

MEDEDELINGEN VAN DE LANDBOUWHOGESCHOOL
TE WAGENINGEN/NEDERLAND – DEEL 50, VERHANDELING 2

TAXONOMY AND NOMENCLATURE
OF CYCLAMEN

BY

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H, VEENMAN & ZONEN – WAGENINGEN – 1950

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*Publicatie no 87 van het Laboratorium voor Tuinbouwplantenteelt
der Landbouwhogeschool, Wageningen*

(Received 27.I.'50)

I. INTRODUCTION

When in 1946 at the Horticultural Laboratory research on *Cyclamen* was started under direction of Prof. Dr Ir S. J. WELLENSIEK, part of the elaborate working project was the assembling of all the botanical species of the genus. The purpose was to ascertain whether forms existed which deserved to be more generally cultivated, or which possessed characteristics worthy of being crossed (if possible) into the cultivated forms of *Cyclamen*.

As far as these wild forms are in cultivation, they were obtained from bulbgrowers firms, while others were received from botanical collections in various countries, but in the mean time we tried to get as many species as possible from the natural habitat.

When the collection grew, it became evident that the nomenclature of the species especially was in a chaotic state in this genus; moreover, the three monographs on *Cyclamen*, published by HILDEBRAND (1898), SCHWARZ (1938) and GLASAU (1939) respectively, did not agree as to the taxonomical division of the genus. Research had to be done to solve two questions:

- 1) What is the most practical taxonomy;
- 2) Which are the names of the different forms according to the International Rules of Botanical Nomenclature. Up till now only SCHWARZ had tried to solve the latter problem, but he did not completely succeed in clearing the mess.

It was not our intention to write a monograph on *Cyclamen*, as the main purpose of the research on this laboratory lies elsewhere. In this paper we intend to give a short general survey of the genus, and to treat in detail only those species which give difficulties as to nomenclature or taxonomy.

2. SURVEY OF THE GENUS

According to HILDEBRAND there are twenty four species of *Cyclamen*; SCHWARZ reduced this number to thirteen, but GLASAU extended it again to seventeen. The morphological differences between the species are rather small; LINNAEUS, who knew about six of our present species, recognized but one.

SCHWARZ, however, divided the species into two sections: *Psilanthum* with smoothly reflexed corolla-lobes, and *Auriculatum* with corolla-lobes which are „eared” at base. Both sections are divided into subsections and these again into series. SCHWARZ apparently did not notice, that in the well-known *C. europaeum*, which usually has smooth corolla-lobes, forms occur in which these are eared. This of course greatly reduces the practical value of his division.

GLASAU divided the species into groups according to number and size of the chromosomes. These undoubtedly are important diagnostic characteristics, but as the only standards for a division they are unpractical. Dr I. DE HAAN has started

a cytological investigation of our *Cyclamen* collection and he will publish his results later. We will not try to group the species into named sections, but sum them up in a more or less arbitrary order of succession, placing, however, those that are closely related next to each other.

In the short description we intend to give the essential characteristics. Names and numbers of the colours are given according to the Horticultural Colour Chart, issued by the BRITISH COLOUR COUNCIL in collaboration with the ROYAL HORTICULTURAL SOCIETY.

Species which are treated in detail in the next paragraph are not fully described in this survey.

Of the sixteen species to be mentioned, eleven are at this moment in cultivation at the LABORATORY OF HORTICULTURE. Of five of these species the material was collected at the natural surroundings, namely of *C. repandum* (Italy), *C. europaeum* (Haute Savoie, Switzerland, Italy), *C. neapolitanum* (Italy, Greece), *C. graecum* (Greece) and *C. persicum* (Cyprus, Palestine). We do not yet possess plants of *C. Rohlfsianum* and the two new species of GLASAU.

Cyclamen balearicum WILLK. Leaves cordate, basis lobes not overlapping, entire. Flowers in spring, scented; calyx-lobes in length about $\frac{3}{4}$ of the corolla-tube, 1-nerved, ovate, almost entire, brownish; corolla-tube globose, lucid; lobes ovate, serrate, white with fine lilac streaks; anthers with white glands; style about as long as corolla-tube. Balearic islands; according to GLASAU also near Nimes in Southern France. The dwarf of the genus; the flowers are small and inconspicuous, the ornamental value is slight.

C. repandum S. & S. Fully described on p. 22. Leaves cordate, thin, with large mucronate teeth. Flowers in spring, almost scentless, beautifully purple (roseine purple 629), or completely white. Mediterranean basin from France to Greece. A highly ornamental species, but flowering rather late.

C. libanoticum HILDEBR. Leaves cordate, basis lobes not overlapping, entire or with a few broad teeth. Flowers from January onwards, almost scentless; calyx-lobes as long as corolla-tube, lanceolate-triangular, 3- to 5-nerved, entire, brown; corolla-tube campanulate, lucid; lobes ovate, pink (mallow purple 630/2) with red spot at base; anthers yellow; style as long as corolla-tube. Syria.

Showy plant, but not as elegant as some other wild species.

C. pseudibericum HILDEBR. Leaves cordate, dentate. Flowers in winter, scentless; calyx-lobes about half as long as corolla-tube, 1-nerved, lanceolate, entire, brownish; corolla-tube white, rather narrow, urceolate; lobes orchid purple (31/1) with large almost black spot, white at base; anthers yellow; style almost as long as corolla-tube. Only one spontaneous plant known, collected about 1897 near Smyrna. Beautiful species with striking violet flowers.

C. cilicium BOISS. & HELDR. Leaves cordate to reniform, entire. Flowers in autumn, scentless; calyx-lobes half as long as the corolla-tube, 1- to 3-nerved, lanceolate, entire, brown; corolla-tube urceolate with narrow mouth, white; lobes obovate, almost white with an orchid purple 31 spot at base; anthers yellow; style shorter than corolla-tube. Southern Turkey (Cilicia and Anatolia).

Small plant with elegantly shaped but rather pale flowers.

C. orbiculatum MILL. Fully described on p. 23. Leaves cordate to reniform, undulate or entire. Flowers in winter, scentless; corolla-lobes not twisted but more or less folded, roseine purple (629) to white, with dark spot above the mostly white base. Bulgaria, Northern Turkey, Caucasus, Southern Turkey.

Well-known species, flowering profusely in winter with bright but small flowers. *C. europaeum* L. Fully described on p. 26. Leaves bluntly cordate, entire or minutely dentate. Flowers in summer and autumn, scented; corolla-lobes pink to purple (orchid purple 31/1 to 31/2) with darker spot at base. Central Europe. Leaves more or less evergreen, flowers strongly scented; otherwise of no particular ornamental merit.

C. neapolitanum TEN. Fully described on p. 27. Rooting from the upper side of the tuber. Leaves very variable, hastate to cordate, more or less lobed, dentate or entire, often beautifully marked. Flowers in autumn, almost scentless; corolla-lobes eared at base, lilac to white with darker spot at base. Mediterranean basin from France to Western Turkey.

Valuable species with very elegant flowers and beautiful leaves.

C. africanum BOISS. & REUT. Leaves cordate to reniform, large, coarsely dentate, often not marked above, shiny, green beneath. Flowers in autumn, scentless; calyx-lobes half as long as corolla-tube, 1-nerved, lanceolate, entire; corolla-tube campanulate, white; lobes obovate to lanceolate, eared, light pink with purple spot at base; anthers yellow; style somewhat longer than corolla-tube. Algeria. Formerly fairly often cultivated, but of no particular merit.

C. cyprium KY. Leaves cordate, often sharply dentate. Flowers in autumn, scentless; calyx-lobes about half as long as corolla-tube, 1-nerved, lanceolate, undulate or entire; corolla-tube campanulate, white; lobes lanceolate, serrate at the top, eared at base, white with purple spot; anthers yellow; style about as long as corolla-tube. Cyprus, Cilicia.

C. graecum LK. Bark of tubers fissured into broad flakes. Leaves cordate, dark green, papillate on the upper side, minutely cartilaginous-crenate to entire. Flowers in autumn, scentless; calyx-lobes half as long as corolla-tube, 1-nerved, lanceolate, entire, brown; corolla-tube urceolate, lucid; lobes narrow, obovate, eared, lilac (mallow purple 630/2 to 630/3) with orchid purple 31 spot at base; anthers dark violet; style somewhat shorter than corolla-tube. Greece, Crete. Species with beautiful leaves and elegant flowers, but in our experience it rarely flowers and does not give seed in cultivation.

C. persicum MILL. Leaves cordate, cartilaginous-dentate to crenate, mostly green beneath. Flowers in winter, scented; calyx-lobes as long as corolla-tube, 1-nerved, ovate, dentate, greenish brown with white margin; corolla-tube broadly urceolate, lucid; lobes lanceolate, pink (mallow purple 630/2) to white with mallow purple (31/1) spot at base, anthers dark violet; style about 2 mm longer than corolla-tube. Crete, Rhodos, Cyprus, Cilicia, Syria and Palestine; not in Persia!

C. Rohlfianum ASCHERS. Leaves reniform, lobed, dentate, often not marked above, green beneath. Flowers in autumn, scented; calyx-lobes ovate, cuspidate, 3-nerved, entire; corolla-lobes oblong, minutely eared, purple; anthers exerted; style about 2 mm longer than anthers. Lybia.

One of the most interesting species, but apparently very difficult to grow.

In 1939 GLASAU described two new species. The first is *C. numidicum* from Algeria. Leaves cordate, lobed, not marked above, green beneath. Flowers in autumn, scented; corolla-lobes eared, oblong, pink with purple spot at base. Apparently closely related to *C. africanum*. The second is *C. Gaidurowrysii* from Greece, with round tubers and leaves like those of *C. graecum* or *C. persicum* (GLASAU does not mention whether they are papillate); the flowers are not known. The number of chromosomes is exceptionally high (according to GLASAU about 162). A form of *C. graecum*?

To make this survey complete we have to mention *C. mirabile* HILDEBR. Of this plant so far only one individual has been seen. It was sent to HILDEBRAND by the firm of VAN TUBERGEN, bulbgrowers at Haarlem, who had received it from Smyrna. As it has never been found since, we will not copy HILDEBRAND's description.

The survey of *Cyclamen*, given above, differs in some aspects from the one given by SCHWARZ.

Firstly, we see no reason to treat *C. balearicum* as only a subspecies of *C. repandum*. Size of the plant, number of chromosomes, colour of the flower, shape, texture and colour of the leaf and geographical distribution all show relatively important differences.

Secondly, we cannot agree with SCHWARZ's opinion that *C. pseudibericum* is only a taxonomically unimportant form of *C. libanoticum*. Colour and shape of the flower as well as origin are different. We lay stress on the difference in shape of the flower: the corolla-tube of *C. libanoticum* is lucid, campanulate and very wide at the mouth, that of *C. pseudibericum* is white, not lucid, urceolate and contracted at the mouth. SCHWARZ apparently did not notice this.

The differences in nomenclature between SCHWARZ's revision and our survey will be dealt with in the following paragraph.

3. SPECIES DIFFICULT IN RESPECT TO NOMENCLATURE

3.1. *Cyclamen repandum* SIBTH. & SM. Fl. graec. prodr. I (1806) 128; etc.¹⁾

C. europaeum L. Sp. pl. I (1753) 145 pro parte; SAVI Fl. pis. I (1798) 213*²⁾.

C. hederacifolium AIT. Hort. kew. I (1789) 196 pro parte; WILLD. Sp. pl. I (1799) 810 pro parte; DIETR. Lexic. Gärtn. u. Bot. III (1803) 473; SIMS CURT. Bot. mag. 25 (1807) t. 1001 (excl. syn.); Hort. Angl. I (1822) 122; SCHWARZ Gartenfl. n.f. (Dec. 1938) 23.

C. vernum REICHENB. Fl. germ. exc. II (1830) 407 non SWEET; DUBY ex DC. Prodr. VIII (1844) 58; OUDEM. Neerl. plantent. I (1865) t. III.

Tubers densely hairy, rooting from the middle of the under side. Leaves on ascending stalks, 4-6 cm long, cordate with coarse mucronate teeth, thin, dull green with concentric band of light green spots above, green beneath. Flowers in February, almost scentless; pedicels to 10 cm long, ascending. Calyx-lobes about 1 mm shorter than corolla-tube, narrowly ovate to triangular, 1-nerved, minutely dentate or entire, greenish brown. Corolla-tube globose, lucid; corolla-lobes oblong, twisted about 45°, lower half roseine purple 629, upper half lighter (pink to almost white), streaky. Anthers with violet glands, as long as corolla-tube; style 2 to 3 mm exerted.

Mediterranean basin (Southern France, Sardinia, Corsica, Italy, Sicily, Dalmatia, Greece).

This species is one of the very few *Cyclamens* that flowers in spring, which was already noticed by DE L'OBEL who described it as „*Cyclamen vernum, flore rubro*” (Plant. seu stirp. hist. (1576) 332). About two and a half centuries later REICHENBACH returned to this name and called the species *C. vernum* LOB. Many botanists followed this example; however, this name is not legitimate: *C. repandum* is older.

The names *C. europaeum* and *C. hederacifolium* are again both older than *C. repandum*. We will show, however, that they are not valid for this species (see under *C. europaeum* and *C. neapolitanum* respectively).

^{1), 2)} etc.: see p. 28.

It is noteworthy that *C. repandum* was originally described as a new species from Constantinople, different from the Italian forms. REICHENBACH and several other botanists have both *C. vernum* RCHB. and *C. repandum*. Even SCHWARZ is doubtful, whether *C. repandum* really represents this species. We cannot share his doubt, however, and rejecting *C. hederifolium* AIT. as a confusing name, we look upon *C. repandum* as the legitimate name for this species.

Old pictures: CLUSIUS Rar. plant. hist. (1601) 265 (probably taken from an older work); SWEERTS Florileg. (1612) t. 59; BESL. Hort. cystett. III (1613) vern. ord. 6 fol. 13; MORISON Plant. hist. un. oxon. III (1715) sect. 13 t. 7. Col. pict.: Bot. mag. 25 (1807) t. 1001; LODD. Bot. cab. 10 (1824) t. 992; id. 20 (1833) t. 1942; Mag. bot. & gard. 2 (1834) 3 t. 21; Neerl. plant. I (1865) t. III; id. 3 (1867) t. 45; Album v. EEDEN (1872-'81) t. 91; Neub. D. Mag. gart. 33 (1880) 73; Garden 27 (1885) t. 496^a).

f. *album* hort. ex KRELAGE's Bloemhof 4 (1902) 69.

C. vernum flore albo hort. ex Album v. EEDEN (1872-'81) t. 91.

C. vernum album hort. ex KRELAGE's Bloemhof 4 (1902) 69.

C. hederifolium album hort. 4).

Corolla-lobes pure white.

C. repandum was introduced into Holland from Erfurt in 1828 by G. J. KOK. In 1836 KOK discovered among his seedlings a plant with white flowers. The offspring of this plant was bought by the well-known bulbgrowers firm E. H. KRELAGE and son, who placed it upon the market in 1863 (Neerl. plantent. I (1865) t. III). Probably, however, the white form was already known to CASPAR BAUHIN (Pinax theatr. bot. (1623) 308).

Col. pict.: Neerl. plantent. I (1865) t. III; Album v. EEDEN (1872-'81) t. 91.

Closely related is a form from Crete, described by HILDEBRAND as *C. creticum*. Leaves not as thin, often entire; flowers white or pink; calyx-lobes 1-, 3- or 5-nerved; style not exerted. SCHWARZ calls it *C. hederifolium* ssp. *creticum*. We have received plants from Crete, which did not yet flower, however.

3.2. *Cyclamen orbiculatum* MILL. Gard. dict. ed. 8 (1768) no 5.

C. europaeum L. Sp. pl. I (1753) 145 pro parte; BIEB. Fl. taur. cauc. I (1808) 140 et III (1819) 135.

C. vernum SWEET Brit. flower gard. I 1 (1823) t. 9* non REICHENB.; GORD. Gard. chron. 3 (1843) 660; SCHWARZ Gartenfl. n.f. (Dec. 1938) 17.

C. coum DUBY ex DC. Prodr. VIII (1844) 56; LEDEB. Fl. ross. III (1847) 23; OUDEM. Neerl. plantent. 3 (1867) t. 44; KNUTH ex ENGL. Pflanzenr. IV 237 h. 22 (1905) 253 excl. tab.

C. ibericum LEM. Jard. fleur. 3 (1853) t. 297 excl. descr., non GOLDIE; KRATZ Primulac. (1861) 91; STEV. ex HILDEBR. Gatt. Cycl. (1898) 41.

C. coum β *vernum* REG Gartenfl. XI (1862) 277.

C. coum et *C. coum* β *ibericum* BOISS. Fl. or. IV (1875) 11.

C. Atkinsii purpureum hort. ex Album v. EEDEN (1872-'81) t. 32.

C. hiemale HILDEBR. Gartenfl. 53 (1904) 70 non SAL.

C. vernum var. *hiemale* SCHWARZ Gartenfl. n.f. (Dec. 1938) 20.

Other synonyms of this species are summed up in SCHWARZ's revision.

Tubers with fine brown hairs, rooting from the underside. Leaves on ascending stalks, 4-6 cm, somewhat broader than long, round to reniform, entire or crenate, dull green with white concentric band above, purple beneath. Flowers in winter, scentless; pedicels 5 to 8 cm long, ascending. Calyx-lobes varying from half to

the full length of the corolla-tube, lanceolate, 5-nerved, entire, brown. Corolla-tube urceolate, slender (8 mm long, 5 mm broad), white; lobes almost round, 10 to 12 mm long, more or less folded, not twisted, roseine purple 629 or lighter, to white (see varieties), with crescent-shaped dark spot, mostly white at extreme base. Anthers yellow. Style as long or somewhat shorter than corolla-tube, with minute round stigma.

South coast of Black sea from Bulgaria to the Caucasus; south of the Caspian sea; Southern Turkey (Silicia, Anatolia).

The name, given by MILLER, is sometimes considered a synonym of *C. europaeum* (a.o. recently by SCHWARZ), and is mostly ignored, except by BAKER who writes: „doubtless a variety of *Coum*” (*Gard. chron.* n. ser. 19 (1883) 307). MILLER’S description is short, but in our view cannot represent but this species. („The fifth sort hath a small irregular root not larger than an Nutmegg; the leaves are orbicular and small; the flowers are of a flesh colour, small and have purple bottoms. They appear in autumn, but rarely produce seeds in England”). The only cause for doubt is the flowering time: the flowers of these species usually do not appear before December, although some of our plants were in bloom as early as September.

Nevertheless we would not have referred to this ancient name, if there was not another practical reason for it. The name by which this species is now generally known, namely *C. ibericum*, belongs according to the oldest publication to another species. (See SCHWARZ loc. cit. and LEMAIRE loc. cit.). The legitimate name would be, if we leave MILLER’S name out of consideration, *C. vernum* SWEET (1824). However, since REICHENBACH (1830) this name is generally used for another *Cyclamen*, *C. repandum* and although the original description is perfectly clear (it is accompanied by a beautiful coloured plate), restoration of this name would only add to the confusion. The reason for the fact, that the name given by MILLER almost at once became obscure, is that the form of *Cyclamen* it represented disappeared from cultivation in England. We will discuss this below.

Old pict.: MUNTING, Naauwk. beschr. aard-gew. (1696) 147?; MORISON Hist. plant. un. oxon. III (1715) sect. 13 t. 7.

Col. pict.: LODD. Bot. cab. (1818) t. 108; SWEET, Brit. flow. gard. 11 (1823) t. 9*, repr. in *Journ. roy. hort. soc.* 74 (1949); *Jard. fleur.* 3 (1853) t. 297; *Gartenfl.* 11 (1862) t. 370; Neerl. plantent. 3 (1867) t. 44; Album v. EEDEN (1872-’81) t. 32.

According to the colour of the flower two forms can be distinguished:

f. *roseum* DOORENB. comb. nov. Corolla lobi rosei, basi macula lunata purpurea notati, ultima basis alba.

C. Atkinsii roseum hort. ex OUDEMANS Neerl. plantent. 3 (1867) t. 44.

C. ibericum roseum hort. 4).

Corolla-lobes pink (phlox purple 632/2 to 632/3) with a crescent-shaped orchid purple 31 spot, white at the extreme base.

Col. pict.: Neerl. plantent. 3 (1867) t. 44; Album v. EEDEN (1872-’81) t. 32; *Garden* 30 (1886) t. 569.

f. *album* DOORENB. comb. nov. Corollae lobi albi, basi macula lunata purpurea notati.

C. Atkinsii TH. MOORE *Gard. comp.* I (1852) 89*.

C. ibericum album hort. ex. KRATZ, *Primulaceen* (1861) 91.

C. Atkinsii album hort. ex. *Garden* 30 (1886) 433.

Corolla-lobes white with mallow purple 31 spot, white at extreme base.

Originally *C. Atkinsii* was described as a hybrid of *C. coum* and *C. persicum* with the latter as father-plant. From the assumed father, however, the plant inherited

no characters; it is true that the corolla-lobes are white, but this mutation occurs in many *Cyclamen*-species; the leaves are marked, but not as those of *C. persicum*, but as those of *C. orbiculatum*. Considering that *C. coum* and *C. Atkinsii* both have 30 chromosomes, *C. persicum* on the other hand 48, we may assume that the cross never took place and the original plant was a mutation of *C. orbiculatum* var. *coum* (or, more probably, of the typical *C. orbiculatum*, which at that time was reintroduced in England, often under the name of *C. coum*), arising from a seed originated by selfpollination. Except for the colour of the flower we did not notice any difference between *C. Atkinsii* and *C. orbiculatum*, in our living material, or in literature. In one of the oldest pictures (LEMAIRE, loc. cit.) the flowers are somewhat larger than those of the typical *C. orbiculatum* (See fig. 9).

In reducing *C. Atkinsii* to a form of *C. orbiculatum* have not kept the epithet *Atkinsii*, because this has been used since long for purple and pink flowering forms of *C. orbiculatum*.

Col. pict.: Gard. comp. 1 (1852) 89*; Jard. fleur. 3 (1853) t. 297; Floricult. cab. (1857) t. 89; *Fl. d. serres* 22 (1877) t. 2345; id. 23 (1880) t. 2425; Neerl. plantent. 3 (1867) t. 44; Album v. EEDEN (1872-'81) t. 32; *Garden* 30 (1886) t. 569.

var. **coum** (MILL.) DOORENB. var. et comb. nov. Folia reniformia, crenata vel integra, supra equaliter viridia, non maculata.

C. europaeum L. Sp. pl. 1 (1753) 145 pro parte?

C. coum MILL. Gard. dict. ed. 8 (1768) no 6 and most later authors, exceptions mentioned under *C. orbiculatum* and *C. europaeum*.

C. hyemale SAL. Prodr. (1796) 118*.

C. orbiculare hort. ex GORD. *Gard. chron.* 3 (1843) 660.

Leaves reniform, crenate, dark green and not marked above.

Probably this mutation can be expected everywhere, where the species occurs. In many books about horticulture and even in some botanical works Southern Europe is mentioned as geographical origin; this is inaccurate!

Various species of *Cyclamen* occur with leaves which are not marked with white above. In hybrids, marked dominates smooth, so that one may speak of the loss of a dominant characteristic through mutation. In relation to this, plants with smooth leaves give an offspring homozygous for this characteristic.

The name *coum* apparently indicates that this *Cyclamen* occurs on the isle of Kos; this, however, does not seem to be the case (see SCHWARZ, loc. cit.). The indication is ancient, for in 1656 the Catalogus of the Royal Gardens at Paris mentions a „*Cyclamen hyemale, orbiculatis joliis, inferne rubentibus, purpurascente flore, Coum Herbariorum*“. It is not certain, however, that this is our variety. MORISON, who referred to this diagnosis in 1715 added a.o. „*folia superne virentia, maculis quibusdam cinereis aspersa*“. Clearly he meant a plant with marked leaves, and his picture (one of the oldest of this species) consequently represents such a one.

MILLER apparently knew both forms with marked leaves (*C. orbiculatum* MILL.) and with smooth leaves (*C. coum* MILL.). Shortly afterwards the former seems to have disappeared in England, for *C. orbiculatum* is not mentioned again and every picture represents a plant with green leaves. In 1818 we again find a picture of a plant with marked leaves, with the remarkable legend: „The variety here represented is constantly marked in the leaf, which is not the case with the common sort of *coum*. We received it some years since from Holland, where it is generally cultivated“ (LODD. *Bot. cab.* 2 (1818) t. 108). Shortly afterwards the marked form was given a new specific name by SWEET, who, like his contemporaries, overlooked that this form was not new at all.

Col. pict. of var. *coum*: *Bot. mag.* 1 (1787, issued 1793) t. 4; *Mag. bot. & gard.* 3 (1835) t. 8; *Garden* 30 (1886) t. 569.

This variety represents the same variation as to colour of the flower as the typical form:

var. *coum* f. *roseum* DOORENB. comb. nov. Corollae lobi rosei, basi macula lunata purpurea notati, ultima basis alba.

C. coum roseum hort. ex MOTTET, *Jardin* 7 (1893) 195.

Corolla-lobes pink (phlox purple 632/2 to 632/3) with mallow purple 31 spot, white at base.

Col. pict.: ?.

var. *coum* f. *album* DOORENB. comb. nov. Corollae lobi albi, basi macula lunata purpurea notati.

C. coum album hort. ex *Proc. Roy. Hort. Soc.* (1866-'69) cxxii.

Corolla-lobes white with mallow purple 31 spot, white at extreme base.

Pict.: *Journ. Roy. Hort. Soc.* 27 (1902/'03) 907. Col. pict.: ?.

3.3. *Cyclamen europaeum* L. Sp. pl. I (1753) 145 pro parte; JACQ. Fl. austr. V (1778) I non MILL. (nec BIEB., nec SAVI); AIT. Hort. kew. I (1789) 196; etc.

C. purpurascens MILL. Gard. dict. ed. 8 (1768) no 2.

C. coum REICHENB. Fl. germ. exc. II (1830) 407 non MILL.

There are many other synonyms of this species, but these do not play a role in the settling of the nomenclature question.

Tubers round, flattened or irregular, rooting above at first, later everywhere. Leaves on ascending stalks, 5 to 7 cm, bluntly cordate or reniform, minutely dentate or entire, with concentric silver band above, purple beneath. Flowers from August onwards; pedicels usually ascending, 8–12 cm long. Calyx-lobes half as long as corolla-tube, ovate, overlapping at base, cuspidate, minutely dentate. Corolla-tube globose, lucid; lobes obovate, twisted 90°, sometimes minutely eared, pink to purple (orchid purple 31/1 to 31/2) or nearly white, with an U-shaped darker spot at base. Anthers yellow. Style exerted for 1–2 mm.

Central Europe (also in some places in Macedonia and Bulgaria), Caucasus. The plants that grow in the Western Caucasus have been described by SCHWARZ as the subsp. *ponticum* (ALBOFF) SCHWARZ. They differ from the main form in having doubly dentate leaves with blunt cartilaginous teeth.

LINNAEUS looked upon all forms known to him (except the enigmatic *C. indicum*) as belonging to one species, which he gave the name of *C. europaeum*. Other authors did not agree with this opinion and soon afterwards the species of LINNAEUS was divided. As far as we know, the first to split up the Linnean species was PHILIP MILLER, who in 1768 recognized six species and retained the epithet *europaeum* for the one we now call *C. neapolitanum*. The species described above he called *C. purpurascens*; the epithet *europaeum* was not used for this one until 1778 by the austrian botanist JACQUIN. This means that it is very probable that the name *C. europaeum* according to the Rules belongs to *C. neapolitanum*, leaving *C. purpurascens* as the legitimate name for the alpine species.

As we are not completely sure that MILLER was indeed the first to split up the Linnean species, and as we do not know which material is preserved in LINNAEUS' herbarium, we refrain from carrying through this drastic change of names here.

Old. pict.: FUCHS, *Plant. effig.* (1551), same in DODOENS, *Cruydeb.* (1554) 335; TABERN., *Eicon. plant.* (1590) 753; CLUSIUS, *Rar. plant. hist.* (1601) 264; BESLER,

Hort. cystett. III (1613) autumn. ord. 3 fol. 4; MÜNTING Naauwk. beschr. aardgew. (1696) fig. 144 a.o.; R. MORISON, Plant. hist. un. oxon. III (1715) sect. 13 tab. 7; CR. DE PASSE, Hort. flor. (1614) herfst t. 13 (repr. in *Journ. Roy. hort. soc.* 74 (1949). Col. pict.: JACQ. Fl. austr. V (1778) t. 401; *Bot. reg.* 12 (1826) t. 1013; id. 33 (1846) t. 56.

„*Cyclamen europaeum Peakeanum*” with dark-violet flowers is portrayed in *The floral mag.* 5 (1886) t. 262.

A form with double flowers is mentioned in the Catalogus of the plants in the Hortus botanicus at Leiden in 1687 on p. 214.

3.4. *C. neapolitanum* TEN. Prodr. fl. nap. Suppl. II (1813) LXVI*; etc.

C. europaeum L. Sp. pl. I (1753) 145 pro parte; MILL. Gard. dict. ed. 8 (1768) no 1; SM. & SOW. Engl. bot. VIII (1799) t. 584 (tab., descr. p.p.); Hort. angl. I (1822) 131. *C. hederacifolium* AIT. Hort. kew. I (1789) 196 pro parte; WILLD. Sp. pl. I (1799) 810 pro parte; SIBTH. & SM. Fl. graec. prodr. I (1806) 128*; GAUD. Fl. helv. II (1828) 74; REICHENB. Fl. germ. exc. II (1830) 407; DUBY ex DC. Prodr. VIII (1844) 57; DECNE *Rev. hort. sér.* 4, 4 (1855) 23; G. J. D. KOCH Syn. Fl. germ. helv. (1857) 513.

C. linearifolium DC. Fl. franc. III (1805) 433.

C. ibericum GOLDIE apud TH. MOORE Gard. comp. I (1852) 89* ex LEM. *Jard. fleur.* 3 (1853) t. 297.

Other synonyms of this variable species are given in SCHWARZ's revision.

Tubers flat, not hairy, rooting from the upper side. Leaves on ascending stalks, very variable: mostly ovate with pointed or rounded basis lobes, sometimes hastate, more or less lobed, dentate or entire; upper side dull dark green with very variable markings in light green, underside purplish. Flowers early in autumn, before the leaves, on upright pedicels 5 to 8 cm long, almost scentless. Calyx-lobes half as long as corolla-tube, 1-nerved, ovate-lanceolate, entire, green. Corolla-tube globose, lucid; lobes obovate or oblong, twisted to 90°, eared at base, pale lilac (orchid purple 31/3) with U-shaped dark spot at base. Anthers dark violet. Style about as long as corolla-tube or slightly longer. Mediterranean basin (Southern France, Corsica, Sardinia, Italy, Sicily, Dalmatia, Greece, Grecian islands, Crete, Western Turkey).

As early as 1576, in the work of MATTHIAS DE L'OBEL: *Plantarum seu stirpium historia*, a beautiful picture of this species is to be found under the name of *Cyclamen folio Hederae* (See fig. 7).

We have already seen that MILLER in 1768 retained the name of *C. europaeum* for this species. AITON, however, twenty years later used the latter name in the same sense as JACQUIN and placed *C. europaeum* MILLER as a synonym under his *C. hederacifolium*, which he describes as follows: *Cyclamen foliis cordatis angulatis denticulatis, Ivy leav'd Cyclamen*.

On first sight there can be no doubt that AITON means *C. neapolitanum*, especially as none of his other descriptions fits this species and it is clear from MILLER's Dictionary and others works that *C. neapolitanum* was the most common *Cyclamen* in England.

AITON, however, adds to his description: „Fl. April”, while *C. neapolitanum* flowers in autumn. Now there is an other species of *Cyclamen*, which has leaves more or less like those of ivy, and which flowers in spring: *C. repandum* S. & S. It seems there are three possibilities: 1) AITON indeed adopted the name given by LOBELIUS and meant *C. neapolitanum* but made a mistake as to the season of

flowering; 2) the epithet given by AITON had no relation to that of LOBELIUS, he meant *C. repandum* but mistook the identity of *C. europaeum* MILL.; 3) he meant both *C. neapolitanum* and *C. repandum*. The last opinion was held by WILLDENOW, and also by AITON JR and by SIMS, if they did not uncritically copy the synonyms they give. Later on, this opinion which is ours as well, is only upheld by BAKER (*Gard. chron.* n. ser. 19 (1883) 339). All other authors are divided into two groups of almost equal strength; one of which holds that *C. hederacifolium* AIT. = *C. repandum* S. & S., the other *C. hederacifolium* AIT. = *C. neapolitanum* TEN. On account of this we believe to be entitled to reject the epithet given by AITON as a confusing name (nomen ambiguum; art. 62 Intern. Rules of Bot. Nomenclature.) That this does not solve the question of the legitimacy of the name *C. neapolitanum* we already discussed under *C. europaeum*.

Old. pict.: LOB. *Plant. hist.* (1576) 331 (same in CLUSIUS (1601) and later editions of DODOENS (i.e. 1608)); SWEERTS *Florileg.* (1612) t. 59; BESLER *Hort. eystett.* III (1613) autumn. ord. 3 fol. 4; CR. DE PASSE *Hort. flor.* (1614) herfst t. 14 (repr. in *Journ. roy. hort. soc.* 74 (1949)); [HILL] *Eden* (1757) t. 6014.

Col. pict.: SM. & SOW. *Engl. bot.* VIII (1799) t. 548; Bot. reg. (1838) t. 49; *Rev. hort. sér.* 4, 4 (1855) 21; WITTE, *Flora* (1868) t. 79; Album v. EEDEN (1872-'81) t. 71; NEUB. *D. mag. gart.* 33 (1880) 73.

There is a garden variety:

f. **album** hort. ex HENDERSON'S Ill. Bouq. II (1859-'61) t. 30.

C. hederacifolium flore albo hort. ex ALBUM v. EEDEN (1872-'81) t. 71.

Corolla-lobes completely white.

Col. pict.: Album v. EEDEN (1872-'81) t. 71.

CLUSIUS (1601) had not yet seen this form, but it is already mentioned by CASPAR BAUHIN in 1623.

A form with double white flowers is mentioned by BOERHAAVE in 1720.

- 1) In this case we mean by etc. to indicate that later authors agreed as to the identity of this plant, so that it is unnecessary to give more quotations.
- 2) Works we have not seen and which are, as far as we know, not in the Netherlands, are marked with an asterisk.
- 3) The iconography is not complete of course; we only sum up those pictures we came across in the course of this study. Different to the *Index Londinensis* we give the pictures according to the legal names of the species they represent in our opinion, not according to the names given by their authors.
- 4) Possibly this name has been published somewhere; we did not come across, it however.

4. SUMMARY

The collection of botanical species of *Cyclamen* at the Horticultural Laboratory led to an inquiry into the taxonomy and nomenclature of *Cyclamen*. In this paper a survey is given of the genus, in which a short description is given of the following species: *C. balearicum*, *C. repandum*, *C. libanoticum*, *C. pseudibericum*, *C. cilicium*, *C. orbiculatum*; *C. europaeum*, *C. neapolitanum*, *C. africanum*, *C. cyprium*, *C. graecum*, *C. persicum* and *C. Rohlfsianum*. Three other species are mentioned, and the reasons for this limitation of species are briefly discussed. Next, four species which are difficult in respect to nomenclature (*C. repandum*, *C. orbiculatum*, *C. europaeum* and *C. neapolitanum*) are dealt with in some detail.

ACKNOWLEDGEMENT

Thanks are due to the „Regeringscommissariaat voor Buitenlandse Agrarische Aangelegenheden (ReCoBAA)” for their valuable assistance in collecting the material.

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Fig. 1. *Cyclamen balearicum* WILLK. Offspring from a plant sent by the Botanical Garden at Barcelona, one and a half year old.



Fig. 2. *Cyclamen repandum* S.S. Old plant, imported from Italy.



Fig. 3 *Cyclamen libanoticum* HILDEBR. Grown commercially.



Fig. 4 *Cyclamen pseudibericum* HILDEBR. Grown commercially.



Fig. 5. *Cyclamen europaeum* L. with „eared” corolla-lobes.
Plant imported from Zagreb.



Fig. 6. *Cyclamen graecum* Lk. Plant imported
from a Grecian island.



Fig. 7. *Cyclamen neapolitanum* TEN. („*Cyclamen folio Hederae*”) from M. DE LOBEL. *Plantarum seu stirpium historia* (1576)



Fig. 8. *Cyclamen repandum* S.S. („*Cyclamen verno tempore florens*”) from C. CLUSIUS, *Rariorum plantarum historia* (1601)



Fig. 9. This picture from *Le Jardin fleuriste* 3 (1853), t. 297 is the oldest but one on record of „*Cyclamen Atkinsii*”. According to the present paper the nomenclature of the pictured forms is *C. orbiculatum* f. *roseum* (a, pink fl.), *C. orbiculatum* f. *album* (b) and *C. orbiculatum* (c), while *C. Atkinsii* (left) is but a synonym of *C. orbiculatum* f. *album*.