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Epimediums, reticulate Irises and newly named snowdrop cultivars comprise the April medley for these pages. Colin Moat is an English nurseryman who has been involved with the RHS Roundtable consideration of *Epimedium* for the Award of Garden Merit; the report on that is now published. Jānis Rukšāns, well known in these pages and elsewhere, as a bulb expert turns his attention to bulbous irises of the Hermodactyloides subsection. Patricia Becker is a keen gardener and galanthophile from New Jersey who introduces us to a sweet snowdrop which she has chosen to name for the well-known American snowdrop enthusiast, Ernie Cavallo. Krzysztof Ciesielski lives in Żary, Poland and has a passion for nature that he follows not least as a relief from his busy worklife. He loves galanthus and enjoys seeing them in nature – in spite of various problems that beset his favourite sites. One of his introductions is named for a Belgian friend, Wim Boens who has also been published in the IRG.

Cover photo*: Iris marivanica* at the locus classicus in Iranian Kurdistan. Photo Jānis Rukšāns.

A handful of our *dramatis personae* for April ……

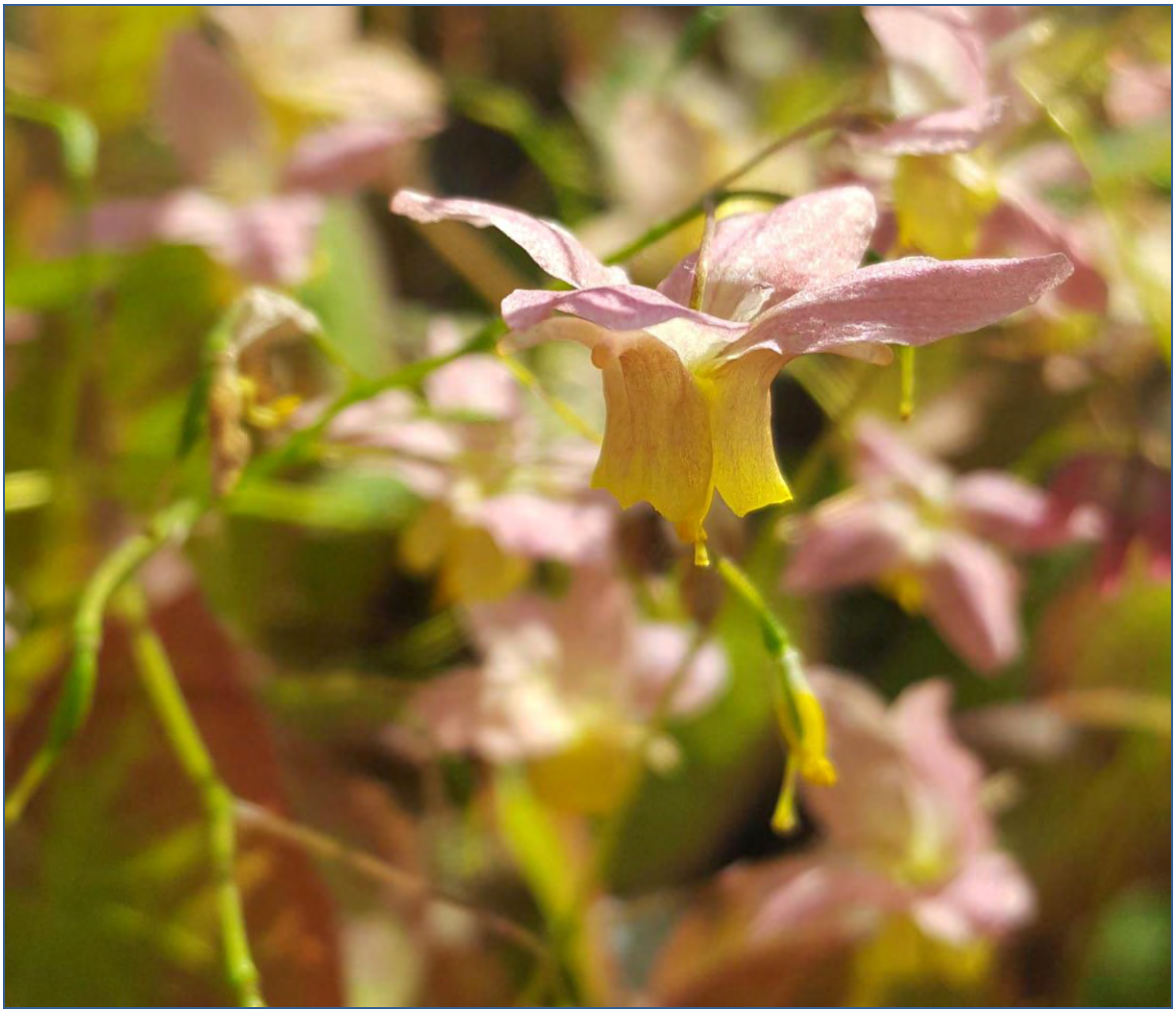
Left to right: Colin Moat, Jānis Rukšāns, Patricia Becker, Krzysztof Ciesielski and Wim Boens.

With the inclusion of an article on reticulate irises this month, your editor felt moved to share these excellent paintings by the accomplished Turkish Botanical Artist, Işik Güner, with her kind permission. You can see more of her work on her website. Left: *Iris reticulata*, right: *Iris histrio.*

Epimedium (A love affair!) by Colin Moat

It's always quite interesting when putting together a piece like this to hark back to when you first became attracted to the plant you are writing about. It happened probably more than 20 years ago at a plant fair, and I was wowed by seeing a fabulous display offered by Europa Nursery (now closed). Shortly after that I visited another plant fair in Beervelde, Belgium and discovered Koen van Poucke and his incredible collection after which I was hooked.

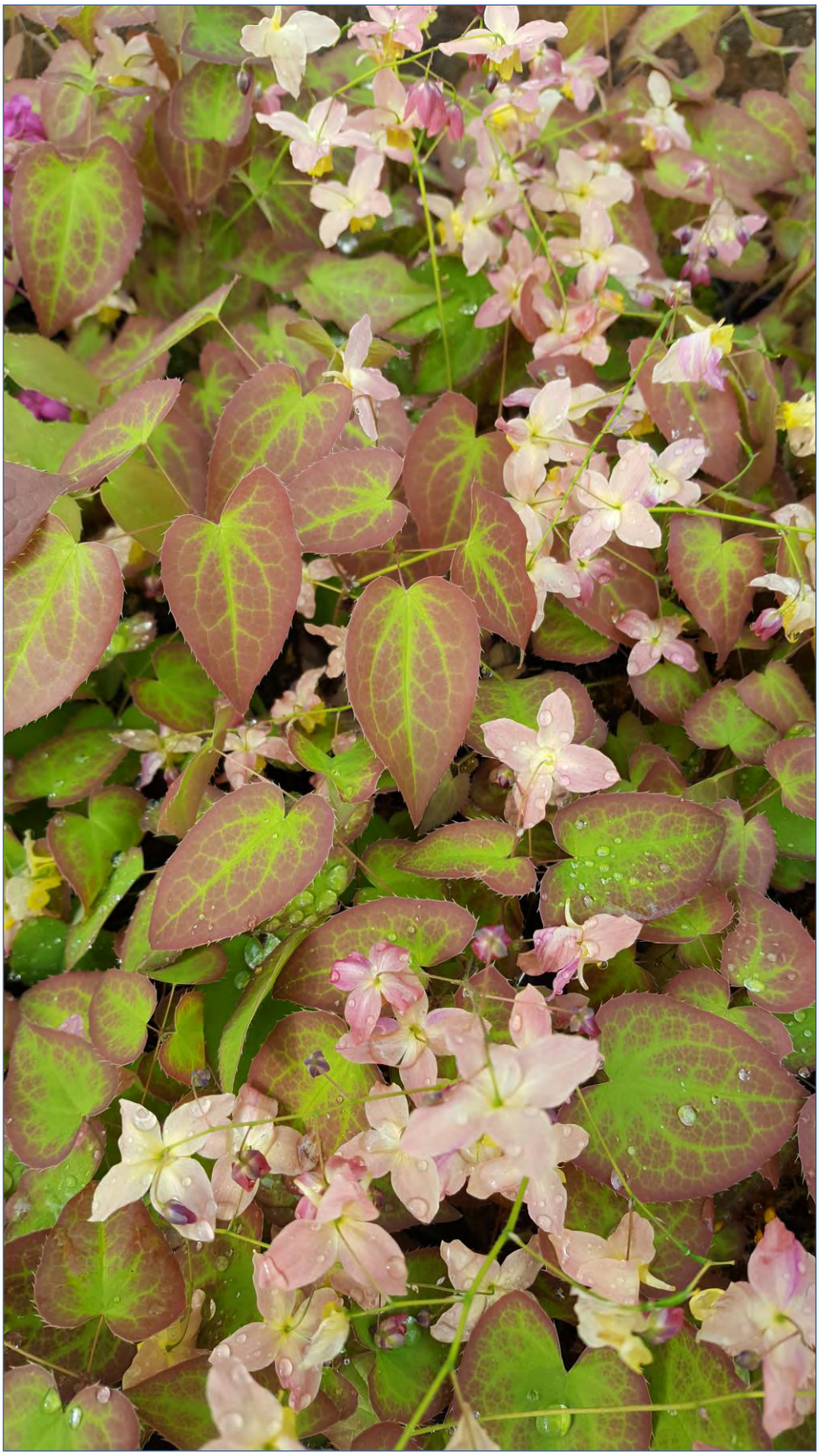
The attractions for me are many, there is a delicacy and daintiness to their flowers held pendulous on their incredibly thin stems, hence their common names of 'Fairy Wings' and 'Bishops Hat' (their other common name of 'Barrenwort' and 'Horny Goat Weed' alludes to their centuries long use in Chinese medicine, and I'll leave you to explore that on google!). This flower power would probably be enough on its own, but when it is combined with many wonderful types and colours of foliage, a general robustness in the garden, a tolerance, even a requirement for shade then I knew I had met a plant I wanted to explore further. The additional bonus is that it is an ideal companion for so many other woodland plants, acting as a highlight and a foil, in equal measures.



Epimedium x *versicolor* 'Cupreum'

Epimedium, rightly, seem to be enjoying a resurgence in popularity, which follows the exploits of plant explorers like Darrell Probst from USA and Mikinori Ogisu from Japan, finding new species in China and Asia, in previous decades. These they have bred (and cross bred) and the results have been distributed and the additional skills of our own Robin White (of the former Blackthorn Nursery),

Elizabeth Strangman, Graham Gough and Dr Julian Sutton (Desirable Plants) (and in France, Thierry and Sandrine Delabroye and in Belgium, Koen van Poucke) amongst many others, have increased these, and produced many additional hybrids too, some of which are outstanding garden plants.



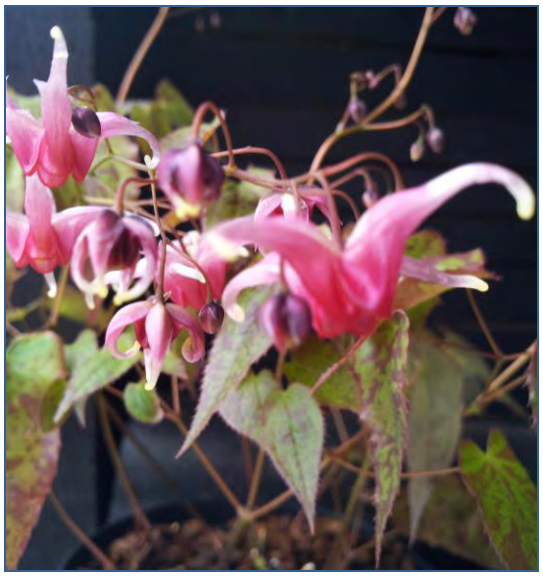
I think it is fair to say that the usual description of some of the older garden varieties, like *E. pinnatum* subsp. *colchicum* (AGM) is that they are good 'groundcover' which is like being damned by faint praise. It is a really robust variety, useful in dry shade, and offers outstanding foliage. To get the best display shear off the old foliage in February and you will then enjoy their sprays of yellow flowers followed by excellent patterned foliage, and they are great weed suppressant too.

In fact, one of my favourites, *E.* x *versicolor* 'Cupreum' which could fall into that 'groundcover' category is an outstanding plant with its combination of lemon and peach flowers and very attractive foliage.

Epimedium x *versicolor* 'Cupreum'

What is new in the modern varieties is the ability to use them as specimen plants. A specimen like *E.* 'Pink Champagne' (AGM) with its two tone light and dark pink flower (over 2 months!) backed by its very attractive reddish-bronze, with maroon speckling, leaf, which ages to green with brick red speckles, looks fabulous skirting the base of Solomon's Seal, *Polygonatum* x *hybridum* (especially the black leaved form 'Betburg').

Three images of *Epimedium* 'Pink Champagne' – this is one of Darrell Probst's most successful introductions.



E. ‘Flowers of Sulphur’

Alternatively, you could combine *E*. ‘Flowers of Sulphur’ with its early chalky yellow flower and pale green leaves, with the ‘Welsh Poppy’ *Papaver cambricum*, or, silky soft ‘Bowles Golden Grass’ *Millium effusum aureum*, with the outstanding *E*. ‘Amber Queen’ (AGM) whose flowering stems can reach a metre long. Combining any of them with early emerging ferns also provides a winning combination.

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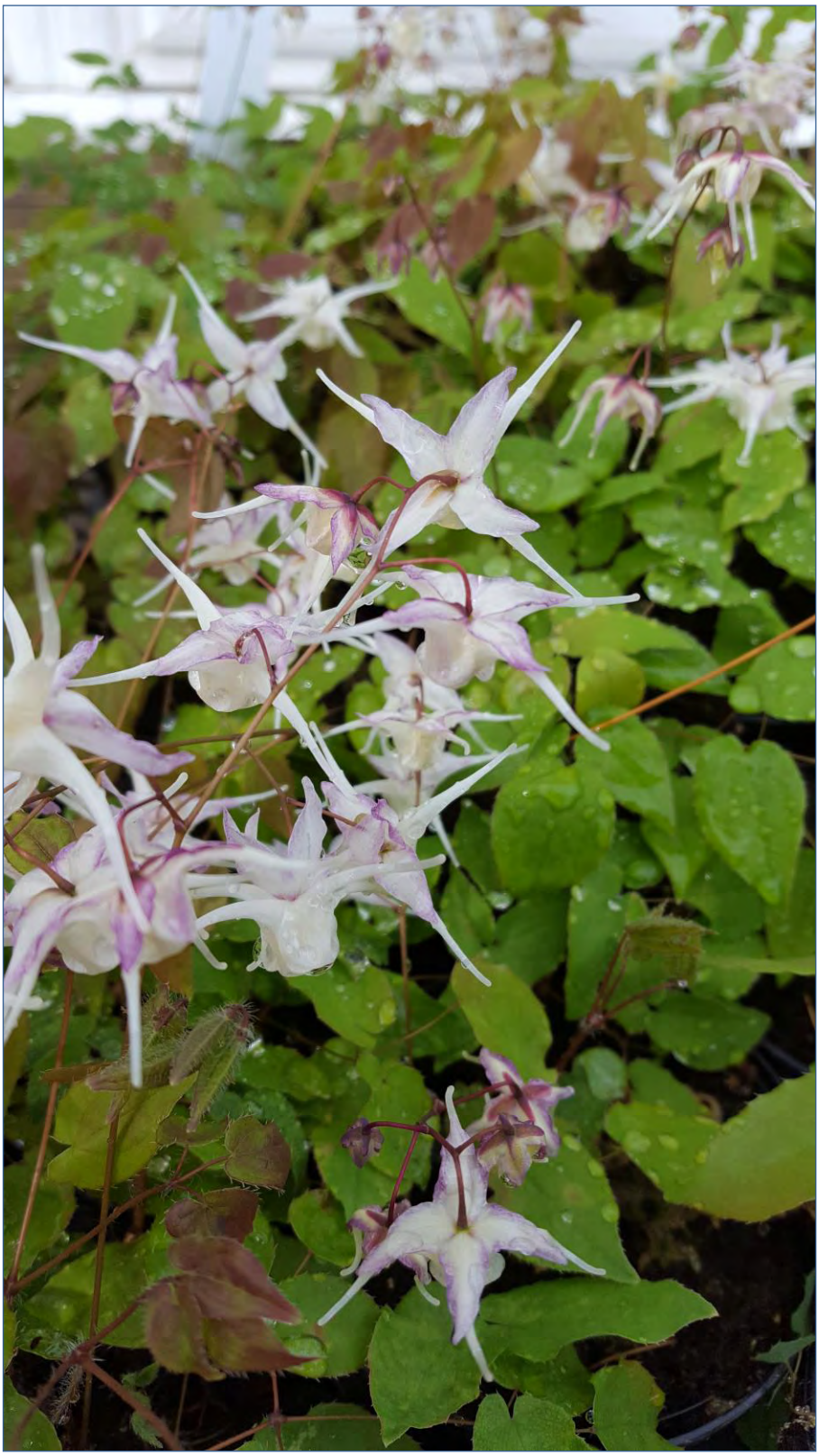
Epimedium grandiflorum



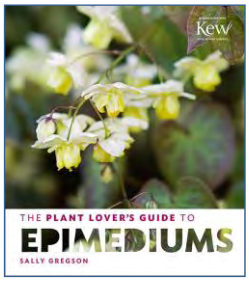
There are a number of *E. grandiflorum* hybrids all offering a wonderful range of colours, although, *E. grandiflorum* itself is quite lovely being white with a hint of pink. For me, though, the *E. grandiflorum* hybrids have the slight disadvantage of being deciduous, and it's also worth knowing that it prefers a neutral to acid soil.

Another word of caution is that whilst the new varieties in general are wonderful; do a bit of research first as they are not all as happy in the classic dry shade that is normally recommended. The Chinese species and their hybrids, seem to favour a bit more moisture and repay the adding of compost, or soil improver, when planting.

In consideration of the above mentioned changes, I was honoured to be asked to Chair the (2018) RHS Round table to review existing AGM awards and recommend new varieties. Main points of this review are highlighted in the May 2019 issue of the RHS magazine 'The Garden'.

So, with some of my favourites, I'll mention some forms that in my view are worth seeking out, such as *E.* 'King Prawn', *E.* 'Spine Tingler' (AGM) and *E. grandiflorum* 'Circe', (AGM) and I include images of some of these.

I feel I have just scratched the surface of this wonderful range of plants, but hopefully, I have encouraged you to find out more. A good starting point for further research is the recent excellent book by Sally Gregson 'The Plant Lovers Guide to Epimediums' (Timber Press) and you will be delighted to know that it explains in great detail why Epimediums have been called 'Horny Goat Weed'!



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Epimedium grandiflorum 'Akagi Zakura' (AGM)

Epimedium ‘Domino’ (AGM)

Epimedium ‘Red Maximum’ (AGM)

Epimedium acuminatum ‘Night Mistress’ (AGM)

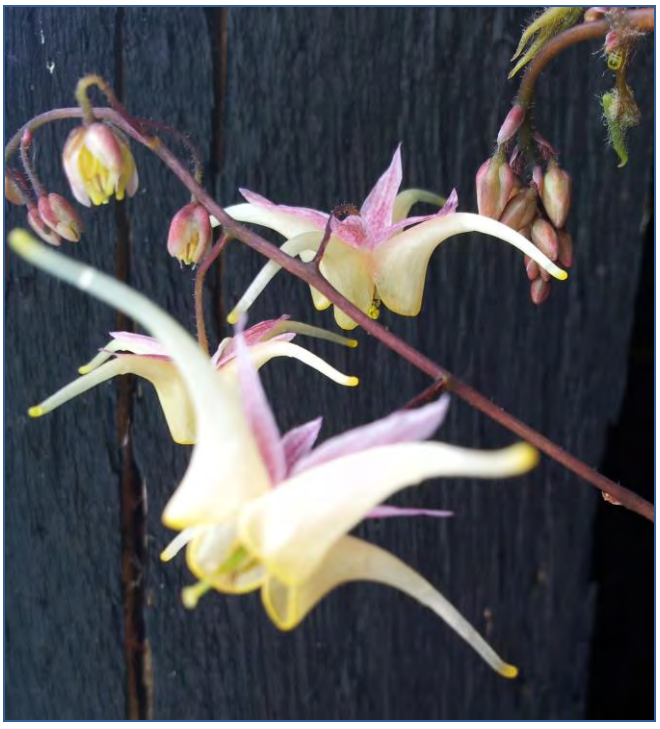
E. x *omeiense* ‘Akane’

E. ‘Kodau Murasaki’ (AGM)

Epimedium ogisui ‘Diane’

Colin and Cindy Moat own Pineview Plants, based in Kent and Colin is also involved in the organisation of events by Plant Fairs Roadshow.

Epimedium brachyrrhizum x *davidii* 'Sam Taylor' (named after Colin's grandson)



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---Reticulate Irises---

Bulbous irises of subgen. *Hermodactyloides* Spach[1] (Iridaceae) :

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Summary: Survey of bulbous irises of subgen. *Hermodactyloides* is presented, a new section *Zagricae* Rukšāns is established, and four new taxa from Central Asia and Iran are published, new status and description for *Iris reticulata* var. *kurdica* is given.

Key words: *Iris* subgen. *Hermodactyloides* Spach, new taxa, Central Asia, China, Iran, Iraq, Turkey. *Iris aintabensis*, *Iris avromanica*, *Iris kolpakowskiana* ssp. *occinica*, *Iris kurdica*, *Iris marivanica*, *Iris zetterlundii*.

Irises have been known and used in different ways for millennia. This well-known genus is the largest and most variable in the *Iridaceae*, with approximately 250–300 circumscribed species. In the wild they are distributed in the Northern Hemisphere – Eurasia, North America and on the northern coast of Africa.

Fig.1: Reticulate iris collection grown in pots, 12th of March, 2019

The first modern survey was undertaken in 1913 by W.R. Dykes; nowadays it is completely out of date. During the last century the taxonomy of the genus underwent dramatic changes. In 1961 G. Rodionenko (Russia) reclassified the genus. He regarded bulbous irises as several separate genera. Brian Mathew in 1981 reverted to the previous naming, updating Dykes" classification. Quite recently Mavrodiev et al. (2014) split the genus *Iris* sensu lato into at least 23 genera, but such splitting is not accepted by many at present, probably not even by the majority of botanists. Here I follow the viewpoint of Tony Hall and Arnis Seisums, the leading botanists in the taxonomy of the so-called "juno irises", who regard them all as members of the large genus *Iris* with several subgenera. Subgeneric classification of *Iris* is based mainly on the form of the subterranean storage organs and the occurrence or absence of the beard on the outer perianth segments (or „falls"). Those with bulbous underground storage organs are placed into the subgenus *Xiphium* (Mill.) Spach (commonly known as Spanish, Dutch or English irises), subgenus *Scorpiris* Spach (known as "junos" – the genus *Juno* Tratt.) and subgenus *Hermodactyloides* Spach (the reticulate irises).

[1] It seems that the name of subgenus was not officially published, it is not listed nor in IPNI nor in World Checklist of Selected Plant Families (Kew). Using it I follow Killens W.R., 1997.

Fig.2: Reticulate iris collection grown in pots 23rd of March, 2012

The taxonomy of reticulate irises is not straightforward – there are still many unclear positions. Some species are very easy to identify for they have some very distinct features allowing easy separation. The most complicated is the taxonomy of the large group of reticulate irises known under the common name *Iris reticulata*. They occur in an extensive area that includes the Caucasus Mountains and Central and Eastern Turkey, and extends eastwards to Khorasan Province in NW Iran and Kopet Dag in Turkmenistan. Further east they are replaced by a very special group of reticulate irises with a differing leaf shape. In 1961 G. Rodionenko separated all irises with reticulated bulb tunics into the genus *Iridodictyum* Rodion., later (1999) he set apart the Central Asian species due to the shape of their leaves and placed them into the genus *Alatavia* Rodion. – at present represented by 3 species, from which *I. kolpakowskiana* occupies the largest area of alatavias entering NW China (?). Later this splitting was supported by Mavrodiev E.V. et al. (2014) and Crespo et al. (2017).

Such a large territory with many well-separated mountain ranges allows me to assume that more than one species are hiding under some names. In my collection I grow around 120 accessions of reticulate irises from the entire range. In this survey about reticulate irises I follow B. Mathew's division of the subgenus *Hermodactyloides* Spach into four sections with one new section established here. Two sections – sect. *Brevituba* B. Mathew and sect. *Micropogon* (Baker) Boiss. are represented by only one species each and are distributed only in Turkey; sect. *Monolepis* (Rodionenko) B. Mathew is distributed in Central Asia of the former USSR entering the NW corner of China and at present contains 3(4) species. Sect. *Hermodactyloides* occupies the largest area with the greatest number of species, and its members are to be found starting from the Caucasus and the E part of Turkey, entering Kopet Dag in Turkmenistan and Golestan in Iran to the east, and reaching NW of Jordan to the south.

Fig.3 above, left: *Iris pamphylica* near Gündogmüs, Antalya Prov., Turkey.
Fig.4 above, right: *Iris pamphylica* in cultivation.

Section *Brevituba* B. Mathew comprises only one species – ***Iris pamphylica*** Hedge. It is so dissimilar that its identification causes no problems. Its specific features are the especially sharp and thin basal leaf fibres and the formation of a relatively long stem above ground with a flower tube only ~ 2 cm long. Its capsule droops atop a long stalk when mature, while in all the other species it stays

erect. It is rather tall when in flower since the flower is carried on a pedicel around 10-20 cm long, and its quadrangular leaves extend hugely after flowering and can reach 50-55 cm in length. The flower colour is of such an extraordinary mixture of light blue, green and purple-brown that it is impossible to misidentify the species in flower. It was described only in 1961 and is confined within Antalya Province. It seems now that *I. pamphylica* is extinct at its locus classicus because of over-collecting, but a few other localities have been found since. Although not very spectacular in comparison with other reticulate irises, it is a most interesting species that is apparently not closely related to any other. *I. pamphylica* is not a garden plant, however, according to B. Mathew (1981), but it responds well to bulb frame treatment, though it dwindles in pots. Here I grow it only in pots where it blooms every year, but is not a fast increaser, although every year it sets seed after hand-pollination.

Fig.5 left: *Iris danfordiae* SASA-307 (near Çiftehan). Fig.6 right: *I. danfordiae* KPPZ-291 (near Sivas).

Fig.7 left *Iris danfordiae* BATM-357 and Fig.8 right: *Iris danfordiae* SASA-270 - both from Mazikiran gec.,W from Gürün.

Section *Micropogon* (Baker) Boiss. is also very outstanding and until recently contained only one species – ***Iris danfordiae*** (Baker) Boiss. In 2006 was described one more species *I. celikii* Akpulat & K.I.Chr., which is so similar to *I. danfordiae* and grows in the same region as its supposed ally that I am quite doubtful about its status and most likely it is only a form of the latter. Tony Hall (Kew) and Henrik Zetterlund (Gothenburg) are of the same opinion (personal correspondence).

Iris danfordiae is the sole reticulate iris with bright yellow flowers; another feature distinguishing it from other species is the reduced, bristle-like standards, which are only 3-5 mm long. It is endemic to Turkey and occurs in two disjunct areas – at the eastern end of the Taurus Mountains (Niğde and Adana Provinces) from where it was described, and in a much larger area more to the north and east (around Ordu, Amasya, Sivas, Gümüşhane, and Erzincan). Comparing the plants from the southern region (sample SASA-307 – from nr. Çiftehan) with the plants from the northern region (samples KPPZ-291 from nr. Sivas and BATM-357, JRRK-084 from Mazıkıran geç., W of Gürün) I found practically no dissimilarities in their morphology, which allows me to suppose that the same species is distributed in both areas. In the wild *I. danfordiae* occupies stony slopes and flatlands with sparse vegetation or sparse pine, fir or cedar woods at altitudes of 1000-2000 m, where it flowers near the snow line.

The areas of *Iris celikii* and *I. danfordiae* overlap. Comparing the material of *I. danfordiae* collected in the wild during several expeditions at a number of localities, I found a fairly considerable variability in almost all the features that are used to separate the two species. In all populations of *I. danfordiae* I have observed there were plants whose bracts were uniformly green or green with a white apex, with acute or obtuse laminas, the outer segments uniformly yellow or fading towards the base, falls very variedly spotted, etc. Only the length of the filaments in regard to that of the anthers was not checked by me, as well as the dimensions of the style lobes. My observations do not allow me to distinguish the two species by utilizing the published description of *I. celikii* without checking their DNA, so at present I can regard the name *I. celikii* only as a synonym of *I. danfordiae*.

Iris danfordiae is well known in cultivation and is grown on a large scale in Holland, although here we speak about its sterile, triploid form that increases well by the small grain-like bulblets, which form in abundance at the base of the parent bulb. The cultivated triploid is of a somewhat paler colour (slightly greenish yellow) and is scentless. Wild forms are brighter and have a nice heather scent, but share with the triploid its odd habit of splitting into many small bulblets after the first year of cultivation. Our team observed the same peculiarity in the wild – on the Mazıkıran geç. all the individual groups were represented by clumps of 1-3 larger bulbs and up to 50+ small bulblets. However, deeper planting (at least 10-15 cm) and richer fertilizing in early spring encourage the formation of larger replacement bulbs of flowering size.

Iris danfordiae has been widely used by the Canadian iris enthusiast Alan McMurtrie in hybridization with various forms of *I. reticulata* sensu lato. He has obtained lots of hybrids with unusual colours and shapes never before seen among reticulate irises. Many of them are being propagated in Holland and several have already appeared in trade.

Fig.9: Iris hybrids from Alan McMurtrie, from left to right: 96-DZ-1, 97-CC-2, 98-GZ-2, 98-GZ-3, 98-MN-1 and 98-PR-2.

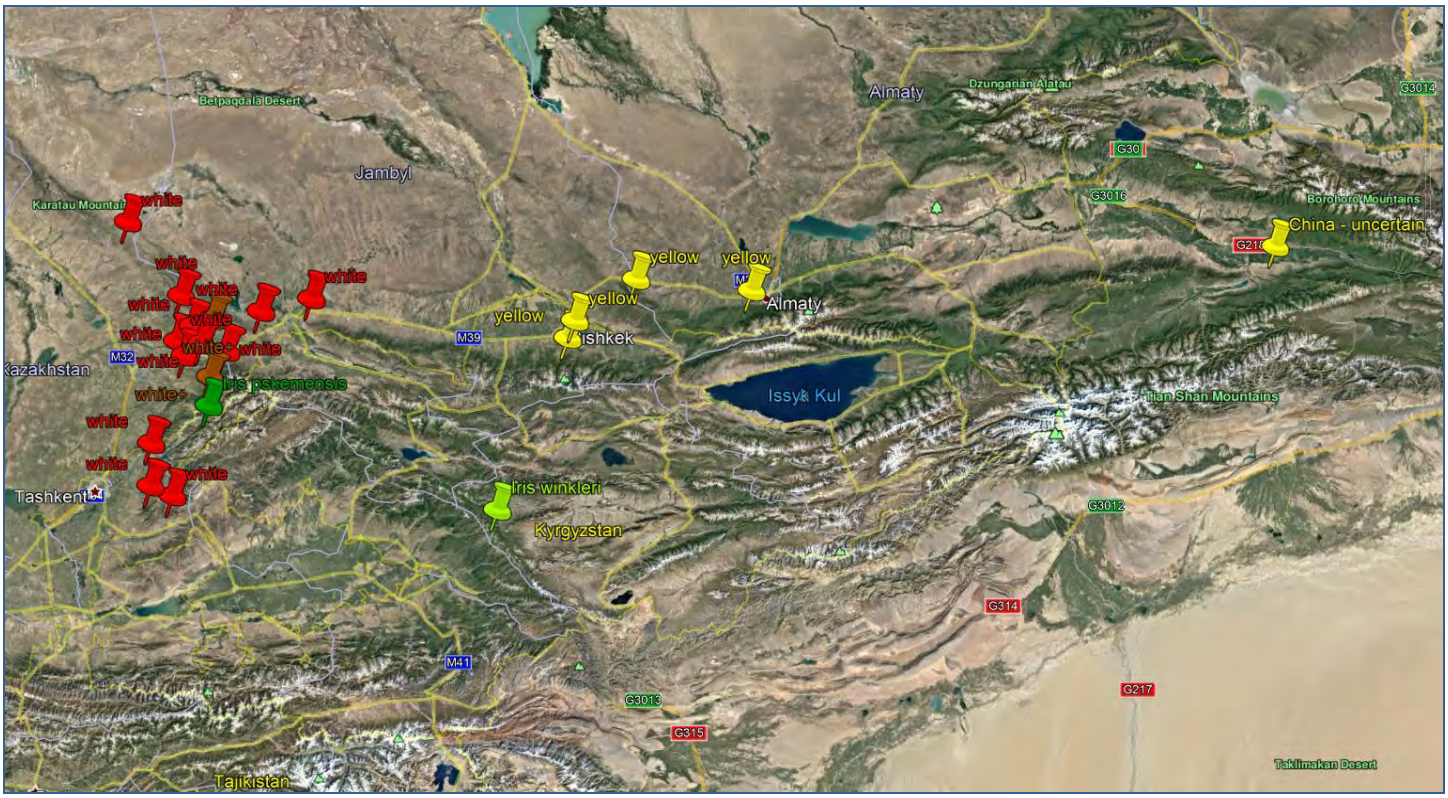

Fig.10: Map of distribution area of *Monolepis* irises - yellow marks - *Iris kolpakowskiana* subsp. *kolpakowskiana*; light green - *I. winkleri*; dark green - *I. pskemensis*; red - *I. kolpakowskiana* subsp. *occinica*; brown - doubtful populations.

Section *Monolepis* (Rodionenko) B. Mathew contains 3 species; one of them here is split into two subspecies. These irises are distributed in Central Asia of the former USSR and in China (?). Several names had been applied to the first officially described species in this section – *Iris kolpakowskiana*. Originally it was published in 1877 by Regel as *Iris kolpakowskiana*, three years later Baker changed its name to *Xiphion kolpakowskianum*, then in 1961 the Russian monographer of the genus G. Rodionenko established a new genus for reticulate irises and renamed it as *Iridodictyum kolpakowskianum*, but in 1999 he separated the Central Asian reticulate irises from sect. *Monolepis* into a new genus *Alatavia* – thus the most recent name applied to it is *A. kolpakowskiana*. According to the results of the latest morphological and molecular studies, the Central Asian reticulatas are much more closely related to the subgenus *Xiphium* (the Spanish irises) than to subgen. *Hermodactyloides*; possibly as a geographically isolated sister group.

Fig.11: *Iris kolpakowskiana* as *Xiphion kolpakowskianum* (Regel) Baker, Bot. Mag. 106 t. 6489.1880.

All three species have similar bifacial, channelled leaves (yet unifacial at some point in their development) and shell-like or membranous tunics. The apparent homology between the near-reticulate fibrous tunics of *Monolepis* irises and the tunics of the true reticulatas, as well as their comparable bulb-scale morphology, are probably expressions of their adaptation to near-identical mountain habitats (Hall T. et al., 2000; Tillie N. et al., 2000). As was noted at the beginning of this survey, I follow here the viewpoint of B. Mathew and others who regard them all as irises (*Iris*). The leaves of *Monolepis* irises are narrow, channelled and arched, more like those of smaller juno irises or even crocuses, enwrapped into a common sheath, very different from those of other members of the subgenus, where the leaves are 4-8-ribbed, cylindrical and without a common sheath.

Iris kolpakowskiana Regel is the best-known member of Section *Monolepis* and, although not easy in cultivation, it is the most widely grown species of this section in collections. It is a typical plant from the foothills and low mountains occurring, according to the Flora of the USSR, up to an altitude of 1000 m, although I have observed it as high as approx. 1300 m. Some authors report even higher elevations, but that needs additional checking. B. Mathew (1981) mentions 3000 m altitude, but this certainly is not correct and has been caused by some kind of misidentification (probably because of a mistakenly identified *I. winkleri*). The species was described from the material gathered near Almaty (in Kazakhstan, at that time known as Verny, later as Alma-Ata) and characterised as having reddish purple falls with a milky white blotch and a **bright yellow ridge**. It is this bright yellow ridge which is characteristic of all the plants gathered in the eastern part of its area *sensu lato* and collected by me or received from other collectors from the vicinities of Bishkek (Kirghizia/ Kyrgyzstan) and Almaty and in-between. In 2016 I got a good sample of *I. kolpakowskiana* (some 20 bulbs) from the Chinese bulb grower Wei-Lin, who reported that it was collected wild in the NW corner of China (not very far from the border with Kazakhstan), although this species is not listed in the Flora of China (the seeds of *I. kolpakowskiana* reported as collected wild in Xinjiang Province of China quite recently were offered by a seed company, Chinese Alpines). All the plants had the very characteristic bright yellow ridge on the falls. Such are the plants in all the pictures from this region published on the site Plantarium.ru, even the albinos from the vicinity of Almaty have falls with bright yellow ridges. Their bulbs are distinctly yellow. To be completely accurate, I must note that on Plantarium.ru is one image (photographed by E. Rahimova) of a small group of *I. kolpakowskiana* (the exact locality is not given, somewhere in the Chu-Ili mountains) where plants with a small pale yellow blotch grow side by side with plants where the blotch is almost absent. I regard these plants as an accidental mutation. Only the plants from the eastern part of *I. kolpakowskiana* area are regarded here as belonging to type subsp. *kolpakowskiana* and they proved to be the easiest in cultivation, occasionally splitting and forming a few bulblets.

To the west there is a gap of 250 km from where I found no records or photos of *Iris kolpakowskiana* sensu lato. Plants similar to typical *I. kolpakowskiana*, but **without the yellow blotch** on the falls reappear starting from the Karatau mountains in Kazakhstan, where I found it for the first time at Berkara Gorge (E of Taraz, from where *Corydalis ainae* and *Tulipa berkariensis* were published). My gatherings and the localities of the pictures published on Plantarium.ru indicate that it occurs in the NW direction along the Karatau Ridge and southwards as far as the surroundings of Tashkent, forming a fairly compact, well-isolated area of morphologically similar plants. Common to them all is the complete absence of yellow on the falls. There are three pictures from this region (localities marked with brown on the attached map) where there are pale yellow markings on the ridge of the falls – two of the photos show plants from high altitudes (according to the given coordinates) where, as is stated in the botanical literature, *I. kolpakowskiana* does not grow. Without seeing these plants it is impossible, only from the pictures, to judge about their taxonomical position.

Comparing with the typical (yellow-blotched) plants, those from the west have lighter yellow bulbs and in many populations clumps had formed as a result of the abundance of bulblets at the base of the mother bulbs. I observed clumps with even 30-40 bulbs in each, although only very few of them bloomed. In cultivation they are weaker growers (at least with me) than the plants from the type

locality and its surroundings. If the plants from the eastern part of the area (sensu lato) are +/- faring well and slowly bulking up their stocks, those from the west are much weaker and I am happy to still have them in my collection. Taking into account the morphological features, I decided to regard the plants from the eastern and western parts of *I. kolpakowskiana* sensu lato range as two different taxa at subspecies level.

Fig.12 above left: *Iris kolpakowskiana* from Alma-Ata, Kazakhstan.
Fig.13 above right: *Iris kolpakowskiana* from Kashka-Su, Kyrgyzstan.

Fig.14 above left: *Iris kolpakowskiana* from China.Fig.15 above centre and Fig.16 above right: Colour forms of *Iris kolpakowskiana*, Kazakhstan. Photos Alexandr Naumenko.

Figs.17 and 18: Colour forms of *Iris kolpakowskiana*, Kazakhstan. Photo Vladimir Epipektov.

Fig.19: *Iris kolpakowskiana* subsp. *kolpakowskiana* flower details.

Iris kolpakowskiana* subsp. *occinica Rukšāns, **subspecies nova**.

Type: Ex culturae in horto Jānis Rukšāns. Plants originally collected after blooming on 30.04.1996 in Uzbekistan, Sangirsai (a side valley of the Bashkizilsai basin, in the western part of the Chatkal Range near the border with the Chatkal Mountain Forest Reserve) 41°11' N and 69°49' E, at an altitude of around 1100 m, ARJA-9661. Holotype GB (Gothenburg) from the plants cultivated by Jānis Rukšāns, collected on 13-03-2015.

Habitat and distribution: Distributed in West Tian Shan Mountains from Kara-Tau in Kazakhstan to surroundings of Tashkent in Uzbekistan, where it is growing on foothills between and inside dwarf shrubs and in grass, blooming in February and March.

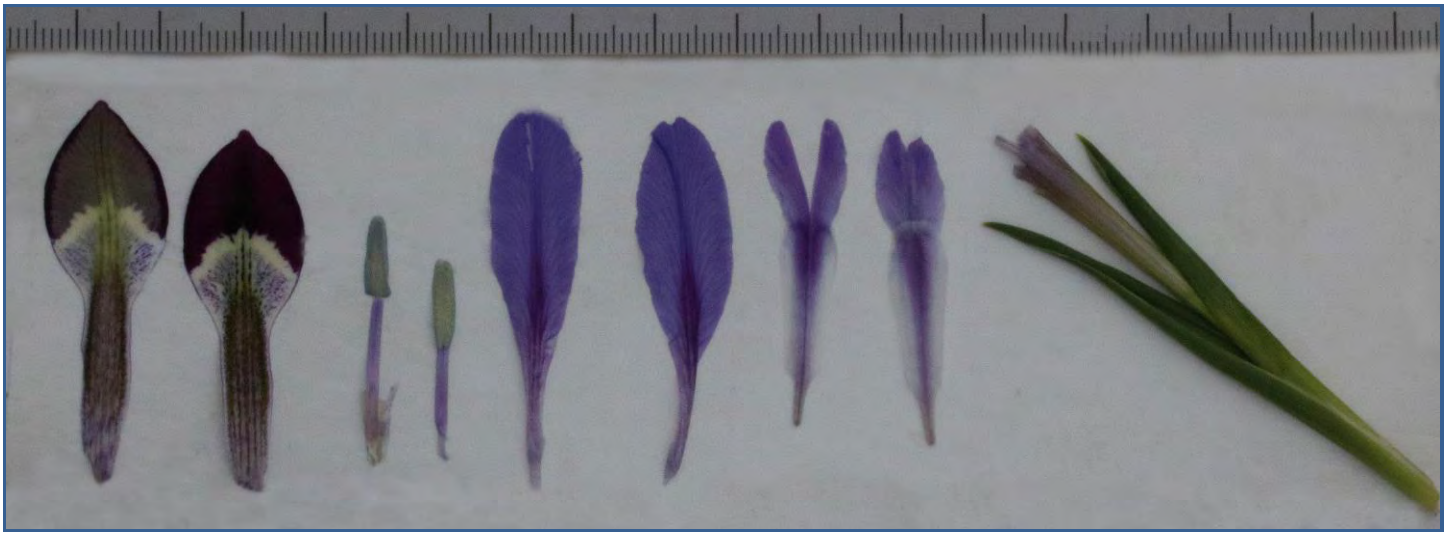

Fig.20: *Iris kolpakowskiana* subsp. *occinica* flower details.

Fig.21: Emerging clump of *Iris kolpakowskiana* subsp. *occinica* in the wild (S Kazakhstan, Tyulkubas Distr.). Photo Eugenij Davkajev.

Description: Plant at anthesis 10-13.5 cm long, leaves reach 7-8 cm length. Bulb egg-shaped, up to 20 mm long and 12 mm wide, light creamy, covered with distinctly reticulated, at top something bristly tunics. Leaves canaliculated, 2 - 3 mm wide. Pedicel light green. Bract and bracteole subequal, bracteole only slightly shorter, green with minor whitish tip, almost reaching base of flower segments. Leaves and flower enclosed into 2-3 semi-transparent, green at top, mainly subterranean sheaths. Flower tube greenish white turning dirty lilac dotted and suffused below flower segments. Outer segments 45-55 mm long with 5-8 mm wide, parallely edged haft (narrowest part of the fall). Haft outside whitish densely dotted and shortly striped dirty purplish, inside whitish, dotted and striped dirty greenish and lilac, glabrous along midrib (in type subsp. haft is minutely hairy to papillose up to base). Lamina gradually expands from haft up to 15-18 mm in widest point and 23-28 mm long, outside at base light dirty purple with white upper rim, further along length light dirty purple with narrow deep purple edge; upside deep purple with larger or smaller white base more or less dotted purple. Central ridge white with darker dots densely covered with minute hairs. Inner segments (standards) club-shaped, 40-50 mm long and 10-15 mm wide, rounded or minutely notched at tip, lilac with darker midrib at base, of same colour on both sides, style lobes 13-15 mm long and 3-4 mm wide, inner side with straight edge,

outer side arcuate. Stigma entire, light lilac turning whitish at edge. Filaments up to 15 mm long, glabrous, light lilac. Anthers 10 mm long, upper side dirty whitish, pollen slightly greenish white.

Etymology: The species name is deduced from *occidentali-tianschanica,* meaning - from West Tian Shan Mountains.
Both subspecies are easily distinguishable – in *Iris kolpakowskiana* subsp. *kolpakowskiana* the falls have a yellow ridge, bulbs are clearly yellow, in subsp. *occinica* the falls are without yellow, the bulbs are light (creamy) yellow.

Fig.22 above left: *Iris kolpakowskiana* subsp. *occinica* from *locus classicus*, Sangirsai, Uzbekistan
Fig.23 above right: *Iris kolpakowskiana* subsp. *occinica* from Karatau Ridge near Taraz, S Kazakhstan.

Fig.24 left: *Iris kolpakowskiana* subsp. *occinica* from Parkent, near Tashkent, Uzbekistan.

Fig.25 right: Virus infection on *Iris kolpakowskiana* subsp. *occinica* from Aksakatasai near Tashkent.

Fig.26: *Iris kolpakowskiana* subsp. *occinica* from Aksakatasai near Tashkent.

At higher elevations *Iris kolpakowskiana* is replaced by two other species. ***I. winkleri*** Regel was published in 1884 from the Yassy Pass in the Fergana Range, where it was found at altitudes of 3000-4000 m. It was introduced to cultivation for the first time in 1899 by O. Fedtschenko, who wrote that this wonderful iris survived two winters in her garden near Mozhaysk in Russia. Later it was collected from time to time in various herbariums, but never again introduced into gardens. Some authors (Killens W., 1977) even expressed doubts about its species status, and I assume that B. Mathew (1981) followed this opinion, when he wrote that *I. kolpakowskiana* grew in the wild up to an altitude of 3000 m.

Figs.27 and 28: *Iris winkleri* from Kugart, Fergana Ridge, Kyrgyzstan.

Iris winkleri is a close relative of *I. kolpakowskiana* sensu lato differing from the latter in the sheaths covering the bulbs – in *I. kolpakowskiana* they are clearly reticulate, whereas in *I. winkleri* the sheaths of the current year are thin, papery, becoming somewhat split only during the following seasons. In addition – *I. winkleri* is a subalpine plant whilst *I. kolpakowskiana* is plant of the foothills. There were special expeditions organized in the second half of the last century to find *I. winkleri*, mostly by the great authority in the genus *Iris* Dr. George Rodionenko, but they were unsuccessful. As a result in gardeners‟ circles the species gained a somewhat mysterious status – everyone spoke about it, everyone wanted it and asked for it, but no one actually believed that it really existed.

At the end of the last century I organized several trips to the Central Asian mountains together with Arnis Seisums from the National Botanical Garden of Latvia, who worked there with the juno irises. The first attempts to reach the localities, where *Iris winkleri* might be found, were made in 1995 and 1996, but we were unlucky. In 1997 during the third attempt, with the help of the Uzbekistan authorities of the highest level, we reached the valley of the river Kugart in the neighbouring Kazakhstan. There were a few points in the Fergana Range from where *I. winkleri* was reported, but only the Kugart was situated in a distance attainable without a specially equipped protracted expedition. All the other localities were at least 100 km from the nearest point that could be reached

by car. In the Kugart Valley, while driving in a Russian jeep “Niva” along a half-destroyed road, we reached a dead-end point at an altitude of around 2000 m that was only 25 km distance from the place where at one time a herbarium of the supposedly *I. winkleri* was gathered. After a very difficult and hard ascent to 3300 m altitude, on the way back we finally found the sought after iris in seed in grass on a moderately steep slope. After seeing the bulb we immediately recognized the species, because the bulb was white and had non-reticulate covering sheaths. When I think about this expedition, I still wonder how we managed to do it. Walking fifty km in one day is not easy even along a perfect road, but at Kugart while striving to find plants we walked the mountain slopes with no roads but cattle paths that crossed water streams. Within one day we ascended some 1300-1500 metres and returned to our base camp, having set out when still was dark in the morning, and coming back long after sunset. More about this trip can be found in my book “Buried Treasures” and in AGS Bulletin (Rukšāns, Seisums 1998; Rukšāns, 2007).

When compared with *Iris kolpakowskiana* sensu lato, *I. winkleri* only occasionally produces 1-2 bulblets at the base of the parent bulbs, and they more regularly split into two, especially in cultivation. Its flowers are very similar to *I. kolpakowskiana*, only they are slightly lighter in colour, although it is possible that the variability is greater as we observed plants from only one population. The main difference is just in the bulb tunics. Although the species hails from high altitudes, where conditions are more similar to those of our gardens, it is not very easy in cultivation. It mostly suffers from overfeeding and overwatering, perhaps from too long a growing period as well. In such conditions it produces very large bulbs, which as a rule rot during the summer rest.

Fig.29: *Iris winkleri* from Kugart, Fergana Ridge, Kyrgyzstan.

While planning our trip to search for *Iris winkleri*, we found in the Conspectus Florae Asiae Mediae (Tscherneva, 1971) a note on this species that there had been some doubtfully named gatherings from the W Tian Shan at Itelgesai in the upper courses of the River Angren (alt. around 3000 m) and another one from the Kastek mountain pass (alt. 2400 m) in the Trans-Ili Alatau. We regarded those as reserve variants if our expedition to Kugart brought no results, but as we found our target iris, those routes were not needed anymore.

In 1998 we organized another expedition to the upper courses of the River Pskem, in search for *Iris albomarginata* (juno). Originally it was described from a cultivated plant collected by the expedition of B. Fedtschenko in August 1903 near a place named Syemesas. We did not know where this Syemesas was and did not find such a name even on the very detailed military maps. Therefore the only thing we could do was to follow the route that B. Fedtschenko recounted in his diaries. The region was closed to foreign visitors due to the political situation in this district, so we used the services and transportation of the Ministry of Defence of Uzbekistan with the kind support of the State Secretary of Defence. We were brought through the village of Pskem and then took a cattle path towards the nearest tops of the Pskem Mountain Range. We set up our camp in the first more or less suitable spot for our tent somewhere around 2500-2800 m.

As it turned out, it was a very good choice. The next morning we found the searched-for juno, but near our tent and higher up the slopes we discovered another three very interesting plants – one tall very special *Allium sp.* growing through water in a swampy place (actually a bog) where a spring emerged from the hillside (I think that this was a new, unpublished species, which, unfortunately, was lost in cultivation), a very interesting *Corydalis* slightly resembling *C. glaucescens*, but so special that I continue to believe that it is a not yet published species (contrary to the opinion of H. Zetterlund and M. Lidén – personal communication), and the third was a reticulate iris. Its tunic coverings were reticulate and the bulb colour was very light, almost white. We were rather high up in the mountains, according to the map and the altitude lines, it was around 2800 m (there was no GPS at that time and we used military maps provided for us by the State Secretary). For *I. kolpakowskiana* it would have been far too high for it is regarded as a typical foothill species. *I. winkleri* which we found a year earlier, has longitudinally fibrous tunics and, besides, it grows very far from Pskem. Most likely it might be identical with the iris from the upper course of the Angren River, therefore for this reason and because of my severe gastrointestinal health problems we cancelled the trip to the Angren. It would, though, be worthwhile to check the place sometime in the future.



Figs.30, 31, 32: *Iris pskemensis* from the *locus classicus*, Ihnachsai, Pskem Ridge, Uzbekistan.

When the following spring the gathered bulbs bloomed in our gardens, it was revealed that the shape and overall look of the flowers of this iris from Ihnachsai were very special and really different from other species in Section *Monolepis*. I decided to name the plants ***Iris pskemensis.*** Flowers of irises in cultivation retain the size and proportions of wild plants, and therefore the floral data gathered from cultivated specimens correspond with those in the wild. It can be distinguished from other species in this section by the lighter colour of the bulbs – pale yellowish to whitish creamy (lighter than in *I. kolpakowskiana* subsp. *occinica*), and the shape and colour of the flowers. The falls are purple violet and mostly rimmed by a conspicuous narrow white band, the standards are pale bluish or whitish, usually somewhat twisted.

Key for the species in Section *Monolepis*:

1. Bulbs white or whitish to light creamy
    2. Bulb tunics longitudinally ribbed, non-reticulate-fibrous ……*I. winkleri*
    2. Bulb tunics reticulate-fibrous
        3. Blade of falls mostly rimmed with a conspicuous white band; standards 0.4–0.6 cm wide. …… .*I. pskemensis*
        3. Blade of falls not rimmed; standards 0.6–1.5 cm wide *I. kolpakowskiana* subsp. *occinica*

1. Bulbs yellow to light yellow, tunics reticulate-fibrous, blade of falls not rimmed
    4. Blade of falls with a yellow central ridge, bulbs yellow *I. kolpakowskiana* subsp. *kolpakowskiana*
    4. Blade of falls without yellow central ridge, bulbs light yellow *I. kolpakowskiana* subsp. *occinica*

Fig.33: *Iris vartanii* in N Israel. Photo Oron Peri.

The most common and largest both in the number of species and their occupied territory are the reticulate irises from **Section *Hermodactyloides***. Although the section contains the largest number of species, it is still the less researched group. Section *Hermodactyloides* includes some species that are very easy to recognise and identify; at the same time the type species of the section – *Iris reticulata* Bieb. sensu lato – poses the toughest problems for taxonomy due to the very great variability and many isolated populations, allowing me to suppose that under this name several unrecognised species are hidden, separation of which without the checking of DNA would be quite difficult.

Figs.34 and 35: *Iris vartanii* in N Israel. Photos Oron Peri.

The southernmost part belongs to ***Iris vartanii*** Foster, occurring from S of Syria and through Lebanon and Israel entering NW Jordan, although in some of its habitats it is fairly rare, most likely due to over-collecting. It is a plant of low altitudes where temperature does not drop below + 6° C and grows on rocky hillsides between low scrub, blooming in the wild from November till January. The main features allowing easy identification are the pale blue or slate colour of the flowers, the long and narrow style lobes, and the longer and proportionally narrower falls than in other reticulate irises. Occasionally in the wild one can even come upon bright blue forms, but they always have the characteristic style lobes. The species produces a lot of rice grain-size bulblets and is not easy in cultivation. I tried to grow it a few times, but always lost due to the very early start of vegetative growth and flowering – sometimes even in December. The following frosts usually damaged the foliage and the plants became weaker from season to season and in the end perished. Maybe with the climate changes and the much milder winters of the recent years, I will be more successful, although I have not tried to reintroduce it. For years its albino form was offered in cultivation; however the blue forms are more attractive.

Another easily recognisable species – ***Iris winogradowii*** Fomin – is distributed in the very north of the “reticulata” iris range – in the W Caucasus: in Adjara (an autonomous republic in Georgia) and in Abkhazia (an autonomous republic in Georgia, at present occupied by Russia). It too has yellow flowers, although they are of a markedly lighter shade than in *I. danfordiae*. By the flower shape it more resembles the “traditional” reticulate irises, having well-developed standards and larger flowers. It is one of the easiest species in cultivation, being an alpine plant that needs plenty of moisture while in growth and should not be over dried when dormant. It can grow for many years without replanting in the open garden until the clumps become too congested and the blooming decreases. Its bulbs split quite well and produce small bulblets at their bases; it sets seed well, especially after hand pollination. *I. winogradowii* is not easy in pots in the greenhouse, where during

the summer the temperature might be too high and conditions too dry. Therefore the pots need to be placed outside after blooming and periodically watered during the summer spells.

Fig.36: *Iris winogradowii*

Fig.37: *Iris winogradowii* hybrid „Katharine Hodgkin" showing symptoms of virus infection.

In everything but colour it is rather similar to *I. histrioides*; the two species can hybridise: there are some hybrids in cultivation, the most popular of which is *Iris „Katharine Hodgkin'.* Unfortunately these hybrids are very susceptible to virus infections. The infected plants form flowers with darker, irregular stripes on the falls, standards or style branches. Sometimes only one or two small darker stripes will flag the infected plant.

The cultivar distributed as *I. winogradowii* „Alba" actually is a sterile hybrid with an unknown origin.

Fig.38: *Iris histrioides* from nr. Amasya, N Turkey.

Fig.39 right: *Iris histrioides* from Rize province (near Soğanli Pass) of central-north Turkey.

Fig.40: *Iris histrioides* „Lady Beatrix Stanley"

As already mentioned, very similar in everything but colour is the bright blue ***Iris histrioides*** (G.F. Wilson) S. Arnott that is confined to a small area around Amasya and in Rize Province (near the Soğanlı Pass) in central northern Turkey. Its flowers are comparatively very large and are similar in shape and size to *I. winogradowii*. Comparing it with *I. reticulata* sensu lato, the falls of *I. histrioides* have a conspicuously spotted area in the centre of the lamina, but I have not seen individuals of a known wild origin with a rich yellow ridge mentioned by B. Mathew (1981). In all the samples seen by me the yellow zone on the falls was thin and light yellow. The bract and bracteole are thin and papery, whereas in *I. reticulata* sensu lato they are rather rigid. The quadrangular leaves are nearly absent at blooming time, but later reach 40-50 cm length. *I. histrioides* is hardy and, although growing wild at high altitudes (1500-2500 m), it suffers less from summer drought – with me it grows equally well both in the outside garden and in the greenhouse. Under this name several cultivars are distributed: some of them really look like true *I. histrioides* („Lady Beatrix Stanley" – is very similar to my wild sample from Amasya), others more resemble *I. reticulata* sensu lato and might be hybrids.

Fig.41: *Iris sophenensis*.

The plant distributed as *Iris histrioides* var. *sophenensis* is similar to a form of *I. reticulata* sensu lato and cannot be regarded as belonging to *I. histrioides*. In 2012 its status was elevated to species level as ***Iris sophenensis*** (Foster) B. Mathew & Güner. Originally it was collected in 1884 near Elâzığ, quite far to the south from the known localities of *I. histrioides* and plants recently re-collected there look similar to the original collection. The flowers are distinctly violet blue with a white lining around the light yellow ridge and without the dark blotches that are characteristic of *I. histrioides*. The segments are noticeably narrower, too. The leaves are barely visible at blooming time and the species abundantly forms small grain-like bulblets. For the time being I grow it only under cover because in its homeland the summers are very hot and dry. It sets seed readily after hand pollination.

Iris histrio Reichb. is superficially very similar to *I. histrioides* ("histrioides" means "similar to histrio"), but occurs in the opposite part of Turkey – in the very south starting from Silifke through Hatay Province down to Israel. Both species can be easily distinguished by the shape of their falls. In *I. histrio* the falls gradually merge with the lamina into a claw with no obvious sinus, while in *I. histrioides* the lamina is separated from the narrower claw by a well-defined sinus and the flowers are somewhat darker blue. The lamina in *I. histrio* (Turkish populations) is prominently blotched over most of its area, whilst in *I. histrioides* only in the centre. Samples from Syria sometimes have a less spotted lamina and are more variable in colour. The leaves emerge together or before the flowers, in the samples from Syria – already in late autumn, though the blooming starts only in early spring. During blooming the leaves well surpass the flowers, reaching even 30 cm in length. Bulbs usually form numerous basal bulblets. It is not a very difficult plant to grow, but due to flowering very early it

requires the protection of a bulb frame. In summer it needs very hot and dry conditions, so I grow it only in pots, which are kept in the greenhouse all year round. Small bulblets must be sown immediately, otherwise they soon dry out.

Figs.42 and 43 above: *Iris histrio* from Hatay Province, S Turkey.

Fig.44 left: *Iris histrio* (ARGI-058) from Syria. Fig.45 right: *Iris histrio* (ARGI-100) from Syria.

Fig.46 *Iris aintabensis* - commercial form.

Figs.47 and 48 below: *Iris aintabensis* from near Gaziantep, Turkey.

Fig.49: *Iris aintabensis* from near Gaziantep, Turkey.

Iris aintabensis (G.P.Baker) Rukšāns **stat. nov.**

Basionym: *Iris histrio* var. *aintabensis* G.P.Baker, Gard. Chron. ser. 3, 89: 137 (1931). [*Iris histrio* subsp. *aintabensis* (G.P.Baker) B. Mathew in K.Tan (ed.), Davis & Hedge Festschrift: 97 (1989); *Iridodictyum aintabensis* (G.P.Baker) M.B.Crespo, Mart.-Azorin & Mavrodiev, Phytotaxa 232: 60 (2015)].

This tiny iris is known from the vicinity of Gaziantep and for a long time was regarded as a variety of *Iris histrio*, although the only common feature for them both is the prominently blotched lamina. In *I. aintabensis* the blotches are more concentrated around the yellow ridge, while in *I. histrio* they tend to congregate towards the edges. In 1989 B. Mathew raised its status to the subspecies level, but in 2015 M. Crespo & al. placed it as a species in the genus *Iridodictyum*. It is a definitely smaller plant in comparison with the "normal" *I. histrio* that grows more to the south. In cultivation it is better known as var. *aintabensis* of *I. histrio* and is more widely distributed than the typical *I. histrio*. Its light (pale) blue form with some darker splashes on the falls around the yellow ridge is the form predominantly grown, but NW of Gaziantep, near Yeşilce village, in an oak tree grove at altitudes of 1100-1200 m I collected seeds from which produced quite different plants – some strongly resembled cultivated forms, while others were coloured a much deeper blue. Although the leaves emerge during blooming, they only rarely and only slightly surpass the flowers. *I. aintabensis* produces a lot of "rice-grains" and often after blooming splits into smaller bulbs, which require around 2 years to reach flowering size. This can be avoided by deeper planting and more frequent watering and fertilizing.

Fig.50: *Iris bakeriana* from near Mardin, Turkey.

Fig.51: *Iris bakeriana* from near Mardin, Turkey.

Fig.52 above and Fig.53 below left: *Iris bakeriana* from W Iran, near Lake Urmia.

Another distinct reticulate iris, which can be identified without any doubt, is ***Iris bakeriana*** Foster because it has a very special leaf form: in all the other species the leaves are quadrangular or channelled (sect. *Monolepis*), whereas in *I. bakeriana* they have eight ribs and are more or less round in cross section. The species is described from SE Turkey (near Mardin), where forms occur with lighter or darker blue flowers with deep purplish blue (even blackish) falls and sparsely dark spotted white hafts with no yellow; this is the form that is distributed in cultivation and occasionally offered by some nurseries. Very different in colour, but with the same leaf design are the plants that occur in NE Iraq (?) and W Iran – between Lake Urmia and Turkish border. It seems that the comment by B. Mathew (1981) that the species is distributed in Iran as far as Shiraz needs rechecking; at least in this area I observed only plants with quadrangular leaves. Iranian *I. bakeriana* is of a darker colour and has a more purplish shade than those from Turkey, but the main feature separating both populations

is the very bright and large yellow ridge and middle zone of the haft in the Iranian specimens. The bulbs multiply very well and even in the wild often form large clumps with many small bulblets. Both principal areas are isolated and located in an almost 400 km distance. Without the checking of DNA it is impossible to judge whether they are different species or only two isolated populations with differing colours. Fresh gatherings from the Turkish populations near Mardin would be helpful, but this would now be quite difficult to accomplish currently. There are reports about plants with 5 to 7 ribs, but I have not seen such in the wild. They might be hybrids with some forms of *I. reticulata* sensu lato. At least the forms from Turkey are easy to grow, but I have tried them only in pots in the greenhouse, although they are grown on open fields commercially in Holland. They bloom early in the season and their flowers (if grown outside) can be damaged by the elements. As to the Iranian samples: it is too early to say anything, because my experience with their culture is still too limited. For the time being they grow only in pots.

Fig.54: *Iris bakeriana* albinos from W Iran, near Lake Urmia.

Iris reticulata M. Bieb. sensu lato is the most well-known species and it certainly is the most inconstant in appearance. Its quadrangular leaves vary hugely in their development at blooming time and its bulbs can split or produce more or less abundant numbers of grain-like bulblets at their bases. Its flowers are very variable in colour – from bluish shades to deepest purple, but albinos are very rare. There is usually a bright yellow crest on the falls, though in some populations it is absent. *I. reticulata* occurs in a wide range of habitats: in alpine meadows or on stony mountainsides and

scrubland, at altitudes from 600 to 2700 metres. It was already described in 1808 from Georgia from where I have seen only plants with reddish purple flowers. These are the ones that must be regarded as typical *I. reticulata*. In neighbouring Armenia, as well as in Azerbaijan, purple and blue-coloured populations grow, although, according to Grossheim (1940), plants with pale lilac or bluish flowers are rare. There are several species selected from this complex and certainly many more will follow in the future. It is no surprise that the taxonomical status of some of the species is differently regarded by different authors.

Fig.55: *Iris hyrcana* RSZ-8706 from Talish, Azerbaijan.

Iris hyrcana Woron. ex Grossheim was described from near Lenkoran in the Talish in the Republic of Azerbaijan. There it is very widespread and near Lerik I observed places where its leaves covered a meadow so densely that they resembled grass. Although some botanists include the name among the synonyms of *I. reticulata* (Wendelbo & Mathew, 1975 – in Fl. Iranica; Killens, 1997), both species are easily separable. The bulbs of *I. reticulata* are elongated (almond-shaped) and occasionally split longitudinally, but mostly can be found in the wild as solitary plants; those of *I. hyrcana* are more globose and produce a lot of bulblets, even in nature clumps are not rare. But the biggest differences are in the pollen and flower colour. All samples regarded by me as *I. hyrcana* have anthers with white to light blue reverse and with white pollen, whilst those regarded as *I. reticulata* almost invariably have yellow pollen.[2]

[2] There are some gatherings from Turkey (Kurucu gec. near Bingol and others), Armenia (near Vanadzor) and Iran (near Hamedan) with white pollen, but by other features they are very distinct. In any case taxonomy of so named "*Iris reticulata*" still needs much research at DNA level.

Fig.56 above left: Dark form of *Iris hyrcana* RSZ-8706 from Talish, Azerbaijan.
Fig.57 above right: *Iris hyrcana* 16IRS-076, Mazandaran Province, Iran.

Figs.58 and 59: *Iris hyrcana* WHIR-134 from Ardabil Province, Iran.

In *I. hyrcana* flowers are very bright sky blue with a bright yellow ridge surrounded by a white striped zone and with hardly any dark veining or spotting. Occasionally very light or dark blue or even violet individuals can be found, but even the darkest ones are not as deep reddish purple as a typical *I. reticulata*; and they all also have rounded bulbs and tend to form clumps. In 1987 our team collected *I. hyrcana* bulbs at the *locus classicus* and in its surroundings (long after blooming, thus the sample was very randomized) and among them there were only two dark lilacs and one very light individual and not one was purple. The falls are wide – obovate and rounded, abruptly narrowing into a claw. Subsequently B. Mathew (1981) accepted its separation at least "for garden purposes" and noted that in the Talish region of Iran they vary in colour from clear pale blue through darker blue to even reddish purple. I saw plants with such a colour (purple) only in one population (at the *Paeonia wendelboi* locality where bright blue and distinctly reddish purple individuals grew side by side, with no intermediates). Dimitri Zubov (personal communication) near Lerik (the Talish region of the Republic of Azerbaijan) among blue-flowered plants also observed purple plants. Among the samples I made after flowering in the area where, in my opinion, *I. hyrcana* is distributed in Iran, I observed only individuals with bright and dark (the last only occasionally) blue flowers, none were purple. This area stretches along the coastal ridge bordering the Caspian Sea in the south: from the border with Azerbaijan to Mazandaran in the east. Further inland the flower style changes – in examples I have observed the falls are dark purple, narrow and with distinctly channelled claws of the same width or even significantly wider. Plants from Golestan Province near the south eastern corner of the Caspian Sea are very similar to *I. hyrcana*, but there more observations are still needed. Unfortunately, I have no samples from the region further east (N Khorasan), although I did find reticulate irises there, but that happened long after blooming, and examples were not collected there due to the fact that they grew in the Golestan National Park. In the Flora Iranica there are two samples listed from this part of the area, but I have not seen them. The samples from the Kopet Dag in Turkmenistan are very different and cannot be regarded as *I. hyrcana*.

Fig.60: *Iris kurbanovii*, type gathering, Kopet-Dag, Turkmenistan

The reticulate iris from the Kopet Dag in Turkmenistan was originally published as *Iridodictyum kopetdaghense* Kurbanov. It was not the best choice of the name because there already was a juno species named *Iris kopetdagensis*. Most botanists still regard them both as belonging to the genus *Iris*, so the reticulate iris from the Kopet Dag needed a new name; therefore it was renamed as ***Iris kurbanovii*** F.O.Khass. & Rakhimova. In appearance it is almost indistinguishable from some forms of *I. reticulata* sensu lato from Turkey and the Caucasus, and only the great distance and the absence of similar plants in-between might allow it to be regarded as a different species. The morphological features given for the differentiation are very subtle and overlapping. One of them is the length of the leaves during flowering. In my collection two samples of this iris grow from the Kopet Dag Range – the type gathering received directly from Dr. Rodionenko, and a sample collected by L. Bondarenko from Lithuania.

Both were collected in the same area and visually are very similar; differences in the colouring of their falls do not exceed the normal spectrum within reticulate irises. In the type specimen leaves do not surpass the flowers at blooming time; in the sample from L. Bondarenko leaves are well developed during blooming and are longer than the flowers. *I. kurbanovii* in its description is characterised as having narrow leaves without four clearly seen borders and shorter fruits [its length only two times (not more) longer than the width, when in *I. reticulata* the fruit length is twice to four times longer than its width (Kurbanov, 1998)]. In my plants the leaves are typically quadrangular in both samples. The seedpod length depends on the quality of pollination and is very variable. H. Kerndorff et al. (2015) noted that “The capsules vary too much in their sizes dependent on nutrients in the soil and climatic conditions which can be different even from season to season. Therefore they are not of great taxonomical value.” Although this excerpt concerns crocuses, the same can also be attributed to reticulate irises. So only the checking of DNA will confirm whether they are identical or not.

This page – Figs. 61 a,b,c,d Photographs from Aleksandr Pavlenko of *Iris kurbanovii* and bulbs in the *locus classicus*.

Fig.62: *Iris sisianica* at *locus classicus*, Armenia. Photo Dimitri Zubov.

Fig.63: Stoloniferous bulbs of *Iris sisianica*.

Very recently (March, 2018) a very special reticulate iris from Armenia was published – ***Iris sisianica*** Zubov & Bondarenko. By its flower it is very similar and practically inseparable from a typical *I. reticulata* (as I regard it), but it has a one-of-a-kind feature unknown in any other species of subgenus *Hermodactyloides* – its bulbs are stoloniferous: the parent bulbs usually produce 1-3 up to 10-23 cm long stolons which branch out from the basal plate. Stolons have up to five reduced, colourless, up to 0.9 cm long clasping sheaths (or lower leaves) terminating in an unequally rounded, up to 1.4 cm wide and 1.7 cm long daughter bulb (bulbil) with a pointed apex. This trait is so unique among reticulate irises that it leaves no doubts about the species status of *I. sisianica*.

Another distinct reticulate iris was described by me as *Iris reticulata* var. *kurdica*, but later its status was altered by Crespo et al. (2015) and it became *Iridodictyum kurdicum* (Rukšāns) M.B.Crespo, Mart.-Azorín & Mavrodiev. Considering that all the bulbous irises belong to the genus *Iris*, the aforementioned name must be changed. A new and more complete description of the species is added here.

Fig. 64: *Iris kurdica* flower details.

Iris kurdica (Rukšāns) Rukšāns status nova.

Basionym: *Iris reticulata* var. *kurdica* Rukšāns, Buried Treasures: 363 (2007). Synonym: *Iridodictyum kurdicum* (Rukšāns) M.B.Crespo, Mart.-Azorin & Mavrodiev. Phytotaxa 232 (1): 61.

Type: Turkey, 27 km S of Başkale along the road to Hakkâri (60 km before Hakkâri), steep serpentine slopes, Rukšāns, Seisums & Zetterlund, 27-05-2004, BATM-118, 37°51‟ N 44°07‟ E, at an altitude ~1800 m. Holotype: Gothenburg (GB), ex culturae in horto Jānis Rukšāns.

Description: Bulb elongated, up to 2 cm long and 12 mm in diameter with netted tunics. Leaves two, quadrangular, up to 3 mm wide, glabrous, green with white apex, at blooming time 5-6.5 cm long, reaching around half of flower height, later elongating. Inflorescence one-flowered, with long pedicel, reaching 10-12 cm in height. Bract green with white apex, rigid, reaching along half of flower tube height, closely enwrapping a somewhat smaller and much finer bracteole and flower tube. Bracteole thin, at base transparent getting light green at top, mostly hidden inside bract, sometimes equal in length and rarely even somewhat longer. Outer perianth segments up to 45 mm long and 7 mm wide at widest part of haft, tapering to 3 mm at base and 5 mm below falls. Outside of haft dark greyish spotted with narrow white edge, inside (upper side) at base brownish, higher gradually turns dark purplish spotted with narrow white edge. Upper half of haft with very distinct, prominent papilla as low, but distinct ridges across median vein. Falls (lamina) acuminate, up to 10 mm wide and 15 mm long, very dark, even blackish purple on upper side, with narrow, 5-6 mm long deep yellow ridge with few very small blackish spots on top. Outside dirty yellowish green, in middle lighter and with narrow deep purple edge. Inner perianth segments (standards) erect, lanceolate to parallel edged with gradually narrowing, pointed tip, 38-40 mm long and 5 mm wide with slightly curved edge, turning lighter to base with 10-15 mm long, narrow, dirty purplish, dark haft. Style branches narrowly cuneate, slightly shorter than standards - 45-47 mm long and 6 mm wide at widest part, at base whitish with dark midrib turning pinkish lilac at top and with 2 dark purple, somewhat triangular, 5 mm long and 2-2.5 mm wide at base, slightly recurved lobes. Stigma lilac, bilobed, lobes triangular. Filaments up to 18 mm long, anthers up to 10 mm long, flat, pointed at apex, bluish black with lighter connective, pollen black.

Etymology: named after Turkish Kurdistan where it is growing, to recall the former independent Kurdish state.

Fig.65: *Iris kurdica* BATM-118 from the type locality, E Turkey.

Iris kurdica originally was found by Arnis Seisums, who collected a few bulbs (out of flower) during our expedition to Turkey together with the Gothenburg Botanical Garden. When it bloomed with me for the first time, it was a plant of a very small habit with a different colour. Its standards can actually be described as purplish pink. Another prominent feature making it distinct from reticulate irises growing in neighbourhood is its black anthers and pollen. In Kurdistan, the region where it is distributed, it is at present known from a rather limited area – from 3 acquisitions (BATM-118, BATM-125 and JRRK-056), all within a distance of ~30 km, along the road from Başkale to Yüksekova. Plants from all 3 populations are very similar, that and the black-coloured anthers as well as the non-compatibility when cross-pollinated with other populations regarded as typical *I. reticulata* (at that time) confirm its species status.

Fig.66: *Iris kurdica* BATM-125, E Turkey.

Returning to ***Iris reticulata*** sensu lato – its situation still remains very complicated. As I noted in the beginning, plants from Georgia can be regarded as typical representatives of the species. In the southern direction (in Turkey) and towards the east (in Iran) there certainly grow several at present unrecognised species. Many localities are still not sufficiently researched. As to Iran, I have not seen any examples from around Tabriz which are mentioned in the Flora Iranica; plants from around Hamadan look very special, although by colour they resemble *I. hyrcana* growing near the Caspian coast; *I. hyrcana* grows along the coastal ridge, but only a little further inland completely different reticulate irises are present; the plants from Kuhha-ye Sabalan, although superficially resembling *I. hyrcana*, have distinct bulb tunics. When I put on the map my accessions of Iranian samples of *I. reticulata* sensu latissimo, it was possible to delineate some 12 areas. Of course, this does not mean that between these areas reticulate irises do not occur, only that there are still many territories which are little or not at all explored. The problem is that reticulate irises usually bloom very early, right after the snowmelt, but at that time there are very few travellers. When flowering is over, they can still be found (even easier than crocuses) thanks to their long leaves (if they have not been grazed), but then it is impossible to evaluate the variability of the population without collecting larger samples, which is not acceptable when the protection of wild populations is considered.
The situation in Turkey is less clear and in my collection there are an insufficient number of samples from there. Most of them look very similar to typical *Iris reticulata* with only a couple of exceptions, but my samples are too small and represent only a few plants gathered in the wild from each location, therefore it is impossible to determine the variability within the populations. All but one have reddish purple flowers. Judging by the size, shape and colour of flowers and pollen, geographical distribution, and some other features my samples might be grouped within four regions – each of which would contain to some extent similar plants that are dissimilar between the regions. But there is still much to do for researchers.

A selection of images of *Iris reticulata* sensu lato follow:

Fig.67 left to right: *Iris reticulata* BARAKA-119 from approximate type locality in Georgia; *Iris reticulata* from Armenia; *Iris reticulata* aff. from Halkis Dag, Turkey - Norman Stevens collection.

Fig.68 left to right: Purest albino of *Iris reticulata* from Armenia; *Iris reticulata* 17IRS-009 - on Kuh-e Sendan Dag, Iran, alt. 2420 m.

Fig.69 left to right: *Iris reticulata* aff. JRRK-078 from Mnt. pass Kubbe in Malatya, Turkey, alt. 1900 m; *Iris reticulata* KPPZ-152 -from near Urfa, Karaca Dag, Turkey, alt. 1800 m; Iris reticulata JRRK-064 - Karabel pass, Turkey, alt., 1800 m.

Fig.70 left to right: *Iris reticulata* SASA-209 - from Pulumur valley, Munzur Dag, Turkey, alt. around 1000 m; *Iris reticulata* BATM-207 - from Yaylasuyun gec., Turkey, alt. 2400m; *Iris reticulata* 17IRS-002 - near Sultaniyeh, Iran, alt. 2200 m.

Fig.71 left to right: *Iris reticulata* KMZ-9505 - very dwarf form from near Hamadan, Iran; *Iris reticulata* WHIR-140 - from Kuh-e Bozqush, Iran, alt. 1900 m; *Iris reticulata* WHIR-190 - from near Tizh-Tizh, Kurdistan, Iran, alt. 1900 m; *Iris reticulata* WHIR-201 - from between Salavatabad and Gorgabad, Iran, alt. 2300 m.

Fig.72: *Iris zagrica* holotype herbarium scan from Kew's Herbarium

Another reticulate iris with smaller flowers than average was published in 2008/09. ***Iris zagrica*** B. Mathew & Zarrei was found in the Zagros Mountains of Iran and was probably known about since 1928, but it had been subsumed under the broad umbrella of *I. reticulata*. The most prominent feature separating it from *I. reticulata* is that the ovary (and later the seed capsule) has a long narrow "beak" at the apex. When the flower fades it breaks off at the apex of the beak with the latter remaining attached to the capsule and hardening while the capsule ripens. In other reticulate irises the long flower tube shrivels together with the flower and what remains is an ovary (later – capsule) with a short beak that stays attached.

Fig.73:
In species of section *Zagricae* old flowers break off with a "neck" only 1-3 mm long. In other reticulated irises flowers wither together with a long neck and remain attached to the seed capsule.

The type locality of *I. zagrica* had been designated as the Zirreh Pass (alt. 1950 m) which is located 38 km east of Khorramabad (P. Furse PF1864). The species was first published in the Winter Bulletin 2008/9 of the British Iris Society Species Group. Six pictures were included to illustrate *I. zagrica*. And this is where the problems arise. The plant used for illustration as the type gathering PF 1864 on plates 7 and 8 actually comes from a different place. The true PF 1864 is shown by Phillips & Rix (1981, p 57, b) and it is the same as in the picture on pl. 8 as a plant from M. Kammerlander. M. Kammerlander wrote to me about this photo "*To number 04-146-MK-30 (not 1460) – this is my own access Number of my database, not a collecting number, it is a collection of Bernd Wetzel (he died before 2000 in China) from Razan Pass, alt. 1950 m without collecting number. I only sent him* (B. Mathew - J.R.) *the material*". I grow four samples of *I. zagrica* I collected myself (16IRS-179 and 185B, 18IRS-006 and 013) and a sample collected during the Swedish-Latvian-Iranian Zagros Expedition – SLIZE-323. They were collected within a 30 km stretch and at approximately 30 to 60 km distance from the designated *locus classicus*. All really look like one clone and seem identical with the **true** type *I. zagrica* (PF 1864) and the plant on Pl. 8 (of the Winter Bulletin 2008/9 of the British Iris Society Species Group) from Kammerlander. As the type locality for PF 1864 Philips & Rix and Kammerlander give the Razan Pass, while B. Mathew – the Zirreh Pass (as on P. Furse"s herbarium sheet - http://specimens.kew.org/herbarium/K000524268. As the altitude is the same (1950 m), then this discordancy can be explained as a misspelling of the local name by one of the authors. The plants collected in Shiraz Province 400 km SE of the type locality of *I. zagrica* (if the locality was correctly deciphered from the label) are illustrated on plate 7 – top left picture (flowers) and on pl. 9 – herbarium of plants in seeds (both Davis & Bokhara 56478). The flowering plant (Pl. 7) looks very similar to typical *I. zagrica* and can be regarded as the same species. In the Flora Iranica two more gatherings of reticulate irises are listed not very far from the D&B 56478 spot. They, too, most likely represent *I. zagrica*, though it is impossible to make any judgement about their position and probable naming without seeing living plants, which is crucial in the identification of irises.

After a short while the description of *Iris zagrica* was published in Curtis"s Botanical Magazine – vol.26 (3): 245-252 (2009).There it was more detailed than in the Winter Bulletin 2008/9 of the British Iris Society Species Group. It seems that P. Furse"s gathering PF1864 for the description was used; I confess that I have seen no specimens of the true *I. zagrica* with "pale violet-blue" standards. In the typical *I. zagrica* specimens grown by me the standards are pure white, even slightly creamy white with no hint of blue, even more – at the start of flowering they are faintly yellowish, although on the type herbarium sheet there are notes of P. Wendelbo (?) characterising the standard colour as pale slate blue. I cannot judge whether those notes were taken from living plants or the colour had changed while drying (in some crocuses white flowers turn bluish during the drying in herbarium). On pictures made by Luc Scheldeman in the wild near the *locus classicus*, standards are white or very slightly bluish shaded. Judging by the shape and the measurements of the flower parts, they all completely match my examples of the typical *I. zagrica*. In the description there are four illustrations of this iris. The photo of the species had been taken S of Marivan on the Kuh-e Shāhu (Hawraman) Ridge of the Zagros Mountains. The specimen is identical with the plants I observed along this ridge in five localities. A virtually indistinguishable plant was used as an illustration on pl. 653. It was collected on the same (?) ridge, albeit more to the south, between Ravansar and Kamyaran. However, they all differ very much from the typical *I. zagrica* whose range begins around 300 km to the south of Marivan.

Eastwards from Marivan, on the highest pass along the road to Saqqez, another reticulate iris was discovered that was somewhat similar to the plants from Kuh-e-Shāhu Ridge, but with a completely different colour pattern – their flowers were much darker (deep purple) and in that area they were very uniform. Identical plants were observed along the same road in the vicinity of the pass. In the direction of Tizh-Tizh, at some distance from the pass, they are replaced by different looking reticulate irises, as yet not researched by me. Judging solely by the pictures those deep purple irises look rather similar to the iris that was very recently published from the Turkish Hakkâri Province as *I. zagrica* subsp. *hakkariensis* Firat. (Alas, my repeated appeals to Dr. Firat for a high-resolution scan

of the type herbarium remained unanswered.) In the same publication M. Firat (2017) informed about the finding of the type subsp. of *I. zagrica* in the same province somewhat less than 30 km to the south from the type locality of the new subspecies. If considering only the attached pictures, the plants look similar to those from Kuh-e-Shāhu Ridge south of Marivan, although they are separated by 250 km. About the status of the Turkish plants I cannot say much, and it is now impossible to go there because the localities where they were found at present are classified as a forbidden zone by the security forces (Firat, 2017). As a rule, herbarium sheets are of little value when dealing with the genus *Iris*. Unfortunately, due to the aforementioned reason, it is not feasible to ascertain their similarities or dissimilarities from herbarium specimens. There is a possibility that in Hakkâri Province *I. avromanica* and *I. marivanica* (see below) are distributed, but for a final decision the DNA of reticulate irises from both regions must be checked. In any case, even judging only from the pictures, it becomes clear that there is no true *I. zagrica* in Turkey.

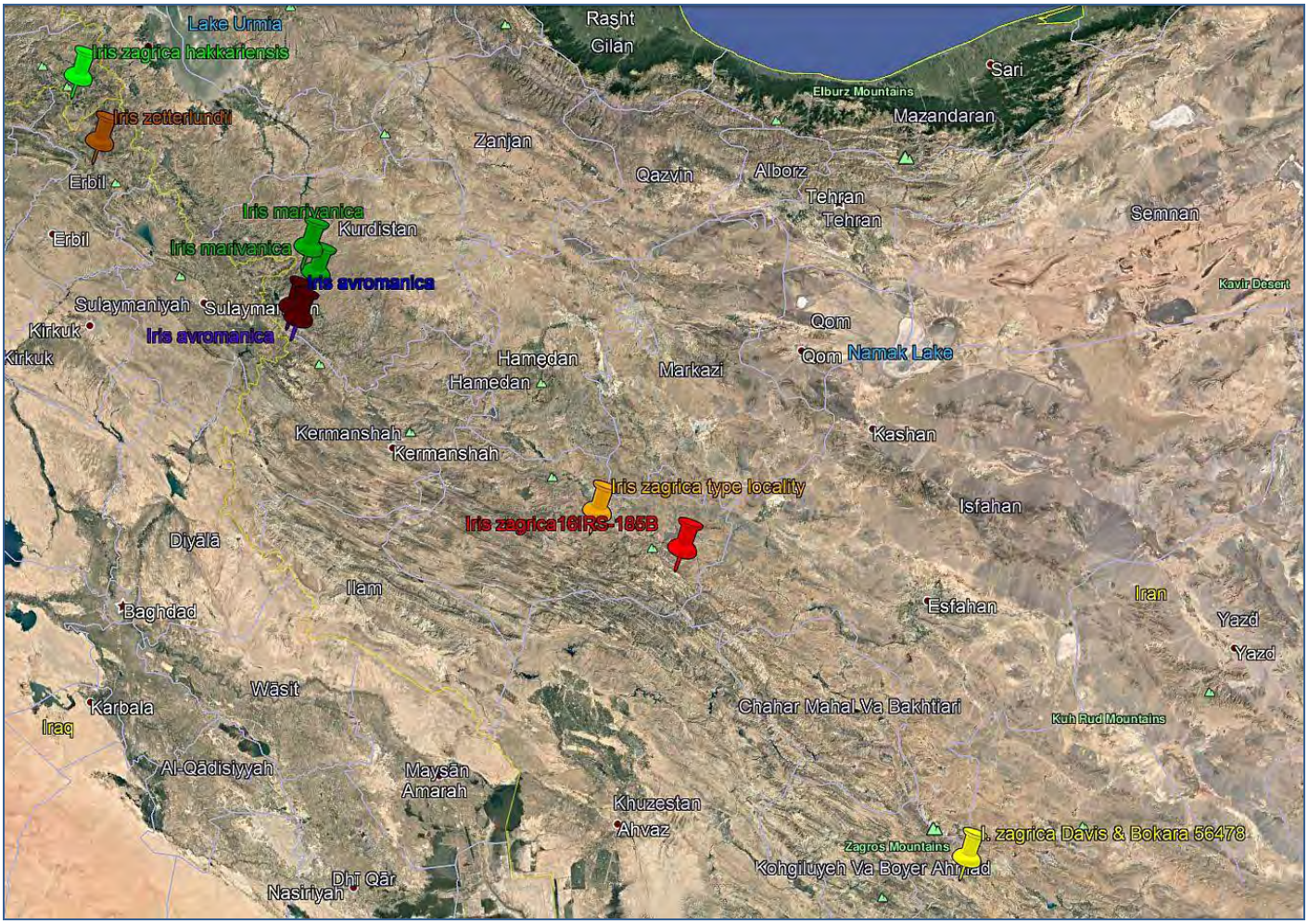

Fig.74: Distribution map of irises from sect. *Zagricae*, from top: light green - localities of unidentified species in Hakkâri Province, Turkey; brown - *Iris zetterlundii*, Iraq; dark green - *Iris marivanica*, brown/purple - *I. avromanica*; orange - *I. zagrica*, type locality; red - *I. zagrica*, own gatherings; yellow - most likely *I. zagrica* in Shiraz (D&B 56478).

In my opinion, in Iran three species are hiding under the name *Iris zagrica* and another one in Iraq; common to them all are the short flower tube and the long beak at the top of the seedpod. A different population with the same type of seed capsule was observed by Henrik Zetterlund in Iraqi Kurdistan on Goras Mountain at an altitude of 1400 m (EGO.IQ-129). Although geographically it is quite close to the so-called Turkish "*I. zagrica*" – separated by only 25-30 km – its flowers are different. I decided to publish it under the name *I. zetterlundii*. One more sample (Polunin 5042) was collected still further south in Iraq. Whether it is the same *I. zetterlundii* or the more distant *I. avromanica*, I cannot judge.

According to Mathew and Zarrei (2009), it might belong to “the same species” (false “*I. zagrica*” - J.R.). Common to all the new species, separating them from true *I. zagrica,* are much wider standards, plants are significantly larger and of different flower colour. Several of the populations regarded as *I. zagrica* sensu lato are separated by populations of reticulate irises, in which the long beak on the seedpods is absent and the flower tube is longer than is usual in *I. zagrica* and its allies. Such are the irises which were gathered around Hamedan, Tizh-Tizh and Sanandaj; they are located between the type locality of *I. zagrica* and populations around Marivan and further to North. This only confirms my suspicions that the *Iris zagrica* name is camouflaging several geographically isolated species, which might even form a new section.

Fig.75: *Iris zagrica* SLIZE-323, Lorestan, Iran.

Fig.76 below left: *Iris zagrica* 16IRS-179, Lorestan, Iran.

Fig.77 below right: *Iris zagrica* in the wild. Photo Luc Scheldeman.

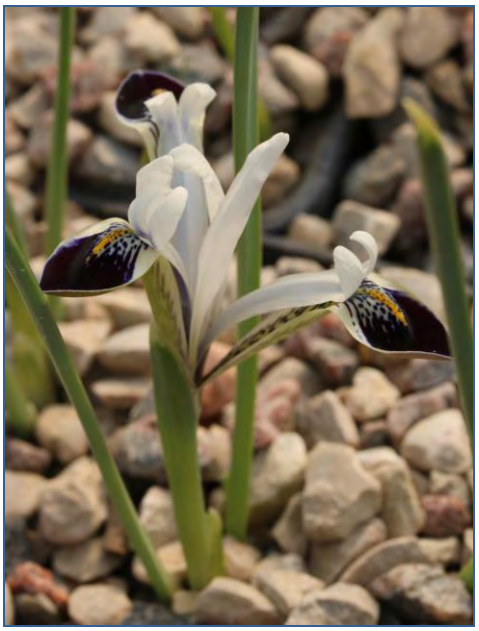

Fig.78: Unusual colour form of *Iris zagrica*. Photo Luc Scheldeman.

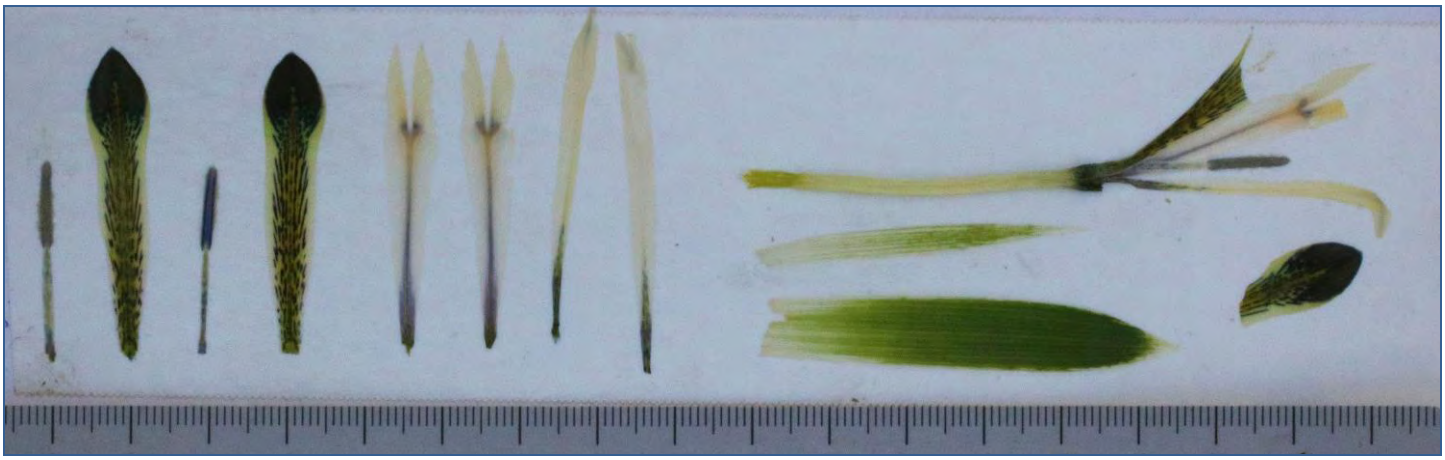

Fig.79: *Iris zagrica* flower details.

Section *Zagricae* Rukšāns, **sect. nov.**

Flowers with a short (up to 3-5 mm) tube, the seed capsule with a long (up to 3 cm) narrow beak at the apex. Type of section: *Iris zagrica* B. Mathew & Zarrei. Species in section: *I. avromanica, I. marivanica, I. zagrica, I. zetterlundii* (? and two unidentified species from Hakkâri Province in Turkey).

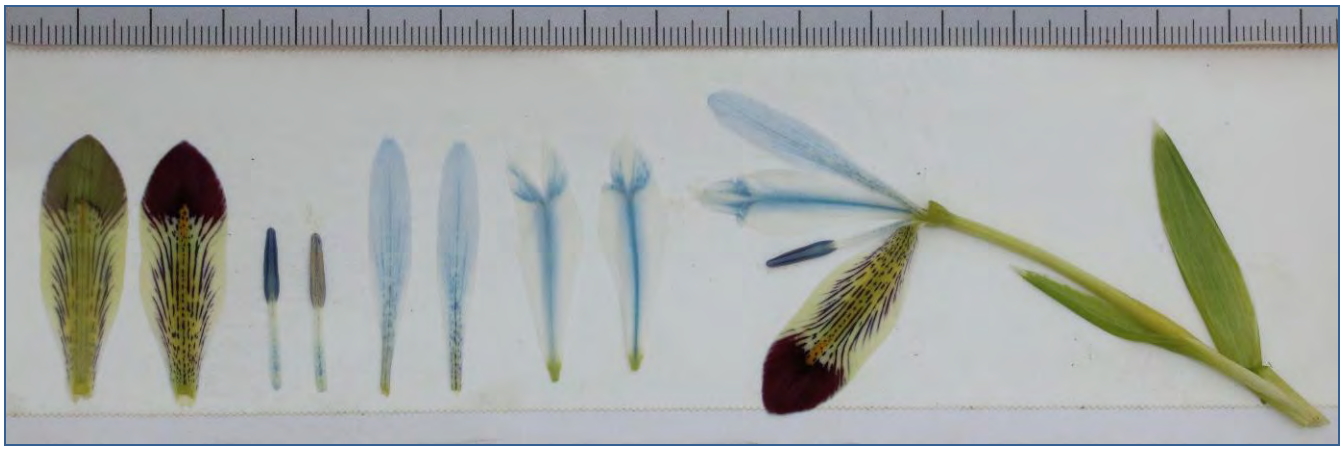

Fig.80: *Iris avromanica* flower details

Iris avromanica Rukšāns ***species nova***

Type: Iran, Kurdistan, Kuh-e Shāhu (Hawraman) Ridge, between Marivan and Nowsud, 36.16.978 N; 46.11.616 E, altitude 2270 m, leg. Jānis Rukšāns, 02-05-2008, WHIR-185. Holotype GB (Gothenburg) from plants cultivated by Jānis Rukšāns, collected on 12-03-2018. Ic: British Iris Society Species Group Winter Bulletin 2008/9 pl. 7 & 8 (as *I. zagrica* PF 1864); Curt.Bot.Mag., pl.653 & photo (as *I. zagrica*).

Habitat and distribution: Observed on steep mountain slopes in grass and among low shrubs together with several *Fritillaria* sp., *Puschkinia scilloides*, *Bellevalia* sp., *Ixiolirion* sp. etc. along Kuh-e Shāhu (Hawraman) Ridge, Kurdistan, Iran, where it blooms just after snowmelt in March and April. There are some pictures of very similar plants from Penjwen, Iraq, on opposite side of Iran-Iraq border not far from Marivan.

Description: Plant (flower) 12-14 cm cm tall, leaves at start of blooming 6-8 cm long, at end of blooming overtopping flowers. Bulb almond shaped, up to 26 mm long and 11 mm wide, occasionally clump-forming, old tunics slightly reticulated, inner ones parallely fibrous. Stem inconspicuous, unbranched with one terminal flower, usually hidden among leaves and elongating somewhat at fruiting. At base two 30-55 mm long transparent cataphylls, each leaf enwrapped into two transparent sheaths, which at the very top are slightly greenish, flower stem with two sheaths, transparent at base and slightly greenish at top. Leaves two, dark green, quadrangular in cross-section, glabrous, up to 5 mm wide at anthesis. Bract cylindrical, up to 10 mm wide, rigid, green, at very top white, ending something below or rarely around base of flower. Bracteole narrowly cylindrical, up to 5 mm wide, mostly enclosed within bract, in upper part free, of same colour, usually something shorter, but occasionally of same length, very rarely reaching base of flower or even overtopping it. Outer perianth segments 37 - 47 mm long and 10 - 12 mm wide, at base gradually tapering to 3 mm. On outside haft yellowish green, turning whitish to edges, on inside mid-zone sparsely hairy, more densely in direction to lamina, yellow, spotted and striped blackish, sides creamy, striped lilac along mid-zone. Lamina (falls) 12-14 mm long and 10-12 mm wide (of same width as haft or only minutely narrower) more or less triangular in shape, with slightly rounded edges and pointed at tip, on outside dirty greenish, inside (upper side) deep dirty purple. Inner perianth segments (standards) something lanceolate, 37 - 45 mm long and 6 - 7 mm wide with long narrow haft, outside light blue, slightly spotted and striped darker blue in direction to base, inside of same colour only spotted darker. Style branches 35 - 40 mm long and 11 mm wide, upside white, light blue around darker blue midrib, downside of similar colour, only toned darker blue in mid-zone. Style lobes 9 - 12 mm long and 3 - 4 mm wide, with straight inner side and rounded on outside and attenuate tip, white, striped light blue. Stigma bilobed, white, slightly striped blue with rounded upper edge. Filaments 12 mm long, glabrous, white or very light blue, sparsely spotted blue along midrib. Anthers 10 mm long, upside light blue with deep blue edges, pollen dirty creamy white.

Etymology: named after Kuh-e Shāhu (Hawraman) Ridge, where it was observed.

Judging only by published pictures (Firat, 2017) it is quite similar to so named "*Iris zagrica*" from Hakkâri Province in East Turkey. Taking into account only dimensions of standards, it certainly isn"t *I. zagrica,* but belongs to another species. Is it identical with I. *avromanica* or represents another still unpublished species: it is impossible to judge without further researches on living specimens.

Fig.81: *Iris avromanica* WHIR-185 from *locus classicus*, Iran, Kurdistan on the Kuh-e Shāhu (Hawraman) Ridge.

Fig.82 above left: *Iris avromanica* 18IRS-024 - the lightest observed form, distinguishable from *Iris zagrica* by width of standards, growing on Hawraman ridge south from *locus classicus* together with typical forms. Fig.83 above right: *Iris avromanica* 18IRS-024 seed capsules with prominent beak.

Fig.84: *Iris marivanica* flower details

Iris marivanica Rukšāns ***species nova***

Type: Iran, Kurdistan, pass between Marivan & Saqqez, 35°43.210‟ N, 46°23.097‟ E, altitude 2130 m, leg. & det. Jānis Rukšāns, 18-04-2017, 17IRS-054. Holotype GB (Gothenburg).

Habitat and distribution: At present known only from *locus classicus* on the highest pass along road from Marivan to Saqqez, where it is growing on vernally very wet meadow along streams, between grasses together with *Crocus* sp., superficially similar to *Crocus iranica*, *Eranthis cilicica, Fritillaria kurdica, Gladiolus kotschyanus, Muscari inconstrictum, Tulipa humilis* etc..Flowering soon after snowmelt, ~April. Possibly distributed in vicinity, too, where several populations of “reticulata” irises out of flower were observed.

Description: Plant 14-16 cm tall at anthesis (leaves), flower 12-17 cm tall. Bulb almond-shaped, up to 30 mm long and 18 mm wide, tunics longitudinally fibrous, slightly reticulated, often clump-forming. Stem inconspicuous, unbranched with one terminal flower, usually hidden among leaves and elongating somewhat at fruiting. At base two semi-transparent 14-35 mm long cataphylls, each leaf enwrapped into 2 transparent sheaths, flower stem into two sheaths, transparent at base and green at top. Leaves two, dark green, quadrangular in cross-section, glabrous, up to 5 mm wide at anthesis. Bract narrowly cylindrical, up to 9 mm wide, rigid, green, at very top white, ending around 1 cm below base of flower. Bracteole narrowly cylindrical, 5-6 mm wide, partly enclosed within bract, in upper part free, of same colour, slightly shorter or both of same length, bracteole occasionally slightly longer. Flower tube very short, light green, separating from the beak of the ovary after anthesis. Outer perianth segments up to 45 mm long and 13 mm wide parallely edged, and tapering to 3-4 mm at base. Outside of haft dirty green with narrow lighter edge, inside light green densely spotted purple in middle part and striped purple on edges, sparsely and minutely hairy in upper part, lower glabrous. Lamina 13 mm long and wide, rounded with shortly acuminated tip, outside dirty green with very thin deep purple edge, inside very dark brownish purple. Ridge minutely hairy, dark deep yellow with small black dots, surrounded by narrow blackish rim on sides and top. Inner perianth segments (standards) erect, lanceolate, 45 mm long and 5-9 mm wide, outside deep lilac purple becoming darker at midrib, with blackish purple haft, inside of same colour. Style branches something cuneate, up to 42 mm long and 10 mm wide, upper side deep lilac purple, with very dark midrib, inside slightly lighter with narrower darker midrib. Style lobes triangular with straight inner side and rounded outer side, 11 mm long and 5 mm wide, very dark lilac purple. Stigma bilobed, at base dirty lilac, upper half whitish pale lilac. Filaments up to 15 mm long, whitish, densely spotted purple, anthers up to 12 mm long, upside lilac edged dark purple, pollen dirty whitish. Seedpods up to 50 mm long with 25-30 mm long beak; seeds yellowish buff, up to 4 mm in diameter, with large (up to 2-2.5 mm) light greenish caruncle and distinct but small, slightly crinkled raphe.

Etymology: named after Marivan, a city in Iranian Kurdistan, not far from where this iris was observed.

Although most of the observed plants (several hundreds) at *locus classicus* were very uniform with very dark purple flowers, there were few individuals with something lighter and more bluish in colour shade. Judging only by published pictures (Firat, 2017) it is quite similar to so named *Iris zagrica* subsp. *hakkariensis*. Long distance between the two localities allows a doubt to their identity and the political situation in region makes additional researches quite difficult or even impossible.

Fig.85 above left: *Iris marivanica* seed capsules with prominent beak.
Fig.86 above right: *Iris marivanica* seeds and seedpods.

Fig.87 above left: *Iris marivanica* 17IRS-054 at locus classicus.
Fig.88 above right: *Iris marivanica* in cultivation.

Fig.89: *Iris zetterlundii* flower details.

Iris zetterlundii Rukšāns ***species nova***

Type: Iraq, Kurdistan, Goras Mnt., Rawanduz to Kahlan, 36.42 N, 44. 27 E, alt. 1400 m., leg. Henrik Zetterlund, EGO.IQ-129. Holotype GB (Gothenburg) from plants cultivated by Jānis Rukšāns, collected on 27-03-2018.

Habitat and distribution: At present known only from *locus classicus* in Iraq Kurdistan, on Goras Mtn. along road from Rawanduz to Kahlan, where it bloomed in March.

Description: Plant 9-11 cm tall at anthesis (leaves), flower 9-10.5 cm tall. Bulb ovoid, up to 2 cm long and up to 14 mm wide, tunics longitudinally fibrous, old tunics reticulated.

Stem inconspicuous, unbranched with one terminal flower, usually hidden among leaves and something elongating at fruiting. At base two semi-transparent 1-3.5 cm long cataphylls, each leaf enwrapped into 2-3 transparent sheaths, flower stem into two sheaths, transparent at base and green at top. Leaves two, dark green, 4-5 mm wide at anthesis, quadrangular in cross-section, glabrous. Pedicel 2.5 cm long, rising ovary just above ground and merging with it. Bract narrowly cylindrical, up to 11 mm wide, rigid, green, at very top white, reaching base of flower. Bracteole narrowly cylindrical, partly enclosed within bract, in upper part free, light green with white tip. Flower tube up to 3 mm long, separating from beak of the ovary after anthesis. Outer perianth segments up to 40 mm long and 11 mm wide in the widest part of haft, tapering to 3 mm at base. Outside of haft yellowish green with wide white edge, striped dirty purplish. Inside (upside) with yellowish green, spotted and shortly striped dark with wide whitish, striped purple edges, glabrous. Lamina 10 mm wide and long, merge with haft without obvious sinus, outside dirty green, upside very dark, even blackish purple. Ridge yellow with small black spots and narrow whitish, black spotted edge, densely covered with very small hairs. Inner perianth segments up to 40 mm long and 8 mm wide, at base narrowing to 1 mm, parallely edged and only at top rounded with shortly acuminated tip. Outside at very top light blue, gradually turning in direction to base blue and even deep lilac in lowest half, inside similarly coloured only deeper purple and with black dots at base. Style branches 35 mm long and10 mm wide, on both sides along the mid-vein deep blue with white to whitish edges of same width. Style lobes widely triangular, 4 mm wide and 6 mm long (distinctly wider than in typical *I. zagrica* from *locus classicus*), blue with darker blue stripes. Stigmatic lobes blue, angular with slightly bent, narrow, slightly dented white edge. Filaments up to 14 mm long, glabrous, white, densely spotted purple, anthers up to 10 mm long, light blue with dark blue edges, pollen white. Easily separable from its allies by colour, dimensions of flower parts and their shape.

Etymology: named after Henrik Zetterlund (Gothenburg Botanic Garden, Sweden) who collected plants used for the description of this species.

Fig. 90: *Iris zetterlundii* EGO.IQ-129 from Iraq.

For easier distinction of species from sect. *Zagricae*, some key features are shown in the following table:

	Iris zagrica	*Iris avromanica*	*Iris marivanica*	*Iris zetterlundii*
Inner perianth segments (standards) length x width colour	45 x 2-3 mm (creamy) white to very light bluish	37-47 x 6-8 mm light blue to blue rarely whitish blue	45 x 5-9 mm deep purple to bluish purple	40 x 6-8 mm light blue with dark midrib and base
Outer perianth segments lamina (fall) haft	8 x 11 mm 30 x 5 mm	12-14 x 10-12 mm 27-47 x 10-12 mm	13 x 13 mm 32 x 13 mm	10 x 10 mm 30 x 11 mm
Style branches	40 x 6 mm white with blue midrib	35-40 x 11 mm white, light blue around darker blue midrib	42 x 10 mm deep lilac purple, rarely dark bluish purple	35 x 10 mm deep blue edged white
Style lobes	narrowly triangular, 11 x 3 mm, distinctly recurved	half-moon shaped 9-12 x 3-4 mm up-turned to slightly recurved	triangular 10 x 4 mm, up-turned to slightly recurved	widely triangular 6 x 4 mm, up-turned, rarely slightly recurved
Stigmatic lobes	blue, edged white	white, striped light blue	dirty lilac edged white	blue edged white
Filaments	15 mm long, whitish, densely spotted purple	12 mm long, white or very light blue, sparsely spotted blue along midrib.	15 mm long, whitish, densely spotted purple	14 mm long, white densely spotted blue
Anthers	10 mm long, light blue edged dark blue	10 mm long, light blue edged dark blue	12 mm long lilac edged dark purple	10 mm long, light blue edged dark blue
Leaves	bluish (glaucous) green, 2-3 mm wide	dark green, 5 mm wide	dark green, 5 mm wide	dark green, 4-5 mm wide

Tab.1: Table comparing *Iris* species*, zagrica, avromanica, marivanica* and *zetterlundii.*

The main feature allowing the separation of all three newly described species from *Iris zagrica,* apart from the flower colour, is the much larger dimensions of flower parts, especially the standards and leaves, which are at least twice as wide as in *I. zagrica*. The easiest way to differentiate between new species is by flower colour, which is very different in each of them. In case of doubt, the shape of the style lobes and other less prominent features or their combination can help. The region still is very little researched and it cannot be excluded that several new species could be found and described in future.

Acknowledgments
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Fig. 91: *Iris zetterlundii* EGO.IQ-129 from Iran.

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Fig. 92: The author, Janis Rukšāns, left, with Richard Bloom, who was visiting Latvia to photograph Janis" plants for The Plantsman (RHS) and The Alpine Gardener (AGS) publications.

***Galanthus woronowii* 'Ernie Cavallo' - described by Patricia Becker**

Galanthus woronowii 'Ernie Cavallo' is a virescent snowdrop which I discovered in 2018 at my New Jersey, USA property. As an American snowdrop collector I have planted species and cultivar snowdrops around the converted stone barn, built in 1848, once a granary now my home. I was delighted to find and am pleased to introduce this stable *woronowii*, found flowering in thin soil on rocky limestone scree above a ditch that runs along the drive. It has bulked up, producing two identical flowers this year. The flowers show a lovely green colour wash on the outers. The inner segments have a broad, green molar-shaped mark at the apex which fades toward the ovary. A distinct white margin borders each of these inners. The flowers are held on sturdy scapes above strongly supervolute leaves. I have named this special snowdrop, with his permission, for American Galanthophile, Ernie Cavallo, a mentor and friend, now an Immortal.

Above: *Galanthus woronowii* 'Ernie Cavallo' Below: The Becker Barn in New Jersey and left, part of the rock garden. Photos provided by Patricia Becker.

Galanthus woronowii ‘Ernie Cavallo’ –above: floral segments, below: foliage.

DESCRIPTION

Flowering height 12cm.
Leaves at flowering time 19x60mm, strongly supervolute with third leaf present.
Scape sturdy, upright ± 4mm thick.
Ovary green, ovoid (7x5mm).
Flower length including ovary 35mm.
Outer perianth segments exhibit a green colour wash.
Inner perianth segments have a broad, green molar-shaped mark at the apex, which fades toward the ovary. A distinct white margin borders each inner segment.

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Galanthus woronowii ‘Ernie Cavallo’

The peaceful surroundings of the Becker Garden.

Charity registered in Scotland SC000942 ISSN 2053-7557

Ernie Cavallo

Three new *Galanthus nivalis* forms described from Poland: Krzysztof Ciesielski

***Galanthus nivalis* 'Forest Muse'**

Galanthus nivalis „Forest Muse" was discovered in 2017 growing in a small population at the edge of a shrubby oak forest, close to a small village a dozen kilometres away from Zielona Góra in Poland. The plant grows and increases very well. It catches the eye even while it is still young and in a small group, because it is not completely white. At the beginning of flowering it hides its true beauty and might resemble an ugly duckling when compared to the purity of the other "white swans". But this is no bird, it is a more mysterious creature, that loves to dance in the wind during warm, sunny spring days, and when it matures, spreading its petals… all is revealed – its bold yellow markings, which were hidden under the outer segments. Unfortunately, the place where it was collected is often disturbed by wild boars, which are attracted by organic waste left

at the edge of the forest and many plants are damaged each year. Luckily, „Forest Muse" survived the brutality of Mother Nature. I gently took it into my hands and brought it home to safety. In future I hope it will have the chance to dance in the wind in your gardens, to bring you all a lot of joy.

„Forest Muse" - floral segments.

DESCRIPTION

Flowering height 170 - 210mm. Two leaves - linear, narrowly lanceolate, greyish-green and erect. Leaves at flowering 130-140mm and 7-8mm wide. Scapes upright. Ovary cylindrical, length:width approximately 6:4mm.
Flower shape when opened – conical, when closed - fusiform. Flower length including ovary 30-34mm. Pedicel 80-90% the length of the straight spathe (39-44mm). All three outer petals are fusiform, navicular, 23-26mm long and 6-7mm wide, lightly yellowish. The colour contrast to a regular white is clearly visible when the flowers are still in bud and is also noticeable from a distance. The inner petals are heart shaped, rounded on the apex, with a narrow sinus 1-2mm deep. The inner petal mark is a broad yellow inverted U. The mark bleeds out with yellow stripes all the way up to the base of the inner petal. The mark may be greenish at the beginning of flowering, quickly turning yellow in the following days and becoming pure yellow after several days of being opened. The colour features of the outer petals and the inner marking are stable. Even in the first year after replanting the yellow colour will be present.

Galanthus nivalis „Forest Muse" shown with a white *nivalis* flower, to show the contrast in colour.

***Galanthus nivalis* 'Trust'**

Galanthus nivalis „Trust"

Galanthus nivalis „Trust" is the embodiment of one of the most pleasant memories I have. It was found in 2014 near Wrocław. It was my last find during my very first "treasure hunt" for snowdrops, and that was an unforgettable experience. I was ready to leave, when the setting sun shone on its shiny, green leaves. That feature alone was something I had never seen before that time. The plant was already withering, but it was clear that the apical mark was more yellow in comparison to the surrounding plants, which were at the same stage of growth. I took it home, not hoping for too much. When it flowered for the first time in my garden, not only the shiny leaves were notable, but also the double coloured markings on the inner segments were a striking characteristic. In 2016, two plants flowered in yet another place with the same kind of markings. I waited till 2018, hoping that the characteristic would come true and remain stable. Now I know, it does not matter if you replant it or let it settle in the same place, the characteristic marking remains stable. The plant is tolerant, strong and resistant to diseases, but also a very slow grower. In the five years since its discovery, there are just a few flowering plants of it in cultivation. It should better be called „Shy", because it does not clump easily, but yellow-green is the colour of "trust", hence the name. Still, it is worth waiting to have a chance to admire it, trust me.

Galanthus nivalis „Trust" – floral segments.

DESCRIPTION

Flowering height 115-120mm. Two leaves - linear, narrowly lanceolate, bright-green, at the beginning erect, later on they grow more parallel to the ground. Leaves at flowering 115-120mm and 7-8mm wide. Scapes upright. Ovary cylindrical, length:width approximately 6:4mm. Flower shape when opened – conical, when closed - fusiform. Flower length including ovary approximately 35mm. Pedicel 80-115% the length of the straight spathe (35-40mm). All three outer petals are fusiform, navicular, 35-37mm long and 5-7mm wide, pure white. The inner segments oviform length:width 13:6mm, with usually equilateral sinus app. 2mm deep. The inner petal mark is clearly yellow on the both sides of the sinus,

further up turning green, starting at the level of the bottom of the sinus, going around 1,5mm down as an irregular thin reversed “V” line. Yellow colouring touches the edges of the inner segment and vanishes at about half the depth of the sinus, the green colouring does not touch the margin of the sinus. The amount of green seen on the front side of the inner segments may slightly vary from year to year, but will always be present and will start at the same level. On the underside of the inner segments, green striation is present on yellow background, which covers whole sinus margin. Green colouring usually does not touch the apical edge of the segment or the sinus, but remains constantly saturated to the base.

Galanthus nivalis „Wim Boens"

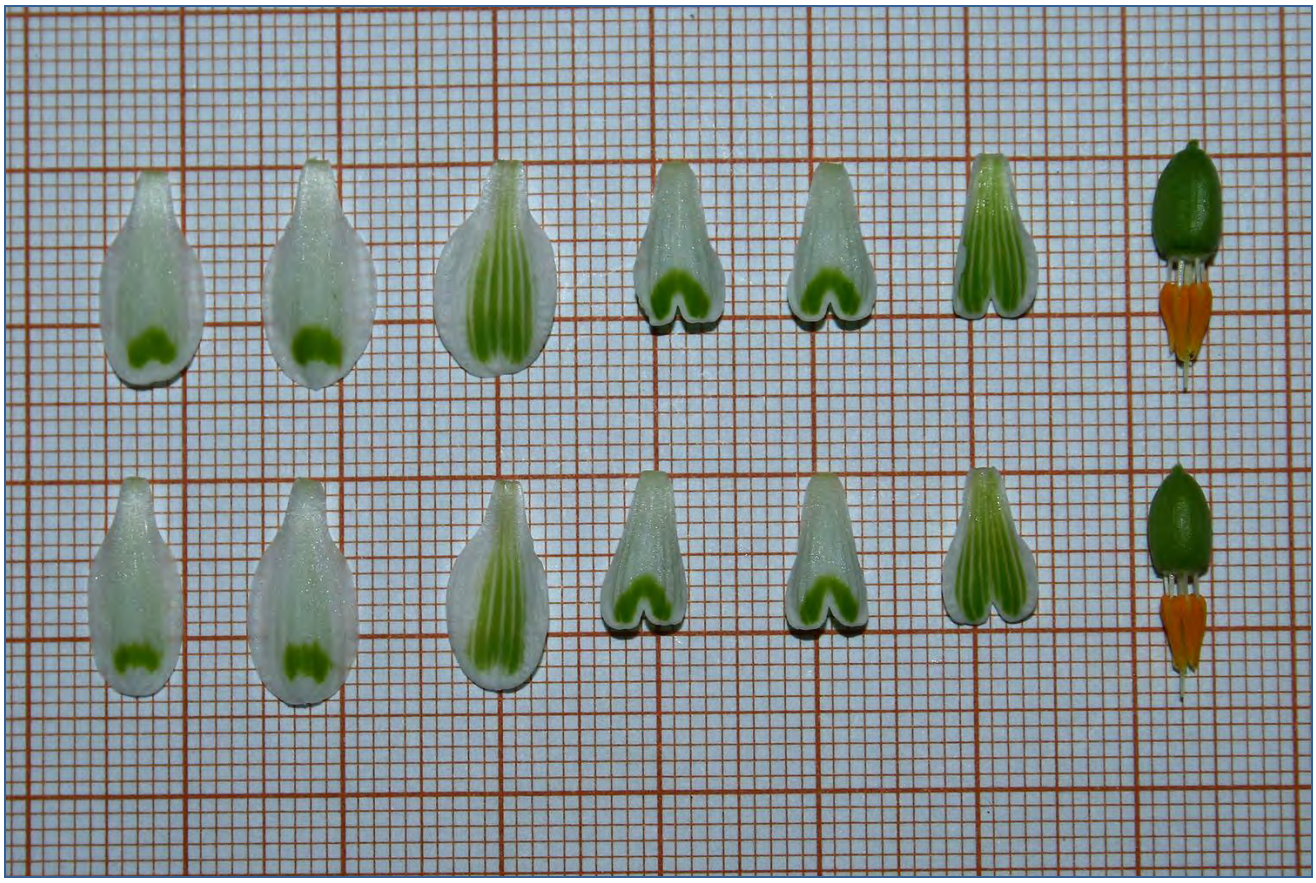
***Galanthus nivalis* ‘Wim Boens’**

After receiving his agreement, I am honoured to present to you all – *Galanthus nivalis* „Wim Boens". This tiny, inverse poculiform (called by some a pterugiform) was found in 2017 near Opole and it still is the smallest and shortest form of that type in my garden. At the end of the flowering it can be up to 9 cm tall, but that is not its average height, which is around 5-6 cm. In comparison to other forms it is a true dwarf. It grows and multiplies very well and I never had any problems with it in my garden. I discovered it together with my wife and at the same time, we found a whole subpopulation of inverse poculiform snowdrops concentrated in an area of about one hundred square metres. During the following two years, the area with the largest concentration of these forms was damaged by wild animals and reduced to less than half in 2018 and less than one third in 2019. This year, my wife and I visited the place quite early and we had the chance to plant back most of the clumps lying on the ground, although many of them already bore signs of fungal infection. Happily, this tiny plant was saved from that sad fate. A very good friend of mine – Wim Boens – fell in love with this plant. To those who might not know Wim, he is a kind, generous, helpful and positive person, a great friend and

a talented grower. It brings me a lot of joy to name this beautiful little plant in his honour. This plant is my tribute to the kind of person Wim is. Thank you Wim! Let *Galanthus nivalis* „Wim Bœns" remind everyone of you forever.

DESCRIPTION

Flowering height at its beginning is 30-40mm, later it can reach up to 60-80(90) mm at its peak. Two leaves - linear, narrowly lanceolate, greyish-green and parallel to the ground. Leaves at flowering 45-60mm and 4,5-6mm wide. Scapes upright. Ovary cylindrical, length:width approximately 7:4,5mm Flower shape – conical. Flower length including ovary approximately 20mm. Pedicel 95-10% the length of the straight spathe (30mm). All three outer segments are spoon-shaped 13-14mm long and 7-9mm wide, with green apical mark shaped in a broad “U” line. The mark continues as green striations all the way to the base on the back of the outer segments The inner segments are heart shaped, rounded on the apex, l:w 10(11):5(6)mm, with usually equilateral sinus 1-2mm deep. The inner petal mark is a broad green inverted “U”. On the back of the inner segments, green striation is present, which covers the whole side, except a broad side margin.



Galanthus nivalis „Wim Boens" – floral segments.

Photos showing the diminutive stature of *Galanthus nivalis* „Wim Boens"

Ed.: Some of the terms used may be unfamiliar to those who are not versed in Galanthus terminology. "Poculiform" refers to a type of snowdrop flower where the inner parts have expanded to appear the same as the outers. There is another type of flower, where the outer segments are transformed to be similar to the inner parts – this is referred to as an "inverse poculiform"- a term established in the 2001 edition of the RHS Daffodil Snow drop and Tulip Yearbook – often shortened to "i-poc". Some years after the publication of "inverse poculiform" a new term was coined which some prefer to use - this is "pterugiform" from the supposed resemblance of these i-poc flowers to the "pteruges" of Roman military uniform.