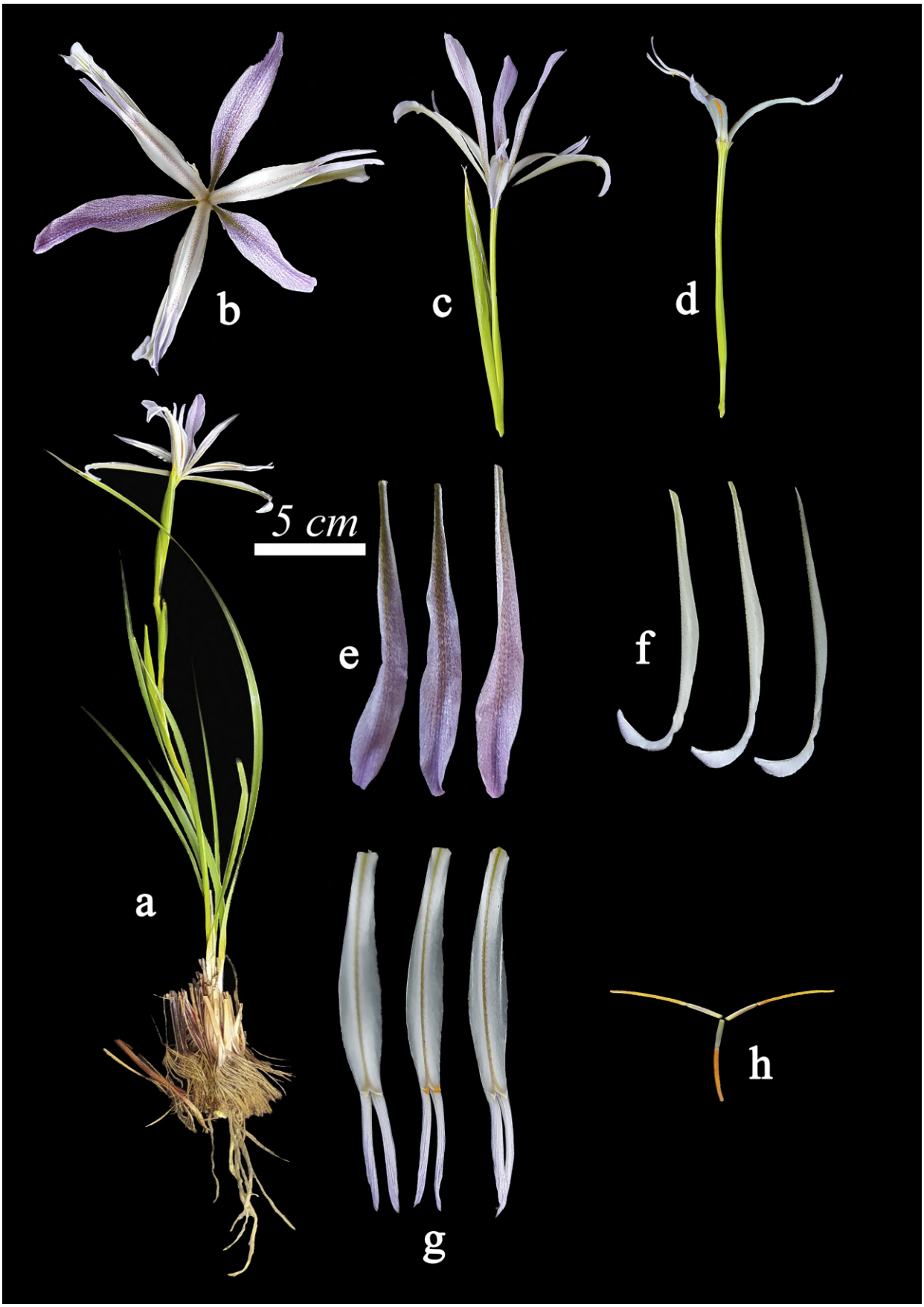


Fig. 2. Living plant of *I. songarica*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Standards (inner tepals); f. Falls (outer tepals); g. Style arms (pistils); h. Stamina.

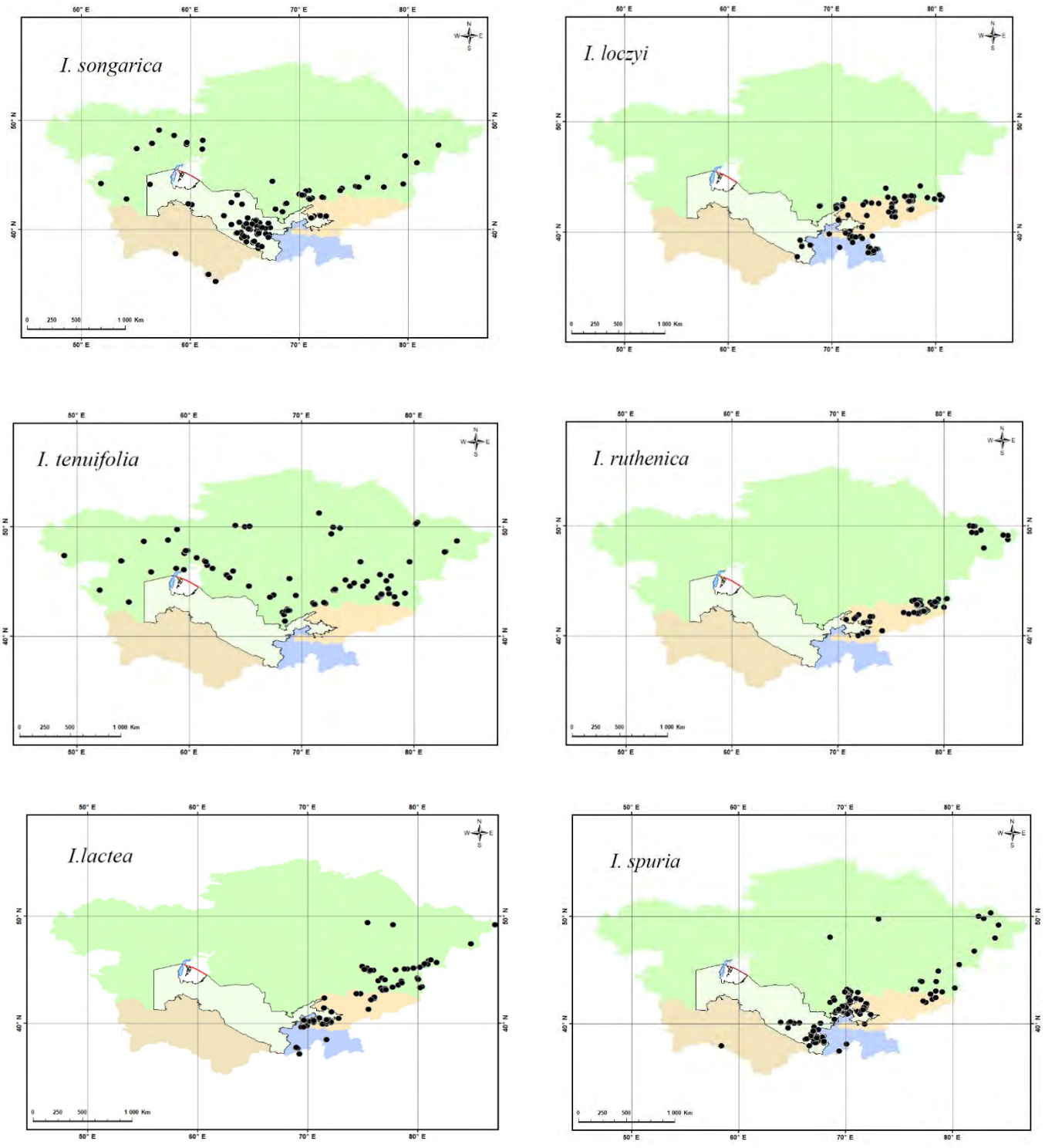


Fig. 3. Distribution of *I. songarica*, *I. loczyi*, *I. tenuifolia*, *I. ruthenica*, *I. lactea* and *I. spuria* in Central Asia.

2. ***Iris*** sect. ***Tenuifoliae*** (Diels) Doronkin in Bot. Zhurn. (Leningrad) 75(3): 413 (1990); Alexeeva in Bot. Zhurn. (Saint-Petersburg) 91(7): 1096 (2006) — *Iris* subsect. *Tenuifoliae* Diels in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 501 (1930) — *Iris* ser. *Tenuifoliae* (Diels) Lawrence in Gentes Herb. 8: 360 (1953) — *Iris* subg. *Tenuifoliae* (Diels) Doronkin in Bot. Zhurn. (Leningrad) 75(3): 412 (1990). Type: *Iris tenuifolia* Pall.
= *Cryptobasis* Nevski in Trudy Bot. Inst. Akad. Nauk SSSR, ser. 1, 4: 331 (1937). Type (designated by Crespo et al. (2015: 61)): *Cryptobasis thianschanica* (Maxim.) Nevski.

2. ***Iris loczyi*** Kanitz, Növényt. Gyujtesek Eredm. Grof Szechenyi Bela Keletazsiai Utjabol: 58 (1891) — *Cryptobasis loczyi* (Kanitz) Ikonn. in Novosti Sist. Vyssh. Rast. 9: 302 (1972). Type: China. Kan-szu. In m. Nan-san collinis circa Czia-kou-ye, 10.06.1879, *L. de Loczy 82* (holotype BP 69376).
= *Iris tenuifolia* var. *thianschanica* Maxim. ex Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 495 (1879) — *Iris thianschanica* (Maxim. ex Regel) Vved. ex Woron. & Popov in Fedtschenko & Popov, Fl. Turkm. 1: 325 (1932) — *Cryptobasis thianschanica* (Maxim. ex Regel) Nevski in Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4: 331 (1937). Type: China. "Almatythal bei Kuldscha", 3000–6000', 04.1878, *A. Regel* (lectotype LE 00050119, designated here).
Nomenclature: The type label of *Iris tenuifolia* var. *thianschanica* Maxim. ex Regel has a correction from "Kuldscha" to "Werny" [Almaty], which is however erroneous (Lipsky 1905). The common spelling of this name found in the literature is "tianschanica", which is contrary to the protologue.
Description: Plants 15–30 cm tall, forming tussocks; rhizome covered by persistent fibrous leaf bases; roots not swollen, elongated; leaves 20–40 cm long, 3–5 mm wide, erect, ribbed, pointed at the apex; stem short, only slightly emerging above ground; bracts 3, outer 10–15 cm long, 2 inner ones shorter, with 1–2 flowers; flowers 4–7 cm in diameter; perianth tube 10–15 cm long, falls 5–6 cm long, white to cream with purple blue veins, basally with or without a beard, claw 3–3.5 cm long, lamina 2.0–2.5 cm long, 1–2 cm wide; standards 4.5–5 cm long, 0.8–1.0 cm wide, oblanceolate, bluish purple; filaments 1–1.2 cm long, anthers 1.3–1.8 cm long; styles 3.5–4.0 cm long, 0.7–0.8 cm wide, lobes 7.0 mm long, stigma bilobed; ovary 1.2 cm long, spindle-shaped; capsule 4–7 cm long, c. 2.0 cm in diameter, with 6 veins, broadly ellipsoid with a long slender beak; pedicel c. 1.5 cm long (Fig. 1).
Flowering: May–June.
Ecology: Sunny grasslands, hillsides.
Distribution: Iran, Afghanistan, China, Pakistan, Mongolia, Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan) (Fig. 3).
Material examined: Uzbekistan—Kugitang Range, 16.05.1928, *Bogdanovich*, *Ryabov*; Near Kitab, river Kuk-su, 30.04.1929, *Linczevsky*; Amankutan rest house, 27.05.1933, *Drobow*, *Sakhabytdinov*; Yakkabag-darya, near Tashkurgan, 12.07.1936, *Botschantzev*, *Butkov*; Near Kshtut village, Zarafshan Range, near Farob village, 18.05.1936, *Gnezdillo*; Alai Range, Katta-Ishman, 25.06.1949, *Sakhobitdinov, Li*; near Chadaksay, Aygyr-Baytal village, 19.06.2011, *Karimov*; Chadak river, near Pashahana, 26.06.2012, *Tojibaev, Karimov* (TASH).
Kazakhstan—Jarkent district, river Chilik, 16.07.1916, *Abolin*; Zailiyskiy Alatau, valley Uch-bulek, 11.04.1923, *Titov*; Semerchensky tract, Torgan-Samsu, 16.04.1924, *Titov*; near Besmuynak, 26.07.1926, *Titov*; Kastekskiy pass area, 06.08.1927, *Dingelstedt, Sovetkina*; Karaganda region, Koshur tuba, near Tobulguly, 10.07.1937, *Paziy*; Zailiyskiy Alatau, Aris, 29.05.1965, *Mikhaylova*; Assy valley, 26.06.1974, *Abolin* (TASH); Ketmen, river Sumbe, 05.15.2009, *Epiktetov*; Chu-Ili mountains, 04.22.2010, *Styazhkin*; Mountains Karatau, river Sumbe, 05.10.2011, *Pirogov*; Ketmen Range, Oikaragay valley, 11.05.2011, *Pirogov*; between Aksai and Koksay rivers, 20.04.2012, *Kolbintsev*; Talass Alatau, near Iirsu village, 05.06.2014, *Davkaev,* Ketmen Range, 28.04.2014, *Kolbintsev*; Altyn-Emel pass, 27.04.2014, *Kolbintsev*; lower part of Kyrgyz Range, 18.04.2017, *Kolbintsev*; Koksay canyon,

04.23.2018, *Epiktetov*; Taskora plateau, 26.04.2020, *Shakula*; Kensai, 03.16.2020, *Epiktetov* (www.plantarium.ru).

Kyrgyzstan—Sut-bulak, 16.07.1916, *Abolin*; Aktash river, 21.08.1926, *Abolin*; Naryn region, Kuk-Bulak river, 27.06.1926, *Sovetkina*; Kochkur river basin, 03.06.1926, *Sovetkina, Uspenskaya*; Kochkur river, 20.04.1926, *Sovetkina, Uspenskaya*; Ukok, Kochkur river, 03.06.1926, *Sovetkina, Uspenskaya*; right side of Kysart river, 14.04.1926, *Sovetkina, Uspenskaya*; left side of Shamsi river, 29.05.1926, *Sovetkina, Uspenskaya*; Kara-Saz, mountain Kapka Taz, 12.09.1932, *Klimovskaya*; State farm No. 53 upstream Archal, 16.08.1932, *Klimovskaya*; Kyzyl-su river, 15.08.1933, *Tyschenko, Velichko*; Terskey Alatau, Kara Kujur river basin, 03.04.1934, *Klimovskaya*; Kara Kujur river basin, 17.06.1934, *Klimovskaya*; Kara Kujur river basin, 30.07.1934, *Klima*; Daraut Kurgan, left side of Kyzyl-su river, 30.05.1934, *Velichko*; Kara Kujur river basin, 03.06.1934, *Klimovskaya*; Kara Kujur river basin, 03.06.1934, *Klimovskaya*; Akche, near Taktersoz village, 14.06.1934, *Korotkova*; Kungey Alatau, Cholpon-Ata river, 04.08.1935, *Gomolitsky, Semenikhina*; Karachaman mountains, 10.10.1935, *Gomolitsky*; Kara Kujur river, 06.05.1935, *Nikitin*; Big Urokchi river, 18.08.1935, *Gomolitsky, Semenikhina*; Kyzyl-Rabatskikh, along the river Berdysh-su, 08.08.1935, *Raikova*; Kyrgyz Alatau, river Kochkorka, 12.06.1937, *Mikhailova, Popova*; Chanach, 17.09.1938, *Parayskaya*; Kovak-Tau, Mun-Kush river, 09.08.1937, *Mikhailova, Popova*; on the way to Kara Batkak, 09.08.1949, *Gordeeva*; Osh region, near Tuya-Dzhailyau, 25.05.1951, *Alexandrova*; Alay valley, 07.1952, *Allayarov*; Khaidarkan, 18.05.1954, *Arifkhanova*; Kyrgyz Range, Ala-Archa, 22.07.1957, *Kuznetsov*, *Pavlov*; Moldotau, 26.04.1958, *Gubanov*; Aksu-Jasabagly, 21.07.1960, *Khassanov*; Kochkor-Tube mountains, 25.05.1960, *Pavlov*; Irkeshtam, 03.08.1962, *Puchkova*; near Kadamjoy, 03.05.1965, *Shonazarov* (TASH); Kyzyl-Eshme village, 16.07.1987, *Pimenov*, *Klyuykov*, *Vasilieva*, *Lavrova*; River Karabalta, 16.05.1986, *Kuvaev*; mountains Manas, 15.06.1988, *Klyuykov*, *Vasilieva* (MW); Zhetyzhol, 24.04.2012, *Epiktetov*; Chon-Kemin River, 07.05.2014, *Lazkov*; Naryn river, near Tash-Bulak village, 04.23.2015, *Chulanova*; Komochek canyon, 27.04.2017, *Leonova*; Chon-Ak-Suu, 05.12.2018, *Kryzhatyuk*; Qum-Bel, 11.05.2018, *Krijatyuk*; near Konorchek Canyons, 03.05.2019, *Emelyanov*; Borulu pass, 26.07.2020, *Menshikova* (www.plantarium.ru); Arslanbab, Shamurat, Pashsha-ata, Northern & Central Tian Shan, Karakol (www.gbif.org).

Tajikistan—Kuli-Kalon, 16.06.1916, *Betger*; Lake Rank-kul, Sai Burguluk, 02.09.1933, *Raikova*; Aksu river basin, 05.08.1935, *Raikova*; near Murghab village, 28.08.1935, *Raikova*; pool of the lake Rank-kul, 09.07.1936, *Stanyukovich*; Lake Kuli-kalon, 12.06.1940, *Smirnova, Ishmatov*; Ai-Topon, 30.05.1966, *Nikolaev*; Murghab river basin, 05.08.1935, *Raikova* (TASH).

3. ***Iris tenuifolia*** Pall., Reise Russ. Reich. 3: 714, tab. C, fig. 2 (1776) — *Iris acaulis* Pall., Reise Russ. Reich. 3: 213 (1776), nom. inval. — *Xiphion tenuifolium* (Pall.) Schrank in Flora 7(2 Beibl.): 19 (1824) — *Neubeckia tenuifolia* (Pall.) Alef. in Bot. Zeitung (Berlin) 21: 297 (1863) — *Joniris tenuifolia* (Pall.) Klatt in Bot. Zeitung (Berlin) 30: 502 (1872) — *Cryptobasis tenuifolia* (Pall.) Nevski in Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4: 244 (1937). Type: Russia. Transbaikal Region: “in arenosis Davuriae” [= Lakes Torei, 28.05.1772], *P.S. Pallas* in Herb. Linnaeus 61.13 (lectotype LINN, designated here; isolectotype BM 000958407).

= *Iris regelii* Maxim. ex Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 495 (1879). Type: Kazakhstan. “Kuiankus [Qoianköz Village], auf den Bergspitze, in Rosen”, 3000‘, 19.04.1877, *A. Regel 311* (lectotype LE 00050098, designated here; isolectotypes LE 00050099, 01017915, 01048119, 00050097).

Description: Plants 20–40 cm tall; rhizome creeping, slender, branching at top and forming dense tufts, covered with brownish fibrous vestiges of leaf sheaths; stem short, only slightly emerging above ground; basal leaves up to 40 cm long, up to 1.5 mm broad, linear-filiform,

revolute; flowers 2, lilac or pale blue, fragrant; perianth tube slender, filiform, to 8 cm long, half as long again to twice as long as the perianth segments; falls basally with or without a beard of unicellular hairs, claw long and broad, lamina oblong; standards slightly shorter and narrower than the falls; style branches narrowly linear, style crests oblong, attenuate at tips; capsule ovoid, rounded 3-angled, to 4 mm long, short-beaked; seeds turbinate, blackish-brown (Fig. 1).

Flowering: April–May.

Ecology: Grassy slopes, fixed dunes, sandy and gravelly soil.

Distribution: China, Mongolia, Russia (European part, Siberia, Far East), Central Asia (Kazakhstan) (Fig. 3). Aidarova et al. (1985) reported this species from the Fergana Depression in Kyrgyzstan without herbarium specimens; this record was accepted by Lazkov & Sultanoca (2014). However, it does not fit the distribution area of the species and is excluded here.

Material examined: Kazakhstan—Arys station, 29.03.1911, *Shulga*, *Sprigin*; near Keskelen river, 24.05.1916, *Abolin*; near Bailey Kul district, 05.08.1917, *Arkhangelskaya*; Zailiyskiy Alatau, 01.06.1916, *Abolin*; Arys, 10.04.1920, *Popov*; around Iliysk station, 06.05.1921, *Titov*; Right Bank Ili, 08.05.1921, *Titov*; Bar-Chukur stony hills, 29.04.1921, *Korovin*; Sary-Shyganak, between Aral and Shaposhnikovs bay, 05.08.1921, *Raykova*; Kara tamak, west coast of the Aral Sea, 05.08.1921, *Raykova*; Syrdarya region, 03.07.1921, *Raykova*; Sary-Shyganak, between Aral and Shaposhnikov bay, 01.06.1921, *Raykova*; Mugodzhari desert, 22.05.1921, *Korovin*; Delta of the river Sir Darya, 03.07.1921, *Raykova*; Uch-Bulak valley, 11.06.1923, *Titov*; Chimkent district, east of Syrdarya river, 15.05.1926, *Granitov*; Muyun-Kum Sands, 25.05.1926, *Drobov*, *Gomolitsky*; Muyun-Kum Sands, 22.05.1926, *Drobov*; near Kara-Chokat station, 15.04.1929, *Korovin*; near Tyuratam station, 16.04.1934, *Ponomareva*; Ata-Su river, 07.1938, *Koroleva*; between Bes-Kutan and Turai Ryndy, 09.05.1947, *Botschantzev*, *Butkov* (TASH); Semipalatinsk, 1840, *Karelin*, *Kiriloff*; Turgay district, 1898, *Kryukov*; Aral, Shaposhnikov bay, 11.06.1921, *Raykova*; right bank of Syr-Darya, between Korkhut and Durmen-Tube, 12.06.1930, *Nazarov*; Koylybai, 30.04.1930, *Astopova*; Koylybai, 20.04.1930, *Astopova, Samsel*; Small Barsuk, 07.05.1931, *Serova*; Muyunkum, Akyrtobe, 08.06.1931, *Akshakova*; Iliyskaya station, right side of Ili river, 18.04. 1934, *Tscherneva*; Big Barsuk, 03.05.1934, *Kolikov*; Turgai region, near Ak-Suat, 07.05.1935, *Demidova*; Saree bulak pass, 13.05.1936, *Goloskokov*; 26–28 km from Kumashkino village, 16.06.1936, *Mikeshin*; Ulnun-Burul mountains, 28.04.1939, *Pavlov*; Kustanay, near Aksust, 06.05.1945, *Voronov*; Karauylkeldy, near Uzunkuduk well, 20.07.1949, *Vostokov*; Volga–Ural Sands, 11.05.1950, *Nikitin*; Chu-Ili mountains and northwestern Balkhash, 1951, *Miroziv*; Balkhash region, Sarchagan bay, 26.05.1951, *Pavlov*; Chelkar mountains, 24.05.1963, *Vsegingeo*; Kasaminsky District, Syr-Darya, 17.05.1972, *Koronikov*; Karakum desert, near Kulsary village, 2–4.05.1983, *Rusanovich*, *Masenko*; Aral Sea Kulandy, 25–26.05.1987, *Rusanovich*; right side of Emba river, 23.06.1987, *Bochkin*, *Rusanovich* (MW); near Kapchagay reservoir, 02.04.2006, *Epiktetov*; north of Mugodzhar, 23.04.2006, *Pirogov*; Ili desert, 06.04.2008, *Rakhimova*; Baikonur, left side of Syr-Darya river, 24.04.2009, *Danilevsky*; Baikonur, left side of Syr-Darya river, 10.04.2009, *Danilevsky*; Mangystau, Ustyurt plateau, 19.04.2009, *Gorbunov*; Baikonur sandy massif, 28.04.2010, *Danilevsky*; Baikonur, left side of Syr-Darya river, 24.04.2010, *Danilevsky*; near Kapchagay reservoir, 10.05.2010, *Epiktetov*; Kyzylorda region, 27.04.2011, *Pirogov*; near Kapchagay reservoir, 08.04.2012, *Epiktetov*; near Kapchagay reservoir, 08.04.2012, *Epiktetov*, near lake Auliekol (Akkol), 07.04.2013, *Kolbintsev*; top of Kumtiyn dune, 29.03.2013, *Kolbintsev*; lake Kyzylkol, 10.04.2013, *Davkaev*; north of Kapchagay reservoir, 22.05.2013, *Epiktetov*; Kapachagai highway, 30.03.2013, *Waldschmit*; near reservoir Kapchagay, 14.04.2013, *Lazkov*; Balkhash-Alakol sandy massif, 11.06.2014, *Smelyansky*; Kapchagai reservoir, 19.04.2014, *Pankratov*; Chelkar, near Bozoy, 22.04.2014, *Evfratova*; Mangyshlak, 06.05.2015, *Komarov*; Sands of Sarykum, 30.04.2018, *Gorbunov*;

Zhuma village, 27.04.2019, *Belousov*; east of Balkhash, 22.06.2019, *Evdokimov*; east of Balkhash, 19.06.2019, *Evdokimov*; Moyinkum sands, 12.05. 2021, *Kolbintsev*; Betpak-Dala desert, 16.04.2021, *Shakula*; Betpak-Dala desert, 14.04.2021, *Shakula*; Karatau, part of Ulkunburultau foothills, 09.04.2021, *Belousov*; near Koksarai hillock, 07.04.2021, *Belousov* (www.plantarium.ru); Qyzylorda, Almaty, Semipalatinsk, Balkhash & Betpak-Dala, Kutentass (www.gbif.org).

3. ***Iris*** sect. ***Ioniris*** (Spach) Rodion., Rod Iris: 190 (1961) — *Iris* subg. *Ioniris* Spach, Hist. Nat. Vég. 13: 35 (1846) — *Ioniris* (Spach) Klatt in Bot. Zeitung (Berlin) 30: 502 (1872) — *Iris* subsect. *Ruthenicae* Diels in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 502 (1930). Type: *Iris ruthenica* Ker-Gawl.

4. ***Iris ruthenica*** Ker-Gawl. in Bot. Mag. 28: tab. 1123 (1808) — *Xiphion ruthenicum* (Ker-Gawl.) Alef. in Bot. Zeitung (Berlin) 21: 297 (1863) — *Limniris ruthenica* (Ker-Gawl.) Fuss, Fl. Transsilv.: 637 (1866) — *Joniris ruthenica* (Ker-Gawl.) Klatt in Bot. Zeitung (Berlin) 30: 502 (1872). Type: Gmelin, Fl. Sibir. 1: t. 5, f. 1 (1747) (lectotype designated by Boltenkov & Grebenjuk in Phytotaxa 369(3): 224 (2018)).
= *Iris caespitosa* Pall. ex Link in Jahrb. Gewächsk. 1(3): 71 (1820) — *Joniris caespitosa* (Pall. ex Link) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 232(1): 57 (2015). Lectotype not designated.
= *Iris ruthenica* var. *brevituba* Maxim. in Bull. Acad. Imp. Sci. Saint-Pétersbourg, sér. 3, 26: 516 (1880) — *Iris brevituba* (Maxim.) Vved. ex Nikitina in Vvedensky, Fl. Kirgiz. SSR 3: 131 (1951) — *Iris ruthenica* subsp. *brevituba* (Maxim.) Doronkin in Malyscheva & Peschkova, Fl. Sibir. 4: 121 (1987) — *Joniris brevituba* (Maxim.) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 232(1): 57 (2015). Type: Russia. Altay Region: "Loktjevski Copper Plant = Lokot' Village]", Herb. Fischer (lectotype LE 01017384, designated by Alexeeva in Turczaninowia 11(2): 42 (2008)).

Description: Plants 25–50 cm tall; rhizome thin, creeping, branched, 2–3 cm across, forming tussocks; stem slender, to 12 cm long, with few vestiges of leaf sheaths at base; basal leaves exceeding the stem, about 30 cm long and 2–5 mm wide, green, not rigid; cauline leaves 3, confined to the lower part of stem, small, amplexicaul; spathe valves elliptic-lanceolate, membranous, finally marcescent; flowers solitary, terminal, fragrant; perianth tube cylindric, campanulately enlarged upward, two fifths the length of segments, 2–3 times as long as or rarely equaling the ovary; falls oblong, gradually tapering toward base, round tipped and usually minutely emarginate, beardless, bluish-violet, darker at the tip, the middle part marked with violet nerves and spots on violet or whitish ground; standards linear-obcuneate, one-third to one-half as broad as or just slightly narrower than the falls, obtuse, emarginate, bluish-lilac; style branches pale lilac, broadly linear, the broadly ovate crest lobes round-tipped and crenate; stigmas squarely truncate, with a prominent tooth at the middle; capsule ovoid to subglobose, obtusely 3-angled, beakless, ca. 15 mm long and 8 mm wide; seeds 3-angled, the aril adhering to edge of seed throughout its length (Fig. 1).
Flowering: May–June.
Ecology: Steppe meadows, meadow slopes, birch woods, and pine forests; sometimes ascending into alpine meadows in the southern part of the high-mountain zone.
Distribution: Europe (Romania), Japan, China, Mongolia, Russia (Siberia, Far East), Central Asia (Kazakhstan, Kyrgyzstan) (Fig. 3).
Material examined: Kyrgyzstan—Near Sary-chelek lake, 23.07.1915, *Roshevitz*, *Fedtschenko*; Terskey Alatau, Aksu, 20.06.1920, *Sovetkina*; Terskey Alatau, Dusety-Oguz river, 09.07.1920, *Sovetkina*; Terskey Alatau, Karakol river, 17.06.1920, *Sovetkina*; Arslanbob hillsides, 23.07.1926, *Korovin*; Kara-Kul River in Mailuu-Suu basin, 25.06.1927, *Korovin*; Pasha-Ata Basin, 20.07.1933, *Kudryashov*, *Krasovsky*; Chatkal Range, Basin Pasha-Ata, 13.07.1933, *Kudryashov*, *Krasovsky*; Arslanbob hillsides, 06.06.1955, *Chevrenidi*, *Korotkova*; Fergana Range, Urcha artash, 16.06.1962, *Pryakhin*;

Fergana Range, left side of Yassi river, 11.05.1965, *Pryakhin* (TASH); Chet-Aksu river, 13.07.1931, *Smirnov*; Kungey Alatau, Djel-Karagat river, 13.07.1931, *Smirnov*; near Issyk-Kul lake, 13.07.1931, *Smirnov*; Uryukti river, 29.08.1940, *Dunbryakov*; Terskey Alatau, 24.04.1947 *Koshivkin*; Chon-Kyzyl-Suu river, 10.07.1957, *Shukin*; Chon-Kyzyl-Suu basin, 10.06.1949, *Gordeeva*; Chon-Kyzyl-Suu river, 10.06.1949, *Gordeeva*; Prezivalka river, 04.07.1958, *Gubanov*; Chanach, 18.06.1959, *Gubanov*; Uch-Terek, 19.06.1960, *Balibaeva*; between Zhardik and Uch-Terek pass, 19.06.1960; Ketmentyubinsk Basin, Mumdyn Kyry, 08.08.1961, *Boletboeva*; near Sary-Chelek Lake, 12.05.1965, *Pavlov*; river Chon-Kyzyl-Suu, 07.1966, 1968, *Shukin*; river Chon-Kyzyl-Suu, 03.08.1982; *Jiryakov*; south side of Issyk Kul, east of Kaji Sai, 21.07.1985, *Kluikov* (MW); left side of Karakol river, 15.05.2018, *Kryzhatyuk, Kolbintsev*; Issyk-Kul region, 31.05.2019, *Chulanova*; Barskaun, near "Leopard‘s tears" waterfall, 07.05.2019, *Emelyanov, Bondareva* (www.plantarium.ru).

Kazakhstan—Near Issyk lake, 02.04.1931, *Tscherneva*; Tekes river, 26.05.1932, *Lipschitz*; Kegen district, foothills, 11.05.1932, *Lipschitz*; near Talgar station, 20.05.1930, *Granitov*; Ketmen Range, 04.07.1957, *Gubanov*; Terskey Alatau, Bayankol, 16.06.1976, *Pimenov* (MW); Ketmen Range, 01.05.2006, *Epiktetov*; Ulansky district, Mountain Ulbinka, 23.06.2007, *Rib*; Mountain Ulbinka, 12.05.2008, *Rib*, Mountain Ulbinka, 16–18.05.2008, *Rib*; Issyk lake, 26.05.2010, *Styazhkin*, *Epiktetov*; Ketmen Range, 10.05.2011, *Epiktetov*; Ketmen Range, 10.05.2011, *Pirogov*; Ketmen, near Tuyuk, 21.05.2011, *Kolbintsev*; Holodnaya valley, 29.06.2012, *Kolbintsev*; Ulba, near Ushanovskoe village, 02.05.2012, *Kolesnikov, Lazkov*; Barskaun river, 23.05.2013, *Lazkov*; lake Shybyndykol, 02.06.2018, *Bolbotov*; right side of Bukhtarma Reservoir, 15.06.2019, *Glazunova* (www.plantarium.ru).

4. ***Iris*** sect. ***Haloiris*** Doronkin in Bot. Zhurn. (Leningrad) 75(3): 412 (1990). Type: *Iris lactea* Pall.

= *Iris* subg. *Eremiris* Spach, Hist. Nat. Vég. 13: 32 (1846) — *Eremiris* (Spach) Rodion. in Bot. Zhurn. (Saint-Petersburg) 91(11): 1707 (2006). Type: *Iris lactea* Pall. (lectotype designated by Doronkin (1990: 411)).

5. ***Iris lactea*** Pall., Reise Russ. Reich. 3: 713 (1776) — *Eremiris lactea* (Pall.) Rodion. in Bot. Zhurn. (Saint-Petersburg) 91: 1708 (2006) — *Limniris lactea* (Pall.) Peruzzi, F.Conti & Bartolucci in Inform. Bot. Ital. 46(2): 276 (2014). Type: Russia. Transbaikal Region: “Ad Tarei Nor”, 31.05.1772, *P.S. Pallas* (lectotype BM 000958418, designated by Boltenkov (2018: 284) as “neotype”).

= *Iris triflora* Balb., Misc. Bot.: 6, tab. 1 (1804) — *Xiphion triflorum* (Balb.) Alef. in Bot. Zeitung (Berlin) 21: 297 (1863) — *Joniris triflora* (Balb.) Klatt in Bot. Zeitung (Berlin) 30: 502 (1872). Type: “Iris triflora” in Balbis, Misc. Bot.: tab. 1 (1804) (lectotype designated by Boltenkov (2018: 284)).

= *Iris biglumis* Vahl, Enum. Pl. 2: 149 (1805) — *Joniris biglumis* (Vahl) Klatt in Bot. Zeitung (Berlin) 30: 502 (1872) — *Eremiris biglumis* (Vahl) Doronkin in Baikov, Konspekt Fl. Aziatsk. Rossii: 458 (2012). Type: [Russia. Transbaikal Region: Lake Torei.] “Iris an spuria?” in Pallas, Reise Russ. Reich. 3: t. C, f. 1 (1776) (lectotype designated by Boltenkov (2018: 284)).

= *Iris haematophylla* Fisch. ex Link, Enum. Hort. Berol. Alt. 1: 60 (1821). Type: Russia. Siberia in Herb. Willdenow (lectotype B-Willd 01000010, designated by Boltenkov (2018: 285)).

= *Iris pallasii* Fisch. ex Trev., Index Sem. (Breslau): 2 (1821) — *Xiphion pallasii* (Fisch. ex Trev.) Alef. in Bot. Zeitung (Berlin) 21: 297 (1863) — *Joniris pallasii* (Fisch. ex Trev.) Klatt in Bot. Zeitung (Berlin) 30: 502 (1872) — *Eremiris pallasii* (Fisch. ex Trev.) Doronkin in Baikov, Konspekt Fl. Aziatsk. Rossii: 459 (2012). Type: Russia. [“Davuria”.] “E semin. Fischerianis Wratislaviae colui 1820”, Herb. Treviranus (lectotype B 100715373, designated by Boltenkov (2018: 285)).

= *Iris pallasii* var. *chinensis* Fisch. ex Sims, Bot. Mag. 49: t. 2331 (1822) — *Iris ensata* var.

chinensis (Fisch. ex Sims) Maxim. in Gartenflora 29: 161 (1880). Described from "Chinese Mongolia". Type: Sims, Bot. Mag. 49: t. 2331 (1822) (lectotype designated by Boltenkov in Phytotaxa 383(3): 288 (2018)).
= *Iris oxypetala* Bunge, Enum. Pl. China Bor.: 63 (1833) — *Eremiris oxypetala* (Bunge) Rodion. in Bot. Zhurn. (Saint-Petersburg) 91: 1708 (2006). Type: China. Sina bor. circa Peking, *Bunge* (lectotype LE 01011526, designated by Grubov (1970: 31)).
= *Iris moorcroftiana* Wall. ex D.Don in Trans. Linn. Soc. London 18: 315 (1841). Type: India. "Ladakh", *W. Moorcroft* in Wallich list 5051 (lectotype K 001104614, designated by Boltenkov (2018: 288)).
= *Iris iliensis* Poljakov in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 12: 88 (1950). Type: Kazakhstan. "Ili District, Maraldy", 07.10.1930, *I. Pokrovskaya* (lectotype AA, designated by Boltenkov (2018: 285)).
Nomenclature: Although the specimen of *Iris lactea* Pall. in the collection of Pallas lacks the species name written by the author, it belongs to the type gathering as indicated in Pallas (1776: 223) and can be designated as lectotype.
Taxonomy: The broad variability of *Iris lactea* does not correspond to the geographic pattern delineated by Grubov (1970). We agree with Mathew (1989) that this polymorphic species cannot be convincingly split further accorting to its morphology.
Description: Plants 25–40 cm tall; rhizomes sheathed with reddish purple fibers, creeping, thick, forming tussocks; leaves basal, grayish green, linear, 14–70 cm long and 3–7 mm wide, tough, drying prominently ribbed, midvein absent. Flowering stems 2–5 cm, elongating to 5–8 cm at fruiting time; spathes green, lanceolate, 4.5–10 × 0.8–1.6 cm, 2–4-flowered, apex acuminate; flowers pale violet, or milky white or yellow, 5–7.5 cm in diam.; perianth tube very short, ca. 3 mm; falls oblanceolate, 4.5–6.5 × 0.8–1.2 cm, apex obtuse or mucronate; standards erect, narrowly oblanceolate, 4.2–4.5 cm × 5–7 mm; stamens 2.5–3.2 cm; anthers yellow; ovary narrowly fusiform, very long, 3–4.5 cm; capsule narrowly cylindric, 6.5–7.5 × 1–1.4 cm, 6-ribbed, apex shortly beaked; fruiting pedicels unequal, 4–10 cm; seeds maroon-brown, pyriform (Fig. 1).
Flowering: April–July.
Ecology: Dry sandy places around lakes, meadows, clay-solonetz places in steppes and solonetz meadows, hillsides.
Distribution: China, Pakistan, Mongolia, Russia, Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan) (Fig. 3).
Material examined: Kazakhstan—Around Verny, 04.1907, *Shpitinnikov*; pass from Kopam to Kora river, 29.06.1910, *Shpitinnikov*; Ili river, 14.06.1915, *Abolin*; Ili river, 14.06.1915, *Abolin*; Dzungarian Alatau, Mingbulak, 02.06.1916, *Dolenko*; Dzungarian Alatau, Tok-jailau, 02.06.1916, *Dolenko*; mountains Kyzylsura, 23.06.1916, *Sergeeva*; upper course of Koksu river, 07.1916, *Kuftin*; upper course of Kusak river, 06.06.1916, *Dolenko*; Ak Su river basin, Suok Tau Mountains, 28.07.1916, *Khitrovo*; Lezhinsky district, 15.05.1917; Dubun, 31.07.1917, *Abolin*; Tok Jailau, 08.07.1917, *Muhya*; left-side part of Dubun, 31.07.1917, *Abolin*, *Kornev*, *Harin*; Ili plane, right side, 13.07.1917, *Abolin*, *Shtamber*; mountains Ketmentau, 17.06.1917, *Abolin*, *Kornev*, *Harin*; Sary-temir river, left side of Ili, 10.08.1919, *Granitov*; near Iliysk station, 05.05.1921, *Titov*; Ili River, 09.04.1926, *Titov*; Ili River, between Cilik river and Terentau, 02.08.1927 (TASH); Ili river, 07.05.2006, *Pirogov*; near Chillik village, 06.05.2006, *Pirogov*; Ulken-Ketpen, 07.06.2008, *Epiktetov*; Kalguty river, 11.05.2012, *Kolbintsev*; Chillik village, 25.04.2012, *Kolbintsev*; mountains of Abraly, 09.05.2012, *Smelyansky*; lake Alakol, 25.06.2014, *Rib*; river Ili, 05.05.2018, *Pankratov*; river Kalguty, 24.05.2018, *Gorbunov*; Tamgaly-Tas, 05.05.2019, *Waldschmit*; Karkaralinsk, 01.06.2022, *Evdokimov* (www.plantarium.ru).
Tajikistan—Between villages Kalacha and Hodzhepta, 25.04.1916, *Shcherneva*; near Khujand, 28.05.1928, *Sovetkina*; Vakhsh valley, near Tush-Kaul village, 26.05.1933, *Botschantzev*; ascent to Fedtschenko peak, 11.02.1936, *Gnesdillo*; between Aruktau and Naiza bulak, 02.05.1939, *Botschantzev*; Lelinabad, 10.05.1950, *Bondarenko*, *Maylun*;

near Verevkino station, 10.05.1950, *Bondarenko*; Isfara river, east of Kanibadam, 10.05.1950, *Bondarenko*; between Leninabad and Kanibadam, 16.04.1959, *Kovalevskaya*; between Leninabad and Konibodom, 16.04.1959, *Khalikov* (TASH); Leninabad, Khujand, Kanibadam (www.gbif.org).
Kyrgyzstan—Near Aravan station, 23.05.1916, *Titov*; near Lebedinskaya station, 17.04.1916, *Sovetkina*; Pishpek district, 17.04.1916, *Sukachev*; Lebedinskoye village, 18.04.1916, *Sovetkina*; Kizylkiya region, Austin river, 17.05.1930, *Tishov*; Kyrgyz Alatau, river Kochkorka, 12.06.1937, *Mikhaylova*, *Popova*; Osh region, near Aydarken, 13.04.1949, *Sakhobiddinov*, *Li*; between Ala-Buka river and Ok-Kiya river, 24.06.1963, *Pratov* (TASH); Kulanak, 9.06.1930; Kokmoinak, 25.05.1959, *Sudnitsyna*; Kochkorka, 12.06.1937, *Popova*, *Mikhailova*; Chu River, 01.05.1941, *Knorring*; Kochkorka, 14.06.1957, *Arbaeva*; Isfana, 25.05.1958, *Ubukeeva*, *Filatova*; Shaldy-Baldy, 30.05.1960, *Sudnitsyna*; Khoja-Bakyrgan river, 01.09.1961, *Tkachenko*; Baul village, 05.05.2006, *Ganybaeva* (FRU); Shuvali village, near of Khaidarkan, Isfayram river, Vuadil village, Kochkorka (www.gbif.org).
Uzbekistan—Karasu-Chibel-tube, 06.04.1916, *Kultiasov*; village Kizil-Ravat, 07.06.1928, *Ioffe*; Near Fergana city, Along the edges of the channel, 18.04.1948, *Shadiev*; Sufan, 02.07.1949, *Sakhobiddinov*, *Li*; around Vuadil, 05.04.1965, *Shonazarov*; Yordon, 05.04.1965, *Shonazarov*; village Mayda Millat, 14.06.2014, *Tojibaev*, *Karimov*, *Naralieva*, *Batashov* (TASH).

5. ***Iris*** sect. ***Xyridion*** Tausch, Hort. Canal. 1: ad Plate II (1823) — *Iris* subg. *Xyridion* (Tausch) Spach, Hist. Nat. Vég. 13: 23 (1846) — *Xyridion* (Tausch) Fourr. in Ann. Soc. Linn. Lyon, ser. 2, 17: 163 (1869). Type: *Iris spuria* L. (lectotype designated by Rodionenko (1961: 191)).
= *Chamaeiris* Medik. in Hist. & Commentat. Acad. Elect. Sci. Theod.-Palat. 6: 417 (1790). Type: *Iris graminea* (L.) Medik. (lectotype designated by Crespo (2011: 65)).

6. ***Iris spuria*** L., Sp. Pl. 1: 39 (1753) — *Chamaeiris spuria* (L.) Medik. in Hist. & Commentat. Acad. Elect. Sci. Theod.-Palat. 6: 418 (1790). Type: Herb. Linnaeus 61.17 (lectotype LINN, designated by Altinordu & Crespo (2016: 299)); Herb. Linnaeus 17.5 (epitype S, designated by Altinordu & Crespo (2016: 299)).
= *Iris halophila* Pall., Reise Russ. Reich. 2: 733 (1773) — *Iris spuria* var. *halophila* (Pall.) Sims, Bot. Mag. 28: t. 1131 (1803) — *Xyridion halophilum* (Pall.) Klatt in Bot. Zeitung (Berlin) 30: 500 (1872) — *Iris spuria* subsp. *halophila* (Pall.) C.E.Lundstr. in Acta Horti Berg. 5(3): 15 (1914) — *Chamaeiris halophila* (Pall.) M.B.Crespo in Flora Montiber. 49: 67 (2011). Type: Kazakhstan. Pavlodar Region: “In salsis siccis ad Irtin [Irtish] frequens” [between Zhelezinka Village and Yamyshevo Village = near Karasuk Village, 53.02 N, 76.26 E, 29.05.1771], *Pallas* in Herb. Linnaeus (lectotype LINN 61.24, designated here).
= *Iris sogdiana* Bunge, Delectus Seminum Dorpatensis 1850: [3]; Bunge, Beitr. Fl. Russl.: 331 (1852); Bunge in Mém. Acad. Imp. Sci. St.-Pétersbourg Divers Savants 7: 507 (1854) — *Iris spuria* var. *sogdiana* (Bunge) Baker in J. Linn. Soc., Bot. 16: 140 (1877) — *Iris halophila* var. *sogdiana* (Bunge) Skeels in Bull. Bur. Pl. Industr. U.S.D.A. 223: 61 (1911) — *Chamaeiris sogdiana* (Bunge) M.B.Crespo in Flora Montiber. 49: 68 (2011). Type: Uzbekistan. Rabat-i-Malik near Karmina, 08.1841, *A. Lehmann* (LE 01017912, lectotype designated here; isolectotype LE 01017911).
Nomenclature: It is commonly believed (e.g. Tscherneva 1971) that the species name *Iris sogdiana* was published by Bunge (1852) on the basis of the specimen collected by A. Lehmann. However, the species was raised by Bunge in the Dorpat (Tartu) Botanical Garden from mature seeds obtained from the herbarium specimen and described in the delectus distributed by that botanical garden (Bunge 1850). Although Bunge (1850) referred to Bunge (1852) in the species account, this reference leads to the species number in yet unpublished manuscript.
Taxonomy: So far, the polymorphic *Iris spuria* s.l. has not been divided satisfactorily, and its recent system of several subspecies (Mathew

1989) is also tentative. We consider that only one taxon of this group occurs in Central Asia, and its more precise classification may be a matter of the future.

Description: Plants 75–110 cm tall; rhizome stout, creeping; stems somewhat compressed, smooth; radical leaves as long as the stems, linear, to 10 cm wide, acuminate; cauline leaves 4, progressively decreasing in size; spathe valves lanceolate, acuminate, carinate; flowers 3 or 4, terminal, violet-blue or yellow; perianth tube ca. 8 mm long, the length of the ovary; falls horizontally spreading, not deflexed, obovate, round-tipped, claw twice the length of the lamina, oblong, with 2 teeth at the base; standards erect, obovate or oblong; style branches linear-oblong; ovary 6-angled, long-beaked; seeds somewhat compressed, surface lustrous (Fig. 1).

Flowering: June–July.

Ecology: Wet places.

Distribution: Eastern Europe, Russia (Caucasus, Siberia), Iran, Afghanistan, Pakistan, China, Mongolia, Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan) (Fig. 3).

Material examined: Uzbekistan—Ulyan-Kul, 26.06.1914, *Popov*; Ulyan-Kul, 06.26.1914, *Popov*; between Maidon and Bash-Khurdon, 26.04.1915, *Popov*; Bukhara oasis, 25.04.2015, *Esanov*; Zarafshan river valley, 06.04.1916, *Drobov*; Tash-kurgan, 29.05.1916, *Popov*; near Abdy, 10.05.1916, *Popov*; Chimgan, 21.06.1919, *Ambrok*; Chimgan, 21.06.1919, *Ambrok*; Chimgan, 07.04.1920, *Vasilin*; near Tashkent Salar, 19.06.1920, *Drobov*; Chimgan, 07.04.1920, *Vasiliev*; Chimgan, 22.06.1921, *Bulgakov*; near Tashkent Salar, 16.05.1921, *Vvedensky*; Ugom, 04.1921, *Tanzevikova*; Khumsan, 15.05.1922, *Korovin*; Near Boz-su, 05.1922, Simonova; Khumsan, 15.05.1922, *Korovin*; Khumsan, 05.05.1922, *Korovin*; Bakhmalsay, 07.05.1922, *Batueva*; Kosh-sai, 01.08.1924, *Sovetkina*; Chimgan, 02.07.1924, *Yakimova*; Chimgan river, 26.08.1924, *Gomolitsky*; Chimgan, 24.07.1924, *Gomolitsky*; Chimgan, 26.08.1924, *Gomolitsky*; Chulik river, 16.05.1926, *Vvedensky*; Chimgan, 29.06.1927, *Gomolitsky*; Shakhrisabz, 16.06.1927, *Kultiasov*, *Granitov*; Kyzyl-Dzhar, 03.06.1927, *Gomolitsky*; Yakkabag, 07.04.1927, *Kultiasov*, *Granitov*; near river Nurek-ata, 20.07.1928, *Kultiasov*; between Beldersay and Chimgan, 21.07.1928, *Kultiasov*; near Pskem river, 27.08.1928, *Kultiasov*; Janjal-say, 22.06.1928, *Ioffe*; between Daudar and Tepe villages, 16.07.1928, *Ioffe*; top of Big Chimgan, 29.07.1929, *Drobov*; near Iskandar village, 12.05.1929, *Gomolitsky*; Iskander village, 12.05.1929, *Gomolitsky*; Bash-Scherbak, 27.07.1931, *Merkulovich*; Chekmen-kuydy, 22.06.1931, *Granitov*; near Rozhdestvensky village, 18.08.1931, *Gomolitsky*; near Bayavut, 16.06.1931, *Koroleva*; Itelgesay 11.06.1931, *Matskevich*; Khumsan, 15.08.1932, *Lepeshkin*; Pashsha-ata, 10.07.1933, *Kudryashev*; Pasha-ata, 10.07.1933, *Kudryashev*, *Krasovsky*; Zarafshan river valley, 09.05.1934, *Kharchenko*; Zarafshan river valley, 09.09.1934, *Anfalov*, *Ivanov*; Gijduvan, 09.05.1934, *Kharchenko*; Surkhan River, 1935, *Tarasevich*; Chatkal Range, 04.07.1936, *Skorokhodov*, *Azatyan*; Kyzyl-Gaza pass, 21.06.1936, *Botschantzev*, *Butkov*; Nurekata, 20.07.1936, *Korotkova*, *Titov*; Tash-kurgan, 01.07.1936, *Botschantzev*, *Butkov*; Denau, 26.06.1936, *Lepeshkin*; Kyzyl-Gaza, 21.06.1936, *Botschantzev*, *Butkov*; Kassan-say, 07.04.1936, *Skorokhodov*, *Azatyan*; Mount Uinatau, 18.07.1936, *Korotkova*, *Titov*; Baksuk-cheshsu, 08.04.1937, *Zakirov*; Guldary, 08.07.1937, *Granitov*, *Dolgikh*; Baksuk-cheshsu, 08.04.1937, *Zakirov*; Beshnau, 12.08.1937, *Kudryashev*; near Zakhcha village, 24.06.1937, *Kudryashev*; Chet-su, 18.07.1938, *Pyataeva*, *Momotov*; Ablyk village, 14.07.1938, *Pyataeva*, *Momotov*; Ertashsay, 21.07.1938, *Pyataeva*, *Momotov*; Lashkeraksay, 11.07.1939, *Demurina*; Chumchuklyk, 10.05.1939, *Romanenko*; Lashkeraksay, 16.05.1940, *Korotkova*; Tupalang river, 06.09.1941, *Gromakov*; Mirake village, 28.05.1941, *Koshurnikova*; Kyzyldaria river, 07.07.1941, *Koshurnikova*; Khontakhta mountains, 27.06.1941, *Koshurnikova*; Zerafshan floodplain, 13.05.1941, *Kamilov*; Kunguzlyk, 07.06.1941, *Koshurnikova*; Yangokli-say, 18.06.1952, *Rodina*; Angren, 31.08.1952, *Koshurnikova*; Gava village, 25.05.1952, *Arifkhanova*, *Gringoff*; Almalyk-say, 30.07.1953, *Maylun*, *Nabiev*, *Zukerwanik*; Irgasai,

02.08.1953, *Maylun*, *Nabiev*, *Zukerwanik*; Katta-Karabash-say, 31.07.1953, *Maylun*, *Nabiev*, *Zukerwanik*; Ertashsay, 22.06.1954, *Li*, *Maylun*; Ertashsay, 30.07.1954, *Butkov*, *Maylun*; Dukent-sai, 15.06.1954, *Li*, *Maylun*; between Shahrud and Zarafshan, 18.08.1955, *Sedov*; bank of Shahcha-sai, 29.06.1955, *Pyataeva*; Zarafshan river valley, 05.07.1955, *Sedov*; near Ak-kishlak village, 02.07.1955, *Pyataeva*; Kainar-say river, 07.15.1955, *Pyataeva*; Shakhgar-say, 07.05.1955, *Pyataeva*; Igri-su river, 07.06.1955, *Pyataeva*; Zarafshan river valley, 05.06.1956, *Sedov*; Chimgan, 12.07.1956, *Kultanasov*; Chapa-Kurgan, 05.06.1956, *Vseyas*; Karzhan-say, 28.05.1959, *Bondarenko*, *Butkov*; Pskem river, 09.07.1959, *Puchkova*; Har-Kush, 07.09.1961, *Miryakin*; Kasansay, 16.05.1965, *Pryakhin*; Bukhara oasis, 05.07.1965, *Sedov*; Bukhara oasis, 05.07.1965, *Sedov*; Aman-Kutan, 1967, *Kostyukovsky*; Aksak-ata river, 22.07.1968, *Pyataeva* (TASH); Chimgan, 26.08.1924, *Gomolitsky*; Mamai, 08.06.1931, *Knorring*; Tupalang river, 09.06.1941, *Gromakov*; Navoli Sai, 22.07.1953, *Pavlov*; Azartekisai, 07.07.1954, *Pavlov*; Ertoshsay, 27.05.1978, *Pimenov*; Kainarsay, 29.06.1988, *Pimenov* (MW).

Kazakhstan—Mountains Kara Tau, 08.08.1930, *Gotolin*; Yany-kurgan, 22.04.1934, *Pyataeva*; Kitaevka, 30.05.1956, *Bulgakov*; Aksu-Jabagly, 07.21.1960, *Khasanov*; Arys, 30.05.1965, *Pryakhin* (TASH); Karatau, 25.05.1930, *Pavlov*; Karatau, 12.04.1931, *Pavlov*; Karatau, 08.06.1931, *Graz-Guseva*; Karatau, 25.05.1932, *Vannovskaya*; Irtish river, 22.07.1932, *Voronov*; Suzak river, 04.04.1934, *Zhekuziev*; Karatau, 15.06.1934, *Khiminnikov*; Kainarbas tau, 26.05.1934, *Mikeshin*; Tyulkubas, 26.07.1934, *Pavlov*; Karatau, 14.07.1935, *Pavlov*; Karatau, 08.04.1936, *Tekutev*; near Almaty, 02.04.1940, *Pavlov*; Uzun-Agash, 19.05.1948, *Pavlov*; Karatau, 17.05.1952, *Pavlov*; Iliysk, 27.05.1957, *Pavlov*; Aris river, 17.05.1958, *Gubanov* (MW); near Kush village, 03.06.2009, *Epiktetov*; Karaganda, 03.06.2010, *Styajkin*; Ugam Range, 05.05.2011, *Pirogov*; near Lepsisnsk village, 09.06.2011, *Valdshmit*; Ukrainka, 23.08.2014, *Rib*; Ukrainka, 11.06.2014, *Rib*; Alatau mountains, 27.06.2014, *Davkaev*; Alatau mountains, 04.06.2014, *Davkaev*; Alatau mountains, 19.05.2014, *Davkaev*; Alatau mountains, 15.05.2014, *Davkaev*; Alatau mountains, 14.04.2014, *Davkaev*; Ulkunburultau mountains, 22.08.2017, *Kolbintsev*; Karaganda, 10.06.2019, *Evdokimov*; Bukpa, 28.05.2020, *Evdokimov*; Karaganda, 25.05.2020, *Evdokimov* (www.plantarium.ru); Altyn-Emel State National Park; Mynbulak Spring; Karagandy (www.gbif.org).

Kyrgyzstan—Big Uryukti, 14.08.1935, *Gomolikiy*, *Seminikhina*; Sarichelak, 31.07.1949, *Chevrenidi*; Dzhidasay, 24.05.1952, *Nabiev*; Aflotun, 24.05.1952, *Galkina*; Uspenka, 20.05.1957, *Galkina*; Sarichelek lake, 24.05.1957, *Galkina*; near Aflotun village, 16.05.1965, *Pryakhin* (TASH); Terskey Alatau, 01.06.1949, *Gordeeva*; Chong Kizil Su, 15.06.1949, *Gordeeva*; Issik-Kul, 11.07.1958, *Gubanov*; Ketmentube, 18.06.1960, *Boshbaeva*; Przhevalsky, 18.06.1967, *Gubanov*; Chatkal River, 16.05.1976, *Baranov*; Kish-kaindi, 24.08.1978, *Boryaev*; Koksay, 21.05.1985, *Pimenov* (MW).

Turkmenistan—Hodja-i-Fil, 21.08.1932, *Bulgakov, Gnezdillo* (TASH); Suluklü (Saratowka) (www.gbif.org).

Tajikistan—Near Parkhar village, 06.04.1930, *Tyshchenko*, *Felshau* (TASH); Childukhtaron, 03.06.1932, *Zapryagaev* (MW).

6. ***Iris*** sect. ***Hexapogon*** (Bunge) Baker in Gard. Chron., n.s., 5: 527 (1876) — *Iris* [unranked] *Hexapogon* Bunge, Beitr. Fl. Russl.: 329 (1852) — *Iris* subg. *Hexapogon* (Bunge) Alef. in Bot. Zeit. (Berlin) 21: 296 (1863) — *Iris* subsect. *Hexapogon* (Bunge) Benth. in Bentham & Hooker, Gen. Pl. 3: 687 (1882). Type: *Iris falcifolia* Bunge (lectotype designated by Lawrence (1953: 354)).

7. ***Iris falcifolia*** Bunge, Beitr. Fl. Russl.: 329 (1852). Type: Uzbekistan. “In deserto sterili inter Buchara et Kermine” [Karmana], 26.03.1842, *A. Lehmann* (lectotype P01846412, designated by Boltenkov (2017: 293); isolectotypes G-BOIS00330791, K000499038, LE01017929–

LE01017933, LECB00000939, P01846413, P01846414).
Description: Plants up to 50 cm tall; rhizome creeping, abbreviated, consisting of nutlike fragments, one such fragment developing each year, forming dense tussocks; roots numerous, thick, covered with fibrous vestiges of leaf sheaths; stem leafless, up to 15–30 cm long; leaves subradical, falcate, 3–5 mm wide, two leaves at the base of each stem translucent, vaginate, short, three upper ones falcate, filiform-linear from a sheathing base; spathe valves 4, scabrous, membranous-margined, the outer entire, the inner ones bicleft, the fourth valve minute; pedicels short; flowers 2 or 3, lilac-violet; falls with the broadly ovate claw separated from the lamina by a constriction, the upper one-third of the lamina horizontally spreading or reflexed; standards spatulate-oblong, about as long as the falls, the lower two-thirds bearded with yellowish hairs; style branches pale lilac; crests overlapping, semiovate (Fig. 4).
Flowering: March–April.
Ecology: Clayey deserts.
Distribution: Iran, Afghanistan, Pakistan, Central Asia (Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan) (Fig. 7).
Material examined: Uzbekistan—Near Khilkovo station, 30.03.1911, *Dimo*, *Sprygin*, *Shulga*; near Kuyu Mazar station, 31.03.1916; northwest of Bek-Budi, road from Ak-Tepe to Anna Bazaar, 05.06.1928, *Linczevsky*; northwest of Bek-Budi, mountain Kungur-tag, 13.05.1928, *Linczevsky*; Nishan steppe, Charagyl, 04.04.1938, *Gomolitzky*; Mountain Kokcha, 14.04.1938, *Granitov*, *Evstafjev*; Charagyl, 11.04.1938, *Gomolitzky*; southern part of Kukcha mountain, 14.04.1938, *Granitov*, *Evstafiev*; near Malik station, 24.04.1941, *Fayziev*; Kyzylkum, Kuju-Mazar, 29.04.1956, *Li*; Southern Kyzylkum, Karanz plain, 27.04.1956, *Li*; northern side of Kokshetau hill, 12.05.1964, *Adylov*, *Shoraimov*; Shurchy region, near Gagarin village, 16.05.1964, *Savitzky*; Kugitangtau, Sherabad River Basin, near Istra village, 29.03.1965, *Kayumov*; Kugitangtau, near gorges Talkhab Dagana, 22.04.1965, *Kayumov*; Kugitang Range, Sherabad valley, 29.03.1965, *Kayumov*; Gizhduvan district, near Uzun-kuduk well, 05.04.1974; Beruni district, Sultanuizdag steppe, 12.05.2009, *Esemuratova*; Kukchatag, 22.03.2013, *Tojibaev*, *Beshko*; Kukchayau, 28.04.2013, *Batoshov* (TASH); Station Muborak (MW); Ayakagytma, 04.09.2021, *Beshko* (www.plantarium.ru).
Kazakhstan—Side of Shardara Reservoir, 28.03.2006, *Kolbintsev* (www.plantarium.ru).
Turkmenistan—Ahal, Gjaurs (www.gbif.org).

8. ***Iris longiscapa*** Ledeb., Fl. Ross. 4: 93 (1852). Type: Uzbekistan. From Tashkent to Karak-Ata [Karakatta], 11.04.1873, *Korolkow & Krause* (neotype LE00050370, designated by Boltenkov (2017: 293); isoneotypes K01193734, LE00050369, LE00050371, LE00050372).
= *Iris filifolia* Bunge, Beitr. Fl. Russl.: 330 (1852), non Boiss. (1842), nom. illeg. Type: Uzbekistan. 1842, *A. Lehmann* (lectotype LE01017925, designated by Boltenkov (2017: 293); possible isolectotypes not identified).
Nomenclature: Five gatherings were cited as syntypes in the protologue of *Iris filifolia*. In presence of many specimens with complete labels at P, Boltenkov (2017) unexplainably designated a specimen at LE as lectotype, which lacks the locality data. For this reason, neither the lectotype locality nor possible isolectotypes can be identified with certainty.
Description: Plants 50–75 cm tall; rhizome creeping, abbreviated, consisting of nutlike fragments, one such fragment developing each year, forming dense tussocks; roots numerous, thick, densely covered with fibrous leaf vestiges; stem leafless, erect, to 70 cm long; leaves all radical, narrowly filiform, not falcate, 2–3 mm wide; spathe valves 3, thinner, sometimes almost hyaline throughout or at least the margin broadly hyaline; pedicels short; flowers 2 or 3, lilac-violet; falls oblong, bearded, hairs at the middle of the beard clavate, yellow, those at the margins slender and paler; standards narrowly spatulate, with few clavate hairs on the claw or sometimes glabrous throughout; capsule 3-angled, pointed (Figs. 4, 5).
Flowering: April–May.
Ecology: Sandy deserts, sometimes sandy-clayey sites or granite hills.

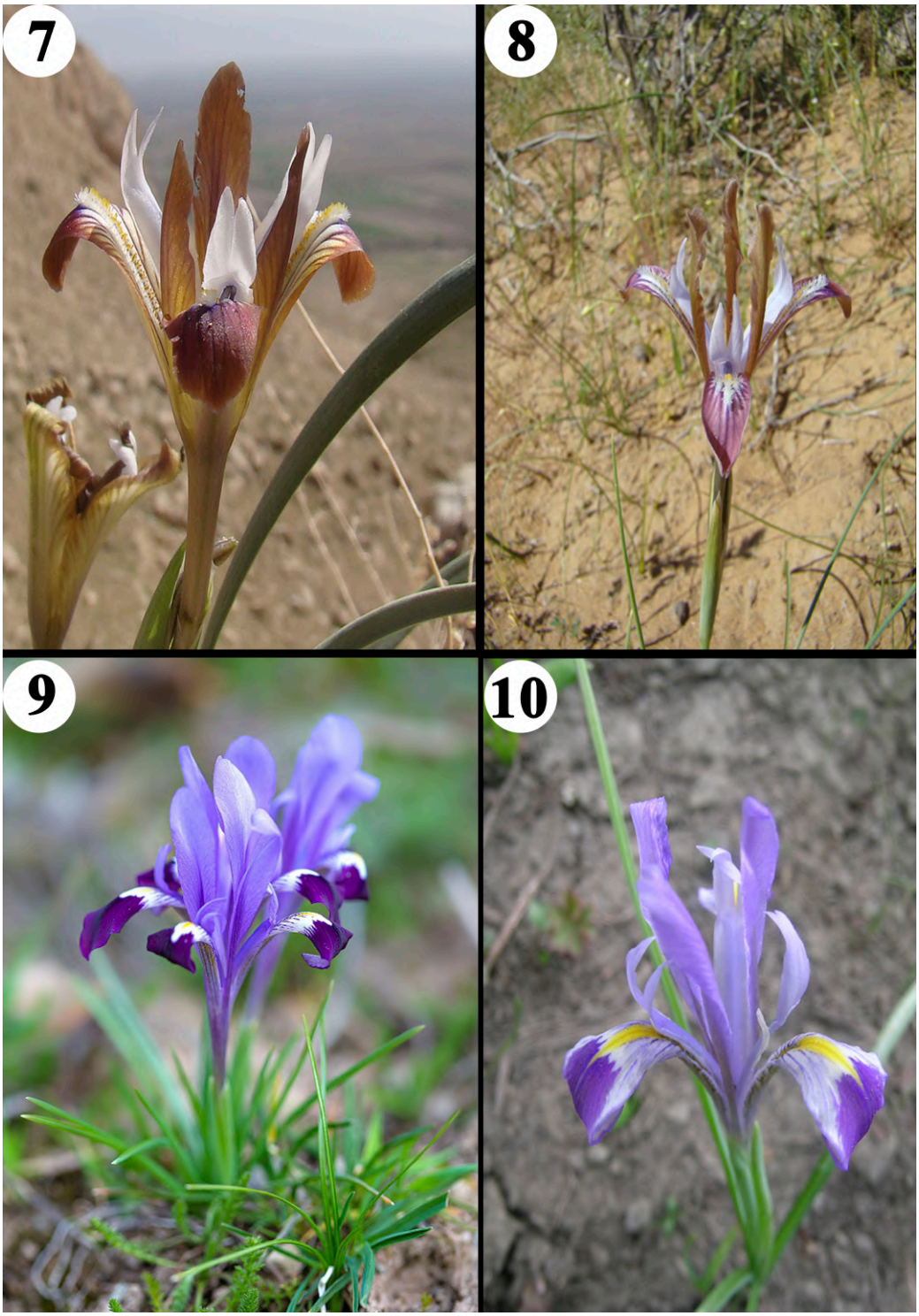
Distribution: Iran, Afghanistan, Pakistan, Central Asia (Kazakhstan, Turkmenistan, Uzbekistan) (Fig. 7).

Material examined: Uzbekistan—Pistalitau, 07.04.1911, *Dimo*, *Sprygin*, *Shulga*; desert Sary-tash, 1913, *Sprygin*; Urgandji, 1913, *Korovin*; between Nazarali and Chay-kazak, 13.04.1913, *Sprygin*; Zekriy spring, 14.04.1913, *Teplov*; Kur-Kuduk-Khushab spring, 28.04.1913, *Stakhanov*; Karaulbazar, 1913, *Sprygin*; Karachkur, 17.04.1913, *Sprygin*; near Kara-Kalpak, 12.04.1913, *Sprygin*; Kamasty-kuduk, 18.05.1923, *Vvedensky*; Sardoba-Karaulbazar, 18.04.1929, *Petrov*; Khotun-Rabat, 14.05.1930, *Granitov*; Hotun-rabat, 14.05.1930, *Granitov*; between Kermine and Malik, 12.04.1931, *Nikifrova*; between Changaly and Tama village, *Arifkhanova*; Astyntau, 12.04.1932, *Muravljansky*; Kuk-kuduk, 13.04.1932, *Muravlyanskiy*; Djingeldiy, 14.04.1932, *Muravlyanskiy*; Astiyn tau, 14.04.1932, *Muravlyanskiy*; Tamdy, 15.04.1934, *Muravljansky*; Kennimech desert, 05.04.1936, *Klimovskaya*; near Khotun-Rabat, 09.04.1936, *Russanov*; Karakata spring, 20.04.1937, *Botschantzev*; Ayak-agitma, 25.04.1937, *Tolbina*; Howdaktau, 13.05.1937, *Vvedensky*; Karag-ata, 20.04.1937, *Botschantzev*; Ayak-Agitma, 16.04.1937, *Botschantzev*; between Ayak-Agitma and Bash-Agitma, 04.05.1937, *Botschantzev*; Dzhangeldy, 17.05.1937, *Botschantzev*; Kyzylkum, 29.04.1937, *Botschantzev*; Tashkuduk, 20.05.1937, *Evstaviev*, *Soykina*; between Chingeldy and Tama, 01.05.1943, *Arifkhanova*; Tagay Murat spring, 28.04.1943, *Dzhanaeva*; Nurata, 15.04.1952, *Zaprometova*; Ayak-agitma, 09.04.1953, *Gringof*; Chaban-kazgan, 06.05.1954, *Dyatlov*; Mulla-bet spring, 06.05.1956, *Li*; Chorikty, 29.05.1956, *Momotov*; Konimekh, 20–21.04.1957, *Shumakova*; Buzau-bay, 1958, *Gringof*; Akbayatal spring, 04.1959, *Gringoff*; Akbaytal spring, 05.04.1959, *Gringof*; Keles massif, Alka-kul-kum Sands, 16.04.1962, *Toyjanov*; Tamdiy, 10.04.1962, *Ratkovsky*; near Ayakagytma, 29.03–03.04.1963, *Pyataeva*; between Bash- and Ayak-agitma, 29.03–03.04.1963, *Pyataeva*; near Kasan, 22.04.1965, *Pryakhin*; Bukantau, 20.05.1968, *Kolomazova*; Takhtakupyr, 23.05.1970, *Saparniyazov*; Akkuduk, 18–19.04.1975, *Javliev*, *Vakhidov*, *Li*; Ayak-agitma, 14.04.1987, *Tolbina*; Dzhangeldy, 07.04.2007, *Tojibaev* (TASH); South Bukhara, 1913, *Kirichenko*; Muborak station, 12.04.1934, *Raikova*; Muborak station 16.04.1934, *Raikova*; Karakul state farm, 12.04.1934, *Raikova*; Muborak station, 12.04.1934, *Shvakyaeva*; near Termez, 17.03.1951, *Kamolova*; Kulatau, 26.05.1965, *Amosov*; Kyzylkum, near Dukey, 15.04.1986, *Pimenov*, *Klyuykov*; between Aitim and Koskuduk, 22.04.1987, *Pimenov*, *Vasilieva* (MW); Bukhara, 15.04.2012, *Lazkov*; Kyzyl Ravat, 15.04.2012, *Beshko*; Aydarkul, 17.04.2012, *Lazkov*; Kuljuktau, 13.04.2015, *Beshko*; Kuljuktau, 10.04.2021, *Beshko* (www.plantarium.ru).

Turkmenistan—Near Repetek, 27.03.1902, *Androsov*; Repetek, 05.04.1913, *Androsov*; near Repetek, 05.04.1913, *Androsov*; Transcaspian region, Takyr, 10.04.1914, *Korovin*; plateau Dushak, 11.04.1914, *Korovin*; Badkhyz, near Er-ailan-duz, 30.03.1916, *Kerkov*; Transcaspian region, near Tash-kati station, 30.03.1916, *Korovin*; near Tush-kati station, 30.03.1916, *Korovin*; between Sangu dag and Duzlu Olumol, 29.03.1916, *Chernyakov*; near Repetek, 15.04.1916, *Drobov*; around Kerkov, 05.04.1925, *Korovin*; Karakum, near Kur-Baba well, 02.04.1925, *Korovin*; near the ruins of Essen-Dengli, 17.04.1925, *Korovin*; Kerki, 08.04.1925, *Korovin*; near Kerks, 05.04.1925, *Korovin*; 10 km north-west of Charyshly, 20.04.1925, *Korovin*; near Sardoba, 14.04.1925, *Korovin*; Danguz-Syrty, 19.04.1926, *Korovin*; near Amandzhik well, 28.04.1926, *Framukevich*; between Imam Baba station and Sary Yazy, 15.04.1930, *Butkov*; Kushki district, near Islim-Cheshme well, 19.04.1930, *Linczevsky*; Repetek station, 15.04.1930, *Vasilievskaya*; between station Tash-Kepri and Komarova, 15.04.1930, *Butkov*; Transcaspian region, Takyr, 07.04.1931, *Vvedensky*; Transcaspian region, Takyr, 07.04.1931, *Vvedensky* (TASH); Er-aylan-duz, 22.04.1916, *Korovin*; near Ashgabat, 06.04.1935, *Gladkov*; near Ashgabat, 13.04.1942, *Gladkov*; eastern Ashgabat, 13.04.1942, *Alevkin*; east of Kakhhka, 31.03.1952, *Judova*; east of Kakhkhka,

31.03.1952, *Guzdeva*; around Ashgabat, 30.03.1952, *Judova*; 30 km east of Kakhkhka, 31.03.1952, *Judova*; Kopetdag, southeast of Kyzyl-Arvat, 05.03.1952, *Judova*; Murghab river near Imambaba village, 05.1965, *Koneva* (MW); near Par well, 04.2017, *Pavlenko*; near Par well, 28.03.2017, *Pavlenko* (www.plantarium.ru).

Kazakhstan—Near Suzak village, 17.05.1936, *Mironov*, *Paziy*; Kyzylkum, 14.04.1965, *Makarchuk* (TASH); Mamekkazgan, 23.04.2009, *Gorbunov*; Senek village, 06.05.2015, *Komarov*; Mangistau, 28.04.2016, *Lazkov* (www.plantarium.ru).



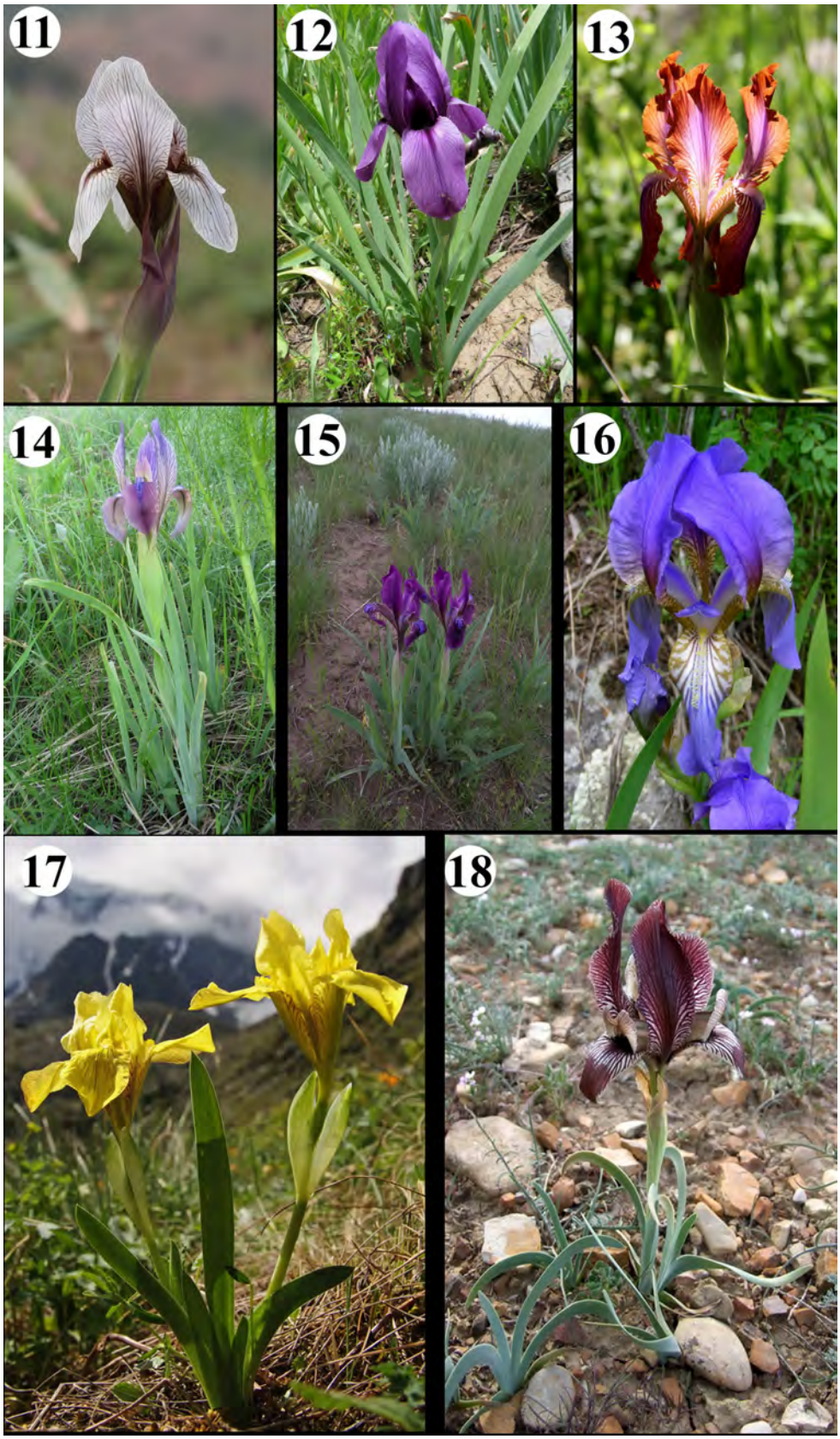


Fig. 4. Species of *I.* sect. *Hexapogon*: 7. *I. falcifolia*, 8. *I. longiscapa*; *I.* sect. *Monolepis*: 9. *I. kolpakowskiana*, 10. *I. winkleri*; *I.* sect. *Regelia*: 11. *I. korolkowii*, 12. *I. darwasica*, 13. *I. stolonifera*, 14. *I. suworowii*; *I.* sect. *Iris*: 15. *I. scariosa*, 16. *I. alberti*; I. sect. *Psammiris*: 17. *I. bloudowii*; *I.* sect. *Oncocyclus*: 18. *I. helenae*.

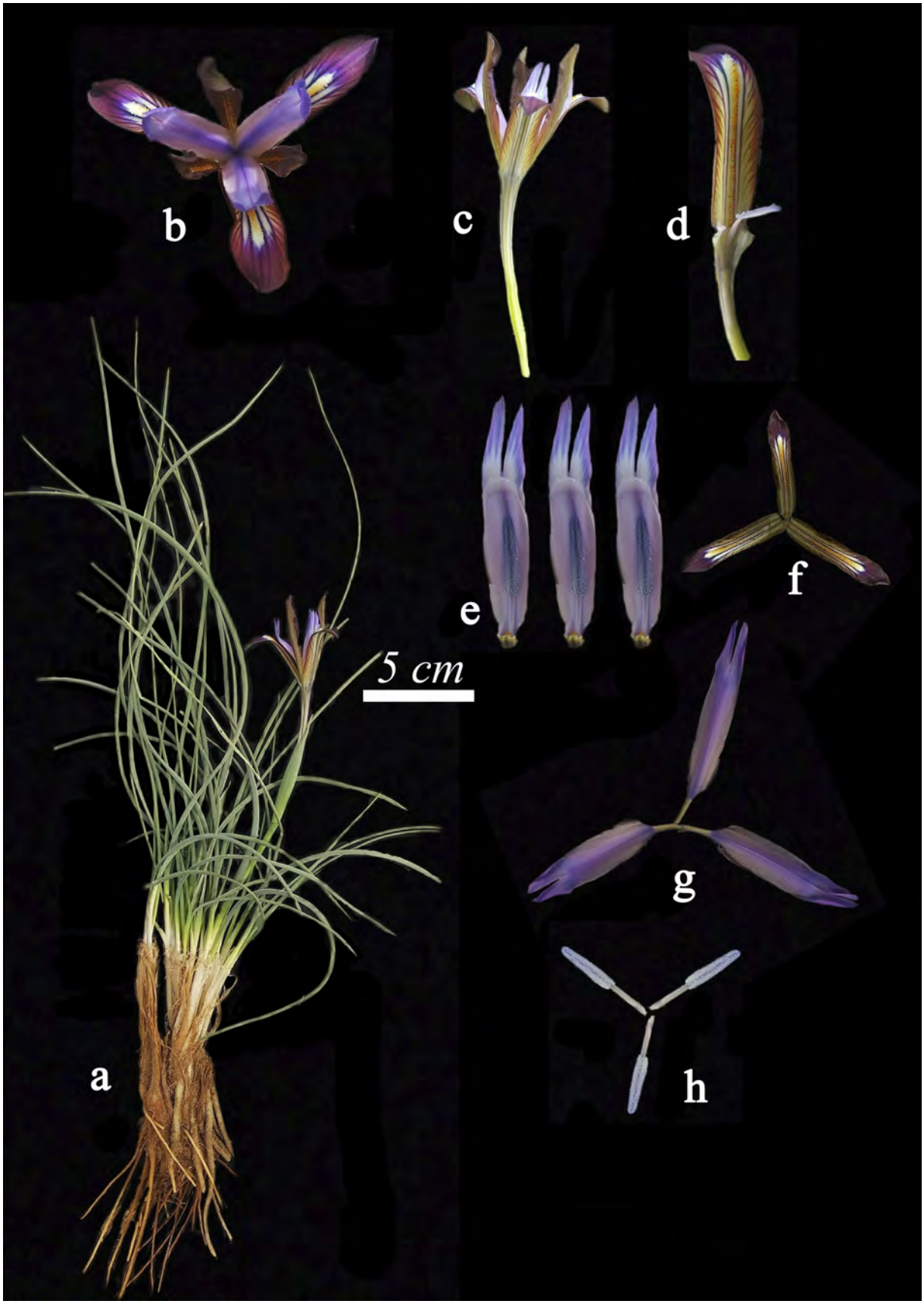


Fig. 5. Living plant of *I. longiscapa*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Style arms (pistils); f. Falls (outer tepals); g. Standards (inner tepals); h. Stamina.

7. ***Iris*** sect. ***Regelia*** (Foster) Foster in Garden 43: 131 (1893) — *Iris* [unranked] *Regelia* Foster in Gardener's Chron., ser. 3, 4: 36 (1888) — *Iris* subg. *Regelia* (Foster) Baker, Handb. Irideae: 20 (1892). Type: *Iris korolkowii* Regel (lectotype designated here).

Nomenclature: Foster (1887) introduced a new taxonomic group of Central Asian irises, which he named *Regelia* due to the kindness and expertise of the "Nestor of Russian botany", as he termed Eduard von Regel (Foster 1888). He left this taxon without a description at that time but supplied it with a diagnosis in the expanded English-language version of the same study (Foster 1888). Subsequently, Foster (1893) termed this unranked group a section, thus effecting a new combination accepted here.

Iris falcifolia, which is a member of *I.* sect. *Hexapogon*, was designated by Rodionenko (1961: 199) as the type of *I.* sect. *Regelia*. This designation was a technical error because *I. falcifolia* was not an original element of *I.* sect. *Regelia*. Foster (1888) cited a number of species in the protologue, of which *I. korolkowii* was clearly central in his concept and discussion, and is designated as lectotype of this section here in agreement with the classical treatments (Fedtschenko & Fedtschenko 1905; Fedtschenko 1909, 1924). This lectotype was introduced but not effectively published by Rodionenko (2009) due to the lack of the formula "designated here".

9. ***Iris korolkowii*** Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 2: 432 (1873); Regel in Gartenflora 22: 225 (1873). Type Uzbekistan. Presumably near Tashkent: "Ex horto bot. Petropolitano, [18]73, sem. m. "*Korolkoff*" (holotype LE 00050067).

Nomenclature: The original plants were probably delivered from the vicinities of Tashkent, e.g. Chimgan Mt., where the species is abundant (Fedtschenko 1935). The species description in *Acta Horti Petropolitani* was published in July, whereas its counterpart in *Gartenflora* appeared in August.

Description: Plants 40–60 cm tall; rhizome short, firm; stem 30–40 cm, erect, branched at the end; leaves glaucescent, the cauline ones progressively decreasing in size, linear-ensiform, slightly acuminate, nearly straight; spathe valves herbaceous, slightly ribbed, broadly lanceolate, membranous and translucid only at apex; pedicels very short; flowers 2, very close to each other; perianth tube subcylindric, rather short; falls lamina elliptic, abruptly narrowed into the claw, spreading, emarginate, dingy white with purple veins, claw blackish-brown within, beard hidden; standards nearly identical to the falls; filaments blackish-brown; style branches oblong, brown; crests acute, bearded at the margin (Fig. 4).

Flowering: May–June.

Ecology: Mountain slopes.

Distribution: Afghanistan, Pakistan, Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan) (Fig. 7). The reported occurrence in Turkmenistan (Nikitin & Geldykhanov 1988) does not fit the distribution area (Tscherneva 1971) and herbarium specimens and may be incorrect.

Material examined: Uzbekistan—Near lake Mahbalkul, 01.06.1921, *Baranov*; Small Chimgan, 02.06.1924, *Yakimova*; Chimgan botanical station, 18–19.05.1929, *Gomolitsky*; Big Chimgan, 03.07.1934, *Alexeeva*; Aksakata basin, 15.07.1936, *Korotkova*; Abzhassay river, 05.07.1936, *Koshurnikova*; Shavazsay, 30.07.1936, *Korotkova*; Sokak-sai river basin, 16.06.1938, *Saransk*, *Klima*; Kizil-say river, 01.06.1939, *Butkov*; Tashkent Alatau, 31.05.1939, *Butkov*; Kyzylsay river, 01.06.1939, *Butkov*; right side of Lashkereksay, 16.05.1940, *Korotkova*; Ugom, 08.04.1940, *Shinarkin*; near Nevich village, 27.06.1947, *Pyatayeva*; near Zarkent, 21.04.1949, *Vorobeva*; Chapan-Kuydi, 04.06.1950, *Bondarenko*, *Maylun*; Chapan-Kuydi, 05.05.1950, *Bondarenko*, *Maylun*; between Chirchyk and Angren, foohills, 07.06.1953, *Butkov*, *Maylun*; Parkent district, Zard-Shah mountain, 22.06.1953, *Maylun*, *Nabiev*, *Zukerwanik*; near Parkent, 07.06.1953, *Butkov*, *Maylun*, *Slovinsky*; Shavazi-kalon-say, 12.05.1953, *Nazarenko*; Shavazi-kalon-say, 31.05.1953, *Nazarenko*; Abzhassay, 26.05.1954, *Vernik*, *Nabiev*; Kattasay, 28.05.1954, *Vernik*, *Nabiev*; Kattasay, 28.05.1954, *Vernik*, *Nabiev*; Baksuk-say, 15.06.1954, *Li*, *Maylun*; Aksarsay, 29.06.1956, *students*; Chatkal basin, Sukok river, 03.05.1963, *Pavlov*; Kengkol river, 31.07.1964,

Pankratsev; Left bank of Angren river, 31.07.1964, *Pankratsev*; Bashkyzylsay, 24.06.1976, *Adylov*; Angren Plateou, Igrisu, 10.07.1977, *Kary*; Chadaksay, Aygyr-Baytal, 10.09.2010, *Karimov* (TASH); Aksai, 14.05.2011, *Gaziev*; Beldersay river, 15.06.2013, *Tillaev*; above Yangiabad village, 13.05.2014, *Beshko*; upper reaches of Beldersay, 14.06.2014, *Gaziev*; Beldersay, 17.05.2014, *Tillaev*; Akhangaran river basin, 10.05.2019, *Tillaev*; between Karakiyasay and Almalyksay, 10.05.2021, *Beshko* (www.plantarium.ru).

Tajikistan—Vakhsh river, 13.06.1933, *Botschantzev*; Rosary Valley, 13.04.1933, *Botschantzev*; southeast of Tutkaul village, 20.05.1934, *Botschantzev* (TASH); Ganishou village, 06.1989, *Komarov* (www.plantarium.ru); Kulob, Tutkaul, Gouli-Zindan (www.gbif.org).

Kazakhstan—Pass Guli-Zinda, 05.04.1913, *Michelson*; Mountains Dzhebogly, 02.06.1924, *Sovetkina* (TASH); mountains Alatau (Daubaba), 23.05.2014, *Davkaev*; Aksu-Zhabagly, 14.06.2017, *Kolbintsev*; Aksu river, 15.05.2018, *Belousov* (www.plantarium.ru).

Kyrgyzstan—River Chatkal, 03.08.1938, *Pyatayeva*, *Momotov*; Kara-Tube, south slope, 31.07.1946, *Arifkhanova*; Kara-Tube, south slope, 05.08.1950, *Arifkhanova*; Sary-chelek, 14.07.1962, *Pyatayeva*, *Arifkhanova* (TASH).

10. ***Iris darwasica*** Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 679 (1884). Type: Tajikistan. “In monte Ala-Kisrak ad orientem urbis Kuljab”, 7000‘, 06.1883, *A. Regel* (holotype LE).

= *Iris hoogiana* Dykes in Gard. Chron., ser. 3, 60: 216, fig. 84 (1916), **syn. nov.** Type: [Cultivated plants received from “Turkestan”.] *Iris hoogiana* Dykes in Gard. Chron., ser. 3, 60: 216, fig. 84 (1916) (lectotype designated here).

= *Iris splendens* O.Fedtsch. in Izv. Glavn. Bot. Sada SSSR 23: 111 (1924), nom. nud.

= *Iris karategina* B.Fedtsch. in Komarov, Fl. USSR 4: 542 (1935), nom. inval.

Nomenclature: Regel (1884) described the flowers of *Iris darwasica* Regel as violet with darker veins, its standards being obovate and nearly equal to the falls. This understanding of *I. darwasica* as a species with violet flowers was correctly accepted by Vvedensky (1963), Tscherneva (1971) and Wendelbo & Mathew (1975), whereas this species treatment in some earlier sources (O.Fedschenko 1909; B.Fedtschenko 1915, 1935) was contaminated with wrong floral characters due to the erroneous inclusion of *I. suworowii* Regel.

The latest national treatments (Vvedensky 1963; Tscherneva 1971) considered *I. darwasica* and *I. hoogiana* to differ in the shape of their floral parts: fall lamina narrowed towards the claw in *I. darwasica* and not narrowed towards the claw in *I. hoogiana*. Broader (obovate) floral parts are more common in *I. hoogiana*, whereas its plants with narrower (oblong) floral parts are less frequent but still regularly noticed in scattered localities. Such plants were described as *I. karategina* B.Fedtsch. (Fedtschenko 1935); this name was invalidly published and later erroneously placed into the synonymy of *I. lineata* Foster (Vvedensky 1963; Tscherneva 1971). The species name *Iris splendens* O.Fedtsch. (Fedtschenko 1924), published without a description, belongs to the plants with broader floral parts.

The lectotype of *I. hoogiana* (designated here) is a photograph reproduced in the protologue, which shows a blue-flowered plant with the orange-yellow beard (in black-and-white reproduction) with broad obovate floral parts. The original description and illustration are completely unambiguous and allow for certain identification.

Description: Plants 40–60 cm tall; rhizome short, the long stolons emerging through the sheaths of old leaves and spreading in different directions; stems 20–70 cm, erect; radical leaves obsolete; cauline leaves broadly linear, attenuate toward apex, acuminate, the upper third membranous, tinged with red; pedicels short; flowers 2 or 3, entirely blue or lilac-violet or sometimes whitish; perianth tube ca. 2.5 cm long, purple-tinged; lamina of falls obovate, gradually narrowed into the claw, the beard prominent, yellow, spreading partly onto the lamina and not confined to the claw, gradually enlarged from base; style branches not differing in color from perianth

segments; crests triangular, straight; capsule elongated, pointed at the top; seeds pyriform, brown, with a milky white aril (Fig. 4).
Flowering: April–June.
Ecology: Grassy mountain slopes.
Distribution: Afghanistan, Central Asia (Tajikistan, Uzbekistan) (Fig. 7).
Material examined: Uzbekistan—Sarimas and Kizibdian, 01.05.1979, *Pimenov* (MW).
Tajikistan—Varzob, Ziddy and Maykhura, 02.07.1930, *Paziy*, *Mironov*; Vakhsh river valley, 22.05.1934, *Botschantzev*; Sarda-i-miona River, 27.04.1930, *Paziy*, *Mironov*; near Tutkaul village, 18.04.1933, *Botschantzev*; near Kebit village, 22.05.1934, *Botschantzev*; Dzhaksy-sary-su river, 09.04.1937, *Paziy*; Sary-su river, 09.04.1937, *Paziy* (TASH); Ziddi, 07.06.1965, *Denisova*, *Belousova*; Obi-Horok river, below Robot village, 13.07.1976, *Klyuykov*, *Baranova*, *Vasilieva*; between Robot village and Khaburabad, 13.07.1976, *Baranov*; Mayhuri river, 07.06.1976, *Pimenov*, *Klyuykov*; Varzob river, 29.07.1978, *Boryaev*; *Klyuykov*; between Dangara and Nurek, 16.05.1979, *Pimenov*; upper reaches of Anzob River, 14.06.1979, *Belyaev*; Anzob pass, 17.06.1990, *Pimenov*, *Klyuykov* (MW); Karateginskoe bekstvo, 13.04.1911, *Golbek*; Mountain Kugi Fruz, 30.04.1932, *Zapryagaev* (LE); Dashtidjum, 04.06.2018, *Ebel*; (www.plantarium.ru); Sagirdasht pass, near Childukhtaron village, 10 km south of Torvil Dara, in Haz-Rati-Sho Range (www.gbif.org).

11. ***Iris stolonifera*** Maxim. in Bull. Acad. Imp. Sci. Saint-Pétersbourg, sér. 3, 26: 535 (1880). Type: Uzbekistan. Zarafshan valley, Sangy-Dzhuman canyon, 25.05.1869, *O. Fedtschenko* (lectotype LE 00050109, designated here; isolectotypes 00050108, 00050110).
= *Iris leichtlinii* Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 680 (1884). Type: [“Buchara.”] Plants cultivated in the private garden of M. Leichtlin, 03.1884, *M. Leichtlin* (holotype LE 00050074).
= *Iris vaga* Foster in Gartenflora 36: 204, tab. 1244, fig. 7 (1887). Type: [Cultivated plants, originally sent by N.I. Korolkov from “Turkestan”.] *Iris vaga* Foster in Gartenflora 36: 204, tab. 1244, fig. 7 (1887) (lectotype designated here).
Nomenclature: Both *Iris leichtlinii* and *I. vaga* were described on the basis of cultivated plants delivered as live rhizomes from “Buchara” and “Turkestan” by N.I. Korolkov. Most likely they originated from the same stock, eventually distributed to M. Leichtlin and M. Foster.
Description: Plants 30–60 cm tall; rhizomes very short, with long fleshy root fibers; long fleshy stolons arising from the collar through the sheaths of old leaves; stems erect, bearing 2 or 3 terminal flowers; radical leaves obsolete; cauline leaves broadly linear, 5–11 mm wide, up to 50 cm long, gradually attenuate toward apex; uppermost stem leaf not reaching the base of spathe; lower spathe valves obtusish, the inner shorter and narrower than the outer; pedicels 2–4 mm long; falls obovate, obtuse, the base of the lamina and the claw bearded with pale violet to whitish hairs, lamina lilac with a broad bronze-colored margin, the lower part whitish or yellowish-ferruginous; standards slightly narrower and shorter than the falls, pale lilac, undulate, the margin crisped; style branches pale lilac; crests brown; capsule elongate acuminate; seeds pyriform, with a milky white aril (Figs. 4, 6).
Flowering: May–June.
Ecology: Wet meadows and near mountain streams.
Distribution: Central Asia (Tajikistan, Turkmenistan, Uzbekistan) (Fig. 7).
Material examined: Uzbekistan—Near Kampyrtepa village, 19.04.1915, *Popov*; around Gilan village, 20.05.1916, *Popov*; Mingbulak, 04.06.1922, *Kurbatov*; near Yakkabag, 12.06.1927, *Kultiyasov*, *Granitov*; near Kyzyl-Alma village, 26.06.1927, *Popov*, *Vvedensky*; Chimkurgan village, 19.04.1928, *Vvedensky*; Khodzha-Gurgurata, 10.06.1928, *Yakimova*, *Moskvin*; between Baysuntau and Vakhshivar, 03.06.1928, *Yakimova*, *Moskvin*; near Sina village, 31.05.1929, *Vvedensky*; near Sina village, 23.05.1929, *Tscherneva*; Ketmen-Chapty, 20.05.1930, *Lepeshkin*; between Baysun and Denau, 30.04.1930, *Botschantzev*, *Vvedensky*; between Boysun and Denau, 21.05.1930, *Botschantzev*, *Vvedensky*; Amankhutan,

17.05.1931, *Nikifrov*; between Tatar village and Chekmen-Kuydy pass, 22.06.1931, *Granitov*; Chakmaksay, 19.07.1934, *Butkov*; Khoja Buzbarak say, 24.07.1934, *Butkov*, *Peshkovich*; east of Mount Khoja-gur-gur-ata, 15.08.1934, *Demurina*; Kyzyl Naursay, 17.07.1934, *Butkov*; Ak-tag mountains, 02.06.1935, *Kudryashev*; Kara-sai, 09.09.1935, *Lepeshkin*; near Ak-Bai-Juma pass, 20.06.1936, *Gnezdillo*; near Tashkurgan, 23.06.1936, *Botschantzev*, *Butkov*; Kapyrsay basin, 12.07.1936, *Botschantzev*, *Butkov*; Chakman-kuydy pass, 18.06.1936, *Botschantzev*, *Butkov*; upper reaches of Yakkabagdarya river, 30.06.1936, *Botschantzev*, *Butkov*; springs near Ishan, 17–18.05.1936, *Gnezdillo*; mountains Kyr-tau, 10.06.1937, *Gnezdillo*; Beschnau mountains, 25.06.1937, *Kudryashev*; upper reaches of Tanhas river, 02.08.1937, *Kudryashev*; Kyr-tau mountains, 02.07.1937, *Granitov*, *Dolgikh*; near Khoja-Kulsin, 27.04.1940, *Bukasov*; near Tamchi village, 18.07.1940, *Goncharov*; Khoja-kulsun-saya, 16.05.1941, *Lopott*, *Pinkhasov*; near Obi-Zarang, 28.06.1941, *Gromakov*; between Mirake and Sukar villages, 26.05.1941, *Koshurnikova*; Malyand Pass, 17.06.1948, *Pyataeva*; to the upper Sai Obi-Shur, 20.06.1948, *Pyataeva*; Shatrut river above Chilik-su, 28.06.1948, *Pyataeva*; Tupalang river basin, 19.07.1948, *Pyataeva*; middle course of Ak-su river, 03.06.1948, *Pyataeva*; Sangardak river, 04.06.1948, *Pyataeva*; between Gava and Parvas, 12.07.1948, *Pyataeva*; near Urgut, 09.07.1952, *Khalmatov*; on the way to Acrabat pass, 26.06.1954, *Pyataeva*; upstream of Igri-su river, 06.08.1955, *Pyataeva*; near Hatay village, 12–13.07.1955, *Pyataeva*; Shakhcha-say river, 29.06.1955, *Pyataeva*; Kainar-say river, 17.07.1955, *Pyataeva*; between Sangardak and Karatash, 08.08.1960, *Pryakhin*, *Abdulkhamidov*, *Azizov*, *Khojimatov*; between Mountains Khoja-gur-gur-ata and Alachapan, 01.07.1961, *Pryakhin*; Tamshush basin river, 19.07.1961, *Tuychiev*, *Khodzhimatov*; Sangardak basin, 01.06.1961, *Pryakhin*; Kyzylkishlak mountains, 03.06.1964, *Khalikov*; Obi-Zarang river, 06.06.1966, *Kayumov*; near Khoja-Kulsin, 02.06.1966, *Kayumov*; Obi-Kangar river, 05.05.1966, *Kayumov*; near Kyzyl-Emchak, 27.06.1967, *Khalmuradov*; near Vandob, 25.05.1970, *Dzhumaev*; near Shalkan, 03.06.1973, *Dzhumaev* (TASH); Kichik Maidan, 1911, *Golbek*; between Langar and Kyzil kishlak, 01.05.1979, *Pimenov*, *Klyuykov*, *Boryayev*, *Baranova*, *Vasilieva*; Beshnau, 29.06.1988, *Pimenov*, *Vasilieva*, *Lavrova*, *Kuznetsova* (MW); Lyangar valley river; near Toda village, 05.06.2013, *Yakovlev*; Takhta-Karacha pass, 05.12.2014, *Beshko*; Amankutan, 11.05.2019, *Mardonov*; Kizilolma, 04.24.2021, *Choriev* (www.plantarium.ru).

Tajikistan—Obyzarang basin, 06.06.1966, *Kayumov*; near Talliybulak, 09.05.1979, *Pimenov*, *Klyukov*, *Boyaev*, *Baranova*; pass Anzob (MW); Khatlon, Malkikinau, Tutkaul (www.gbif.org).

12. ***Iris suworowii*** Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 9: 619 (1886); Regel in Gartenflora 35: 397 (1886). Type: Tajikistan. “In montibus Kuh-i-Frusch”, “1883”, *“A Regel*” (lectotype LE 00050118, designated here); *Iris lineata* in Gartenflora 36: 201, tab. 1244, fig. 1–6 (1887) (epitype designated here). = *Iris lineata* Foster in Gartenflora 36: 201, tab. 1244, fig. 1–6 (1887). Type: [Cultivated plants of uncertain provenance] *Iris lineata* in Gartenflora 36: 201, tab. 1244, fig. 1–6 (1887) (lectotype designated here).
Nomenclature: Although specimens are generally recommended to prefer over illustrations in lectotypification, in irises a good illustration showing floral details and colours is commonly better than an old and faded specimen. For this reason, the excellent illustration published in the protologue is designated as a lectotype of *Iris lineata*.

Iris suworowii Regel was described nearly simultaneously in Regel (1886a, 1886b). The first of the aforementioned publications appeared in *Acta Horti Petropolitani* and as a separate reprint from this journal, which was mentioned in German announcements in late September (probably published in the beginning of summer). The second appeared in the bimonthly magazine *Gartenflora* in the first half of July. Regel (1886a) provided an academic description of *I. suworowii* and cited specimens collected by A. A. Regel in 1883 in southern Tajikistan, whereas

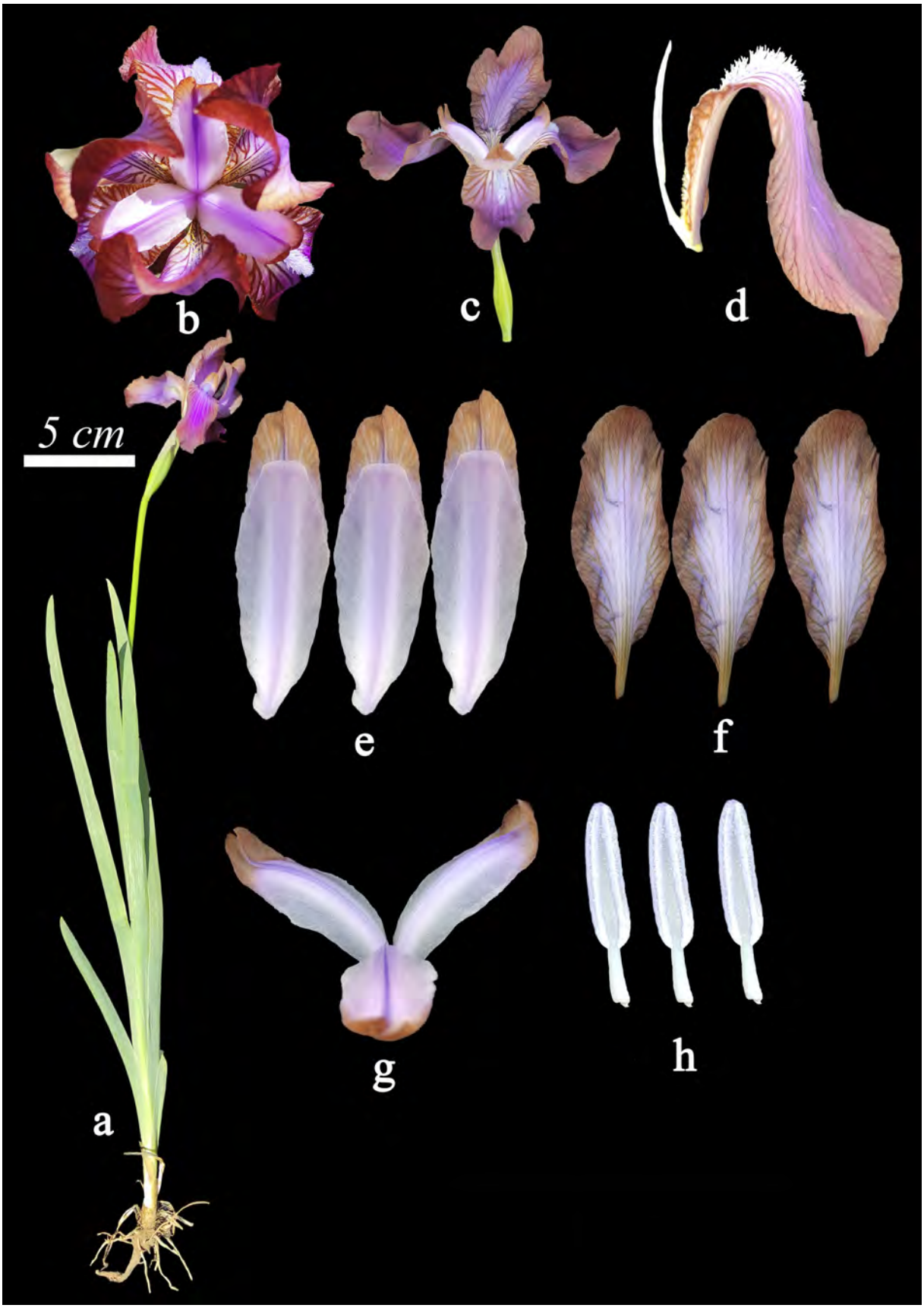


Fig. 6. Living plant of *I. stolonifera*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, g. Style arms (pistils); f. Standards (inner tepals); h. Stamina.

Regel (1886b) added details regarding the cultivation of the species, whose rhizomes were collected by A. Regel and sent to M. Leichtlin at Baden-Baden for garden cultivation. The cultivation was successful and a flower with its morphological description was sent back by Leichtlin to E. Regel, who was therefore able to update the species description and verify the taxonomic status of the plant as a separate species (Regel 1886b). According to Regel (1886a, 1886b), the flowers of *I. suworowii* had acute, elliptic-lanceolate floral parts of "transparent-green" colour with apparent "greenish-blue" veins and a conspicuous blue beard on the falls, without stolons. This description excludes *I. korolkowii* (which has broadly obovate floral parts with an inconspicuous beard), *I. hoogiana* / *darwasica* (whose flowers are conspiculusly blue or violet without brown veins) and *I. stolonifera* (with prominently brown-margined floral parts and stolons), but agrees with pale colour forms and typically narrow floral parts of *I. lineata*.

Iris lineata (Foster 1887) was described on the basis of living plants cultivated by M. Leichtlin at Baden-Baden, which were believed to have been delivered under the name *I. acutiloba* by G. Radde from the Caucasus. Foster recongnised the apparent difference of this plant from *I. acutiloba* and described it as new to science. The species description was accompanied by an excellent drawing showing a typical plant of *I. lineata* as currently understood (Vvedensky 1963; Tscherneva 1971). The species name and description belonged to M. Foster as stated in the protologue, whereas E. Regel, who signed the text, merely translated the original notes into German and Latin.

Baker (1888) examined the original descriptions of *I. suworowii* and *I. lineata* to conclude that both are based on the same cultivated plants and represent the same species. He provided a formal synonymy and a new description and drawing of the species, which were based on plants from the same stock cultivated at Kew.

Baker's synonymy and comments went apparently unnoticed by Russian researchers. Fedtschenko (1909) examined the original descriptions of *I. suworowii* and *I. darwasica* and the holotype of the latter, which was relabelled as *I. suworowii* by a preparator of the Imperial Botanical Garden in Saint-Petersburg. She concluded, in spite of the apparent mismatch of the diagnostic characters between the protologues, that the two species names are synonymous, and this synonymy has been maintained in the Russian taxonomic literature since then. In agreement with the protologues and the origin of the original material, we restore the nomenclature correctly established by Baker (1888).

The original material of *I. suworowii* consists of two herbarium gatherings from the collections of A. Regel (at LE, duplicates distributed elsewhere) and a dried flower specimen sent to E. Regel by Leichtlin (not traced). The specimens from the collections of A. Regel (cited in Regel 1886a) are apparently heterogeneous. The plants collected in "Darwas ad fl. Pändsch" (BM 000958413, LE 00050115, 00050116, 00050117) have intensely violet flowers and belong to *I. darwasica* (*I. hoogiana*); these specimens were erroneously associated with the species because of their apparent conflict with the original description but were likely another reason for O.Fedtschenko (1909) to believe that *I. suworowii* is conspecific with *I. darwasica*. The specimen collected "in montibus Kuh-i-Frusch" has brown-veined flowers and cannot belong to *I. darwasica*; its falls are apically pale-violet and therefore disagree with the characters of *I. korolkowii* but agree with *I. lineata*. This is apparently the voucher specimen for the rhizomes sent for garden cultivation, and we link both elements, the wild specimen and the illustration based on its garden propagation, by epitypification.

Description: Plants 20–40 cm tall; rhizome short, often giving rise to short stolons; stems erect, bearing 2 or 3 terminal flowers, surrounded at base with fibrous vestiges of old leaves; leaves nearly all cauline, broadly linear, attenuate toward apex, slightly recurved, ca. 15–20 cm long, ca. 5 mm wide; spathe valves carinate, acuminate, the upper one-third membranous; pedicels short; perianth tube 2.5–4 cm long; falls lamina obovate, gradually narrowed into the claw, intensely brownish-violet or brown as a

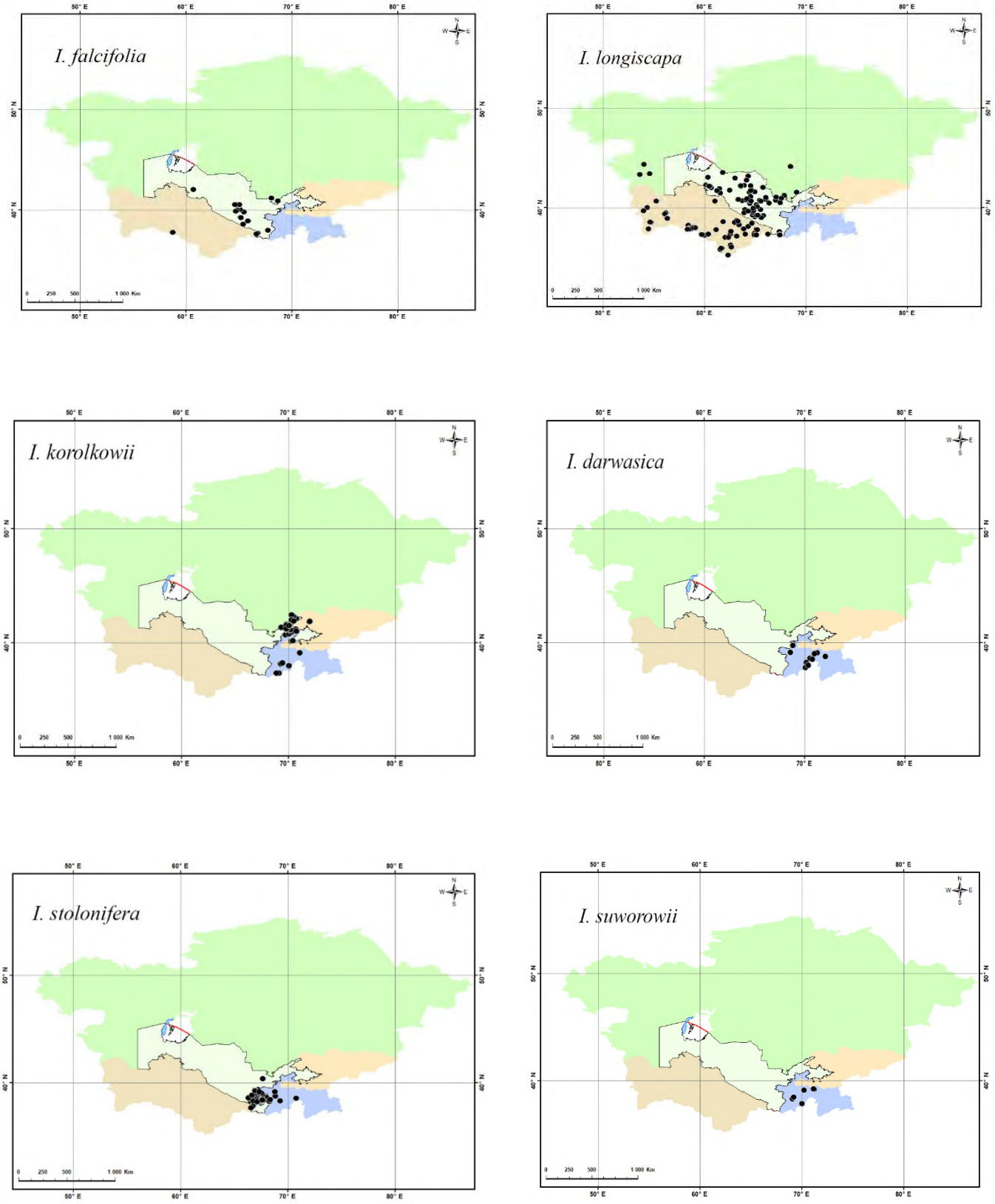


Fig. 7. Distribution of *I. falcifolia*, *I. longiscapa*, *I. korolkowii*, *I. darwasica*, *I. stolonifera* and *I. suworowii* in Central Asia.

whole, with brown or bluish-violet veins, the beard spreading onto the lamina, bluish-violet (in violet forms) or white (in brown forms); standards the same color as the falls, rather abruptly narrowed into a very narrow claw; style branches not differing in color from perianth segments; crests lanceolate, long-acuminate (Fig. 4).

Flowering: April–June.

Ecology: Mountain slopes, at altitudes of about 1600 m.

Distribution: Afghanistan, Central Asia (Tajikistan) (Fig. 7).

Material examined: Tajikistan—Vakhsh river, 26.05.1933, *Botschantzev*; near Nayza-bulak village, 02.05.1939, *Badyeva* (TASH); Peter I Range, near Sary-Obi-Shirin river, 20.07.1987, *Pimenov*, *Klyuykov*, *Vasilieva*, *Lavrova*; Komarou river valley, 3–5.07.1988, *Pimenov*, *Vasilieva*, *Lavrova*; under the pass Zardelyu, 02.05.1934, *Tscherneva* (MW); Khatlon region, near Yavan, 19.04.2017, *Ebel* (www.plantarium.ru).

8. ***Iris*** sect. ***Psammiris*** (Spach) J.J.Taylor in Proc. Biol. Soc. Washington 89(35): 417 (1976) — *Iris* subg. *Psammiris* Spach, Hist. Nat. Vég. 13: 69 (1846). Type: *Iris arenaria* Waldst. & Kit. (= *I. humilis* Georgi).

13. ***Iris bloudowii*** Ledeb., Ic. Pl. Fl. Ross. 2: 5, tab. 101 (1853) — *Iris flavissima* var. *bloudowii* (Ledeb.) Baker, Handb. Irid.: 29 (1892). Type: Russia. Irkutsk Region: "Ad Grammatucham" [Gramatukha Village], 04.05.1826, *K. von Ledebour* in Hb. Ledebour 95 (lectotype LE 01010770, designated here).

Nomenclature: Alexeeva (2012: 416) credited Grubov (1977: 97) for the typification of *Iris bloudowii*, who plainly stated just "type at LE" without any citation of a certain specimen. The type was fully cited but the type designation was not formally effected by Alexeeva (2012) either because she omitted the statement "designated here" or its equivalent. Later, Alexeeva (2018) realised her error and credited herself with the lectotypification, yet ineffectively.

Description: Plants 15–25 cm tall; rhizome stout, creeping, branched, the upper part covered with short brown fibers; stem to 30 cm long, terminating in a 2-flowered inflorescence and bearing 2–4 leaves; radical leaves clustered, surrounded at base by membranous sheaths, about equaling or slightly exceeding the stem including flowers, broadly linear or lanceolate-linear, short-acuminate, inflated, hyaline-margined; pedicels short or up to 15–20 mm long; perianth tube as long as ovary and 3–4 times the length of the segments; falls lamina obovate, slightly emarginate, yellow, bearded, gradually narrowed into the distinctly violet-veined claw; standards shorter and narrower than the falls; style crests narrowed upward, the margin irregularly toothed; capsule ovoid, 6-angled, pointed at both ends (Fig. 4).

Flowering: May–July.

Ecology: Mountains in the lower alpine zone and alpine meadows, meadows and slopes in the forest zone, wood margins and valleys of mountain streams.

Distribution: Russia (Siberia, Far East), Mongolia, China, Central Asia (Kazakhstan, Kyrgyzstan) (Fig. 9). Alexeeva (2018) stated that two species of this section occur in Kyrgyzstan, *Iris bloudowii* and *I. humilis* Georgi. This treatment contradicts the revision of Tscherneva (1971) which is followed here.

Material examined: Kazakhstan—Kizilsura, 22.06.1916, *Titov*; Aksu Kyzyl-sura, 22.06.1916, *Titov*; Koksu river valley, 16.07.1916, *Titov*; Kok-su river valley, 16–18.07.1916, *Titov*; Mountains Kar-kara, 04.07.1917, *Abolin*, *Kornev*, *Harin*; Ters-ayryk valley, 26.06.1917, *Titov*; Kak-jeta mountains, 26.07.1817, *Abolin*; Ters-Irica valley, 26.06.1917, *Titov*; near Lake Jasil-Kol, 25.06.1917, *Titov*; Tepe-arik, 26.06.1917, *Titov*; near Kara-saryk and Ak-Chunak, 21.08.1939, *Pyatayeva*; Right side of Sarkand, 21.08.1939, *Pyatayeva* (TASH); Baskarkar mountains, 07.1991, *Komarov*; Kyrgauyldy, 19.06.2005, *Epiktetov*; Kara river valley, 04.07.2009, *Epiktetov*; Kuksu river, 05.2012, *Jukova*; Tekeli, 16.05.2013, *Kolbintsev*; Dzhungarskiy Alatau, 31.05.2016, *Gorbunov*; near lake Serzhinskoe, 04.07.2018, *Bolbotov*; Southern Altai, *Kolbintsev* 22.06.2019, (www.plantarium.ru).

9. ***Iris*** sect. ***Iris***. Type: *Iris germanica* L.
= *Iris* ser. *Pumilae* G.H.M.Lawr. in Gentes Herbarum 8(4): 353 (1953) — *Iris* sect. *Pumilae* (G.H.M.Lawr.) Rodion. in Bot. Zhurn. (Saint-Petersburg) 94(3): 432 (2009). Type: *Iris pumila* L.

14. ***Iris scariosa*** Willd. ex Link in Sprengel et al., Jahrb. Gewächsk. 1(3): 71 (1820). Type: Russia. Samara Region, western side of Volga: "Iris aphylla", 08.05.1769, *P.S. Pallas* in Herb. Willdenow (lectotype B-Willd 00959010, designated here; isolectotype HAL 0109666).
= *Iris eulefeldii* Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 633 (1878). Described from China (along Talki River); type not traced.
Nomenclature: Although this species was believed to have been described from Siberia (e.g. Dietrich 1833), due to the lack of provenance in the protologue, Pallas (1771) collected his "Iris biflora" along the western side of the Volga River near Syzran Town, in European Russia. Lectotypification is needed because of the presence of two specimens previously at hands of C. Willdenow, one in his personal collection at B and another in the collection of Schlechtendal at HAL. These specimens agree with the characters provided by Rodionenko (1977) because of their narrow leaves and shorter flower tubes, and do not show the hybridisation with *I. pumila* L. (do not belong to *I. astrachanica* Rodion.).
Description: Plants 10–20 cm tall; rhizome creeping, covered at the top with short brownish fibers; stem to 15 cm long, bearing 3 or 4 leaves and terminating in a 2-flowered inflorescence; radical leaves commonly clustered, covered at base with membranous sheaths, broadly linear to sublanceolate, falcate, about as long as the stem including flowers; spathe valves membranous, commonly lilac, elliptic-lanceolate, acuminate, conduplicate; inflorescence 2-flowered; flowers lilac-violet, sometimes whitish, rarely yellow, on short pedicels or sessile; perianth tube 2–3 times the length of the ovary, about as long as the segments, slightly enlarged upward; falls lamina oblong-obovate, obtuse, gradually narrowed into the claw, white-bearded at base; standards as long as but slightly narrower than the falls; style crests elongate, acuminate, often crenate; stigmas crenate; capsule oblong-ellipsoid, 6-angled, pointed at both ends (Fig. 4).
Flowering: April–May.
Ecology: Solonetz spots and stony soil in steppes, also stony slopes of low mountains.
Distribution: Russia (Lower Volga, Caspian Sea, Siberia), Mongolia, China, Central Asia (Kazakhstan) (Fig. 9).
Material examined: Kazakhstan—Between Kara-chek and Gavrilov stations, 11.06.1917, *Titov*; Mountains Ketmen-tau, 12.08.1917, *Abolin*; near Chiili-bulak spring, 08.08.1935, *Mironov*, *Paziy*; near Buguly 13.06.1937, *Paziy* (TASH); Irtish, Koriakovo, 1840, *Karelin*, *Kiriloff*; between Brmakol and Kalkamanch, 1914, *Kutscherovskaja*; Temerlik pass, 05.07.1932, *Lipschitz*; north of Aksuat village, 12.05.1945, *Voronov*; Berkut Bien, 17.05.1957, *Gubanov*; Moikin river, 27.05.1957, *Pavlov*; upper reaches of Karagaili river, 27.05.1959, *Goloskokov*; Altyn Emel pass, 16.08.1979, *Klyuykov* (MW); Karaganda, distr. Osakarovka, Ereymentau (www.gbif.org).

15. ***Iris alberti*** Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 260 (1877). Type: Kazakhstan. "Kleine Almatinka, Abhänge bei 4000", 10.04.1877, *A. Regel 38* (lectotype LE 00050048, designated here; isolectotype LE 00050047).
Description: Plants 30–40 cm tall; rhizome short; stem to 40 cm long, branched, 2 or 3 branches bearing 1–3 flowers each; leaves broad, erect, glaucescent, slightly rounded at apex, commonly suffused with purple at base; spathe valves green, slightly inflated, margins only slightly coriaceous in flower; pedicels very short; perianth tube ca. 12 mm long, greenish, slightly enlarged upward; falls lamina obovate, cuneate at base, commonly purplish-violet, the reddish-brown-veined claw separated from the lamina by a line; standards suborbicular, the same color as the falls, lamina abruptly narrowed into the yellowish claw; style branches broad, the same color as the perianth segments, crests short, subquadrangular,

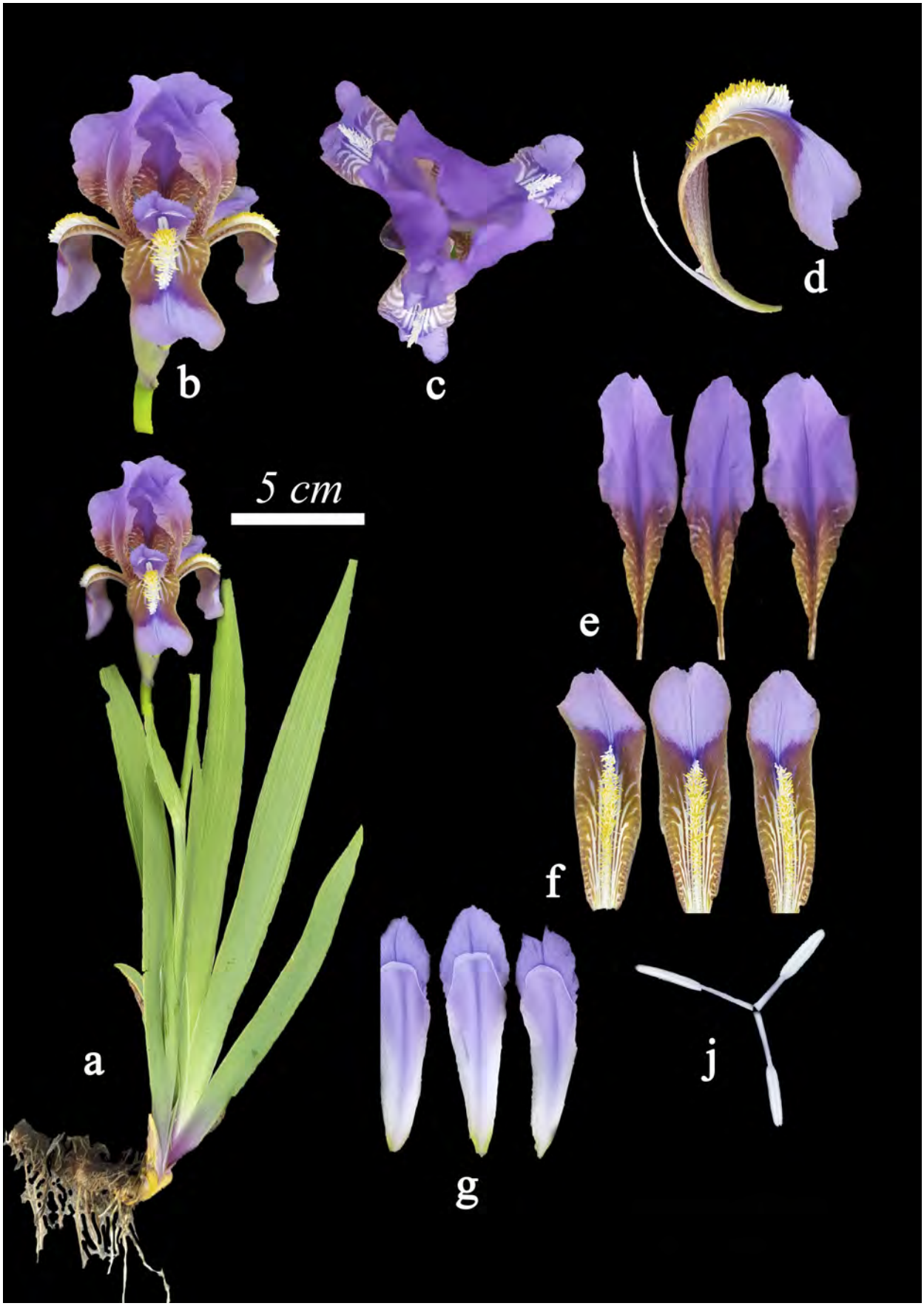


Fig. 8. Living plant of *I. alberti*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Standards (inner tepals); f. Falls (outer tepals); g. Style arms (pistils); h. Stamina.

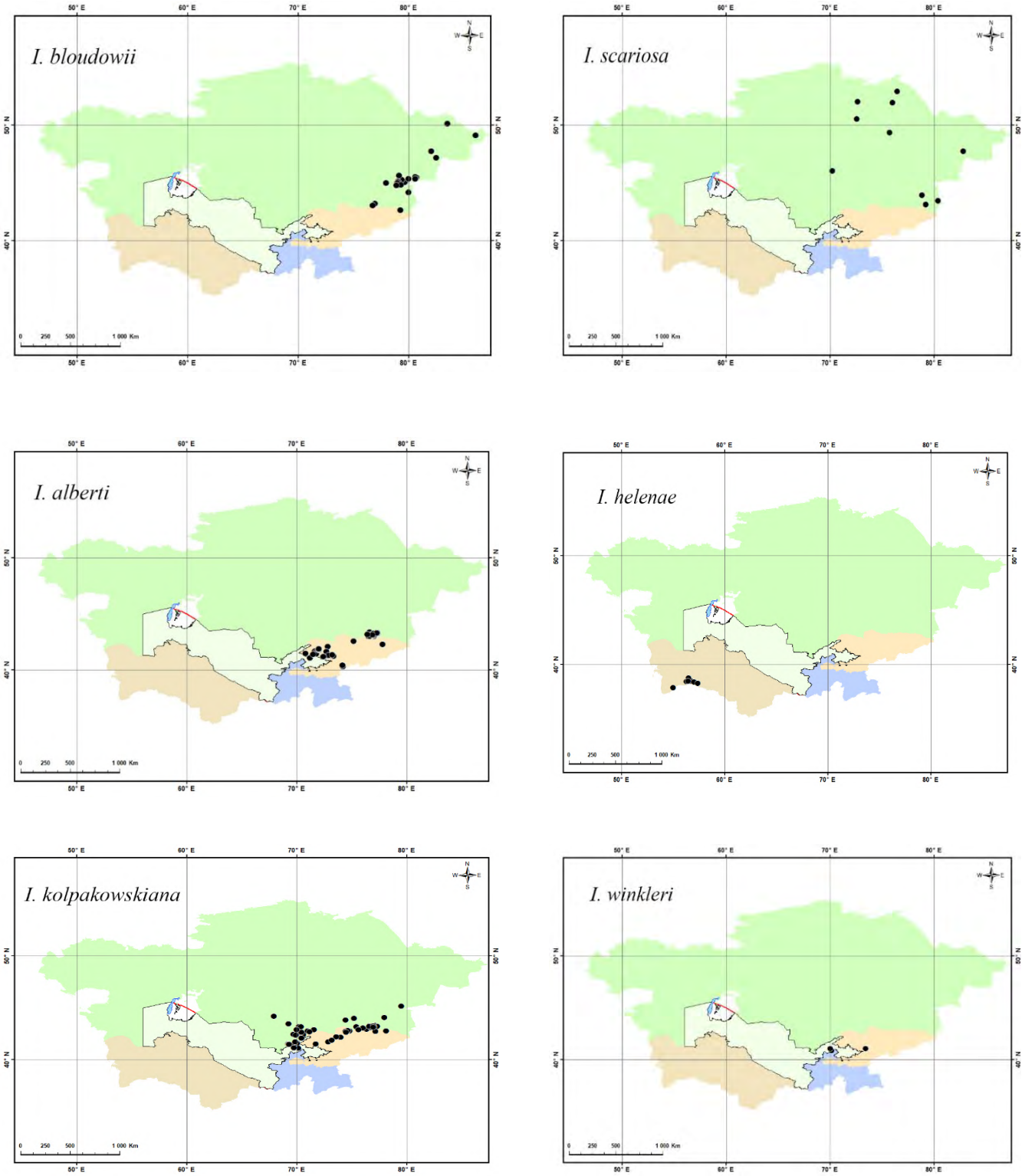


Fig. 9. Distribution of *I. bloudowii*, *I. scariosa, I. alberti*, *I. helenae*, *I. kolpakowskiana* and *I. winkleri* in Central Asia.

overlapping, spreading, upper margin serrate-crenate; stigmas broad, oblong; filaments whitish; capsule short, broad, subglobose, not distinctly angled; seeds hemispherical (Figs. 4, 8).
Flowering: April–May.
Ecology: Mixed-grass steppes in foothills.
Distribution: Central Asia (Kazakhstan, Kyrgyzstan, Uzbekistan) (Fig. 9). This species is reported from Uzbekistan for the first time here.
Material examined: Uzbekistan—Ungor-tube Mountain, 10.07.1933, *Kudryashev*, *Krasovsky*; Nanay, 08.05.2021, *Ortikov* (TASH); Pass Kumbel, Ungor Tube (www.gbif.org).
Kyrgyzstan—Near Padsha-ata-say, 19.06.0000, *Galkina*, *Nabiev*; Left side of Kegeti river, 06.05.1915, *Sovetkina*; Aksai river, 02.04.1915, *Titov*; Sarichelek, 25.07.1919, *Androsov*; Ayukti, 17.07.1927, *Abolin*; of Kara Kul valley, 25.06.1927, *Korovin*; Maily-Su, 25.06.1927, *Korovin*; upper reaches of Kara-Kuldzha river, 21.07.1927, *Sovetkina, Uspenskaya*; Sari Chelek, 06.08.1933, *Kudryashov*, *Krasovsky*; Shamurat slope, 25.06.1935, *Kazachkov*; Sari Chelek pass, 31.07.1949, *Bondarenko*; between Gava and Arslanbob, 10.08.1950, *Pyataeva*; Kara-Alma river, 26.04.1955, *Pakhomova*; near Sari Chelek lake, 17.05.1965, *Pryakhin* (TASH); Chichkan river, 26.01.1990, *Pimenov*, *Boryaev*, *Trusov*, *Saprunova*; Jalal Abad, Arisht state farm, 14.08.1945; Chatkal Range, 28.05.1958, *Gubanov*; Kochkor-tube mountain, 25.05.1960, *Pavlov*; near Sary Chelek, 11.05.1965, *Pavlov*; Chichkan river, 04.05.1986, *Kuvaev*, *Klyaznika*; Ala Buka Sai, 28.05.1958, *Gubanov*; around Ketmen-Tube, 25.05.1959, *Botbaeva*; Suusamyr Range, 26.06.1969, *Pimenov*, *Boryaev* (MW); Suusamyr mountain, Chichkan river, 18.04.2021, *Menshikova*; Sary-Chelek, 27.05.2011, *Epiktetov* (www.plantarium.ru); Chatkal Range, Kara-alma river, lake Sary-chelek, between Gava and Arslanbab, Arkit, mount Shamurat, Padsha ata, Small Karangutung (www.gbif.org).
Kazakhstan—Chemolgan, 03.05.1907, *Shigitnikov*; Malaya Almatinka, 13.05.1915, *Abolin*; Aksay river, 11.04.1915, *Titov*; Bolshaya Almatinka, 18.04.1916, *Shigitnikov*; Big Almatinka, 18.04.1916, *Abolin*; Small Almatinka, 15.05.1917, *Abolin*; around Vernensky, 06.06.1918, *Titov*; near Verny, 06.05.1920, *Sovetkina*; Zailiysky Alatau, 06.05.1920, *Sovetkina*; near Almaty, 06.05.1921, *Granitov*; Soy-Djom, 14.05.1930, *Granitova*; Talgor station, 14.05.1930, *Granitova* (TASH); Almatinka, 10.04.1877, *Regel* (LE); near Almaty, 07.05.1950, *Pavlov*; Uzun-Kargali river basin, 12.05.1963, *Goloskokov* (MW); Zailiyskiy Alatau, 10.05.2005, *Epiktetov*; Almaty, 05.05.2006, *Pirogov*; Uch-Konchur, 05.2007, *Styazhkin*; Zailiyskiy Alatau, 03.07.2009, *Epiktetov*; Zailiyskiy Alatau, 28.05.2009, *Epiktetov*; Zailiyskiy Alatau, 23.05.2010, *Styazhkin*; Zailiyskiy Alatau, 19.05.2010, *Styazhkin*; Zailiyskiy Alatau, 08.05.2010, *Styazhkin*; Almaty, 07.05.2010, *Styazhkin*; Zailiyskiy Alatau, 24.03.2010, *Styajkin*; Zailiyskiy Alatau, 15.05.2011, *Waldschmit*; Kaskelen, 26.04.2012, *Kolbintsev*; Almaty, 18.05.2014, *Kolbintsev*; Big Almaty, 05.08.2016, *Waldschmit*; near Almaty, 20.04.2016, *Kolbintsev*; (www.plantarium.ru); Bostandyk District, upper part of the Kaskelen, Almaty (www.gbif.org).

10. ***Iris*** sect. ***Oncocyclus*** (Siemssen) Baker in Gard. Chron., ser. 3, 5: 787 (1876) — *Oncocyclus* Siemssen in Bot. Zeitung (Berlin) 4: 706 (1846) — *Iris* subg. *Oncocyclus* (Siemssen) Alefeld in Bot. Zeit. 21: 296 (1863). Type: *Iris paradoxa* Stev. (lectotype designated by Lawrence (1953: 355)).

16. ***Iris helenae*** C.Koch in Wochenschr. Gartn. Pflanzenk. 13: 179 (1870), "Helena" — *Oncocyclus helenae* C.Koch in Linnaea 21: 639 (1848), nom. inval., "Helena". Described from Azerbaijan ("Helenendorf" = Göygöl); holotype destroyed at B.
= *Iris ewbankiana* Foster in Gardener's Chron., ser. 3, 29: 397, fig. 152 (1901). Described from the Kopetdag Mts. on the border of Iran and Turkmenistan ("from the mountain range which separates Persia from Trans-Caucasia, 120 versts to the west of Askabad"); type not designated.
= *Iris acutiloba* var. *lineolata* Trautv. in Trudy Imp. S.-Peterburgsk. Bot. Sada 1: 24 (1870) — *Iris lineolata* (Trautv.) Grossh., Fl. Kavkaza, ed.

2, 2: 221 (1940) — *Iris acutiloba* subsp. *lineolata* (Trautv.) Mathew & Wendelbo in Rechinger, Fl. Iran. 112: 32 (1975). Type: Azerbaijan. "Prope Diabar", 05.1870, *G. Radde* (holotype LE).

Description: Plants 8–15 cm tall; rhizome firm, compressed; stem erect, to 10 cm long, bearing a solitary terminal flower; leaves all radical, to 10 cm long and 6 mm wide, linear, subfalcate, usually not overtopping the flower; spathe valves lanceolate, acuminate, green, to 5 cm long; pedicel very short; perianth tube cylindric, ca. 5 cm long, green dotted with purple; falls lamina lanceolate, strongly deflexed, gradually passing into the claw, whitish with purplish-brown veins and a rather small round dark purplish-brown spot, the lower part covered with dark brown hairs, the claw destitute of velvety pubescence; standards commonly much longer than the falls, sometimes only slightly longer, always broader than the falls, oblong-lanceolate, acute, light brown, unspotted, veined brownish-purple; ovary cylindric, style branches more densely brown-spotted (Fig. 4).

Flowering: April.

Ecology: Dry hills.

Distribution: Turkey, Iran, Caucasus, Central Asia (Turkmenistan) (Fig. 9).

Material examined: Turkmenistan—Left side of Sumbar river, 20.04.1900, *Gnezdillo*; Kara Kala valley, 05.04.1916, *Shernzhakovskaya*; Koped Dag, Gaudach, 28.05.1916, *Shernzhakovskaya*; Gaudin, 27.04.1916, *Drobov*; near Sumakli village, 15.05.1923, *Androsov*; on the road to Tutley Kaul, 14.07.1933, *Gnezdillo* (TASH); Marv region, 2 km west near Imam-Baba (www.gbif.org).

11. ***Iris*** sect. ***Monolepis*** (Rodion.) B.Mathew in Davis & Hedge Festschrift: 87 (1989) — *Iridodictyum* sect. *Monolepis* Rodion., Rod Iris: 205 (1961) — *Alatavia* Rodion. in Bot. Zhurn. (Saint-Petersburg) 84(7): 103 (1999). Type: *Iris kolpakowskiana* Regel.

17. ***Iris kolpakowskiana*** Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 263 (1877) — *Xiphion kolpakowskianum* (Regel) Baker in Bot. Mag. 106: ad tab. 6489 (1880) — *Iridodictyum kolpakowskianum* (Regel) Rodion., Rod Iris: 202 (1961) — *Alatavia kolpakowskiana* (Regel) Rodion. in Bot. Zhurn. (Saint-Petersburg) 84(7): 104 (1999). Type: Kazakhstan. "Pr. Werny" [near Almaty], 02.04.1877, *Fetissow* (holotype LE).

= *Iris pskemensis* Rukšāns, Buried Treasures: 363, fig. 138 (2007), **syn. nov.** — *Iridodictyum pskemense* (Rukšāns) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 232(1): 61 (2015) — *Alatavia pskemensis* (Rukšāns) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 321(3): 294 (2017). Type: Uzbekistan. [Pskem Range, Ihnachsai, stony slopes, altitude 2500–3000 m.] Ex culturae in horto Jānis Rukšāns, 17.06.1998, *Rukšāns & Seisums ARJA 9865* (holotype GB).

Description: Plants 15–25 cm tall; bulb densely covered with reticulate leaf vestiges; stem short, single-flowered; leaves 3 or 4, all radical, surrounded at base by a common membranous sheath; sheath ca. 5 cm long at anthesis, linear-filiform, ribbed; spathe valves acuminate, green; pedicel 1–2 cm long; perianth tube 5–7.5 cm long; falls lanceolate, the outer side of the lamina greenish-yellow tinged with purple, the inner side reddish-purple veined with darker purple at apex, or milky white with a bright yellow crest at base, the claw yellow on both sides of the crest; standards oblong, plain pale purple; style branches pale purple; crests narrow, acuminate; stigmas entire (Figs. 4, 10).

Note: The flower colour of *Iris kolpakowskiana* is highly variable. As evident from field photographs taken in Kazakhstan and Kyrgyzstan, far away from the type locality of *I. pskemensis*, standards of this species may take either blue or lilac colour, whereas the apical blotch on its falls may occupy the complete lamina or be limited to its apical half, sometimes fading away, and the white area behind the blotch may be tiny or may expand to its basal half. Occasionally nearly pure white flowers may be found, with a pale bluish tint only or even completely without it, and also with the blotch disappearing without a trace or being replaced by longitudinal stripes. Size and shape of floral parts vary noticeably as well. The only rare difference of *I. pskemense* from *I. kolpakowskiana*, which was noted in its protologue, was a white margin

over the apical blotch on its falls, which seems to be another variant of the flower discolouration (disappearance of the blotch). Due to the wide variability of floral features in *I. kolpakowskiana*, .

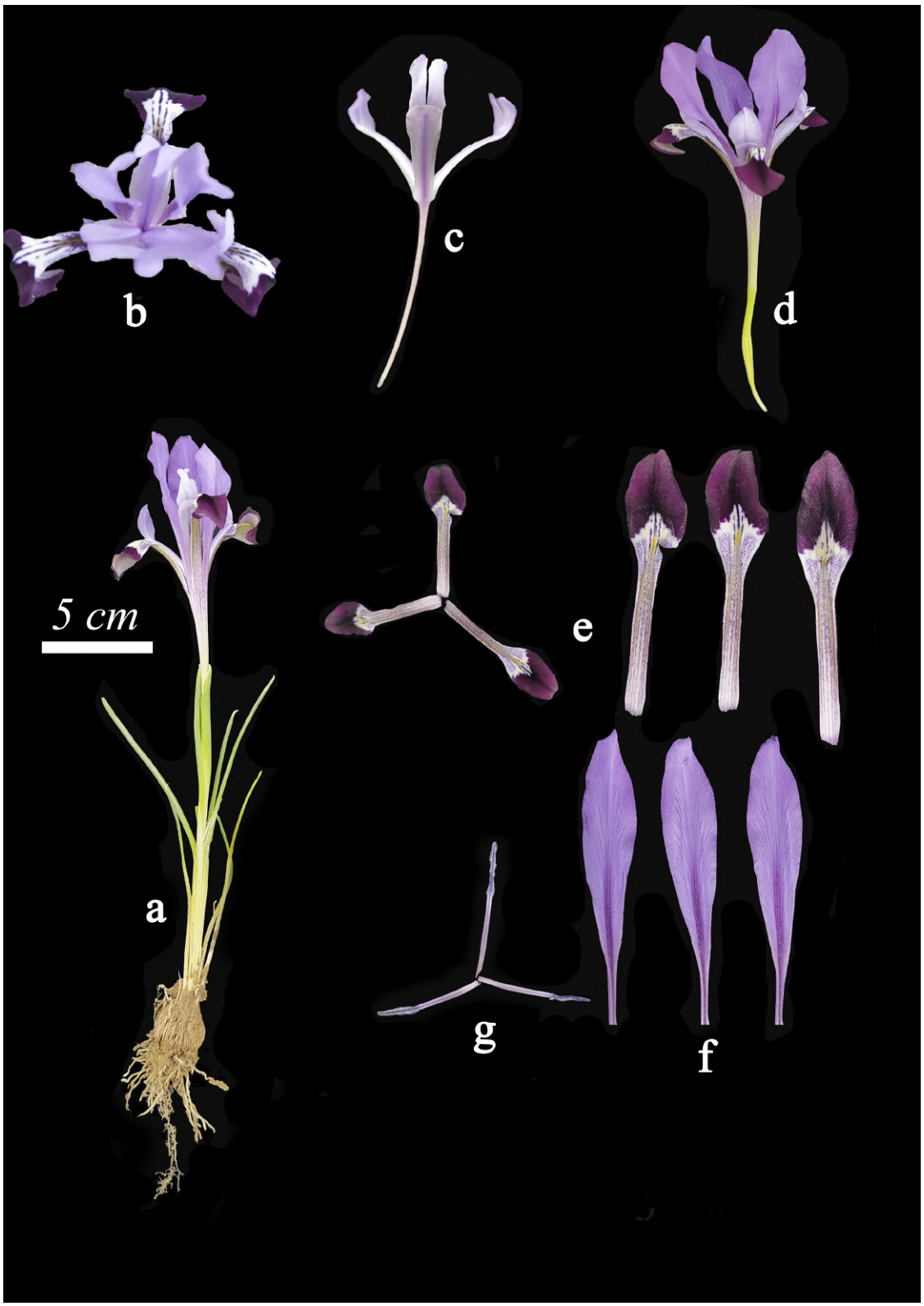


Fig. 10. Living plant of *I. kolpakowskiana*. a. Complete plant; b, d. Complete flower; c. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals); g. Stamina.

any taxonomic segregation of its local colour variants is completely unreasonable. Another warning message comes from the photographs of *I. pskemensis* taken by the species discoverer in cultivation and reproduced in Crespo et al. (2017); one of these photographs, without a white margin around the blotch, with certainty represents a typical colour variant of *I. kolpakowskiana*.

Flowering: March–May.

Ecology: Grassy and stony slopes, from foothills up to 3000 m above sea level.

Distribution: Central Asia (Kazakhstan, Kyrgyzstan, Uzbekistan) (Fig. 9).

Material examined: Uzbekistan—Near Aktash, 10.04.1922, *Korovin*; Chimgan, 22.03.1926, *Belov*; Angren valley, 02.03.1928, *Dimitriev*; Kamchiksay, 18.03.1928, *Dimitriev*; left side of Chirchik river, 04.04.1993, *Baranova*; near Sukok village, 02.04.1936; Angren river, 04.05.1945, *Korotkova*; Lashkeraksay, 24.03.1947, *Sumnevich*, *Dzhangurazov*; near Parkent, 02.03.1952, *Butkov*; Ugam Range, 31.03.1959, *Vernik*; Kainarsay, 31.03.1959, *Vernik*; Ertashsay, 23.02.1963, *Toyjanov*; between Uchterak and Chimgan, 25.03.2021, *Ortikov* (TASH); Bashkyzylsay, 15.03.2009, *Beshko*; Bashkyzylsay, 21.03.2011, *Davkaev*; Gazalkent, 29.03.2014, *Tillaev*; Krasnogorsk, 03.24.2021, *Gaziev*; Chavlisay, 03.24.2021, *Beshko*; Chimgan pass, 03.21.2021, *Tillaev* (www.plantarium.ru).

Kazakhstan—Big Almatinka, 02.03.1916, *Abolin*; Verensk, 02.03.1916, *Abolin*; Karzhan-Tau, 10.04.1922, *Korovin*; Aulieatinsky, 1922, *Chernov*; near Almaty, 02.07.1926, *Titov*; Kaplanbek, 25.03.1927, *Vvedensky*; Karatau mountains, 03.04.1930, *Lipschitz*; Karatau, near Chimkent, 12.03.1932, *Dzhemurina*; near Vernogo, 16.03.1947, *Titov*; near Sayram, 20.03.1962, *Vlasov*; river Jushale, 10.06.1966, *Mekliburya* (TASH); Kaplanbek, 15.03.1921, *Vvedensky*; Karatau mountains, 03.04.1930, *Pavlov* (MW); Boroldaytau, 18.03.2003, *Davkaev*; Kyrgauldy, 03.30.2004, *Epiktetov*; Ugam Range, 30.04.2006, *Pirogov*; Mashat pass, 8.03.2009, *Waldschmit*; Zailiyskiy Alatau, 23.03.2010, *Styazhkin*; Zhetyzhol, 01.04.2011, *Epiktetov*; Karatau, 01.05.2011, *Pirogov*; near Sergievka, 24.03.2012, *Davkaev*; Kshi-Kaindy, 19.04.2012, *Kolbintsev*; near Balykchy village, 26.03.2012, *Davkaev*; Alatau mountains, 11.04.2014, *Davkaev*; Chu-Ili mountains, 21.03.2016, *Rakhimova*; Taraz, 24.03.2017, *Kolbintsev*; canyon Mashat, 22.03.2017, *Belousov*; Taskora plateau, 30.03.2020, *Shakula*; Zhabagly, 30.03.2020, *Shakula*; Kendyktas mountains, 03.03.2020, *Evdokimov*; Upper Kurganzaz, 24.03.2021, *Kolbintsev* (www.plantarium.ru); Eastern Karatau, Karasai district (www.gbif.org).

Kyrgyzstan—Aleksandrovsky Range, 25.03.1919, *Sovetkina*; left side of Issykata river, 07.05.1920, *Titov*; near Pishpek district, 24.03.1920, *Sovetkina*; 02.05.1936, *Pyataeva*; Ay-topon, 30.05.1966, *Nikolaev* (TASH); near Frunze, 05.04.1929, *Nikitina*; Kirgiz Alatoo, 03.03.1935, *Nikitina*; Besh-Kungey, 08.04.1935, *Nikitina*; near Frunze, 19.03.1944, *Inchina*; Kirgiz Alatau, 28.03.1946, *Inchina*; Katta Tal, 22.03.1947, *Kashenko*; Kirgiz Alatau, 17.03.1947, *Popova*; Beshkungay, 17.03.1948, *Nikitina*; near Frunze, 19.03.1950, *Yakubova*; Suusamyr, 24.05.1952, *Sudak*; Karapol, 11.05.1953, *Kornevi*, *Ribin*; Akterak, 24.04.1955, *Meldopov*; near Frunze, 05.04.1956, *Nikitina*; Chon-aryk, 20.03.1958, *Nikitina*, *Ubukoeva*, *Faleeva*; Suusamyr, 24.05.1959, *Sudnitsina*; Kungey Alatau, 12.04.1962, *Arbaeva*; Kara-Kulja river, 24.05.1966, *Gorbunova*; Khaydarkan, 23.06.1968, *Ubukeva*, *Sultakova*; Suusamyr, 25.04.1976, *Aydarova*, *Ubukeeva*, *Sultanova*; Kirgiz Range, 20.04.1977, *Gorbunova*; Ala-archa, 08.04.1979, *Aydarova*, *Mamataliev*, *Amankhanova*; Kenkul river, 05.05.1989, *Shimalov*; Isfayramsay, 10.04.1990, *Sheremetova* (FRU); upper reaches of Susamyr river, 29.04.2015, *Zhukova*; Orto-Sai, 23.03.2015, *Chulanova*; Suusamyr river valley, 31.03.2018, *Epiktetov*; around Tuzovka, 15.03.2020, *Menshikova* (www.plantarium.ru); Jalal-Abad, Suusamyr (www.gbif.org).

18. ***Iris winkleri*** Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 677 (1883) — *Xiphion winkleri* (Regel) Vved. in Kudriashev, Fl. Uzbekistan 1: 511 (1941) — *Iridodictyum winkleri* (Regel) Rodion., Rod Iris: 202 (1961) —

Alatavia winkleri (Regel) Rodion. in Bot. Zhurn. (Saint-Petersburg) 84(7): 104 (1999). Type: Kyrgyzstan. "Pass Jassy zw. Urgent [Özgön Town] und der Alabuga [River], 9–11000 ft.", 01.06.1880, *A. Regel* (holotype LE).

Taxonomy: This species is very poorly known and its distribution has never been properly traced. Its taxonomic status has been in doubt (Mathew 1989).

Description: Plants 10–20 cm tall; bulb covered with brown membranes not separating into fibers; stem short, single-flowered; leaves 3 or 4, all radical, enclosed at base in a common membranous sheath, falcate, linear-filiform, 1–2 mm wide; spathe valves acuminate, green; pedicel ca. 1 cm long; falls lanceolate, bluish-violet; standards oblong, slightly broader than the outer; style crests oblong (Fig. 4).

Flowering: April–May.

Ecology: High mountain zone, at altitudes about 3000 m.

Distribution: Central Asia (Kazakhstan, Kyrgyzstan, Uzbekistan) (Fig. 9).

Material examined: Kazakhstan—Kastek pass, 17.04.1916, *Abolin* (TASH).

Uzbekistan—Angrensay, Itelge, 03.05.1931, *Mackewicz*; Shevalysay, 22.04.1957, *Ustinova* (TASH).

Kyrgyzstan—Kugart (www.gbif.org).

12. ***Iris*** sect. ***Reticulatae*** Dykes, Gen. Iris: 220 (1913) — *Iris* subg. *Hermodactyloides* Spach in Ann. Sci. Nat., ser. 3, 5: 91 (1846) — *Iridodictyum* Rodion., Rod Iris: 201 (1961). Type: *Iris reticulata* M.Bieb.

19. ***Iris reticulata*** M.Bieb., Fl. Taur.-Cauc. 1: 34 (1808). Type: Georgia. "Ex Iberia", *J.F. Adams* in Herb. Bieberstein (holotype LE).

= *Iridodictyum kopetdaghense* Kurbanov in Bot. Zhurn. (Saint-Petersburg) 83(6): 110 (1998), **syn. nov.** — *Iris kurbanovii* F.O.Khass. & Rakhimova in Stapfia 97: 177 (2012), nom. illeg. superfl. Type: Turkmenistan. Western Kopetdagh, 10 км south of Garaul village, near melting snow, on clayey slopes among juniper trees, 2000 m a.s.l., 06.04.1997, *J. Kurbanov, N. Cherepova, V. Cherepov* (holotype LE).

Nomenclature: Khassanov & Rakhimova (2012) transferred *Iridodictyum kopetdaghense* Kurbanov to the genus *Iris*, for which a replacement name (*Iris kurbanovii*) was coined to avoid homonymy with *Iris kopetdagensis* "Vved.) B.Mathew & Wendelbo". However, the latter name was not validly published at that time due to the lack of type designation (see under *Iris kopetdagensis*); for this reason, the transfer of "kopetdaghense" was formally available to *Iris* and the replacement name published by Khassanov & Rakhimova (2012) became therefore illegitimate. Checking the description provided by Kurbanov (1998), we can see that the alleged differences between this species and *I. reticulata* cannot stand because nearly terete leaves can be found in the latter species, whereas its leaves can elongate quite typically up to about 40 cm after anthesis. Both species are treated as synonyms here, so that no new name is required for *I. kurbanovii* nom. illeg.

Description: Plants up to 15 cm in flower, 30 cm in fruit; bulb ca. 1.5 cm in diameter, well developed; roots thickened, fusiform; stem usually with closely approximate leaves and imperceptible internodes; leaves falcate, gradually attenuate toward the apex, marginate, margin scabrous; lower leaves (1)2–3 cm wide; flowers 2–6(10), blue to violet or pale discoloured, inodorous; perianth tube 4–4.5 cm long; falls 3.5–5.5 cm long; claw gradually narrowed at both ends, broadest about the middle and there 6–8 mm wide, marked with green veins; lamina elliptic, obtuse, 6–10 × 10–15 mm, green-veined, a triangular white blotch occupying one-third of the surface; crest yellow, undissected, crenate; standards linear, acute, ca. 1 cm long; style crests obliquely triangular, acutish, 3–4 × 10–14 mm, margins entire; anthers white, with yellowish pollen (Fig. 12).

Flowering: April.

Ecology: Stony and clayey slopes in the lower mountain zone.

Distribution: Turkey, Iraq, Iran, Afghanistan, Caucasus (Armenia, Azerbaijan, Georgia, Russia), Central Asia (Turkmenistan) (Fig. 11).

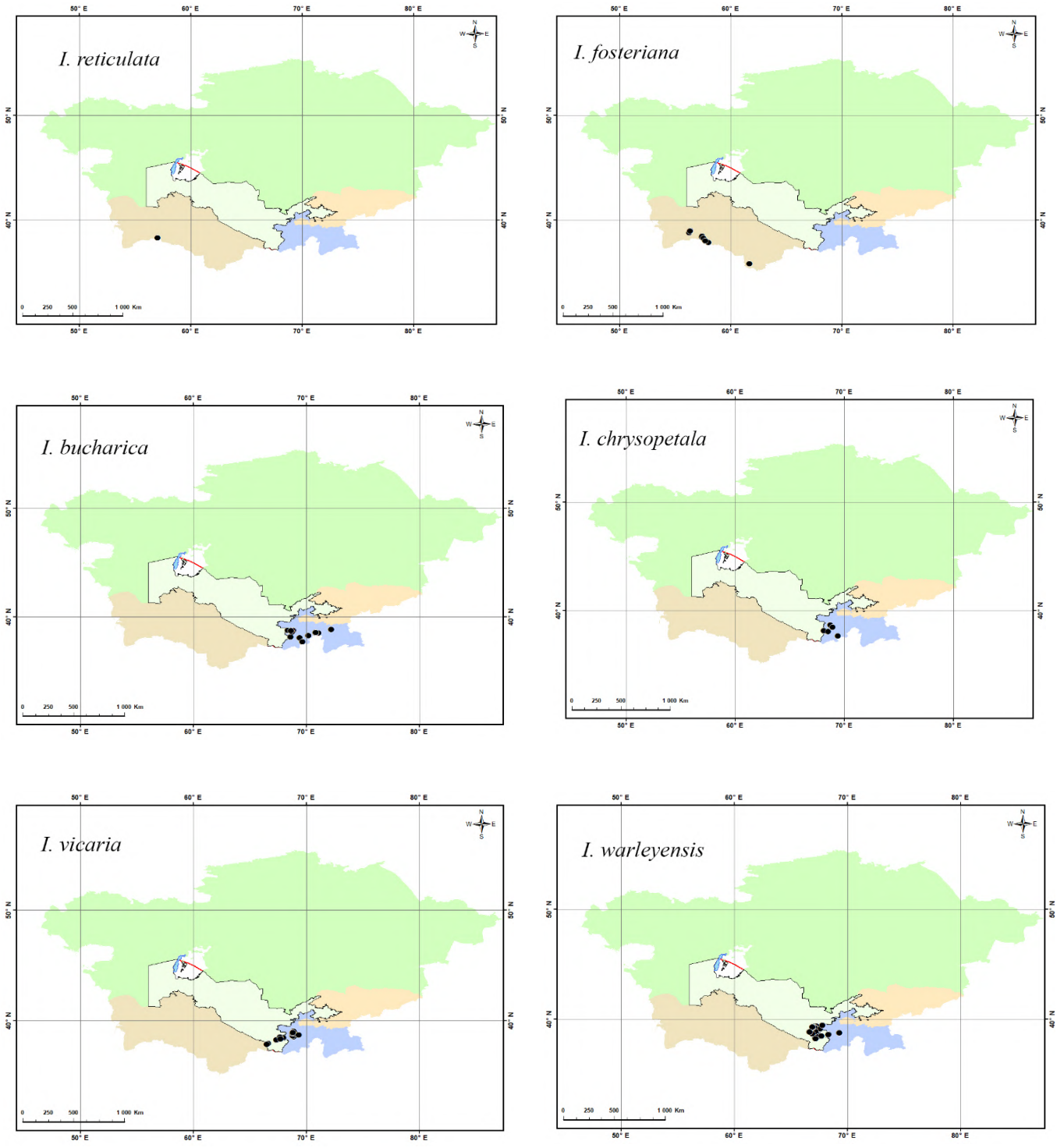


Fig. 11. Distribution of *I. reticulata*, *I. fosteriana, I. bucharica*, *I. chrysopetala*, *I. vicaria* and *I. warleyensis* in Central Asia.

Material examined: Turkmenistan—Ssarijal, 03.04.1844, *Kolenati*; Kopetdagh, near Garaul village, 06.04.1997, *Cherepova, Cherepov, Kurbanov* (LE); near Garaul village, 18.04.2019, *Pavlenko* (www.plantarium.ru).

13. ***Iris*** sect. ***Juno*** (Tratt.) Maxim. in Bull. Acad. Imp. Sci. Saint-Ptersbourg 26: 505 (1880) — *Juno* Tratt., Ausw. Gartenpfl. 1: 135 (1821) — *Iris* subgen. *Scorpiris* Spach, Hist. Nat. Vg. 13: 91 (1846) — *Xiphion* subg. *Juno* (Tratt.) Baker in J. Bot. 9: 11 (1871) — *Xiphion* sect. *Juno* (Tratt.) Baker in Gard. Chron., n.s., 5: 527 (1876). Type: *Iris persica* L. (lectotype designated by Rodionenko (1961: 206)).

13a. ***Iris fosteriana*** aggr.

20. ***Iris fosteriana*** Aitch. & Baker in Trans. Linn. Soc. Bot. 3: 114 (1888) — *Juno fosteriana* (Aitch. & Baker) Rodion., Rod Iris: 208 (1961). Type: Afghanistan. "Badghiz", 15.03.1885, *J.E.T. Aitchison 128* (lectotype BM 000465000, designated by Wendelbo & Mathew (1975: 57)).

Description: Plants 10–20 cm tall; stem roots thickened, cordlike; bulb ca. 2 cm in diameter, elongated, poorly developed; stem (5)10–15 cm long, elongating in fruit; leaves approximate in flower, distant in fruit, falcate, the nearly parallel margins smooth; lower leaves 5–8 mm wide; flowers 1(2); perianth tube 3–4 cm long; falls pale yellow, ca. 4 cm long, with parallel margins, 5 mm wide, gradually enlarged into the lamina; lamina obovate, obtuse or emarginate, with a large dark yellow blotch, 1–1.5 cm long, crest undissected; standards violet, ca. 2 cm long, lamina obovate, obtuse, mostly abruptly narrowed into the claw; style crests obliquely triangular, obtuse, crenate, 4–10 mm long; stigmas commonly reniform (Fig. 12).

Flowering: March–April.

Ecology: Gravelly slopes in the steppe mountain zone.

Distribution: Iran, Afghanistan, Central Asia (Turkmenistan) (Fig. 11).

Material examined: Turkmenistan—Ashgabat, *Litwinow* 2047; between Kurtsu and Gaudan, *Lipsky* (LE); between Poole and Hafuna, 29.08.1930, *Linczevsky*; 25 km from Koyne-Kesiryano to Arvaz, 24.04.1957, *Ashirova* (TASH); near Kyzyl Arvat mountains, 29.02.1952, *Judova*; near Kyzyl Arvat mountains, 23.02.1952, *Judova*; Germab road, 28.04.1990, *Pimenov*, *Klyuykov*; Kov-ata, 05.04.1994, *Polevova*, *Stefanchuk* (MW); Serdar, 04.2014, *Pavlenko*; near Serdar, 03.2018, *Pavlenko*; Doyran, 11.03.2018, *Pavlenko*; near Chalsu well, 24.02.2019, *Pavlenko* (www.plantarium.ru).

13b. ***Iris bucharica*** aggr.

21. ***Iris bucharica*** Foster in Gardener's Chron., ser. 3, 31: 385 (1902) — *Juno bucharica* (Foster) Vved. in Kudriashov, Fl. Uzbekistan 1: 517 (1941). Type: *Iris bucharica* in Gard. Chron., ser. 3, 31: 387, f. 135 (1902) (lectotype designated by Boltenkov (2016b: 224)).

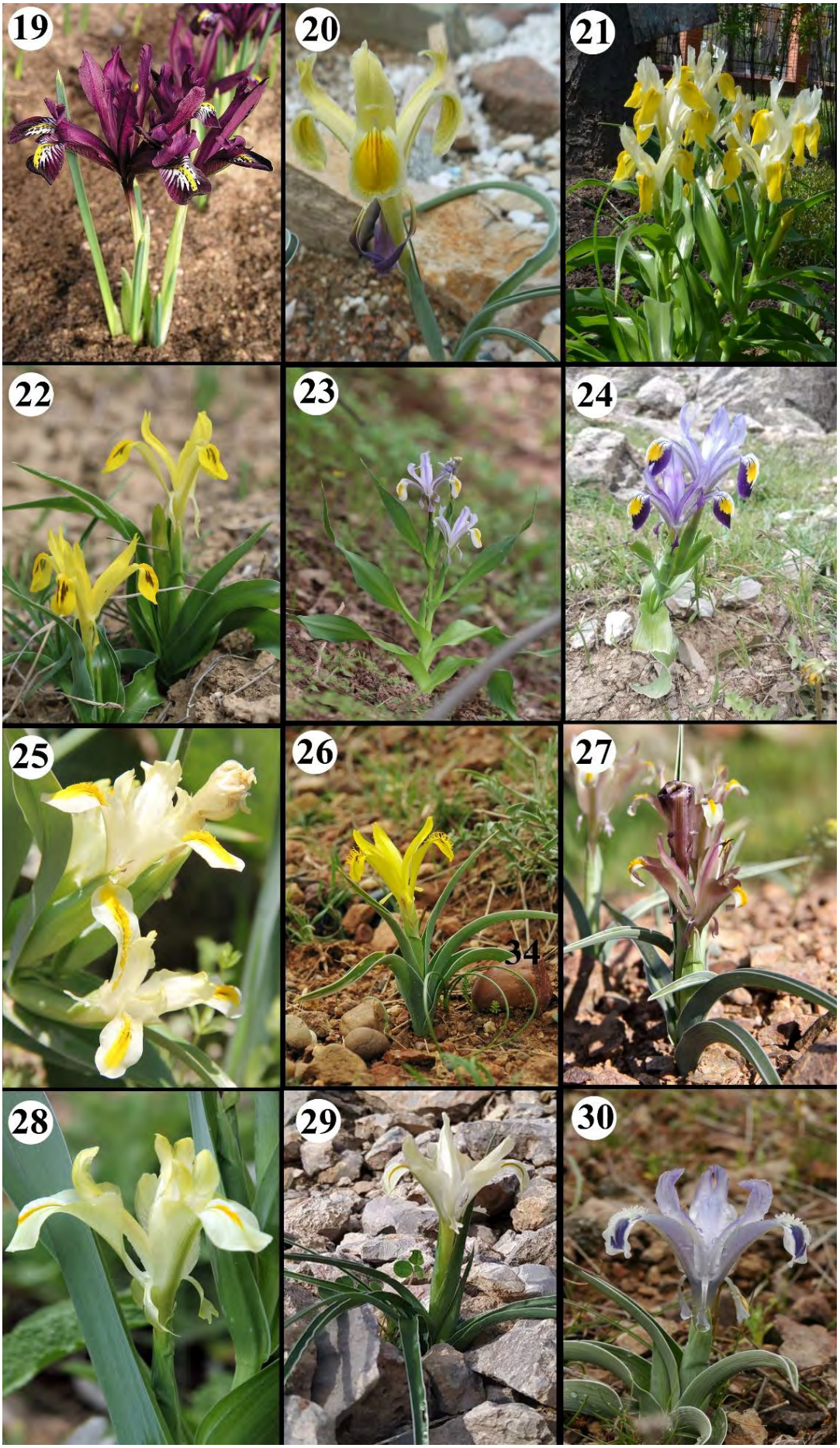
Description: Plants up to 40 cm tall. Bulbs 1.5–2.5 cm in diam., storage roots thickened; stem with prominently elongated internodes during the whole period of flowering and fruiting; leaves 7–12, glossy green above, slightly greyish-green beneath, 1.5–3 cm wide, carinate, undulate, gradually tapering to the apex, margins narrowly cartilaginous and ciliate; flowers 3–6; flower tube 3.5–5 cm long, greenish-yellow; outer tepals 3.5–4.5 cm long, claw unwinged but gradually broadening towards the lamina, 6–10 mm wide, white, lamina reflexed downwards, broadly elliptic, 1–2 cm long, 0.8–2 cm wide, abruptly expanded from the claw, almost completely bright yellow except for the back side, with a few violet stripes along the golden-coloured, entire crest. Inner tepals 1–2 cm long, obliquely reflexed downwards, lamina rhombic or elliptic, often mucronate, white; style branches 1–1.5 cm long, 0.4–0.7 mm wide, white; anthers and pollen white (Fig. 12).

Flowering: March–April.

Ecology: Pebble beds and slopes in the lower mountain zone.

Distribution: Afghanistan, Central Asia: Southern Pamir-Alay (Tajikistan, Uzbekistan) (Fig. 11). The occurrence in Turkmenistan (Nikitin & Geldykhanov 1988) was not confirmed by Sennikov et al. (2022).

Material examined: Uzbekistan—Near Sangardak waterfall, 20.08.1960, *Tuychiev*, *Khodjimatov*; Denau–Chagam road, 06.03.2020, *Ortikov* (TASH).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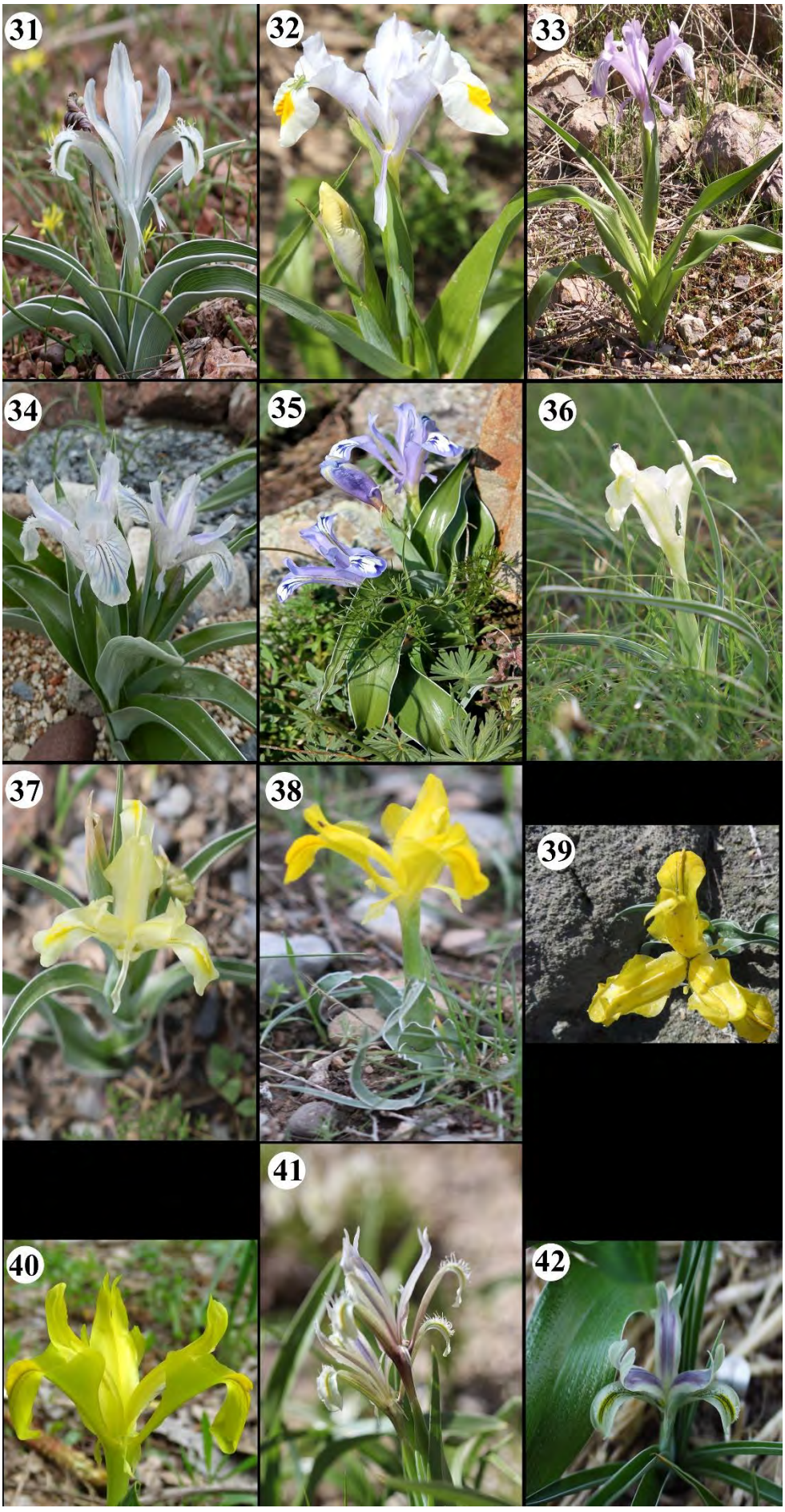
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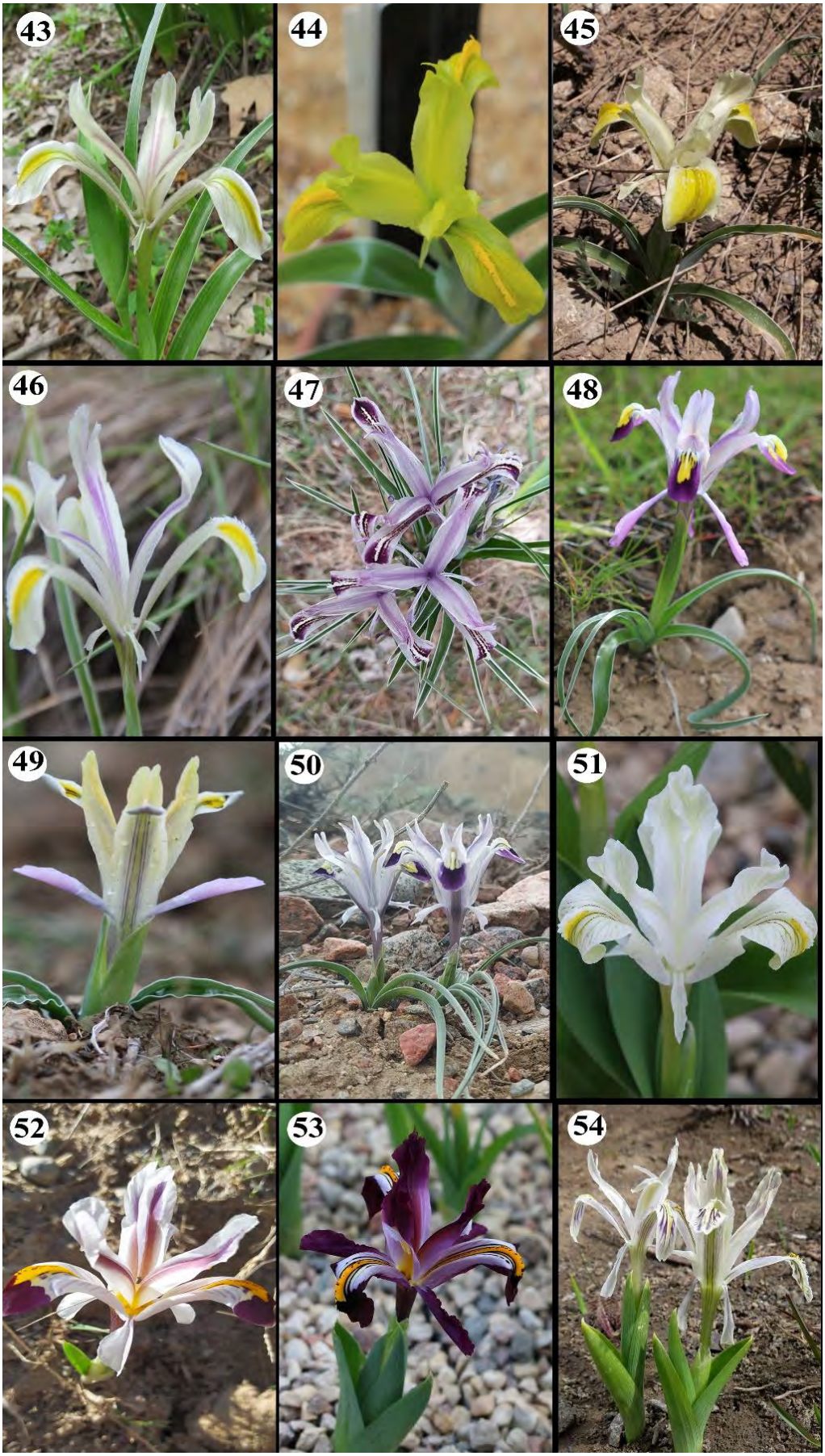
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Fig. 12. Species of *I.* sect. *Reticulatae*: 19. *I. reticulata*; *I.* sect. *Juno*: 20. *I. fosteriana*, 21. *I. bucharica*, 22. *I. chrysopetala*, 23. *I. vicaria*, 24. *I. warleyensis*, 25. *I. orchioides*, 26. *I. tubergeniana*, 27. *I. capnoides*, 28. *I. pseudocapnoides*, 29. *I. austrotschatkalica*, 30. *I. kuschakewiczii*, 31. *I. subdecolorata*, 32. *I. magnifica*, 33. *I. graeberiana*, 34. *I. albomarginata*, 35 *I. willmottiana*, 36. *I. hippolyti*, 37. *I. maracandica*, 38. *I. svetlanae*, 39. *I. victoris*, 40. *I. petri*, 41. *I. parvula*, 42. *I. tadshikorum*, 43. *I. khassanovii*, 44. *I. vvedenskyi*, 45. *I. linifolia*, 46. *I. linifoliiformis*, 47. *I. narynensis*, 48. *I. narbutii*, 49. *I. rudolphii*, 50. *I. rodionenkoi*; *I.* sect. *Physocaulon*: 51. *I. zaprjagajevii*, 52. *I. nicolai*, 53. *I. rosenbachiana*, 54. *I. baldschuanica*, 55. *I. drepanophylla*, 56. *I. kopetdagensis*, 57. *I. leptorrhiza*.

Tajikistan—Near Regar village, 16.04.1928, *Vvedensky*; Varzob river, 20–22.04.1957, *Grigoryev*; on the southern side of Stalinabad, 20.03.1957, *Grigoryev*; Khoja-Mumin mountains, 30.05.1960, *Botschantzev*; Hodja-mumyn, 30.05.1960, *Botschatzeva*; Tut-Kaul sai, 06.06.1960, *Botschantzev* (TASH); Singisafat, 29.04.2011, *Davkaev*; near Luchob village, 21.04.2011, *Davkaev*; road Dushanbe–Luchob, 21.04.2011, *Davkaev*; near Obikiik village, 20.04.2017, *Ebel* (www.plantarium.ru); Tarvil Dara, Shurabad, Khatlon, Murghob, North of Varsob village, north of Kala-i-Khumb, Gorno-Badakshan, north of Gissar (www.gbif.org).

22. ***Iris chrysopetala*** Sennikov, F.O.Khass. & Pulatov in Memoranda Soc. Fauna Fl. Fenn. 98: 15 (2022). Type: Uzbekistan. Surxondaryo Region: Bobotog Range, north of Oqmachit Village, 735 m a.s.l., 08.03.2021, *O. Turginov & S. Pulatov* (holotype TASH; isotypes H, LE).

Description: Plants up to 30(40) cm tall.; bulbs 1.5–2 cm in diam., storage roots thickened; stem with short (sometimes barely visible) internodes during the period of flowering, usually elongated at the fruiting time; leaves 6–8, glossy green above, slightly greyish-green beneath, 1.5–3 cm wide, carinate, undulate, gradually tapering to the apex, margins narrowly cartilaginous and ciliate; flowers 1–4(5); flower tube 3.5–5 cm long, greenish-yellow; outer tepals 3.5–4.5 cm long, claw unwinged but gradually broadening towards the lamina, 7–10 mm wide, pale or bright yellow, lamina reflexed downwards, narrowly elliptic, gradually expanded from the claw, 1.2–1.8 cm long, 1–1.5 cm wide, almost completely golden yellow except for the back side, usually with strong violet stripes along the golden-coloured, entire crest; inner tepals 1–2.5 cm long, reflexed downwards, lamina narrowly rhombic, often mucronate, pale yellow; style branches 1–1.5 cm

long, 0.4–0.7 mm wide, pale or bright yellow; anthers and pollen whitish (Figs. 12, 13).
Flowering: March–April.
Ecology: Grasslands and shrublands in the lower mountain zone, at altitudes between 600 and 1200 m a.s.l.
Distribution: Afghanistan, Central Asia: Southern Pamir-Alay (Tajikistan, Turkmenistan (possible occurrence), Uzbekistan) (Fig. 11).
Material examined: Uzbekistan—Between Argamchi and Chagam villages, 03.06.2020, *Turginov, Pulatov, Ortikov*; mountain Babatag, near Chagam village, 02.04.2021, *Turginov, Pulatov, Akbarov, Jabborov, Turdiboev* (TASH).
Tajikistan—(www.gbif.org).

23. ***Iris vicaria*** Vved. in Komarov, Fl. USSR 4: 569 (1935) — *Iris orchioides* var. *coerulea* Baker, Handb. Irid.: 46 (1892) — *Juno vicaria* (Vved.) Vved. in Kudriashev, Fl. Uzbekistan 1: 569 (1941). Type: Uzbekistan. Surxondaryo Region: "Inter lapides ad declivia saxosa in montibus Hissaricis supra p. Schargun, alt. ca. 1250 m", 14.04.1928, *A.I. Vvedensky* [= Herbarium Florae URSS no. 5449] (neotype TASH0000322, designated by Vvedensky (1935b: 570, 1975: 61); isoneotypes BM000832580, E00705955, LE0050124, LE0050125, MW0021782 etc.).
Nomenclature: The nomenclature of this species follows Sennikov et al. (2022b).
Description: Plants up to 40 cm tall.; bulbs 1–3 cm in diam., storage roots thickened; stem with prominently elongated internodes during the whole period of flowering and fruiting; leaves 8–12, glossy green above, slightly greyish-green beneath, 1.5–3 cm wide, carinate, undulate, gradually tapering to the apex, margins narrowly cartilaginous and ciliate; flowers 3–6; flower tube 4–4.5 cm long, pale violet; outer tepals 4–5.5 cm long, claw unwinged but gradually broadening towards the lamina, 5–10 mm wide, pale violet, lamina reflexed downwards, narrowly elliptic, gradually expanded from the claw, 1.2–1.7 cm long, 0.8–1.4 cm wide, pale violet (sometimes nearly white) along margins, bright yellow blotched with barely recognizable violet stripes along the whitish, entire crest. Inner tepals 2–2.5 cm long, obliquely reflexed downwards, lamina narrowly rhombic or elliptic, often mucronate, pale violet; style branches 1–2 cm long, 0.4–0.6 mm wide, pale violet; anthers and pollen whitish (Figs. 12, 14).
Flowering: March–April.
Ecology: Stony slopes and among rocks in the lower mountain zone.
Distribution: Central Asia: Western Pamir-Alay (Tajikistan, Turkmenistan, Uzbekistan) (Fig. 11).
Material examined: Uzbekistan—Chulbayir, 24.04.1926, *Vvedensky*; Mirshodi, 06.04.1928, *Vvedensky*; Saricha, 16–17.06.1928, *Linczevsky*; Shargun, 04.04.1928, *Vvedensky*; Tashkak, 27.04.1930, *Botschantzev*, *Vvedensky*; Derbend village, 28.05.1933, *Butkov*; Babatag Range, 17.05.1941, *Lopott*, *Pynkhasov*; Shargun, 05.1966, *Kajumov*; left side of Sangardak river, 07.05.1979, *Pimenov*, *Klyuykov*, *Baranova*, *Boryaev*, *Vasilieva*; Sangardak, 11.04.2022, *Ortikov* (TASH); Shargun, 04.04.1928, *Vvedensky*; Sina, 24.04.1928, *Vvedensky*; Khandiza river, 07.05.1979, *Pimenov*, *Klyuykov*, *Baranova*, *Boryaev*, *Vasilieva* (MW); Saukbulak mountain, 20.04.2019, *Gaziev* (www.plantarium.ru).
Tajikistan—Varzob village, 20.05.1934, *Vvedensky*; Varzob, 18.04.1957, *Grigoryev*; Kandara river, 18.04.1957, *Grigoryev*; Tarnab river, 24.04.1957, *Grigoryev*; Varzob village, 22.04.1957, *Grigoryev* (TASH); Khondara, 21.04.2011, *Pankratov*; Kho'ja-Obigarm river, 06.05.2011, *Pankratov*; Kondara river, 24.04.2017, *Ebel* (www.plantarium.ru).
Turkmenistan—Khodzhafilata, 07.05.1915, *Popov*; Tengedara, 23.04.1916, *Popov* (TASH).

24. ***Iris warleyensis*** Foster in Gardener's Chron. 31: 386, fig. 134 (1902) — *Juno warleyensis* (Foster) Vved. in Kudriashev, Fl. Uzbekistan 1: 517 (1941). Type: *Iris warleyensis* in Gardener's Chron. 31: 386, fig. 134 (1902) (lectotype designated by Boltenkov (2016b: 231)).
Description: Plants up to 35 cm tall; bulbs 1.5–3 cm in diam., storage roots slightly thickened; stem with prominently elongated internodes during the whole period of flowering and fruiting; leaves 7–10, glossy green above, slightly greyish-green beneath, 1.5–3 cm wide, carinate, undulate, gradually tapering to the apex, margins narrowly

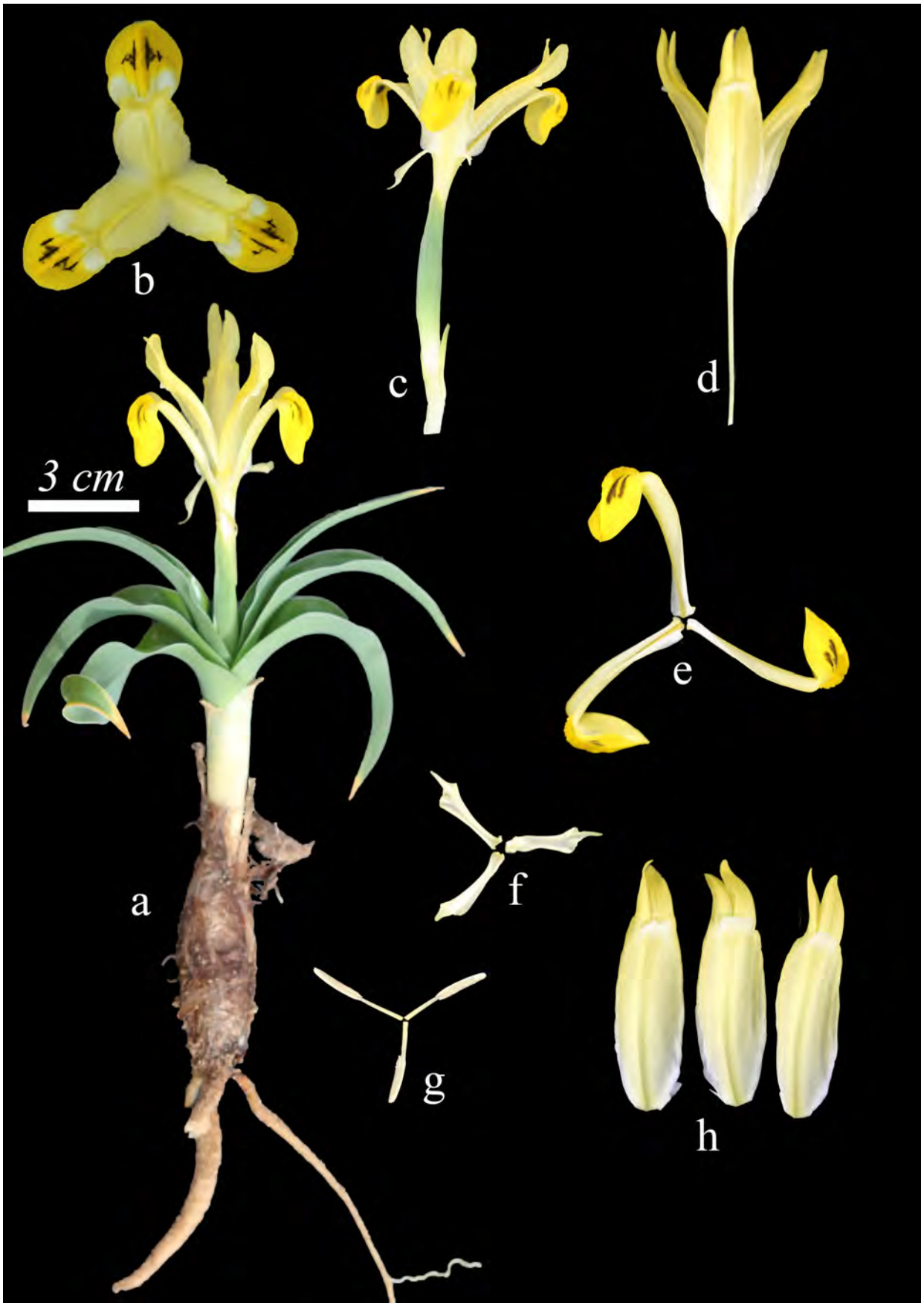

Fig. 13. Living plant of *I. chrysopetala*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals); g. Stamina, h. Style arms (pistils).

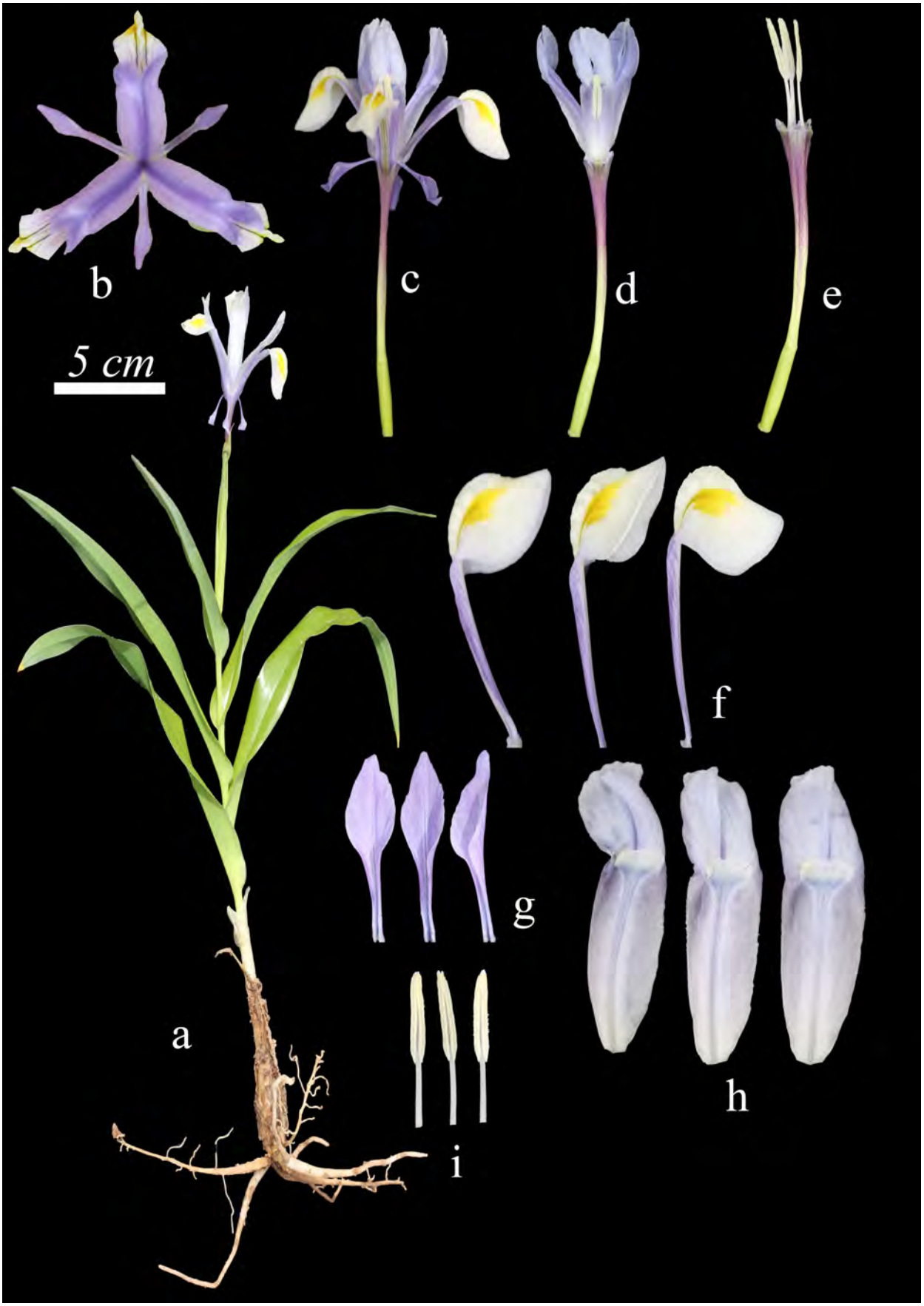

Fig. 14. Living plant of *I. vicaria*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina; f. Falls (outer tepals); g. Standards (inner tepals); h. Style arms (pistils).

cartilaginous and ciliate; flowers 2–4; flower tube 4–4.5 cm long, greenish violet; outer tepals 4–5.5 cm long, claw unwinged but gradually broadening towards the lamina, 7–12 mm wide, pale violet, lamina reflexed downwards, broadly elliptic, abruptly expanded from the claw, 1–1.5 cm long, 1.5–2 cm wide, broadly dark violet along margins, bright yellow blotched without violet stripes along the whitish, entire crest. Inner tepals 1.2–2 cm long, obliquely reflexed downwards, lamina narrowly rhombic or elliptic, often mucronate, dark violet; style branches 1–1.5 cm long, 0.4–0.7 mm wide, pale or intensely violet; anthers and pollen whitish (Fig. 12).

Flowering: March–April.

Ecology: Stony slopes in the lower mountain zone.

Distribution: Central Asia: Western and Southern Pamir-Alay (Tajikistan, Uzbekistan) (Fig. 11). The occurrence in Turkmenistan (Nikitin & Geldykhanov 1988) was not confirmed by Sennikov et al. (2022).

Material examined: Uzbekistan—Takhta-Karacha pass, 16.04.1915, *Popov*; Kitob, Shut, 18.05.1916, *Popov*; near Uordan village, 05.07.1927, *Kultiasov*, *Granitov*; Bul-bulzorsai, 15.04.1930, *Nikanorov*; Ketman-Chapti Range, 20.05.1930, *Lepeshkin*; Amankutan dacha, 22.05.1933, *Drobov*, *Sakhobitdinov*; Saylyk river, 02.05.1936, *Gnezdillo*; Khizil-gaza pass, 21.06.1936, *Botschantzev*, *Butkov*; near Zarmas village, 16.07.1936, *Botschantzev*, *Butkov*; Chakman-kuydy pass, 18.06.1936, *Botschantzev*, *Butkov*; near Ishan village, 19.05.1936, *Gnezdillo*; pass Rabat, 19.05.1936, *Gnezdillo*; Kungus Khan pass, 20.05.1936, *Gnezdillo*; Beshnau, 24.06.1937, *Kudryashev*; near Chopukh village, 31.07.1937, *Kudryashev*; Kyr-tau mountains, 19.05.1937, *Gnezdillo*; Kyzyk-Imchak, 22.08.1937, *Kudryashev*; Oyborik, 07.06.1940, *Arhireev*; river Kizildarya, 02.09.1941, *Koshurnikova*; near Ishkent village, 17.04.1942, *Arnoldi*; Sherjan-say, 17.04.1942, *Khudoyberganov*; Sangardak River, 04.06.1948, *Pyataeva*; Bakhchi-say river, 02.06.1948, *Pyataeva*; Takhta-Karacha, 13.06.1954, *Pyatayeva*; mountain Kizil-kishlak, 03.05.1964, *Khalikov*; Amankutan, 28.04.1965, *Pryakhin*; Amankutan, 09.04.2021, *Ortikov* (TASH); Sangardak, 04.04.1948, *Pyataeva*; between O‘rtadara and Kani villages, 02.05.1979, *Pimenov*, *Klyuykov*, *Boryaev*, *Baranova*, *Vasilieva* (MW); Kitab Pass, 06.04.2010, *Gaziev*; Humman village, 29.04.2013, *Tillaev*; Takhta-Karacha pass, 16.04.2016, *Beshko*; near Tuda village, 17.04.2021, *Karimov* (www.plantarium.ru); Yukory-Tersak, between Urta Dara and Langar (www.gbif.org).

Tajikistan—Sarda-i-miona river, 27.06.1930, *Paziy*, *Mir*; Pishti-ishona village, 30.06.1930, *Kudryashev* (TASH); Tautash pass, 24.06.1988, *Pimenov*, *Vasilieva*, *Lavrova*, *Kuznetsova* (MW).

13c. ***Iris orchioides*** aggr.

25. ***Iris orchioides*** Carrière in Rev. Hort. 52: 337 (1880) — *Juno orchioides* (Carrière) Vved. in Kudriashev, Fl. Uzbekistan 1: 519 (1941). Type: *Iris orchioides* in Rev. Hort. 52: 337, f. 68 (1880) (lectotype designated by Boltenkov (2016b: 230)); Kazakhstan. Tian-Shan occidentalis, in collibus argillosis circa st. v. f. Darbaza, 07.04.1923, *E. Korovin, M. Kultiassov, M. Popov & A. Vvedensky* [Herbarium Florae URSS No. 5538] (epitype LE 00050145, designated by Boltenkov (2016b: 230); isoepitypi BM 001191245, E 00705960, L 1473040, LE 00050144, P 02163488, TASH etc.).

Nomenclature: The problems connected with the current typification are discussed in Sennikov et al. (2022) and Sennikov (2022).

Description: Plants up to 30 cm tall; roots cordlike, little thickened; bulb ca. 2 cm in diameter, well developed; stem (10–)20(30) cm long, leaves subdistant, internodes distinct at least by the end of flowering; leaves pale green, falcate or rarely nearly straight, gradually attenuate toward apex, marginate, margin more or less scabrous; lower leaves 1.5–3(4.5) cm wide; flowers (1–)3–4(–8), pale yellow, in fading anthocianin-tinged, inodorous or faintly scented; perianth tube 3–6 cm long, often violet; falls 3–4.5 cm long, pale yellow; claw strongly winged, 1.5–2.5 cm wide in enlarged part and 6–9 mm at base; lamina elliptic, slightly narrowed toward base, often emarginate at apex, 8–12 × 12–18 mm, the large dark yellow well defined blotch occupying nearly the entire surface and sometimes dotted violet-green on the sides of the

crest; crest dark yellow, reaching far down the claw, sometimes to its base, undissected crenate on the lamina, dissected on the claw; standards 7–15 mm long, pale yellow, lamina trilobed, acute; style crests pale yellow, obliquely triangular, obtusish, 4–6 × 9–10 mm, margins entire; stigma obreniform; anthers and pollen whitish (Figs. 12, 15).

Flowering: March–July.

Ecology: Stony clayey slopes, from foothills up to 2000 m.

Distribution: Central Asia: Western Tian-Shan (Kyrgyzstan, Kazakhstan, Tajikistan, Uzbekistan) (Fig. 16).

Material examined: Uzbekistan—Chimgan, 30.07.1920, *Vasiliev*; Big Chimgan, 30.07.1920, *Vasiliev*; Big Chimgan, 08.07.1920, *Vasiliev*; Big Chimgan, 22.04.1921, *Bulgakov*; Ak-tash, 21.04.1921, *Baranov*; Kaplanbek, 12.04.1921, *Vvedensky*; Maidantau valley river, 13.08.1922, *Baranov*; Ak-kavak, 02.05.1922, *Korovin*; Bakhmalsay, 05.07.1922, *Babueva*; Ak-kavak, 02.05.1922, *Korovin*; Chimgan, 15.07.1923, *Baranov*; Big Chimgan, 22.04.1923, *Baranov*; Big Chimgan, 15.07.1923, *Baranov*; Chimgan, 22.06.1923, *Baranov*; Chimgan, 14.08.1925, *Gomolitsky*; Ak-tash, 19–20.04.1925, *Linczevsky*; Chimgan, 30.04.1925, *Gomolitsky*; Aktash, 28.04.1926, *Raykova*; Kaplanbek, 05.1926, *Linczevsky*; Chimgan, 08.06.1927, *Gomolitsky*; Chimgan station, 30.04.1927, *Gomolitzky*; Chimgan, 01.05.1929, *Gomolitsky*; Itelgesay, 18.06.1931, *Matskevich*; Big Chimgan, 04.06.1934, *Alexeeva*; Guralash, 31.05.1935, *Zakrzhevsky*; Kurama, 14.04.1936, *Komarova*; Karzhantau Range, 1937, *Gishin*, *Janaeva*, S*aranskaya*, *Tsvetkov*; Korajantau, 1937, *Saranskaya*; Kyzyl-Sai river valley, 31.05.1939, *Butkov*; Kizil-say, 31.05.1939, *Butkov*; Sukak-say, 31.05.1939, *Butkov*; Turkestan Range, 08–14.06.1939, *Arifkhanova*; Sukok village, 18.04.1940, *Vvedensky*; Tashkent Alatau, Sukok village, 18.04.1940, *Vvedensky*; Lashkeraksay river, 13.05.1940, *Korotkova*; Lashkaraksay, 20.04.1941, *Krassovsky*; Guralash, 28.05.1944, *Nazarenko*; Guralash, 23.04.1947, *Nazarenko*; Kulsay, 19–24.05.1947, *Nazarenko*; Iransay, 08.05.1953, *Nazarenko*; Abdzhassay, 28.05.1954, *Butkov*; Lashkerelsay, between Gushsay and Lashkerek, 28.05.1954, *Butkov*; Angren, 26.05.1954, *Nabiev*; Chatkal Range, Adamtash pass, 02.08.1954, *Butkov*, *Maylun*; Karamazar, 30.05.1954, *Vernik*, *Nabiev*; Kosh-Davan pass, 28.06.1954, *Nabiev*, *Li*; Kurama Range, Abjas-say, 06.05.1957, *Kamalov*; Kulsay, 24.05.1961, *Gordova*; Zarkentsay, 22.05.1962, *Adilov*, *Zuckerwanik*; Pskem Range, Oygaing, 04.06.1963, *Puchkova*; Oygaing river, 05.06.1963, *Akhunov*; Barkrak-say, 05.06.1963, *Puchkova*; Oygaying, 05.06.1963, *Akhunov*; left side of Abzhassai, 29.05.1965, *Balaevich*; Abjazsay, 29.05.1965, *Balajievich*; Angren river, 14–15.04.1984, *Nabiev*, *Butkov*; Big Chimgan, 15.05.2020, *Jabborov*, *Turdiev*; Chadak, 26.04.2012, *Karimov* (TASH); Maydantal, 18.05.1958, *Pavlov*; Sukok river, 30.04.1963, *Pavlov* (MW); Big Chimgan mountain, 16.05.2010, *Tillaev*; Chimgan, 14.05.2011, *Gaziev*; Chimgan, 08.06.2013, *Gaziev*; Aksay, 16.05.2014, *Beshko*; Akhangaran river basin, 23.04.2017, *Beshko*; Chatkal, 26.04.2021, *Gaziev* (www.plantarium.ru).

Tajikistan—Kansay, 1939, *Azbukin*; Bortashsay, 25.05.1957 (TASH).

Kyrgyzstan—Issikati river 03.05.1915, *Sovetkina*; Between Darboza and Nayzak, 02.04.1916, *Kultiasov*; Kurdai pass, 15.04.1924, *Titov*; Jebalatau, 26.07.1928, *Granitov*; Tyuya-jailau, 29.05.1954, *Aleksandrova*; *Bystrovsky*, 23.04.1958, *Gubanov*; Kumushtag, 09.05.1958, *Gubanov*; Karabolta, 12.05.1986, *Pavlov* (TASH); Kuksay river, 21.05.1985, *Pimenov*, *Melibaev* (MW); Talas, 27.04.2011, *Lazkov*; Ak-Tash mountains, 06.04.2016, *Naumenko*; Kara-Balta river valley, 05.04.2016, *Naumenko*; Chatkal mountain range, 13.04.2018, *Lazkov* (www.plantarium.ru).

Kazakhstan—Karatau Range, 06.04.1916, *Raykova*; Aulieata, 30.04.1916, *Sovetkina*; Chimkent Alatau, 09.06.1924, *Mokieva*; Alimtau, 03.06.1960, *Pryakhin*; Sary-Agach, 02.04.1929, *Linczevsky*; Aulieata, 31.03.1916, *Sovetkina*; Sariagach, 02.04.1929, *Linczevsky*; Kaplanbek, 1930, *Botschantzev*; Chimkent district, 02.04.1923, *Samovich*; Aksuu, 02.04.1924, *Sovetkina*; Sary-agach, 01.05.1916, *Kultiasov*; Sary-agach, 15.04.1924, *Mokieva*; Daubabi, 30.05.1924, *Sovetkina*; between Suzak and

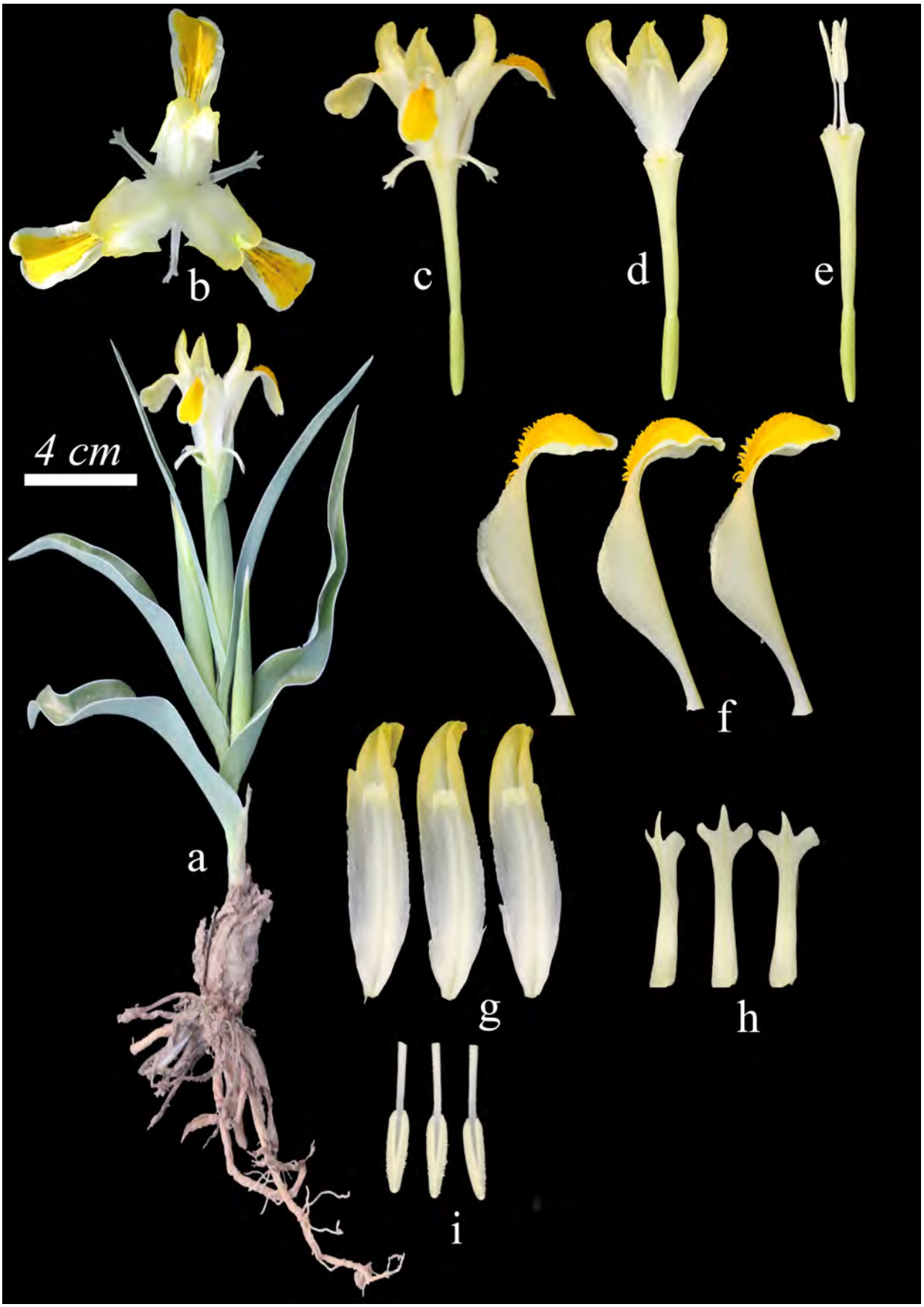

Fig. 15. Living plant of *I. orchioides*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina, f. Falls (outer tepals); h. Standards (inner tepals); g. Style arms (pistils).

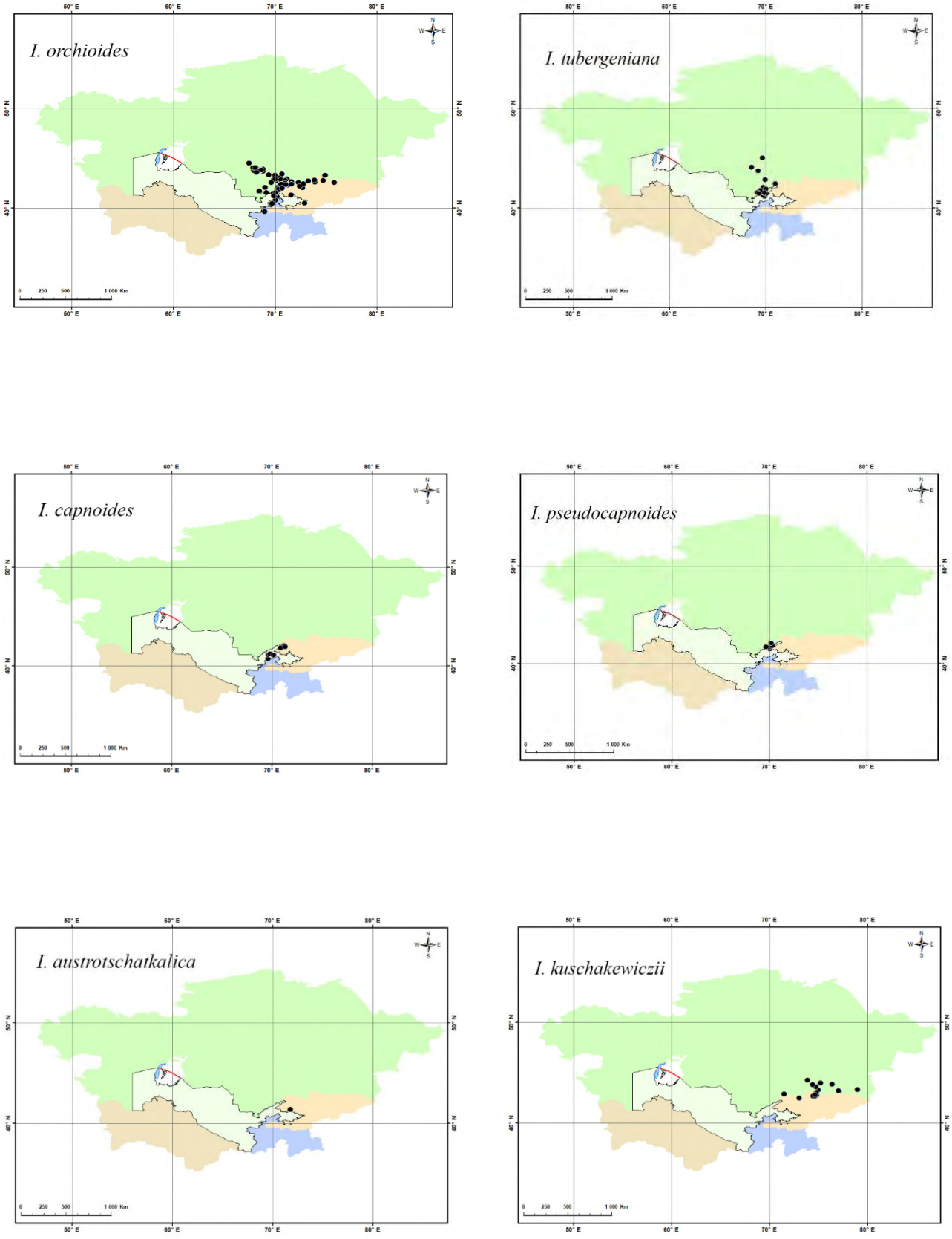

Fig. 16. Distribution of *I. orchioides*, *I. tubergeniana*, *I. capnoides*, *I. pseudocapnoides*, *I. austrotschatkalica* and *I. kuschakewiczii* in Central Asia.

Chulakkurgan, 25.05.1989, *Mukumov*; Kaplanbek, 12.04.1921, *Vvedensky*; Djebaltau, 26.07.1928, *Granitov*; Karatau mountains, 04.07.1923, *Mokieva*; Mindkilke, 05.07.1923; Alimtau, 14.04.1984, *Melibaev*; Karasay, 10.05.1935, *Pyataeva*; Jellaghan-ata, 13.05.1934, *Pyataeva*; Karatau moutain, 27.04.1930, *Gavlov*; near Tabaykurgan village, 27.04.1930, *Gavlov*; Karatau mountains, 03.04.1936, *Pyataeva*; (TASH); Darboza station, 07.04.1923, *Vvedensky*; Kuyuk Mountains, 01.05.1939, *Pavlov*; Kayindy Pass, 31.07.1948, *Pavlov*; Kyzyljar, 28.04.1969, *Shmarina*, *Rusov*; Beltau mountain, 26.05.1976, *Pimenov*, *Klyuykov*,*Cherneva*, *Vasilieva*; Kumysty river, 18.05.1985, *Pimenov*, *Melibaev*; Alimtau, 25.04.1986, *Pimenov*, *Klyuykov*; Montayntash station, 29.04.1987, *Pimenov*, *Vasilieva* (MW); Talas Alatau, 04.2006, *Waldschmit*; Sazanata, 30.04.2006, *Davkaev*; Boralday, 15.05.2008, *Pirogov*; Kuyuk pass, 02.04.2009, *Belousov*; Tayaksaldy, 10.05.2010, *Belousov*; Besaryk river, 29.04.2011, *Pirogov*; Sazanata, 05.05.2011, *Pirogov*; Boroldaytau, 01.05.2012, *Davkayev*; Kazanbulak, 24.04.2013, *Ebel*; Akkul, 17.04.2014, *Kolbintsev*; Sazanata, 07.05.2014, *Davkaev*; Karatau, 18.04.2015, *Gorbunov*; Karatau, 13.04.2015, *Davkaev*; Ulkunburultau mountains, 21.03.2016, *Kolbintsev*; Kuyuk pass, 27.03.2016, *Davkaev*; Kyrgyz mountain range, 13.04.2016, *Kolbintsev*; Kuyuk pass, 25.03.2016, *Waldschmit*; lake Akkol, 23.04.2017, *Kolbintsev*; Karatau, 04.04.2017, *Kolbintsev*; Aksu-Dzhabagly, 24.04.2018, *Epiktetov*; Aksu, 08.05.2018, *Belousov*; Koksay canyon, 23.04.2018, *Epiktetov*; Kuyuk Pass, 04.04.2020, *Belousov*; Karatau mountains, 08.04.2021, *Kolbintsev* (www.plantarium.ru).

26. ***Iris tubergeniana*** Foster in Gardener‘s Chron. 25: 225 (1899) — *Juno tubergeniana* (Foster) Vved. in Kudriashev, Fl. Uzbekistan 1: 520 (1941). Type: Kazakhstan. “Ad declivia saxosa-argillosa circa st. Darbaza”, 02.03.1922, *Vvedensky, Korovin* (neotype LE 00050146, designated by Boltenkov (2016b: 230)).

Description: Plants up to 15 cm tall; roots cordlike, only slightly thickened; bulb ca. 2 cm in diameter, well developed; stem ca. 10 cm long, with approximate leaves and imperceptible internodes; leaves pale green, falcate, gradually attenuate toward apex, marginate, margin more or less scabrous; lower leaves 1.5–2.5 cm wide; flowers 1–3, yellow, lustrous, inodorous; perianth tube 4.5–5 cm long, slightly suffused with violet; falls 4–4.5 cm long, yellow; claw winged, ca. 1 cm wide in the enlarged part and 5 mm at base, faintly marked with greenish-violet longitudinal veins and dotted along the midvein; lamina obovate, narrowed toward base, 1 × 1.5 cm, dark yellow, with violet-green spots on the sides of the crest; crest dark yellow, reaching down to the middle of the claw, dissected; standards ca. 1.5 cm long, yellow, lamina trilobed, acute; style crests yellow, obliquely triangular, obtusish, 4 × 9 mm, margins entire; stigmas elongate-semicircular; anthers and pollen whitish (Figs. 12, 18).

Flowering: March–April.

Ecology: Clayey hills in the foothill zone.

Distribution: Central Asia: Western Tian-Shan (Kazakhstan, Uzbekistan) (Fig. 16).

Material examined: Uzbekistan—Galavasay, 1951, *Butkov*; Iransay, 19.04.1953, *Nazarenko*; right side of Chirchik river, 04.04.1955, *Ubaydullaev*; Bashkyzylsay, 10.04.1959, *Kartashev*; Parkent Reserve, 30.03.1961, *Petrov*; Khumsan, 31.03.1961; May village, 30.03.1994, *Glavatskaya*, *Bakanova*; Gazalkent, 30.03.2021, *Ortikov* (TASH); Bashkyzylsay, 21.03.2011, *Davkaev*; Gazalkent, 20.04.2013, *Gaziev*; Gazalkent, 24.03.2013, *Gaziev*; Kungirbuka Mount, 29.03.2014, *Tillaev*; Beldersay, 17.05.2014, *Tillaev*; Maisky village, 26.03.2016, *Tillaev*; Beldersay, 19.04.2016, *Beshko*; between Maisky and Turkestan, 20.03.2018, *Tillaev*; Maisky, foothills, 14.03.2019, *Gaziev* (www.plantarium.ru)

Kazakhstan—Kaplanbek, 12.04.1921, *Vvedensky*; Lakes Ak-kul, 26.05.1925, *Sovetkina*; Aulie-Atinsk, 26.05.1925, *Sovetkina*; hills near Kaplanbek, 19.04.1933, *students*; between Chulak-kurgan and Suzak villages, 14.05.1936, *Mironov*, *Paziy* (TASH); Keles river, 09.04.1921, *Abolin*; Kaplanbek, 05.05.1921, *Abolin*; near Darbaza station, 27–28.03.1922, *Vvedensky*, *Korovin* (MW); Sazanata, 30.04.2006, *Pirogov*;

Sazanata, 07.05.2014, *Davkaev*; Kazygurt pass, 21.03.2019, *Epiktetov* (www.plantarium.ru).

27. ***Iris capnoides*** (Vved.) T.Hall & Seisums in Bot. J. Linn. Soc. 167(3): 300 (2011) — *Juno capnoides* Vved. in Vvedensky & Kovalevskaya, Opred. Rast. Sred. Azii 2: 321 (1971). Type: Uzbekistan. Mountain forest reserve, Bashkyzylsay River basin, western slope exposure in the upper reaches of the Iransaj River, on dry rocky stream bed, 10.05.1953, *L. Nazarenko 30* (holotype TASH 0000312, isotype TASH 0000313).

Description: Plants up to 20 cm tall; rhizomes swollen; bulbs ovoid, 1.5–2 cm wide, with grey thin tunics; stem 8–15 cm, with abbreviated internodes; leaves falcate, 10–15 mm wide; flowers 1–3, pale violet with darker veins; tube 4.5–5.5 cm long, grey-green; falls 3–4 cm long, lamina 17–22 mm wide, claw broadly expanded, crest yellow, undissected; standards 13–17 mm long, trilobed (Figs. 12, 19).

Flowering: March–April.

Ecology: Gravelly slopes in the middle mountain zone, at altitudes of 1200–1800 m.

Distribution: Western Tian-Shan (Uzbekistan) (Fig. 16).

Material examined: Uzbekistan—Ugam river valley, 22.06.1921, *Uranov*; Iran-say, 19.05.1953, *Nazarenko*; Ikhnach-say, 26.07.1959, *Butkov*, Maylun, *Niyazov*; Bashkyzylsay, 22.05.1962, *Adylov*, *Zuckerwanik*; Sichashma-say, 23.05.1962, *Adylov*, *Zuckerwanik*; Zarkentsay, 23.05.1962, *Zuckerwanik*; Takhtasang-say, 22.05.1962, *Adylov*, *Zuckerwanik*; Tokmak [Tokmak-Saldy] pass, 29.04.1962, *Markova*; Bashkyzylsay, 20.05.1967, *Puchkova*; Kattasay river basin, 19.04.2014, *Tojibaev*; Yangiabad, 13.04.2022, *Ortikov* (TASH); Yangiabad, 23.04.2017, *Beshko* (www.plantarium.ru); Chatkal Range Sukok/Sanginek village, Rukšāns (www.plantarium.ru).

28. ***Iris pseudocapnoides*** Rukšāns, Buried Treasures: 362, fig. 108, 109 (2007) — *Juno pseudocapnoides* (Rukšāns) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 232(1): 54 (2015). Type: Uzbekistan. [Chimgan, on rocky outcrops, Rukšāns 1975.] Ex culturae in horto Jānis Rukšāns, 28.04.1996, *Rukšāns & Seisums ARJA 9622* (holotype GB).

Description: Plants up to 40 cm tall; rhizomes long, swollen; stems up to 30 cm, with elongated internodes; leaves carinate, 25–30 mm wide; flowers 2–5, pale yellow to whitish; falls lamina with a narrow golden blotch, crest white, toothed, claw prominently expanded; standards 17–22 mm long, trilobed (Figs. 12, 17).

Flowering: March–May.

Ecology: On rocky and shallow-earth slopes in the lower mountain zone, at altitudes of 800–1200 m.

Distribution: Central Asia: Western Tian-Shan: Pskem Range (Kazakhstan, Uzbekistan) (Fig. 16). The occurrence in Kazakhstan was reported by Ivaschenko (2019).

Material examined: Uzbekistan—Pskem river valley, Tepar-say, 18.05.1965, *Pyatayeva*; Hodjikent, 23.04.2021, *Turdiev*; Chimgan, 12.05.2021, *Ortikov* (TASH); Chimgan, 05.2006, *Kreitsberg*; Katta-Koksay, 05.05.2012, *Gaziev*; near Khumsan, 13.04.2013, *Gaziev*; Khodjikent station, 19.04.2015, *Gaziev*; Khodjikent station, 19.04.2015, *Tillaev*; Obirakhmat, 16.04.2016, *Gaziev*; Big Chimgan Mountain, 30.04.2016, *Gaziev*; near Navolisay, 02.05.2017, *Gaziev*; Aksai, 27.04.2017, *Beshko*; Chatkal river, 27.04.2021, *Gaziev* (www.plantarium.ru).

Kazakhstan—Karjantau, 03.05.2011, *Pirogov* (www.plantarium.ru).

29. ***Iris austrotschatkalica*** Tojibaev, F.Karimov & Turgunov in Turczaninowia 17(4): 12 (2014) — *Juno austrotschatkalica* (Tojibaev, F.Karimov & Turgunov) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 376(5): 187 (2018). Type: Uzbekistan. Western Tian-Shan, Southern Chatkal, Ungor-Tepa Mts., 3 km north of the Paramon village, stony slopes, 1200 m s.l., 41°25'18.69" N, 71°43'44.39" E, 24.04.2010, *Karimov, Turgunov* (holotype TASH, isotype ALTB).

= *Iris hoellerii* Jílek in Acta Geographica Silesiana 14: 43 (2013), nom. inval. Original locality is uncertain.

Description: Plants up to 15 cm tall; bulb ovoid, 1.0–1.3 cm in diam., tunics papery, brownish; stem 5–10 cm; leaves falcate, linear-lanceolate,

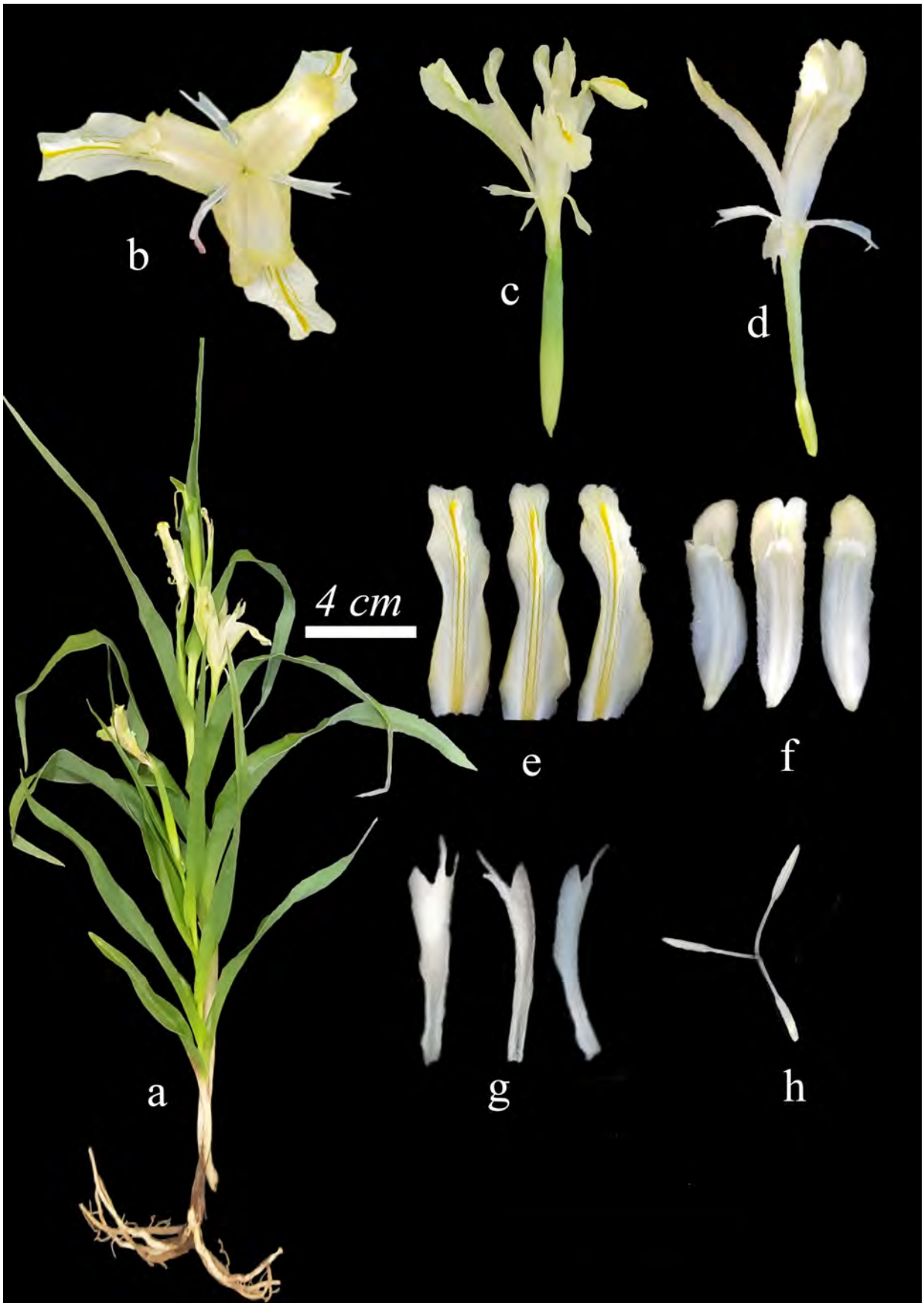

Fig. 17. Living plant of *I. pseudocapnoides*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Style arms (pistils); g. Standards (inner tepals); h. Stamina.

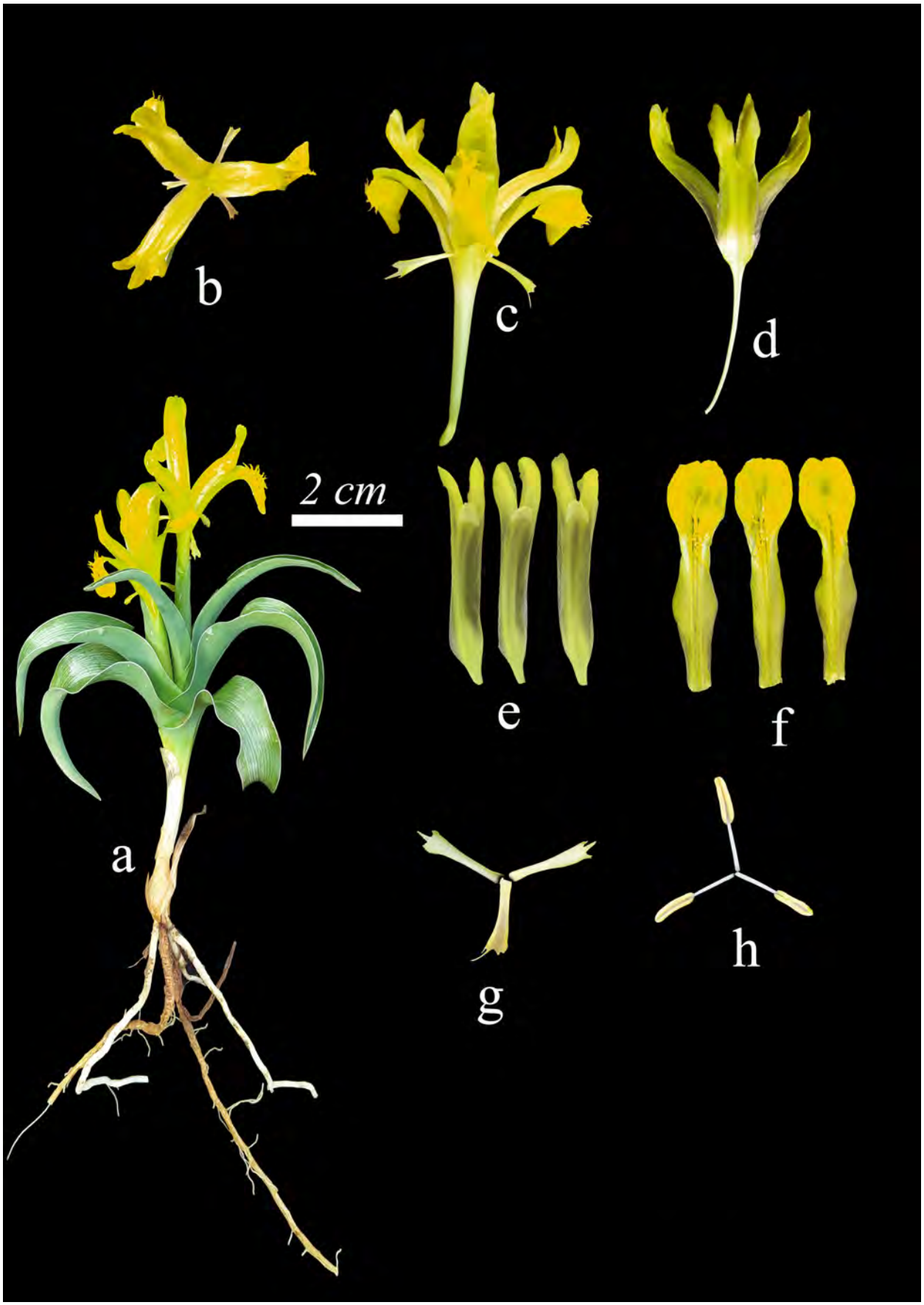

Fig. 18. Living plant of *I. tubergeniana*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Style arms (pistils); f. Falls (outer tepals); g. Standards (inner tepals); h. Stamina.

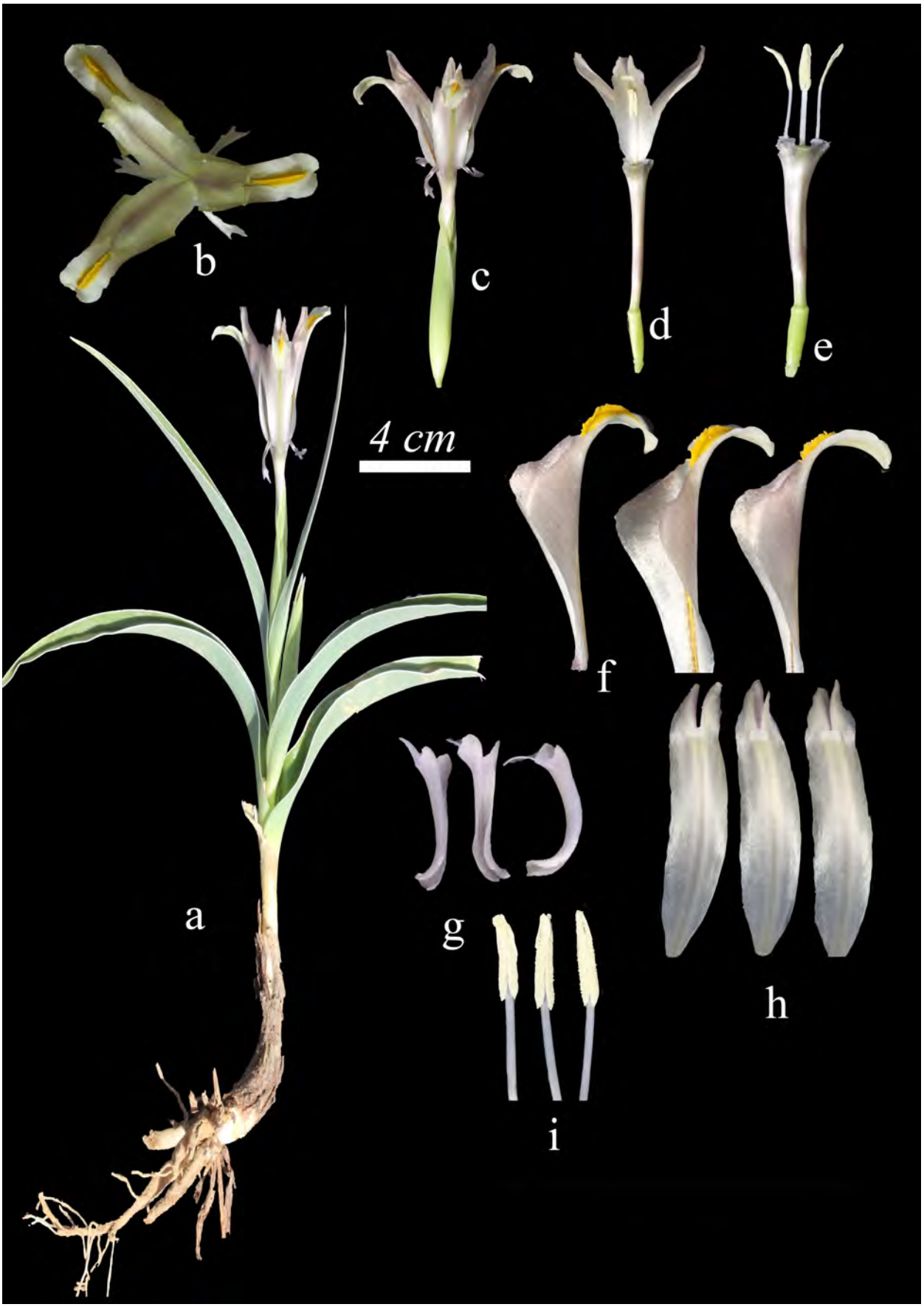

Fig. 19. Living plant of *I. capnoides*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina, f. Falls (outer tepals); g. Standards (inner tepals); h. Style arms (pistils).

acuminate, with white margins, up to 4–6 mm wide, upper ones exceeding the flowers; flowers 1(4), white, whitish with greenish-purple veins (whitish-yellowish with the purple veins in herbarium specimens); perianth tube 2.5–3 cm long; falls claw 18–23 mm in wide part, lamina 7–9 × 13–15 mm, rounted or slightly notched, crest yellow, denticulate with a yellowish blotch and greenish-purple or greenish-yellow veins; standards 15–17 mm long, 3–4 mm wide, often dissected; style branches white, without coloured veins (Figs. 12, 20).
Flowering: March–April.
Ecology: Stony slopes, altitudes of 1200 m.
Distribution: Central Asia: Western Tian-Shan (Uzbekistan) (Fig. 16). This species apparently occurs also in Kyrgyzstan, for which undocumented claimes exist.
Material examined: Uzbekistan—Ungor-Tepa mountain, 24.04.2010, *Karimov*, *Turginov*; Ungor-Tepa mountain, 28.03.2021, *Tojibaev*; Ungor-Tepa mountain, 21.03.2022, *Ortikov* (TASH); Chatkal Range, 07.04.2017, *Beshko* (www.plantarium.ru).

13d. ***Iris kuschakewiczii*** aggr.
30. ***Iris kuschakewiczii*** B.Fedtsch. in Izv. Imp. S.-Peterburgsk. Bot. Sada 5: 158 (1905) — *Juno kuschakewiczii* (B.Fedtsch.) Poljakov in Pavlov, Fl. Kazakhst. 2: 249 (1958). Type: Kazakhstan. "Saitzewka" (now Şelek Village), 31.03.1877, *A.A. Kuschakewicz* (lectotype LE 00050068, designated by Boltenkov (2016b: 229); isolectotype 00050073).
= *Iris almaatensis* Pavlov in Vestnik Akad. Nauk Kazak. SSR 3(60): 26 (1950), **syn. nov.** — *Juno almaatensis* (Pavlov) Poljakov in Pavlov, Fl. Kazakhst. 2: 248 (1958). Type: Kazakhstan. Almaty Region, sandy hills near Chemolgan Village, 21.04.1939, *N.V. Pavlov 3* (holotype AA, isotype MW 0021784).
Nomenclature: *Iris almaatensis* Pavlov was described as a local endemic of lowlands around Almaty (Pavlov & Poliakov 1958); this type of distribution is highly unusual because the lowland species of *Iris* are typically not local. Vvedensky (1971) placed this taxon into the synonymy of *I. subdecolorata* because of the "dirty-yellowish-green" background flower colour but this placement contradicts the distribution of the latter species which is restricted to the lower mountain belt of the Western Tian-Shan. This synonymy is currently accepted in Central Asia (Khassanov & Rakhimova 2012) but some major online resources (e.g. Plants of the World online) continue maintaining *I. almaatensis* as a species, probably following Czerepanov (1995), Ivaschenko (2005), Ikinci et al. (2011) and Ivaschenko & Belyalov (2015). As the falls of *I. almaatensis* were characterised with a "dirty-brown" blotch around the crest, we consider it a good match of *I. kuschakewiczii* because of its brown-blotched flowers (the flowers of *I. subdecolorata* are brown-green-blotched). The yellowish background colour is less common in *I. kuschakewiczii* but sometimes can be found near Almaty and Bishkek, where both colour forms occur in a close proximity or even together.
Description: Plants up to 20 cm tall; roots thickened, cord-like; bulb ca. 1.5 cm in diameter, well developed; stem ca. 10 cm long, with quite imperceptible internodes; leaves 4 or 5, closely approximate, dark green, gradually attenuate toward apex, broadly marginate, margin scabrous; lower leaves 1–1.5 cm wide; flowers 1–3(4), pale violet, inodorous; perianth tube 3.5–4.5 cm long; falls 3.5–4 cm long; claw slightly enlarged above the middle (up to 1 cm), constricted below the lamina (ca. 0.5 cm), 5 dark violet interrupted veins prolonged onto the lamina; lamina oblong-obovate, 7 × 12 mm, white or faintly lilac-margined, with a dark violet blotch, crest white, finely dissected or largely dentate; standards 1–1.5 cm long, lamina trilobed, acute; style crests obliquely triangular, rather acute, 4 × 10 mm, margins entire; stigmas semicircular; anthers whitish (Fig. 12).
Flowering: April–May.
Ecology: Gravelly slopes in foothills.
Distribution: Central Asia: Northern Tian-Shan (Kazakhstan, Kyrgyzstan) (Fig. 16).
Material examined: Kazakhstan—Verny district, 22.06.1919, *Granitov*; Arasan, 10.05.1920, *Titov*; Kurdai Pass, 29.04.1920, *Titov*; between Salsu and Parganam, 27.04.1920, *Titov*; Between Aulie-ata and Tekturmas, 16.04.1916, *Raykova*; Chu-Ili mountains, 07.04.1931, *Botschantzev*; Chu-Ili mountains,

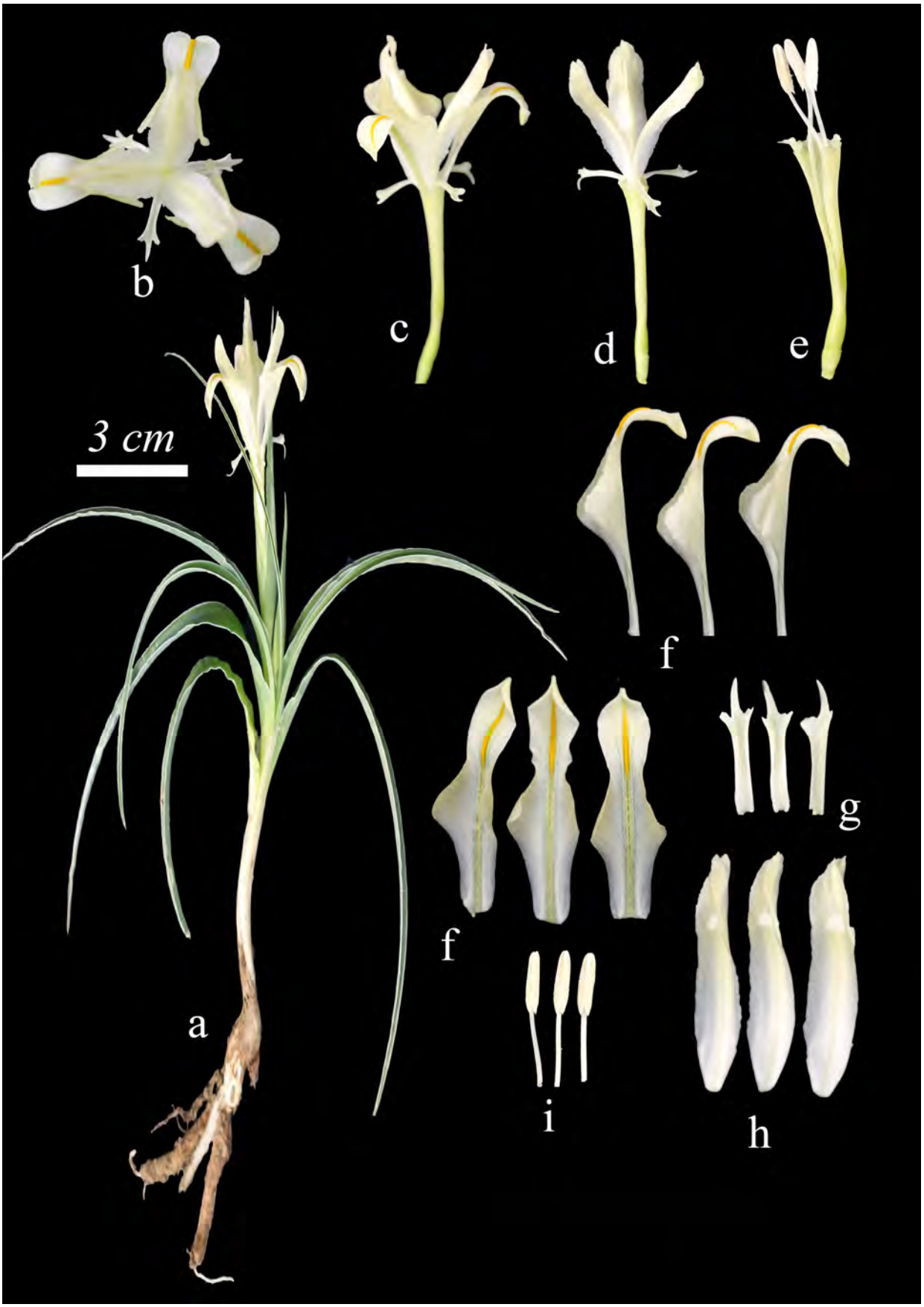

Fig. 20. Living plant of *I. austrotschatkalica*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina; f. Falls (outer tepals); g. Standards (inner tepals); h. Style arms (pistils).

04.23.1939, *Pavlov*; Chu-Ili mountains, 23.04.1949, *Botschantzev*; (TASH); Kurdai pass, 31.03.1877, *Kushakevich*; Kurdai pass, 20.03.1879, *Kushakevich*; (LE); near station Chokpar, 23.04.1939, *Pavlov*; Karashail mountain, 16.04.1976, *Orazova*, *Fisyun* (MW); Chu-Ili mountains, 31.07.2007, *Epiktetov*; Kurti, 04.04.2010, *Epiktetov*; Chu-Ili mountains, 03.04.2010, *Waldschmit*; Chu-Ili mountains, 10.04.2011, *Waldschmit*; Toraigyr, 09.04.2014, *Kolbintsev*; Hantau mountains, 15.04.2015, *Gorbunov*; Alas pass, 24.05.2016, *Kolbintsev* (www.plantarium.ru).

Kyrgyzstan—Near Frunze, 12.04.1929, *Nikitina*; Kirgiz Alatau, 06.04.1944, *Tkachenko*; Frunze mountain, 03.04.1944, *Tkachenko*; Kirgiz Alatau, 17.03.1947, *Popova*; Chon-kemin, 23.04.1954, *Jakov* (FRU); Kyrgyz Range, 30.03.2014, *Naumenko*; east of Orto-Sai, 04.05.2015, *Chulanova*; Tuzovka, 22.03.2019, *Menshikova* (www.plantarium.ru).

31. ***Iris subdecolorata*** Vved. in Popov, Key Fl. Tashkent: 75 (1923) — *Juno subdecolorata* (Vved.) Vved. in Kudriashev, Fl. Uzbekistan 1: 516 (1941). Type: Uzbekistan. Tashkent region, Tashkent suburbs, "Nikiforovsky lands" [now within Tashkent], 09.04.1920, *V. Drobow* (lectotype TASH 0000467, designated by Boltenkov (2016a: 145); isolectotype TASH 0000468).

= *Juno inconspicua* Vved. in Vvedensky & Kovalevskaya, Opred. Rast. Sred. Azii 2: 321 (1971) — *Iris inconspicua* (Vved.) T.Hall & Seisums in Bot. J. Linn. Soc. 167(3): 300 (2011). Type: Uzbekistan. Plants collected and grown in the Botanical Garden (Tashkent) from Kurama Range, Angren, 1957, *Filimonova 512* (holotype TASH 0000315).

Taxonomy: The plants described as *Juno inconspicua* differed from *I. subdecolorata* in their pale-lilac (vs. pale-bluish with a greenish tint) background colour. On this basis, the species was reported aslo from Kyrgyzstan (Lazkov et al. 2014). As observed from the photographs from Kazakhstan (www.plantarium.ru), such populations sporadically occur within the range of *I. subdecolorata*. Both species share the same diagnostic character, i.e. the greenish spot around the crest, and should be treated as synonymous.

Description: Plants up to 20 cm tall; roots thickened, cord-like; bulb ca. 1.5 cm in diameter, well developed; stem ca. 10 cm long, internodes imperceptible even in fruit; leaves 4–6, closely approximate, dark green, falcate, gradually attenuate toward apex, broadly marginate, margin ciliate, 8–20 mm wide; flowers 1–3, pale dingy green or lilac-tinged, inodorous; perianth tube ca. 4.5 cm long; falls 4–4.5 cm long; claw slightly enlarged above the middle, 7–9 mm wide, slightly constricted below the lamina, 5–6 mm wide, often as wide as the lamina; lamina oblong to oblong-obovate, round-tipped, 7–10 × 14–16 mm, with dingy green diffuse spots on both sides of the crest, crest white, finely dissected or deeply dentate, standards 15–20 mm long, acute rhomboidal or often trilobed; style crests obliquely triangular, rather acute, 11–13 mm, margins entire; stigmas semicircular; anthers and pollen whitish; filaments azure (Figs. 12, 21).

Flowering: March–April.

Ecology: Loess foothills.

Distribution: Central Asia: Western Tian-Shan (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan) (Fig. 22).

Material examined: Uzbekistan—Chimgan. 29.08.1924, *Gomolitsky*; Ablik, 20.03.1944, *Sulievich*; near Akhangaran, 01.04.1951, *Butkov*; near Bozsu, 03.04.1956, *Ubaydullaev*; Buzsuv, 03.04.1956, *Ubaydullaev*; Angren river, 01.04.1951, *Butkov* (TASH); near Tashkent, 08.04.1921, *Vvedensky*; near Tashkent, 25.03.1925, *Vvedensky* (MW); near Krasnogorsk, 12.03.2021, *Beshko*; beween Karakiyasay and Almaliksay, 06.04.2022, *Beshko*; near Krasnogorsk, 31.03.2022, *Gaziev* (www.plantarium.ru).

Kazakhstan—Ush-uzgen, 08.04.1930, *Lipschitz*; Sary-Agach district, 14.04.1960, *Pratov*; (TASH); Kuyuk-Tau mountains, 12.04.1931; near Kulan village, 04.06.1931, *Pavlov*; near Mikhailov station, 26.05.1934, *Chilinina*; Koktal, 02.08.1934, *Mikelin*; Kainar terrace, 23.05.1935, *Nikolaev*; Big Aktau, 22.05.1936, *Chilinina* (MW); Chimkent, 29.03.2007, *Belousov*; Aksai-Koksay, 21.04.2014, *Kolbintsev*; Akkul lake, 17.04.2014, *Kolbintsev*; near Aksumbe village,

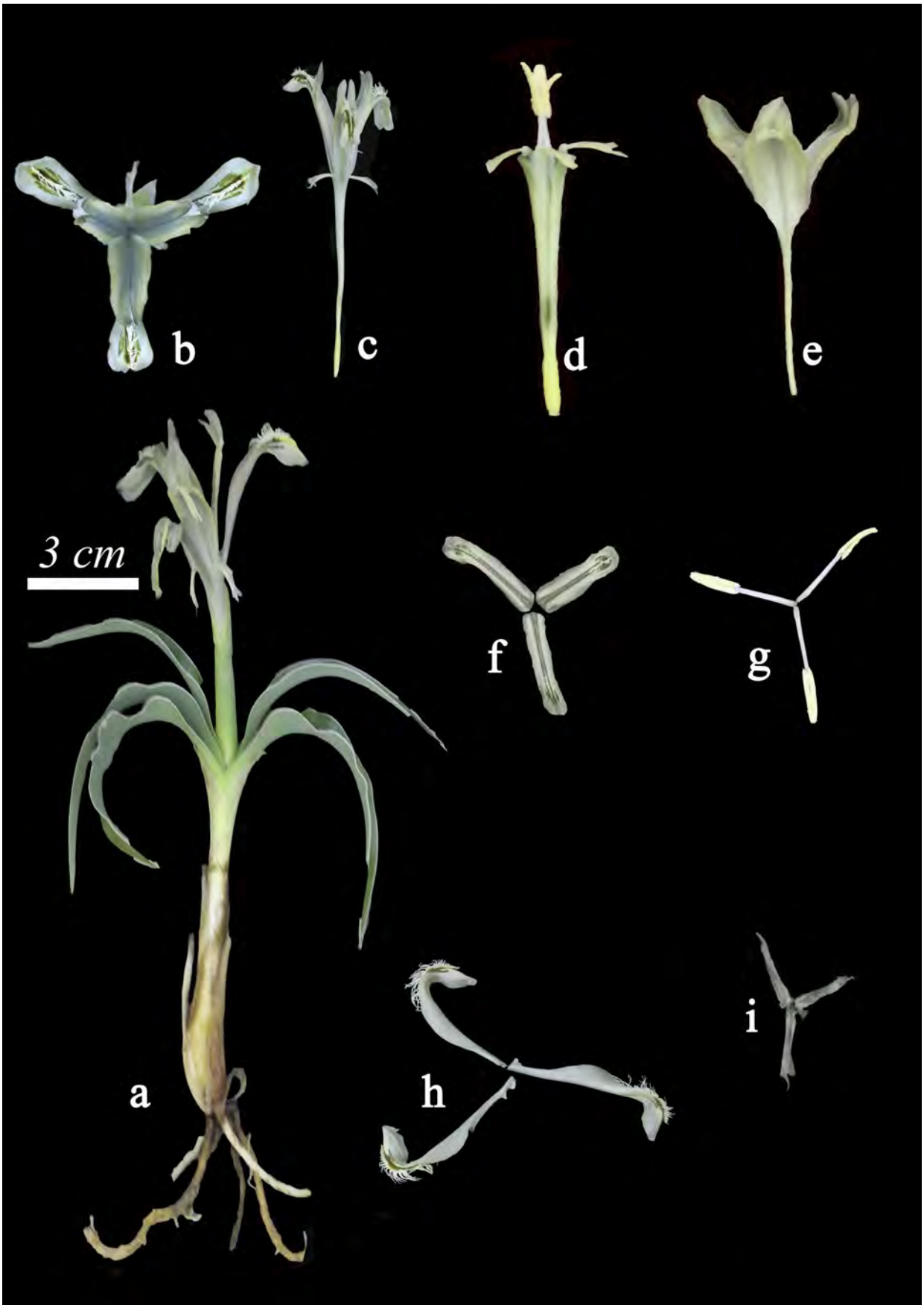

Fig. 21. Living plant of *I. subdecolorata*. a. Complete plant; b, c. Complete flower; d, e. Dissected flower; f, h. Falls (outer tepals); g. Stamina; i. Standards (inner tepals).

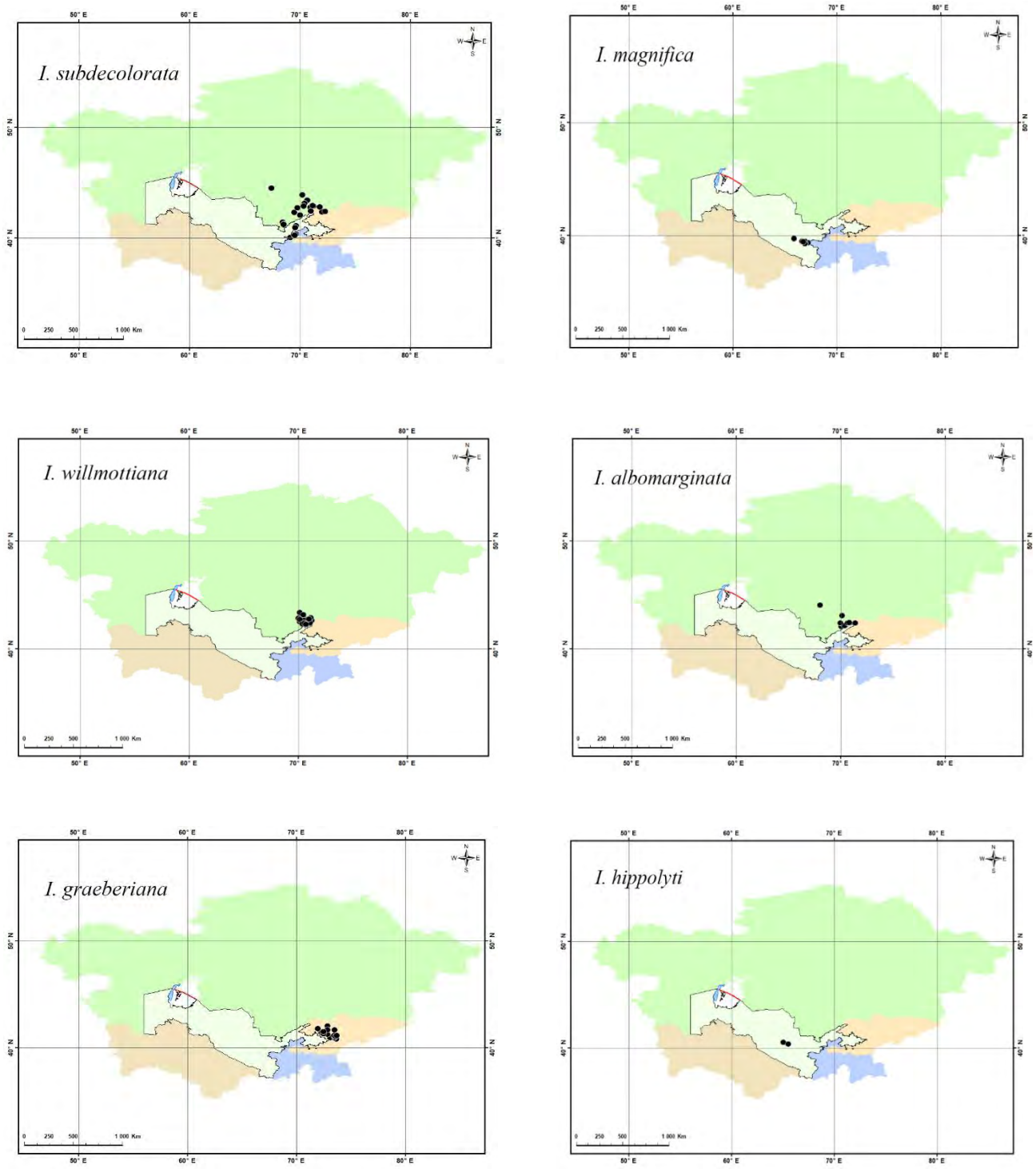

Fig. 22. Distribution of *I. subdecolorata*, *I. magnifica*, *I. willmottiana*, *I. albomarginata*, *I. graeberiana* and *I. hippolyti* in Central Asia.

16.04.2014, *Gorbunov*; Kuyuk pass, 12.03.2016, *Kolbintsev*; Ulkenburyltau mountains, 09.04.2017, *Kolbintsev*; Karatau, 27.03.2019, *Kolbintsev*; Aksumbe, 06.04.2019, *Gorbunov*; Assa river, 20.03.2019, *Kolbintsev*; Akkul lake, 11.04.2021, *Belousov*; Taskol lake, 04.03.2021, *Belousov* (www.plantarium.ru).

Tajikistan—Mogoltau, 05.04.1939, *Komarov*; Mashrap pass, 23.03.1939, *Komarov* (TASH); northern Tajikistan, 20.03.2018, *Suyunkulov* (www.plantarium.ru).

Kyrgyzstan—Talas Range: Kara-Kayyng, 2100 m a.s.l., 20.05.1959, *Korneva & Zaikin*; ravine of Besh-Tash River, at the entrance to the National Park "Besh-Tash", low hills, NE-exposed slopes, 1560–1600 m a.s.l., 20.04.2014, *Koichubekova*; Kyrgyz Range: Jol-Say, 14.04.1964, *Sudnitsyna* (FRU).

13e. ***Iris magnifica*** aggr.

32. ***Iris magnifica*** Vved. in Komarov, Fl. USSR 4: 571 (1935) — *Iris caucasica* var. *major* Maxim. in Bull. Acad. Imp. Sci. Saint-Ptersbourg, sr. 3, 26: 505 (1880) — *Juno magnifica* (Vved.) Vved. in Kudriashev, Fl. Uzbekistan 1: 518 (1941). Type: Uzbekistan. Zeravshan Valley, Aksai Mountain, 15.05.1869, *O. Fedtschenko* (lectotype LE 00050080, designated by Boltenkov (2016b: 226); isolectotype LE 00050081).

Description: Plants up to 50 cm tall; roots much thickened, fusiform; bulb ca. 3 cm in diameter, well developed; stem strong, 25–40 cm long, with distant leaves and pronounced internodes; leaves pale green, lustrous, falcate; scarcely marginate, margin scabrous; lower leaves 3–5 cm broad; flowers (2–)3–7, inodorous; perianth tube 4.5–5 cm long, greenish-violet; falls ca. 5 cm long, pale lilac or sometimes almost white, claw winged, 2–2.5 cm broad in enlarged part and ca. 7 mm at base, 4 longitudinal violet veins sometimes prolonged to the base of the lamina, lamina white, oblong, scarcely narrowed toward base, 13–22 × 20–25 mm, scarcely emarginate at apex, a dark yellow blotch on the sides of the undissected white crest overflowing at the front onto the crest; standards pale lilac, faintly marked with 3 violet veins, 22–27 mm long, lamina obovate, obtuse; style crests pale lilac, obliquely triangular, obtuse, 4–5 × 10–11 mm, margins entire; stigmas flattened semicircular; anthers and pollen whitish (Figs. 12, 23).

Flowering: April–May.

Ecology: Rock crevices and fine-textured spaces among rocks.

Distribution: Central Asia: Western Pamir-Alay (Uzbekistan) (Fig. 22). The reported occurrence in the Western Tian-Shan, Sairam-Ugam National Park, Kazakhstan (Pavlov & Poliakov 1958) is erroneous and belongs to *Iris pseudocapnoides* (Ivaschenko 2019).

Material examined: Uzbekistan—Agalyk river, 11.04.1923, *Raykova*; near Agalik, 05.06.1925, *Repnikov*; Agalik, 19.04.1929, *Valnev*; near Aksay, 05.05.1931, *Butkov*; near Lyangar, 09.08.1937, *Granitov*, *Dolgykh*; Kugisurh Mountains, 19.05.1937, *Gnezdillo*; Urgut, 19.04.1940, *Popov*; Takhta-Karacha pass, 16.04.2008, *Tojibaev*; Uriklisay, 07.05.2014, *Tojibaev*; Amankutan, 09.04.2021, *Ortikov* (TASH); Samarkand mountains, 29.03.2009, *Gaziev*; Samarkand mountains, 09.04.2010, *Gaziev*; Samarkand mountains, 12.04.2012, *Gaziev*; Agalyk, 15.04.2016, *Beshko*; Takhta-Karacha pass, 16.04.2016, *Beshko*; Amankutan, 10.04.2021, *Mardonov* (www.plantarium.ru); Samarkand, Tersak, Nurobod (www.gbif.org).

33. ***Iris graeberiana*** Sealy in Bot. Mag. 167: tab. 126 (1950) — *Juno graeberiana* (Sealy) Soják in Cas. Nár. Mus., Odd. Prír. 150: 138 (1982). Type: Kyrgyzstan. Comm. bulbs J. Hoog, of C. Tubergen, Haarlem, Holland; Old Gardens, Tunbridge Wells, Kent (holotype K 001045489).
= *Juno zenaidae* Vved. in Vvedensky & Kovalevskaya, Opred. Rast. Sred. Azii 2: 322 (1971) — *Iris zenaidae* (Vved.) F.O.Khass. & Rakhimova in Stapfia 97: 178 (2012). Type: Kyrgyzstan. "E bulbis a Z. Botschantseva in jugo Ferganico ad r. Aubek sub rupibus a. 1933 lectis in Horto Botanico Universitatis Asiae Mediae sub no. 581 enatus", 07.04.1934, *A. Vvedensky* (holotype TASH 0000323).

Nomenclature: Boltenkov (2016b: 228) designated a superfluous lectotype of Iris graeberiana in the presence of the holotype designated in the protologue. The synonymy was established by Lazkov et al. (2014).

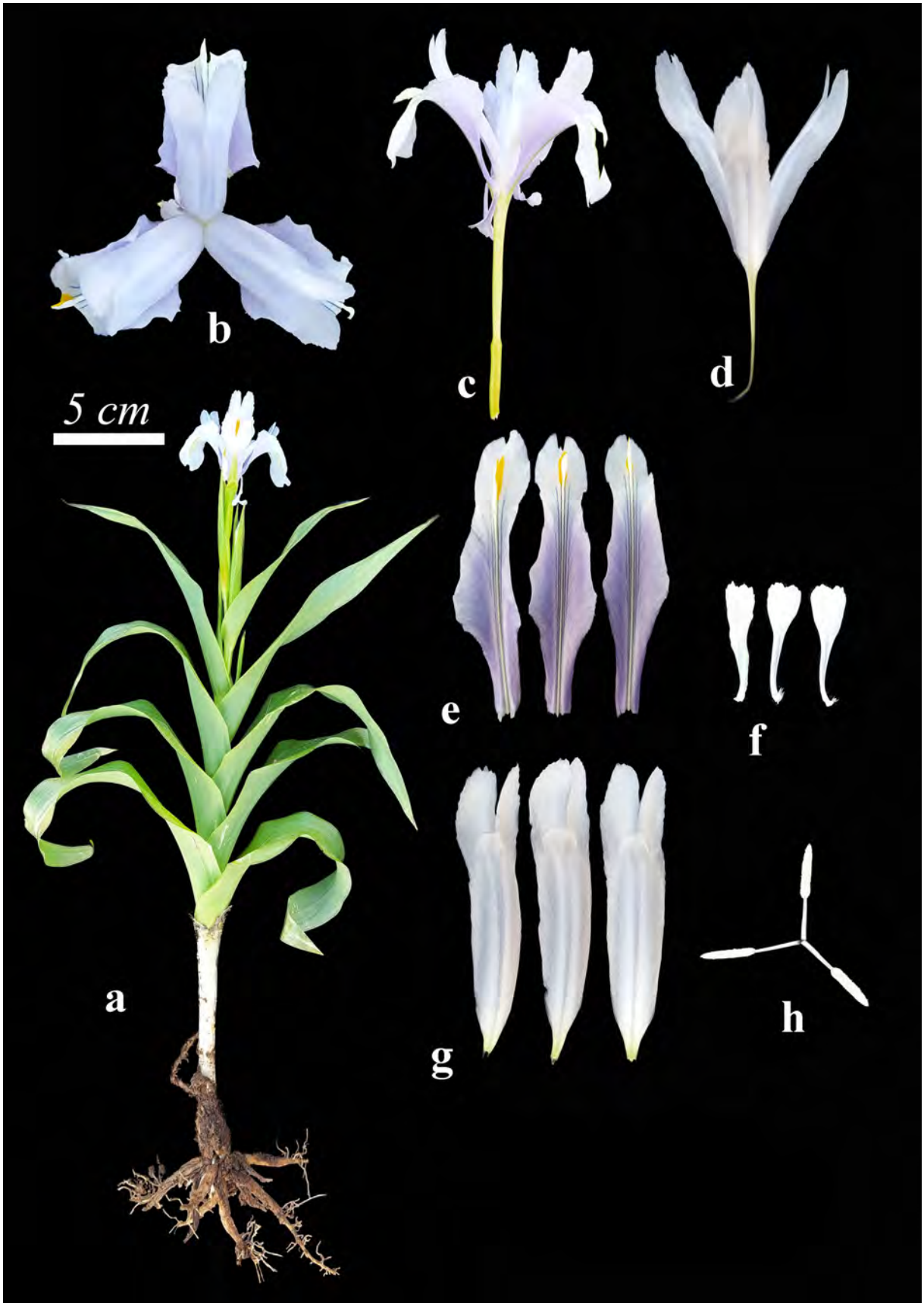

Fig. 23. Living plant of *I. magnifica*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals); g. Style arms (pistils); h. Stamina.

Description: Plants up to 40 cm tall; roots thickened, fusiform; bulb ovate, ca 2.5 cm thick, covered with brown membranous tunics; leaves carinate, with noticeable internodes, further elongating in fruit, up to 2 cm wide; flowers 1–3, blue or violet; perianth tube 4.5–5.5 cm long, pale violet, falls 4.5–5.5 cm long, lamina with a large white blotch and darker longitudinal stripes, about 22–28 mm long, crest white, entire; standards 20–28 mm long, lamina broadly oblong; styles more intensely coloured (Fig. 12).
Flowering: April.
Ecology: Middle mountain zone.
Distribution: Central Asia: Pamir-Alay, Fergana Range (Kyrgyzstan) (Fig. 22).
Material examined: Kyrgyzstan—Fergana Range, Kyzyl-Ungur basin, 29.05.1966, *Rahmonov*; Yassy, 22.08.1962, *Puchkova*; Dmitriev village, 1933, *Botschantzev* (TASH); 25 km south of Chaek, 26.04.1958, *Gubanov* (MW); Naryn river, 12.04.2012, *Naumenko* (www.plantarium.ru).

13f. ***Iris willmottiana*** aggr.

34. ***Iris albomarginata*** R.C.Foster in Contr. Gray Herb. 114: 42 (1936) — *Iris coerulea* B.Fedtsch. in Bull. Herb. Boiss. 4: 917 (1904), nom. illeg. — *Juno coerulea* Poljakov in Pavlov, Fl. Kazakhst. 2: 250 (1958), nom. illeg. superfl. — *Iris fedtschenkoi* F.O.Khass. & Rakhimova in Stapfia 97: 178 (2012), nom. illeg. superfl. — *Juno albomarginata* (R.C.Foster) Vved. ex M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 376(5): 186 (2018). Type: Uzbekistan. Pskem Range, Semizsazsay, 09.08.1902, *B. Fedtschenko* (lectotype LE 00050054, designated by Boltenkov (2016b: 227)).
Nomenclature: The nomenclature of this species has been clarified by Lazkov & Sennikov (2017).
Description: Plants up to 30 cm tall; bulbs 2–3 cm in diameter, 3–4 cm long, ovoid; bulb tunics slightly extended, papery, brown, up to 6 cm; roots not swollen; scale leaves 2, membranous, clasping, brownish or pale brownish; stem 15–25 cm above ground, internodes shortly visible in anthesis; leaves 5–7, developed by anthesis, clasping, almost straight, broadly dilated at base, broadly attenuated at apex, lowermost ones 10–15 cm long, 1–4 cm wide, uppermost ones 5–10 cm long, 1–2 cm wide, pale-green above, glaucous-green below, with distinct white margins; inflorescences with 1–5 flowers, rather lax; bracts 5–7 cm long, 1–2.5 cm wide, lanceolate, pale-green, membranous at apex and along margins; flowers 5–7 cm in diameter; flower tube 4–6 cm long, violet; falls 4–5 cm long, claw 2.5–3 cm long, winged, up to 2 cm wide, blue to lilac with thin darker stripes, lamina 1.2–1.5 cm long, 0.9–1.2 cm wide, ovate, not emarginate at apex, whitish with violet lines, unspotted; crest 0.7–1 cm long, dentate or shortly fimbriate, whitish; standards deflexed, 1.2–1.8 mm long, lanceolate or narrowly lanceolate, trilobate at apex, pale blue; style branches 3.5–4.5 cm long, with lobes 1–1.2 cm long, 0.5 cm wide; stamens with filaments 1.2–1.5 cm long, anthers 1.5–1.8 cm long; pollen well-developed, blue (Fig. 12).
Flowering: June.
Ecology: Stony clayey slopes in the mountains, at altitudes of about 2000 m.
Distribution: Central Asia: Western Tian-Shan (Kazakhstan, Uzbekistan) (Fig. 22). The distribution has been clarified and mapped by Lazkov & Sennikov (2017).
Material examined: Uzbekistan—Pass from Pskem valley to lake Mahbalkul, 06.1921, *Baranov;* Pskem village, 07.05.2022*, Ortikov* (TASH).
Kazakhstan—Kaplanbek, 12.04.1921, *Vvedensky*; Big Balde-berek river, 02.08.1922, *Baranov*; Kara-Tau mountains, 28.05.1922, *Drodov*; Chimkent Alatau, 09.06.1924, *Mokieva*; Chimkent Alatau, 02.06.1924, *Sovetkina*; Kuyandy-Su river, 09.06.1924, *Gomolitsky*; Jebalatau, 03.08.1928, *Granitov*; Djebogly-su, 1928, *Blagoveshensky*; Kuyuk mountains, 25.05.1933, *Khlebnikova*; Taldy-bulak river, 07.04.1934, *Butkov*, *Botschantzev*; Baydjansay, 1959, *Filimonova* (TASH); Aksu-Djabagly, 30.04.2006, *Pirogov*; Aksu-Djabagly, 28.04.2006, *Pirogov*; Sazanata river, 05.05.2011, *Pirogov*; Sairam peak, 28.05.2018, *Ebel* (www.plantarium.ru).

35. ***Iris willmottiana*** Foster in Gardener‘s Chron. 29: 261, fig. 100 (1901) — *Juno willmottiana* (Foster) Vved. in Kudriashev, Fl. Uzbekistan 1:

518 (1941). Type: *Iris willmottiana* in Gardener's Chron. 29: 261, fig. 100 (1901) (lectotype designated by Boltenkov (2016b: 231)).

Description: Plants up to 30 cm tall; bulbs up to 3 cm in diameter, up to 3 cm long, ovoid; bulb tunics not extended, papery, brown, up to 3 cm; roots not markedly swollen; scale leaves 2, membranous, clasping, brownish; stem up to 30 cm above ground, internodes not visible or sometimes visible after anthesis; leaves up to 9, developed by anthesis, dense, sometimes becoming slightly spaced after anthesis, clasping, falcate, broadly dilated at base, tapering at apex, lowermost ones up to 12 cm long, 2.5 cm wide, uppermost ones up to 8 cm long, 1.5 cm wide, rather dark-green above, glaucous-green below, with distinct white margins; inflorescences with 1–3 (5–7) flowers which may emerge already from the second lower leaf; bracts up to 5 cm long, 1 cm wide, lanceolate, green; flowers ca. 5 cm in diameter; flower tube ca. 4 cm long, greenish; falls up to 4 cm long, claw up to 2.5 cm long, winged, nearly as wide as the lamina, up to 1.8 cm wide, blue with thin darker stripes, lamina up to 1.5 cm long, 0.9 cm wide, oblong, slightly emarginate at apex, blue, with a large white reniform spot in the middle part; crest ca. 1 cm long, dentate, whitish; standards deflexed, up to 1.6 cm long, lanceolate, acute or trilobate at apex, pale blue; style branches up to 3.5 cm long, with lobes ca. 1 cm long, 0.5 cm wide; stamens with filaments up to 1 cm long, anthers up to 1.2 cm long; pollen well-developed, violet (Figs. 12, 24).

Flowering: May.

Ecology: Slopes in foothills.

Distribution: Central Asia: Western Tian-Shan (Kazakhstan, Kyrgyzstan) (Fig. 22). The distribution has been clarified and mapped by Lazkov & Sennikov (2017).

Material examined: Kazakhstan—Boraldai, 04.1872, *Korolkoff*; Jabagly-Su River, 06.1928, *Blagoveschensky*; Kaindy, *Mokeeva*; Kishi-Kaindy, 24.06.1933, *Linczevsky*; Taldy-Bulak, 07.04.1934, *Butkov & Botschantzev* (TASH); Saisu, 25.05.1933, *Khlebnikova*; Kuyuk, 16.04.2015, *Lazkov* (FRU); Kshi-Kaindy, 25.04.2006, *Waldschmit*; Kenuzen, 29.04.2007, *Davkaev*; Boroldaytau, 29.04.2007, *Davkaev*; Karatau, 30.03.2009, *Belousov*; Karatau, 25.03.2009, *Belousov*; Aksu-Djabagli, 17.04.2011, *Kolbintsev*; Aksu canyon, 17.04.2011, *Kolbintsev*; Aksu-Djabagli, 16.06.2012, *Kolbintsev*; Karakus mountains, 03.04.2012, *Davkaev*; Ulken-Kaindy, 16.05.2012, *Kolbintsev*; Karakus mountains, 09.04.2012, *Davkaev*; Baraldaytau, 13.04.2012, *Davkaev*; Karakus, 20.04.2012, *Davkaev*; Baraldaytau, 23.04.2012, *Davkaev*; Baraldaytau, 01.05.2012, *Davkaev*; Kshi-kaindi, 12.04.2013, *Davkaev*; Irgayli, 02.05.2013, *Davkaev*; Kuyuk, 18.04.2014, *Kolbintsev*; Alatau mountains, 08.04.2014, *Davkaev*; mountains Talas Alatau, 22.04.2014, *Davkaev*; Kuyuk, 21.03.2015, *Davkaev*; Kuyuk, 13.04.2015, *Davkaev*; Kuyuk, 10.05.2015, *Davkaev*; Kuyuk, 16.04.2015, *Lazkov*; Kuyuk, 20.05.2015, *Davkaev*; mountains Karachat-Too, 25.03.2016, *Lazkov*; Kuyuk, 27.03.2016, *Davkaev*; Kuyuk, 12.03.2016, *Kolbintsev*; Lake Akkol, 23.03.2016, *Davkaev*; Ulkunburultau, 21.03.2016, *Kolbintsev*; Aksu-Dzhabagly, 24.04.2018, *Epiktetov*; Karatau, 14.03.2019, *Kolbintsev*; Syrdarya Karatau, 29.03.2019, *Gorbunov*; Syrdarya Karatau, 20.03.2019, *Epiktetov*; Kokterek, 22.04.2020, *Shakula*; Ulkunburultau mountains, 08.04.2021, *Kolbintsev*; Kuyuk pass, 03.04.2021, *Belousov* (www.plantarium.ru).

Kyrgyzstan—Near Maimak railway station, 25.03.2016, *Lazkov* (FRU).

13g. ***Iris maracandica*** aggr.

36. ***Iris hippolyti*** (Vved.) Kamelin in Takhtajan, Redkie Izchez. Vidy Fl. SSSR, ed. 2: 102 (1981) — *Juno hippolyti* Vved. in Kudriashev, Fl. Uzbekistan 1: 545 (1941). Type: Uzbekistan. Southern Kysylkum, Kokcha Mt., steep southern stony slopes with rare shrubby vegetation, 14.04.1938, *I. Granitov, A. Evstafiev* (holotype TASH 0000314).

Description: Plants up to 15 cm tall; roots thickened, fusiform; bulb about 1.5 cm thick; stem about 10 cm tall, with densely spaced leaves, internodes not noticeable; leaves falcate, gradually narrowed to the top, smooth, up to 1–1.5 cm wide; flowers solitary; flower tube 4 cm long; falls 4–4.5 cm long; claws winged, about 2 cm wide; lamina oblong, 10 mm wide, 15 mm long, pale-purple with a yellow blotch; crest

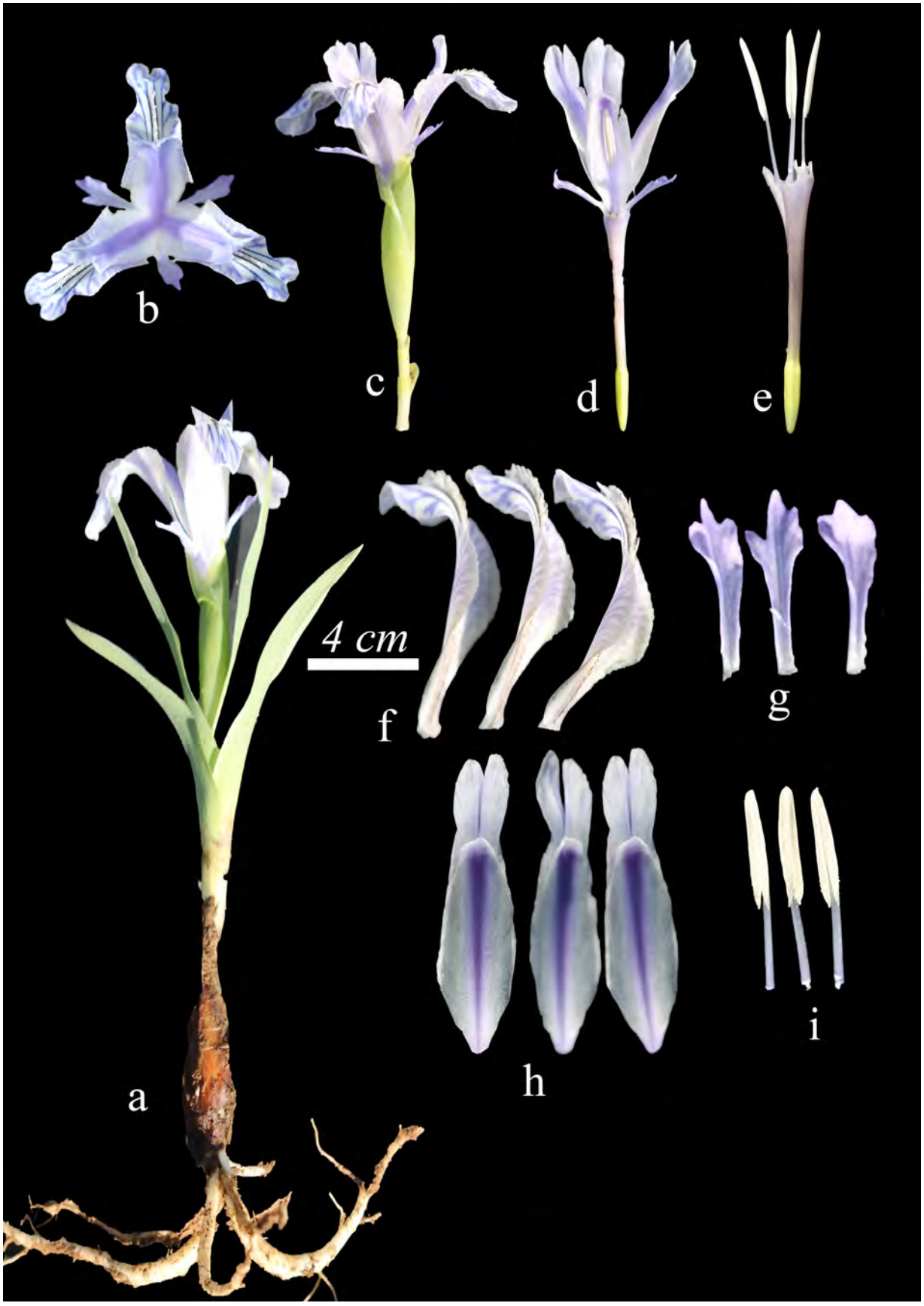

Fig. 24. Living plant of *I. albomarginata*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina; f. Falls (outer tepals); g. Standards (inner tepals); h. Style arms (pistils).

entire, white; standards about 15 mm long, pale violet, lamina rhombic or weakly three-lobed; style branches obliquely triangular, 5 mm wide, 13 mm long (Figs. 12, 25).
Flowering: April.
Ecology: Rocky-gravelly slopes in hilly semidesert.
Distribution: Central Asia: Kyzylkum desert, Kokcha Mts. (Uzbekistan) (Fig. 22).
Material examined: Uzbekistan—Kokchetau 14.04.1964, *Adylov*, *Shorakhimov*; Kokchetau, 22.03.2013, *Shomurodov*; Kokchetau, 11.04.2013, *Batoshev*; Kokchetau, 11.04.2015, *Shomurodov*, *Batoshev*; Kokchetau, 11.04.2015, *Shomurodov*, *Batoshov*, *Srybayeva*, *Abduraimova*; Kokchetau, 06.04.2021, *Ortikov*; Qora-qarg'a pass, 09.04.2022, *Ortikov*; Qora-qarg'a pass, 02.04.2022, *Tojibaev*; Qora-qarg'a pass, 09.04.2022, *Ortikov* (TASH).

37. ***Iris maracandica*** (Vved.) Wendelbo in Bot. Not. 128(2): 216 (1975) — *Juno maracandica* Vved. in Ovchinnikov, Fl. Tadzhiksk. SSR 2: 393 (1963). Type: Uzbekistan. Samarkand Oblast, Jizzakh District, hills on the right side of Sanzar River, 04.04.1921, *A. Vvedensky 169* (lectotype TASH 0000480, designated by Boltenkov (2016a: 146)).
Description: Plants up to 20 cm tall; roots fusiform, thickened; bulb ca. 2 cm in diameter, well developed; stem 10–15 cm long, with densely congested leaves and imperceptible internodes; leaves falcate, gradually attenuate toward apex, margins smooth, up to 1.5–2 cm wide; flowers 1(–4), strongly scented, violet-tinged in fading; perianth tube 3–4.5 cm long; falls 3.5–4 cm long, pale yellow; claw winged, ca. 2 cm broad in the enlarged part and 9 mm at base, black-dotted along the veins; lamina elliptic, slightly narrowed toward base, ca. 1 × 1.5 cm, dark yellow; crest dark yellow, undissected, crenate; standards pale yellow, 1–1.5 cm long, lamina rhomboid; style crests pale yellow, obliquely triangular, 5 × 10 mm, margins entire; stigmas semicircular; anthers and pollen whitish (Figs. 12, 26).
Flowering: March–April.
Ecology: Gravelly slopes in foothills.
Distribution: Central Asia: Western Pamir-Alay (Kyrgyzstan, Tajikistan, Uzbekistan) (Fig. 27).
Material examined: Uzbekistan—Agalik, 12.04.1920, *Gomolitsky*; Sangzar river, 04.04.1921, *Vvedensky*; Tamerlan Gates, 03.04.1921, *Vvedensky*; Guralash, 01.06.1935, *Zakrzhevsky*; Guralash, 01.06.1935, *Zakrzhevsky*; Balty-divan, 19.05.1937, *Gnezdillo*; Agalik, 21.05.1937, *Vadova*; Agalik, 4–6.04.1941, *Zakirov*; Nurata, 02.05.1941, *Momotov*; Nurata, 13.04.1943, *Djanaeva*; Tuyatashsay, 23.04.1947, *Nazarenko*; Nurata, 07.04.1952, *Zaprometova*; Nurota, 15.04.1954, *Zaprometova*; Sarymych village, 06.05.1955, *Momotov*, *Li*; Nurata, 27.03.1955, *Zaprometova*; Koytash, 30.04.1956, *Zakirov*; Kichiksay, 08.05.1956, *Zaprometova*; Nurota, 02.04.1958, *Galkina*; Alaysay, 25.03.1958, *Zaprometova*; Chashma, 27.03.1963, *Markova*; Nurata, 03.04.1963, *Khaydarov*; Gachasay, 03.04.1963, *Markova*; Kichiksay, 09.04.1981, *Mukina*; Pistalitau, 16.04.2011, *Batoshev*; Pistalitau, 03.04.2012, *Batoshev*; Pistalitau, 04.04.2012, *Batoshev*; Hayatboshi, 07.05.2012, *Beshko*; Uchkulach, 17.04.2012, *Batoshev*; Hayatsay, 13.04.2013, *Beshko*; Pistalitau, 18.03.2013, *Batoshov*; Pistalitau, 22.03.2013, *Batoshev*; Pistalitau, 23.03.2013, *Batoshev*, *Tojiboev*; Pistalitau, 08.04.2013, *Batoshev*; Medjurumsay, 25.03.2016, *Beshko*, *Usmonov*; Hayatsay, 26.03.2016, *Usmonov* (TASH); Sanzar river, 14.04.1921, *Vvedensky* (MW); Nurata Nature Reserve, 04.2007, *Beshko*; Sentab village, 18.04.2012, *Beshko*; Hayatsai, 14.04.2013, *Beshko*; Zaamin National Park, 19.04.2015, *Beshko*; Zaamin National Park, 27.04.2019, *Gaziev* (www.plantarium.ru).
Tajikistan—Karatau Range, 04.1936, *Zakrjevsky* (TASH).
Kyrgyzstan—Baul village, 16.04.2019, *Lazkov* (www.plantarium.ru).

38. ***Iris svetlanae*** (Vved.) T.Hall & Seisums in Bot. J. Linn. Soc. 167(3): 300 (2011); F.O.Khass. in Red Data Book Uzbekistan, ed. 4: 85 (2009), comb. inval. — *Juno svetlanae* Vved. in Vvedensky & Kovalevskaya, Opred. Rast. Sred. Azii 2: 322 (1971). Type: Uzbekistan. "E bulbis a Kovalevskaja, Tscherneva et Vvedensky in collibus gypsaceis inter p.p. Tojtschi et Kzyltscha

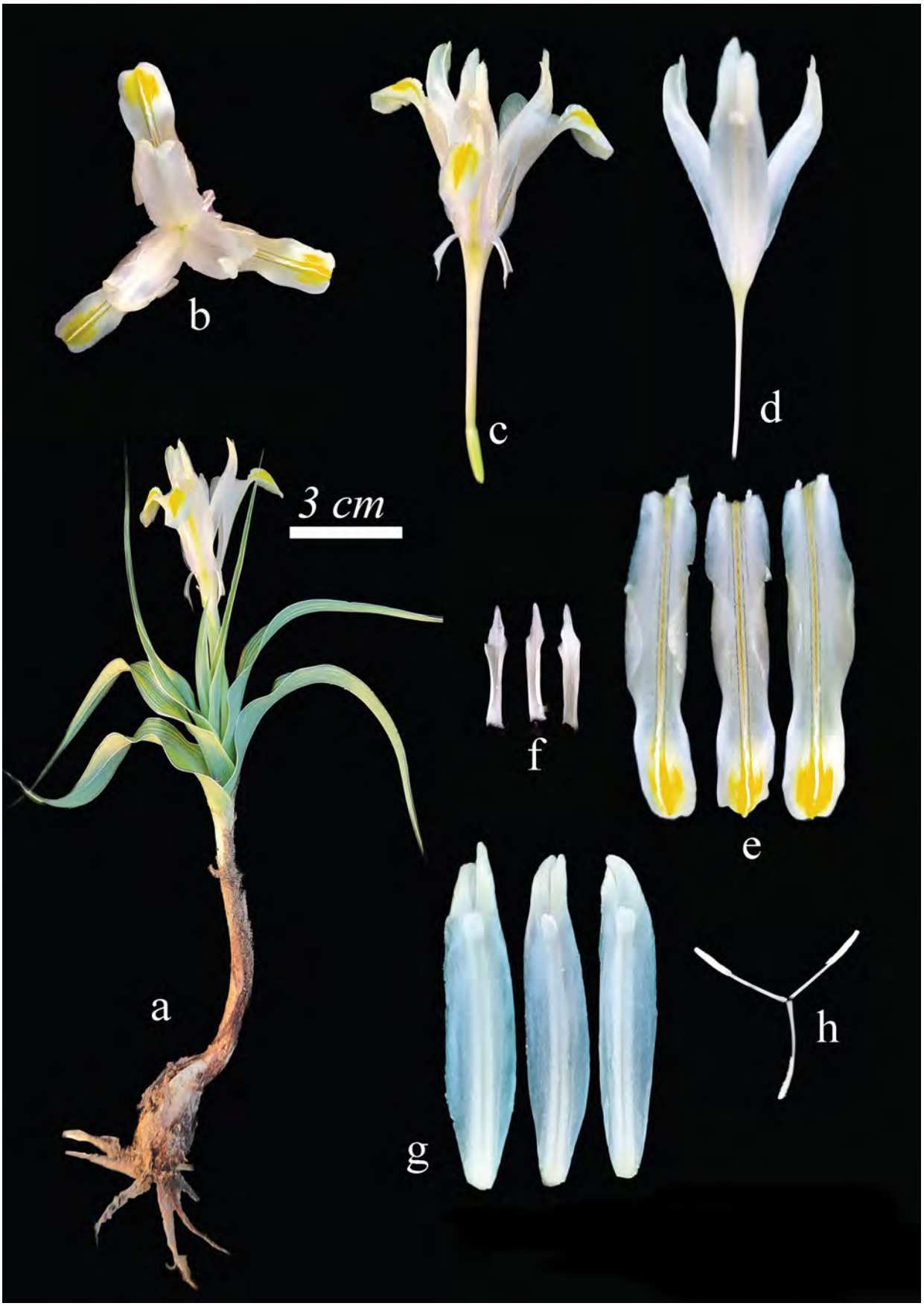

Fig. 25. Living plant of *I. hippolyti*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals); g. Style arms (pistils); h. Stamina.

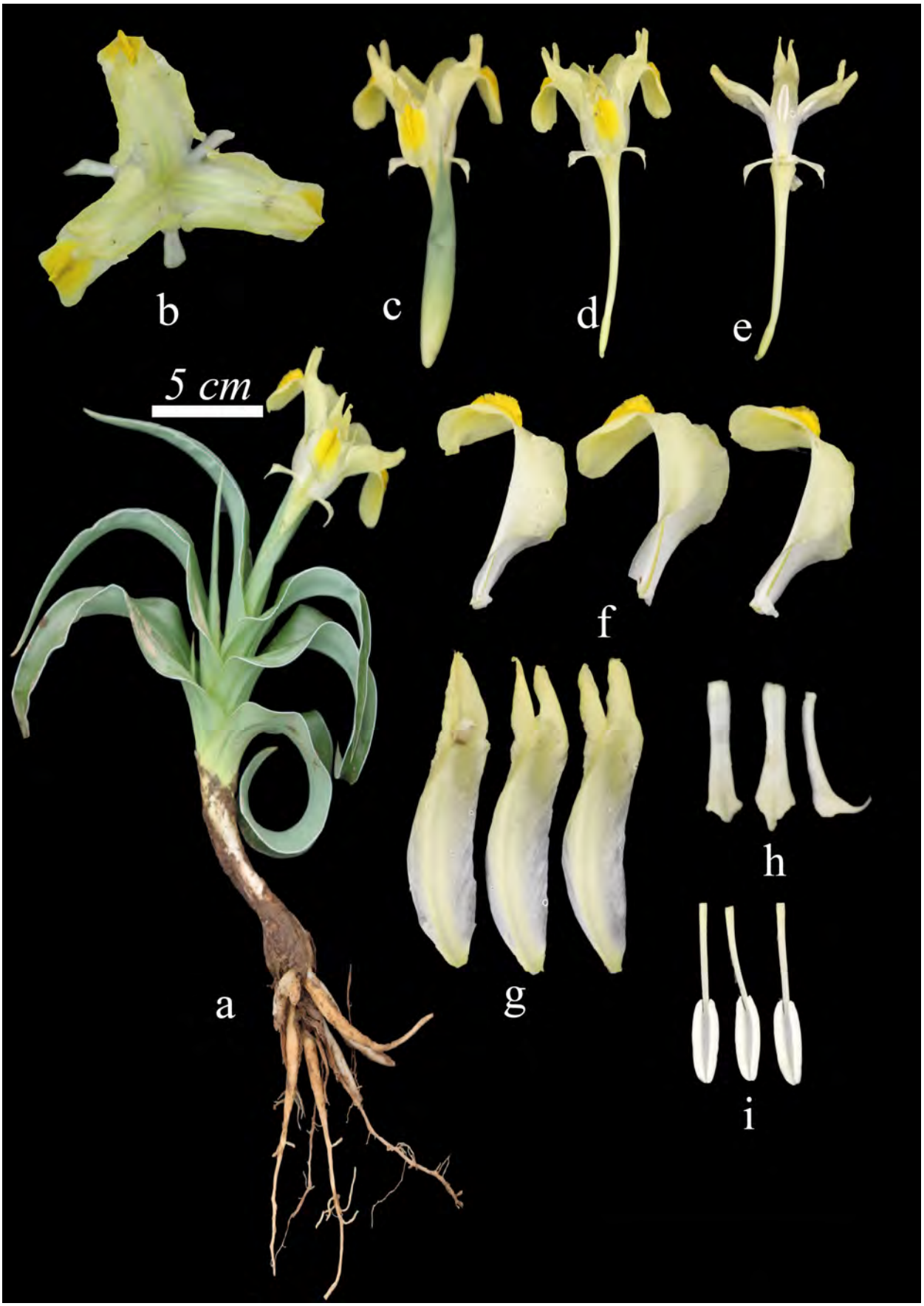

Fig. 26. Living plant of *I. maracandica*. a. Complete plant; b, c. Complete flower; d, e. Dissected flower; f. Falls (outer tepals); g. Style arms (pistils); h. Standards (inner tepals); i. Stamina.

in valle fl. Kaschka-Darja a. 1958 lectis in Horto Botanico Academiae Scientiarum UzSSR enatus", 12.03.1962, *S. Kovalevskaja, A. Vvedensky* (holotype TASH 000321).
Nomenclature: The neotype designated by Boltenkov (2016a: 146) is superfluous in presence of the holotype (Khassanov & Rakhimova 2016).
Description: Stems up to 20 cm tall; rhizomes swollen; bulb ovoid, 2–2.5 cm wide, with thin grey tunics; stem 10–15 cm high; leaves falcate, narrowed at the top, white-edged along the edges, smooth, 3–4 cm long; flowers 1–2, bright to golden yellow; perianth tube 4.5–5 cm long; falls 4–5 cm long, 2–2.2 cm wide, lamina golden yellow with 2–4 dark greenish stripes, crest bright yellow, entire, claws broadly expanded, up to 2 cm wide; standards 12–16 mm long, lamina oblong-rhomboid (Figs. 12, 28).
Flowering: April.
Ecology: Rocky and shallow-earth slopes in the lower mountain zone, at altitudes of 800–1400 m.
Distribution: Central Asia: Western Pamir-Alay (Tajikistan, Turkmenistan, Uzbekistan) (Fig. 27).
Material examined: Uzbekistan—Kyzylchi, 24.04.1935, *Lepeshkin*; Ishkent village, 26.03.1942, *Arnoldi*; Takhta-Karacha pass, 20.06.1962, *Belolipov*; near Kushrabad, 23.04.1965, *Terelygyna*; Tally pass, 08.04.2012, *Tojibaev* (TASH); foothills of Baysuntau, 08.03.2021, *Karimov*; Upper Punjab, 24.03.2021, *Karimov*; near Rabat, 08.03.2021, *Karimov* (www.plantarium.ru).
Turkmenistan—17 km north of Kugitang village, 15.04.1958 (TASH).

39. ***Iris victoris*** F.O.Khass., Khuzhan. & Rakhimova in Stapfia 99: 207 (2013) — *Juno victoris* (F.O.Khass., Khuzhan. & Rakhimova) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 232(1): 54 (2015). Type: Uzbekistan. Kelif-Sherabad Range, nearby village Aktash, grey clays, 37°33'08.01N, 66°41'29.44E, 560 m a. s. l., 02.03.2013, *F.O. Khassanov, U. Khuzhanazarov & N. Achilova* (holotype TASH).
Description: Plants up to 15 cm tall; bulb ovate, about 1 cm across; tunics papyraceous, greyish; stem 5–10 cm high; leaves 3–6, falcate, acute, with whitish margins, up to 2–4 cm wide; flowers yellow, 1(2–3); tube 2–3 cm long; falls 3.5–4 cm long, lamina with 3 greenish stripes, claws with large wings, 1.4–1.8 cm long, 2–2.4 cm wide; crests yellow, smooth; standards 1–1.3 cm long, acute; style blades yellow, shorter than falls, divided in the apex (Fig. 12).
Flowering: February–March.
Ecology: Gray clays in foothills.
Distribution: Central Asia: Southern Pamir-Alay (Uzbekistan) (Fig. 27).
Material examined: Uzbekistan—the holotype.

40. ***Iris petri*** F.O.Khass., Rakhimova & Achilova in Stapfia 101: 19 (2014) — *Juno petri* (F.O.Khass., Rakhimova & Achilova) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 376(5): 190 (2018). Type: Uzbekistan. Kelif-Sherabad range, 25 km east of Boysun Town, grey clays, 38°33'50.84"N, 67°26'18.58"E, 860 m a. s. l., 18.03.2014, *F.O. Khassanov et al.* (holotype TASH, isotype MBG).
Description: Plants up to 15 cm tall; bulb ovate, about 1 cm across; tunics papyraceous, greyish; stem 5–10 cm high; leaves 3–6, falcate, acute, with whitish margins, up to 1–2 cm wide; flowers yellow, 1(2); tube 2–3 cm long; outer tepals 4–4.5 cm long, lamina with 2 greenish stripes, claws with large wings, 1.5–1.8 cm long, 2–2.4 cm wide; crests yellow; standards 0.7–1.0 cm long, obtuse; style blades yellow, divided at the apex, shorter than falls (Fig. 12).
Flowering: March.
Ecology: Gypsum, grey clay in foothills.
Distribution: Central Asia: Southern Pamir-Alay (Uzbekistan) (Fig. 27).
Material examined: Uzbekistan—the holotype.

13h. ***Iris linifolia*** aggr.
41. ***Iris parvula*** (Vved.) Sennikov, **comb. nov.**; Vved. in Komarov, Fl. USSR 4: 563 (1935), nom. inval.; T.Hall & Seisums in Bot. J. Linn. Soc. 167(3): 300 (2011), comb. inval. — *Juno parvula* Vved. in Bobrov, Schedae ad Herbarium florae URSS 20: 61 (1975); Vved. in Kudriashev, Fl. Uzbekistan 1: 514 (1941); Vved. in Ovchinnikov, Fl. Tadzhiksk. SSR 2: 425 (1963), nom. inval.; Boltenkov in Phytotaxa 252(2): 146 (2016), isonym. Type: Tajikistan. "Ad declivia argilloso-saxosa montium Tschulbair supra pag. Sina, alt.

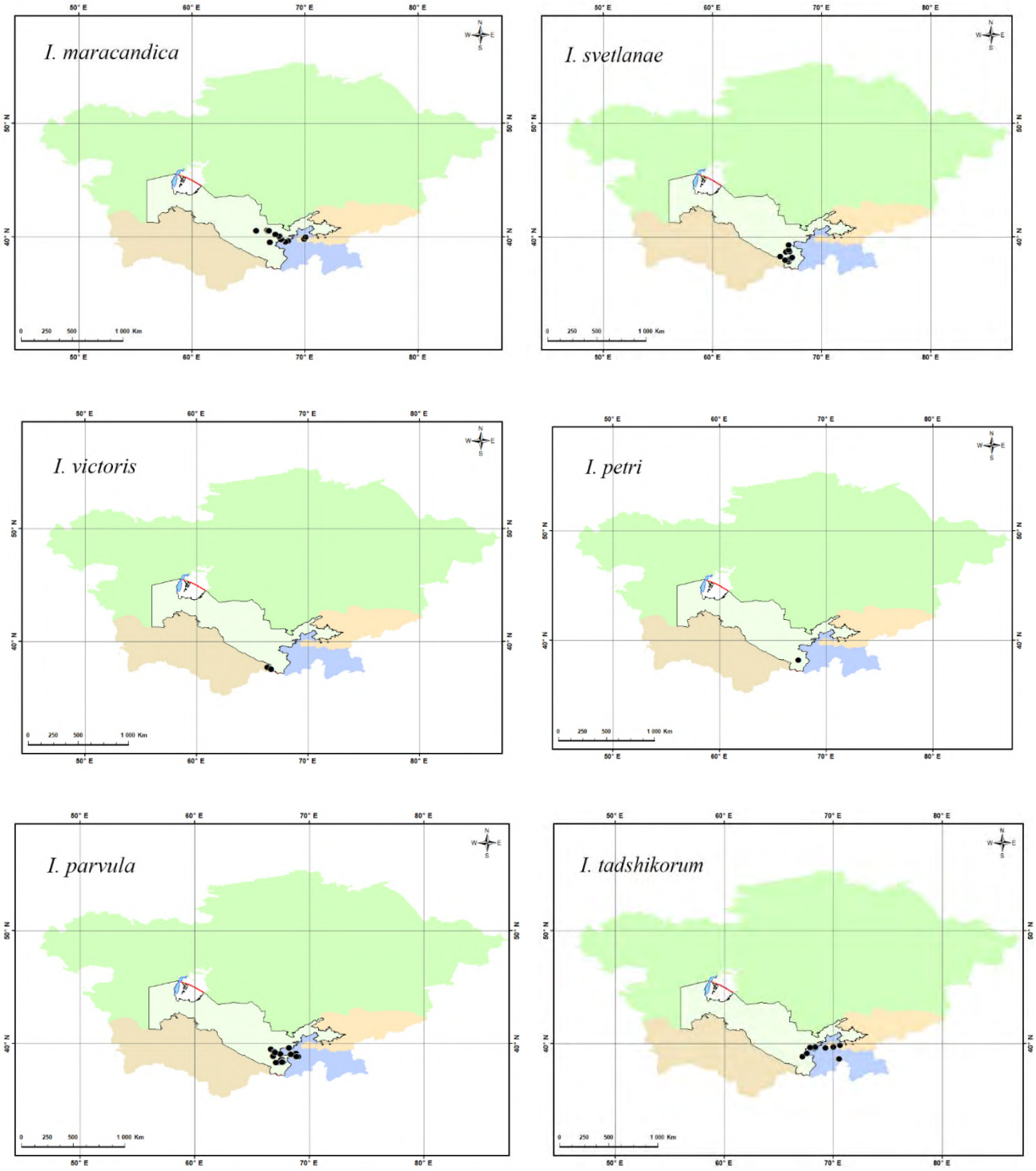

Fig. 27. Distribution of *I. maracandica*, *I. svetlanae*, *I. victoris*, *I. petri*, *I. parvula* and *I. tadshikorum* in Central Asia.

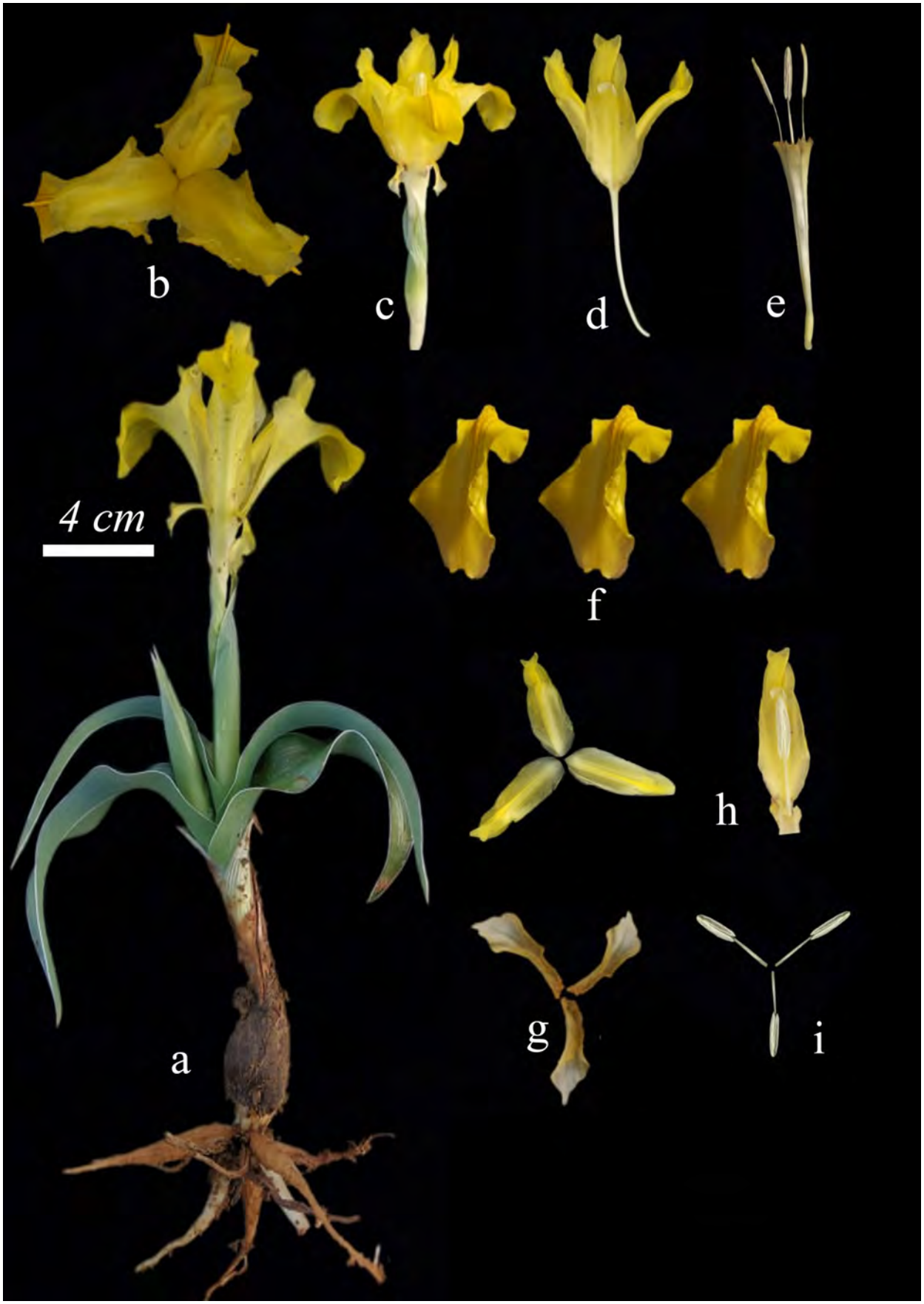

Fig. 28. Living plant of *I. svetlanae*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina; f. Falls (outer tepals); g. Standards (inner tepals); h. Style arms (pistils).

ca. 2600 m s.m.", 23.05.1929, *A. Vvedensky* [Herbarium Florae USSR 5447] (lectotype TASH 0000320, designated by Vvedensky (1975: 61); isolectotypes LE 00050092 etc.).

Nomenclature: Vvedensky (1935b) described this species originally in Russian only, in anticipation of its distribution in *Herbarium Florae Asiae Mediae*, in which Latin diagnoses were normally supplied. However, publication of the latter work was suspended and its juno part has never been issued. For this reason, Vvedensky (1963) attempted valid publication of the species name with a Latin description and a reference to the type material to be distributed in the exsiccata. That material, distributed later as Vvedensky (1975), belonged to more than one gathering because it included plants in the flower and fruit stages; because of this fault, the species name was not published in 1963 (Boltenkov 2016a). With this conclusion, Boltenkov (2016a) believed that the species name remains invalidly published and attempted to validate it in his list of typifications. In doing so, he has overlooked the printed statement (nomenclatural actions are effected only when printed) of Vvedensky (1975) that the specimens in this exsiccata are isotypes of the species name. Vvedensky (1975) provided a full and direct reference to the species description in Latin and cited a single gathering (flowering date only), which he termed type, thus unambiguously fulfilling conditions for valid publication at the time. The fruiting specimens, physically included in the exsiccata, are therefore nomenclaturally irrelevant. As Ikinci et al. (2011) and Khassanov & Rakhimova (2012) used the wrong presumed basionym for the new combination *Iris parvula*, it was not validly published there and, to our best knowledge, has never been validated at all. This nomenclatural act is effected here.

Description: Plants up to 15 cm tall; roots much thickened, short, fusiform; bulb ca. 1 cm in diameter, well developed, outer tunics papery; stem 5(10) cm long, with subdistant leaves and more or less distinct internodes; leaves nearly straight, very slightly recurved, with nearly parallel margins, attenuate only at apex, acute, narrowly marginate, margin scaberulous; lower leaves 5–8(–15) mm broad; flowers 1–2(–5), pale yellowish-green; perianth tube ca. 4 cm long; bluish-green; falls 3–3.5 cm long; claw with parallel margins, 5 mm broad, marked with longitudinal bluish-green veins, gradually enlarged into the lamina; lamina oblong to oblong-ovate, slightly acute to obtuse, 6–8 × 10–12 mm, with dingy green veins and dingy yellow blotch, crest pale yellowish-green, dissected; standards ca. 5 mm long, acute, three-lobed; style crests obliquely triangular, acute, entire, 3 × 5 mm; stigmas obreniform (Figs. 12, 29).

Flowering: May–June.

Ecology: Fine-textured stony slopes in the upper mountain zone, at altitudes of 2500–3000 m.

Distribution: Central Asia: Western Pamir-Alay (Tajikistan, Uzbekistan) (Fig. 27).

Material examined: Uzbekistan—Between Kul and Gilyan villages, 19.05.1916, *Popov*; village Aksu, 05.05.1931, *Butkov*; Aman-Kutan, 24.05.1933, *Drobov*; Tashkurgan, 09.07.1936, *Botschantzev*; Kungus-khan pass, 20.05.1936, *Gnezdillo*; Rabat pass, 19.05.1936, *Gnezdillo*; Kulsay, 11.05.1938, *Korotkova*; Oykaichukur, 8–16.06.1939, *Akhmedov*; Chulbair, 1941, *Kukushkina*; Aman-Kutan, 24.05.1941, *Popov*; Tupalang river, 17.07.1948, *Pyataeva*; Aksu river, 04.06.1948, *Pyataeva*; Sangardak, 08.08.1960, *Pryakhin*, *Khodjimatov*; Obi-Kangar river, 05.05.1966, *Kayumov*; upper Machai river, 21.05.2021, *Ortikov* (TASH); Sina village, 23.05.1929, *Vvedensky* (LE); upper Machai river, 26.05.2020, *Juramurodov* (www.plantarium.ru).

Tajikistan—Anzob pass, 08.06.1924, *Kaleshkina*; Anzob pass, 24.04.1958, *Kaleshkina*; Saritag, 10.06.2019, *Schegelova* (TASH).

42. ***Iris tadshikorum*** Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 152 (1935); Vved. in Komarov, Fl. USSR 4: 563 (1935) — *Juno tadshikorum* Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 152 (1935). Type: Tajikistan. Darwas, between Sary-Tash and Tavildara, on the pass, on stony soil (9000–10000‘), 17.06.1897, *S. Korshinsky 5096* (holotype LE 00050120).

Nomenclature: Vvedensky (1935a) introduced both combinations (in *Iris* and *Juno*) as alternative, although his main generic placement was in *Juno*.

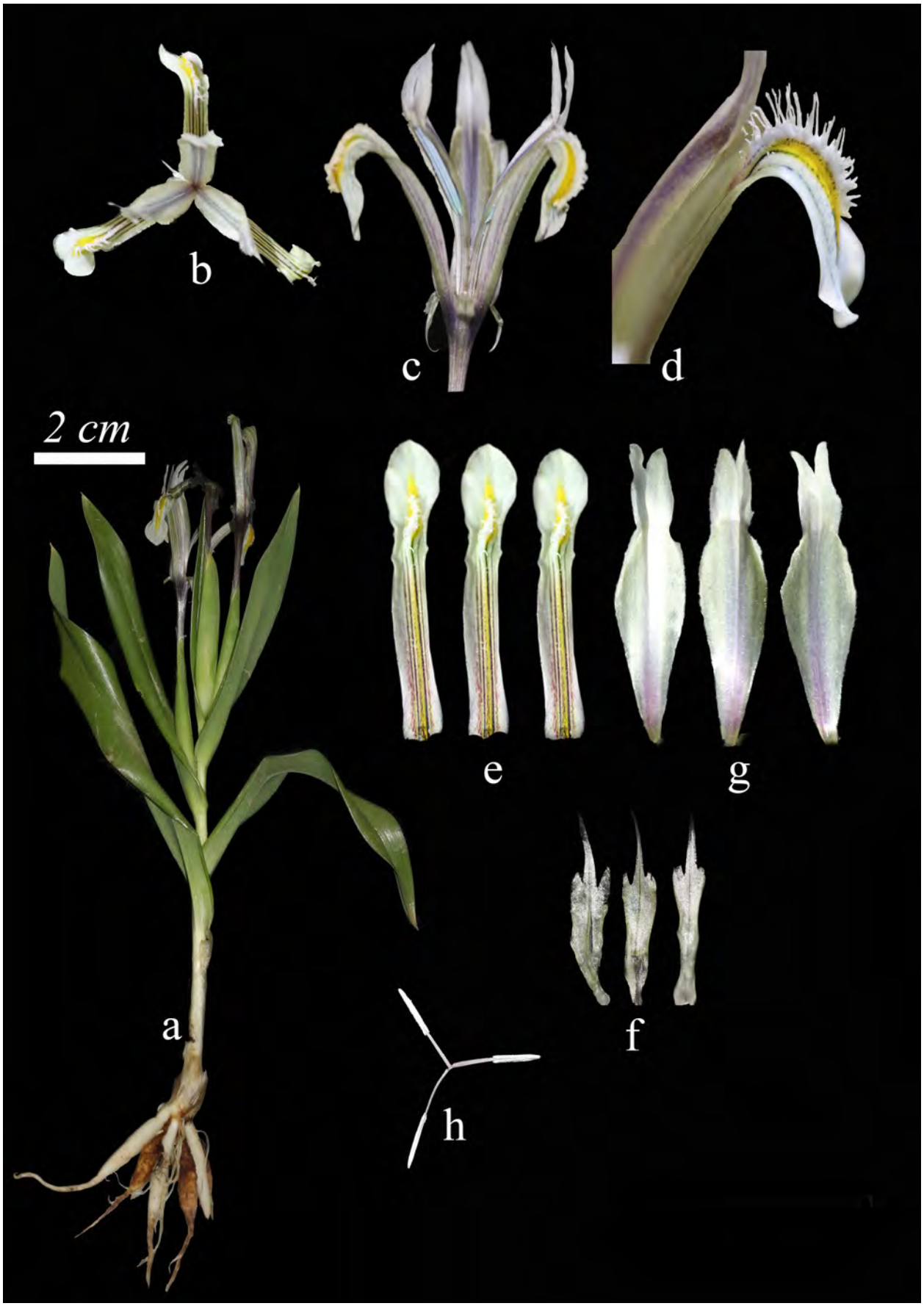

Fig. 29. Living plant of *I. parvula*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals); g. Style arms (pistils); h. Stamina.

Description: Plants up to 15 cm tall; roots strongly thickened, fusiform; bulb 1.5–2.0 cm across, outer tunics papery; stem up to 10 cm high, with closely spaced leaves, internodes inconspicuous; leaves fused into the vagina at the base, falcate, gradually narrowed towards the apex, white-margined, up to 6–10 mm wide; flowers (1)2–4 in number, pale violet with slightly darker veins; perianth tube 3.5–4.0 cm long; falls 4.0–4.5 cm long; claw with almost parallel edges, 7–8 mm wide, gradually expanding into an obovate lamina; lamina 1.2 cm wide, 1.5 cm long; crest white, dissected; standards about 1.5 cm long, acute, obtusely trilobate; style branches obliquely triangular, obtuse, crenate, 12 mm long, 5 mm wide; stigma oblique (Fig. 12).
Flowering: April.
Ecology: Alpine meadows at altitudes of 2600–2800 m.
Distribution: Central Asia: Pamir-Alay (Tajikistan, Uzbekistan) (Fig. 27).
Material examined: Uzbekistan—Pass between Kalta-Kul and Tashkurgan, 28.05.1916, *Popov*; near Shut village, 18.05.1916, *Popov*; Kaltasay, 31.05.1935, *Zakrjevsky*; Tyuya-tashsay, 28.05.1944, *Nazarenko*; Kulsay, 23.06.1947, *Nazarenko*; Kulsaya, 24.05.1961, *Gordova* (TASH).
Tajikistan—Zakhmad-Abad, 31.05.1940, *Zakirov* (TASH); Sari-Taval-daray pass, 17.07.1927, *Korshinsky* (LE); Tamingen, Tavildara, Haz-Rati-Sho Range (www.gbif.org).

43. ***Iris khassanovii*** Tojibaev & Turginov in Phytotaxa 158(3): 224 (2014) — *Juno khassanovii* (Tojibaev & Turginov) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 232(1): 53 (2015). Type: Uzbekistan. Pamir-Alay: border of the Hissar Range, Bayssuntau, near the village of Gumatag, Parakhnaursaj, stony slopes, 2123 m, 38.35696° N, 67.33598° E, 04.05.2013, *Turginov 1421* (holotype TASH).
Description: Plants up to 15 cm tall; bulb ovoid, 1.0–1.5 cm in diameter, tunics papery, brownish; stem 5–10 cm high; leaves with internodes inconspicuous at anthesis but elongating later, falcate, linear-lanceolate, acuminate, with white margins, up to 4–10 mm wide; flowers 1 (2), whitish with violet veins (whitish-yellowish-green when dry, violet veins no longer visible); perianth tube 4 cm long, yellowish-green; claw of falls 4–5 mm wide, with parallel margins and parallel violet veining; falls lamina 6–7 × 10–12 mm, wider than the claw, with violet veining and a yellow stripe along the crest; crest white, denticulate; standards 6–7 mm long, acute, trilobed, with central lobe 2–3 times or more longer than lateral ones, with violet veining; style branches each with two symmetrical broad violet stripes (Fig. 12).
Flowering: May.
Ecology: Stony slopes with *Juniperus* forests at altitudes of 2100–2200 m.
Distribution: Central Asia: Southern Pamir-Alay (Uzbekistan) (Fig. 30). The record of *Iris khassanovii* from Kyrgyzstan (Lazkov et al. 2014) belongs to *I. linifoliiformis*.
Material examined: Uzbekistan—Near Gumatak village, 04.05.2013, *Turginov*; Baysuntau, 12.04.2017, *Beshko* (TASH).

44. ***Iris vvedenskyi*** Nevski ex Woron. & Popov in Fedtschenko & Popov, Fl. Turkm. 1: 323 (1932) — *Juno vvedenskyi* (Nevski ex Woron. & Popov) Nevski in Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, 4: 331 (1937). Type: Turkmenistan. Kuhitang Range, near Khodzhafil-ata village, alpine meadows with spiny schrubs on stony slopes, 27.04.1931, *S. Nevski 475* (lectotype LE 00050126, designated by Boltenkov (2016a: 230); isolectotypes LE 00050127, LE 00050128).
Description: Plants up to 15 cm tall; roots much thickened, fusiform; bulb ca. 1 cm in diameter, well developed, outer tunics papery; stem 3–5 cm long, with subdistant leaves and more or less distinct internodes; leaves falcate, gradually attenuate toward apex, prominently veined, marginate, margin scaberulous, up to 4–5 mm wide; flowers 1(2), pale yellow; perianth tube 2.5–3 cm long; falls 2.5–3 cm long, claw with nearly parallel margins, ca. 5 mm wide, gradually enlarged into the lamina, lamina darker, obovate, obtuse, 7 × 12 mm, crest undissected, orange; inner segments ca. 6 mm long, acute, sublinear or obtusely three-lobed; style crests obliquely triangular, acute, 2 × 7 mm, margins entire; stigmas obcordate (Fig. 12).

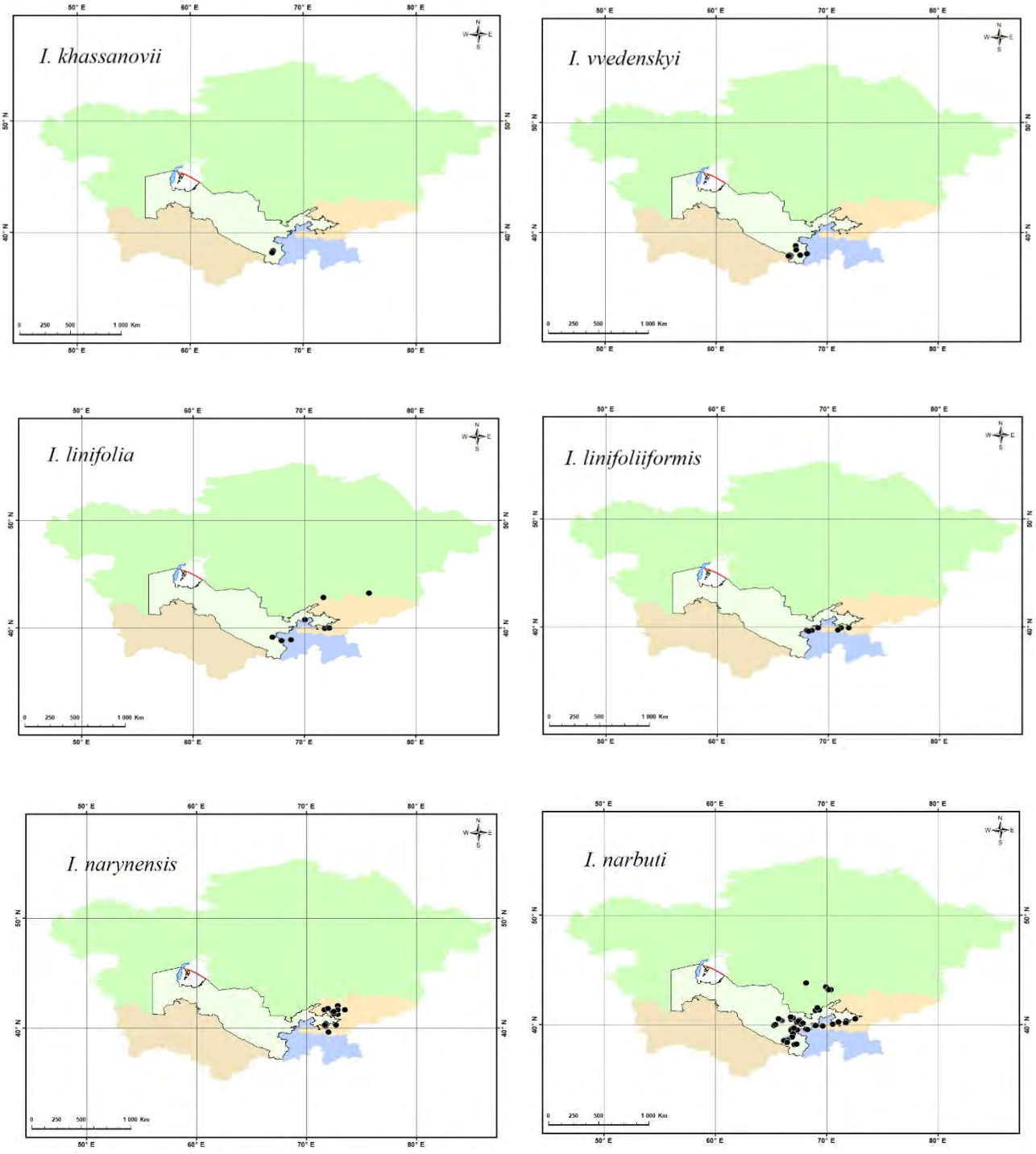

Fig. 30. Distribution of *I. khassanovii*, *I. vvedenskyi*, *I. linifolia*, *I. linifoliiformis*, *I. narynensis* and *I. narbutii* in Central Asia.

Flowering: April–May.
Ecology: Stony and gravelly slopes in the upper mountain zone, at altitudes about 2500 m.
Distribution: Pamir-Alay: Kuhitang Range (Turkmenistan, Uzbekistan) (Fig. 30).
Material examined: Uzbekistan—Maydan, 20.06.1935, *Gnezdillo*; Zakharly, 27.04.1965, *Kayumov*; Machay, 07.04.2012, *Turginov*; Qizildarya river, 23.05.2022, *Turdiev* (TASH).
Turkmenistan—Hodzha-i-fil-ata, 14.05.1915, *Popov* (TASH); Hodzha-i-fil-ata, 27.06.1934, *Nevski* (LE); Khodja-karaul, 06.06.1973, *Pimenov*, *Baranova*, *Klyuykov*, *Sdobina* (MW).

45. ***Iris linifolia*** (Regel) O.Fedtsch. in Izv. Imp. S.-Peterburgsk. Bot. Sada 5: 159 (1905) — *Iris caucasica* var. *linifolia* Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 678 (1884) — *Juno linifolia* (Regel) Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 152 (1935). Type: Uzbekistan. "Pass Kendyr-aus [Kendyr-Daban], zwischen Angren and Kokand", 20.05.1880, *Mussa* in Herb. A. Regel (lectotype LE 00050078, designated by Boltenkov (2016b: 226)).
Description: Plants up to 15 cm tall; roots much thickened, short, fusiform; bulb ca. 1 cm in diameter, well developed, outer tunics papery; stem 5–10 cm long, slender, with subdistant leaves and more or less distinct internodes; leaves subfalcate, gradually attenuate, marginate, margin smooth or scabrous, up to 4–7 mm wide; flowers 1(2), pale yellow; perianth tube ca. 4 cm long; falls 3.5(–4) cm long; claw with nearly parallel margins, ca. 6 mm wide, gradually enlarged into the lamina, lamina obtuse or shortly emarginate, broadly oblong, darker than the claw, 9–12 × 12–15 mm, crest white, undissected; inner segments ca. 1 cm long, acute, obtusely three-lobed; style crests obliquely triangular, obtuse, entire, 5 × 11 mm; stigmas obcordate (Figs. 12, 31).
Flowering: May–June.
Ecology: Stony and gravelly slopes in the upper mountain zone, at altitudes of about 2500 m.
Distribution: Central Asia: Western Tian-Shan, Northern Pamir-Alay (Kyrgyzstan, Tajikistan, Uzbekistan) (Fig. 30).
Material examined: Uzbekistan—Kshtut river, 14.04.1946, *Prosvirina*; Shakhimardan, 08.07.1948, *Shafeev*; basin of Angren river, Abjas-say pass, 29.05.1954, *Butkov*; Pap-Chust range, 29.04.1969, *Filimonova*; Abjassay, 29.04.1969, *Filimonova*; Yordon, 18.05.2022, *Ortikov* (TASH); Angren, 20.05.1900, *Mussa*; Beshnau, 25.06.1937, *Kudryashev* (LE).
Tajikistan—Alay Range, Shavil-say, 20.04.1957, *Ustinova* (TASH).
Kyrgyzstan—Isfayramsay river, 04.07.2011, *Naumenko* (www.plantarium.ru).

46. ***Iris linifoliiformis*** (Khalk.) Tojibaev & Turginov in Phytotaxa 158(3): 228 (2014) — *Juno linifoliiformis* Khalk. in Bot. Zhurn. (Leningrad) 70(12): 1693 (1985). Type: Kyrgyzstan. Declive boreale jugi Turkestanici, ad trajectum Kumbel, 2600 m s. m., in glareoso-argillosis, 03.06.1984, *P. Chalkuziev, G. Schermatov, A. Machmedov, G. Gaffarov 122* (lectotype TASH 0000316, designated by Boltenkov (2016b: 231); isolectotype TASH 0000317).
Description: Plants up to 15 cm tall; roots strongly thickened, filamentous; bulb about 1 cm across, tunics papery; stem 5–10 cm high; leaves basally sheathed, with noticeable internodes; leaves falcate, gradually narrowed, margins white, smooth, up to 4–7 mm wide; flowers 1–2, pale yellow with a violet tint; perianth tube about 4 cm long; falls 3.5–4 cm long, claw with nearly parallel sides, violet-stripped, 6 mm wide, lamina whitish with a narrow yellow blotch, 9–12–15 mm long, 12 mm wide, crest dissected, white; standards about 1 cm long, three-lobed; style crests obtuse, entire (Fig. 12).
Flowering: May–June.
Ecology: Rocky slopes of the highlands.
Distribution: Central Asia: Northern Pamir-Alay (Kyrgyzstan, Tajikistan, Uzbekistan) (Fig. 30).
Material examined: Uzbekistan—Guralash, 02.06.1937, *Vasilchenko*, *Korotkova*; Kulsay, 11.05.1938, *Korotkova*; Sokh river, 08.07.1962, *Puchkova*; upper course of Sanzar river, *Vasilchenko*, *Korotkova*; Shakhimardan, 10.04.1963, *Shonazarov* (TASH).
Kyrgyzstan—Shakhimardan, Aksu, 24.04.1954, *Alexandrova*; Sufikurgan, 09.08.1963, *Puchkova* (TASH).

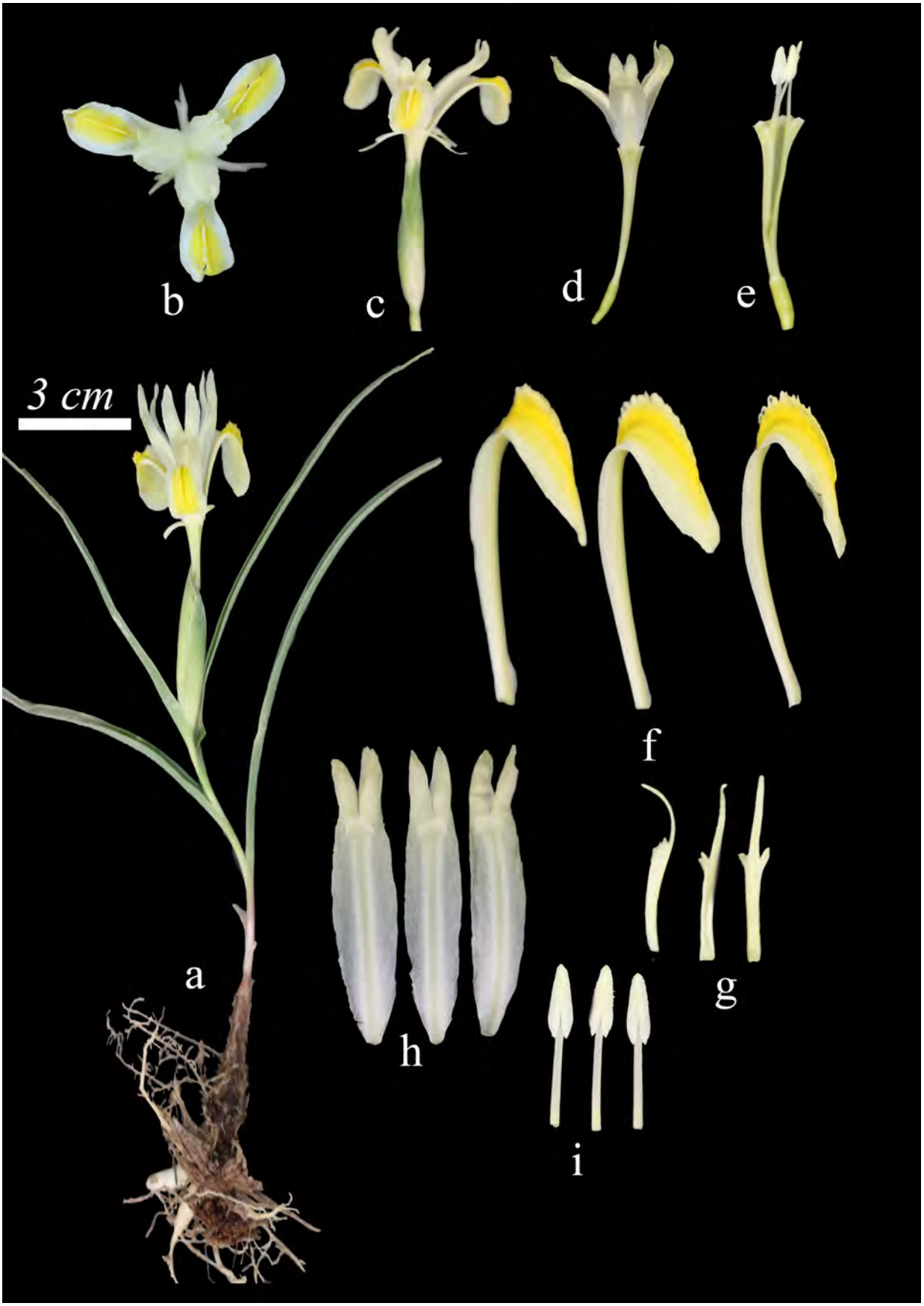

Fig. 31. Living plant of *I. linifolia*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina; f. Falls (outer tepals); g. Standards (inner tepals); h. Style arms (pistils).

13i. ***Iris narynensis*** aggr.

47. ***Iris narynensis*** O.Fedtsch. in Izv. Imp. S.-Peterburgsk. Bot. Sada 5: 159 (1905) — *Juno narynensis* (O.Fedtsch.) Vved. in Kudriashev, Fl. Uzbekistan 1: 515 (1941). Type: Kyrgyzstan. "In valle fluvii Naryn", "1881", *"A. Regel*" (lectotype LE 00050091, designated by Boltenkov (2016b: 229); isolectotype LE 00050090).

Nomenclature: The label of the type specimen belongs to the collections of Albert Regel and states "In valle fluvii Naryn" and "1881". This information does not match the routes of A. Regel, and the whole label curatorially written by C. Winkler is unreliable (Lipsky 1905). So far, the species is not known from the Naryn River (Lazkov et al. 2014), and its actual type locality and collection data remain mysterious.

Description: Plants up to 15 cm tall; roots much thickened, short, fusiform; bulb ca. 1.5 cm in diameter, well developed; stem ca. 5 cm long, with congested leaves and imperceptible internodes; leaves falcate, gradually attenuate toward apex, marginate, margin more or less roughly ciliate, up to 5–10 mm wide; flowers 1(2), pale violet; perianth tube 4.5–5 cm long; falls ca. 4 cm long, claw slightly enlarged in the upper part (ca. 8 mm wide), with nearly parallel margins; lamina rather acute or obtuse, 9 × 10 mm, dark violet except for the margins, crest white, dissected; standards ca. 2 cm long, linear-oblanceolate, gradually narrowed toward base, acute to obtuse; style crests obliquely triangular, rather acute, 4 × 10 mm, margins entire; stigmas semicircular (Figs. 12, 32).

Flowering: March–April.

Ecology: Gravelly slopes in the lower mountain zone.

Distribution: Tian-Shan: Chatkal Range; Pamir-Alay: Alay Range (Kyrgyzstan, Uzbekistan) (Fig. 30).

Material examined: Uzbekistan—Skobelev, steppe, 28.03.1919, *Gomolitsky*; village Vuadil, 15.03.1964, *Shonazarov*; Arbag'ish, 21.03.2021, *Tojibaev*; Nanay, 04.04.2021, *Ortikov* (TASH).

Kyrgyzstan—Padsha-ata, 30.03.1926, *Gomolitsky* (TASH); Osh region, 08.04.2014, *Naumenko*; near Osor village, 26.03.2017, *Zenin* (www.plantarium.ru).

13j. ***Iris narbutii*** aggr.

48. ***Iris narbutii*** O.Fedtsch. in Izv. Imp. Obshch. Lyubit. Estestv. Moskovsk. Univ. 103: 147 (1902) — *Juno narbutii* (O.Fedtsch.) Vved. in Kudriashev, Fl. Uzbekistan 1: 515 (1941). Type: Uzbekistan. Vicinity of Samarkand, 16.03.1869, *O. Fedtschenko* (lectotype LE 00050088, designated by Boltenkov (2016b: 229); isolectotype LE 00050085).

= *Iris dengerensis* B.Fedtsch. in Izv. Imp. S.-Peterburgsk. Bot. Sada 5: 157 (1905). Type: Tajikistan. "Inter Dengere [Danghara] et Sängtoda [Sangtuda]", 03.1884, *Mussa* in Herb. A. Regel (lectotype LE 00050057, designated by Boltenkov (2016b: 227); isolectotypes LE 00050058, LE 00050059, LE 00050060, LE 00050061, LECB 0004258).

= *Iris hissarica* O.Fedtsch. in Allg. Bot. Z. Syst. 11: 157 (1905). Type: Tajikistan. "Buchara, Khanat Chussar, bei Sari-Kannisch auf trockenen berasten Hügeln, awl. 2000–4000 m", 1903, *A. Kronenburg 30* (lectotype LE 00050063, designated by Boltenkov (2016b: 228)).

Nomenclature: The identifications and descriptions in Central Asian *Iris* published in Kneucker (1905) were supplied by Olga Fedtschenko and should be treated under her authorship.

Description: Plants up to 15 cm tall; roots thickened, fusiform; bulb ca. 2 cm in diameter, well developed; stem 5–10 cm long, with closely approximate leaves, internodes sometimes perceptible in fruit; leaves dark green, falcate, gradually attenuate toward apex, broadly marginate, margin smooth or very rarely scabrous; lower leaves 5–25 mm wide; flowers 1–2(6), inodorous; perianth tube gradually enlarged upward, greenish, violet-tinged, 4–5 cm long; falls 3.5–4(–5) cm long; claw pale violet or yellowish with greenish-yellow median part and violet lateral veins, 4–7 mm broad, gradually enlarged into the lamina, lateral veins prolonged onto the lamina; lamina obovate, emarginate, 7–12 × 9–16 mm, with a dark violet velvety blotch varying in size and sometimes broken up, crest white, undissected, sometimes crenate; standards 2.5–3.5 cm long, violet, with few darker veins, lamina oblanceolate or obovate, gradually narrowed into the claw; style branches pale violet

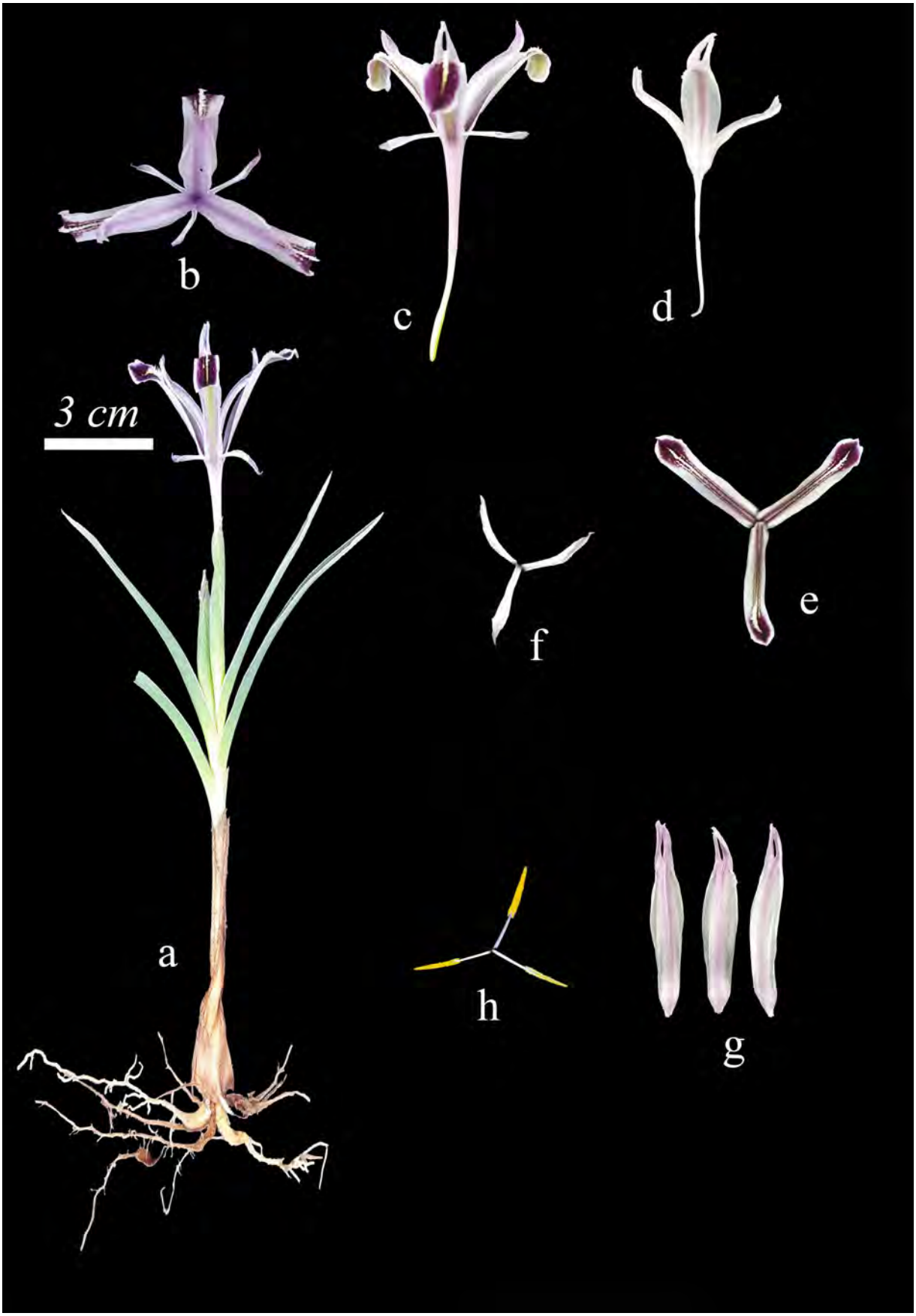

Fig. 32. Living plant of *I. narynensis*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals); g. Style arms (pistils); h. Stamina.

or very often dingy yellow; style crests narrow, obliquely triangular, rather acute, 4–5 × 11–12 mm, margins entire; stigmas elongate-semicircular; anthers whitish or often azure; pollen whitish (Figs. 12, 34).
Flowering: March–April.
Ecology: Rocky and gravelly slopes in foothills.
Distribution: Western Tian-Shan: Tashkent Alatau, Mogoltau Range; Pamir-Alay (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan) (Fig. 30).
Material examined: Uzbekistan—Tahku-tau, 07.05.1913, *Korovin*; Kyzyl-Chali, 28.04.1913, *Korovin*; Nurata mountains, 23.04.1913, *Korovin*; Pistalitau, 08.04.1915, *Popov*; near Dargom, 07.04.1919, *Gomolitsky*; near Baulikhana village, 07.04.1920, *Gomolitsky*; Choponata, 30.04.1921, *Drobov*; near Makhau village, 13.04.1921, *Gomolitsky*; Dargom, 04.04.1921, *Blagoveschensky*; near Agalyk, 04.04.1921; Sanzar river, 1–4.04.1921, *Korovin*; Sanzar river, 01.04.1921, *Vvedensky*; near Akpelyal hills, 21.03.1921, *Shafaev*; Kara-Murt, 07.04.1927, *Linczevsky*; Choponata, 28.03.1929, *Valnev*; near village Kyzylchi, 23.04.1935, *Lepeshkin*; near Guzar, 05.04.1935, *Lepeshkin*; Guzar, 22.04.1935, *Gnezdillo*; Guzar, 04–05.04.1935, *Lepeshkin*; Dultali kizil, 23.04.1935, *Lepeshkin*; Agalyk mountains, 21.05.1937, *Vadova*; between Kulsay and Churtanga, 02.07.1937, *Korotkova*, *Vasilkovskaya*; Koytash, 23.07.1937, *Demurina*; Kulsay, 27.05.1938, *Korotkova*; Kizilchaura, 19.05.1938, *Kudriyashev*, *Sumnevich*; Dargom, 09.03.1941, *Fayziev*; Zirabulak, 26.04.1941, *Fayziev*; near Ishkent village, 28.03.1942, *Arnoldi*; Kizilcha, 04.04.1951, *Novikova*; near Kizilcha village, 07.04.1951, *Novikova*; near Chardar village, 05.05.1955, *Vernik*, *Nabiev*; near Boysun, 15.05.1962, *Belolipov*; near Nurata district, 16.03.1963, *Markova*; near Vuadil village, 15.03.1964, *Shonazarov*; Sherabad river, 29.03.1965, *Kayumov*; Narvon, 29.03.2021, *Ortikov* (TASH); Sangsar river, 4.04.1921, *Vvedensky* (MW); Nuratau, 03.2002, *Beshko*; Nuratau, 26.03.2011, *Davkaev*, *Beshko*; Nuratau, 26.03.2011, *Gaziev*; Pistalitau, 18.03.2013, *Beshko*; near Tulibay village, 10.04.2014, *Beshko*; between Egiz-Bulak and Karatash villages, 04.04.2014, *Beshko* (www.plantarium.ru); Jizzakh (www.gbif.org).
Kazakhstan—Kaplanbek, 03.1909, *Pavlov*; Alym-tau, 08.04.1916, *Kultiasov*; Keles river basin, 02.04.1921, *Abolin*; Kaplanbek, 27.03.1922, *Vvedensky*; Karatau mountains, 08.04.1930, *Lipschitz*; Kainar Bastau, 24.05.1935, *Nikolaev*; Karatau mountains, 17.05.1936, *Chilinina*; Kaynarbastau, 24.05.1935, *Nikolaev*; Small Aktau mountains, 10.05.1936, *Chilinina*; Satyl-sai, 05.08.1954, *Pavlov* (MW); Keles river, 21.03.2019, *Epiktetov* (www.plantarium.ru); South Kazakhstan, Karatau (www.gbif.org).
Tajikistan—Leninabad, 12.03.1935, *Musina*; Ura-Tube, 19.04.1959, *Kovalevskaya*; Okbel, 01.04.1981, *Levichev* (TASH); Mountains Shurab, 24.03.2008, *Pankratov* (www.plantarium.ru).
Kyrgyzstan—Laylak, 18.05.1952, *Popov*; Tusjaylu, 14.05.1962, *Aydarova*; Tuzbel, 14.06.1967, *Sudnitsina*; Koshbulak, 2004, *Ganybaeva*; Turkestan Range, 15.06.2006, *Ganybaeva*; Akturpak, 03.04.2014, *Lazkov* (FRU); Charakdan mount, 02.05.1987, *Pimenov, Vasilieva* (MW).

49. ***Iris rudolphii*** F.O.Khass., Esankulov & Achilova in Stapfia 99: 207 (2013) — *Juno rudolphii* (F.O.Khass., Esankulov & Achilova) M.B.Crespo, Mart.-Azorín & Mavrodiev in Phytotaxa 232(1): 54 (2015). Type: Uzbekistan. Kelif-Sherabad range; near Aktash village, red sands; 37°32'0.75"N, 66°42'11.66E, 500 m s. l., 02.03.2013, *F.O. Khassanov, Esankulov & N. Achilova* (holotype TASH).
Description: Plants up to 30 cm tall; bulb ovate, about 1 cm wide; tunics papyraceous, brownish; stem 10–30 cm high; leaves 3–4, connivent, crescent, acute, with whitish margins, up to 1.5–2 cm wide; flowers bluish, single; tube 2 cm long; falls 3–3.5 cm long, claws without wings, lamina reniforme, 2 cm long, 1.5 cm wide; crest yellow, smooth; standards 2.5–3 cm long, rounded; style blades white-bluish, equal to the falls, deeply divided above (Figs. 12, 35).
Flowering: February–March.
Ecology: Gravelly slopes in foothills.

Distribution: Central Asia: Southern Pamir-Alay (Uzbekistan) (Fig. 33).
Material examined: Uzbekistan—Near Aktash village, 02.03.2013, *Khassanov*, *Esankulov*, *Achilova*; between Zarabag and Kampyrtepa villages, 18.02.2021, *Ortikov*; near Rabat, 03.15.2021, *Karimov*; near Kampirtepa village, 14.03.2022, *Ortikov* (TASH); Rabat village, 15.03.2021, *Karimov*; between Zarabag and Kampirtepa villages, 18.02.2021, *Ortikov* (www.plantarium.ru).

50. ***Iris rodionenkoi*** (Lazkov & Naumenko) T.Hall in Species Group Brit. Iris Soc. Newsletter 2014 (December): 12 (2014); Lazkov & Sennikov in Memoranda Soc. Fauna Fl. Fenn. 90: 105 (2014) — *Juno rodionenkoi* Lazkov & Naumenko in Turczaninowia 17(2): 33 (2014). Type: Kyrgyzstan. North-western spurs of the Fergana Range, between the rivers Uuru-Sai and Sary-Bel, 41°27'06.5"N, 72°17'35.6"E, 04.04.2014, *A.N. Naumenko* (holotype LE; isotypes FRU, MW, ALTB).
Description: Plants up to 5–7 cm tall from soil level to tips of the style lobes; bulb 1.5–1.8 cm in diameter, ovoid; tunics coriaceous, elongated, dark brown; roots spindle-shaped; stem very short, concealed by closely packed leaves; leaves 3–5, well developed at anthesis, slightly falcate, broadest at the base, gradually tapering, with narrow, white scarious margins, green above, glaucous beneath, up to 6–8 cm long, 0.6–0.8 cm wide; flowers 1–2, pale violet-grey or pale violet-yellowish, perianth tube 3.5–4.0 cm long; falls 3.5–4.5 cm long, claw almost parallel-sided, 2–2.5 cm long, 0.7–0.9 cm wide, lamina broadly ovate, with a dark violet blotch (brownish in yellowish forms) on the apex and a yellow blotch around the crest, 1.0–1.3 cm long, 0.8–1.0 cm wide, crest 0.9–1.1 cm long, yellow, slightly dentate, standards 1–2 cm long, lanceolate or three-dentate; style branches 3.0–3.5 cm long, deeply divided above; stamens 2.0–2.2 cm long, with thin filaments; anthers 1.0–1.2 cm long (Figs. 12, 36).
Flowering: March–April.
Ecology: Rocky and gravelly slopes.
Distribution: Central Asia: Western Tian-Shan: Fergana Range (Kyrgyzstan, Uzbekistan) (Fig. 33).
Material examined: Uzbekistan—Uygursay, 08.04.2014, *Tojibaev*, *Karimov*; near Chustnon village, 29.03.2015, *Batashov*, *Ashurov*; Chap hills, 21.03.2021, *Ortikov* (TASH); near Baymak village, 04.03.2020, *Turginov*; near Varzik village, 23.03.2021, *Hoshimov* (www.plantarium.ru).
Kyrgyzstan—Chanachsay, 17.09.1938, *Parayskaya*; Mayli-say, 05.1952, *Galkina*; (TASH); between Uuru-Sai and Sary-Bel rivers, 04.04.2014, *Naumenko* (LE); Naryn river basin, 04.04.2014, *Naumenko*; Bekechal, 15.04.2017, *Lazkov*; Bekechal, 20.03.2020, *Lazkov* (www.plantarium.ru).

14. ***Iris*** sect. ***Physocaulon*** (Rodion.) Mathew & Wendelbo in Rechinger, Fl. Iran. 112: 59 (1975) — *Juno* sect. *Physocaulon* Rodion., Rod Iris: 208 (1961). Type: *Iris drepanophylla* Aitch. & Baker.

14a. ***Iris*** subsect. ***Rosenbachianae*** (Rodion.) Sennikov, **comb. nov.** — *Juno* ser. *Rosenbachianae* Rodion., Rod Iris: 208 (1961). Type: *Iris rosenbachiana* Regel.

14aa. ***Iris zaprjagajevii*** aggr.
51. ***Iris zaprjagajevii*** (N.V.Abramov) T.Hall & Seisums in Bot. J. Linn. Soc. 167(3): 300 (2011) — *Juno zaprjagajevii* N.V.Abramov in Novosti Sist. Vyssh. Rast. 8: 115 (1971). Type: Tajikistan. Pamir austro-occidentalis, fl. Bizhun-Dara prope pag. Nischusp, 2200 m s. m., 24.04.1968, *N.V. Abramov* (holotype LE 00050130, isotype LE 00050131).
Description: Plants 10–15 cm tall; roots strongly thickened, fusiform; bulb up to 1.5 cm across, tunics papery, inner ones white, outer ones grey-brown; leaves light green, falcate, gradually tapering from the middle to the apex, along the edge with a narrow cartilaginous border, up to 4 cm wide; flowers 1–3, white; perianth tube yellowish, 6–9 cm long; falls up to 4 cm long, claws up to 2 cm wide, lamina up to 1.5 cm wide, with thin violet veins and a small yellow blotch along the crest; standards up to 10 mm long, 5 mm wide, lanceolate to rhombic, acute; style branches

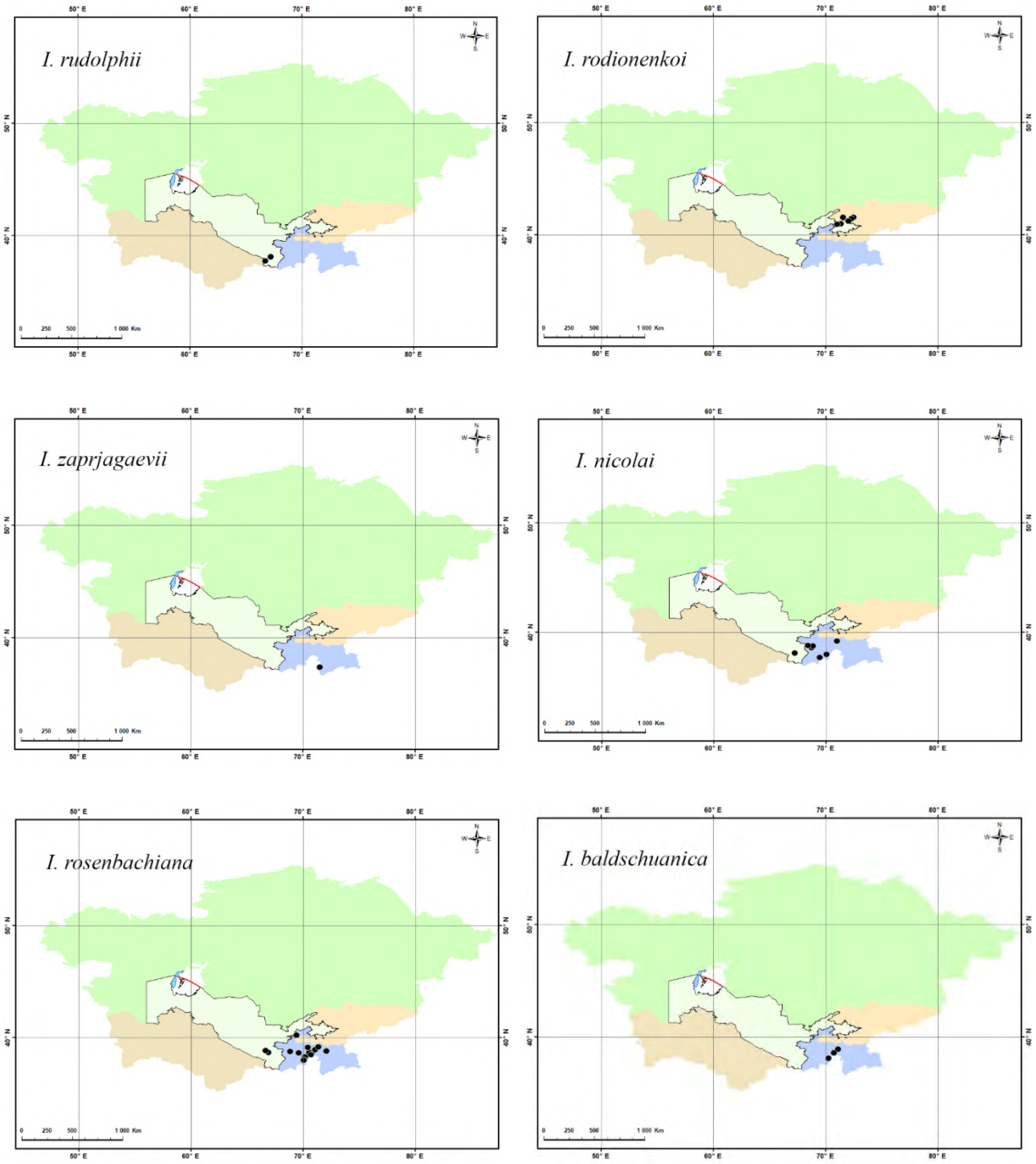

Fig. 33. Distribution of *I. rudolphii*, *I. rodionenkoi*, *I. zaprjagajevii*, *I. nicolai*, *I. rosenbachiana* and *I. baldshuanica* in Central Asia.

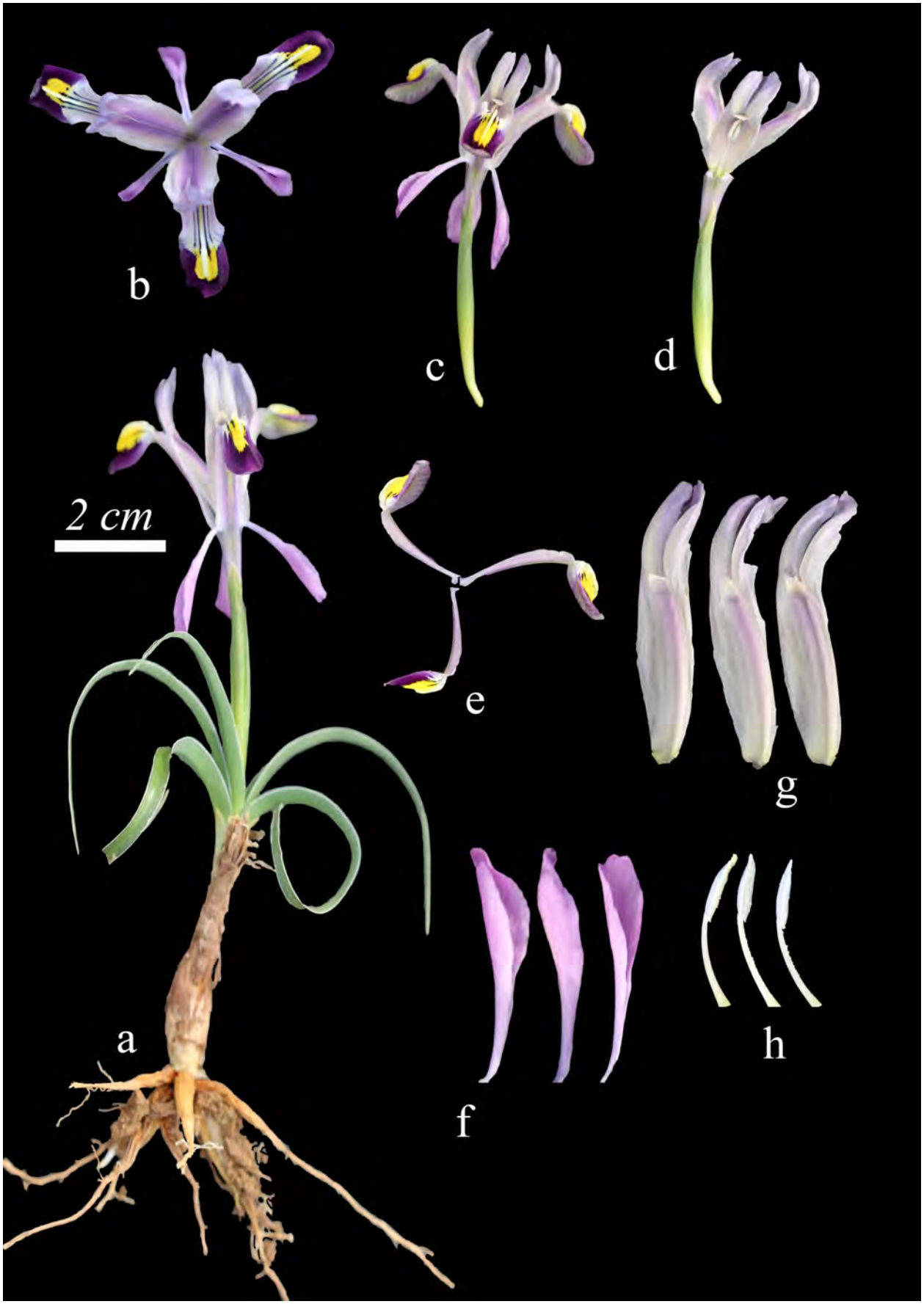

Fig. 34. Living plant of *I. narbutii*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals); g. Style arms (pistils); h. Stamina.

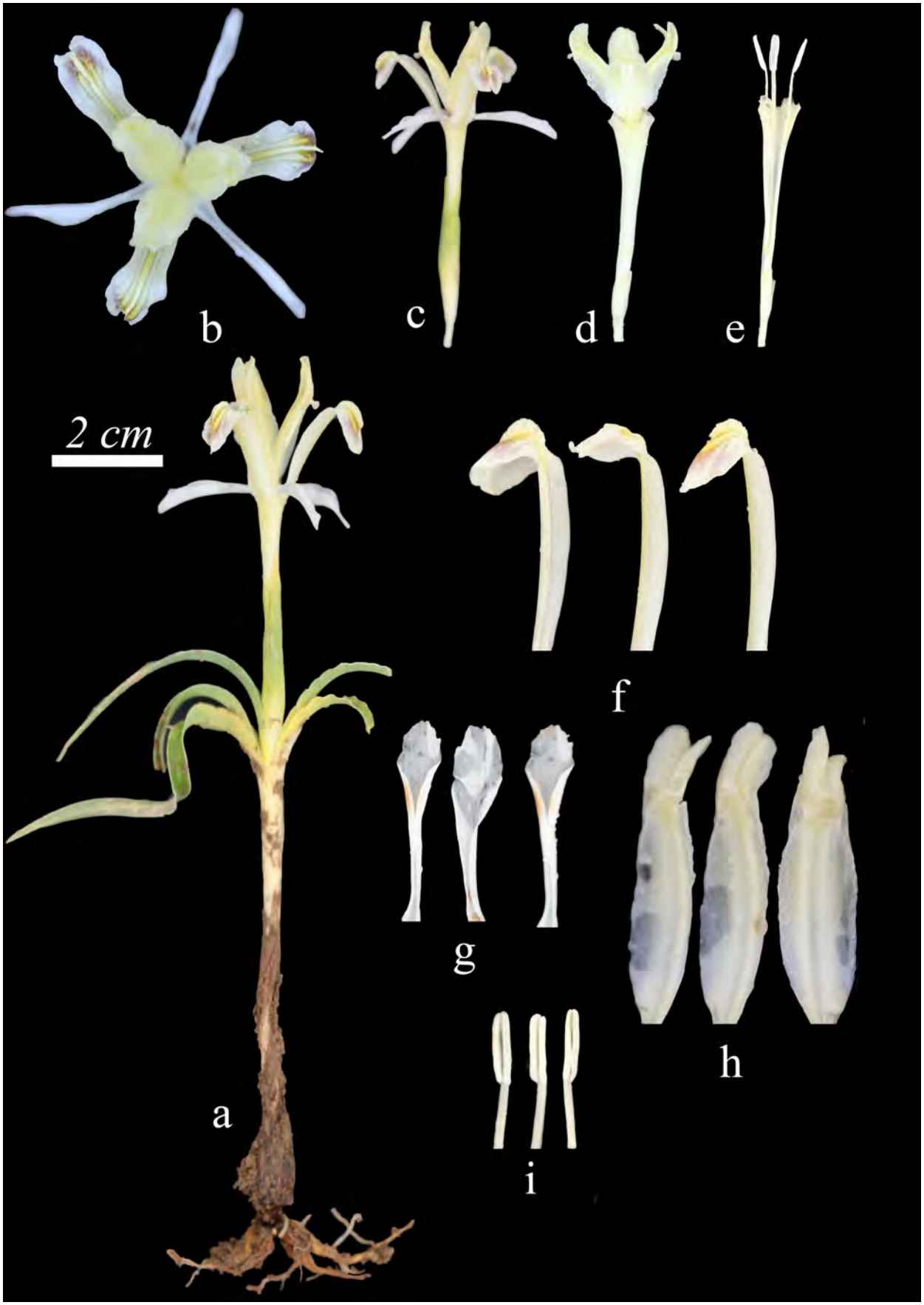

Fig. 35. Living plant of *I. rudolphii*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e, i. Stamina; f. Falls (outer tepals); g. Standards (inner tepals); h. Style arms (pistils).

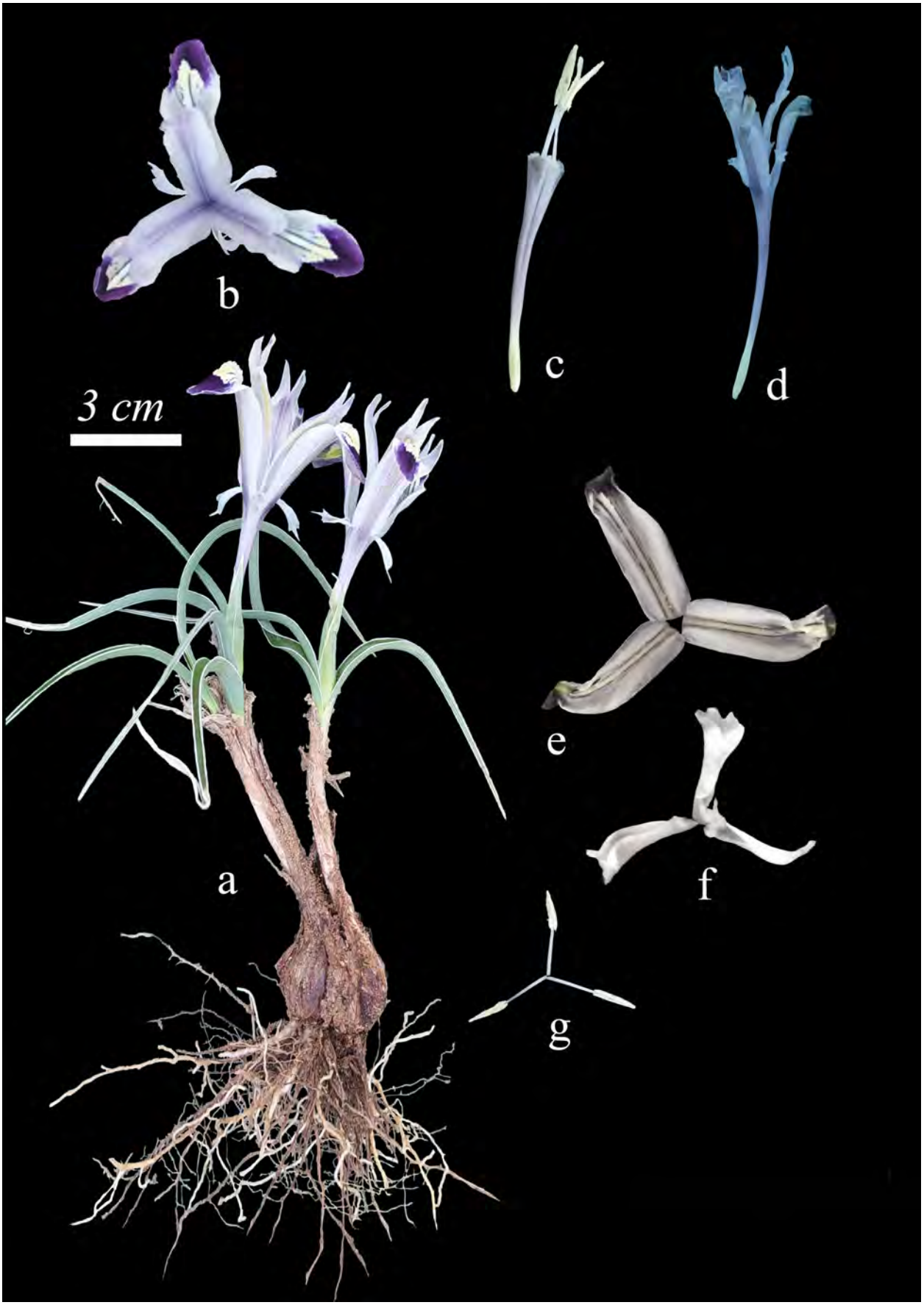

Fig. 36. Living plant of *I. rodionenkoi*. a. Complete plant; b. Complete flower; c, g. Stamina; d. Dissected flower; e. Falls (outer tepals); f. Standards (inner tepals).

oblique-triangular, crenate, 5–6 mm wide, 10–13 mm long; stigmas semicircular, with a heart-shaped notch (Fig. 12).
Flowering: April–May.
Ecology: Clayey slopes in the upper mountain zone, at altitudes between 2200 and 3000 m.
Distribution: Central Asia: Pamir (Tajikistan) (Fig. 33).
Material examined: Tajikistan—the holotype; Ishkashim Mts., near Vogz village [37.119° N, 71.444° E], 05.06.1969, *N.V. Abramov* (LE).

14aaa. ***Iris rosenbachiana*** aggr.
52. ***Iris nicolai*** Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 151 (1935); Vved. in Komarov, Fl. USSR 4: 561 (1935) — *Juno nicolai* Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 151 (1935). Type: Uzbekistan. Surkhandaria basin, Chulbair Mts., sloping hills above Sina village, 24.04.1928, *A. Vvedensky 217* (holotype TASH 0000319).
Nomenclature: Vvedensky (1935a) introduced both combinations (in *Iris* and *Juno*) as alternative, although his main generic placement was in *Juno*.
Description: Plants up to 15 cm tall; roots thickened, fusiform; bulb ca. 2 cm in diameter, well developed; stem obsolescent, with closely approximate leaves and imperceptible internodes; leaves developing together with flowers, at anthesis greatly overtopped by the flowers, subcordate, attenuate from the middle, narrowly marginate, the margins more or less scabrous, up to 1–3 cm wide; flowers 1–2(3), pale pink-violet; perianth tube 8–9 cm long, dusky purple-violet; falls 4–4.2 cm long; claw whitish-margined, yellow veined with purple-violet at center, with nearly parallel margins, 9–10 mm wide, gradually enlarged into the claw; claw oblong, obtuse or emarginate, 10–12 × 17–20 mm, tipped dark purplish-violet, white on both sides of the crest; crest yellow purple-spotted, margins entire; standards 3–3.5 cm long, 5–9 mm broad, lamina oblong-oblanceolate, obtuse or emarginate, pale pink-violet, gradually narrowed into a darker claw; style crests obliquely triangular, obtuse to subacute, dentate-crenate, 6–8 × 18–20 mm; stigmas shortly semicircular, slightly emarginate (Figs. 12, 37).
Flowering: March–April.
Ecology: Clayey slopes in the lower mountain zone, up to 2000 m.
Distribution: Central Asia: Southern Pamir-Alay (Tajikistan, Uzbekistan) (Fig. 33).
Material examined: Uzbekistan—Surhandarya river basin, 13.04.1926, *Vvedensky*; Fazyl-Kushy, 13.04.1928, *Vvedensky*; pass to Bayssun, 24.02.1963, *Belolipov*; near Machay village, 20.04.2014, *Turgunov*; Rabat, 14.02.2021, *Ortikov* (TASH); Soukbulak, 17.03.2018, *Beshko*; near Rabat village, 14.02.2021, *Ortikov*; near Rabat, 13.02.2021, *Karimov* (www.plantarium.ru). **Tajikistan**—Djaltyr-tube village, 12.05.1937, *Gomolitsky*, *Arifkhanova*; Kondara, 04.04.1962, *Kamelin*; Stalinabad, 30.04.1957, *Grigoryev*; Gulbista river valley, 20.03.1957, *Grigoryev* (TASH); Varzob river, 1982, *Rukšāns* (www.plantarium.ru).

53. ***Iris rosenbachiana*** Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 675, tab. 8 (1884) — *Juno rosenbachiana* (Regel) Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 152 (1935). Type: Tajikistan. "Baldschuan, Kalaichodsa ad fl. Aksu, 6500', 15/27.03.1883, *A. Regel* (lectotype LE 00050101, designated by Boltenkov (2016b: 230); isolectotype LE 00050102).
Description: Plants up to 10 cm tall; roots thickened, short, fusiform; bulb ca 1.5 cm in diameter, well developed; stem obsolescent; with closely congested leaves and imperceptible internodes; leaves developing together with flowers, at anthesis commonly greatly exceeded by the flowers, subfalcate, with almost parallel margins, attenuate at apex, narrowly marginate, margins more or less scabrous, up to 2–3 cm broad; flowers (1)2–3, violet; perianth tube 9–10 cm long; falls (4)5–5.5 cm long; claw with nearly parallel margins, gradually enlarged into the lamina; lamina 12–17 × 17–22 mm, dark violet, on both sides of the crest white with dark violet spots; crest undissected, with entire margins, the front part dark violet, the back part yellow; standards 2.5–3 cm long, lamina oblong-obovate to obovate-obtuse or often emarginate, 6–12 mm broad; style crests obliquely triangular, subacute

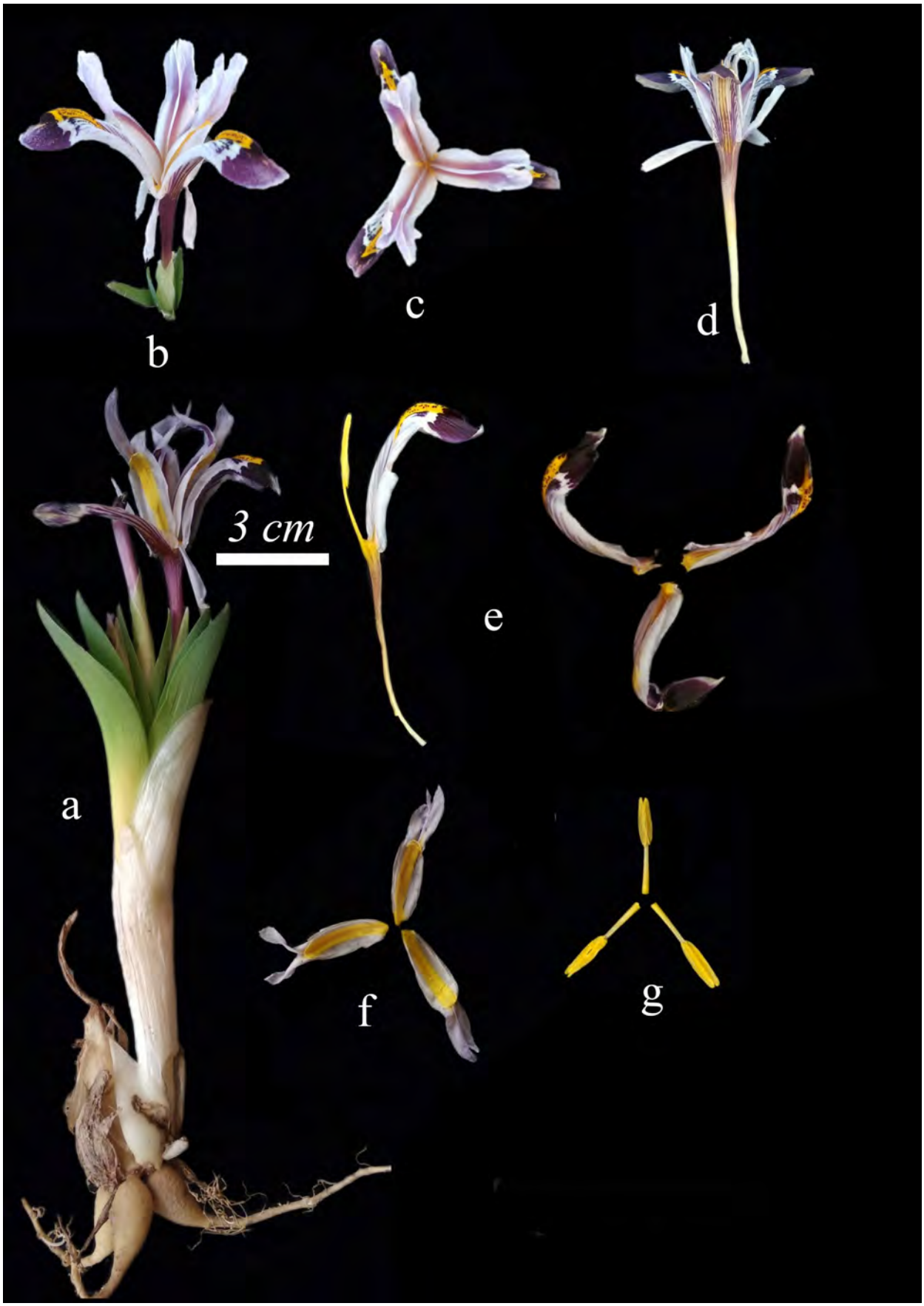

Fig. 37. Living plant of *I. nicolai*. a. Complete plant; b, c. Complete flower; d. Dissected flower; e. Falls (outer tepals); f. Style arms (pistils); g. Stamina.

to obtuse, crenate-dentate, 5–10 × 15–22 mm; stigmas shortly semicircular (Fig. 12).
Flowering: March–April.
Ecology: Stony slopes of the lower mountain zone, up to 2000 m.
Distribution: Afghanistan, Central Asia: Southern Pamir-Alay (Tajikistan, Uzbekistan) (Fig. 33).
Material examined: Uzbekistan—Maidanak mountains, 02.05.1979, *Pimenov*, *Klyuykov*, *Boryaev*, *Baranova*, *Vasilieva* (MW).
Tajikistan—Samburak, 13.05.1913, *Michelson*; Darvaz, 15.06.2019, *Shegelova* (TASH); Dengere, 03.1884, *Regel*; Vahsh Range, Sambura mountain, 1913, *Michelson*; Komarou river, 04.07.1988, *Pimenov*, *Vasilieva*, *Lavrova*; Pandara river 03.07.1988, *Pimenov*, *Vasilieva*, *Kuznetsova*; near Dashti-Hirson village, 04.07.1988, *Pimenov*, *Vasilieva*, *Kuznetsova* (MW); Tavildara, 27.03.2010, *Zubov* (www.plantarium.ru); 2 km south of Romit village, Qurghonteppa, 30 km north of Kulob, near Childukhtaron village, Sagridascht (www.gbif.org).
Note: The plants sampled as *Iris rosenbachiana* for phylogenetic studies (Ikinci et al. 2011; Mavrodiev et al. 2014) have pale blue flowers with distinct apical spots on the falls and therefore belong to *I. nicolai*.

54. ***Iris baldshuanica*** O.Fedtsch. & B.Fedtsch. in Russk. Bot. Zhurn. 1909(5): 77 (1909) — *Iris rosenbachiana* var. *baldshuanica* (O.Fedtsch. & B.Fedtsch.) Dykes, Gen. Iris: 206 (1913) — *Juno baldshuanica* (O.Fedtsch. & B.Fedtsch.) Vved. in Ovchinnikov, Fl. Tadzhiksk. SSR 2: 385 (1963). Type: Tajikistan. [Alpine meadows near Tevildara Village, collected as living plants by A. Kronenburg on 10.06.1903.] Cultivated in Saint-Petersburg Botanical Garden, obtained live by B.A. Fedtschenko from Van Tubergen (native from Bukhara) (lectotype LE 00050049, designated by (Boltenkov 2016: 224)).
= *Juno popovii* Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 152 (1935); Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 152 (1935), **syn. nov.** — *Iris popovii* Vved. in Komarov, Fl. USSR 4: 562 (1935). Type: Tajikistan. "Emirate of Bukhara, Darwaz District, Peter the Great Range, pass Gardan-i-Kaftar, 17.07.1911, *A. Golbek 271* (lectotype LE 0050095, designated by Boltenkov (2016a: 146); isolectotype LE 0050096).

Nomenclature: The name *Iris baldshuanica* was ascribed to "Fedtsch." in the protologue, whereas the other species names authored by Olga or Boris Fedtschenko were ascribed as "O.Fedtsch." or "B.Fedtsch." The ascription "Fedtsch." is commonly interpreted as a joint authorship, as accepted here.

Vvedensky (1935a) introduced both combinations (*Iris popovii* and *Juno popovii*) as alternative, although his main generic placement was in *Juno*.

Van Tubergen (1947) clarified that numerous plants of *Iris rosenbachiana* s.l. were delivered to his nursery by A. Kronenburg, who travelled extensively in the Emirate of Bukhara and collected the species on 10 June 1903 at "Dewildara" (now Tavildara, Tajikistan), possibly at altitudes of about 2400 m (Kneucker 1905).

Fedtschenko (1909) described the flowers of *I. baldshuanica* as "yellow, smaller" [than in *I. rosenbachiana*]. Vvedensky (1935b, 1963, 1971) did not support the idea of smaller flowers but added that the falls have violet veins. According to the unpublished drawing made from the type plant, its background flower colour was pale yellow.

Vvedensky (1935a, 1935b) separated another species of this group, *I. popovii*, based on a single dried gathering at LE. The flower colour of that specimen has faded by the time of description; Vvedensky inferred that it was blue or pale lilac, with violet veins on the fall. Upon the re-examination of the type, it was impossible to ascertain what its background flower colour was (it could have been whitish because no traces of colour remained) but its fall lamina was certainly with strong violet veins and without an apical violet spot (this spot is characteristic of *I. rosenbachiana*). The photo taken by Alexander Ebel in 2019 at the type locality of *I. popovii* shows plants with the whitish background and violet veins, which apparently correspond to the type.

Given a certain variability in the background colour of such junos (which can be whitish, yellowish or bluish in *I. nicolai*) and the close proximity of the type localities (ca. 60 km along the same river), we consider *I. popovii* as a synonym of *I. baldshuanica* because both plants share the pale background colours and have falls with strong violet veins but without a violet apical spot.

Description: Plants up to 10 cm tall; roots thickened, fusiform; bulb ca. 1–2 cm in diameter, well developed; stem with closely congested leaves and imperceptible internodes; leaves developing together with the flowers, greatly overtopped by the flowers at anthesis, shortly attenuate at apex, narrowly marginate, margins smooth, ca. 1 cm wide; flowers 1–3, whitish, pale violet or pale yellow; perianth tube ca. 10 cm long; falls3.5–4.5 cm long; claw with nearly parallel margins, 0.7–1 cm wide, poorly distinct from the lamina; lamina obovate, 1 cm wide, ca. 1.5 cm long, marked with strong violet veins, which can be connected into an indistinct spot, crest entire, pale yellow; standards ca. 2 cm long, lamina oblong-ovate, 5–7 mm broad; style crests obliquely triangular, obtuse, crenate, ca. 15 mm long, ca. 6 mm wide (Fig. 12).

Flowering: June.

Ecology: Near melting snow on clayey soils, at altitudes between 3000 and 3500 m.

Distribution: Central Asia: Pamir-Alay: Karategin, Hazratishoh and Peter the Great ranges (Tajikistan) (Fig. 33).

Material examined: Tajikistan—Tavil-Dara-Bolo, *Regel*; Kalai-Khumb – Sarydascht, *Korzhinsky* (LE); Dashti-Hirson, 04.07.1988, *Pimenov*, *Vasilieva*, *Lavrova* (MW); near Langar village, 15.06.2019, *Ebel* (www.plantarium.ru).

Note: The plants sampled as *Iris popovii* for phylogenetic studies (Ikinci et al. 2011; Mavrodiev et al. 2014) have purple flowers with distinct apical spots on the falls and therefore belong to *I. rosenbachiana*.

14b. ***Iris*** subsect. ***Drepanophyllae*** (Rodion.) Sennikov, **comb. nov.** — *Juno* ser. *Rosenbachianae* Rodion., Rod Iris: 208 (1961). Type: *Iris drepanophylla* Aitch. & Baker.

14bb. ***Iris drepanophylla*** aggr.

55. ***Iris drepanophylla*** Aitch. & Baker in Trans. Linn. Soc. Bot. 31(1): 115 (1888) — *Juno drepanophylla* (Aitch. & Baker) Rodion., Rod Iris: 208 (1961). Type: Afghanistan. Gulran, N.W. of Herat in Paropamisus range, 06.04.1885, *J.E.T. Aitchison 173* (lectotype K 000802286, designated by Wendelbo & Mathew (1975: 60); isolectotype BM 000958399).

Description: Plants up to 30 cm tall; roots thickened, fusiform; bulb ca. 1.5 cm in diameter, well developed; stem 10–20 cm long, with subdistant leaves and distinct internodes; leaves falcate or very often obliquely twisted, gradually attenuate toward apex, slightly margined; margin scabrous, up to 5–10–16 mm wide; flowers (1)2–4(6), pale yellow, inodorous; perianth tube greenish, ca. 4 cm long; falls 3.5–4 cm long; claw with parallel margins, 5–7 mm wide, gradually enlarged into the lamina, marked with interrupted buff veins; lamina obovate, 8–10 × 12–15 mm, central part dark yellow; crest undissected, yellow, margin entire; standards linear, acute, 5–8 mm long; style branches obliquely triangular, acutish, 4 × 10 mm long, with entire margins; stigmas very short, emarginate; anther white, with yellowish pollen (Fig. 12).

Flowering: April.

Ecology: Clayey hills.

Distribution: Iran, Afghanistan, Central Asia (Turkmenistan) (Fig. 38).

Material examined: Turkmenistan—Kushka, 24.03.1913, *Androsov*; Gaudin, 29.04.1916, *Drobov*; Tash-keprik, 30.03.1916, *Korovin*; Transcaspian region, 30.03.1916, *Korovin*; Transcaspian region, 17.04.1916, *Evkarova*; Poltarauka, 18.04.1923, *Androsov*; station Tash-kenri, 07.04.1929, *Lisova*; around Kushka, 16.04.1930, *Butkov*; Kizyldjar, 29.08.1930, *Linczevsky*; Morgunovsky village, 10.04.1930, *Linczevsky*; near *Kushka*, 10.04.1930, *Linczevsky*; *Kushka*, 18.05.1930, *Butkov*; Karakala, 12.06.1931, *Butkov*; Shar-Chashma, 12.06.1932, *Butkov*; Kushka river, 16.04.1941, *Adylov*, *Tsukervanik*; Kala-i-Mor, 02.04.1948, *Gaevskaya* (TASH); Kushka, *Michelson* (LE); near Kushka, 20.04.1930, *Vvedensky*; 6 km east of Ashgabat, 04.04.1935, *Arkhireev*; Kahka, 31.03.1952, Judova, *Grudeva*; Balkhan valley, 11.04.1959,

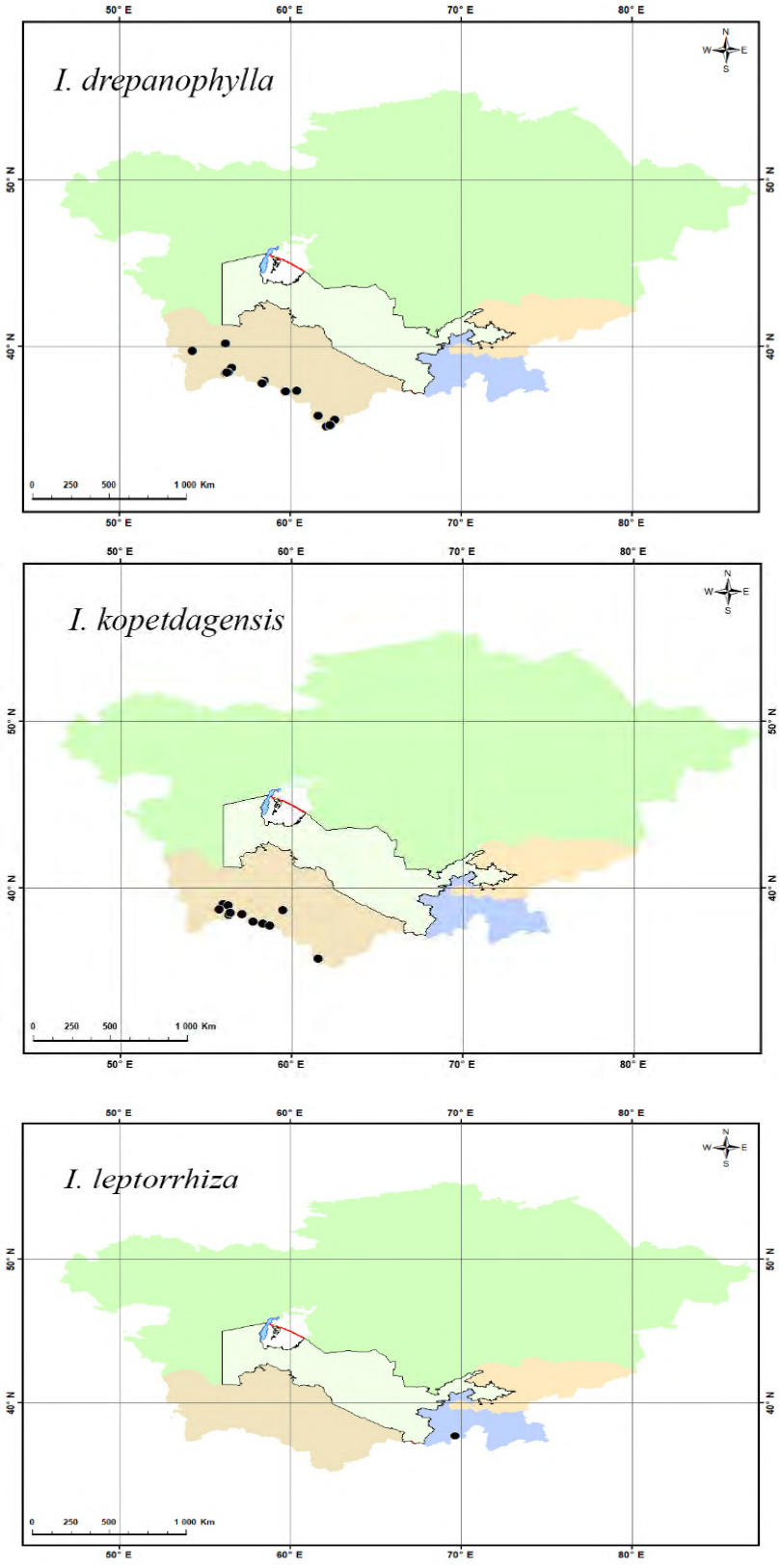

Fig. 38. Distribution of *I. drepanophylla*, *I. kopetdagensis* and *I. leptorrhiza* in Central Asia.

Shkiyar; Kiriki river, 19.04.1965, *Shapovalov*; between Chaek and Heyrabad, 05.05.1975, *Pimenov*, *Baranova*, *Klyuykov*; Zer-Zav, 14.04.1988, *Vakhrameeva*; 30 km east of Kahka, *Guzdeva*; Badhyz Nature Reserve, 06.04.1990, *Shapovalov*; Isak mountain, 29.03.1994, *Polevova*, *Stefanchuk* (MW); Karakum (www.gbif.org).

56. ***Iris kopetdagensis*** Vved., **sp. nov.**; Vved. in Komarov, Fl. USSR 4: 575 (1935), nom. inval.; B.Mathew & Wendelbo in Rechinger, Fl. Iran. 112: 61 (1975), nom. inval. — *Juno kopetdagensis* Vved. in Vvedensky & Kovalevskaya, Opred. Rast. Sred. Azii 2: 322 (1971), nom. inval. Type: Turkmenistan. Western Kopet-Dagh, Karakala District, Sünt-Hasardag Nature Reserve, 24.04.1980, *N.V. Chernishev* (holotype MW 0816697; isotype MW 0816696).

Nomenclature: Vvedensky (1935) described this species originally in Russian, in anticipation of its upcoming inclusion in the never-issued part of the exsiccatae of the Central Asian flora. He supplied a Latin description at the latest occasion (Vvedensky 1971). However, by that time the original collection was reportedly lost and no type specimen was designated; no single gathering was specified in the protologue because Vvedensky‘s statement of “Typus: The species was described in 1935 on the basis of plants collected in the vicinity of Karakala Town. At present the type is lost” cannot constitute mention of a single specimen or gathering but is limited to the locality information. Due to the lack of type designation, neither *Juno kopetdagensis* (Vvedensky 1971) nor *Iris kopetdagensis* (Mathew & Wendelbo 1975) were validly published. As *I. kopetdagensis* is clearly distinct from *I. drepanophylla* in the greenish outer tepals with a broadening claw (vs. pale yellow to yellow outer tepals with a sublinear claw: Vvedensky 1971; Mathew & Wendelbo 1975), this taxon still required a species name, which is formally validated here with the provision of a type designation and a species description translated from Vvedensky (1935). The designated type specimen at MW originated from the locality indicated by Vvedensky (1935) and is in excellent condition, showing the features of flowers, leaves and underground organs. Since the original description belongs to Vvedensky and the species name is also ascribed to him, the authorship of the species name should be *“I. kopetdagensis* Vved.”

Description (Translated from Vvedensky (1935: 575) for the purposes of valid publication): Plants up to 30 cm tall; roots thickened, fusiform; bulb ca. 1.5 cm in diameter, well developed; stem 15–30 cm long, usually with closely approximate leaves and imperceptible internodes; leaves falcate, gradually attenuate toward apex, marginate, margin scabrous; lower leaves (1)2–3 cm wide; flowers 2–6(10), pale greenish, inodorous; perianth tube 4–4.5 cm long; outer segments 3.5–5.5 cm long; claw gradually expanding towards the lamina, 6–8 mm wide at that point, marked with green veins; lamina elliptic, obtuse, 6–10 × 10–15 mm, green-veined, with a yellow blotch occupying one third of the lamina surface; crest yellow, undissected, crenate; inner segments linear, acute, ca. 1 cm long; style crests obliquely triangular, rather acute, 3–4 × 10–14 mm, margins entire; anthers white, with yellowish pollen (Fig. 12).

Flowering: April.

Ecology: Stony and clayey slopes in the lower mountain zone.

Distribution: Afghanistan, Iran, Central Asia (Turkmenistan) (Fig. 38).

Material examined: Turkmenistan—Sumbar, 05.04.1916, *Chernyakovskaya*; near Kurt-su station, 29.04.1916, *Drobov*; near Poltoratsk, 18.04.1923, *Androsov*; Heyrabad mountain station, 16.05.1927, *Polyakov*; between Zerakev and Kashin, 27.04.1960, *Ishenko*, *Yakovleva* (TASH); eastern Kopetdag, 29.04.1963, *Gubanov*; Western Kopetdag, 05.1980, *Chernyshev* (MW); Kisil-Arwat, Balkan, Mt Sundsodagh, Nephton (www.gbif.org).

14bbb. ***Iris leptorrhiza*** aggr.

57. ***Iris leptorrhiza*** Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 151 (1935); Vved. in Komarov, Fl. USSR 4: 576 (1935) — *Juno leptorrhiza* Vved. in Byull. Sredne-Aziatsk. Gosud. Univ. 21: 151 (1935). Type: Tajikistan. Tabakchy Mountains to Vakhsh River, 19.03.1913, *A.I. Michelson 195* (lectotype LE

00050076, designated by Boltenkov (2016a: 145); isolectotype LE 00050077).
Nomenclature: Vvedensky (1935a) introduced both combinations (in *Iris* and *Juno*) as alternative, although his main generic placement was in *Juno*.
Description: Plants up to 10 cm tall; roots slender, filiform; bulb ca. 1 cm in diameter, well developed, the coats brown with very prominent convex nerves; stem obsolescent with quite imperceptible internodes; leaves 3 or 4, closely approximate, falcate, gradually attenuate toward apex, marginate, margin more or less scabrous, 7–10 mm wide; flower solitary, violet-green; perianth tube ca. 4 cm long; falls long; claw with parallel veins, ca. 5 mm broad, gradually enlarged into the lamina; lamina obovate, emarginate at apex, 7 × 10 mm; crest undissected; standards linear-lanceolate, acute, ca. 1 cm long; style crests obliquely triangular, rather acute, 3 × 10 mm, margins entire; stigmas elongate-semicircular (Fig. 12).
Flowering: March.
Ecology: Mountain zone.
Distribution: Central Asia: Southern Pamir-Alay (Tajikistan) (Fig. 38).
Material examined: Tajikistan—the type.

Identification key to species of *Iris* in the Mountains of Central Asia biodiversity hotspot

1. Plants rhizomatous; leaves laterally flattened 2
+ Plants bulbous; leaves dorsoventrally (horizontally) flattened 17

2. Stems very short (2–4 cm), almost hidden in the ground; flower tube very long (8–12 cm) (*Iris* sect. *Tenuifoliae*) 3
+ Stems well developed, above the ground; flower tube shorter, up to 6 cm 4

3. Leaves filiform, 1–2 mm wide ..... 3. *Iris tenuifolia*
+ Leaves flat, 3–5 mm wide ..... 2. *Iris loczyi*

4(2). Falls with a beard, i.e. a distinct row of hairs along the basal part of the central vein 5
+ Falls without a beard 14

5. Flowers yellow (*Iris* sect. *Psammiris*) ..... 14. *Iris bloudowii*
+ Flowers in shades of blue, violet and brown, rarely yellow with an extensive brown colouration or white 6

6. All leaves basal, narrowly linear to filiform, 2–5 mm wide; falls and especially standards narrowly oblong (*Iris* sect. *Hexapogon*: *I. longiscapa* s.l.) 7
+ Leaves basal and cauline, broader; falls and standards broadly elliptic to obovate 8

7. Leaves straight, 2–3 mm wide ..... 8. *Iris longiscapa*
+ Leaves falcate, 3–5 mm wide ..... 7. *Iris falcifolia*

8(6). Standards basally attenuated into a prominent, long thin claw; seeds not arillate; capsule dehiscent into three separate valves (*Iris* sect. *Iris*) 9
+ Standards narrowed into an inconspicuous, very short claw; seeds arillate; capsule opening with lateral splits 10

9. Stem simple, with 2 apical flowers ..... 15. *Iris scariosa*
+ Stem branching, with several flowers ..... 16. *Iris alberti*

10(8). Falls with beards of sparse short hairs; flower 1 (*Iris* sect. *Oncocyclus*) ..... 17. *Iris helenae*
+ Falls with prominently expressed linear beards; flowers 2–3 (*Iris* sect. *Regelia*) 11

11. Flowers monochromic, intensely blue or violet, sometimes white, without prominent veins of brown colour ..... 10. *Iris darwasica*
\+ Flowers with brown colours and prominent violet to brown veins, which conspicuously differ in their colour from the background 12

12. Flowers whitish or pale violet with a small spot of brown or violet at the base of the floral parts, completely covered by a reticulate network of intensely brown or violet veins; falls with a short beard nearly hidden in the flower throat ..... 9. *Iris korolkowii*
\+ Flowers intensely coloured with violet and brown; falls with a conspicuous long beard extending into the lamina 13

13. Falls intensely violet in the middle and whitish at the base, with a bright-brown colouration along the margins; standards pale violet in the middle and bright-brown along the margins, with a brown network of veins; beard pale violet to whitish .... 11. *Iris stolonifera*
\+ Falls intensely brownish-violet or brown as a whole, with brown or bluish-violet veins; standards violet to violet-brown, with a brown or bluish-violet network of veins; beard bluish-violet (in violet forms) or white (in brown forms) ..... 12. *Iris suworowii*

14(4). Leaves 1–1.5(2) cm wide; fall lamina suborbicular to obovate, sharply delimited from the narrow claw (*Iris* sect. *Xyridion*) ..... 6. *Iris spuria*
\+ Leaves 0.3–0.7 cm wide; fall lamina oblong, less sharply delimited from the claw 15

15. Plants laxly growing; stems basally without numerous dry leaves and their remnants (*Iris* sect. *Ioniris*) ..... 4. *Iris ruthenica*
\+ Plants densely caespitose; stems basally with numerous dry leaves and their remnants 16

16. Flowers light-violet with brown tint to yellowish; flower tube 4–6 cm long (*Iris* sect. *Sclerosiphon*) ..... 1. *Iris songarica*
\+ Flowers intensely blue or bluish-violet to whitish; flower tube nearly absent (*Iris* sect. *Haloiris*) ..... 5. *Iris lactea*

17(1). Standards erect, large, as long as the falls 18
\+ Standards directed horizontally or downwards, reduced, at least twice smaller than the falls 20

18. Leaves quadrangular or subterete, with several membranous sheaths at the base (*Iris* sect. *Reticulatae*) ..... 19. *Iris reticulata*
\+ Leaves canaliculate, with a single membranous sheath at the base (*Iris* sect. *Monolepis*: *Iris kolpakowskiana* s.l.) 19

19. Bulb tunics papery ..... 18. *Iris winkleri*
\+ Bulb tunics fibrous ..... 17. *Iris kolpakowskiana*

20(17). Flower tube prominent, 6–15 cm long, well exserted; margins of fall claws slightly turned downwards (*Iris* sect. *Physocaulon*) 21
\+ Flower tube shorter, 3–4 cm long, hidden in the foliage; margins of fall claws, when visible, turned upright (*Iris* sect. *Juno*) 27

21. Leaves well-developed by the flowering time, narrowly attenuated towards the apex 22
\+ Leaves developing during the flowering time, shortly tapering towards the apex 24

22. Internodes abbreviated; flower single, terminal; bulb tunics with strong parallel nerves; roots thin, filiform ..... 57. *Iris leptorrhiza*
\+ Internodes elongated; flowers terminal and axillar; bulb tunics without strong parallel nerves; roots swollen 23

23. Flowers pale yellow to yellow, claw nearly linear ..... 55. *Iris drepanophylla*
\+ Flowers greenish, claw expanding towards the lamina ..... 56. *Iris kopetdagensis*

24(21). Leaves falcate by the flowering time; flowers white with only faint tint of blue, claw elliptic, ca. 2 cm wide, lamina elliptic, ca. 1.5 cm wide, with thin greenish to violet veins and a yellow stripe along the crest ..... 51. *Iris zaprjagajevii*
\+ Leaves scale-like during the flowering time; flowers violet to whitish with strong violet veins or spots on the falls, claw narrowly elliptic, ca. 1.5 cm wide, lamina narrowly elliptic, ca. 1 cm wide 25

25. Falls without prominent violet apical spots but with strong violet veins around the crest; background colours pale (whitish, pale violet or pale yellow) ..... 54. *Iris baldshuanica*
\+ Falls with prominent violet apical spots 26

26. Background flower colour intensely violet or blue, darker in the apical parts .... 53. *Iris rosenbachiana*
\+ Background flower colour white, pale violet or pale yellowish ..... 52. *Iris nicolai*

27(20). Leaf margins basally connected into a sheath 28
\+ Leaf margins basally not connected into a sheath 36

28. Fall claws expanded in the middle, with pronounced wings 29
\+ Fall claws nearly linear, without wings 30

29. Flowers pale pinkish-violet with a yellow stripe along the crest; internodes abbreviated .... 27. *Iris capnoides*
\+ Flowers pale yellow to nearly white with a yellow stripe or a small blotch along the crest; internodes elongated ..... 28. *Iris pseudocapnoides*

30(28). Falls and style arms light-yellow, fall lamina with a large yellow blotch; standards violet .... 20. *Iris fosteriana*
\+ Falls and standards similarly coloured 31

31. Leaves soft, flat, up to 2 cm wide ..... 41. *Iris parvula*
\+ Leaves rigid, falcate, up to 1 cm wide 32

32. Flowers yellow with thin greenish veins, or white to pale yellow with a large yellow blotch, never with violet tint or veins 33
\+ Flowers whitish with violet or greenish tint and veins, with a yellow blotch or stripe along the crest 34

33. Flowers golden-yellow with greenish veins, yellow blotch poorly recognisable; crest narrow, dentate ..... 44. *Iris vvedenskyi*
\+ Flowers white to pale yellow, with a large pronounced yellow blotch around the crest; crest broad, entire ..... 45. *Iris linifolia*

34(32). Falls with a broadly elliptic lamina (1.2–1.5 cm wide), evenly pale violet with indistinctly coloured veins, and greenish stripes on the yellow blotch ..... 42. *Iris tadshikorum*
\+ Falls with a narrowly elliptic lamina (0.7–1 cm wide), with more pronounced violet tint and stripes along the style arms and claws, and greenish stripes on the yellow blotch 35

35. Crest entire or slightly dentate ..... 43. *Iris khassanovii*
\+ Crest finely dissected ..... 46. *Iris linifoliiformis*

36(27). Fall claws expanded in the middle, with pronounced wings 37
\+ Fall claws nearly linear, without wings 49

37. Flowers yellow or otherwise coloured but always with a yellow blotch or stripe along the crest 38
\+ Flowers blue or pale blue, violet or pale violet, always without yellow colour even along the crest 42

38. Crest finely dissected, long-fimbriate 39
\+ Crest entire or dentate 40

39. Flowers light yellow to pale yellow or nearly white, rarely rather intensely yellow; fall lamina with a large dark yellow or orange blotch, claw abruptly and conspicuously expanded, 1.5–2.5 cm wide ..... 25. *Iris orchioides*
\+ Flowers golden-yellow; fall lamina with prominent violet longitudinal stripes, claw gradually and moderately expanded, ca. 1 cm wide ..... 26. *Iris tubergeniana*

40(38). Flowers whitish to pale yellow; inner tepals with a prominent dark yellow spot around the crest ..... 37. *Iris maracandica*
\+ Flowers intensely yellow; inner tepals with a poorly distinguishable darker spot around the crest (*Iris svetlanae* s.l.) 41

41. Inner tepals clavate, obtuse on the top ..... 40. *Iris petri*
\+ Inner tepals rhomboid, sharp on the top ..... 38. *Iris svetlanae*
\++ Inner tepals bifurcated with round small lobes ..... 39. *Iris victoris*

42(37). Internodes elongated 43
\+ Internodes abbreviated 44

43. Flowers with a narrow bright-yellow or orange blotch around the crest ..... 32. *Iris magnifica*
\+ Flowers with a broad white (prominently veined) blotch around the crest ..... 33. *Iris graeberiana*

44(42). Falls with a yellow blotch or stripe along the crest, not yellow-coloured otherwise 45
\+ Falls without yellow colouration around the crest, although sometimes with yellow tint .. 46

45. Fall lamina with a narrow yellow stripe along the crest ..... 29. *Iris austrotschatkalica*
\+ Fall lamina with a yellow blotch around the crest ..... 36. *Iris hippolyti*

46(44). Falls with a prominent blue, brown or greenish blotch or stripes along the crest, with gradually expanded claws ca. 1 cm wide 47
\+ Falls evenly pale or with a white blotch or stripes along the crest, with abruptly expanded claws ca. 2 cm wide 48

47. Flowers pale- to light-blue or pale- to light-violet, sometimes yellowish; falls pale-coloured with strong blue or violet longitudinal stripes and a dark-blue or dark-violet blotch around the crest ..... 30. *Iris kuschakewiczii*
\+ Flowers pale-blue or pale-violet, sometimes nearly whitish; falls with faint blue or violet stripes and a greenish-brown blotch or stripe around the crest ..... 31. *Iris subdecolorata*

48(46). Falls apically with a large white reniform spot, distinct longitudinal stripes and oblique veins ..... 35. *Iris willmottiana*
\+ Falls unspotted, evenly coloured and veined ..... 34. *Iris albomarginata*

49(36). Internodes abbreviated; leaves rigid, falcate; falls with a prominent apical or central violet blotch (sometimes reduced to broad violet stripes) 50
\+ Internodes elongated; leaves soft, flat; falls with or without prominent violet blotches 53

50. Crest finely dissected; fall lamina with a violet blotch and a narrow yellow stripe around the crest ..... 47. *Iris narynensis*
\+ Crest entire; fall lamina with an apical violet blotch (sometimes reduced to broad violet stripes) and a small yellow blotch around the crest 51

51. Standards pale violet or yellowish, reduced to 1–2 cm, with a tiny acuminate or tridentate lamina ..... 50. *Iris rodionenkoi*
\+ Standards pale violet to violet, 2.5–3.5 cm long, with a large elliptic lamina (*Iris narbutii* s.l.) 52

52. Style blades blue to bluish or nearly whitish ..... 48. *Iris narbutii*
\+ Style blades yellow or yellowish ..... 49. *Iris rudolphii*

53(49). Flowers white and yellow, without violet tint 54
\+ Flowers lilac and violet, sometimes very pale, with a bright yellow blotch 55

54. Flowers pale or bright yellow; fall lamina narrowly elliptic, golden yellow, with prominent violet stripes along the crest ..... 22. *Iris chrysopetala*
\+ Flowers white; fall lamina broadly elliptic, bright yellow, with faint violet stripes along the crest ..... 21. *Iris bucharica*

55(53). Flowers pale lilac; fall lamina narrowly elliptic, with pale lilac margins ..... 23. *Iris vicaria*
\+ Flowers pale violet; fall lamina broadly elliptic, with a dark violet apical blotch ..... 24. *Iris warleyensis*

Discussion

Based on a large number of herbarium specimens and extensive field observations, and careful examining of the original material of nearly all species described or recorded from Central Asia, we accept 57 species in this territory. Taking into acount the results of phylogenetic studies (Ikinci et al. 2011; Mavrodiev et al. 2014), we distribute these species among 14 sections. The most species-rich phylogenetic clade of *Iris* in Central Asia, the juno irises with 38 species, are classified, following Ikinci et al. (2011), into two sections, of which the largest one, *Iris* sect. *Juno*, is subdivided into 10 species groups, whereas *I.* sect. *Physocaulon* is subdivided into 2 subsections, each with 2 aggregates.

Considering Central Asia as a whole, 36 species of *Iris* (63%) are endemic to the territory, whereas distribution areas of the other species extend to Afghanistan (15), Iran (10), China (8), Mongolia (7), Russian Siberia (7) and Europe (3). Among the countries of Central Asia, Uzbekistan is by far the most species-rich (42), followed by Tajikistan (26), Kyrgyzstan (23) and Kazakhstan (22), with Turkmenistan harbouring the smallest number of species (15). The number of national endemics is rather low, due to the complexity of administrative borders and the fact that most of botanical hotspot areas are shared by two or more countries. Nevertheless, Uzbekistan is leading here with 7 species (16%), followed by Tajikistan (3 species, 11%) and Kyrgyzstan (1 species, 4%).

Ecologically, the species of *Iris* can be subdivided into two groups. The first group (9 species) occurs in steppes or semideserts in arid lowlands (including hilly areas), with species ranges covering large territories of Kazakhstan and extending into Europe and Siberia. The only section with rather restricted species distribution areas in this group is Hexapogon, which is nearly confined to the deserts of Turkmenistan and Uzbekistan.

The second group (48 species) is distributed in mountains, from foothills to the alpine zone, and is characterised by rather limited, sometimes very narrow species ranges. Among the mountainous species, 3 species (*I. drepanophylla*, *I. kopetdagensis*, *I. helenae*) occur exclusively within the Irano-Anatolian phytogeographic region. The distribution areas of other species (45) are predominantly in Central Asia (southern Kazakhstan, Kyrgyzstan, Tajikistan, eastern Turkmenistan, Uzbekistan, sometimes extending to northern Afghanistan).

This taxonomic diversity corresponds to the Mountains of Central Asia biodiversity hotspot (Mittermeier et al. 2011). The distribution of species along the main mountain ranges and desert zones of Central Asia generally follows the pattern found in other species-rich taxonomic groups with high rates of Central Asian endemism (Kamelin 1973).

Only one species, *I. loczyi,* occurs throughout the whole of Tian-Shan and Pamir-Alay mountain systems, whereas other species are more restricted in their distributions and limited to some parts of these mountains.

The mountains of Tian-Shan harbour a large endemic diversity (14 species out of 20), which is the greatest in the Western Tian-Shan but also significant in the Northern Tian-Shan, with a high number of endemics in both areas (Tojibaev et al. 2021). Only 3 endemic species (*I. alberti*, *I. kolpakowskiana*, *I. winkleri*) are shared between the western and northern Tian-Shan, whereas all juno irises are restricted to either of these parts: 10 species to the Western Tian-Shan and 1 species (*I. kuschakewiczii*) to the Northern Tian-Shan, thus stressing the importance of the phytogeographical division between these large areas (Tojibaev et al. 2021). The mountains of Eastern Fergana (surrounding the eastern part of the Fergana Depression) are a local hotspot, shared between the Tian-Shan and the Alay Range; these mountains harbour 4 endemics of juno irises (*I. austrotschatkalica*, *I. graeberiana*, *I. narynensis*, *I. rodionenkoi*).

There are some significant phytogeographic connections between the Western Tian-Shan and the Northern Pamir-Alay, i.e. Alay and Turkestan ranges (Kamelin 1973). However, in irises only one species (*I. linifolia*) occurs in both these areas, and only two species (*I. korolkowii*, *I. narbutii*) are shared between the Western Tian-Shan and the Hissar Mountain System. The paucity of such examples in irises indicates that the regional specialisation in mountainous irises is very high, thus providing strong evidence for allopatric speciation in this group of plants.

The Pamir-Alay Mountain System harbours 27 species of irises, of which 23 species are endemic to the area. Three broadly distributed species occur also in the Tian-Shan (*I. korolkowii, I. loczyi*, *I. narynensis*), whereas only two species (*I. linifoliiformis*, *I. maracandica*) are shared between the Northern and Southern Pamir-Alay, which is a surprisingly low number. The majority of the species (21) are endemics of the Hissar Mts. and its neighbouring foothills, where more western (e.g. *I. khassanovii*, *I. svetlanae*, *I. vvedenskyi*) or eastern (e.g. *I. baldshuanica*) variants can be distinguished.

One interesting feature of *Iris* in Central Asia is the occurrence of closely related species in the same area. Whereas some pairs of close relatives may be vicariant (*I. graeberiana – I. magnifica*; *I. subdecolorata – I. kuschakewiczii*; *I. maracandica – I. svetlanae*; *I. albomarginata – I. willmottiana*), many others co-occur (*I. orchioides – I. tubergeniana*; *I. bucharica* aggr.; *I.* sect. *Regelia*). Reticulate evolution with differences in ploidy level was confirmed for at least one case of co-occurrence (*I.* sect. *Regelia*) (Botschantzeva 1969) and suspected for another case (*I. bucharica* aggr.) (Ikinci et al. 2011). Hybrid sterility was reported for the pair *I. orchioides – I. tubergeniana* (Rukšāns 2007). These observations indicate that hybridisation, together with spatial segregation noted above, played an important role in the speciation of *Iris* in Central Asia.

We conclude that the species distributions of mountainous irises correspond to the major hotspots and their divisions (areas of narrow endemism) in mountainous Asia, as defined by Kamelin (1973), Mittermeier et al. (2011) and Tojibaev et al. (2021) and discussed above.

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