

A New Record: *Cyclamen Persicum* Mill. var. *Autumnale* Grey-Wilson was Added to the Native Lebanese Flora

Khodr Addam^{a*}, Mohammad S. Al-Zein^b, Mounir Bou-Hamdan^c, Hala Naous^d

^{a,d}*Faculty of Business Administration, Research department, Arts, Sciences and Technology University in Lebanon, AUL*

^b*Faculty of Science, American University of Beirut, AUB*

^c*Clinker Production Unit at Lebanese Cement Factory, LCF*

^a*Email: draddam@hotmail.com*

^b*Email: msalzein@gmail.com*

^c*Email: mounirbouhamdan@yahoo.com*

^d*Email: halanaous@hotmail.com*

Abstract

Cyclamen persicum var. *autumnale* Grey-Wilson was observed to thrive in abundance in the village of Bchamoun, Lebanon. The plant was re-described and illustrated. Morphologically, this variety closely resembles *Cyclamen persicum* Mill. But it differs in some taxonomic and other details, such as smaller flowers and leaves, growth of flowers before leaves, and very early flowering (in Autumn) for a short period.

Key Words: Primulaceae; *Cyclamen persicum* Mill. var. *autumnale* Grey-Wilson; taxonomy; biodiversity; flora; Lebanon; Mediterranean.

1. Introduction

Although the land area of the Mediterranean basin is only 1.5% of the earth's land surface, its flora includes more than 25,000 species of flowering plant [1], which is approximately 10% of all known flowering plant species on earth [2]. Lebanon is one of the richest Mediterranean countries in its flora. In the sixties Lebanon was labelled worldwide as 'Green Lebanon'. This is due to the forests that cover this small country (total area of 10,452 km²).

* Corresponding author.

Relative to its small size, Lebanon has one of the highest densities of floral diversity in the Mediterranean basin (more than 80% of plant species in Lebanon are terrestrial). Lebanon also is highly mountainous with a natural environment, mosaic of biotopes and typical Mediterranean climate [5,6,7]. There is no exact calculated new number of the Lebanese floral varieties, but certainly there are already more than 3150 plant species. This large number of wild plants is due to its geomorphology (five geomorphological regions) and microclimates that boast their biological wealth and survival. Moreover, Lebanon hosts a lot of rare endemic Mediterranean species, which makes it one of the world's most phenomenal spots for conservation [8]. Mount Lebanon area (where *Cyclamen persicum* Mill. var. *autumnale* was found) is noted as a "regional hotspot". It is remarkable that endemism in this region increases with altitude, which explains the very high levels of endemism among plant species in the Mount Lebanon chain [4,9,10,11]. The family Primulaceae includes twenty-three species of the genus *Cyclamen*. Their distribution in the wild is most concentrated in the Mediterranean, Western Asia, parts of North Africa and Europe. The name *Cyclamen* comes from the Greek *kyklaminos*, meaning circle. It may be a reference to the spiraling habit of the seed stem or the round corms. It is thought that some species in the wild around Palestine and Syria brought to west Europe in the 17th century, were distributed in France, Belgium, England, Holand (Netherlands) and Germany. *Cyclamen persicum* is the only one species distributed these days as a garden cultivar, although many species exist in the wild like *Cyclamen repandum*, *Cyclamen coum*, *Cyclamen cilicium* and *Cyclamen persicum* [12].

The presence of *Cyclamen coum* Mill. Figure (1,a), *Cyclamen persicum* Mill. Figure (1,b) and *Cyclamen libanoticum* Hildebr. in Lebanon was mentioned by Dr. Paul Mouterde, Dr. George Edward Post, Georges and Henriette Tohme [13,14,15].

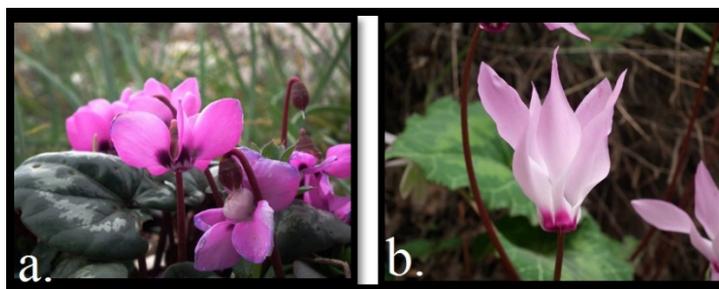


Figure 1: *Cyclamen coum* Mill. and *Cyclamen persicum* Mill.

In addition to the kinds of *Cyclamen* mentioned above, Mouterde highlighted the presence of *Cyclamen persicum* Mill. var. *autumnale* Wilson Grey Figure 2. in 1966 without knowing that it was a new species and considered it *Cyclamen persicum* Mill. He said that the flowering of *Cyclamen persicum* was observed from the second half of October and lasted until May, with apparently two maxima, one in autumn in late November and another in February and March. In the one that blooms in October-November, sometimes the flowers precede the leaves [13].

It is now clear that he was talking about *Cyclamen persicum* Mill. var. *autumnale* Wilson Grey. This was about thirty years before it was published by Christopher Grey-Wilson for the first time [16].



Figure 2: *Cyclamen persicum* Mill. var. *autumnale* Grey-Wilson.

The classification of Grey-Wilson in 1997 for various taxa is based on the flowering period and petal color:

Cyclamen persicum

Cyclamen persicum var. *autumnale* (flowering in autumn. Figure (2, 7).

Cyclamen persicum var. *persicum* (flowering in winter and spring, all of range) Figure (3,4).

Cyclamen persicum var. *persicum* f. *persicum* (white to almost pale pink) Figure (3).

Cyclamen persicum var. *persicum* f. *albidum* (pure white) Figure (4,a).

Cyclamen persicum var. *persicum* f. *roseum* (rose to pink) Figure (4,b,c,d).

Cyclamen persicum var. *persicum* f. *puniceum* (red to carmine) [17]



Figure 3: *C. persicum* var. *persicum* f. *persicum*



Figure 4: *C. persicum* var. *persicum* f. *albidum* (a), *C. persicum* var. *persicum* f. *roseum* (b,c,d).

2. Materials and Methods

Around 100 *Cyclamen persicum* var. *autumnale* varieties were found by Dr. Addam at 9/XI/2003 in Bchamoun (western slopes of Mount Lebanon), but they were not identified as *Cyclamen persicum* var. *autumnale*. Two years later the research team observed that the flowering time of this cyclamen was about one month before the blooming of *C. persicum*. Another interesting and significant observation was the absence of the leaves during the bloom (the flowers bloom before the leaves). The serious taxonomic and chorological study started after eight years (2011) and the plant was closely monitored. At the beginning, the team thought it was a new species due to lack of information about it; even the description they found about it later was very limited.

2.1. Taxonomy and observation

Detailed taxonomic description of the plant was developed by Mr. Al-zein and Dr. Addam and for the first time this variety had a full description for every tiny detail. Mr. Bou-Hamdan followed the process of identification from the beginning to the final confirmation. *Cyclamen persicum* Mill. var. *autumnale* Grey-Wilson. is still growing safely in the place it was found in and the team found more of it in nearby places in 2016. The team think that the number may soon increase because the search for this rare *Cyclamen* will continue.

2.2. Voucher specimen

A voucher specimen (dried material) of the flower was deposited in the Post Herbarium (BEI) American University of Beirut and collected by Dr. Addam at 31/X/2015, collection number (Addam 5). The existing herbarium material was examined and identified and its distribution recorded. Figure (5).



Figure 5: The dried herbarium material.

2.3. Pictures

All pictures were taken by Dr. Addam and Mr. Bou-Hamdan.

3. Results and Discussion

Cyclamen persicum Mill. var. *autumnale* Grey-Wilson was added for the first time to the flora of Lebanon in this study.

C. persicum var. *autumnale* can be identified by the following key:

- Flowering time is one month before the blooming of *C. persicum* var. *persicum*. ----- 1.3 -- 2
- The flowers bloom before the leaves. ----- 1.3 -- 2
- The flowers are smaller and Pedicels are shorter. -----1.3 -- 2
- Grows in tight places between the rocks. 1.3 -- 2

3.1. Species description

1- Morphologic description of *Cyclamen persicum* Mill.

Numerous flowers, individual stalks 10-23 cm long or more with five almost erect petals on top. The flowers vary from pure white to deep red, pink, mauve and purple with a deep pink or crimson-magenta zone at the base of each petal. The flowers' stalk rises among leaves (5-10 cm) that are marked in silver. The long leaf-stalks rise directly from a corky, flattened tuber of the plants. Figure 3 [17].

2- Morphologic description of *Cyclamen persicum* Mill. var. *autumnale* Grey-Wilson.

Plant, perennial, 11.00-14.00 cm in height. Tuber globose, its shape mostly determined by the shape of the rocks surrounding it, dark brown to greyish brown, ca. 5.50-6.00 cm in diameter Figure (6,d), rooting from the lower surface. Roots unbranched, often covered with mucilage, growing into very shallow, uncompact soil and sometimes penetrating cracks in rocks. Figure (6,d). Leaves thick, forming a sparse rosette; cordate, sometimes elongated; margin serrate, the teeth round, yellowish-orange and very close to each other; lamina 2.20-3.40 cm long, 2.00-2.40 cm wide. Figure (6,b). Pedicels erect to ascending; dark cream at the base, becoming greenish at the surface of the soil and dark brown towards the middle, the upper half reddish brown darkening towards the flower; curving at a right angle in flower and fruit, the curved part more fuzzy; 3.75-5.60 cm long, greenish grey at the base, lighter towards the top. Figure (6,b). Flowers appearing in autumn (Oct - Nov), less crowded than in *C. persicum* var. *persicum*; calyx campanulate with reflexed lobes, greenish brown at the base, grey green with greenish brown to brown longitudinal veins; the lobes triangular, greenish grey towards the base and lighter towards the tip, greyish (yellowish) white to pure white at the margin; ca. 0.40 x 0.30 cm; corolla 5-merous, white, light pink or deep pink, darker (sometimes magenta) towards the mouth and fading into the petal lobes;

veins greenish-purple, brownish and prominent inside the mouth, and blurred, sometimes barely visible in petal lobes; petal lobes elliptical, sometimes elongated but not arrow-like, twisted, 2.3-3.6 long , ca. 0.22-0.35 cm wide at the mouth, 0.66-1.10 cm at maximum width; mouth (opening of the corolla) 0.65-0.70 cm wide; stamens 5, purple, with a yellowish orange margin, adnate to corolla, the anthers 0.40-0.50 cm x 0.12-0.14 cm; ovary superior, 5-carpellate; style purple, the uppermost part white, 0.40-0.60 cm long. Figure 7,6 – a,c.

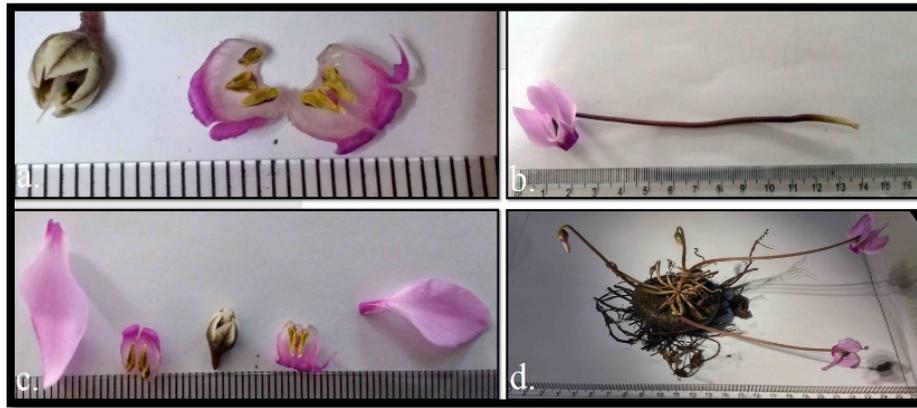


Figure 6: Cyclamen persicum var. autumnale flower parts variations.



Figure 7: Cyclamen persicum var. autumnale flower viewed from all around.

3.2. Phenology

From the beginning of October (depends on the rain fall) to the end of November.

3.3. Habitat

Perennial flowering herbaceous plant growing from a tuber, native to shrub land rocky hillsides, and under pine trees. Figure. (7,c).

3.4. Distribution and Location

Western slopes of Mount Lebanon Range, Bchamoun (N 33, 46, 385 EO 35, 31, 129, 434 m alt., N 33, 46, 383 EO 35, 31, 132, 440 m alt., N 33, 46, 414 EO 35, 31, 107, 445 m alt.), located in the_Qadaa of Aaley , an

administrative division of the Mohafaza of Mount Lebanon, 18 km from Beirut. Figure (8) [18].

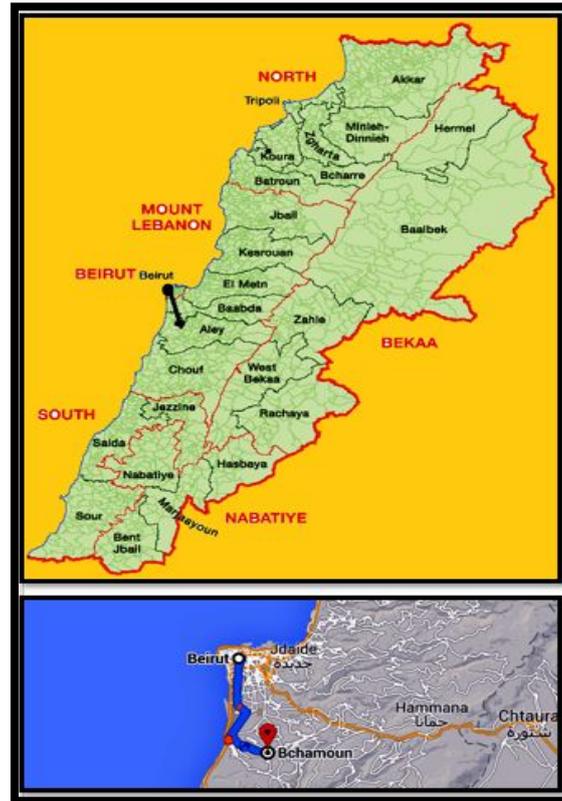


Figure 8: Distribution of *C. persicum* var. *autumnale* in Lebanon.

4. Discussion

The flowering time of *Cyclamen persicum* var. *autumnale* which is one month before the blooming of all other cyclamens and the blooming flowers before the leaves differentiate it from all other cyclamens that grow in Lebanon. The small flowers and short pedicels and the growth between the rocks only are two more additional characteristics that makes this variety more unique.

4.1. Recommendations

This *Cyclamen* variety is very rare worldwide, but even though it was found in fair abundance (more than 100 varieties) it is in big danger in Lebanon. The process of fast urbanization in the region it was found in might soon lead to the extinction of this flower, but so far *Cyclamen persicum* Mill. var. *autumnale* Grey-Wilson. is still growing safely it was discovered and we found more of it in other places nearby in 2016. We think that the number may increase more soon because the search for this rare *Cyclamen* will continue. The Conservation Status of this variety is very critical so it is viewed by the team as endangered and very rare, and should be classified as Critically Endangered (CR B1ac (ii, iv) [19].

5. Conclusion

All the explanations and data that were mentioned above (taxonomy, observation, morphologic description and phenology) confirms that a new record *Cyclamen persicum* Mill. var. *autumnale* Grey-Wilson is added to the Lebanese native flora.

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