

## TÜRKİYE'DE EREMURUS (LILIACEAE) CİNSİ

### THE GENUS EREMURUS (LILIACEAE) IN TURKËY

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#### SUMMARY

According to our taxonomical research made on the genus *Eremurus* (Liliaceae - Asphodeloideae - Asphodeleae), between 1976-1982, two species are found in Turkey as indicated in previous literature: *E. spectabilis* Bieb. subsp. *spectabilis* (sect. *Eremurus*) and *E. cappadocicus* J. Gay ex Baker [sect. *Ammolirion* (Kar. et Kir.) Boiss.]. In this paper, their descriptions, distributions, habitats, flowering time, altitudes and variations mainly based on the examined specimens, have been represented. Furthermore, two drawings are added to the text.

#### ÖZET

*Eremurus* (Liliaceae - Asphodeloideae - Asphodeleae) cinsi üzerinde 1976-1982 yılları arasında yaptığımız taksonomik araştırmaya göre daha önceki literatürde de belirtildiği gibi Türkiye'de 2 tür bulunmaktadır: *E. spectabilis* Bieb. subsp. *spectabilis* (sect. *Eremurus*) ve *E. cappadocicus* J. Gay ex Baker [sec. *Ammolirion* (Kar. et Kir.) Boiss.]. Bu yazımızda başlıca incelediğimiz örneklerle dayanarak bu türlerin tanımları, yayılışları, yetişme ortamları, çiçeklenme zamanı, bulunduğu yükseklik ve varyasyonları belirtilmiştir. Ayrıca bu iki türün bitkilerine ait 2 çizim ilâve edilmiştir.

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The genus *Eremurus* (Liliaceae - Asphodeloideae - Asphodeleae) has about 50 species and is distributed mainly in the Central Asia and the Middle East (1, 2). Particularly the Central Asia is considered as a center of this genus (2). The three sections of *Eremurus* are distinguished: Sect. *Eremurus*, Sect. *Ammolirion* (Kar. et Kir.) Boiss. and Sect. *Henningia* (Kar. et Kir.) Baker (3).

In Turkey, *Eremurus* is represented by 2 species: *E. spectabilis* Bieb. (Sect. *Eremurus*) and *E. cappadocicus* J. Gay ex Baker (Sect. *Ammolirion*). The presence of these two species in Turkey, was mentioned in some previous revisional and basic floristic literature concerning the flora of Turkey and the genus *Eremurus* (36).

This study is mainly based on the material collected personally and the specimens kept in several Herbariums (AEF, ANK, ATA, E, ESSE, HUB, K, ISTE, ISTO). Our specimens are kept in the Herbarium of the Faculty of Pharmacy, Istanbul University (ISTE). The descriptions of the both species are mainly based on our studies and observations. In addition some basic revisional and floristic literature has been used (3-7). A few records taken from the literature, have been pointed out in the distribution of the species (8-10).

This paper is a taxonomic part of the revision of the genera *Asphodelin*?, *Asphodelus*, *Eremurus* and *Anthericum* in Turkey which was realised during 1976-1982 as a thesis.

**Eremurus** Bieb., Fl. Taur. - Cauc. 3: 269 (1819).

Syn. *Ammolirion* Kar. et Kir., Bull. Soc. Nat. Mosc. 15: 515 (1842). *Henningia* Kar. et Kir., l. c.: 516. *Selonia* Regel, Bull. Soc. Nat. Mosc. 41: 457 (1868).

Perennial herbaceous plants. Rhizome short, the neck often covered with membranous or fibrillose remnants of old leaves. Roots clustered, thick and fleshy, cylindrical or fusiform. Leaves numerous, all basal, spirally arranged and connate to each other with their scarious bases, green or glaucous, broadly linear, carinate beneath, smooth or canaliculate. Scape (flowering stem) single, erect, terete, smooth, leafless. Inflorescence simple raceme. Bracts membranous. Pedicels jointed or not. Flowers numerous, hermaphrodite, actinomorphic. Perianth pale yellow, greenish yellow.

low or brownish (in Turkish plants), campanulate, infundibular or  $\pm$  tubular; segments 3+3, free, 1 - nerved above, 3 - nerved in lower part (in Turkish plants), outer 3 narrower than inner 3. Stamens 3+3, all equal, exceeding perianth. Filaments filiform dilated toward base. Anthers oblong to ovoid, dorsifixed near base, introrse. Ovary superior, 3 - valved, 3 - celled, with 4 ovules in each cell. Style filiform. Stigma minute. Fruit a loculicidal capsule, globose or subglobose, membranous or subligneous, smooth or transversely ribbed. Seeds irregularly acutely triquetrous, with hard testa, winged, 2-4 in each cell.

### Key to species

1 — Scape completely glabrous; perianth pale yellow or greenish yellow, campanulate or infundibular, 10-14 mm long; capsule (6-) 7-9 mm diam., transversely ribbed.. 1 - **E. spectabilis**

1a — Scape puberulent at least at base; perianth brownish,  $\pm$  tubular or narrowly tubular-infundibular, 9-10 mm long; capsule 10-12 mm diam., smooth ..... 2 - **E. cappadocicus**

Note: In the description of both species below, the measurement of lower bracts was given and the wings were included in the measurements of the seed.

### Sect. *Eremurus*

Syn.: sect. *Euremurus* Boiss., Fl. Or. 5:321 (1882).

*Selonia* Regel, Bull. Soc. Nat. Mosc. 41 (1): 457 (1868).

Perianth  $\pm$  broadly campanulate; segments involute at last, consequently filaments clearly exerted.

**E. spectabilis** Bieb., Fl. Taur. - Cauc. 3:269 (1819).

Subsp. **spectabilis** (Fig. 1).

Perennial. Plant (50-) 70-120 cm tall. Roots up to 22, fleshy, purplish brown, fusiform, tapering towards tip, up to 20 cm long, up to 10 mm thick. Scape erect, (4-) 5-7 mm thick, glabrous, collar surrounded by fibrillose or membranous remnants of old leaves. Leaves greenish or glaucescent, usually purplish brown near base, broadly linear, usually acute or rarely obtuse, 25-40 cm long, 5-30 mm broad, glabrous or rarely puberulent only near

apex, margins scabrid, usually ciliate towards tip. Inflorescence (12-) 20-50 cm long,  $\pm$  densely-flowered. Bracts linear-subulate or narrowly lanceolate, cuspidate at apex, 10-15 mm long, long ciliate. Flowering pedicels c. 10 mm, fruiting pedicels (10-) 12-15 (-23) mm long, thickened, arcuate-erect,  $\pm$  approaching axis, not jointed. Perianth pale yellow or greenish yellow, infundibular or campanulate, 10-14 mm long; segments  $\pm$  linear, lanceolate or narrowly liptic, obtuse, sometimes slightly ciliate at apex, outer segments c. 3 mm, inner ones c. 4 mm broad, with greenish brown or greenish mid-vein. Stamens somewhat longer than perianth. Filaments (11-) 12-17 mm long. Anthers  $\pm$  oblong or ovoid, 2-3 mm long. Ovary globose, 1.5-2 mm long. Style filiform, 12-17 mm long. Stigma minute, capitate. Capsule globose,  $\pm$  apiculate, (6-) 7-9 mm long and broad, (4-) 5-6 (-7) transversely wrinkled, perianth segments and style partly or completely persistent on fruit. Seeds 2-3 in each loculus, greyish, yellowish or yellowish brown, 4-6 mm long, 2-3 mm broad and 3-4 mm high, with c. 0.5 mm broad membraneous winged.

**Flowering time:** May, June.

**Habitat:** Stony, rocky places, steppe, mountain slopes, alpine meadows, river banks, forest (*Pinus nigra*, *Juniperus*, *Quercus*) clearings, scrub.

**Altitude:** 1300-2750 m.

**Type:** Described from N. Caucasus, between Kuma and Sablya rivers (LE).

*Distribution in Turkey :*

A2 Bursa : Uludağ, Aras-Soğukpınar, 30.VI.1944, M. Heilbronn. ISTF 3792! İbid. Kusaklıkaya, 4.VII.1944, M. Heilbronn. ISTF 4043! İbid. on the road to Aras, 4.VII.1944, M. Heilbronn. ISTF4048! A 3/4 Ankara, Karaşar, 1400 m, Y. Akman (ANK.) (8). A7 Giresun : Giresun-Şebinkarahisar, 16 km. from Kümbet, 2000 m, 8.VII.1982, N. and E. Özhatay ISTE 49304! A8 Erzurum : Sarı Koma pass, 1830-2750 m, 2.VII.1960 Furse and Syngé 843 (E.K.)! 62 km from Eczucum to Ispir, 2000 m, 27.V.1977, S. Özyurt 1213 (ATA) (9). Gümüshane : Bayburt, from Eczucum to Ispir, 2000 m, 27.V.1977, S. Özyurt 1213 (ATA) (9). Kop köyü, 1300 m, 19.VI.1967 Tobey 2050 (E, Kop Da., 20.VII.1974, E.K. Balls 1022a (E.K.)! Kop köyü, 1300 m, 19.VI.1967 Tobey 2050 (E, Kop Da., 20.VII.1974, E.K. Balls 1022a (E.K.)! 9 miles East of Bayburt, 1600 m, 14.VI.1973, Grey-Wilson, Phillips ISTE 21046, ISTO 9542)! 41 (K)! Erzurum-Bayburt Kop Da. 2400 m, 13.VII.1975, K. Baykal, M. Koyuncu 1523 (AEF)! Kop Da. pass-Bayburt, Kop Da. 2270 m, 24.VII.1978, E. Tuzlacı, ISTE 41165! A9 Kars : Su-Kop Da. pass-Bayburt, Kop Da. 2270 m, 24.VII.1978, E. Tuzlacı, ISTE 41165! A9 Kars : Su-suz 1750 m, 5.VII.1957, P.H. Davis, I.C. Hedge D 30652) (ANK)! Yağmurlu D. between Sarıkamış and Karaorgan, 2200 m, 7.VII.1957, P.H. Davis 30731, (E.K.)! near Çıldır gölü, 2009 m, 24.VI.1973, M. Koyuncu 3522 (AEF)! Sarıkamış, Karakurt, Ağaç mevlâ, 1503 1600



m, 16.VI.1960, O. Güneş 1110 (HUB)! *B2 Kütahya* : Murat Da. above Keşik Sığıt, 1650 m, 5.VI.1962, P.H. Davis, M.J.E. Coode (D. 36859) (E)! İbid, above Banaz, 1800 m, 15.V.1955, M.J.E. Coode, B.M.G. Jones 2466 (E,K)! 6 miles from Simav, on forest road to Simav Da. 1600 m, 18.VI.1965, M.J.E. Coode, B.M.G. Jones 2546 (E)! Gediz Murat. Da. above Sığırkuyruğu, 1850 m, 12.VI.1977, A. Çirpıcı ISTF 30616! Banaz, Murat Da., above Sığır-Çukuroluk, 1650 m, 18.VI.1978, A. Çirpıcı, ISTF 31867! *B3 Eskişehir* : Sündiken Da. Bozalan Deresi, 1450 m, 22.V.1971, T. Ekim (ISTO 25387)! İbid, B. Alç alanı, 1500 m, 20.VI.1973, T. Ekim (ANK, E)! İbid. Çatacık, Asar tepe, 1750 m, 29.V.1982, A. Eaytop, ISTE 833! *B5 Yozgat* : Akdağmadeni, Sofular deresi, VI.1960 E.W. Curtis 166 (E)! Akdağmadeni to Büyük Nalbant Da., 2000 m, 6.VI.1965, M.J.E. Coode, B.M.C. Jones 2070 (E, ISTO 5543 K)! *B6 Adana* : Saimbeyli, west slopes of Saksagan boğazi, 1750 m, 30.V.1977, E. Tuzlacı, ISTE 37290! *Maras* : Göksun, Dibek Da., Cennet yücresi, 2000 m, 19.VI.1979, E. Tuzlacı ISTE 42339! Göksun, above Koçcağız köyü, Malakhasan mevkii, 1900 m, 14.VII.1933, T. Baytop ISTE 50766! *Sivas* : Gürün-Pınarbaşı, 48 km west of Gürün, 2300 m, 19.VI.1960, Stainton, Henderson 5671 (E,K)! *B7 Elazığ* : Harput, 28.V.1889 Sintenis 707 (K)! *Sivas* : 13 km from İmranlı to Zara, 1680m, 22.VII.1978, E. Tuzlacı, ISTE 41060! *Tunceli* : Ovacık, Munzur Da. between Dilap yaylası and Koyun gölü, 1250-2250 m, 8.VII.1980, Ş. Yıldırım 3608 (HUB)! *B8 Bingöl* : Bingöl Da. near Kırıkhan, 2200 m, 17.VII.1980, A. Engin 637 (ATA)! *Bitlis* : Kambos Da., above Hürmüz, 2130 m, 31.VI.1954, P.H. Davis 23406 (E,K)! İbid., 2250 m, 9.VIII.1984, E. Tuzlacı, ISTE 54907! *Erzurum* : Palandöken Da., Egerli Da., 2500 m, 16.VI.1977, (ATA) 994 (9). *Muş* : 11 km. from Solhan to Muş, 1630 m, 30.VII.1978, E. Tuzlacı ISTE 41357! *B9 Ağrı* : 5-10 km from Hamur to Tutak, 1650 m, 2.VI.1966, P.H. Davis, 44125 (E)! 50 km east of Ağrı 2300 m, 27.VI.1969, J.S. Andersen, I.C. Petersen 52 (E, K)! Tahir Da. 2475 m. 11.VI.1977, S. Özyurt 1292 (ATA) (9). 20 km from Ağrı to Tutak, 2100 m, 12.VI.1977, S. Özyurt 1283 (ATA) (9). 18 km. from Tutak to Hamur, 1560 m. 27.VII.1978, E. Tuzlacı, ISTE 41230! *Bitlis* : Nemrut Da., 1972, H. Peşmen (10). *Van* : Ereğ Da., 2300 m, 23.VI.1973 T. Baytop, ISTE 26106! *C3 Antalya* : Tahtalı Da., Çukurardıç, 15.VII.1949, A. Atilla ISTF 9049! Çalbah Da., near Feslegen yaylası 1900 m, 4.VIII.1960, E. Tuzlacı, ISTE 45642! between Manavgat and Akseki, T. Baytop, ISTE 48627! *C4 Antalya* : between Gündoğmuş and Ge'endost yaylası, 12.V.1979, T. Baytop, ISTE 41941! Gündoğmuş, Yelek Da., Beyçukuru, 1430 m, 6.VIII.1960 E. Tuzlacı, ISTE 45683! *C5 İçel* : Gusgutathal, VI.1896, Siehe 257 (E, K)! *C6 Maras* : Kuru Da. (Nuru Da.), Zeytin, 1525 m, 10.V.1934 E.K. Bails 1022 (E, K)!

**General distribution:** Turkey, Iran, Caucasia, Crimea, Iraq, Lebanon, Syria, Israel.

Subsp. *eremurus* is distinguished from subsp. *regeli* (Vved.) Wendelbo (Afghanistan, Central Asia) mainly by yellowish or greenish yellow perianth (not reddish!) and subsp. *albiflora* (Vved.) Wendelbo (Iran, Türkmenistan) by glabrous (or sometimes puberulent only near apex) leaves (not minutely pubescent!).

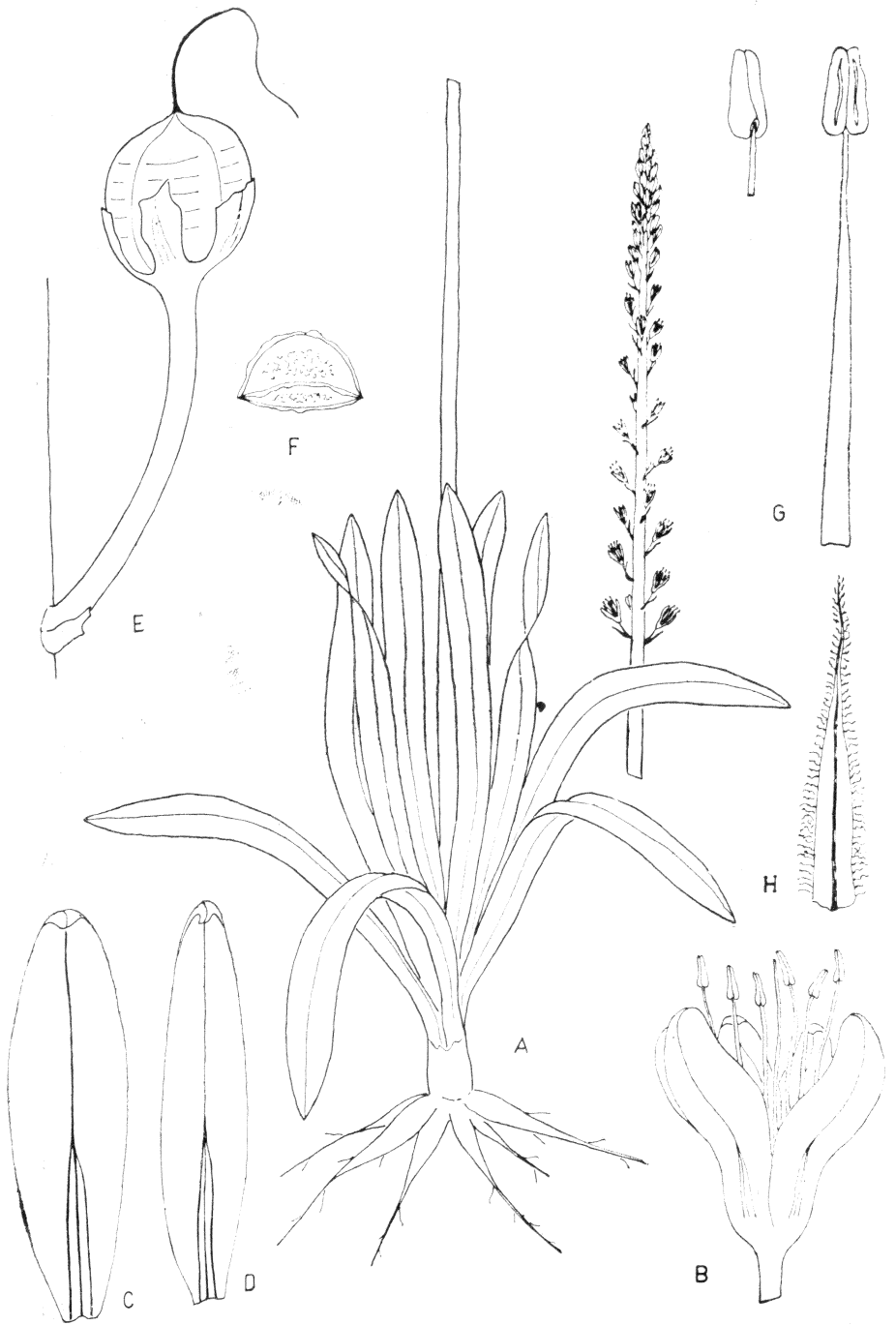


Figure - 1 : *Eremurus spectabilis* subsp. *spectabilis* : A. plant ( $\times 1/4$ ) B. Flower ( $\times 3$ ) C. inner tepal ( $\times 5$ ) D. outer tepal ( $\times 5$ ) E. fruit ( $\times 3$ ) F. seed ( $\times 3$ ) G. stamen ( $\times 5$ ) H. bract ( $\times 3$ ).

*E. spectabilis* is one of the most widespread species of this genus. The west border of its distribution is found in Anatolia and the distribution of the genus also reaches its western end in the same area by means of this species. It is usually abundant in its distribution areas recorded above. This species is an Irano-Turanian element. But its distribution is also extended into the mediterranean areas in Anatolia.

The leaves of plants (Turkish: Çiriş) are edible and used as a vegetable (Antalya, Adana, Maraş, Bitlis) and its roots are used to make gum (Erzurum, from the note of Furse and Synges on the label of the sheet of their plants).

**Sect. Ammolirion** (Kar. et Kir.) Boiss. Fl. Or. 5:322 (1882).

Syn.: Ammolirion Kar. et Kir., Bull. Soc. Nat. Mosc. 15:515 (1842)

Perianth tubular; segments incurved at apex at last. Filaments scarcely exerted.

***E. cappadocicus*** J. Gay ex Baker, in Jour. Linn. Soc. Bot. 15:281 (1876). (Fig. 2).

Syn. *Asphodelus glaucus* Aucher - Eloy, Pl. Orient Exsic, No: 2166

Perennial. Plant 45-70 (-80) cm tall. Roots up to 17, fleshy, brownish or purplish brown,  $\pm$  fusiform or cylindrical, tapering towards tip, up to 25 cm long, up to 10 mm thick. Scape erect, 3-5 (-7) mm thick, puberulent, at least just above the leafy part, collar surrounded by fibrillose or membranous remnant of old leaves. Leaves glaucous, usually purplish towards base, linear, gradually tapering towards base, acute at apex, 25-40 cm long, 5-15 (-18) mm broad, glabrous, margins usually smooth or slightly scabrid towards apex. Inflorescence (15-) 20-30 (-40) cm long, laxly-flowered, usually more densely-flowered towards apex. Bracts linear-subulate, 10-14 (-17) mm long glabrous or sparsely and minutely ciliate. Flowering pedicels 15-20 mm long, ascending-erect, jointed at the end (near the base of flower or fruit). Perianth brownish  $\pm$  tubular or narrowly tubular-infundibular, 9-10 mm long; segments linear or linear-oblongate, outer segments c. 1.5 mm, inner ones c. 2 mm broad with paler or sometimes whitish margins and broadly, sometimes branched, brown

or purplish brown mid-vein. Stamens somewhat longer than perianth. Filaments 11-12 (-15) mm long. Anthers oblong-ovoid, c. 1,5 mm long. Ovary globose, 1,5-2 mm long. Style filiform 11-12 (-15) mm long. Stigma minute, capitate. Capsule globose,  $\pm$  adpressed or retuse at apex, 9-10 mm long, 10-12 mm broad, smooth, sometimes perianth segments and style partly or completely persistent on fruit. Seeds 3-4 in each loculus, yellowish white, greyish or brownish yellow, 6-7 mm long, 3-5 mm broad and 4-5 mm high, with irregularly c. 1 (up to 2) mm broad membranous winged.

**Flowering time:** May, June.

**Habitat:** Arid, open places, steppe, stony, rocky slopes.

**Altitude:** 1000-1450 m.

**Syntypes:** Cappadocia meridionalis, Aucher-Eloy 2166, 2332.

**Distribution in Turkey:**

*B8 Malatya (/Sivas?):* Darende to Gürün, 1000-1050 m., Hub. Mor. 16032. *Sivas:* 22 km. W of Divriği, 1400 m., Sorger 70-24-17 20 km. from Divriği to Kangal, 1400 m., 6.VII.1982, H. Başer, H. Malyer, ESSE 1932 (ISTE 49989)! *B8 Erzincan:* 1 km W of Tercan, 1340 m., Hub.-Mor. 11337. Near Tercan, Karasu valley, 1440 m., 23.VII.1978, E. Tuzlacı, ISTE 41111! 1 km from Tercan to Erzincan, 1400 m., 10.VII.1979, E. Tuzlacı, ISTE 42594! 3 km from Tercan to Erzincan 1400 m, 31.VII.1983, N. and E. Özhatay, ISTE 51952!

**General distribution:** Turkey, N. Iraq

It is very close to *E. nderiensis* (Stev.) Boiss. (Iran, Afghanistan, Central Asia). This species is distinguished from *E. cappadocicus* by taller (up to 120 cm) and thicker (up to 10 mm) scape, puberulent leaves, long ciliate bracts, longer perianth (10-16) mm, broader perianth segments (up to 2 mm), smaller capsule (8-10 mm diam.). *E. cappadocicus* is an Irano-Turanian element.

Indumentum of flowering stem is variable. Scape is densely puberulent up to inflorescence on the specimens collected from Sivas (ESSE 1932, ISTE 49989) and on the other specimens collected from Erzincan the stems are usually hairy in lower half or only just above the leafy part.

It is abundant in near Tercan (Erzincan).

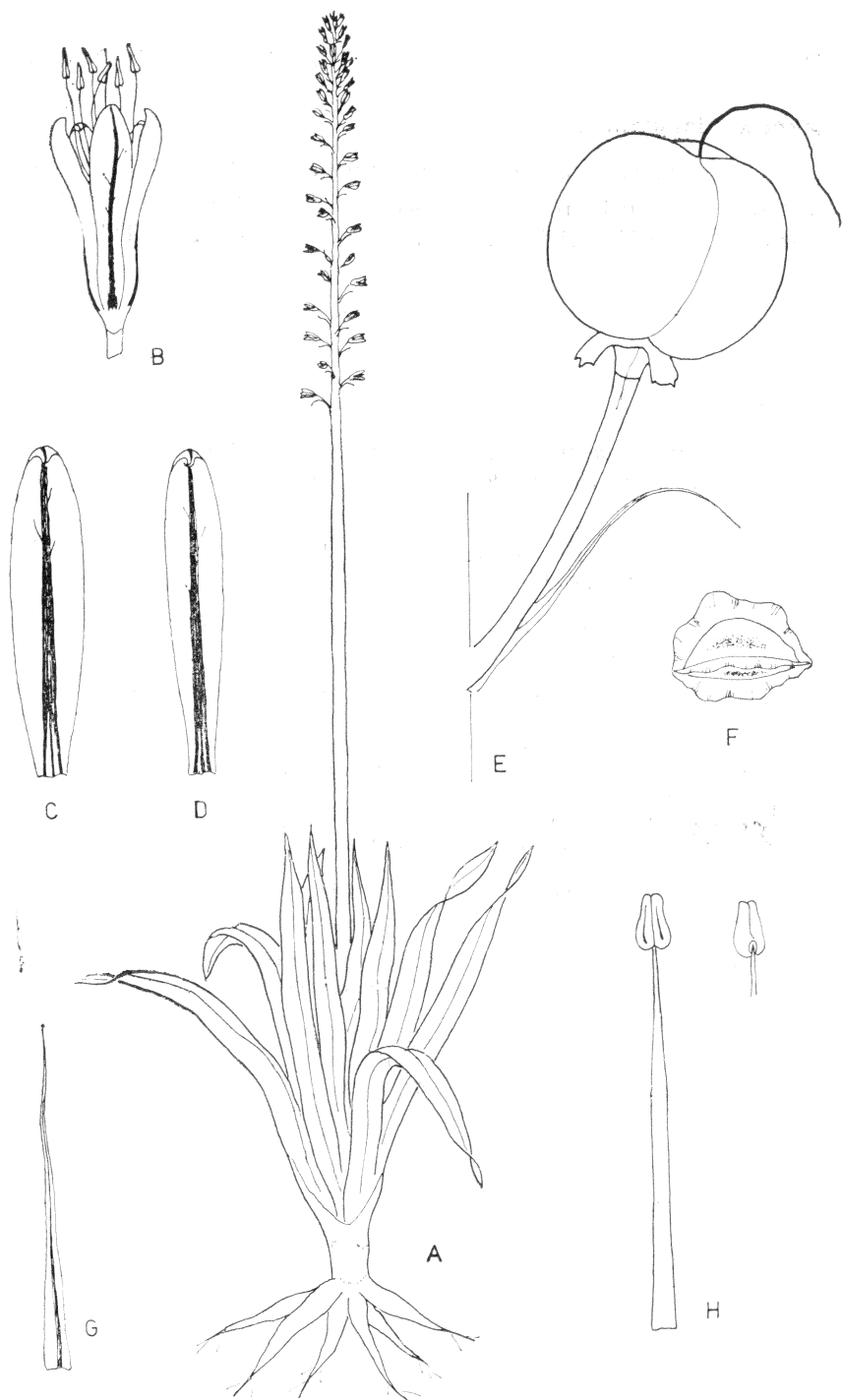


Figure -- 2 : *Eremurus cappadocicus* : A. plant (x1/4) B. flower (x3) C. inner tepal (x3)  
 D. outer tepal (x5) E. fruit (x3) F. seed (x3) G. bract (x3) H. stamen (x5).

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