A Report of the Taurus Mountains

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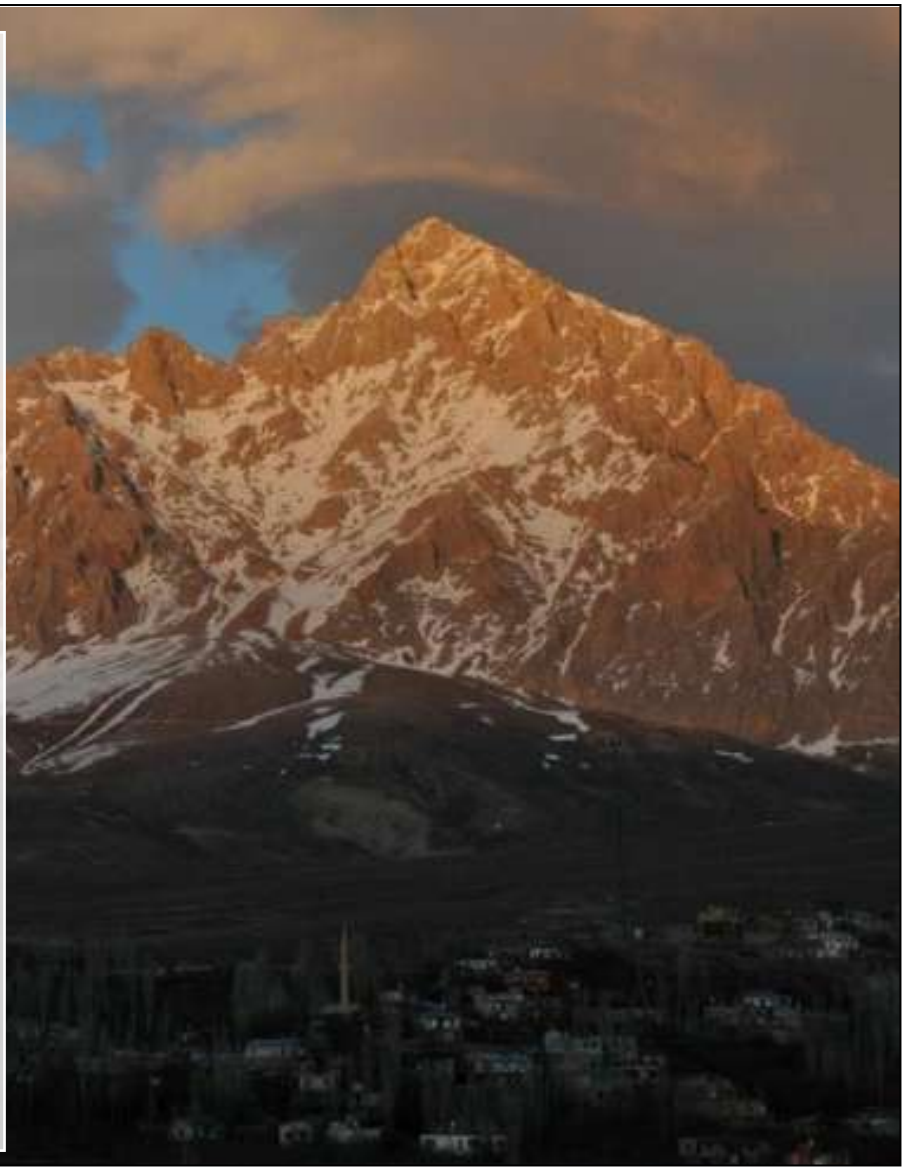
2012



A report of the alpine flora of the Taurus Mountains situated in the South of Turkey. The trip was taken as part of a bursary kindly offered to me by the Merlin Trust to enhance my studies as a Horticulture Student. The tour lasted two weeks (4th April 2012 – 18th April 2012) and incorporated many cultural experiences as well as horticultural. (Cover Photo of Ala dağ, Authors own)

Acknowledgements

I would firstly like to thank the Merlin Trust for allowing and funding a young developing horticulture student the opportunity to experience such an experience, this would not have been possible without their backing and I hope the trust carries on giving these opportunities to other horticulture students, as I believe the benefit of such a trip has really broadened my outlook on not just plants but the world we live in.

A huge thank you to Rob and Rannveig Wallis is also in order. They were knowledgeable, patient and genuinely lovely people, always willing to give their own time to help the two Merlin students in the group, even giving up their evenings on most nights to help us improve our skills at using keys. What these two didn't know about bulbous monocots was not worth knowing. The guide of the tour Alper Ertubey was not just a fountain but a waterfall of knowledge about Turkey and its historical and modern history, every town had a hundred stories, every meal had an anecdote and his aptitude to take care of the group in some difficult situations was second to none. The group must also be thanked for their help and willingness to share their passion of plants with the students. Collectively I felt the group knew everything, with members like John and Hillary Birk having a fantastic ability to be able to identify nearly every interesting plant we came across, and Pat Craven being able to distinguish the smallest of birds from a thousand paces and helped me greatly with my photography. I cannot fail to mention my fellow Merlin student and baklava fan Giulio Veronese, he was a great companion on a trip like this and always wanting to explore that little further and his passion for plants was exemplary. Jim Archibald, a very close friend of Bob and Rannveig and an important member of the Alpine Garden Society who had passed away in 2010 but had left his hand notes of many sites to the Alpine Garden Society, without these notes we would have missed some truly spectacular regions of Turkey.

Mick Lavelle for encouraging me to go for this trip in the first place and his teachings and direction which have enabled me to learn so much in my time at Writtle College. Glen King, for giving a young man the opportunity to work in the horticulture industry.

Finally I must thank Mark and Denise Graham, my mum and dad, for backing and helping me in everything I choose to do, without this freedom from them I would not be able to pursue my passions of horticulture and alpine plants.

Without these people this tour would never have happened for me, I would have missed out on this once in a life time opportunity to visit such an exquisitely beautiful country, seeing some of the most desirably attractive plants growing in the wild. For all of the help I received applying, during and after this trip I am truly grateful.

Vast, diverse and inspiring: the three momentous factors that make the Taurus Mountains one of the most unimaginable places of beauty I have ever had the honour to visit. However I shall try and do it justice with this report and my photos. From my research of the Taurus Mountains when applying for the tour it was evident that Turkey was a genuinely remarkable place, in terms of culture, incredible terrain and extraordinarily diverse ecology.

Turkey is an important hot spot for biodiversity due to its geography, it lies between two major continents both with very different environmental pressures. On the west of Turkey is Europe; on the East is Asia. These two varied floras along with the addition of a very diverse and grand landscape throughout the country have led to great variability. Plus the effects of the two coastlines that Turkey has, along the north is the Black Sea, creating warm humid temperatures. Along the south is the Mediterranean Sea, known throughout Europe for its flora. Unlike most of Northern Europe which devastated by the last 'Ice Age' wiping out most of the endemic species, Anatolia (Turkey) is described as a 'Massif de refuge' meaning it wasn't affected by the last ice age, so mass extinction wouldn't have occurred, as in the glaciated areas. All these combination factors have lead to Turkey having over 9000 native species of wildflowers, which is more than the rest of Europe combined and over 30% of which are endemic to Turkey (Flora of Turkey, 2012). Many of the ornamental flowers we find in our gardens, parks and streets originate from Turkey. Plants including the Tulip (*Tulipa spp.*), Crocus (*Crocus spp.*), Snowdrop (*Galanthus spp.)* and the Lily (*Lilium spp.*). Turkey was where one of the first herbals 'De Materia Medica' was written by Pedanius Dioscorides in the 1st Century AD (Society for Medicinal Plants and Natural Product Research, 2011). Unfortunately conservation is in its infancy in Turkey, even with this abundance of interesting and exciting plants, over grazing and human effects are big issues.

As a small child I used to read or got read stories about adventurers and explorers, as I expect many young boys and girls did. Stories of great explorers like Captain Cook, sailing around the unknown world to discover lands for King and Country. More recently I have started to read about the plant hunters trying to make their fortune by travelling the world and returning with exotic and unusual plants for their sponsors. These men were celebrities of their day and deserved every bit of credit they got. Unfortunately those days are long gone, cheap travel and greater financial backing has lead to most of the plant species to be discovered, I was born 170 years too late to write my name in the history books of botany... or so I thought until I arrived in Turkey and met the Alpine Garden Society.

Termessos – +900 metres 5/4/2012

Turkey is layered with thousands of years of history and some of the oldest settlements originate around Antalya. The site is over 900 metres high and lies on top of the natural plateau of Güllük dağ (translates roughly to rose mountain) and is one of the finest remaining examples of an ancient city in Turkey. Termessos is now maintained as one of Turkeys National Parks due to its high level of biodiversity.

As you walk around this ancient city you really can grasp what it must have been like living in such a place, high up in the Taurus Mountains looking out on to the surrounding flatlands. These people did not just survive on top of these mountains they positively thrived, building Theatres **(Plate 5)** and Temples from the local rock. These structures were structurally sound and still held the same atmospheric effect they were built for over 2000 years ago. Termessos was abandoned in the 5th

century, being relatively undisturbed by shepherds and their goats, this has lead to the ancient city being full of interesting and unusual plants and animals.

The first treat of the day was on the drive up through the dense pine woodland, we could see pink reflecting back the light that was bursting between the thick canopies of the fantastic *Arbutus andrachne* with its smooth tan leather bark. Upon further inspection it was *Orchis anatolica* **(Plate 3 and 6)** in both its beautiful baby pink and pure white albino form. As the name suggests it is native to Anatolia. Maybe not the alpines we were looking for but after the previous days travelling we had experienced it was a pleasure to see growing in such a well suited position. Further up the route we saw lovely examples of *Daphne sericea* shrubs in flower lining the twisting road up to the park. On some of the lowland areas surrounding the foothills of the Taurus Mountains sections with large quantities of *Euphorbia characias* **(Plate 10)** meant that the area was heavily grazed by goats, allowing it to prosper, as the goats will not eat the plants containing the caustic, poisonous milky sap. Although *Euphorbia characias* is a pleasant looking plant, to me it represented what could have been, with the goats being the number one enemy to the floral diversity of Turkey.

Once we actually reached the site we saw plenty of other sumptuous specimens of the alpine plants, this is what we had travelled so far for. *Muscari armeniacum* **(Plate 39)** wasn't the rarest or even the most beautiful plant of the trip but seeing the plant grow in its natural environment with is deep lapis lazuli blue flowers just added that extra bit of spice to a formidable European garden plant. *Muscari armeniacum* must also take the title of the most common plant throughout the trip, but just proves how successful this species really is and why it is capable of naturalising so freely in other areas of Europe. *Muscari muscarimi* **(Plate 1 and 4)** was unfortunately not so common on our tour, the flowers however didn't have the aesthetics of the *Muscari* armeniacum but even with the modest colours the scent was so sweet it made up for its lack of aesthetic beauty. The name actually translates to the smell of Rome; the Romans clearly enjoyed this scent as much as the group did. *Cyclamen alpinum* **(Plate 12)** was also present amongst most to the overgrown areas amongst dense shade similar to in the UK.

Corydalis paschei was one plant we were very fortunate to find. This newly discovered species has only been found in two locations and fortunate for us Termessos was one of these. The pedicel is substantially longer than the bract; this is its key identification against other *Corydalis spp* .of which there is many found locally. The plant enjoys growing in leaf litter and light shade, so could be found underneath the deciduous *Quercus robur* trees. The small population we discovered would indicate these are particularly slow to germinate and spread.

My favourite plant of the area was the *Aristolochia lycica* **(Plate 2)** with its dark velvet flowers forming the shape of some elaborate ceremonial trumpet, whilst secreting a terrible odour that is meant to recreate the smell of rotten meat. All to allure small flies in to the tube, which eventually become trapped by small hairs within the tube which wither after a few days and release the pollen smothered flies to repeat the pollination process. What is not to love about these extraordinary adaptations this plant has evolved.

Top left – bottom right

Plate 1: (5/4/12) *Muscari muscarimi* growing on step scree slope.

Plate 2: (5/4/12) *Aristolochia lycica* abundant in its unusual dark flowers.

Plate 3: (5/4/12) The albino variety of *Orchis anatolica.*

Plate 4: (5/4/12) *Muscari muscarimi* with pollinated flowers, preparing to set seed.

Plate 5: (5/4/12) Huge theatre at the centre of Termessos, dating before Roman times.

Çomakli Pass – 1460 metres 5/4/2012

Travelling from Termessos to Acipayam we stopped off along the Çomakli pass. This was my first experience of serpentine soil types. The change from the green fertile abundant flora or the Termessos woods to the brown and sparse toxic outcrops of the pass was startling, and shows how quickly the landscape can change in the Taurus Mountains. There was *Pinus sp.* trees present but these were products of forestry rather than natural. Once we climbed higher up the serpentine slope we found *Juniperus oxycedru* and *Juniperus excels* but they had been clipped and dwarfed due to the constant nibbling of by goats. The area was very bare from the combination of heavy grazing and the potent serpenticular soils. Although some small *Hyacinthella heldreichii* had been found growing amongst the prickly *Juniperus spp.* and *Quercus ilex* bushes, this is where the goats refuse to chomp.

Acipayam- Mevlűtter – Road to Boz Dag Ski Centre 1230-1850metres 6/4/2012

The Hotel we are staying in is already higher than Ben Nevis.

Heading back out of Acipayam we drove past several small Chromium mines set into the hill side, this represents the high metal content that is present in these soils, making it toxic to most plants. With the exception of serpentine endemics which positively revel in the soil conditions and lack of competition. A beautiful example of this is the deep egg yolk yellow *Fritillaria serpenticola* **(Plate 9)**, this small delightful pendula flower is easy to spot because of the lack of competition, but tended to grow amongst rocky crevices protected from the high winds, with a north facing outlook. With such little vegetation around these areas they aren't as heavily grazed by the goats, allowing the plants that can survive these conditions to dominate. A prime example of this supremacy was the *Sternbergia fischeriana* **(Plate 13)**, both Rob and Rannveig had been to this site the previous year on the exact same date and not seen any signs of this plant, but this year there were glades of them. These were found at 1680 metres, this is extremely unusual for this plant as it is normally distributed around coastal lower altitudes, and it was brought up that this could potentially be a new species adapted for these more mountainous conditions.

With the extreme winter most of Europe had experienced plus the low air temperature in early spring the snow had taken longer to retreat up the mountain. This was a pattern found across the whole trip; plants we were expecting to see were not ready to flower for another few weeks. *Thlaspi sp.* flourished on the steep south facing scree slopes, the surface was difficult to move over because of the lack of adhesion between the aggregates. A soil like this would be very free draining and with little shade from surrounding trees the *Thlaspi sp.* must have survived on the huge quantity of snow melt flowing down the hillsides.

Many of the passes we travelled along would have originally been carved out by millions of years of snow melt creating these pathways between the mountains. Streams running along the tracks were a fantastic source of interesting flora, it required a sharp eye and plenty of concentration but the occasional splattering of pigment was visible from the bus. Unlike the surrounding steep gritty serpentine soils, the streams were surrounded by good old fashioned mud. The silty soil was full of organic matter which was presumably washed down the slopes into the river banks; this allowed for the delicate *Merendera trigyna* **(Plate 15)** to grow almost in the water of the stream, with its wedding dress white colour, it was a stark contrast to the surrounding scenery.

Top left – bottom right

Plate 6: (5/4/12) *Orchis anatolica* amongst the dappled shade of the pine forest at Termessos national park.

Plate 7: (6/4/12) *Crocus sp., Anemone blanda* and *Colchicum triphyllum* all lined in a row on top of Boz dağ.

Plate 8: (6/4/12) *Scilla bifolia* with a pollen covered bee doing his job.

Plate 9: (6/4/12) *Fritillaria serpenticola* with its egg yolk yellow flowers in their prime.

Plate 10: (5/4/12) *Euphorbia characias*, a sign of grazing in the area, as surrounding competition is eaten by the goats.

Crocus fleischeri **(Plate 11)***, C. biflorus subsp punctatus, C. baytopiorum* **(Plate 14)** and *C. biflorus* subsp *crewii* were also found further up the slopes above the river, with populations tending to be intermingled. To my untrained eye these looked very similar and with the genetic variability amongst the species I personally found them impossible to distinguish, but with the aid of Rob and Rannveig the differences were evident upon further inspection. *C. biflorus subsp punctatus* had a pale lilac/blue flower with darker speckling on outer petals. The *C. Fleischer* has snow white flowers with blood red styles. The pale blue of *C. baytopiorum* was the distinctive feature. Finally the *C. biflorus* subsp *crewii* looks very similar to the *C. fleischeri* but with the difference that it has blackish maroon anthers. All of these are distributed around the south west of Turkey.

Further up the road to the Boz Dağ ski centre at 1770 metres the soil conditions very rapidly became less serpentine and more limestone, once at 1850 metres there was very little signs of serpentine soil, this led to a change in flora. Beautiful *Anemone blanda* **(Plate 7 and 31)** of varying colours, shapes and sizes, plus the electric blue *Scilla bifolia* **(Plate 8)**, both grew well under the shade of weathered and unusual forms of *Juniperus sp.* trees. These also contained a parasitic plant called *Arceuthobium oxycedri*, this unusual growth was much more vivid green than the Juniper trees it hosted but had a very similar texture and aesthetic from a distance, without closer inspection these bundles of *Arceuthobium oxycedri* could have been mistaken for a plant in ill health rather than a parasite, as the parasite seemed to replace the leaves it defoliated. Another unusual site was *Viscum album* or the common mistletoe, this is not rare and its distributed all over Europe, but what was unusual was rather than growing on *Malus spp.*, *Tillia spp.* or *Populus spp.* as it does in the UK, it seemed to favour coniferous trees like *Cupressus spp.* and *Juniperus spp.*. I had no idea that mistletoe would take host on coniferous trees. With plenty of apple and poplar trees present it made me wonder whether it was the different climate that caused this different growth habits or the method of distribution by birds to effect which trees the plant grew on! Unfortunately I do not have an answer.

Signs of high winds were evident, as some of the larger pine trees had the tops blown over causing them to grow in an irregular fashion. Some of the taller *Pinus nigra* had similar shapes to *Cedrus labani*, due to the high winds causing flat branching structures creating a flat plateau commonly seen in Cedars. *Cedrus labani* is a common tree found in the Taurus Mountain range, due to its uses in construction it has been planted for thousands of years in the forests. The tree is more common in the Taurus mountain range than its native Lebanon, which it is named after.

Travelling up the pass the route was getting snowier, which was unusual at this time of year at a height of 1850 metres, until the pass was no longer drivable for the bus. At this height we had one final look, with the exception of more *Anemone blanda* not much else was found until I found a very small specimen of *Corydalis erdellii*, this is one of the first bulbs to flower after the snow has melted. With only one specimen found it was decided we were too high up in the snow level to find anything more interesting. Speaking to Bob and Rannveig on the return I discovered why plants struggled to grow through the snow, I had always presumed the cold temperatures would keep the plant dormant, not allowing vital chemical reactions to occur. This is not the case the plants actually have adapted to wait for the snow to melt, this is because microbes within the snow cause any new growth to become decayed and eventually die. Plants like *Primula vulgaris* and *Galanthus spp.* have adapted to be able to avoid this problem allowing them to get a head start over the surrounding foliage.

Top left – bottom right

Plate 11: (6/4/12) Utilising the shelter of the rock *Crocus fleischeri* basking in the Turkish sun.

Plate 12: (6/4/12) *Cyclamen alpinum* was abundant throughout the trip but found predominantly amongst limestone cracks in woodland habitat.

Plate 13: (6/4/12) The odd sighting of *Sternbergia fischeriana* found in its thousands on the serpentine slopes of Boz Dağ.

Plate 14: (6/4/12) The beautiful *Crocus baytopiorum* with its baby blue tones and a curious honey bee.

Plate 15: (6/4/12) *Merendera trigyna* emerging from the bank of the small snow melt river.

Acipayam- Yesilova – 1000 metres 7/4/2012

The first site of the day didn't look particularly promising, *Euphorbia rigida* although the plant is exquisite, with its half dome structure, uniform lanceolate grey/green leaves and the flowers which would be better suited at a rave with their lime green and vibrant orange tones. This common plant is a sign of goats. Fortunately for us and the diverse flora of Turkey the shepherds take the goats the more accessible routes, the goats also do not graze amongst the spiky undergrowth shrubs of *Juniperus sp.* and Q*uercus sp.*. First of all a tricky river crossing reduced the chance of goats getting to the flowers on the other side. The large quantities of low growing *Quercus infectoria* this added to the potential for the site. So we ventured across, with our heads down we scanned for anything amongst the oak scrub. The rock was very mixed as this was a river bed and conglomerate rock represented new mountains forming in this tectonic region. The flora was not very rich but we did manage to find the adorable *Crocus chrysanthus* **(Plate 19)**, *Gagea foliosa* which was at almost every site and the beautifully fragrant *Muscari muscarimi.* Each was nice to find on these tough, north facing and heavily grazed scree slopes and stood out like a glistening gem amongst the brown wasteland, but was nothing compared to the modest but graceful *Fritillaria sp.* **(Plate 17)**, the colours were subtle with a glaucous complexion to the leaves that twisted and pointed up like thin flames, the flowers were humble in appearance with a deep mauve colour surrounding the petal and a yellow green central stripe. As the flower aged the 3 outer petals would unfold and bend back towards the bud, creating this elegant shape. They all seemed to be situated on the north side of the oak shrubs, meaning they suited summer shade. Growing under the oak shrub meant the goats would not be able to graze them so easily but also was a yearly source of nutrients as the deciduous *Quercus* shrub dropped its leaves. According to our experts this *Fritillaria sp.* is new to science and we had discovered a new species. *Fritillaria assyrica ssp. melananther* is the closest relative but this is distributed around West Iran, which is roughly 1200 miles away.

Acipayam- Sagalossos ancient site Egirdir – 7/4/2012

On route to Sagalossus we stopped off along the Saldabeli Pass, West of Yesilova. At 1300 metres the snow had melted weeks earlier, but the area was heavily forested with clear signs of recent activity, with soil disturbance and mounding ready for new *Pinus sp.* saplings to be planted. With this process happening I had presumed that all the bulbs would have been damaged and died, meaning that there would be very few flowers to see, but actually it was the reverse. *Fritillaria serpenticola* could be seen rejoicing amongst and even on top of these mounds, with very little in the way of competition. Compared to the *Fritillaria serpenticola* **(Plate 9)** we had found at Boz Dağ, these were much more variable in flower colour, varying from deep purples, blood reds and oranges. Mottling of these colours over the base yellow meant that each flower was very unique **(Plate 22)**. This genetic variance would be because of the greater population, maintaining a large source of genetic variability on this site. *Fritillaria serpenticola* use to belong to *Fritillaria carica ssp. Serpenticola* but the vivid yellow was not found in *Fritillaria carica* so it became described as a new species.Sagalassos **(Plate 16)** is the ancient site of a Pisidian town, which has been developed and grown throughout many eras of history including the Roman Empire. The town is situated over 1500meters high and has only been excavated by Belgian archaeologists in 1990. The site had been left uninhabited since the seventh century (sagalassos.be, 2012). The rock is visibly whiter where it has been buried for hundreds of years and ancient theatres and market squares have been lovingly

Top left – bottom right

Plate 16: (7/4/12) Sagalossos market square, originally a Pisidian town, expanded by the Roman Empire.

Plate 17: (7/4/12) The new to science of *Fritillaria* found surrounded by low growing *Quercus infectoria.*

Plate 18: (8/4/12) Many nests were seen for cranes but this was the only bird we saw on the trip.

Plate 19: (7/4/12) *Crocus chrysanthus* standing proud in a small patch of light shining through the thick *Pinus sp.* canopy.

Plate 20: (8/4/12) *Crocus chrysanthus* x *biflorus* hybrids were found very rarely, the yellow from the *Crocus* chrysanthus and the purple mottling from the *Crocus biflorus* subsp *punctatus*.

Plate 21: (8/4/12) *Corydalis wendelboi* with its pedicel much shorter than the bract.

Plate 22: (7/4/12) *Fritillaria serpenticola* seen before but a purple speckling and rusting type appearance.

restored, with the process still ongoing. It was an important town for trade between Egypt and the rest of Europe, with the town being able to control the caravans running through the valleys below. This was an interesting historical site to visit; it was extraordinary how some of these structures were over 4000 years old and still looking the same as they would have all those years ago. Some bulbous plants were also found on the site *Gagea foliosa, Colchicum triphyllum* **(Plate 7)** and *Merendera trigyna*. These were found in and amongst busy pathways so it was nice to see these plants doing so well.

Egirdir- South of Ayvali 1175-1350metres 8/4/2012

With the season being so much later than normal most of the sites that we had planned to see would still be under snow, therefore meaning the plants would not be visible. This led to our guide and experts deciding to visit a site no one had been to before, this was obviously a risk but ended up being a risk well worth taking. Getting off the bus signs of bulbs were present, there were great big scrapes and overturned rocks in the saturated soil, these were boar marking as they had been digging for bulbs in the soil, their nose is much more sensitive than ours and capable of smelling the bulbs under the snow and soil. Travelling further up the mountain towards the snow line again the flora was becoming more and more interesting.

It started off with a trickle of small *Eranthis cilicica* **(Plate 27)** grouped together in the dappled shade of *Quercus cerris* growing amongst the leaf litter. We then came across the occasional *Ornithogalum cydni* and *Corydalis wendelboi* **(Plate 21)***,* both just coming into flower. As we ascended up the mountain the small groups of *Eranthis cilicica* we had seen below seemed insignificant as larger blooms mixed with *Crocus chrysanthus, Cr. biflorus* subsp *punctatus* and *Scilla bifolia* **(Plate 24)***.* These large swathes of various tones of yellow mixed with the vibrant blue of the *Scilla sp.* bouncing back at me in the gorgeous Turkish sunshine was a spectacle that could only be matched by what proceeded it. Climbing though limestone crevices to finally reach the snow line, vast floods of white flowers were present, most of which were *Galanthus gracilis* **(Plate 26)** just reaching their flowering maturity, they were bulging with life and the shaded steep north facing slope was exactly what they desired. Until seeing these in the wild I had never noticed the variability, the cultivated ones you see in the UK all seem very similar, but these varied in size, colour and shape. Amongst these were dove white *Anemone blanda*, only further around the mountain on the west slopes could I observe the more common blue flowers. The rocky limestone boulders provided shelter for the flowers to attain their maximum potential, and must have been a haven for any pollinating insects that were fortunate enough to stumble across it. This really was a spectacular site, it was totally undefiled by the influences of humanity, and it was as though this minute patch of ground had been there for millions of years, unchanged. Clearly the shepherds did not know about the area and I hope it stays that way.

Driving for several hours a day could have been a chore but the Turkish countryside is so full of life and unusual cultural and horticultural practices it was fascinating to watch. Venturing to areas where few tourists would have been before meant the locals looked upon us like aliens travelling past in the bus, but were always extremely polite, always offering directions for a next destination, even if they clearly did not know where it was. A large part of the Turkish economy depends on agriculture and in particular orchards. Most the orchard trees had a peculiar blue colour to the bark, this was a copper fungicidal spray they used which I had never witnessed before. Other practices

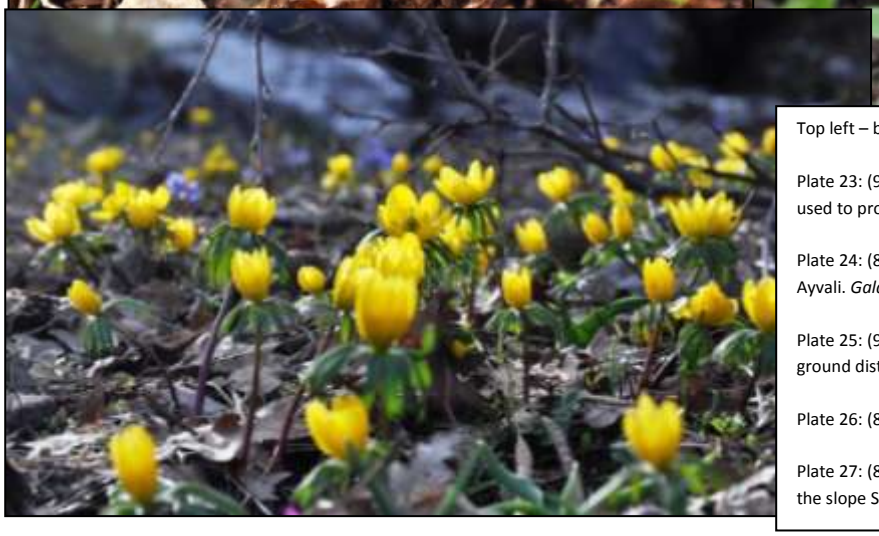


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Plate 23: (9/4/12) *Crocus chrysanthus* just about to flower, the sheath used to protect the leaves and flowers whilst emerging.

Plate 24: (8/4/12) The spectacular abundance of flowers found South of Ayvali. *Galanthus gracilis, Crocus chrysanthus* and *Scilla bifolia.*

Plate 25: (9/4/12) *Crocus biflorus* subsp *issauricus* growing amongst ground disturbed by boar.

Plate 26: (8/4/12) Prime specimens of *Galanthus gracilis* flourishing.

Plate 27: (8/4/12) *Eranthis cilicica* was found in big glades right across the slope South of Ayvali, enclosed by *Scilla bifolia, Anemone blanda*.

included painting the lower section of trunk on apples and cherry trees white, this was to reflect the heat so that the tree would not produce blossom too early and get damaged by late frosts, and the paint delayed the process by up to two weeks. We were even fortunate enough to see some remarkable wildlife along our trip, the most splendid of which was the *Upupa epops* also known as the Hoopoe. These unusual birds have an unusual arrangement of feathers on their crest which are very reminiscent of the punk rock Mohawk, unfortunately much too skittish to photographer on this trip. Found nesting around Turkey it has been noted that orchards are a common breeding ground for these unusual birds, this was apparent as we drove through these regions. The final curiosity noted while travelling across Turkey was small patches of *Populus alba* trees each in small clumps dotted around the landscape. When I asked Alper about this he explained it was a tradition to plant 21 White Poplar trees when a daughter was born, so when she grew up they would sell the wood and put the money towards a house.

South of Ayvali - Beyşehir 8/4/2012

In the afternoon we headed up the Vali Çesmesi Pass (the name translates to 'land of springs') managing to reach a height of 1810 metres. The flora was very similar to that seen earlier thriving off the snow melt of the pine forests. *Primula vulgaris* were a nice treat, along with *Colchicum szovitsii* and *C. triphyllum*. Travelling along the east side of the valley we came across an abundance of *Crocus chrysanthus* **(Plate 23)**, amongst these were *Crocus chrysanthus* x *biflorus* hybrids **(Plate 20)**. These hybrids stood out amongst the *C. chrysanthus* but what was unusual is that *C. biflorus* was not present, or at least not found, it was mentioned that the *C. biflorus* was not ready to flower so early in the season. This obviously raises questions as to how they would have got cross pollinated in the first place. *Crocus spp.* is rare to hybridise but does happen between these two species.

Beyşehir – Akseki 9/4/2012

Site one of the day was south of Űzűml and a known site for *Iris spp.* but the information was over 50years old. It had been described a haven for wildflowers, but upon arrival it was evident the combination of forestry and grazing had removed that prospect. *Arum sp.* were scattered amongst the oak scrub, these are another plant that the goats leave due to its toxicity. *Hyacinthella heldreichii* and *Muscari armeniacum* with their deep dark purples were also scattered around the site but in no great numbers.

Later in the day, south of Uğurlu (1450 metres) its undulating scenery and rocky pinnacles created habitats for small populations of plants. The flora was much the same as previous days, with *Crocus chrysanthus, Corydalis wendelboi* and *Anemone blanda* being the majority of the alpine plants found. With the exception of *Fritillaria pinardii* **(Plate 32)** being something different. With its broader leaves than other *Fritillaria* we had found it was quite distinctive. The flower was mostly red/purple on the outside and vibrant yellow inside, the dull texture to the petals did nothing to enhance the colour and made the flower tricky to find against the tree litter of surrounding *Quercus sp.* trees.

The afternoon was meant to be the highlight of the trip, a trek along the Irmasan Pass taking this beautiful historical route through the centre of a secluded *Abies cicilica* forest. This was unfortunately not an option; with the season being so delayed the pass was almost hip high in snow in areas making it difficult to move on, as to not miss out on this once in a life time experience we

Top left – bottom right

Plate 28: (12/4/12) Cedar forests NW of Akova, the Cedrus libani were bizarre shapes due to cutting by locals.

Plate 29: (9/4/12) *Crocus biflorus* subsp *issauricus* on the right with a hybridised *Crocus chrysanthus* specimen on the left.

Plate 30: (10/4/12) *Iris stenophylla* found in the car park of the Tinaztepe limestone caves.

Plate 31: (12/4/12) The variance of *Anemone blanda* across the trip was splendid, these small pink forms were found more commonly in some regions.

Plate 32: (9/4/12) *Fritillaria pinardii* with flowers that remind me of a brand of bacon flavoured crisps.

Plate 33: (9/4/12) Groupings of *Muscari neglectum* found along the Irmasan Pass.

scouted the area surrounding the bus. It was obvious that this was a truly wild region of Turkey, the trees were gnarled and twisted due to the high winds, fresh large mammal footprints were visible in the snow and very few signs of human influence, and this was one of the most untouched places I had ever been.

Fine specimens of *Muscari neglectum* **(Plate 33)** were on site, the flowers resembling a bunch of purple grapes, which reflects the common name for the plant of grape hyacinth. The flowers at the bottom are a much deeper purple than the pale lavender tones of the upper flowers. The lower flowers are the ones ready to be fertilised and progressively the upper flowers became open, as to extend the flowering season and the chance of pollination. These were found growing amongst the limestone rocks, in open areas away from the heavy shade of the *Abies* trees and are known to enjoy growing amongst grassland (Streeter et al, 2009). *Crocus biflorus* subsp *issauricus* **(Plate 25)** was another variety of *Crocus* that had hybridised with the *C. chrysanthus* **(Plate 29)** to make some interesting and colourful varieties but these were very few, with only two found.

The final stop of the day near Ibradi was an unusual and hostile site. Sharp intimidating limestone towers protruding from the ground created deep crevices and channels where millions of years of rainfall have carved routes through the rock creating bizarre pot holes, which would make an ideal bouldering venue. Plants were growing out of any nook and cranny. *Alkanna pamphylica* leisured in growing out of one of these pot holes and even somehow managed to avoid being grazed in its exposed spot on top of one of these limestone slabs. Tiny hairs cover the stems and leaves giving the plant an overall dull look, this makes the vivacious petite blue flowers stand out even more.

Akseki – Tashkent 10/4/2012

The first site along the Alacabel Pass was known to be covered in *Galanthus elwessii* and a wealth of *Crocus sp.* by Bob and Rannveig, but as we travelled up the route it was obvious that this wasn't to be, the ground was covered in nearly 60cm of snow, meaning nothing would emerging for at least another 2-4 weeks. To get round this we travelled 500 metres lower in altitude where the higher air temperature would mean the snow should already be melted. Due to the continuing snowfall even at the lower altitude it was decided that the local limestone caves would be a suitable shelter.

Luck works in mysterious ways, as soon as we had given up on finding any plants for the day and visit the caves a member of the group spotted some colour around the car park amongst small pine trees. The area was surrounded by small patches of open ground next to a river that had burst its banks. This was ideal territory for *Primula vulgaris* and was seen generally growing amongst the sodden river bank. Along with this we found *Galanthus elwesii*, this species looks very similar to *Galanthus gracilis* but has different leaves. The icing on the cake was seeing the elaborate *Iris stenophylla***(Plate 30)**, the German botanist Walter Siehe once described the colour as 'cobalt blue with a big violet blotch on the falls' (International Rock Gardener, 2010). Unlike the *Iris ssp.* we see in UK gardens which are tall and slender, with long flowering stems. These alpine species are dwarfed and barely total a height of over 10cm of which the majority of the height being the flower.

Tashkent – Ermenek 11/4/2012

South of Kazanci was our first stop with *Quercus coccifera* scrubland on limestone dominating the surrounding region. The *Viola kitabaliana* was an interesting find, with the flowers just a few

millimetres across it is a wonder how it ever gets seen by the pollinators amongst the grass swards. The pass we had to travel was at an altitude of 2000 metres and covered in snow; if we got stuck we would be in some serious troubles. Just before reaching the pinnacle of the pass the bus lost grip, and was skidding on the ice and snow, all respects go to the driver who came up with the plan to move everyone to the back of the bus to add weight on the rear tyres. The plan worked and we made it up and over.

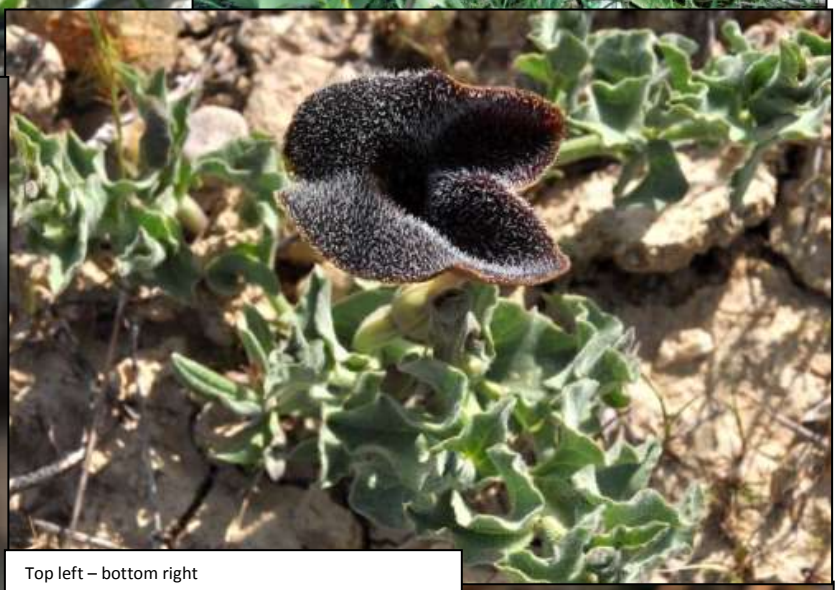
Ermenek - Aydıncık, S of Bozağaç 770 metres 12/4/2012

As we came closer to the coast our altitude dropped and the temperature became noticeably warmer and the threat of further snowfall became a distant memory as the sun cream was applied. *Orchis anatolica* was present growing in the midst of the *Daphne ssp.* shrubs that were heavily in their magenta blooms and swarmed with bees. The best plants in this area were the abundance of *Fritillaria ssp*.. *Fritillaria persica* **(Plate 35)** was unlike any we had seen on the trip, with its multiple flowers off one stem (6-20 fertile flowers on one stem), the colour was a dark deep mauve colour and rather than being a few inches the plant grew upwards of 60cm. These adaptations obviously were representative of its more sheltered habitat at lower altitudes. The *Fritillaria sororum* **(Plate 41)** was much more reminiscent of the *Fritillaria spp.* found in the more mountainous regions. The colours were very varied like the *Fritillaria serpenticola* but were generally less colourful, tending to favour more towards the greens, purples and browns. Some small markings on the inner petals reminded me of the marking of the *Fritillaria meleagris* which is found in the UK. It was a depressing site to see locals out digging up plants to sell in their small makeshift plant nurseries and highlights one of the other threats to the Turkish flora.

The comparison between the last two days had been bizarre. Living in the UK, a hot topic for conversation is always the weather and how readily it changes, I never knew how lucky we had it comparing it to the extreme weathers we had just experienced.

I have talked about the comparison in genetic variability but one thing I had never grasped before this trip was the visible difference in plants from the same species. I understand the theory of evolution; survival of the fittest is a logical concept in my eyes. Seeing these plants in the wild in such vast populations rather than in small groupings within a garden environment exaggerated the point. A prime case study was seen at the site between Gulnar and Mut. *Muscari armeniacum* originates from the south east of Europe (Streeter et al, 2009) and we had seen it flowering at nearly every site apart from serpentine soils. All of which had those bright blue flowers, with the exception of one. The flowers were white with a pink rose colour to the lower flowers **(Plate 39)** as they aged. This was an albino, a mutant, with only blue *Muscari armeniacum* surrounding it.

Pass between Gulnar and Ermenek was dominated by *Cedrus libani*. Being close to many small villages and towns the trees are commonly used for fire wood for the locals, this led to some astonishing shaped trees to from, as they only cut the lower and larger branches, causing twisted and mangled structures with huge decaying cavities filled with large stones and boulders **(Plate 28)**. I wish I knew why they did this but it was a very common practice and caused these prematurely aged trees. The ground flora was abundant with *Anemone blanda* but many more pink ones **(Plate 31)** than had been seen before.



Top left – bottom right

Plate 34: (13/4/12) *Tulipa armena* subsp *lycica* luscious raspberry red flowers emerging from the fragile step soils near Mut.

Plate 35: (12/4/12) The tall *Fritillaria persica* with its beautiful flower stalks, unlike any other Fritillaria we had seen on the trip.

Plate 36: (12/4/12) The spiralling twisted leaves of the *Fritillaria assyriaca* subsp *melananthera* and the modest tones of the flower.

Plate 37: (13/4/12) *Aristolochia sp.* with its freakish flower designed to lure unsuspecting flies to pollinate it.

Plate 38: (12/4/12) Frog found amongst apricot orchard near Mut

Plate 39: (12/4/12) *Muscari armeniacum* in its albino form, this being the only one seen on the whole trip.

Ermenek – Mut 13/4/2012

Travelling down into Mut we reached our lowest altitude for over a week (275 metres). The only signs of snow were on the surrounding mountains at much higher altitudes. We first looked amongst orchards surrounding Mut, although they had obviously been cultivated the sites were bountiful with flowers. *Muscari comosum* was the most impressive and varied so greatly from the *Muscari armeniacum* we had seen so abundantly but still possessed the vibrant blue colour to the flowers. The spindly form of the *Muscari comosum* **(Plate 42)** probably suited the lower more sheltered regions compared to the stockier *Muscari armeniacum*. This was the same with *Ornithogalum narbonnense*, the species found almost 1500 metres higher up were much more dwarfed with small flowering spikes in comparison. *Allium gayi* was another new plant we found amongst the orchard, it appearance was very similar to those found in gardens in the UK. The twisting coiled leaves offered as much to the beauty of the plant of the pastel purple petals.

The second site of the day was NE of Mut on a ridge 1420 metres towards Zeyker. The area was known for being very poor especially in Zeyker and signs of grazing were clear. The site was pretty much stripped bare except from the occasional nibbled *Juniperus sp.*. The site was known to have *Alkanna sieheana* but the chances of finding it were miniscule due to grazing. My short attention span got the better of me so I started to explore the small rocky cliff faces. This provided to be more bountiful than first thought. I had managed to find the tiniest and not so healthy looking specimen of the *Alkanna sieheana* we had been looking for. Even though this was never going to win a photography competition or even be a prized specimen it still evoked a small amount in pride that I had found this one example in such an obscure cubby hole in the limestone cliff away from the ruthless chops of the goats. I even managed to persuade John Birk to do some quite tricky climbing to get a view himself.

Our final stop for the day was on the way back to the hotel at Ermenek near Suçati and Evren (150 metres). Our first Tulip of the trip, *Tulipa armena* subsp *lycica* **(Plate 34 and 43)**, with its raspberry pigment decorated petals protruding from the surrounding baked sandy soil stood out like a bursting flare above a distressed ship at night. The rippled edges of the glaucous leaves made them easier to find even if they were not ready to flower as there was little competition from surrounding grasses. The north facing slopes were very loose and gritty, with signs of earth movement present due to heavy rainfall. Bob Wallis explained these are typical habitat for a *Tuipa spp.* and we had been unfortunate not to see more on other sites. *Aristolochia sp.* **(Plate 37)** with its dark brown colour and white hairs in the unusual shape of a disfigured ear, the plant looked like some bizarre prop from a cheap science fiction film. Also seen was the *Eminium rauwolfii* with its equally abnormal flowers, evolved to lure flies into the flower with its odour of rotting flesh.

Ermenek – Karaman 14/4/2012

We travelled over 155 miles along a pass that contained approximately 180 hairpin bends reaching an altitude of 1925 metres well into the snow level. We travelled through a village called Bakusan, which bizarrely translates to 'Honey Vomit' and makes reference to the quantity they produce in this region, and hives were littered over the slopes. We stopped at 1800 metres on north facing mountain slope below the snow melt. This site was perfect for the *Iris stenophylla* even though the site was heavily grazed they would grow under rocks and between low growing shrubs.






Top left – bottom right

Plate 40: (14/4/12) *Colchicum triphyllum* forming these small bouquets of flowers just below the snow melt.

Plate 41: (12/4/12) *Fritillaria sororum* with its large bell shaped flowers, reminiscent of the *Fritillaria meleagris* found in the UK.

Plate 42: (13/4/12) Tall and slender *Muscari comosum*, found amongst an orchard near Mut.

Plate 43: (14/4/12) *Tulipa armena* subsp *lycica* a typical bulbous monocot that western society has come to love. The free draining soil is ideal conditions for it.

Plate 44: (15/4/12) *Iris persica* found at one of the highest altitudes of the trip at the end of an extremely inaccessible road.

Plate 45: (15/4/12) *Iris danfordiae* found growing amongst small shrubs that had been destroyed by shepherds, creating the perfect ash back drop to these vibrant yellow flowers.

Karaman - pass above Maden 1700-2100metres 15/4/2012

The pass started at the bottom of a gorge carved out by millions of years of water running between the pinnacles of the surrounding mountains, the area was more populated than I had presumed, with orchards planted all around the banks of the river. The site we were going to was a Jim Archibald site. We stopped at the top of the pass at 1975 metres and walked up and down the surrounding open mountain slopes, the rock type was mainly limestone but other rock types were present in patches.

For some unknown reason small shrubs had been burnt to the ground by the shepherds**.** This left black piles of ash where these shrubs had once stood. Maybe it was to clear more areas for grazing, to provide a little bit of heat or even just because they could. Either way it worked fantastically for us to find the almost iridescent yellow *Iris danfordiae* on the backdrop of the black smouldered ash **(Plate 45)**. The Iris had obviously been protected from pasturing under the shrub. Even an amateur photographer like me could not take a bad photo of such specimens. The genus Iris is distinctive for having three sepals which droop down and called 'falls'. We managed to find one example which had four such falls a genetic abnormality that is rare but not unique within this genus **(Plate 47)** (Pers. comm. Rannveig Wallis).

Travelling down the gentle north facing slopes it became very boggy as the snow had only recently melted and was slowly flowing down the slope. This created very wet areas like huge puddles with very little flow. This saturation of the soil was obviously a prime habitat for the huge sheets of *Colchicum triphyllum* **(Plate 40 and 50)**, there were thousands some stood individually and others bunched together like pink marshmallows thrown across the slope. *Muscari azureum* **(Plate 48)** was another new plant we had found, that grew on these embankments, but generally out of the sodden snowmelt puddles. The flowers were delicately small with two shades of light blue striped like a stock broker's shirt.

Moving around the mountain we looked at the south facing slopes as well, these were much drier with no remaining snow, and were sheltered by the opposing mountains. This was where we discovered a small patch of *Iris persica*. In appearance it looks very similar to *Iris stenophylla* being only a few inches tall, but rather than the blue /purple tones to the *Iris stenophylla* the *Iris persica* **(Plate 44)** is more mauve, brown to yellow, which looked almost golden in direct sunlight. This made spotting them extremely tricky on the clay soils.

Ala dağ 16/4/2012

Ala dağ **(Plate 46)** translates to 'superb mountain' and the highest point is 3756 metres. The region is one of the Turkey's hot sports for climbing especially with British servicemen based at Cyprus. We were dropped off at Demirkasık Mountain hut which was the current home for women and children homeless because of the earthquakes destroying their homes in the east of Turkey, the children came out and were intrigued with what we were doing. Walking up I reached an altitude 2400 metres. This was totally futile as the snow was much too deep to find any plants coming through and was thigh burning work, but was worth it for perfect silence with only the occasional bluster of wind to keep me company. I joined back up with the group at roughly 2100 metres.

Top left – bottom right

Plate 46: (16/4/12) The amazing sight Ala dağ mountain range from our traditional Turkish cottage in the setting Turkish sun.

Plate 47: (15/4/12) The *Iris danfordiae* with its rare mutation of four falls, a rare but not unique feature of the Iris genus.

Plate 48: (15/4/12) *Muscari azureum* with its pinstriped shades of baby blue. The photo also shows how bulbs grow amongst the spiny thorns of low growing shrubs as shelter from the menacing mouths of goats.

Plate 49: (16/4/12) *Scilla ingridae* has a similar colour scheme to the *Muscari azureum* (plate 42). Bees were found pollinating these flowers even at nearly 2000m.

Plate 50: (15/4/12) *Colchicum triphyllum* on a gentle slope near pass on pass above Maden. The areas was filled with thousands of them. Much more abundant than anywhere else on the trip.

Plate 51: (16/4/12) *Scilla ingridae* was the reason for walking up Ala dağ. Found in big patches, mostly in west facing cracks between the limestone rocks away from very strong winds, the flowers would all be worshiping the sun, facing the same direction.

The hike up was well worth the effort to see the large quantities of *Scilla ingridae* **(Plate 49 and 51)**. Being so high up snow was still present on the north facing slopes so we were finding the *S. ingridae* more common on the west facing slopes, they were sheltered from high winds and the strong sunlight but the snow had disappeared. They had similar pigmented flowers to the *Muscari azureum* seen before. The dark blue anthers were covered in pale grey pollen which you could see covered over the bees in the area. Two yellow Crocuses were found on the mountains as well, both looked similar but *Crocus sieheanus* **(Plate 52)** was bigger than the other (one member of the group even described the plant as having a Marilyn Monroe waist). The other was *Crocus danfordiae* which only had flowers half an inch high. On the decent down to the bus we found some of the best examples of *Anemone blanda* we had seen on the whole trip, they were the best specimens seen, with some of the largest flowers and brightest colours.

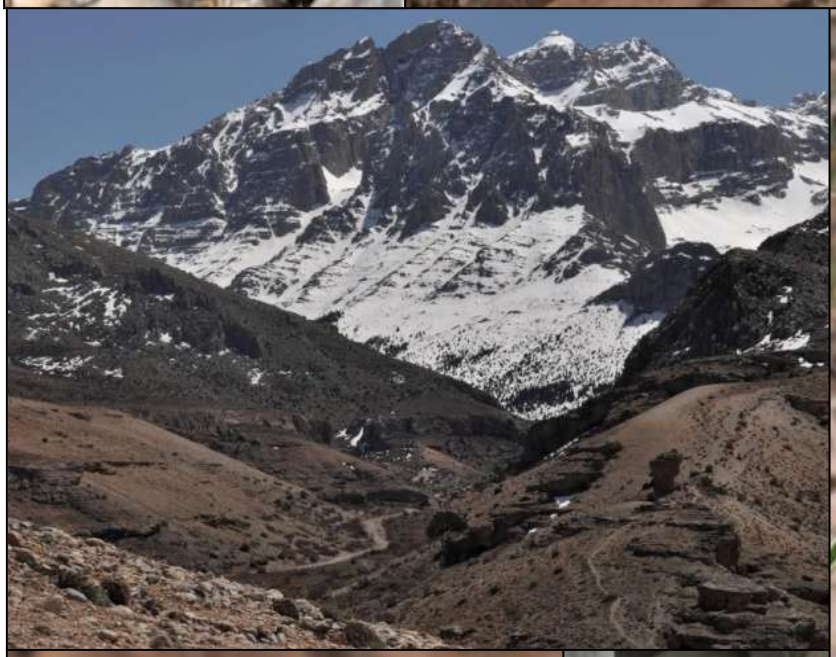
Ala dağ, Emli Valley South of Çukurbağ 17/4/2012

Emli valley **(Plate 54)** is a famous part of the Taurus Mountains due to the rare amount of biodiversity and for its natural beauty. The valley itself it is also just 10km south of the site we visited yesterday. This brings in many tourists to the area, unlike most of the other areas we had visited. The area has now been declared as a National Park of Turkey. Even still the route into the valley was not accessible by our bus; this meant we hired a tractor to take us. The valley is surrounded by mountains all over 3500 metres and the valley would have originally been a riverbed, which is visible with the wear and damage on the limestone cliffs when entering the valley. The path through the valley was scattered in beautiful waterfalls running down the amongst the *Abies cilicica* woodland. Much of the flora was similar to yesterday but was much more abundant. *Crocus sieheanus* and *Crocus danfordiae* were found in much bigger groups and were mingled amongst each other making it easier to compare the two species.

Red Valley, Cappadocia 1250 metres - The return home18/4/2012

Cappadocia **(Plate 53)** is one of these places unlike any other in the world, with local communities literally carving their existence into the soft sandy rocks. Everything from homes, shops, places of worship **(Plate 57)** and plenty of pigeon coops were all dug into the rock by hand, with extraordinary detail and precision. The word Cappadocia originally comes from Persian and translates to 'The land of beautiful horses'. The unusual thing about this valley is the quantity of pigeon coops that were purpose built, many having hundreds of cubby holes for the birds to roost, today we view pigeons as a pest for munching on the leaves of our vegetables, but years ago they had a value for producing large quantities of important guano to be sold as fertiliser. The soils around Cappadocia are very sandy and low in organic matter to retain the structure, so pigeon waste was added to improve the soil for agriculture.

With the site being such a busy tourist site, with people wanting to see this unusual collection of buildings I doubted the flora would be anything other than the occasional patch of grass, but amongst some of the more secluded areas of the valley we did find *Iris caucasica* **(Plate 55 and 57)**. Its opaque and discrete light green petals with a central splash of tennis ball yellow to direct the bees towards the pollen, were no more than 20 cm high, standing proud of the multiple arcing leaves folded in on itself and marked on the edge of the leaves by a single white strip. This was the last plant of the trip but certainly a case of 'last but not least'.



Top left – bottom right

Plate 52: (17/4/12) Two *Crocus sieheanus*, one flowering and one emerging protected in the sheath. Very similar to *Crocus chrysanthus* in terms of colour but *Crocus sieheanus* is smaller and has a waist.

Plate 53: (18/4/12) Red Valley, Cappadocica. Peoples homes carved into the soft volcanic rock.

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Plate 55: (18/4/12) *Iris caucasica* found amongst the Red valley. The white stripe along the edge of the leaf is very visible against the glaucous tones.

Plate 56: (18/4/12) *Iris caucasica* is more subtle than other Iris we had seen with the petals being slightly opaque.

Plate 57: (18/4/12) Inside an old monastery in Cappadocica. All hand carved into the rock.

Travelling back is an experience I am not likely to forget in a hurry. The winds were high and even the modern airport was struggling to cope in these conditions never mind the planes. The turbulence immediately after takeoff was the scariest part and felt like gravity had decided it wanted us back on terra firma. This made the plane full of Japanese tourists scream like something out of a cheap Godzilla film but apart from that the rest of the journey was humour free. It was sad to leave such an amazing group of people and such a beautiful country but I was happy knowing that I had the pleasure of experiencing such a fantastic opportunity and that was good enough for me.

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Plate 57: (18/4/12) Inside an old monastery in Cappadocica. All hand carved into the rock.

References

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