

SIGNA



Iris boissieri

Number 68

Spring 2002

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From the President

That author could be you

Who do you think writes all the articles you enjoy reading in our SIGNA Bulletin? People just like you write most of the articles. They are Iris enthusiasts and not professional writers. This bulletin is written by Iris People for Iris People. And they come from all walks of life. What our authors have in common is a love of the species and a willingness to share what they have learned or discovered with others. That willingness to share is what makes such a wonderful organization.

While we are grateful for those who have contributed so much to the bulletin throughout the years, (and we hope will continue to send us their material) we would like to hear from more of you. You do not have to write a major article to be a contributor. How about starting with something short and easy? Anyone can write a letter to the editor or ask a question that would lead to either learning more about a particular plant, or would spark an answer that would be of interest to many people. There are no stupid questions. How about sending in a tip or shortcut you have developed in your garden. In your own area you can at least grow some of the species that we know of, and you could share your experience in growing, or trouble you are having with that particular plant.

For those of you who are up to writing a longer article, you might be wondering what topic might have the best chance of being accepted for publication. First, I would like to emphasize that SIGNA covers topics on all types of species Iris and most of the Species crosses (known as Spec. X). We will consider almost any topic dealing with Iris and the ways we enjoy this hobby.

Just because you have never seen an article in SIGNA on the subject you have in mind, don't assume we would not be interested. There is an old axiom in publishing that says, "You get what you publish." What this means is, aspiring authors look at the types of articles a publication has printed in the past and will make the assumption that this is all they are interested in receiving. That is not necessarily so.

At this time in our organization we are especially interested in articles that demonstrate ways to enjoy these special plants and ways to grow them better in many different and maybe difficult circumstances or areas. Many of our members tell us they have less time to spend in the garden than they would like due to other obligations both at work and at home.

We are interested in all types of articles that would make it easier for us to grow a particular type of plant, or would make it quicker and/or easier to bloom or germinate. We would like to learn about techniques, different mediums, creative solutions, and advice for beginners and humor. Yes Humor. This is for most of us a hobby and it should be above all fun.

Okay so you don't like to write, you can still help us in other ways. You can be our eyes and ears in your local area. If you see someone who is doing something of interest, encourage him or her to send in an article. If you know of a student doing research or defending his or her degree on a subject that deals with Iris, encourage them to let us publish it. Maybe you just have an idea of something you would like to see in SIGNA. Send that idea to our editor or to me and I will try to find someone who can write that article.

Your officers, directors and chairmen are all here to help promote this great organization, but we need to know about you the members and what you would like to see. We need to hear from you about what you are doing. There is so much to be shared by all.

Will



I. boissieri

Photos
By
Tim Loe

Lírio-Do-Gerês - In Search Of *Iris Boissieri*

By Tim Loe

INTRODUCTION

Irises are beautiful and beguiling; and when these qualities are sharpened by mystery, as in the case of *Iris boissieri*, an irrevocable urge develops to investigate the matter further.

Iris boissieri is a very distinctive and rare member of the Iris subgenus Xiphium, known from only one small mountain range. The Serra do Gerês in Northern Portugal on the border with Spain (now part of the Peneda-Gerês National Park). This is where the mystery comes in; why should such a spectacular European species be so poorly understood?

Once I had stumbled upon Colingwood Ingram's account of finding this species 80 years ago or so (reproduced in the Autumn 2000 edition of the British Iris Society Species Group Bulletin), the matter was settled; I must sooner or later, (and preferably sooner) travel to North Portugal to find and study *Iris boissieri*. The idea was discussed with my wife Kate, and though it would be difficult with our 13-month-old daughter Imogen, we agreed that an expedition to find *I. boissieri* could be the basis of a summer holiday. I applied to the Alpine Garden Society (AGS) for a travel award and to my great surprise an award was granted which enabled the expedition to go ahead.

PENEDA-GERÊS NATIONAL PARK

The U-shaped park wraps around part of Portugal's northern border with Spain. It consists of two granite mountain ranges – the Serra da Peneda in the north and the Serra do Gerês in the south. It is the latter, that we are interested in, as it is here in the River Homem Valley, on the Border with Spain, that *Iris boissieri* grows.

The scenery of the park is spectacular. The valley bottoms have been dammed to form reservoirs with the mountains rising steeply from these gorges. The lower slopes are largely forested which gives way to scrub as altitude is gained. The upper reaches are characterised by colossal walls of jagged and uncompromising granite; huge glacial boulders are strewn over the landscape. The whole is undoubtedly dramatic, but when alone in this wilderness, surrounded by low cloud I found it quite threatening.

From Caldas de Gerês (the main town within the park) the road north toward the Spanish border has seventeen hairpin bends and rises to Leonte, the watershed between the Gerês and Homem rivers. A mile or so before reaching the Spanish border at Portelo de Homem you come to a bridge over the raging River Homem - Ponte de S. Miguel. This is a spectacular gorge with waterfalls and has been adopted as a "beauty spot". To the east is a rough, rocky track, impassable to vehicles that leads up to a disused wolfram (tungsten) mine called Carris, at the top of the Serra. This track follows the River Homem and it is in this valley that *I. boissieri* can be found.

FINDING IRIS BOISSIERI

We were full of excitement and expectation when we arrived at the bridge for the first time and saw with our own eyes the track that lead up to where we hoped to find *I. boissieri*. We set off up the track, at about 10 am. Kate had Imogen and I had a heavy rucksack, filled with equipment to cover every eventuality. On this first morning the cloud was low and visibility was only 100 metres (330 feet) or so; we were soon sodden. The base of the track was hard and rocky, with a loose covering of stones. The effect was like walking on marbles, and so we progressed slowly, looking at our feet.

We knew from various correspondents that the Iris was beyond the tree line and probably not lower than 800 metres (2600 feet), so we trudged on through the mist for about two hours before stopping, but still no sign of *Iris*

boissieri. We had walked about 7Km (4.4 miles) and climbed about 200 metres (650 feet) and were now above the tree-line. We picnicked near a 75° degree wall of granite, down which rivulets of frothy water fell. It is difficult to describe quite how angular and uncompromising this landscape is, it is neither gentle on the eye or on the body. Add to this a layer of impenetrable shrubs and exploring off the path and general access is impossible. As we ate our sandwiches the cloud began to lift and quickly a huge landscape appeared with jagged peaks rising above us. The effect was startling – we had no idea of the grandeur of the deep valley we were travelling through.

We continued marching upward and after half an hour still no sign of the Iris. We had long since ascended above the tree-line and had now reached about 1000 metres (3300 feet) – the iris should be here. Concern set in and conversation dried up. I looked and looked again and shouted “BOISSIERI”. Kate came running up, but it was stunted euphoria: it was clearly *I. boissieri* but the flower was over. It was a single plant growing from a crack no more than 3mm (0.12 in.) wide in a granite sheet at the edge of the path. It was extraordinary that a plant could grow in such a minute pocket of soil. We checked our GPS (Global positioning system) and noted that we were at about 1075 metres (3500 feet) and hoped that at higher elevations we could find plants still in flower. We continued upward with renewed energy, though Imogen clearly didn’t share our enthusiasm.

After a further twenty minutes we spotted another Iris - but this time in flower! At last we had found the treasured object of our quest and with a feeling of elation mixed with relief, we marvelled at its beauty. The flower is a rich blue-purple, with standards standing proudly upright and a strong but narrow yellow signal on the bluer falls. It is large in relation to the delicate stem and fine leaves. But despite this mismatch of proportion it has an elegance and a poise that suggests refinement and distinction. I was immediately struck by the prominence of its beard of yellow hairs, having expected a much more Spartan affair. At least, to me, at that moment, they were the cat’s whiskers!

We looked around and found further plants: in all about 25 growing in pockets of soil in the fissures of north-facing granite sheets inclined at an angle of about 70°. Many of the plants were inaccessible, though a couple of plants with fresh flowers were growing in a shady “ditch” at the base of the rock and at the side of the path.

Having found this colony and satisfied ourselves that the flowers would be good for a few more days we decided to ascend further with a view to discovering further colonies. We continued to about 1400 metres (4600 feet), but on this occasion we neither made the summit, nor discovered further colonies. We knew that it was about 15 kilometres (9.3 miles) and three and a half hours back to the car so began our descent, in the knowledge and satisfaction that we had found *Iris boissieri* and would be back tomorrow.

IRIS BOISSIERI

Following the discovery of the first station, further stations were discovered on subsequent days. *I. boissieri* is very slight and of little substance and therefore, when not in flower, it is extremely difficult to find. It is a case of “getting your eye in” and then scouring the surrounding vegetation through binoculars. In this way other stations were discovered. It is in no way common. Whilst we looked for this Iris more generally within the Park, we found it only in the Upper Homem Valley, though it does grow elsewhere as explained in the section below, entitled “Status”. The Homem River flows down this valley over waterfalls and through rapids and in flatter sections quiet pools are created between the rounded glacial rocks. The valley, leads to a highland plateau at around 1400 metres (4600 feet) where long-horned cattle graze. The track continues onwards to the old wolfram mine at Carris, at the top of the mountain (1500metres) (5000 feet), now an abandoned village complete with mine buildings. Carris is about 18 km (11 miles) from the road, all uphill, on marbles. This walk is not for the feint-hearted, or at least not for the sensible.

Stations

The iris was found growing in 7 different stations within the Homem Valley, ranging from 909 metres (3000 feet) to 1,300 metres (4300 feet) altitude. Stations at these two extremes were approximately 7 kilometres (4.4 miles) apart, but all stations were within a few hundred metres of the River Homem. Perhaps the Upper Homem Valley should be seen as one large station; all the plants within the Valley are closely interrelated and certainly should be viewed as a single population.

With the exception of one station all were to the south side of the river. This is notable only in that the path runs along the south side and therefore these stations (plants) were more obvious. I am sure that I only scratched the surface and clearly there are other stations within this huge valley landscape. Had I visited two weeks earlier when still in flower and therefore conspicuous, no doubt more would have been discovered. I cannot emphasize enough, quite how impenetrable this landscape is, making comprehensive investigation impossible. Wherever this iris occurs it always grows singly and is then usually scattered about within a defined area.

Altitudinal Range

The altitude range of this species within the Homem Valley is between 900 and 1300 metres (3000 and 4300 feet) with most plants favouring the range 1000 – 1200m (3300. – 4000 feet). The Peneda-Gerês National Park Botanists¹, whom I visited in Braga confirmed this. Thorough searches were carried out at higher altitudes and revealed no plants and I am fairly confident that the upper range of this species in the Homem Valley is about 1300m (4300 feet).

Temperature

An estimation of temperature for the upper areas (by DAVEAU e col.1985) suggests that for 40 days a year the minimum air temperature will drop below 0°C (32°F). The park botanists suggested that during January and February the average minimum temperature at the growing range for *Iris boissieri* would be in the region of -1°C (30°F) with the temperature occasionally falling to -5°C (22°F) and that the maximum summer temperature would be about +30°C (86°F). Whilst snow is not rare in the upper areas, it is insignificant in terms of annual precipitation. *I. boissieri* is therefore not subjected to very low temperatures. (Species such as *Linaria triornithophora* that are known to be tender were growing within the altitudinal range of *I. boissieri* that suggests that it never gets "really cold" here.)

Precipitation

The position of the Serra do Gerês range in the Portuguese north-west means that it benefits from the wet Atlantic air masses and also from a marginal Mediterranean climate resulting in very high rainfall. Mean annual precipitation in the higher areas can reach 3500mm (138 in.)! (It is likely to be lower than this for *I. boissieri*'s altitudinal range but clearly will still be very high.) Most of the precipitation falls in winter, autumn and spring – as rain. There is little summer rainfall with frequent dry and warm intervals.²

Habitat And Associated Species

Iris boissieri was always found growing in amongst granite rocks. Often these were steeply inclined with the Iris perched on ledges and growing from fissures in these rocks. In a couple of places it was found growing in shady areas (almost dank) with mosses and grasses, but these areas were elevated and free draining. The general vegetation was dominated by blankets of the ubiquitous *Chamaespartium tridentatum*, other leguminous shrubs, *Erica* and members of the *Cistaceae*. On no occasion did I see *I. boissieri* growing up through these species. Where the ground had been cleared in the not too distant past, presumably by fire, *I. boissieri* was growing alongside these species. It clearly cannot withstand any significant competition from other vegetation and

¹ Georgina F. Borges de Macedo and M. Helena L. Almeida Tiago of Parque Nacional Da Peneda-Gerês, Quinta das Parretas 4700 Braga, Portugal. Tel 053 6003480.

² Information on Precipitation and Thermal conditions from:- Gonçalo Teles Viera, Centro de Estudos Geograficos, Faculdade de Letras, Alameda da Universidade, 1699 Lisboa Codes, Portugal.

consequently always exploits small pockets of soil amongst the rock. Inevitably it was growing with other species that could exploit the small pockets of soil in the rock. These included, *Fritillaria lusitanica* (pyreniaca?) *Tulipa sylvestris*, *Dactylorhiza maculata*, *Narcissus bulbocodium*, *Asphodelus lusitanica*, *Simethis planifolia*, *Polygala microphylla*, *Ranunculus* sp. (abnormis?) *Eryngium duriaei*, *Erica umbellata*, *festuca* sp. and other grass species.

Soil

The soil in which it was growing was dark, almost black. It was a mixture of fibrous peaty organic matter and granitic grit varying in size from 20mm (0.8 in.) down to coarse sand. The soil was strongly acidic, pH 3.72 – 5.13 and indicative according to the University of Plymouth of moorland type soil.

Aspect

This was quite surprising as plants were found on south, north and east facing slopes. Some were in full sun on south facing slopes, whilst others were in comparatively shady locations at the foot of north facing rocks, though it would be fair to say that most were growing in fairly sunny positions.

Morphology

I. boissieri is a bulbous plant of slender and slight stature with proportionally very large flowers. All plants inspected only had a single flower and are therefore less vigorous smaller plants. It should be assumed that two flowered specimens are likely to be larger and therefore may exceed the dimensions given.

- **Bulb:** As I was not granted permission to excavate a plant I was unable to inspect this feature.
- **Leaves:** 1–2 basal leaves, 1-3 stem leaves, 1-2 stem bracts (with the upper leaves/lower bracts there is no obvious distinction between a leaf and a bract and probably it is easier to treat them all as sheathing stem leaves). The leaves are linear and tightly involute (rolled inwards towards the upper side) thereby rendering them almost filiform. The upper surface is silky with a semi-transparent membranous covering - similar to the fine inner skin of an onion. This is characteristic of subgenus *Xiphium*. The underside is dark green with parallel lines (ribs). They are 2 - 4mm (0.08 - .16 in.) wide and when “unfurled” and flattened, are 4 – 10mm (0.16 - 0.4 in.) wide. The leaves are between 270 and 570mm (10.6 and 22.4 in.) long.
- **Stem:** Fine and delicate, only a few millimetres in diameter. Including the perianth tube, between 270 and 450mm (10.6 and 17.7 in.) high, average about 350mm (13.8in.). It does have a tendency to be flexuous. The basal sheath surrounding the stem is not obviously evident above ground level and stupidly, I did not examine this feature.
- **Spathe Valves:** These are a fine green colour at anthesis, are slightly keeled and inflated; acuminate. The inner valve, 60 – 72mm (2.4 – 2.8 in.) long, is always longer than, or at least equal to, the outer valve, 56 – 68mm (2.2 – 2.7 in.).
- **Pedicel:** It was not possible to measure the pedicel without removing the spathe valves so only one recording was taken – 12mm (0.5 in.) long.
- **Ovary:** As with the Pedicel, it was not possible to measure the ovary without removing the spathe valves so only one measurement was taken - 20mm (0.8 in.) long and trigonal. The combined length of the pedicel, ovary and perianth tube varied between 55 and 71mm (2.2 and 2.9 in.).
- **Perianth Tube:** Slender, 25 - 32 mm (1.0 – 1.3 in.) long, upper section green, becoming paler in the lower section beneath the spathe valves. Most of the tube is concealed by the valves with only the top 3 - 8mm (0.12 – 0.3 in.) visible between and above the valves. Dykes in his monograph “the Genus *Iris*”,

1912, gives figures of $1\frac{1}{2}$ - 2 inches (37 - 50mm). These measurements are interesting as they are significantly greater than mine. Whilst two-flowered plants may have larger flowers, it would still seem unlikely that the perianth tubes of the plants in the Upper Homem Valley population would ever reach 2 inches - 50mm. Dykes was meticulous and therefore it is unlikely that he would have got his measurements wrong. No doubt there is a rationale explanation for this discrepancy, but what it is remains unresolved.

- **Falls:** 35 - 50mm (1.4 - 2.0 in.) long, maximum blade width 14 - 24mm (0.55 - 0.94 in.). The blade is obovate narrowing to the wedge-shaped haft that is u-shaped in section, and 9 - 13mm (0.35 - 0.5 in.) wide. The whole approximates to a spatulate shape where the blade accounts for a little over half the overall length. The blade is inclined downwards at an angle of between 45° and 90° to the near horizontal fall. The colour is a beautiful rich blue-purple (RHS 88A) much bluer than the standards, with striking, darker blue veins (RHS 89A) spreading out from the axis. Running along the axis of the haft and on to the fall is a narrow, bright yellow signal (RHS 15B) 25 - 28 mm (1.0 - 1.1 in.) long. On this signal is a beard of bright yellow hairs, perhaps a little more orange than the signal. The beard always finishes 1 - 3mm (0.04 - 0.12 in.) before the end of the signal on the blade.
- **Beard:** This is the distinguishing feature of this iris and deserves special mention. I was surprised at the prominence of the beard having read that it was a sparse affair, but then perhaps I am easily pleased! It is difficult to define the hairs, other than to say that they are "fleshy" and not like the hairs of a bearded iris. They show well in the photographs - when greatly magnified the hairs on the haft appear to be almost glandular. The beard is between 23 and 25mm (0.9 and 1.0 in.) long and appears to be a few millimetres wide, but on close inspection through a x10 hand-lens, it would appear that all the hairs are fanning out from the same central line. I am sure that this beard may hold clues as to this plants ancestry and in turn help with the systematics of the subgenus *Xiphium*.
- **Standards:** Erect, though falling back as the flower ages. There was a surprising variety in shape, some being squat (19 x 41mm) (0.75 x 1.6 in.) and others, tall and elegant (13 x 38mm) (0.5 x 1.5 in.). Though all approximate to a more or less oblanceolate shape with a short, channelled haft and a fairly pointed apex. Length 31 - 45mm (1.2 - 1.8 in.) , width 12 - 19mm (0.5 - 0.75 in.). The colour (86A) is noticeably less blue and more purple than the falls.
- **Style Arms:** These are a sumptuous red-purple (RHS 89A) similar to the standards but richer, diffusing into a much darker line running along the keel (RHS 83A but darker). They are held tightly over the falls and have a curved keel.
- **Style Crests:** 10 - 15mm (0.4 - 0.6 in.) long, slightly darker than the style arms (RHS 83A). Divided into two diverging lobes, each fairly pointed, roughly triangular with the outside edge irregularly and only slightly dentate. 10 - 15mm (0.4 - 0.6 in.) long sharply reflexed and rounded.
- **Stigmatic Lip:** 6 - 7mm (0.24 - 0.28 in.) wide, 1.5 - 3mm (0.06 - 0.12 in.) deep. White, perhaps very pale blue. Strongly bilobed, often with the apex of each triangular lobe, finishing in a distinct tooth.
- **Filaments:** Purple, 9 - 12mm (0.35 - 0.5 in.) long.
- **Anthers:** 12 - 17mm (0.5 - 0.67 in.) long, always longer than the filaments. Cream colour (RHS 12C), pollen yellow (RHS 14B).
- **Capsule:** Trigonal, narrow with a groove down each side. My measurements relate to capsules still green and probably before fully enlarged. 24 - 56 mm (0.94 - 2.2 in.) long, average about 40mm (1.6 in.). The main capsule of the Herbarium Specimen of the Parque Nacional da Peneda-Gerês in Braga measured 65mm (2.6 in.) and the secondary capsule 42mm (1.65 in.). Colour of the mature capsule is a pale but warm terracotta.

- **Seeds:** Shape varied, spherical, pyriform or "half moon". Small for Iris seed; longer dimension 1.5 – 3.5mm (0.06 – 0.14 in.), shorter dimension 1 - 2mm (0.04 – 0.08 in.).
- **Nectary:** This appears as a white tooth between the fall and the standard at the point where they join the perianth tube. It varies in prominence from plant to plant, but remains a strong feature. It would be interesting to compare it with the nectaries of the other species within the sub-genus *Xiphium*.

Physiology

Without being able to observe this plant throughout a complete growing cycle it is not possible to comment accurately on all aspects of its physiology, to be able to grow it would of course help with this. Some observations and conjectural thoughts are offered below.

Altitudinal Range

The altitudinal range of this species appears to be well defined, but what determines it is not - there appears to be no single overriding factor governing its altitudinal range. At higher and lower elevations, there were many rocky habitats, very similar to those in which it was growing, where it could establish a niche. Lack of suitable habitat would therefore not appear to be a factor defining its altitudinal range.

Temperature and exposure are more likely to be factors. Dykes maintained that this species was not hardy (in the British Isles). Certainly, it is of a slight constitution and would not survive the exposure of the upper levels well. Also, it may require certain warm temperatures and dry summers to ripen its bulbs to ensure regular flowering and seed production. As described below, this species is entirely reliant on seed for its reproduction and survival, there being no evidence of vegetative reproduction. Conversely its physiology may require certain cold temperatures to ensure dormancy and flowering and perhaps seed germination.

It is unlikely that rainfall is a factor determining either its upper or lower range as the whole area is generally very wet.

Perhaps the predation of plant collectors has taken its toll on more accessible populations lower down.

Of all the plants inspected, all had set seed with the exception of the three plants in the lowest station. This may suggest a specialist pollinator that only lives in a narrow altitudinal range, but I suspect that this was just coincidental. The plant is obviously very fertile and Dykes in "The Genus Iris" makes the point that it readily sets seed in cultivation.

Clearly, *I. boissieri* would appear to be a niche species with very specific requirements. It may be for this reason that it has never become established in cultivation, but ironically it would help to determine these reasons if the plant could be cultivated.

Aspect

Aspect did not seem to be an important factor in the growth of this plant. I found plants on north, south and east facing slopes and slopes between. Most were in sunny exposed positions but some were in shady locations, where there would only be a few hours of direct sunlight each day.

Flowering Period

This will obviously vary from year to year. During the expedition the last flower finished around the 27th of June. The last plants to flower were those in shady north-facing aspects at higher altitudes. I suspect that plants growing in sunny locations at lower altitudes had come into flower 3 - 4 weeks earlier, the complete flowering period therefore spanning no more than 4 weeks. Interestingly, herbarium material from Madrid Botanic Gardens was collected on the 28th May 1952, 28th May 1984, 30th May 1982 and 11th July 1958, which coincide pretty well with my own findings. Each flower lasted about 5 days, but this was dependent on exposure.

Vegetative/Sexual Reproduction

I found no evidence of any vegetative reproduction – there was no “clumping” with all plants growing singly. Clearly, therefore the species is dependent on seed for its survival, endorsed by the fact that, of all the plants inspected 98% had set seed successfully. The previous year’s capsules still in tact yielded between 40 and 80 seeds, averaging at least 60 seeds. The seed production of the Homem Valley, assuming a thousand flowering plants would yield an annual harvest of about 60,000 seeds.

An interesting phenomenon: plants were never growing in tight groups. This is surprising, as one would assume that the majority of seed would fall around the parent plant. Does this suggest that there is some dispersal mechanism not immediately obvious, or that the plant is short-lived? Topics, I think for future study.

One or Two Flowers per Stem

Within the specialist “Iris literature” there has been an amount of speculation about the status of the second flower and whether in fact this species is in the evolutionary throws of losing this second flower. When Nigel Service visited the Homem Valley about 15 years ago, he observed in some specimens “... *an additional, inner valve to the spathe, sometimes enclosing a minute aborted flower*”³. I did not observe this phenomenon, but like him I was reluctant to pull too many plants apart.

All the herbarium specimens at Kew only have one flower, but there are two sheets at the British Museum with two-flowered plants, collected in 1890 and 1936⁴. Also the herbarium sheet of the Parque Nacional da Peneda Gerês in Braga showed a two-flowered specimen. This specimen in Braga was bigger in all its parts than any of the specimens I had observed in the field and clearly more vigorous. The park botanists, explained that this was a seasonal phenomenon. If plants were growing vigorously they would produce two flowers.

Certainly, of all the plants inspected, not one had a second flower, but I did find an old stem from the previous year that clearly had two capsules. I think therefore, it is safe to conclude that this species is not in the process of losing its second flower but it is just a simple case of seasonal influence.

Distribution And Conservation Status

The distribution of *I. boissieri* within the Upper Homem Valley is well documented above and as stated those stations found are likely to only be the “tip of the iceberg”. I think it would be safe to assume that at least 1,000 adult plants grow here and probably significantly more.

³ Service, Nigel. British Irish Society Year Book 1988.

⁴ Information from Nigel Service.

It was heartening to hear from Georgina F. Borges de Macedo and M. Helena L. Almeida Tiago, that they knew of at least 5 locations within the park other than the Homem Valley, where this species grows. They were also able to report that *Iris boissieri* was increasing its range. This, they attributed to fires deliberately started by shepherds, to burn-off the scrub. However it did not appear that there was any deliberate management within the Park aimed specifically at protecting and enhancing the *Iris boissieri* population.

Perhaps some of the most exciting information on *I. boissieri* to come to light, was on the tags of the herbarium material at Madrid Botanic Garden kindly supplied by Pablo Vargas. This includes a specimen of *Iris boissieri* collected in the Sierra de Ancares in Northern Spain. The Sierra de Ancares is about 160km (100 miles) to the northeast of the Serra do Gerês, and therefore if correct, throws new light on the distribution of this species as "conventional wisdom" states that the species is endemic to the latter.

If there are populations disjunctive from the Serra do Gerês, would it suggest that the species has not evolved in the latter region, but that both are relic populations of a pre-ice age species? What were the implications of the last ice age on this species, or has it evolved since? There is a whole field of study here, and one for another day.

For further information please contact Tim Loe.

Iris barbatula

Jean Witt

Iris barbatula of Subgenus *Nepalensis* was described by H. Noltie and Y. K. Guan from northwest Yunnan, China, and is illustrated in color in the BIS Yearbook for 1997. About three years ago I was given a plant by a friend who subscribes to seed collecting expeditions. It has now bloomed twice, and the clump has doubled in size every year.

The flowers, about 1-1 2 inches across, are supported on perianth tubes to a height of about 4 inches. The narrow petals are medium blue-violet, marked in white, with a linear "mini" beard of mm-high orange hairs--barely more than bumps. They are cute little fellows, but alas they are fugacious (fleeting). On a warm day they are wilted by eleven am; on a cloudy day they last till four pm. Additional flushes of bloom follow the first set at intervals of a day or so. Fat, pointed pods form at the ground line. The leaves are narrow, with prominent ribs, and extend to about ten inches as the season advances. I haven't looked at the roots, but the British Iris Society's [A Guide to Species Irises](#) describes them as "a cluster of swollen roots, giving rise to a clump of fans; old fibrous leaf bases persist"--below ground, obviously; there is no sign of them on the surface.

The foliage disappears completely in the fall, its reappearance in spring is so delayed that every year I'm certain the plant has been winter killed. In 2001 the leaves finally emerged on the 12th of May. A month later the flowers were out. By September the leaves were browning, but every flower had set a pod, even the ones I had not hand pollinated. Spring must heat up more suddenly in Yunnan than in Seattle!

I. barbatula is attractive, but I can't see it as ever being anything but a collector's item. I am left wondering, what is the advantage to a plant in being fugacious? So far it appears hardy, but we haven't really had a winter to test it.

I. barbatula

Photo by Jean Witt



Photo by Kim Blaxland

<i>Iris tenuis</i> S. Wats.—A New Perspective

*I. tenuis* Habitat—Photo by Carla Lankow*I. tenuis* —Photo by Carla Lankow*I. gracilipes* —Photo by Carla Lankow*I. odaesanensis*— Photo by Jan Sacks

Iris tenuis S. Wats. - A New Perspective

(including a summary of the latest DNA results, especially in relation to the *Lophiris* and *Chinenses* irises)

by Tony Hall

In May 2001, *Iris tenuis* was exhibited at the Chelsea Flower Show and earned the Royal Botanic Gardens Kew's Alpine Unit a Cultural Commendation.

Received as seed from the Janet Starnes Nursery, Oregon in 1987, this rarely cultivated endemic of N. Oregon was grown, initially, in Kew's Woodland Garden (near Cumberland Gate). There it flourished for a few years before succumbing to a particularly cold wet winter. However, one potted seedling was retained in the Alpine Yard and grown on, in a cool shady frame, where it remains to this day. *I. tenuis* is grown in a lean, slightly acid mix, top-dressed annually, fed a little liquid low N high K whilst in leaf and repotted only every three or four years. It now fills a 30cm diameter pan and seems to enjoy being congested. The species has a reputation for being temperamental, if not slightly tender, but has been cultivated successfully in peat banks in a Scottish garden, so perhaps the answer is simply that *I. tenuis* resents poor drainage, especially during its deciduous winter phase, which would partly explain why it responds so well to being pot-bound.

Iris tenuis was described in 1882 from material collected by L. F. Henderson the year before. This was discovered in Eagle Creek, a branch of Clackamas River, not far from Mount Hood in the Cascade Range. Henderson's specimens were said to have originated from Washington County but apparently the precise locality is not indicated on the herbarium sheets and -since then-, the species has been found only in Clackamas County, on Clackamas River and its tributary Eagle Creek. In the wild it prefers cool shady spots, either in moist soil, often amongst dense undergrowth on the canyon floor, or beneath Douglas firs on hillsides, where it can form extensive colonies in leaf litter and decaying moss.

Initially *I. tenuis* was placed in the *Californicae*, primarily because of its distribution. Morphologically and cytologically it is quite unlike any Pacific Coast Iris. The more recent trend - since Dr. Lee Lenz's 1959 study - has been to include it in the *evansias* and certainly its general vegetative characteristics are reminiscent of *Iris cristata*. However, its flower has a poorly defined and undissected crest rather like that of *Iris speculatrix* and *Iris gracilipes*. The two latter species, on present anatomical and molecular data, appear to be quite unrelated to others in the *Lophiris* group and - in my opinion - all three species are best considered primitive members of section *Linniris* and should be included (if only for convenience); in series *Chinenses*.

Section *Lophiris*, in a more narrow concept, consists of two groups that form quite obvious natural entities (i.e. the so-called "bamboo" irises of E. Asia and the New World *Iris cristata* and *I. lacustris*) as well as those other not so closely related species, *I. milesii* and *I. tectorum*, that happen to share some anatomical and morphological features. *Iris proantha* (syn. *I. pseudorossii*) has not been studied so I cannot comment on its inclusion in the *Lophiris*. All are part of a larger, seemingly disparate assemblage of species that forms one of the two major branches in *Iris* evolution - plants with a well defined crest, cockscomb or beard, a distinct dormant period (for most species), deciduous leaves and, generally, extensive root systems. This assemblage includes the genera *Belamcanda* and *Pardanthopsis* (considered by many to be ancestral to genus *Iris*), *Iris verna* (which has a microscopic beard but has always been placed - and on present evidence, mistakenly - in the apogons) and the three subgenera *Nepalensis*, *iris* and *Scorpiris*. Molecular data and leaf anatomy strongly support this large grouping.

The second main division in *Iris* development includes all the remaining series of section *Linniris* (except for the *Unguiculares*, which appear to be basal to the whole genus and are quite distinct in flower morphology and leaf anatomy) and the subgenera *Xiphium* and *Hermodyctyloides*. The genus *Hermodyctylus* is undoubtedly a member of the *reticulatas*, despite its unique rootstock and unilocular ovary, whilst *Iris kolpakowskiana* and *I. winkleri* (for which Rodionenko created the genus *Alatavia* in 1987) should be recognized as a divergent branch of the *xiphiums*. The problematic series *Chinenses* is counterpart to the *Lophiris* and that group's relationship to the prominently crested/bearded irises. Species of the *Chinenses* appear to be - in evolutionary terms - the surviving ancestors of subsidiary branches within section *Linniris* and represent another mishmash of not particularly

closely related species (apart from *I. koreana*, *minutoaurea*, *odaesanensis* and probably *rossii*) but with some morphological characters in common, as well as their distribution. All the *Chinenses* are from E. Asia, apart from *I. tenuis*. This ancient isolated New World species has been repeatedly linked to series *Longipetalae* in DNA results and may prove to be ancestral to that group, although there is no strong support for this theory as yet. Lenz drew attention to the similarities between *Iris tenuis* and that other troublesome and equally isolated species *I. gracilipes*. More molecular work needs to be done on the *Chinenses* but not all are in cultivation. *Iris speculatrix*, on the other hand, is clearly basal so to a mostly xerophytic assemblage of species that includes the *Tenuifoliae*, *Spuriae* (within which group *I. foetidissima* - in its own series mostly on account of its distinctive fruits - and *I. graminea* are close allies), the *Syriacae* and those two other bulbous subgenera *Hermodactyloides* and *Xiphium*. The morphological, molecular and anatomical support for this grouping is overwhelming. *Iris anguifuga*, for which section *Ophioiris* was created, is - in reality - a member of series *Tenuifoliae*.

A combination of new techniques - including work at the molecular level- may help one to formulate a more natural classification based upon relationships but "unfortunately, evolution cannot be easily constrained within the rigid boxes of traditional taxonomy" (Ray Harley, 2001). In genus *Iris*, nowhere is this more apparent than with the *Lophiris* and *Chinenses*. Meanwhile, *Iris tenuis*, *I. speculatrix* and *I. gracilipes* are best treated as members of the rather disparate series *Chinenses*.

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Iris Notes

by Jean Witt

The following information comes from F. R. Cowell, The Garden as a Fine Art Houghton Mifflin Co., Boston 1978.

Page 76. Using early Arabic manuscripts, "James Dickie in 1968 compiled a list of 52 common flowers mentioned by Arabs up to the 11th Century," which included blue iris.

Pages 78-79. Abbott Walahfrid Strabo (German c 809-849) from the Benedictine monastery of Reichenau "notes the beauty of his purple flowered iris" in his poem Hortulus, in which he writes about "the little garden" he had made there.

Pages 150-151. Around 1467 a Dominican friar, Francesco Colonna.....in his Hypneroto-machia "gave minute descriptions of the flowers and the design of a garden" which included irises.

Membership News

By Rodney Barton

General Membership directory

Gary Meli, of Woodside NY has suggested that the membership directory would be a good tool for communicating our various interests. If you would like your listing in the directory to include your interests please drop me a note or e-mail. Use the abbreviations from the seed list, and please hold it to less than 6 different classes or simply put "all" (I'm N, O and Z for water irises (Laevigatae), Louisiana (Hexagonae) and other irids.)

Printed directories are available for \$4 to US addresses and \$6 to overseas addresses. Electronic versions are free if sent e-mail. Let me know if you do not want to be listed in directory.

E-mail directory/ SIGNA news "announcement" group

We've topped 200 members with e-mail and I am no longer routinely mailing out the e-mail directory. I will e-mail copies on request. However, to make it easy to keep the directory updated and to distribute in a timely manner, I have formed a "group" on Yahoo. If you join the group, you can easily download the e-mail directory from the "files" area for SIGNA_news on Yahoo. The group can also be used to make general announcements, but that use would be kept to a minimum. To join, send a blank e-mail to SIGNA_news-subscribe@yahoo.com and follow the directions in the automated reply from Yahoo. Those of you on Iris-talk or another Yahoo group will find it easy to join. The rest you will have to join Yahoo to access the group and that process is a bit more involved. You will be asked some personal questions. If that bothers you, answer only the required ones and give phony answers where you can. This is not meant to be a discussion group.

Stats: Total membership (2 02) 677

USA - 542 Overseas and Canada - 135

65 life members and 29 complimentary

We gained 58 new members in 2001, but 50 failed to renew.

General things: Please remember SIGNA when you have a change of postal or e-mail address. We "lose" several members each year.

Please watch your mailing labels for your renewal date. 2002-7 means you are up for renewal in July of 2002. Reminders will be sent but you can save SIGNA the cost of a postcard by renewing before that date. (Reminders cost us about \$100 per year.) Renewals are now \$9 for one year and 24 for 3 years. Life memberships are \$200.

International members may charge their renewal to MC or VISA. Just send me the card information and please limit the number of necessary transactions by renewing for 3 years.

Join the American Iris Society

Our parent organization is the **American Iris Society** (AIS). Single membership rates for AIS are \$20.00 USA/ \$25.00 Overseas (1 year) and \$43.00 USA/ \$54.00 Overseas (3 years). Dual memberships are \$25.00 USA/ \$28.00 Overseas (1 year) and \$54.00 USA/ \$65.00 Overseas (3 years). Your membership includes four informative bulletins per year. The other special interest sections of the AIS (like SIGNA) include Pacific Coast, Medians, Siberians, etc. and are also available at a nominal fee. Membership also allows you to participate in the annual popularity poll. Memberships may be paid by check, VISA or Mastercard to Anner Whitehead, AIS Membership Secretary, PO Box 14750, Richmond, VA 23221-4750. Overseas memberships include first class postage, and are payable in U.S. currency.

The Experts Column

(X = unknown quantity spurt = drip under pressure)

A year or so ago Bob Pries tried a question and answer column in SIGNA which met with mixed response. I decided to try it again, surely you do not know all there is to know about Irises do you? I know I certainly don't. Well here is the place to ask those questions. I will not be able to answer a lot of them but when I don't know the answer I will try very hard to find it for you. Send your questions to me by regular mail or email (see addresses below) and we will try to answer them.

Since I do not have a question to answer this time I am listing some simple definitions of terms that you will see on the pages of SIGNA. When I give talks on species iris I am often asked about some of these terms. I hope these definitions will help all of our SIGNA members understand what they are reading.

SIMPLE DEFINITIONS

TAXONOMY: The science of the classification of organisms. Linnaeus was the father of the binomial (two names) system we use for the naming of organisms. Each organism (in our case iris) is given two names. The first one is the genus and the second one the species. It is usually Latin and often descriptive such as *Iris cristata*, a crested iris. It may indicate where the plant originated as in *Iris cretensis* from Crete or it might be a Latinized name to honor someone such as *Iris forrestii* to honor the plant explorer George Forrest.

SPECIES: The definition of species is difficult because taxonomists don't always agree. All plants are continuously evolving and changing, some become extinct and some hybrids stabilize and breed true and in time are considered separate species. *I germanica* is one of these, it was probably originally a hybrid between two other species but it is stable and sets some seed. Most still considered it a hybrid while other experts consider it to be a species. (Gardeners definition) A species is a plant unaltered from the way it was growing in the wild, a wild iris.

GENUS: Plural: genera. A genus is the next higher division in botanical nomenclature from a species. A group of species with similar characteristics comprises a genus. Our interest lies in the *Genus Iris* which includes several further subdivisions (subgenus, section, subsection, series, subseries) which we will discuss at a later date. The *Genus Iris* consists of several hundred species all found naturally in the northern hemisphere.

FAMILY: A Family is a natural group of closely related genera. The next higher division above genus. The *Genus Iris* belongs to the family *Iridaceae* which contains about one hundred genera including such things as *Crocus*, *Gladiolus*, *Sisyrinchium*, *Schizostylis*, and the southern hemisphere counterparts of *Iris*, the genera *Moraea*, *Dietes* and *Cypella*.

HYBRID: Hybrids are crosses between two species, between two hybrids or between a hybrid and a species usually all in the same genus but rarely crosses between plants in different genera occur. In plants it usually refers to crosses between genetically different parents. Most hybrids are the result of mans deliberate crosses but hybrids also occur in the wild more commonly than was formerly realized. Most of our more common garden plants are hybrids. Being a hybrid between two genetically different clones often gives plants extra strength, this is known as "hybrid vigor". Hybrids are usually somewhat intermediate between their parents in their characteristics and if their parents are widely diverse they may be sterile.

CLONE: A clone is a plant raised from a single seed. To still be considered a single clone it must be propagated vegetatively (by division or tissue culture not seed). It may be divided thousands of times and be distributed all over the world but if done vegetatively the plants will all be identical genetically and still be the same clone.

Plants raised from seed of a clone will be different genetically from the parent clone and will each be different clones. The registered named iris we grow are each separate clones each raised from a single seed and then propagated vegetatively.

CHROMOSOME: The World of Irises defines chromosome as "The dark-staining body in the cell nucleus bearing genes in a linear order. The number of chromosomes is usually constant for the species or variety". Even the beginning gardener needs a rough understanding of this term. In most living things (plants, birds, bacteria, animals and even man) there are two sets of chromosomes in each cell. During reproduction the cells each divide and combine in such a manner that the offspring receive one set of chromosomes from each parent. The number of chromosomes in iris is important to the hybridizer as an indicator as to whether a cross between two species is possible or not. However there are many hybrids in which the chromosome counts of the parents are different, particularly in the bearded irises. In siberian irises we refer to chromosome counts regularly. No one has found good descriptive common names for the two types of siberian irises so we usually refer to them as the 40 chromosome siberians and the 28 chromosome siberians or often shorten this to the "40's" and the "28's". I once asked how chromosome counts were made and Jean Witt told me that you make a slide of plant tissue, often using the fast growing root tips, by using a stain that will darken the chromosomes. Then you put the slide under a strong microscope and go 1,2,3,4.... Not as easy as it sounds when you are working on an iris that may have over two dozen chromosomes.

DIPLOID: A diploid is a plant having the usual two sets of chromosomes in each cell. Most wild plants are diploid.

TETRAPLOID: Now here is where those of you that skipped the last two definitions will find that maybe they do have some use to the average gardener. I am going to talk in terms of iris now because that is where our interest is. An iris that is tetraploid has double the number of chromosomes, that is four sets instead of two. Almost all of our modern bearded hybrids are tetraploid, only the MTB's are still largely diploid. Until the turn of the century hybridizers had worked with the European diploid bearded species then the tetraploid species from the middle east were discovered and an iris revolution took place. These middle eastern species were natural tetraploids. Within about 30 years the hybridizers had managed to transfer the wide range of colors from the diploids to the larger flowered tetraploids. Its a good thing they knew nothing about chromosome counts or many of their successful crosses would never have been attempted.

In the world of beardless irises we have few natural tetraploids. Dr. Currier McEwen has used the drug colchicine extensively to artificially induce tetraploidy in siberian and Japanese irises. Now many hybridizers are working with these irises. Dr. Tamberg in Germany has induced tetraploidy in many species. This enables him to experiment with wide crosses with iris species that would probably not cross as diploids. Why do we want tetraploid irises? As I said one reason is to be able to experiment with wider crosses. Also an iris that is tetraploid sometimes (as in siberian irises) has thicker wider heavier leaves, the flower parts are often thicker and larger and because the petals are thicker the color is often deeper and brighter. The plant is not usually much taller but is sometimes stiffer and wider. Some people feel these characteristics are superior but others feel tetraploid irises, such as the tetraploid siberians, lack grace. What ever your opinion on the subject it is important to know the differences between diploid irises and tetraploid irises.

Please send me a couple of good questions for the next issue!!

**Carla Lankow
11118 169th Ave. S.E.
Renton, WA 98059 USA
SIGNA@bigfoot.com**

SIGNA Source List For Species Irises

We have had many requests for a list of sources of Species Irises. The following list of Commercial Growers (in alphabetically order) offer in their catalog at least 10 species iris, either bearded or beardless. We know this is by no means a complete list, only a beginning from what we had knowledge of or could find listed elsewhere. If you are a nursery that offers at least ten species irises and would like to be included in this listing in the future please send your name and address and the necessary information about your garden to me, Carla Lankow, at signa@bigfoot.com or to my USPS address as listed on the inside front cover.

SIGNA Seed Exchange- Every SIGNA member will receive in the mail (in December 2002 and every December thereafter as long as membership is maintained) a listing of available seeds together with an order form for ordering **bearded and beardless species and other irids.**

Aitken's Salmon Creek Garden (Terry & Barbara Aitken), 608 NW 119th St., Vancouver, WA 98685, USA, phone (360) 573-4472, aitken@flowerfantasy.net, www.FlowerFantasy.net, Color Catalog \$3.00, **bearded and beardless species.**

Alan McMurtrie, 22 Calderon Cres., Toronto, Canada, M2R 2E5, phone (416) 221-4344 Please call after dark, alan.memurtrie@rogers.com, <http://www.Reticulatas.com> and <http://www.Irises.biz> Order from websites, **bearded, beardless and bulb iris species.**

Bearded Irises from Lynn & Peter Markham, 61 Upland Avenue, PO Box 154, Lunenburg, MA 01462, USA, phone (978) 582-0445, Free iris listing, **bearded (aphylla) species.**

Cape Iris Gardens (Dave Niswonger), 822 Rodney Vista Blvd., Cape Girardeau, MO 63701, USA, phone (573) 334-3383, capeiris@aol.com, Catalog \$1.00 refundable, **beardless species.**

Chuck Chapman Iris (Chuck Chapman), RR#1, 8790 Hwy 24, Guelph, Ont., Canada, N1H 6H7, phone (519) 856-4424, Catalog \$2.00 refundable, **bearded and beardless species.**

Clarks Gardens (Jimmie Clark), RR Box 3245, Edwards, MO 65326, USA, phone (573) 347-4103, Price List \$1.00, **beardless species.**

Collector's Nursery (Bill Janssen/Diana Reeck) 16804 NE 102nd Ave., Battle Ground, WA 98604, USA, phone (360) 574-3832, dianar@collectorsnursery.com <http://www.collectorsnursery.com>, **beardless species**

Ensata Gardens (Bob Bauer & John Coble), 9823 E. Michigan Ave., Galesburg MI 49053-9756, USA, phone (616) 665-7500, ensata@aol.com, www.ensata.com, Free Color Catalog, **beardless species**

Foxbrook Iris Farm (Andrew Wheeler), 90 Call Road Colrain, MA 01340 USA foxbrook@rcn.com, Free iris list, **beardless species**

Garden Vision (Darrell Probst), 63 Williamsville Road, Hubbardston, MA 01452-1315 USA darrellpro@earthlink.net, Free iris list, **beardless species**

Héronswood Nursery (Dan Hinkley) 7530 NE 288th St., Kingston, WA 98346, USA, phone (360-297-4172, <heronswood@silverlink.net>, <www.héronswood.com>, Catalog \$5.00, **beardless species**.

Iris City Gardens (Macey and Greg McCullough), 7675 Younger Creek Road, Primm Springs, TN 38476, USA, phone (615) 799-2179 or (800) 934-IRIS, <icity@msn.com>, <www.iriscitygardens.com>, Free Catalog, **beardless species**.

Iris Colorado (Lowell Baumunk), 10918 N. Sunshine Drive, Littleton, CO 80125, USA, phone (303) 791-0456, <LBAumunk@aol.com>, <http://www.members.tripod.com/irisColorado>, Free Catalog, **bearded species**.

The Iris Gallery (Jay and Terri Hudson), 33450 Little Valley Road, Fort Bragg, CA 95437, USA, phone (707) 964-3907 or (800) 757-IRIS, <irishud@mcn.org>, Catalog \$2.00, **beardless species**.

Isle of View Iris Garden (Lynn & Barry Finkel), 21015 NE 220th Circle, Battle Ground, WA 98604, USA, phone (877) 290-3302 or (360) 687-5597, <lynn@isleofviewirisdgarden.com>, <http://www.isleofviewirisdgarden.com/>, Free Catalog, **beardless species**.

J. & V. Craig Iris (Jim and Vicki Craig), 16325 SW 113 Ave., Tigard, OR 97224, USA, (fax) (503) 684-4819, <craigiris@ipns.com>, First Class Stamp for Price List, **bearded species**.

Joe Pye Weed's Garden (Jan Sacks & Marty Schaefer), 337 Acton Street, Carlisle, MA 01741, USA, phone (978) 371-0173, <jpwflowers@aol.com>, <www.geocities.com/jpwflowers/> Catalog \$2.00 refundable, **beardless species**.

Munchkin Nursery & Gardens, LLC (Gene E. Bush), 323 Woodside Dr. NW, Depauw, IN 47115-9039, USA, phone (812) 633-4858 <www.munchkinnursery.com>, <genebush@munchkinnursery.com>, Catalog \$3, **bearded and beardless species**.

Nicholls Gardens (Diana Nicholls), 4724 Angus Drive, Gainesville, VA 20155-1217, USA, phone (703) 754-9623, <NichollsGardens@juno.com>, <www.Nichollsgardens.com>, Catalog \$2.00, **beardless species**

Ohio Gardens (W. Terry Varner), 148 Alta Street Marietta, OH 45750-2607. USA, phone (740) 374-8612, <tvarner@ee.net>, Catalog- First Class Stamp, **bearded species**.

Pacific Rim Native Plant Nursery (Paige Woodward), 44305 Old Orchard Road, Chilliwack, BC, V2R 1A9, CANADA, phone (604) 792-9279, <paige@hillkeep.ca>, <www.hillkeep.ca>, order off website, **bearded, beardless and bulbous**

WE-DU Nurseries (Dennis P. Niemeyer and Joani Lawarre), 2055 Polly Spout Rd., Marion, NC 28752, USA, phone (828) 738-8300, <weddu@wnelick.com>, <www.we-du.com>, Catalog \$3.00, **beardless species**.

Wildwood Gardens (Will Plotner) PO Box 250, Molalla, OR 97038-0250, USA, phone (503) 829-3102, <gardens@molalla.net>, Colored Catalog \$3.00, **beardless species**.



Iris germanica 'Alba'
Photos by Nigel Service



Iris germanica 'Carrulea'
Photos by Nigel Service



Iris germanica 'Seattle'
Photos by Nigel Service

44-Chromosome Forms of *Iris Germanica*

By Nigel Service

Introduction

Poor old *I. germanica* does not get a good press; derided for being of hybrid origin, with the wrong number of chromosomes, largely sterile, not a true species. Reproached as unworthy to be the type of the genus it represents. I felt it was time to put in a good word for it, to expound a bit on its virtues and its complexities. What follows is the result of long study with hundreds of specimens involved and much ground covered. The study is not finished and continues, but it will probably never be complete.

The situation

In the south of Europe these flags are so common as a wayside and wasteland plant that probably not even the average iris enthusiast gives more than a passing salute of appreciation at their fine show and their tenacity. He and she do not pause to look. They miss a lot. For some reason I have paused to look and have been studying these flags for some time. I hope, over the next few issues of SIGNA to describe, and discuss where appropriate, a number of them and to look at matters connected with them. I will look at them a few at a time, some widespread, some uncommon or even, seemingly, unique.

W.R. Dykes noted certain distinctions besides the flowers of some of those he mentioned, for instance, Sivas, '...weak, yellow green, narrow leaves...'. Fontarabie 'This is rather a dwarf form....', but not much, the differences are much more profound. The spathes enclosing the flowers and the bracts subtending the branches have to be looked at separately. Flowering season, flower size, luxuriance of beard, length of stem, number of branches, distribution of blooms, size and shape of leaves, all these vary.

Some terms used

First a bit of terminology. We will have to distinguish between the patterning on that part of the haft of the fall which is hidden until you pull up the style-arm and that part which appears on the base of the blade around the beard. For this latter part I shall use a term quite common in the older literature concerning hybrids and which breeders struggled to eliminate: striations and striation ground for what lies behind.

For reasons which will become clearer later, I am going to call the various sorts, which you might regard as clones, vegetatively increasing, 'Groups'.

The degree to which these plants die down in winter varies from group to group. I use a rough, rule of thumb evergreenness scale from 1 (wholly herbaceous) to 15 (fully evergreen), categorizing each year and getting an average over the years.

Bracts run from short and open to long and leaf-like; a convenient way had to be found to describe them:

Bract-like -- inner surface unfused all the way,

± bract -- small length of apex joined, bract shaped,

semi-foliate -- greater length of apex fused, shape more or less intermediate,

elongate-bract -- open bract, longer than usual,

foliate -- long with extended length of apex fused and leaf-like.

It is of course the nature of the flowers which define the groups, the characteristics follow the flower sorts.

The names, where not given elsewhere in the literature or where not certainly identifiable, are my own. If they seem at times unsuitable, even frivolous, then it has to be so, it is to do with where they were first seen and so on. Individual plants, of course, are identified by number, either by my collection number (N.S.--) or, if presented, a donation number (D.--). I shall mention these as little as possible.

Stem, branch & bract

To look in some detail at the typical development of stems might, I think, be an advantage. Typical for *I. germanica*, so that departures from this norm can be simply dealt-with. Developing stems feature initially a series of well filled bracts from which, as elongation proceeds, the branches and buds are produced. The longest stem of any plant of this species I have seen was 93cm (37in.) but this belonged to a specimen in a naturally long-stemmed group and a great deal of variation will be seen to exist.

As the stems vary so also do the leaves on the stems. Certain typical characteristics do seem to exist but conditions modify the situation. Where therefore, cauline leaves are mentioned under the flower groups, they are intended to be no more than typical.

Towards flowering, stem elongation can be very swift: in the twenty-four hours between 7:30 on the mornings of 16th & 17th of April, a stem on a plant we will call 'A' grew 14cm (5.5in.), on plant 'B' grew 6.5cm (2.6in.) and on plant 'C' grew 5.5cm (2.2in.). In the following 24 hours the same three stems grew 5cm (2.0in.), 4cm (1.6in.) and 5.5cm (2.2in.).

On the stem a varying number of branches are born. Each branch is subtended by a pair of bracts. The smaller, on the inner side, is of little substance, the larger will vary according to the place of the branch on the stem and, to a degree, the flower group. Up to four branches may be produced on some groups, on others rarely more than two. In addition the general length of those branches varies from group to group. 'General' has to be stressed for, as in all parts, there is great variability. Quite often, in probably all groups, particularly on ill-developed stems, the upper branch, and sometimes the second also, can exceed the apex of the stem in height. Sometimes it is clear that although no branch is present, a structure is by nature a bract rather than a stem leaf, the potential for increased branching can often be suspected. When a stem is, for instance, two-branched but is on a plant of a group that is often three-branched, the upper branch will nearly always be rather longer than normal. Further, if a stem bears less than its potential number of branches, the lower bract is likely to undergo some modification.

In general the bracts and bract-like structures will start to become scarious at the same time as the spathes, those foliate will stay green longest, often becoming scarious eventually in a crescent-shape, in from the margin. At an early stage the bracts tend to behave differently from group to group, some appearing from the leaves dark and the colour losing intensity somewhat, others appearing more or less green and increasing in strength as the stem elongates. Basically the green will be distinctly lighter than that of the stem, the shape more or less navicular and sharply keeled, except for that of the top branch and even that on occasion. All save the albino flowered groups, and some even of them, will be, to a greater or lesser extent stained with various shades of reddish-brown-purple. The nature of this pigmentation is characteristic within the groups; tending to be most intense towards the keel and margins and, in some, broken into uneven blotches. Intensity tends to fade as flowering approaches and scariousness increases.

The pigmentation of the spathes, also, is peculiar to the flower groups in intensity and in colour. The growth of scariousness is initially almost insensible, it just is there, increasingly, in the upper quarter of the valve, and spreading downwards. Starting usually some days before the opening of the first flower and in most cases being total, or near total by the time the last fades. Which valve will be more scarious at the start of flowering is certainly group-related. The valves are often separated by a few mm. In the flower group descriptions, unless it is mentioned, no more than this sort of distance is to be expected. But this is a feature which is to a large extent seasonally related.

The first flower, almost invariably, is from the apex and, where the spathes contain more than one bud, with very few exceptions this will be from the side away from the upper branch. Thus, following the pattern to be expected, it is not the actual apical flower which is first into bloom.

If the maximum number of branches is produced, it is improbable that the maximum number of flowers will be born at the apex. This means, in effect, that groups with two-flowered apices will be less likely to produce such on a three-branch inflorescence. Single flowered branches are normal and few groups breach this rule. The second

flower will generally be on the lowest branch except on single-branched stems where it is more usually the second apical flower, if one exists. The third flower is likely to be the second apical flower, or that on the middle branch in three-branch stems. The fourth flower, if not final, will be on the upper branch, or at the apex, depending on where the fifth flower will be located. No good reason to account for which it might be has been discovered as yet. It is more probable though that the final flower will be on the upper branch. Usually, on a single-branch stem with a two-flowered apex, the final flower is on the branch, but all groups can be occasional exceptions to this. With multiple flowered branches things can become further complicated and it seems unprofitable to try to pursue the matter. The first out of a pair of flowers on a branch will, of course, be that on the outer side.

The Groups

In considering the various sorts it was found that different parts of the plant were of particular significance, not so much as a result of studies concentrating on one aspect but from their being more varied, complex or important in that context. For although these categories have been based on the varying flowers, it is not *just* in these that they vary. So what follows cannot be called descriptions in the orthodox sense. I have attempted though to keep them in roughly the same form, with digressions here and there.

Alba

Leaves about 50cm (20in.) long x 3-3.5cm (1.2-1.4in.) wide, broadest about 2/3rds of the way up. The most evergreen group, average 14.253 on the scale of 15.

Stem averaging about 59cm (24in.), the longest measuring 76cm (30in.). Stems over 65cm (26in.) not uncommon. Usually with 5-7 basal leaves, all long, one low set stem leaf and another above, short and rather bract-like.

Sometimes 3-branched, usually 2. In a 3-branched specimen the lowest branch 13-19cm (5.1-7.5in.) long set at about 30cm (12in.), the middle branch 4-13cm (1.6-5.1in.) long, the upper sessile 5.5cm (2.2in.) long, rarely up to 9.0cm (3.5in.) long. In 2-branch stems the upper branch can reach 10cm (3.9in.) long and will sometimes exceed the stem as the highest point of the inflorescence.

The subtending bracts are bract-like to shortly foliate and green; measuring 6-10cm (2.4-3.9in.) on the lowest branch, and bract-like on the upper ones. The bracts, on first emerging from the leaves are green and quite unstained. Shortly before the whiteness of the bud becomes visible there is a distinct, large, pale flecking over the spathes and the upper bracts and some slight pigmentation towards the apex, and this persists until they become scarious.

The spathes remain green, often less than 1/3 scarious at the commencement of flowering. Outer valve 3.5cm-4.0cm (1.4-1.6in.) long, inner valve about 4.5cm (1.8in.) long.

2-flowered at the apex and sometimes on the lowest branch. Rarely both lower branches can be 2-flowered. Buds a slightly blued white. Flower white, not always clean, diameter 8.0-9.0cm (3.1-3.5in). Flower size large. Almost unscented. Pedicel very short, about 4mm (0.16in.).

Ovary about 1.8-2.2cm (0.7-0.9in) long x 0.9 cm (0.4in.) wide, roundedly octagonal 6-grooved, three being deeper.

Tube 2.6cm (1.0in.) long, light green with a slightly darker, whitened-green line below the standards, \pm running down onto the top of the ovary.

Falls white, often irregularly marked with a more or less faint purple and slightly yellowed around the beard, tending to be recurved and tucked in. Haft white, yellowed towards the edge, veined olive green; reverse base green. Striation ground white, striations green, not extending to the end of the beard. Beard white tipped yellow, becoming orange in haft. About 8.8-9.5cm (3.4-3.7in.) long x 5.3cm (2.1in.) wide.

Standards shorter and narrower than falls, although obovate, less distinctly so than some groups. White, sometimes also with some purple colouration. Haft yellowed with slightly purplish markings becoming green on base of blade. Very slightly bearded often, on at least one standard. 8.0-9.0cm (3.0-3.5in.) long x about 4.4cm (1.8in.) wide.

Style arms white, about 5.7cm (2.3in.) long overall with crest of 1.8cm (0.7in.), white, acute tipped, the lobes diverging only towards the apex. Filaments white, 1.9cm (0.8in.). Anthers pale cream, 1.7cm (0.7in.). Pollen cream.

Capsules trigonal with rounded, deeply grooved angles and somewhat concave sides, shallowly grooved, oval to obovate with obtuse ends, 4.5-5.0cm (1.9-2.0in.) long x 2.1-2.5cm (0.8-1.0in.) wide.

Seeds variable, elliptic to oval, acute at one or both ends, lightish brown, wrinkled, usually about 5.5-7.0mm (0.22-0.28in.) long x 3.5-5.0mm (0.14-0.2in.) wide.

Flowering season: late-mid.

Capsules are formed easily and seed is produced nearly every year, seeming to germinate easily.

Distribution

Alba is only found in a quite small region of southern France, the area around the lower part of the Rhone, mainly to the west of the river. It is very common in that area.

Discussion

Alba is unusual in being able to produce two flowers on the branches. I have one record of a stem with three branches, two-flowered on each and at the apex.

It is also exceptional among these forms in having its standards both shorter and narrower than its falls. The latter dimension seems especially curious.

Caerulea

Leaves about 50cm (20in.) long x 4.0-4.5cm (1.6-1.8in.) wide, becoming broadest rather under 2/3rd of the way up. Rather light green-yellow, red-edged on the overlap towards flowering and in some years dark-tipped. The degree of herbaceousness is distinctly variable from plant to plant and year to year, averaging between 7.285 (D.6) and 11.50 (N.S.186).

Stems averaging nearly 60cm (24in.) long with the longest recorded being 78.5cm (30.9in.) with up to four long basal leaves and one or two stem leaves, the lower long, the upper set high with node revealed and much stained.

Stems 2-, 3-, sometimes 4-branched usually with a foliate lower bract. The lowest branch, even on a 3-branch stem, is set high, often as much as 2/3rds of the stem. The middle branch is (often) contained within its (often) semi-foliate bract. The upper is short and always exceeded by its bract.

The bracts, on first becoming visible are dark purple-tinged towards the apex, the keels heavily pigmented. The lower bract is, at an early stage, heavily stained on its lower, inflated section and less so on the blade, this colour fading as the stem elongates. Heavy, dark blotches develop on bracts and spathes with the upper bract tending to become scarious early.

Spathe about 5.5cm (2.2in.) long, the inner valve more scarious. The outer valve 1/2-scarious by flowering, about 4.5cm (1.8in.) long.

2-flowered at apex, though often only 1. If 4-branched then only single flowered, 1-flowered on branches.

Flower blue-violet, diameter 6.0-7.0cm (2.4-2.8in.). Flower size small. Barely scented.

Pedicle short, 6.0-7.0mm (0.24-0.28in.).

Ovary to 1.9cm (0.75in.) long x 0.9cm (0.35in.) wide, roundedly triangular, 6-grooved.

Tube 2.8cm (1.1in.), green with dark purple and noticeably recessed lines below the standards.

Falls open closest to 86A/87A¹ and fade to 88A-B 90A. Haft ground white veined ochre. Reverse green mottled. Striation ground white, striations golden-yellow-brown with a grey tinge. Beard white tipped yellow 13A but becoming orange in haft, quite dense. 7.2cm (2.8 in.) long x 4.1cm (1.6 in.) wide.

Standards often distinctly asymmetric in the lower margins of the blade. Opening 92A but darker, fading to about 94C but bluer. Haft yellowy-white marked with brown. Occasionally bearing a few hairs. 7.2cm (2.8in.) long x 4.6cm (1.8in.) wide

Style arms pale pink-colourless with a blue keel, about 4.5cm (1.8in.) long overall with crest 1.3cm (0.5in.). Opens ± 91A and barely fades. Filaments palest blue, 1.7cm (0.7in.). Anther cream-white, 1.6cm (0.6in.). Pollen white..

Capsule rounded to roundedly triangular with 3 strong grooves at the angles and less defined grooves down the sides, obovate both ends obtuse, the apex more so. 4.5-6.2cm (1.8-2.4in.) long x 2.2-2.5cm (0.86-2.0in.) wide.

Seeds globular-short beaked to oval or roundedly pyriform, dark reddish-brown, wrinkled. 5.7-6.6mm (0.23-0.26in.) long x 3.3-4.8mm (0.13-0.19in.) wide. Flowering season is early. Fertility is not high, capsules occur only occasionally, three seedlings were raised (1989) one, of which died and one second generation seedling obtained (1992). Nothing since

Distribution

With the exception of one isolated collection from just over the river at Tarascon, *Caerulea* seems limited to the area to the west of the mouth of the Rhone where there is an extraordinary concentration of groups. Here, in this small area, it is probably the dominant blue, or violet flowered form. It will be seen that this is broadly the same area as that in which *Alba* occurs, *Caerulea* however extends further to the west, almost as far as Montpellier.

Discussion

The spelling of the name is uncertain, Randolph and Mitra (1959) spell it *Coerulea* and this was the spelling on the label in the Jardin des Plantes, Paris from which my first named plant came, allowing me to put a title to the group. This was the plant (Verriers No.511) used by Prof. Marc Simonet for his cytological work (1932) and he spelt it *Caerulea*. Here the group is spelt as Simonet did.

Up to four branches with a clear relationship between the maximum number of branches and the number of flowers at the apex that is not, I think, so obvious or so without exception in other groups.

Foliage

The foliage here demands attention as, for the first time we see variation within a group.

The results of the observations of evergreenness are bewildering and unsatisfactorily variable from year to year. The extreme difference between the readings for different plants (averaged over a number of years) does seem a clear indication of clonal differences within this group with identical flowers.

¹ Note: Where colour readings are given, they are made from the RHS-FCC Colour Chart.

Roughly the higher the number, the bluer (less purple). The higher the number, the paler.

In 1992, about ten days before flowering, it was observed that the leaves of this group were extraordinarily dark towards the tips, the extreme apexes were blackened with, again, a distinct degree of difference between plant and plant. But it was also found that the influence varied from fan to fan on the same plant and that the central, youngest leaf was not so pigmented. This was an isolated event and has not been expressed so strongly since.

Finally, in this first part of our survey, a unique, one example 'group'.

Seattle

Leaves 40cm (16in.) long x 3.5cm (1.4in.) wide, becoming broadest well over half-way up. Blue-green, glaucous, not pigmented at base. Moderately deciduous, 5.166 on the scale of 15. Stems about 34cm (13.4in.) long, with the longest recorded 39cm (15.3in.) long, with 3-4 basal leaves and one stem leaf.

1- or 2-branched, the upper about 4.0cm (1.6in.) long, the lower, from well above the mid-point, about 8.0cm (3.1in.) long.

The early bracts, on first becoming visible, lightly stained pinkish, particularly around the margins and with some darker flecks near the apex. Later sparsely marked with isolated light blotches.

Spathes pigmented and very membranous at apex, barely stained below but marked with a number of elongated blotches. Two weeks before flowering spathes already 1/3 scarious. Outer valve 4.5cm (1.8in.) long, inner valve 5.0cm (2.0in.) long.

Single flowered from apex and from each branch.

Flowers of flimsy substance, standards blue-violet, falls purple, diameter 10cm (4.0in.). Flower size small. Slightly scented. Pedicel 5mm.

Ovary 1.2cm (0.5in.) long x 0.5cm (0.2in.) wide, roundedly triangular, 6-grooved. Tube 3.1cm (1.2in.) long pale green, notably grooved below standards. Falls open 82A but darker with a line about 88A down the center and a narrow margin about 90C. Fades to 81A, central line \pm 88B, edged 90D. Haft whitish veined brownish-purple. Reverse green, lightly marked in center and with much darker marks towards edges. Striation ground white, whitish towards edges. Striations brownish violet, more violet towards blade and continued out well beyond tip of beard at edges. Beard yellow 15A, white at base, quite dense. 7.2cm (2.9in.) long x 3.3cm (1.3in.) wide.

Standards opening \pm 94C/91A, fading to 91B. Haft yellowish, white at base of blade, veined pale brownish-violet. 7.1 cm (2.8in.) long x 4.0cm (1.6in.) wide.

Style arms very pale blue, stronger towards the keel. 4.6cm (1.8in.) long overall with the crest 1.4-1.6cm (0.55-0.63in.) long, opening striped 92A and 84C/90D, fading to around 91A-B with darker veins.

Pod and seed not produced. Flowering late mid-season.

Comments

This was sent to me by Jerry J. Flintoff when he lived in the city after which it is named. I seem to remember, -it was as long ago as 1987-, that it was a local form which he gathered for me. The plant is not vigorous. Its dwarf stature makes it seem possible that it is a seedling -see later for more on this matter.

New SIGNA Checklists

By Bob Pries

The SIGNA checklists for species and cultivars are due to be reprinted very soon since they have been out of stock for some time. This will be a newly revised edition. The lists continue to evolve: Jean Witt is adding additional chromosome numbers to the species list and I have found more for the cultivar list. I find new information every-so-often, which goes into the checklist. Also, each year's registrations and introductions are added as the new R & I are available and, of course, corrections have been made as we have found them, and omissions included. Someday I hope this will reflect all of the collective knowledge of our membership. But that can not happen without your help. For a month or so after this issue of SIGNA I will continue to incorporate any information you send. Then we will go to press. As an added incentive, I am announcing the following contest. For the five members providing the most significant contributions to this edition I will send a Deluxe, personalized, numbered, limited-edition on better acid-free bright white paper, including some illustrations, a twenty-five dollar cost value (actually fifty dollar value if we were a profit making organization). Remember if you know of errors or of entries omitted send the necessary information on quickly because as part of SIGNA this reference represents all of our knowledge. Or as the saying goes "Speak now or forever hold your peace".

Our goal is to always have a checklist available but not to print so many that we must wait to get rid of old copies before we can issue an update in another 2-5 years. Therefore if you desire a new revised edition please reserve your copy with our publications chairman, Carla Lankow. The new edition will be both parts (Species - part 1 & Cultivars & Variations - Part 2) divided into sections under one cover and cost \$16.00 prior to publication in July (Orders Must be Postmarked before July 4th) or \$19.00 thereafter. Please send your request and money for a new revised edition of the SIGNA Checklist to Carla Lankow, 11118 169th Avenue SE, Renton, WA 98059-5964 and any new entries, revisions or corrections to Bob Pries, 6023 Antire Road, High Ridge, MO 63049-2133.

Editorial Skills Wanted

We are on a quest to find a new Editor of our SIGNA publication. If you have editorial skills, know something about Taxonomy, have publishing skills and can work with Microsoft Word or Publisher **we want you**. If this seems overwhelming, it really is not, what we most need is your skill in putting this together within the Microsoft format we use. We do have people who will help you with the taxonomy and the proofreading if you need it. If you also have writing skills and would like to contribute in that way articles, tips or other written material is always welcome. One more qualification for the editorship is that you must be on E-Mail and be able to be contacted quickly. Anyone interested please contact: President Will Plotner at his E-Mail address of gardens@molalla.net.

Iris Notes

from Jean Witt

National Geographic Magazine for August 2001, pages 22-23, in an article entitled "The Big Open" by John G. Mitchell about U.S. Bureau of Land Management lands, has a photograph of *I. missouriensis* on Medicine Lodge Creek in eastern Idaho, showing its typical habitat in lush creek-side meadows, surrounded by shrub steppe-covered hills

2001 Seed Exchange

By Jan Sacks and Marty Schafer

This year we had seeds in every category of the list - all the letters of the alphabet were represented - even L (Chinenses) and X (Nepalensis). Our 61 donors outdid themselves and we are very grateful. There were many hand-pollinated selections as well as wild collections (thank you, thank you!). For many of the most requested selections, we had ample seed. The bearded folks did an especially good job and the members were clearly grateful by the number of requests they made.

Here are the particulars for next year's seed exchange: **The deadline for mailing your 2002 seed to us is November 10.** If your seed will not be ripe by that date, please send a list of these late species. Send your seed or list to Jan Sacks and Marty Schafer at 337 Acton St., Carlisle, MA 01741-1432, USA (or use e-mail <jpwflowers@aol.com> for the lists). This deadline is necessary to get the Seedlist out before Christmas.

All seed should be clearly labeled. Anything hand pollinated should be marked **HP**. Anything collected should be marked **coll.** with the location of the collection. On all seed it is very helpful to have a short bit of extra information as to color, or any other specific characteristic of the parent. If you are at all unsure of the true identity of your iris let us know and we will include a question mark with the listing. It is always a good idea to look up a description of a species (Mathew, The Iris is a good reference) to confirm that your flower, plant and seed look like the description.

There were 14 items on the list this year with 40 requests or more. For some of these we were able to fill every request. For *I. koreana*, where we had 88 requests!!!, we were able to fill all but the last one. There were others where we fell far short - for *I. suaveolens* 'Rubromarginata' we had 54 requests and only 7 packets of seed to send.

- 01A001 attica HP -- cream x yellow from Harald Mathes, Gladbeck, Germany 150+ [42 requests]
- 01A020 suaveolens 'Rubromarginata' from Carla Lankow, Renton, WA 25+ [54 requests]
- 01J087 chrysographes 'Black Beauty' from Tim Loe, Cornwall, England. 300+ [40 requests]
- 01J094 Sino-siberian 'Anticipation Orange' from Lorena Reid, Springfield OR 400+ [40 requests]
- 01J117 Sino-siberian 'Mirza Citronella' R2-3 from Lorena Reid, Springfield OR 400+ [42 requests]
- 01L199 koreana ex. plants coll. S. Korea from Darrell Probst, Hubbardston MA 600+ [88 requests]
- 01L200 speculatrix from Harald Mathes, Gladbeck, Germany. 50+ [40 requests]
- 01O326 nelsonii HP from Rodney Barton, Hickory Creek TX 100+ [42 requests]
- 01R373 lactea selected for repeat from Marty Schafer and Jan Sacks, Carlisle, MA 300+ [44 requests]
- 01R389 verna alba from Marty Schafer and Jan Sacks, Carlisle, MA 100+ [40 requests]
- 01S397 japonica var. pallescens coll. China from Darrell Probst, Hubbardston MA 400+ [45 requests]
- 01S404 tectorum 'Taiwan' -- very dark form from Carla Lankow, Renton, WA 200+ [48 requests]
- 01S405 tectorum -- lots of red purple spots from Carla Lankow, Renton, WA 100+ [40 requests]
- 01X452 barbatula from Jean Witt, Seattle, WA 300+ [50 requests]

For Phase I of the 2001 Seedlist we filled 265 orders and took in \$3436.50 with expenses of \$886.08 for packaging and shipping and \$645 for the printing and mailing of the list. For Phase II, left over seed will be available at the SIGNA Section meeting at the AIS National Convention in Tennessee and then on-line through Rodney Barton, SIGNA's membership secretary. Last year we were able to make \$540.00 during Phase II. Special thanks go out to Rodney. Many of you sent additional donations of money which are greatly appreciated. All of the work on the seed exchange is done by volunteers. The Seed Exchange is an important fund-raiser for SIGNA and supports both seed collecting grants and research grants. People who are planning seed collecting trips where wild irises or irids are expected can apply to the SIGNA Seed Chairs for grants.



EYE SHADOW IRIS

Photos by
Hiroshi Shimizu

Left: Hagno

Right: Tsuki



Left: Kouryu

Right: Kinuma



Left: Shira

Right: Ryugan



Left: Shinr

Right: Ryujin



Eye Shadow Iris

Hiroshi Shimizu

Edited by Clarence Mahan

The range of colors of *Iris ensata* flowers is extensive: white and almost all shades of pink, blue, blue-violet and red-violet. Most of the colors provide a strong contrast to the yellow signal spot at the base of the styles. Yellow, however, is the one color that has eluded hybridizers. Many attempts have been made in the past to get yellow-brown into this iris by using *Iris pseudacorus*. Mr. Osugi bred the first of these hybrids, and the seedling first bloomed in 1977. It was named 'Aichi no Kagayaki.' It has elegant flowers that are a rather pale but clear yellow, with *I. ensata* shape and *I. pseudacorus* signal markings. It is, of course, sterile. Mr. Ueki bred the second hybrid in 1977, and he named it 'Kimboshi.' I decided to start interspecies hybridizing using *I. pseudacorus* and *I. ensata* in 1993. I will introduce you to my F1 hybrid plants and the mysterious pod parent 'Gubijin' in this article.

During the first stage from 1993 to 1995, I collected many strains of *Iris pseudacorus* seed from seed exchanges of the British Iris Society (BIS) and the Species Iris Group of North America (SIGNA). In the second stage, 1996 to 1998, I mixed pollen from several Japanese iris cultivars and put it on about 100 stigmas of the various *Iris pseudacorus* clones. The purpose of mixing pollen was to select clones of *I. pseudacorus* that showed the most extensive fertility with many Japanese iris cultivars. The results of these crosses prompted me to select a special *Iris pseudacorus* clone, which I named 'Gubijin.' 'Gubijin' was a tragic princess who died in B.C.E. 202 in China. It is said that a yellow flower bloomed on her grave.

About half of my F1 hybrid seedlings bloomed the next year after they germinated in pots in the spring. The leaves of these seedlings were almost green, showing little yellow, and the plants demonstrated hybrid vigor and rapidly increased in size and number. I noted two significant features of the seedlings from 'Gubijin.' First, some of the F1 seeds from 'Gubijin' germinated in their pods in autumn. Second, some of the 'Gubijin' seedlings, those resulting from pollen taken from white *I. ensata*, have white flowers with a yellow signal. This led me to conclude that 'Gubijin' possesses a gene for white color in heterozygous condition.

Let me explain the parentage of 'Gubijin.' It is a seedling from seeds that Anne Blanco White donated to the British Iris Society seed exchange in 1994/1995. She has told me that it is probably a third generation seedling from 'Holden Clough.' However, it shows no characteristics of 'Holden Clough.' The flower color, color pattern and leaves all resemble a 'normal' form of *I. pseudacorus*. In this regard, the article "White Flowers from Roy Davidson" by Terry Aitken, on page 3398 of *SIGNA*, is very interesting because he reports that he obtained three seedlings with white flowers from 'Roy Davidson.' 'Roy Davidson' is a third generation seedling from 'Holden Clough.'

I think that 'Holden Clough,' 'Roy Davidson' and 'Gubijin' may possess the same white color gene in heterozygous condition. 'Holden Clough' may be an F1 hybrid of *I. pseudacorus* and either *I. versicolor* or *I. ensata*. I hope that people will try crossing 'Holden Clough' with *I. versicolor* and *I. ensata*. 'Holden Clough,' *I. versicolor* and *I. ensata* are closely related and it should be possible to get interesting new types of irises by intercrossing them.

At the urging and with assistance of Clarence Mahan, I have registered 'Gubijin' with AIS. 'Gubijin' is self-infertile because it is aneuploid, $2n=35$, and has only collapsed pollen. It is very pod fertile, however, and readily sets seed when pollinated by *I. ensata*. There are usually 20 to 30 seeds in each pod when pollinated with *I. ensata*.

The third stage of my interspecies hybridization program began in 1999. I made selective crosses using 'Gubijin' and selected Japanese iris cultivars with flowers of various color and color patterns. I obtained about 1,200 hybrid seeds in three years. I have selected about 20 beautiful F1 hybrid plants from approximately three hundred seedlings that have bloomed. These include hybrids with flowers of near white with blue halos; yellow with dark veins; bicolor yellow and creamy brown with lavender veins; yellow with crimson sanding; yellow with blue

margins; and lavender-pink self. All of the flowers have beautiful blue halos around yellow signals. I named these hybrid plants "Eye Shadow Iris" because the blue halos remind me of eye shadow used by women to appear more beautiful.

It is unfortunate, as in the case of most wide-cross hybrids from diploid parents, all of the "Eye Shadow Iris" are sterile. I will, however, be able to select many plants with unique flowers every year without resorting to embryo culture because 'Gubijin' is a very fertile pod parent and Japanese irises have so many colors and patterns. "Eye Shadow Iris" may make a new wave in the iris world.

English Irises

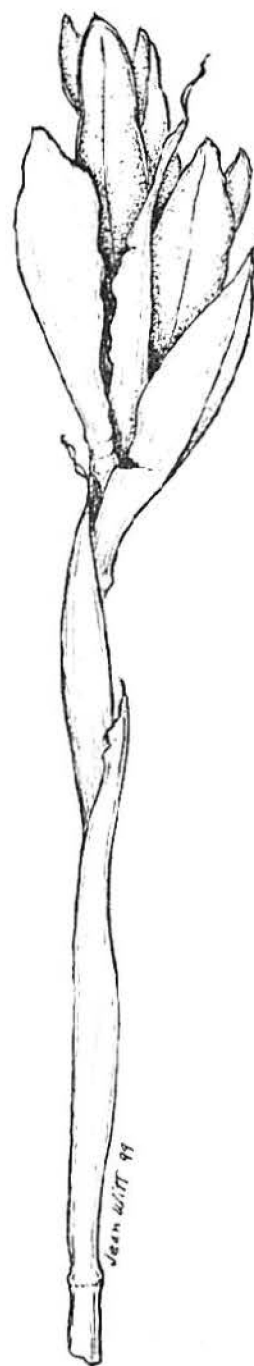
By Jean Witt

I. latifolia Miller (Syn. *I. xiphoides* Ehrh.) is a native of the Pyrenees Mountains in northwestern Spain, which was brought to Bristol, England several centuries ago, hence the common name, English Iris. Friends who visited the Pyrenees toward the end of June last year told of seeing *Iris latifolia* in bloom on the open slopes of a small river valley, along with *Juniper* and *Helleborus foetidus*. The slopes faced southeast, and the irises grew in little colonies, widely spaced, in oozing areas or damp slumps. They were all the same color, dark blue-violet, and more than knee high.

Dykes says in *The Genus Iris* p. 212, that as early as 1720 no less than 20 garden varieties were represented in Simula's *Flora Exotica*. To judge by the great numbers of named varieties recorded in the AIS 1939 checklist--there are literally hundreds--this species enjoyed greater popularity during the 19th Century than it does today. It appears to have been eclipsed by the Dutch Hybrids with their greater color range, which includes yellow, and possibly by their greater hardiness.

I. latifolia differs from other bulbous irises in having much large blades to the falls, which are often slightly ruffled, with a slash of yellow on the mid-line, surrounded by a white area, sometimes large, sometimes small. Colors range from the deep violet blue of the wild type to red-violets and blues, light to dark and an occasional white. (See SIGNA #39: 1394-97 for descriptions of some 19th century cultivars.) Flecked flowers, once greatly admired, are now considered virused. Fortunately new bulbs are easily raised from seed, which is set in copious quantities. Bloom can be expected in about four years.

In the Pacific Northwest this species is useful for extending the iris season, bridging the gap between the Tall Bearded and the Japanese. It thrives in ordinary garden soil, kept moist but not wet, and as with other bulbs, it benefits from the addition of bone meal. The leaves die down after flowering. Large papery bracts surround the pods, so that they are not quite as attractive as some for dried arrangements, but both pods and bracts are a good rusty brown. The bulbs are sheathed in brown fibrous bulb coats, the inner ones shining and pinkish. They multiply well, quickly forming large clumps. If you have to store



the bulbs any length of time after digging, put them through a soak with insecticide soap. I learned the hard way that aphids can lurk in the bulb coats, seriously damaging the bulbs.

The following are named varieties listed as current by the KAVB (The Royal General Bulb Growers Association' international bulb registry) in Holland:

- ARISTOCRAT (W. Hey 1972) aster violet veined darker.
- DELFT BLUE (J. G. Eldering) dull blue, standards darker
- DUCHESS OF YORK (Barr & Sons 1928) purple
- KING OF THE BLUES (Barr & Sons 1898) dark blue
- MANSFIELD (G. Meijer, no date) purple, dark blue blotch
- MENELIK (J. G. Eldering, no date) dark purple
- MONT BLANC (about 1883) white, faintly shaded lilac
- QUEEN OF THE BLUES (G. van Dierman about 1920) standards indigo blue, falls blue-purple.
- ISABELLA, a pale orchid-lavender, is offered by some American sources.

Retail bulb dealers tend to offer English Irises only as collections, without names. As I have raised many of my bulbs from seeds, they don't exactly match the colors of named varieties, but are similar. As of 2001, I have whites, medium red-violets, pale lavenders, dark purples and light, medium and dark blues.

The implication has always been, this species is tender, only suited to England and the Pacific Coast states. If it was originally a mountain plant, what happened to its hardiness? If you have tried growing it in colder climates, please let SIGNA know what sort of luck you have had.

BACK ISSUES

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Autumn Iris

By Darrell Probst

Part 1: Hybridizing x *Pardancanda*

It was my admiration for the way the Blackberry Lily, *Belamcanda chinensis*, bloomed so prolifically through the heat and drought of my garden in southeastern Pennsylvania that led to my interest in x *Pardancanda*. I remember staring at its mass of bloom in August of 1981, wishing they came in other colors. My desire became reality when I opened the 1982 Park's Seed Co. catalog to find "their new creation" x *Pardancanda norrisii*. Later I learned it had actually been created by a very generous man who sent them seed, the person for whom it was named, Samuel N. Norris. I immediately ordered seeds and soon had plants growing. Little did I know at the time that this plant would lead me down the road to an addiction, with all the common symptoms, including inability to concentrate, insomnia caused by visualizing new combinations and near financial ruin from skipping work in order to plant seedlings or make more cross-pollinations.

x *Pardancanda norrisii*, for those unfamiliar with this intergeneric hybrid, is the result of numerous attempts made over many years by Mr. Norris of Owensboro, KY at cross-pollinating *Belamcanda chinensis* with *Pardanthopsis dichotoma*, formerly known as *Iris dichotoma*. Both species are native throughout much of China and Korea with *Belamcanda* extending into Japan. While they may resemble one another in overall plant habitats (both parent commonly reach at least 36" (91cm) tall with flowers approximately 2" (5 cm) in diameter), they differ greatly in bloom shape, color and time of day that the individual flowers open. *Belamcanda* has relatively flat flower with three sepals and the petals that are nearly equal in size and shape, and primarily yellow or orange base color, spotted orange or red, sometimes with a touch of white near the base of the sepals and a simple stigma. The blooms open shortly after sunrise and close before dusk. On the other hand, *Pardanthopsis* flowers do not open until between 3 and 4 PM and may remain open well after sunset. The sepals and petals are held in different planes, as in the genus *Iris*. The sepals are bent at the harts. The sepals are usually lavender with a white signal and darker lavender spots while the petals are more upright flaring and solid lavender in color. The stigma also resembles those in the genus *Iris*, being separated almost to the base into three style arms.

The seed capsules of *Belamcanda* are similar in shape to an ordinary hot air balloon. They are rather unique in that the capsule walls dehisce by flexing back toward the stem. The seeds remain attached to the central axis well into winter and indefinitely if the stem is cut and brought indoors. The seed coats are round and glossy black, reminiscent of blackberry fruits. *Pardanthopsis* capsules are similar to those of *Iris confusa*, long and cylindrical, and splitting at the top upon maturity to spill the brown, angular seeds. Each seed has a wing-like protrusion resembling that of *Iris nepalensis*, although the seeds are similar in shape and size to those of *Iris confusa*.

Their hybrids provide a mixed bag of characteristics, intermediate between the two parents in early generations, but soon reverting back to those of the original parents in most characteristics with the exception of color. The plants with flowers similar in form to *Belamcanda* retain a wide color range, though orange still predominates. Those with *Pardanthopsis*-type flowers produce mostly typical lavender colored flowers with occasional white, purple or pink flowers showing up. My first challenge was to produce plants with iris-type flowers in wide color range.

I began by requesting seed from Mr. Norris and George Bush of York, PA (Mr. Bush had advertised the first registered x *Pardancanda* cultivar "Summer Snow" in an AIS Bulletin at the time). The resultant seedlings bloomed during the summer of 1984. All had iris-type flowers in shades of lavender and white and were over 36 inches (91 cm) tall with narrow petaled flowers 1 1/2 to 2 inches (3.8-5 cm) in diameter. These were cross-pollinated with the richest orange *Belamcanda* type seedlings to begin what I thought would be a long process to producing yellow and orange-flowered intermediates. To my surprise, I found one yellow and three orange-flowered intermediates on the first attempt. No one had ever achieved this before.

With this first batch of seedlings in bloom I had more diversity to observe, and that lead me to widen the scope of my hybridizing program. My idea was to enhance many characteristics and continue to work toward a larger goal. The characteristics I wanted included increased plant sturdiness, a range of heights from 1 ft (30.5 cm) to 6 ft (183 cm), large quantities of flowers per stem, increased petal width, larger flower size, a greater color range, expanded time of flower opening and many more. With this in mind, I began crossing the best plants exhibiting one or more of these characteristics. I began what I called "quantity for quality", producing large number of seedlings (10,000 or more) to find the top 5 to 10 plants exhibiting the most improvement for specific characteristics.

In 1986 I moved from Pennsylvania to central Massachusetts and a 20 degree F colder winter climate. Unknown to me at the time, two plants bloomed that would revolutionize my program. They were a wide petaled, bright yellow, near-iris type intermediate and a new strain of *Pardanthopsis* from Korea. Unfortunately, due to a second move, it was two years before I realized their potential value. Meanwhile other beautifully formed, wide-petaled iris-type flowers began showing up as well as a few orange colored, near-iris-types (A "near-iris type" flower is one that is still intermediate between the two parents in flower form, etc., but closer to the iris type).

The strain of *Pardanthopsis dichotoma* from Korea was much different from the original strain used by Mr. Norris. The leaves did not extend more than 1 ft (30.5 cm) from the ground level. They were sickle-shaped and curved away from the stem, very reminiscent, but larger than some aril species. The flowers were more bluish and in 1988 I realized that some plants produced as many as ten flowers from a single spathe. Previous forms produced only three to five per spathe like *Belamcanda*. The Korean strain is also unique in that about 25% of them readily cross pollinate with *Belamcanda* from my experience. Mr. Norris spent nearly ten years attempting this cross before finding a successful match!

The wide-petaled yellow-flowered near-iris type turned out to be a dwarf with abundant branching and as many as 85 flowers per stem. With these two parents crossed to everything, 1988 was a bountiful year for seed production. Unfortunately, the seed were not planted until the autumn of 1989 and the seedlings didn't mature until 1991. When they did it was amazing. Nearly all of my early goals were reached that year: fabulous flower form, sturdy plants, a range of heights, phenomenal branching - some with over 100 spathes on a single stem, wide petals and a great variety of colors and color combinations. There were deep purples, sparkling lavenders, bright whites and pinks and beautiful yellows everywhere, even a few oranges and a real red. My favorite was a light pink intermediate with a purple signal. It produced over 150 2-1/2 inch (6.6 cm) diameter flowers per stem. Each stem is only 24 inches (61 cm) tall with small, blue-green leaves. The flowers even opened early at 10 am. Now if I can only get a wide color and height range of iris types that are open by mid-morning, I'll be ready to introduce them and let other hybridizers take over. Although there are those two characteristics I noticed in 1991 that I wouldn't mind seeing combined into a single plant: ten flowers per spathe x 100 spathes per stem equals ? and of course they'd have to come in different colors.... and different heights.... well, maybe only a few more sleepless nights!

Part 2: Growing x *Pardancanda*

In my experience, germinating x *Pardancanda* from seed is easy. Nearly 100% germination will result from seeds sown outdoors in the autumn before the ground freezes. They should be planted 1/4 inch (.6 cm) deep in the soil. Seeds germinated in this manner often bloom the first year in climates with a six to eight month growing season. To assure first year bloom, I plant the seeds indoors in early February. I use an ordinary seed-starting mix comprised of approximately 2 parts peat moss sifted through 1/4 inch (0.6 cm) mesh, 1/2 part small aggregate such as perlite or small grit and 1 part fine vermiculite. The seeds are covered with a 1/4 inch (0.6 cm) of the mix, watered, and then placed under fluorescent lights. The soil temperature is 70 degrees F (20 C). Germination occurs within a month. X *Pardancanda* seeds resembling those of *Pardanthopsis* give 80-90% germination with this method, intermediate-type seeds give 50-70% germination while only 10-30% germination will be achieved from *Belamcanda* type seeds. These appear to require a cold stratification to obtain higher germination results. After germination they are fertilized biweekly with a weak liquid fertilizer solution. In mid-April, when the nights are frost free, I move the seed flats outside to a cold frame for two weeks to harden off the seedlings before planting.

In the garden, x *Pardancanda* prefer a sunny site. Full sun is ideal, but many will survive and bloom in partial shade. In less light they have fewer flowers, tend to fall over or lean toward the brightest light and have a greater

affinity to slugs and leaf spot. Both of these culprits can render the leaves unsightly for the remainder of the season and will weaken the overall health of the plant. The plants grow best in loose, ordinary garden soil. They will rot in soils that are primarily composed of clay and remain water-soaked over winter when the plants are dormant. Sturdy plant habit can be achieved by sitting the plants in somewhat lean soil. Plants become too robust and require staking in overly fertile soil. They are very tolerant of dry, sandy soil and even salt, which makes them ideal for roadside or seaside planting.

Part 3: Relationship and Hybridization with Member of the Genus *Iris*.

Prior to Mr. Norris, I am unaware of information suggesting that anyone else has attempted pollinating *Pardanthopsis (Iris) dichotoma* with *Belamcanda*. In fact, Mr. Norris spent nearly ten years making cross-pollination between numerous individuals of the two genera before he found a *Pardanthopsis* that would cross successfully with *Belamcanda*.

Prompted by this one successful cross-pollination with *Belamcanda* and the fact that there were no reports of successful cross-pollinations with other members of the genus *Iris*, Dr. Lee W. Lenz of the Rancho Santa Ana Botanic gardens decided to remove *Iris dichotoma*, as it was formerly known, from the genus *Iris* and to create the new genus *Pardanthopsis*. (ALISO 17:4, pp.401-403, July, 1972). Using a chart describing their morphological characters he attempted to show that *Iris dichotoma* is more similar to *Belamcanda* than to the genus *Iris* as a whole. Being a novice, it sounded convincing to me. Of course, *Belamcanda chinensis* and *Iris dichotoma* bloom at the same time of the year, so it is more likely that someone would eventually attempt crossing the two. Other iris species have long completed their bloom season. One would have to collect and store pollen or force plants into bloom out of season to attempt hand pollinations.

My opinions began to change in 1986 when I saw a picture of *Iris* "Darjeeling" , a second generation hybrid between *I. confusa* and *I. japonica*, on the page facing 141 in *The Iris and its Culture* by Jean Stevens, New Zealand. The picture shows a clump with over fifty scapes reminiscent of the visual effect produced by a large mass of *Iris dichotoma*. Immediately I set out to learn as much as I could about these so-called "tender Evansias". In 1988 I acquired three plants through a friend visiting California *I. japonica*, *I. confusa* and the robust *I. "Darjeeling"*. When the first flowers opened in early February 1989, it was obvious to me that they possessed enough similarities with *I. dichotoma* that I might be successful in crossing the two. Unfortunately, "Darjeeling" lacked pollen and the few flowers produced from the other two barely produced enough pollen to make saving it worthwhile, but I did.

In August of the same year I attempted crossing the two groups. Pods did indeed form from crosses with *I. confusa*, but none from *I. japonica*. I also saved pollen from *I. tectorum* and *I. milesii*. Crosspollinations with the latter also produced pods. I could hardly contain my excitement when, after two weeks the pods remained and were growing. Unfortunately it was not to be. After one month all ten pods had fallen off. The normal size seeds enclosed were empty inside.

I did not view this small attempt as a failure. To me, it was proof that such a cross could be successful, but it would require more pollen to find the right match. Perhaps another Evansia clone might also be required. I began to acquire every tender Evansia available. In 1991, I tried more crosses with similar results. No success with *I. japonica* varieties or named hybrids, but a few more pods from *I. confusa* and *I. confusa* "Chengdu". This time one mature seed formed. Of course it didn't germinate!

Then my mission changed. Perhaps what I needed was not more pollen from these two clones, but more clones with various genetic combinations in order to find one that would match. I began hybridizing tender Evansias in hopes of creating a seedling in the second or third generation that would be fertile with x *Pardamcanda* or *I. dichotoma*. At the moment I am in possession of seeds from F2 crosses awaiting germination.

Meanwhile, my reason for crossing the two changed. Originally I saw two beneficial qualities the Evansias could pass on to x *Pardamcanda*. In my cool dining room where the Evansias bloomed January through March, the flowers lasted for two to three days. This would certainly give hybrids with flowers that lasted at least a day, whereas present x *Pardamcanda* opened at noon at the earliest. The other characteristic I believed that would

make a difference was the long rhizomes Evansias produced. x *Pardancanda* produced extremely short rhizomes. After three or four years, the clumps tend to die out. I attributed this to the thick mass of rhizomes inhibiting growth of the newer rhizomes that soon die. If I could create plants that spread three inches (7.5 cm) a year, they might live longer.

The first characteristic proved untrue when a late summer bloom spike appeared on one of my hybrid Evansias seedlings. The blooms lacked enough substance to keep them firm in the August heat. They deteriorated and essentially closed up in less than day. The spreading rhizome characteristic has become less necessary since advanced *Pardancanda* have now survived five and 6 years without being divided. The idea of introducing genes of the Evansia, unable to survive 20degree F (-4 C) without complete bloom stalk destruction into something at the limit of its hardiness range here in Massachusetts, where it drops to -20 degree F (-27 C) has never been appealing. The only reason left for me to attempt more crosses would be to prove the close relationship.

During this time I have made many comparisons between *Iris dichotoma* and tender Evansias. Surely Dr. Lenz did not have the recent species introductions, imported after he removed *Pardanthopsis* from the genus *Iris* in 1972, with which to compare. He may not have considered their close examination worthwhile. In light of my finding, I believe they are.

Using the same morphological features Dr. Lenz used (No.1-10) to separate *Iris dichotoma* from the genus *Iris* as whole, I have made the following comparison using *I. confusa*, *I. dichotoma* and *Belamcanda*. These comparisons clearly show that *I. dichotoma* approaches *I. confusa* in more respects than it does *Belamcanda*. *Iris setosa* has been used in the comparison to highlight the wide diversity within the genus *Iris*. To assist others in making similar comparisons, three clones of known wild origin were used. *Iris confusa* "Chengdu" collected in Sichuan, China. *I. dichotoma* and *Belamcanda* both collected on islands off the coast of Korea in 1986 by the National Arboretum and growing in the Asian collections of that institution.

Upon examination of the characteristics, Dr. Lenz used (No.1-10) to separate *Iris dichotoma* from the genus *Iris*, I believe it is highly unusual to use bloom season, the length of time individual bloom remain open and branching as criteria for separating genera, especially when the differences are minor. Disregarding these three, *I. dichotoma*, is similar to *Belamcanda* in (1) arrangement of floral parts following anthesis, (2) articulation below ovary and (3) absence of a perianth tube. It is similar to *I. confusa* in (1) arrangement of floral parts following anthesis, (2) articulation below the ovary, (3) the structure of the style branches, (4) position of the stamens and (5) having geniculate sepals. Additional comparisons made by me (Nos. 11-13) of petals, seed capsules and seeds show even more similarity between *I. dichotoma* and *I. confusa* while differing even further from *Belamcanda*.

The genus *Iris* is a large and varied one. As it is clearly outlined here, *I. dichotoma* shares more characteristics with *I. confusa* than *I. confusa* shares with *I. setosa*. If *Iris dichotoma* can be removed from the genus based only upon a few difference isn't the entire *Iris* Genus in jeopardy?

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Comparison of Iris Species with *Belamcanda*

<i>Iris setosa</i>	<i>Iris confusa</i>	<i>Iris dichotoma</i>	<i>Belamcanda</i>
1. After anthesis flower parts assume no regular arrangement	After anthesis flower parts assume a loosely-spiraled arrangement	After anthesis flower parts assume a tightly spiraled arrangement	After anthesis flower parts assume a tightly spiraled arrangement.
2. If articulated then above the ovary	Articulation below the ovary	Articulation below the ovary	Articulation below the ovary
3. Perianth tube present	Perianth tube present	Perianth tube absent	Perianth tube absent
4. Flowers remain open for more than one day	Flowers remain open for one day or less in warm temperatures.	Flowers open between 3 and 4PM and close by early morning lasting less than one day	Flowers open around 8AM and close by 7PM lasting less than one day
5. Blooms In June	Blooms in May	Blooms in July & August	Blooms in July & August
6. Inflorescence with few branches (up to 3 branches), alternately spaced with a definite terminal spathe.	Inflorescence with many branches alternately spaced, with a definite terminal spathe, the lower branches usually branched as well (with up to 23 branches)	Inflorescence with many branches alternately spaced, with a definite terminal spathe, the lower branches usually branched as well (with 15 to 20 branches).	Inflorescence with many branches alternately spaced, usually without an obvious terminal spathe
7. Style branches large, petaloid in shape, divided nearly to the base; each style branch with stigmatic flap on underside and two style crests above.	Style branches narrow, slightly winged, divided nearly base; each style branch with a stigmatic flap on the underside and with two style crests above	Style branches narrow, slightly winged, divided nearly to the base; each style branch with a stigmatic flap on the underside and with two style crests above.	Style branches not petaloid or winged, divided about 1/3 the length of the style; tip of each division divided into three parts outer ones rolled inward, center one forming a lip like flap. All three parts stigmatic.
8. Stamens held firmly against the underside of the style branch	Stamens held firmly against the underside of the style branch	Stamens held firmly against the underside of the style branch	Stamens free, not held against the style
9. Sepals geniculate, with a distinct claw and blade	Sepals geniculate, with a distinct claw and blade	Sepals geniculate, with a distinct claw and blade	Sepals not geniculate or separated into a claw and blade
10. Hybrids with <i>I. confusa</i> , <i>I. dichotoma</i> or <i>Belamcanda</i> unknown	Hybrids with <i>Iris setosa</i> and <i>I. dichotoma</i> or <i>Belamcanda</i> unknown, but pod stimulation was achieved from a limited amount of crosses with <i>dichotoma</i>	Hybrids with <i>Iris setosa</i> and <i>I. confusa</i> unknown, but pod stimulation was achieved from a limited amount of crosses with <i>I. dichotoma</i> . Hybrids with <i>Belamcanda</i> were achieved after numerous attempts with <i>I. dichotoma</i> as pod parent.	Hybrids with <i>Iris setosa</i> and <i>I. confusa</i> unknown, Hybrids with <i>I. dichotoma</i> were achieved after numerous attempts with <i>I. dichotoma</i> as pod parent. No pod stimulation recorded from crosses where <i>Belamcanda</i> was the pod parent.
11. Petals generally subulate, very small compared to sepal	Petals generally oblong-emarginate, somewhat smaller than sepals, unspotted	Petals generally elliptic to oblong-emarginate, somewhat smaller than sepals, unspotted	Petals oblong, not emarginate, nearly equal in size to the sepals, heavily spotted.
12. Seed capsules elliptic; splitting at the top upon maturity at which time the seeds detach.	Seed capsules narrow-oblong in shape, splitting at the top upon maturity at which time seeds detach.	Seed capsules narrow-oblong in shape, splitting at the top upon maturity at which time seed detach.	Seed capsules elliptic obovate, splitting at the top upon maturity, valves reflex to expose column covered with seeds which usually remain attached for months.
13. Seeds somewhat rounded, with glossy, light brown, somewhat hardened seed coat with conspicuous raphe down one side.	Seeds somewhat angular, with dull brown seed coat that is tightly attached to the seed.	Seeds somewhat angular, with dull, dark brown seed coat that is tightly attached to seed and a papery wing about 1/3 as long as the seed on one end.	Seeds round, with glossy black seed coat with is very loosely attached to the seed.

X Pardancanda



Pardanthopsis dichotoma



Butterfly Magic
Probst 2002



Heart Of Darkness
Probst 2002



Belamcanda chinensis



Mandarin Lady
Probst 2002



Pastel Parfait
Probst 2002



Spooky World Probst 2002
Photos by Jan Sacks

Signa Treasurer's Report

1/1/01 - 12/31/01

As of 1/1/01:

Checking Account Balance	\$11282.81
CD (life memberships)	6791.21
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TOTAL ASSETS:	\$18475.79

REGULAR INCOME

Memberships	\$3372.00
Past Publications	281.00
Seed Exchange	3786.14
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Interest on Checking	<u>59.66</u>
	7875.41

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Donation	100.00

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REGULAR EXPENSES

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Medals	<u>16.45</u>

Total Regular Expenses 7058.88

SPECIAL EXPENSES

Research Grants	200.00
Seed Collecting Grants	199.50

Total Expenses \$7458.38

\$19302.82

As of 12/31/01:

Checking Account Balance	\$12204.00
CD (life memberships)	\$7147.82
Outstanding Officers' Advances	<u>\$(49.00)</u>
TOTAL ASSETS:	\$19302.82

Editors Note: *I wish to thank Dr. James W. Waddick for editing this article for SIGNA and providing the definitions contained in the foot notes.*

Cytological Studies on Some Iris Species in Sichuan

Zhou Yong-Hong

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The following article is a summary and reworking of the final report given to the AIS Scholarship Committee. All information on accounting and other specifics has been removed to make the basic studies more accessible. The Editor hopes to make these findings clear and practical to the SIGNA readers. J. W. Waddick

This research project was sponsored by the American Iris Society (AIS). The purpose was to determine the relationships between *I. confusa* and *I. japonica* from the view of cytology. In the two years, I have achieved progress and fulfilled the research work. Field work was conducted from 1996–1998 throughout Sichuan Province in Central China. Over forty *Iris* collections of seeds and plants were made including:

1	<i>I. confusa</i>	18 collections
2	<i>I. japonica</i>	18 collections
3	<i>I. tectorum</i>	4 collections

One collection of each of the following, which were not used in the studies.

4	<i>I. narcissiflora</i>
5	<i>I. lactea</i>
6	<i>I. sichuanensis</i>
7	<i>I. leptophylla</i>

The Study Topics:

1) Relationships

I. confusa and *I. japonica* are widely distributed in Eastern Asia. They are morphologically similar. *I. confusa* has an obvious stem, leaves alternate on stem or group at stem apex and the flowers are pale blue or white. While *I. japonica* has not obvious stem, leaves are all basal and the flowers are violet or pale blue. It is very difficult to distinguish them with morphological characters. Therefore, it is necessary to determine other relationships between them.

2) Chromosome Numbers

I traveled and made field expeditions in most parts of Sichuan for *I. confusa* and *I. japonica*. By checking the chromosome number among the accessions, I found that *I. confusa* and *I. japonica* show variations on the chromosome numbers. Nearly 85–90 % of *I. confusa* and *I. japonica* that I collected are aneuploids¹. The chromosome numbers of *I. confusa* vary from 28–48. Only 3 accessions of *I. confusa* have 30 chromosomes. These three accessions are fertile and bear fruits. They were collected from Siping (Yingjin), Xingou (Tianquan) and Juejiping (Tianquan). Most of the accessions of *I. confusa* are sterile and the chromosome numbers are not 30. In the collections of *I. japonica*, the chromosome numbers vary from 28–58. Only 1 accession from Dali (Yunnan) is fertile and with 30 chromosomes.

¹ Aneuploid - A plant or cell having an unequal number of chromosomes usually one or two more (or less) than the typical diploid state, but hybrids may alter the number drastically. The number of chromosomes in the species studied varied widely from 28 to 48. Aneuploids may be both unstable and have decreased fertility.

The other seventeen accessions are aneuploids. Therefore, the diploid² plants of *I. confusa* and *I. japonica* are those with 30 chromosomes.

3) Hybrid Studies

Because *I. confusa* and *I. japonica* are commonly observed to be aneuploids, I selected the pure diploid plants ($2n=30$) for cross study. I have made 4 cross combinations. The results were as follows:

<u>Combinations</u>	<u>Pollinated Flowers</u>	<u>No.. of Fruits</u>	<u>Hybrids Plants</u>
<i>I. confusa</i> (Siping) X <i>I. japonica</i> (Dali)	25	4	1 (died)
<i>I. confusa</i> (Xingou) X <i>I. japonica</i> (Dali)	16	3	3 (died)
<i>I. japonica</i> (Dali) X <i>I. confusa</i> (Siping)	23	7	9
<i>I. japonica</i> (Dali) X <i>I. japonica</i> (Dali)	15	1	0

4) Cytomixis

Cytomixis is a natural process of chromatin exchange among cells. In our studies, synchronized cytomixis takes place among the pollen mother cells of *I. confusa*, *I. japonica* and their hybrids during early stage in meiosis. This process produces euploid³ and aneuploid offspring. It may explain why there are many aneuploid accessions in *I. confusa* and *I. japonica*. The result showed that *I. confusa* and *I. japonica* have the same genomes. Their relationship was quite close.

5) Seed Germination

Inhibitory affects of seed coat on germination of the seeds of *I. confusa*, *I. japonica* and their artificial hybrids were studied. The seeds with no seed coat germinated much earlier than the normal ones. The percentage of germination of the seeds without the seed coat was higher than that of the normal seeds. Statistical tests showed significant differences. So seed coat in *I. confusa*, *I. japonica* and their hybrids obviously inhibit the seed germination. This study also showed that the germination is inhibited by endogenous inhibitor and mechanical penetrability of seed coat.

6) Fertility

The fertility of pollen grains of *I. confusa* and *I. japonica* varies among the accessions. The fertility of these two species which can bear fruits are very high (above 85%). In those with no fruits, the fertility is lower than 50%. In the hybrid, the fertility was 66.72% and they can bear a few fruits. Most of the fruits have no seeds.

² Diploid - A plant or a cell having two sets of chromosomes. All plant species have two sets of chromosomes. This is written as $2n$. The suggested diploid number of chromosomes for *Iris japonica* is $2n = 30$. Diploids are the normal and most fertile states for most plants.

³ Euploid - A plant or cell have any number of complete chromosome sets. This gives a chromosome number that is an exact multiple of the basic chromosome set such as $3n$, $4n$ etc. In the examples given, these numbers would be $3n = 45$, $4n = 60$ etc. These sets tend to be more stable and have some increased fertility especially when compared to the variable aneuploid states.

The results are showed in this Table.

<u>Species and hybrid</u>	<u>Locality</u>	<u>No. of pollen grains observed</u>	<u>No. of fertile pollen grains</u>	<u>Fertility (%)</u>
<i>I. confusa</i>	Siping	1523	1500	98.49
	Jizigang	1520	705	46.38
	Yaan	1450	597	41.17
<i>I. japonica</i>	Xingou	891	876	98.32
	Yaan	895	800	89.39
	Dujiangyan	1074	476	44.32
<i>I. japonica</i> X <i>I. confusa</i>		1352	902	66.72

Conclusion: These morphological comparison, cytological studies and fertility analysis suggest that: 1) *Iris confusa* and *I. japonica* are quite closely related, and they share the same genomes. It is reasonable to consider *I. japonica* a subspecies of *I. confusa*. 2) Many aneuploids of *I. confusa* and *I. japonica* maybe come from the cytomixis in the early stage of meiosis. 3) Seed germination may be very low due to a variety of inhibitory factors. 3) Pollen fertility is also very low except in uncommon diploid plant. I hope to extend the studies to the other species observed and collected.

SIGNA DUES

EFFECTIVE January 1, 2001

One year membership.....	\$9.00
One year dual membership (one household).....	\$10.00
Three year membership.....	\$24.00
Three year dual membership (one household).....	\$25.00
Life membership (individual).....	\$200.00

Make checks payable to SIGNA (Species Iris Group) and mail to:

Rodney Barton
Membership Secretary
3 Wolters Street
Hickory Creek, TX 75065-3214

Readers Write

Editor's Note: This column is in response to Will Plotner's plea for greater member involvement in this publication (See his President's Message). This is how we learn to grow the species!

Iris chrysographes in Tromsø Norway! - Jean Witt of Seattle WA

Among the plants that Dr. Finn Haugli, director of the Arctic-Alpine Botanic Garden in Tromsø, Norway, is able to grow successfully is *Iris chrysographes*! This is the world's northernmost botanic garden, at 70 degrees north latitude--north of the Arctic Circle--but warmed by the Gulf Stream, with short, cool summers and relatively mild winters with good snow cover. I'm inclined to think that many of our problems with this group of Siberians may stem from the fact that our mid-latitude soils become too warm and dry during the summer. Mulching and a location with afternoon shade might help.

Iris pseudopumila subsp. *Gonzoensis* - Nigel Service

In the Editors Corner of SIGNA #65 Graham Ware had a bit about *I. pseudopumila* subsp. *gonzoensis* and the iris on Malta which a friend of a friend Harald Mathes found. Graham Ware was speculating about their possible relationships. The two are really not at all the same, the Maltese Iris has a shorter stem and the flower much more purple. They do not look closely related, certainly not colour forms of the same iris.

The Maltese plant has, for both Harald and for me, produced curiously deformed flowers in cultivation. I am still waiting for Harald to be able to count the chromosomes of *I. subsp. gonzoensis*, that will be really interesting.

Iris tenax - Colin Rigby of Rochester WA

In SIGNA No. 52, Spring, 1994, I wrote that I had never seen what I would call a yellow *I. tenax*. Thanks to the generosity of fellow irisarians, I have now seen it. It blooms faithfully every spring. What a wonderful species this iris is. Cold hardy, nice green grass-like foliage in summer and a color range from dark purples to lavenders, pale pinks, pure white with a yellow signal and clean butter yellow. Of course, those muddy combinations of pale lavender and yellow still exist, but we can't have it all. I just wish there were a couple of young, energetic hybridizers out there doing some work with this iris, as its potential hasn't been explored yet. The surface hasn't been scratched. Last winter was rather a mild one for us with lots of spring rains. Bloom on the Pacific Coast Iris was the best I have had in several years. In fact, as I write this on July 27, I am still enjoying two lavender flowers, "Typical" color for its northern limits in western Washington.

Growing Irises In Eastern Washington State - Christy Hensler of Newport WA

In response to your query about what SIGNA members are growing, we raise a wide assortment of bearded as well as beardless irises, bulb irises, and irids. Those iris species established here are *I. cristata*, *I. dicotoma*, *I. ensata*, *I. laevigata*, *I. missouriensis*, *I. monneirii*, *I. pseudacorus* (a large range of forms), *I. setosa*, modern 28-C Siberians and their species relatives, a few 40-C Sino-Siberians, PCIs, *I. giganticerulea*, *I. hexogona*, *I. fulva*, *I. brevicaulis* and a few LA hybrids, *I. versicolor*, and *I. virginica* alba and a large range of species crosses.

A few ABs have adapted well over the years and recent additions to the garden are *I. korolkowii* and *I. stolonifera*. *I. verna* and *I. carthagineae* were also added this spring.

We are located at approximately 2500 feet elevation in the foothills of the Selkirk Mountains in northeastern Washington state. Average precipitation is 16 inches with little to none of it falling during the summer. Our soil is a combination of rotten granite, sand, and where greatly improved, sandy loam with a pH of 5.6 to 5.8. The last hard spring frost is usually June 1 and our first killing frost usually arrives in mid-September. The average low temperature is -20° F (-28° C) though we will drop to -29° F (-37° C) on occasion. Average highs are in the mid 90's F (35° C) but this past season stayed in the high 90's for a few weeks.

Most of our garden is situated in full sun. Except for planting the water-loving species in those areas with better soil to help retain moisture and providing the *I. cristata* and *I. verna* with a bit of shade, we haven't gone to great lengths to change our growing conditions to suit any species.

Among other projects, I've begun work with *I. missouriensis* to increase the gardenability and broaden the range of color. A stand of *I. missouriensis* from the Columbia Basin area (Washington state) has yielded some interesting variations in color and form to build on. Another form shows increased bloom and is more agreeable to being divided and transplanted than is common. It's hoped that seedlings from the SIGNA seed exchange will also contribute some diversity.

Irises in Pots - Rodney Barton of Hickory Creek, TX

In the fall 1999 issue Elaine Hulbert asked for experiences growing water irises in pots as a way of dealing with summer drought. I grow a number of things in pots trying to control moisture either summer or winter and to deal with alkaline soil and water. There are two water irises that I have maintained in pots for a number of years, *I. pseudacorus* dwarf and *I. laevigata* 'Semperflorens'. These were potted in 12 in pots in 50:50 garden soil and peat. Most of the year they get rain and no supplemental water but in the summer they are placed in buckets and watered daily. I use collected rainwater when available, as my well water is quite alkaline. I don't have a set feeding regimen. The pots are protected in the winter from hard freezes. I've never put the *I. pseudacorus* dwarf in the ground so I can't compare it's growth but the typical *I. pseudacorus*, I'm almost ashamed to admit, doesn't do well for me. The *I. laevigata* performs better in the pot than in the ground here. *I. prismatica* has also done well in pots for me. Most recently, I've potted several varieties of *I. brevicaulis*. They seem to be growing better than they do in the ground here. While not "water irises" (i.e. Series *Laevigatae*) these later two do seem to appreciate the extra moisture.

Saving Iris Seeds - Mechanics

Marty Schafer and Jan Sacks

In our series on seed collecting, last time we discussed labeling seed pods - whether wild collected, hand pollinated, or open pollinated. Continuing from there we will cover our methods of processing seeds from the pod to the packet. Once again we invite alternative ideas and suggestions from all of you.

Keeping track of pods we want to collect comes first. We mark on our calendar six weeks from the time we make hand pollinations to remind us to start checking for ripening pods. That is a good time period for most of the seeds that we collect, but some irises may take less time to ripen (or more) and over time you will learn how long it takes - sometimes by getting there too late. Just make a note for next year. With open pollinations, bee pods, it is harder to keep track, since we don't have a part in making the pod. We have tried several different methods to remind us to keep track of these pods. One of the surest methods is to put a seed-catching bag on the pod. If we forget to get the pod on time, the bag is there to catch the seed. At the end of the article there are recipes for making these bags. They work extremely well on most irises - but the smallest ones without any stalk (pedicel) to wrap the bag around are a big problem, such as with *I. ruthenica*. Its pods are often right on the ground, and there is no way to put a bag on them. These we try to mark with colorful tape or flags to remind us to check them regularly for ripening.

Deciding when a pod is ready to pick is the next challenge. (Of course if you are using the bag method mentioned above, this is not a problem.) It is ideal to wait until the pod turns brown and the top begins to crack open along the three chambers, but before it opens enough to lose any of the seeds. This requires being very precise as the time frame from cracking to fully open can be a day or two depending on the weather. Because of this, we often pick pods when they are still somewhat green with maybe a touch of brown. In these pods the seeds might still be greenish, but are fully developed and viable. (If you pick them when they are totally green and not fully expanded you risk collecting undeveloped seeds which will not germinate.) Getting the timing right is something that takes a little trial and error.

If you pick pods that are at all green, the seeds need to be shelled immediately and allowed to dry. We use net seed-drying bags for this, also described at the end of this article. We put a label in each bag with the species and or hand pollination information. Then we hang them from a makeshift clothesline or use an old towel rack, keeping them in a dry shady place (not too hot). Another option is to put the seeds in paper plates. We do not use plastic containers, which seem to encourage mold. If the seeds are really green you will want to stir the seeds occasionally or run your hands over the bags.

After a couple of weeks of drying, the seeds are ready to clean and package. This is a really good time to inspect your seeds for unwanted visitors. Our most typical critters are iris seed weevils, but occasionally we also have some little caterpillars, which burrow into the seeds. Look for any pinholes in the seeds, or any noticeable frass or webbing which causes the seeds to clump together. This is often a good sign of some invader. Of course, destroy all pests, even if it means destroying the seeds as well.

Cleaning iris seeds is relatively easy compared with many other types of seeds, especially daisy family seeds, which are accompanied by several kinds of chaff. However, we are always surprised by various kinds of stuff that comes with iris seeds including unformed seeds, pod parts and even dirt. These can be removed by one of two methods. An easy method is to use a sieve or colander. We collect lots of different kinds of seeds so have a whole series of sieves with different size holes, from very fine to very coarse, including spaghetti strainers. Of course iris seeds also have a wide range of sizes, from tiny *I. gracilipes* to giant Louisianas. For irises the goal is have the iris seeds fall through the sieve and have the chaff remain in the sieve, or to have dirt and small bits of chaff fall through the sieve and have the seeds remain. We usually do it both ways. It may sound time consuming but actually only takes a couple of seconds.

Another way to clean seeds is winnowing. This method uses moving air to separate chaff and dirt from the relatively heavier seeds. We like to put seeds in a paper plate and blow on them while moving the plate back and forth across the flow of air. Hold the plate at a slight angle from horizontal so the seeds roll to the bottom of the plate and the chaff rises toward the top. Then scoop off the chaff and continue until the seeds are clean. Finding the right strength to blow takes a bit of practice. Blowing too soft doesn't separate anything. Blowing too hard lifts the seeds along with the chaff. Luckily, iris seeds are round and usually roll down the plate easily while chaff is irregular and sticks to the plate, slowing its descent.

After cleaning the seeds we put them in packages. We like to use brown craft paper envelopes that office supply stores sell as coin envelopes. They are common and inexpensive. Some people recycle letter envelopes. It is important to watch for gaps in the gluing of these envelopes. Some envelopes look good but have hidden holes, especially at the corners, which allow the hard-earned seeds to escape. Close these with tape or staples. It is also possible to make a very secure seed envelope from a piece of paper by folding it. See the description at the end of the article.

The worst choice for packaging seeds is plastic bags. Sometimes the seeds are not as dry as you thought and they will mold in the plastic bags. In the past few years we have started using little plastic zip-lock bags for the tiniest seeds in the seed exchange, especially some of the irids. This is because the smallest seeds can leak out of even the coin envelopes. Special care is taken, however, to ensure that the seeds are totally dry before they are put in these little plastic bags.

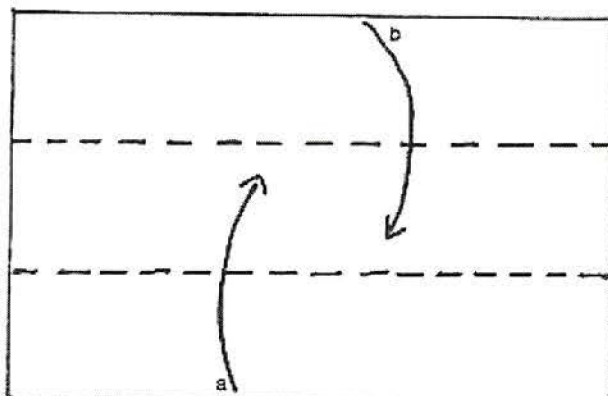
At this point all that is left is to make sure that each envelope or seed package is properly labeled and it can go into your seed drawer or in the mail to a seed exchange.

Making Seed Bags

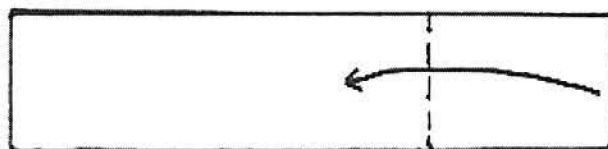
Two types of seed bags were mentioned above one for seed-catching and one for seed drying. The basic bags are the same with a bit of different embellishment. They do require very simple sewing. If you don't sew, ask a friend for help. The material we use is tulle (used for bride's veils and making ballerina's tutus.) You can buy it at any fabric store and it's pretty inexpensive. The advantage of the tulle is that it does not unravel when cut so it is not necessary to hem the raw edges. (You can also use a loosely woven fabric with holes small enough to keep iris seeds in, but large enough to allow a lot of air to flow through. For this type of fabric you will need to add to the directions below for a hem.) We cut a piece that is about 6in. x 9in. (15cm x 23cm) (7in. x 9in. (18cm x 23cm) if a hem is required) You might prefer a different size. Fold it in half creating a piece 6in. x 4.5in. (15cm x 11cm) and sew closed the 6in. (15cm) side and one 4.5in. (11cm) side which will leave one end open. It is best to use a zig-zag stitch if you have it. Otherwise, make two rows of stitching about 1/8in. (4mm) apart. For seed-drying bags we then take some type of string and sew a loop on the one corner of the open end for hanging. For seed-catching bags we attach a twist tie to the open end to use to clamp the bag around the stalk of a pod.

Making A Paper Seed Packet

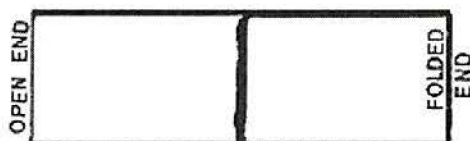
Start with a piece of paper 4in. x 6in. (10cm x 15cm). This is quite small and is the minimum size to use. You may want to increase the dimensions and make a larger packet.



Step 1: Fold paper in thirds
a. bottom edge towards the top and crease
b. top edge towards the bottom and crease



Step 2: Fold the right end toward the left, a little bit less than a third of the length, and crease.

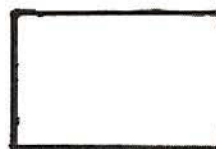


Step 3: Put your finger in the open (left) end to create a tube and pour in the seeds.



Step 4: Fold open end toward closed end, about one-third, and crease.

Step 5: Tuck one flap inside the other flap to hold the packet closed.



Editor's Footnotes

Carla Lankow

As you may have noted from the listing of SIGNA Officers, Will Plotner has officially taken office as our new President. For those of you who do not know him yet, let me introduce you. Will has been my right-hand man as Vice President for the last four years while I was President. He is active locally in the Greater Portland Iris Society and Region 13 and at the AIS national level he is a member of the AIS Foundation Board. Will grows many types of irises including a large number of species and species crosses at his 'Wildwood Gardens' nursery in Mollala Oregon. His garden is scheduled to be on tour during the 2006 Portland AIS Convention. With his experience I am sure he will be an excellent leader for SIGNA.

Also note that on the list of officers I am still listed as the 'Temporary' Editor, a position I have held for several issues of SIGNA over the last few years. As I have said before I am not really an editor. I just don't see the errors as easily as some people. Some of the errors from the last issue and their corrections are listed below. We are fortunate to have help from Bob Seaman (from the Seattle area), doing the layout of this issue of SIGNA. Bob has taken a load off of our job as Editor for this issue.

I have been an officer of SIGNA for eight years and I will remain on the board in the office of Immediate Past President. I am also Publications Chair and I do not wish to keep this 'Temporary Editor' job as well. My husband George and I feel we deserve to rest on the sidelines for a while. So won't you please heed our "Plea for Editor" article and volunteer as an individual or as a group to assume the Editor's role. If you have questions about the job please contact Will Plotner or me. Our addresses are on the inside front cover.

I hope that this issue helps fill the needs of the membership. The questionnaire from a year or so ago is helping to guide us. We have included a Source List for Species Irises in this issue. We also have a Readers Write column and an Experts Column (that is meant as a tongue in cheek title) to help some of the newcomers learn about species and to answer questions they may have. We have included another article from Jan Sacks and Marty Shafer on Seed Collecting and a very informative article on *I. germanica* from Nigel Service plus two exciting reprints from British Iris Society publications. Add to that Darrell Probst's paper from the 1995 'Gardening With Iris Species' symposium in St. Louis plus several excellent shorter articles. I think this will be a good issue, we hope you think so also.

Errata SIGNA #67

Page 3415, Evansia Key to Hybrids and Cultivars Many of the species names were not italicized.

Page 3418, Key to Evansia Hybrids and Cultivars Jeanne Gardiner's name was misspelled.

Page 3428, *Iris tenax* the title should have been in italics and several spaces were left out between Martha Sleeper's name and the name of her hometown, Gaston, Oregon.

Page 3438, There was no credit for the drawing done by Jean Witt.

Page 3442, *Iris attica* The poor quality of reproduction on Doris Taggart's photos, particularly the habitat photo was due to technical problems. Doris was not credited with the photos

Page 3444 Juno Chromosome Counts from Kew Several of the iris species were misspelled including *Lorchioides*, *I. rosenbachiana*, and *I. willmottiana*.