AMENDMENTS TO APPENDICES I AND II OF THE CONVENTION

Other Proposals

A. PROPOSAL

Inclusion of Galanthus spp. and natural hybrids in Appendix II.

B. PROPONENT

The United States of America.

C. SUPPORTING STATEMENT

1. Taxonomy

11. Class: Liliopsida (Monocotyledonae)

12. Order: Liliales

13. Family: Amaryllidaceae (which is sometimes included in Liliaceae)

14. Species: Galanthus L.

141. Species and Natural Hybrids:

G. caucasicus (Baker) Grossh. 1926
G. elwesii Hooker fil. 1875
(syn. = G. graecus Orph. ex Boiss.;
syn. = G. maximus Velen.)
G. fosteri Baker 1889
G. gracilis Celak. 1891
(syn. = G. elwesii ssp. minor D.A. Webb)
G. ikariae Baker 1893
(syn.? = G. ikariae ssp. latifolius Stern,
= G. platyphyllus Traub & Mold.;
syn.? = G. woronowii Losinsk.)
G. krasnovii A. Khokr. 1963 (?)
G. lagodechianus Kem.-Nath. 1947
G. nivalis L. 1753
subsp. cilicicus (Baker) Gottl.-Tann. 1904
subsp. nivalis
G. plicatus Bieb. 1819
subsp. byzantinus (Baker) D.A. Webb 1978
subsp. plicatus
G. reginae-olgae Orph. 1876
G. rizehensis Stern 1956
G. transcaucasicus Fomin 1907 (?)

Galanthus is composed of about 12 species (Mabberley, 1987; Artiushenko, 1966). At least portions of the genus continue to receive taxonomic revision by specialists; the four taxa indicated with a question mark above may not be distinct (see Brickell, 1984; Kamari, 1982; Webb, 1978, 1980; Wendelbo, 1970). There has been some taxonomic study of the genus in Turkey (Ekim et al., 1984), published by N. Zeybek [n.v.] (T. Ekim in litt. to M. Read, ca 5/89). The basic

taxonomy used here follows the most recent treatment and considerations, by Brickell (1984) in the Flora of Turkey, where most species of the genus occur; others are endemic to the Caucasus of the U.S.S.R. [e.g. G. allenii Baker 1891 (syn.? = G. alpinus Sosn., according to Stern, 1956); and G. bortkewitchianus G. Koss.]. This proposal covers all Galanthus species and infraspecific taxa and natural hybrids known and any yet to be recognized or discovered. Galanthus nivalis may form natural hybrids with G. plicatus subsp. byzantinus (Brickell, 1984).

15. Common Names:

English:	All members of the genus share a similar appearance and are referred to as: snowdrops
French:	perce-neige
Spanish:	Campanillas de invierno
German:	Schneeglöckchen

16. Code Numbers:

2. Biological Data

Species with bulbs of various genera in 20 or more countries are under rapidly increasing threat from usually local collectors, to supply intensifying international horticultural demand. Each year a greater diversity of wild-collected species are included in trade catalogs. Yet all species involved, including all taxa of the genus Galanthus, can be artificially propagated using well-established techniques. The genus Galanthus is traded from the wild in the greatest volume of all the bulb genera; several species of limited range, including G. allenii, G. fosteri and G. rizehensis, are known to be in decline as a result. Even the widespread G. elwesii is being so seriously damaged as to almost be disappearing from whole areas of Turkey (Ekim et al., 1984; Ekim in litt. to Read, ca 5/89) as "whole populations are being decimated by this intense collection" (Demiriz and Baytop, 1985).

21. Distribution: The genus Galanthus is native to Europe, the Caucasus, and Asia Minor (Stern, 1956). The greatest diversity of species and subspecies (varieties) is found in Turkey, the Caucasus and the Balkan Peninsula. Approximate distributions of generally well-recognized species and subspecies are given below. Galanthus nivalis subsp. nivalis, as well as having the widest native distribution, has naturalized in many areas; in some countries no populations are considered to be native. Where this subspecies is only naturalized rather than native, country names are given below in brackets; other populations probably exist.

G. caucasicus	Iran, Turkey (Davis et al., 1988), U.S.S.R.
G. elwesii	Bulgaria, Greece, Romania, Turkey, U.S.S.R., Yugoslavia
G. fosteri	Lebanon, Syria, Turkey
G. gracilis	Bulgaria, Greece, Turkey
G. ikariae	Greece, Turkey; U.S.S.R. (G. ikariae ssp. latifolius, and as G. woronowii?, G. krasnovii)
G. lagodechianus	U.S.S.R.

G. nivalis subsp. cilicicus	Greece, Lebanon, Syria, Turkey
subsp. nivalis	Albania, Austria, [Belgium], Bulgaria, Czechoslovakia, France, Germany (West and East?), Greece?, Hungary, Italy, (including Sicily), Luxembourg?, The Netherlands, Norway], Poland, Romania, Spain, Sweden], Switzerland, Turkey, [United Kingdom, U.S.A. (slight)], U.S.S.R., Yugoslavia,
G. plicatus subsp. byzantinus	Turkey
subsp. plicatu	Romania, U.S.S.R.
G. reginae-olgae	Albania (as G. octobrensis Shortt 1883) , Greece, Italy (Sicily), Turkey
G. rizehensis	Turkey; Iran, U.S.S.R. (as G. transcaucasicus)

22. Population: Galanthus ikariae is considered rare (IUCN Red Data status) and G. reginae-olgae vulnerable worldwide (IUCN Threatened Plants Committee, 1980). Galanthus bortkewitchianus of the U.S.S.R. is considered rare worldwide (Vasilyev et al., 1984; it was listed as endangered in Takhtajan, 1975), as it occurs at only one locale of 5-6 hectares in the headwaters area of a river in the Caucasus Mountains. It has a large population number there (where other endemics occur) but appears to reproduce only vegetatively. Populations of Galanthus species in most European countries are believed to have declined substantially in recent years as a result of habitat loss, and the 10 species and subspecies in Turkey are known to be decreasing more rapidly still as a result not only of habitat loss but the pressure of collection to supply the accelerating horticultural demand. Within Turkey, particular concern is being expressed for G. fosteri and G. rizehensis (Demiriz and Baytop, 1985; Ekim et al., 1984). Galanthus reginae-olgae is also considered to be threatened there (Rix and Phillips, 1981). Galanthus plicatus subsp. byzantinus is an endemic of Northwestern Turkey that may be at risk. Galanthus plicatus (subsp. plicatus) is considered rare in Romania (IUCN Threatened Plants Committee, 1977). In the U.S.S.R., G. allenii (sic G. alpinus) is rare; and even the more widespread Caucasus endemic G. lagodechianus is in decline (Takhtajan, 1975; Vasilyev et al., 1984). Galanthus elwesii probably still numbers in hundreds of millions, but as well as the decline in Turkey, it is considered endangered in the northeastern portion of its range in the U.S.S.R. (Vasilyev et al., 1984); G. nivalis subsp. nivalis probably still numbers in thousands of millions (see section 5. Information on Similar Species below). The other species and subspecies are much less numerous, but detailed data are lacking.

23. Habitat: The habitat may be quite characteristic for some of these species, and more variable for others. Various of these species occur on steep slopes to level ground in open to dense woodlands and broadleaf to conifer forests, forest margins, shady to open or rocky areas (limestone), as well as shrubland (maquis) and scrub communities, streamsides, and wet and alpine meadows.Assorted species occur in moist soil or leaf mold and rock crevices to sandy soil. The genus occurs from sea level to

3000 m, and some species occur over a fairly extensive elevational range in mountains (Brickell, 1984; Kamari, 1982; Losina-Losinskaya, 1935; Vasilyev et al., 1984).

3. Trade Data

31. National Utilization: A sizeable trade in bulbs of Galanthus species from collectors via local representatives to wholesalers exists within Turkey (Read, 1989; van der Plas-Haarsma, 1987), although most of this is destined for export. In the U.S.S.R., G. allenii, G. elwesii and possibly G. bortkewitchianus may be collected for bouquets, and there is also concern about commercial trade in the former two species (Vasilyev et al., 1984). Galanthus allenii are reported to contain pharmacologically active alkaloids, with the former species considered a promising source (Vasilyev et al., 1984), but it is not known if collection for this use is a threat in the U.S.S.R. A limited trade in plants collected from naturalized populations, from collector to gardener or bulb retailer, occurs within the United Kingdom and may similarly occur with native or naturalized populations elsewhere (e.g. France).

32. Legal International Trade: Galanthus are among the most popular of spring-flowering garden bulbs, and are traded in very large numbers to many countries, mainly by re-export from the Netherlands. Bulb exports from the Netherlands presented in the annual report Produktschap voor Siergewassen give data of: 48,300,000 bulbs for 1984/85; 48,400,000 for 1985/86; and 49,600,000 for 1986/87.

Of the 1986/87 exports (including re-exports) from the Netherlands:

33%	16,257,000	bulbs went to the Federal Republic of Germany
35%	17,543,000	to the United Kingdom
8%	4,195,000	to the United States of America*
6%	2,992,000	to Sweden
5%	2,477,000	to France
4%	1,811,000	to Switzerland

and the remainder to a wide range of countries including Austria, Denmark, Finland, Greece, Italy, Norway, Spain, Israel, Canada and Japan. (* United States imports of Galanthus for 1984/85 were 2,237,000 bulbs; for 1985/86 they were 3,156,000 -- thus demand nearly doubled over the 3 years from 1984/85 to 1986/87).

While there are 2-3 hectares of Galanthus under cultivation in the Netherlands [almost entirely G. nivalis (Oldfield, 1989)], an additional 30,000,000-40,000,000 bulbs are imported each year from Turkey, and 10,000,000-15,000,000 each year from France. Turkish exports have risen steadily in recent years, increasing fivefold within the last 10 years. French exports have varied relatively little in volume since 1974, and are believed to be entirely harvested bulbs from naturalized populations of G. nivalis subsp. nivalis (Lear, 1988). Exports from Turkey are almost entirely bulbs collected from wild populations, principally of G. elwesii. Other species, including G. ikariae, G. gracilis and G. fosteri, are increasingly being collected

(inadvertently or intentionally) as the more numerous species become scarcer in some areas. At least six firms in Turkey export Galanthus.

Galanthus bulbs in international trade occur in their dry, dormant form, although this is considered to be poor horticultural practice. Survival rates for bulbs that are kept dry for extended periods are poor. Losses of 50% for wild-collected bulbs would not be unusual. Data are given below for exports of the genus from Turkey, and imports into the Netherlands from Turkey, Hungary, France, and the United Kingdom. The U.K. stocks are artificially propagated. Hungarian stocks are believed to be wild-collected. Czechoslovakia also is exporting relatively low numbers of probably wild-collected Galanthus although exact figures are not available. All available trade data are only for the genus as a whole and not divided into individual species. Summary notes on particular taxa are appended after this INTERNATIONAL TRADE TABLE:

YEAR	TURKEY EXPORTS[1]	THE NETHERLANDS IMPORTS				THE NETHERLANDS EXPORTS
		Turkey	France	U.K.	Hungary	
1985	36,748,000	31,019,000	10,744,000	246,000	-	48,400,000
1986	38,636,000	34,839,000	17,120,000	301,000	8,000	49,600,000
1987	30,000,000[2]	23,801,000	9,186,000	373,000	-	?[3]

1. The difference between the first two columns is believed to be statistical inaccuracy more than an indication of substantial direct exports from Turkey to any other country than the Netherlands (but there is some direct export to e.g. F.R. Germany, U.K. and U.S.A.).

2. Preliminary estimate only, from Dr. T. Ekim, Chairman, Dept. of Biology, Gazi University, Teknikokullar-Ankara, Turkey.

3. Data not yet available.

Separate Species and Subspecies:

1) Galanthus caucasicus is available in relatively small numbers through specialist trade catalogs, origin uncertain (but probably wild-collected -- see * below).

2) Galanthus elwesii comprises the largest part of Turkish exports, mostly wild-collected, although a small number of 'cultivated' specimens are recorded (see 7. Additional Remarks below). Widely available in trade.

3) Galanthus fosteri wild-collected bulbs exported from Turkey along with G. elwesii, from which it probably is not usually distinguished by traders. Also available in relatively small numbers through specialist trade catalogs, origin uncertain (see * below).

4) Galanthus gracilis wild-collected bulbs are exported from Turkey along with G. elwesii, from which it probably is not usually distinguished by traders. Also available in relatively small numbers through specialist trade catalogs, origin uncertain (see * below).

5) Galanthus ikariae wild-collected bulbs are exported from Turkey along with G. elwesii, from which it may not be distinguished or may be knowingly substituted for G. elwesii by traders. Also available in relatively small numbers through specialist trade catalogs, origin uncertain (see * below). Bulbs believed to be wild-collected but of unknown country of origin are being sold by a Czechoslovakian trader.

6) Galanthus lagodechianus bulbs believed to be wild-collected are offered by a Czechoslovakian trader.

7a) Galanthus nivalis subsp. cilicicus is known to be in cultivation in the Netherlands (O. Wijnands, pers. comm. to Read); it is not known to be in trade, although it possibly occurs misidentified.

7b) Galanthus nivalis subsp. nivalis wild-collected bulbs are exported from Turkey along with G. elwesii, from which it probably is not usually distinguished by traders. Wild-collected bulbs exported from Hungary in 1986. Naturalized populations are harvested in France and exported. Also artificially propagated on a commercial scale in the Netherlands and the United Kingdom.

8ab) Galanthus plicatus subsp. byzantinus and G. plicatus subsp. plicatus are available in relatively small numbers through specialist trade catalogs, origin uncertain (see * below). Bulbs believed to be wild-collected but of unknown country of origin are being offered by a Czechoslovakian trader.

9) Galanthus reginae-olgae is available in relatively small numbers through specialist trade catalogs, origin uncertain (see * below).

10) Galanthus rizehensis is available in relatively small numbers through specialist trade catalogs, origin uncertain (see * below).

* The origin of bulbs of species and subspecies sold through specialist catalogs are mainly twofold: both directly collected in the wild, and cultivated stock from originally wild-collected material, being maintained in cultivation with varying degrees of success.

Uncharacteristically for the large-scale ornamental bulb trade and unfortunately for Galanthus, the majority of fanciers and nurseries trade Galanthus species and subspecies rather than horticultural cultivars (including hybrids). International trade in Galanthus cultivars is under 10% and probably well under 5% of the annual total. A great many cultivars of Galanthus are known; far fewer have been widely cultivated in recent years than around the turn of the last century. Yet growing the older cultivars is undergoing something of a revival as part of the general increase in popularity of 'unusual' garden bulbs. Overall, horticultural catalogs issued in 1988 in the U.K. list 48 cultivars, subspecies and species of Galanthus, a 33% increase over the preceding 6 years. In the Netherlands at least 59 cultivars, subspecies and species are in cultivation (Wijnands, pers. comm. to Read). Stern

(1956) listed 137 cultivars, of which up to 20 were artificial hybrids from one of six species-pair crosses (e.g. G. x grandiflorus Baker 1893 = G. nivalis x G. plicatus). Many cultivars are still available through the specialist catalogs.

33. Illegal Trade: Under a Turkish regulation of December 1986, which does not distinguish between species of Galanthus, a maximum quota of 8,000,000 wild-collected Galanthus may be exported annually. However more than 30,000,000 bulbs are exported, the balance being categorized as 'cultivated'. McGough et al. (1989) found that these 'cultivated' plants are transplanted wild stock, i.e. cultivated for approximately a year before export; the bulbs are not artificially propagated. These exports probably remains strictly legal under Turkish law, but this is an uncertain issue. (More is below, in section 7. Additional Remarks.)

34. Potential Trade Threats: The massive collection of Galanthus bulbs from wild populations in Turkey poses a substantial threat to the survival of the species and the maintenance of their roles in their ecosystems. The greatest volume of trade from Turkey is in G. elwesii, which although not in immediate danger of extinction, is being decimated in many areas. According to Demiriz and Baytop (1985), this once-common species has greatly diminished as a result of the activities of bulb exporters. Currently the Taurus region is worst affected (Ekim et al., 1984); entire populations have been so seriously damaged that they have nearly disappeared there (Ekim in litt. to Read, ca 5/89). Prof. Ekim et al. (1984) reported that the prices have risen for bulbs, people are going much further away from their villages (even into dangerously steep areas) but get fewer bulbs than in the past, and one villager requested some governmental control to prevent continued decline. A Turkish regulation that attempts to control geographically the regions within which Galanthus may be collected at any particular time, in order to remove pressure from areas where populations have suffered the worst exploitation, is considered insufficient (Ekim et al., 1984). If collection continues at current or greater levels, widespread further population damage and loss can be expected.

Demiriz and Baytop (1985) also express particular concern for the much more restricted G. rizehensis (which occurs near Turkey's northeastern Black Sea coast) and G. fosteri (which occurs in a central northern area partly at the coast and in a central southern area). Collection of Galanthus along the Black Sea coast has been taking place for approximately 10-15 years. As demand for 'unusual' small bulbs steadily increases, these and other restricted Galanthus, such as the endemic G. plicatus subsp. byzantinus, will come under still greater pressure. Outside Turkey, G. rizehensis is known perhaps only in Iran and U.S.S.R. (as G. transcaucasicus; Brickell, 1984), and G. fosteri only in Lebanon and Syria. The status as to vulnerability of these other countries' populations remains unknown.

Some Galanthus bulbs are known to be collected in the Caucasus of the U.S.S.R.: G. allenii (sic G. alpinus), G. bortkewitchianus, G. elwesii (Vasilyev et al., 1984), and G. lagodechianus (see section 32. Legal International Trade above). Taxonomic integration of these species with the concepts of Galanthus in Brickell (1984), and data on export and effect on populations are

needed. There are particular concerns about G. bortkewitchianus (one locality), as well as G. allenii, and perhaps G. krasnovii (Vasilyev et al., 1984; Takhtajan, 1975).

Collection of Galanthus in Turkey generally takes place while the plants are in flower and easy to find, i.e. before seed pods have ripened, thus preventing recovery of populations through seed production. Although bulbs do divide underground (one 'mother' bulb can produce many small offshoot bulbs each year), this does not appear to ameliorate the effect of collection on populations. Bulbs that are too small for export nevertheless are collected for temporary transfer to 'growing-on' fields. (Refer also to 7. Additional Remarks below.)

4. Protection Status

41. National: The status of protection of Galanthus species varies considerably throughout the genus' range in many countries (Davis et al., 1986; Oldfield, 1989). Turkish regulations limit the export of wild-collected Galanthus to 8,000,000 bulbs per year, and attempt to restrict the regions within which collection may occur. No other countries are known to be exporting wild-collected Galanthus on a large scale. As explained above in sections 33. Illegal Trade and 34. Potential Trade Threats, these regulations have been ineffective in protecting Galanthus. Also, the regulations do not distinguish between the species of Galanthus, so species such as G. rizehensis, G. fosteri and G. plicatus subsp. byzantinus would remain under threat even if the present regulations were strictly interpreted and enforced. Turkey has an inspection infrastructure that could be very effective. In the U.S.S.R., some populations of G. allenii, G. elwesii and G. lagodechianus are in nature reserves.

42. International: None known.

43. Additional Protection Needs: The scarcest and most restricted species and subspecies, and those most heavily exploited, require a closer study of their population biology (including years from seed and offset to maturity), ecological requirements, distribution and pressures. Taxonomic study of the genus overall is needed to provide a consistent usage for the terms species, subspecies and variety in Galanthus, to give a biosystematic understanding of the populations, and to clarify which are the good taxa and those most restricted in range. As well as loss from the horticultural trade, habitat loss from agricultural and other development exacerbates the pressure from trade. Expanding agriculture is a threat to G. bortkewitchianus (Vasilyev et al., 1984). Grazing does not appear to be too great a threat to Galanthus species. In general, their vegetative and flowering parts appear above ground when few grazing animals are present.

5. Information on Similar Species

When in flower, plants of Galanthus are readily identifiable as that genus. Out of flower and when traded as dry bulbs, they might be mistaken for a number of other genera of bulbous plants (e.g. Rix and Philipps, 1981; Baytop and Mathew, 1984). Seized bulbs might have to be grown to flowering to be identified. Distinguishing between the species and subspecies, even in flower, requires botanical expertise.