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FOURTEEN NEW SPECIES FROM TURKEY

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The species described in this paper are some of the new taxa that have remained unpublished in my Turkish collections; most of the others will have to wait until their family is revised for the "Flora of Turkey" before they can be described.

I am indebted to Mr. E. Nelves for allowing me to include his description of a new *Carex* in this contribution. To Professor Sir William Wright Smith I am, as always, grateful for improving my Latin descriptions. My thanks are due to the Directors of the Kew, Geneva and Vienna Museum herbaria for the loan of relevant material.

GERANIACEAE

***Erodium hakkiaricum* P. H. Davis, sp. nov.** (Subsect. *Absinthioidea* Brumh.)

Valde affinis *E. cinereo* Boiss. et Heldr. praesertim var. *canescenti* Davis et Roberts et *E. absinthioidi* Willd. var. *armeno* Trautv.; a priorie habitu graciliore, foliis caulinis paucioribus, pedunculis longis, calyce pilis longis patentibus proviso recedit; ab altero habitu gracili, floribus et fructibus minoribus (rostro 2.5 cm. longo), sepalis vix mucronatis, petalis albis 6 mm. longis divergit.

Planta perennis, dioica, parviflora. *Radix* crassa, verticalis, caudices saepe plures abbreviatis stipulis foliorum vetustorum vestitos emittens. *Folia* basalia longipetiolata, ad terram adpressa; lamina laxè bipinnatisecta ambitu oblonga, 2-5 cm. longa, 1-2 cm. lata, segmentis primariis utrimque 4-5, inferioribus subdistantibus, superioribus approximatis, in lacinias lanceolato-oblongas subacutas integras vel dentatas pinnatisectis, pilis subadpressis sparsim vel dense vestitis, eglandulosis vel glanduloso-pubescentibus; rachis inter segmenta laminae inferiora dentato-lobata; petiolus 3-5 cm. longus, 0.5-0.75 mm. latus, vix pubescens vel etiam glanduloso-pubescent. *Caules* prostrati, 4-10 cm. longi (pedunculis

exclusis), graciles, superne in pedunculos 1-3 abeuntes. *Folia caulina* 1-3 paria; lamina bipinnatisecta, ambitu oblongo-ovata, subcanescens, petiolo longior. *Pedunculi* 1.5-5.0 cm. longi, vix 0.5 mm. lati. *Umbella* 5-7-flora, multibracteata. *Pedicelli* gracillimi, 5-8 mm. longi, ut pedunculi pubescentes vel interdum hirsuti et brevissime glandulosi. *Sepala* oblonga, obtusa, 3-5-costata, 3.0-3.5 mm. longa (in fructu 5.5 mm.), pilis longis eglandulosis patentibus et pilis brevissimis glandulosis vestita, ad apicem mucrone vix 0.3 mm. longo vel obsoleto munita. *Petala* alba, oblongo-obovata, 6 mm. longa, 2.75-3.5 mm. lata, obtusissima, ad basin pilosa. *Filamenta* antiseipala in floribus masculis lineari-lanceolata, 2.5 mm. longa fertilia; staminodia antiseipala in floribus femineis anguste obovata, 2 mm. longa. *Ovarium* in floribus masculis valde reductum. *Rostrum* gracile, 2.5 cm. longum, adpresse pilosum, basi glanduliferum. *Mericarpia* 5 mm. longa, dense et breviter hispidula.

PROV. HAKKÄRI (Kurdistan). Kara Dağ above Çölemerik, 2,900 m., in earthy patches on rocky N. slope, dioecious perennial, stems prostrate, flowers white, anthers (male) orange, 13 Aug. 1954, *Davis & Polunin* (D. 24319, holotype; iso. E.).

The new *Erodium* is remarkable in Subsect. *Absinthioidea* for the very small size of its white flowers and short fruits. It seems to come nearest to *E. cinereum* Boiss. et Heldr. var. *canescens* Davis & Roberts and *E. absinthioides* Willd. var. *armenum* Trautv. From the first it is distinguished by its more slender habit, much longer peduncles, even smaller flowers with the sepals hirsute with long spreading eglandular hairs (not shortly glandular-pubescent). *E. cinereum* is the only other species in the Subsection with such short fruits and very short sepal mucro. The new species differs from *E. absinthioides* var. *armenum* in its more slender flexuous habit, smaller flowers and fruits (beak 3.5-4 cm. in var. *armenum*), extremely short sepal mucro and white petals.

E. hakkiaricum is also related to *E. flexuosum* Davis & Roberts (in Notes Roy. Bot. Gard. Edinb. xxii, 15:1955), but differs in its leaf-indumentum (adpressed hirsute, not densely glandular-pubescent with spreading hairs), hirsute calyx, longer laxer leaf-blade, smaller flowers, branched stems, and old petioles thinner and not persistent.

On Kara Dağ near Çölemerik the new species formed a fairly uniform population (except for variation in glandulosity of stems), and in August was in flower and fruit on a N. slope at 3,000 m. *E. absinthioides* var. *armenum*—which I found widely but locally distributed in the mountains S. of Lake Van—grew on the same mountain, where a variable population (*Davis* 24,402) having white or lilac flowers smaller than usual, suggested that there may have been some hybridisation with *E. hakkiaricum* that we found 2 or 3 miles away. As the latter is dioecious, there is no question of its being a self-pollinated race of *E. absinthioides* var. *armenum*.

RHAMNACEAE

Rhamnus nitida P. H. Davis, sp. nov. (Sect. *Cervispina* (Moench) DC.).

Affinis *R. Heldreichii* Boiss. et *R. amasiensi* Bornm., sed ab ambabus foliis late ellipticis ut ramulis juvenilibus glaberrimis recedit; a priori habitu dissimili et fasciculis paucifloris insuper differt; ab altera disco subpuberulo et rima seminis apice bifida divergit.

Frutex erectus, laxe intricatus, horridus, ad 4 m. altus. *Rami* stricte divaricati, alterni, vetusti et annotini pallide grisei; ramuli juveniles rufescentes, spinosi, glaberrimi, nitidi, 3–6 cm. longi, tenues, prope basin saepe 1 mm. lati. *Folia* ramorum annotinorum in turiones brevissimos conferta, ea ramulorum juvenilium sparsim alterna; lamina late elliptica (raro obovato-elliptica), plana, integerrima, glaberrima, concolor, virescens, firma sed haud crassa, ad apicem rotundata, saepe mucronata vel etiam retusa, 13–31 mm. longa, 7–20 mm. lata, nervo mediano subtus subprominente et nervis lateralibus utrimque ± 5 ut nervulis reticulatis obscuris praedita, in petiolum glabrum 3–8 mm. longum abrupte angustata; stipula subulata. *Flores* ignoti. *Pedicelli* fructiferi 1–3-enati, recurvi, 5–8 mm. longi. *Discus* in fructu immaturo intus sub lente minutissime et sparsim puberulus, deinde glaber. *Drupa* globosa, a latere subcompressa, glabra, reticulato-venosa, ad 6 mm. longa et 5.5 mm. lata, apice subretusa. *Semina* 2, sulco subclauso apice breviter bifido margine undulato-cartilagineo munita.

PROV. ANTALYA. Dist. Gebiz (Pisidia): Kozlu Dere N. of Bozburun Dağ, 1,100–1,200 m., 27 July 1949, *Davis & Bilger* (D. 15759, holo. K; iso. E). Dist. Kemer (Lycia): Teke Dağ near Ovacik, in *Pinus Brutia* forest, 12 July 1949, *Davis, Bilger & Attila* (D. 15176). Dist. Antalya: Termessus, 700 m., shrub 3–4 m. tall, 11 Aug. 1947, *Davis & Bilger* (D. 13944). Dist. Elmali (Lycia): dans les rochers Adendepa, 21 June 1860, *Bourgeau* (sub *R. Heldreichii* Boiss.).

Rhamnus nitida is apparently confined to S.W. Anatolia, where it is based on four gatherings from the province of Antalya. *Bourgeau's* Lycian specimen was referred to *R. Heldreichii* by Boissier—a species originally described from Pergame near Antalya. Bornmüller (in Fedde, Repert. xxix, 35:1931) pointed out that it represents a distinct species, and now that more material is available it is possible to describe it.

R. nitida is closely related to *R. Heldreichii* Boiss. and to *R. amasiensis* Bornm. From the first it differs in its habit, broadly elliptical, very glabrous leaves, glossy spines, and few-flowered fascicles. From *R. amasiensis* it is distinguished by its different leaves (with even the petiole glabrous), shining spines, minutely puberulent disc and seed having a groove with a bifid apex. It may be a larger shrub than *R. amasiensis*, which is described as 1 m. tall by Bornmüller; *R. nitida* grows up to 4 m.

The new species also comes close to *R. palaestina* Boiss. (from Lebanon and Palestine), but the latter differs from *R. nitida* in having obovate-spathulate, typically crenulate leaves, and hairy shoots and petioles.

R. Heldreichii was originally based on flowering material, the fruit description in Boissier's *Flora Orientalis* being derived from *Bourgeau's* specimen now assigned to *R. nitida*.

COMPOSITAE

Centaurea ensiformis P. H. Davis, sp. nov. (Sect. *Phalolepis* (Cass.) DC). Plate 1.

Species insignis, a *C. lactucifolia* Boiss. caulibus pluribus tenuioribus e basi lignoso haud lanato enatis, foliis lineari-lanceolatis integerrimis,

indumento adpresse canescente, capitulis 1-3 ovatis minoribus, appendicibus intermediis involucri in spinulam mollem longius cuspidatis, acheniis glabris, pappo brevior inter alia valde differt.

Planta perennis, basi breviter ramoso-lignosa caules plures et turiones steriles emittens. *Caules* erecti, subsimplices, 20-35 cm. alti, 3-4 mm. lati, prominente costati, 8-15-foliati, canescentes, monocephali, vel superne capitulis 2-3 breviter pedunculatis (pedunculo bracteis membranaceis ad phylla involucri transeuntibus munito) provisa. *Folia* integerrima, ensiformia, pilis mollibus adpressis canescentia, eglandulosa; basalia lineari-oblancoolata in petiolum sensim attenuata, 15-25 cm. longa (petiolo incluso), 8-14 mm. lata, firma, acutissima vel etiam breviter acuminata, nervo mediano subtus prominente, nervis lateralibus obscuris; caulina simillima sed mediana brevius petiolata, superiora sessilia, omnia erecta, margine ad caulem spectante, nervis exclusis haud decurrentia, summa capitulo terminali multo breviora capitula lateralia vix superantia. *Capitula* ovata, luteoflora; involucrium 2.5-3.5 cm. longum, 1.7-2.8 cm. latum, appendicibus phyllorum haud decurrentibus nitido-eburneis fimbriato-laceratis concavis bases adpressos occultantibus; phylla extima basi brevissimo in appendicem cuspidatam ovato-orbiculatam abeunte; phylla intermedia basi breviter ovato-oblonga in appendicem 7-12 mm. longam (spinulo exclusa) triangulari-orbiculatam in spinulam invalidam 2-9 mm. longam cuspidatam constricta; phylla intima lineari-oblonga ad 28 mm. longa (appendice inclusa), appendice 5 mm. longa orbiculata breviter lacerata vix cuspidata terminata. *Receptaculum* setosum. *Flores* lutei, aequilongi, marginales neutri, alii hermaphroditi. *Corolla* glabra, 22 mm. longa, in lacinias 10 mm. longas lineares acutas fissa. *Filamenta* papillifera. *Antherae* 12 mm. longae, basi breviter caudatae, apice acutissimae. *Stylus* exsertus, 4.5 mm. infra apicem pilosulo-annulatus. *Achenia* glabra, compressa, late oblonga, 7 mm. longa, 3.0-3.75 mm. lata, pallide brunnea, prope basin hilo laterali munita. *Pappus* persistens; externus pluriserialis e setis scabris ab exterioribus brevissimis ad interiores 6 mm. longas inferne albidas superne pallide fuscas regulariter elongatis compositus; internus uniserialis e setis abbreviatis conniventibus 2 mm. longis compositus.

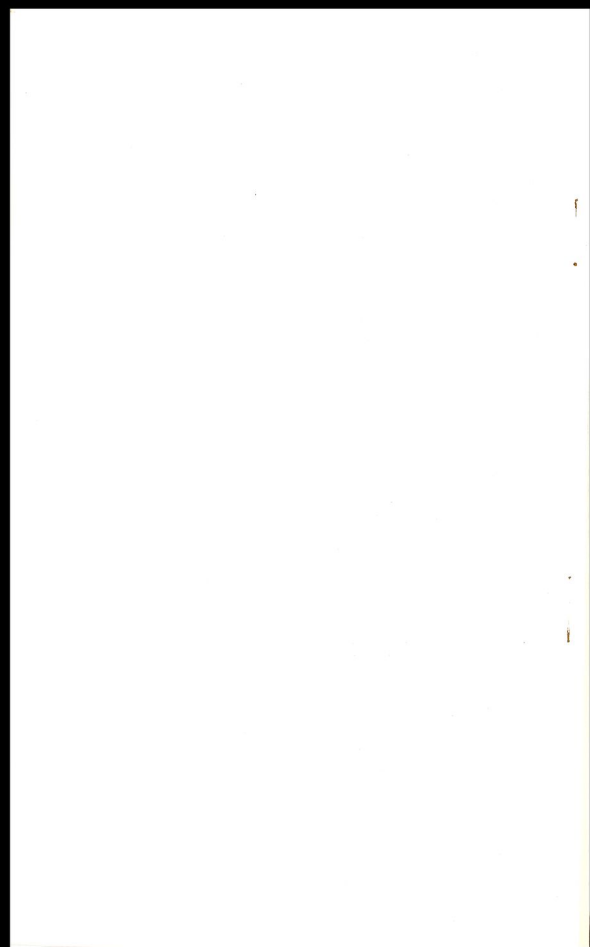
PROV. MUĞLA, Dist. Köyceğiz (Caria). Sandras Dağ above Ağla, near Gökce Ova, 1,700 m., on serpentine in open *Pinus nigra* subsp. *Pallasiana* forest, 23 July 1947, Davis & Bilger (D. 13,510, hol. E; iso. K).

No close affinity could be found for this beautiful species. Despite its softly spiny involucrial bracts, it must be referred to Sect. *Phalolepis* (Cass.) DC., where it comes nearest to the yellow-flowered *C. lactucifolia* Boiss. (Syn. *C. chorionensis* Hoffm.-Grob. & Beauv., *C. halkensis* Major & Barbey—cf. K. H. Rechinger, Fl. Aeg., 662: 1943) confined to the Dodecanese. In the new species the soft involucrial spine is no more than an extension of the cusp found in *C. lactucifolia* and does not warrant its inclusion within Sect. *Acrocentron* (Cass.) DC., where it would have no ally as close as *C. lactucifolia*. *C. ensiformis* differs strikingly from the latter in its numerous, more slender, nearly simple stems that arise from a branched, rather woody and non-lanate base, very entire and narrowly lanceolate leaves (held edgewise to the stem), canescent indumentum,



PLATE 1. *Centaurea ensiformis* P. H. Davis.

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fewer smaller ovate capitula (5–11 in *C. lactucifolia*) that are not borne in a panicle, longer spine (cusp) on the median involucre bracts, and glabrous achenes slightly longer than the pappus.

C. ensiformis is probably confined to the serpentine soils of Sandras Dağ in S.W. Anatolia, a mountain climbed by Professor O. Schwarz and the writer whence the following endemics (?) have been described: *Phlomis Schwarzii* Davis, *Umbilicus (Rosularia) serpenticus* Werd., *Viola sandrasea* Melch., *Teucrium sandrasicum* Davis, *Lamium sandrasicum* Davis, and *Senecio sandrasicum* Davis; no doubt others await description.

Echinops (Sect. *Ritro* Endl.)

The three new *Echinops* described below are all probably related to *E. pannosus* Rech. fil. (Öst. Bot. Zeit. xc, 244 : 1950), based on Kotschy's specimen from the Cilician Taurus. This has weakly coherent inner involucre phyllaries, and was therefore referred by Rechinger (with reservations) to Sect. *Ritrodes* Bunge. The discovery of three allied species in Sect. *Ritro* Endl. (particularly *E. heterophyllus* P. H. Davis, which is also related to *E. Tournefortii* Led.) shows that the affinities of *E. pannosus*, despite its somewhat coherent phyllaries, are with Sect. *Ritro* Endl. in which the inner phyllaries are free.

In this genus the specific diversity in the form of the involucre bracts is evidently related to the fact that the one-seeded capitulum is the unit of dispersal, the very short pappus playing no part in dissemination.

Echinops Emiliae O. Schwarz ex P. H. Davis, **sp. nov.** (Sect. *Ritro* Endl.) Fig. 1, v.

Species splendens viridiflora, affinis *E. pannoso* Rech. fil. sed indumento heteromorphico, forma foliorum inferiorum diversa nervatura prominentissima, involucre maximo ex toto pallide virescente, phyllis externis et medianis valde attenuatis superne glandulosis, infimis exacte liberis valde differt.

Caulis erectus, validissimus, 40–60 cm. altus, 1–1.5 cm. latus, obscure sulcatus, indumento dense et adpresse albo-lanato pilis patentibus glanduloso-capitatis commixto, dense foliatus, 1–3-capitatus, basi vaginis crassis lanatis foliorum emarcidorum vestitus. *Folia* rigida, perforte armata, nervatura valde prominente, lamina superne pilis mollibus tenuissimis adpressis araneosa pilis patentibus manifeste barbellatis eglandulosis et pilis glanduloso-capitatis subpapilliferis commixta, subtus indumento dense et adpresse albo-lanato pilis glandulosis patentibus commixto; folia basalia breviter petiolata, irregulariter multipinnatifida, 30–40 cm. × 8–12 cm. (petiolo incluso), segmentis majoribus triangularibus (lobis spinosis minoribus alternantibus) fere ad rachidem attingentibus spina valida straminea 10–15 mm. longa terminatis et lobulis accessoribus breviter triangularibus spinosis provis; rachis subtus prominens pilis barbellatis valde numerosis vestitus, inferne in petiolum crassum sulcatum spinoso-lobatum (vel etiam spinoso-alatum) basi vaginatum abiens; folia caulina inferiora sessilia, ambitu oblonga, ad 40 cm. longa et 17 cm. lata, in lobos triangulares spinoso-lobulatos (spinis pervalidis ad 2.5 cm. longis provis) ad medium pinnatilobata, basi semiamplexicaulia valide spinosa, nervo mediano inferne lato et flavescente; folia superiora simillima sed

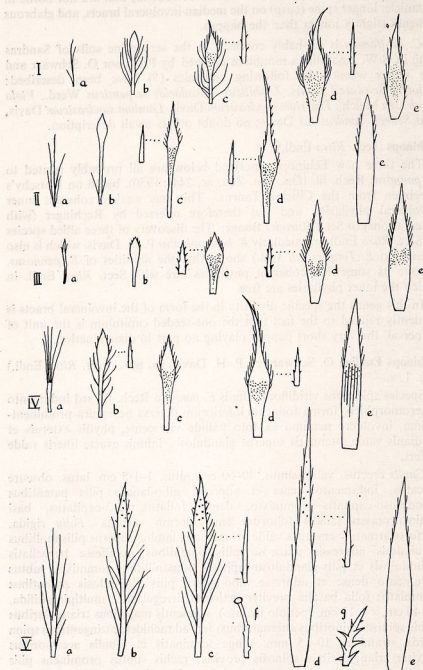


FIG. 1. Involucres of species of *Echinops*. I, *E. pannosus* Rech. fil. (type). II, *E. heterophyllus* P. H. Davis (type). III, *E. Onopordum* P. H. Davis (D. 14213). IV, *E. Tournefortii* Led. (type). V, *E. Emiliae* P. H. Davis (D. 13651). a, setae of 'pencil'; b-c, outer phyllaries (with marginal setae); d, median phyllaries (with marginal setae); e, inner phyllaries; f-g, leaf hairs. All $\times 1\frac{1}{2}$.

breviora paucius lobata, 7–20 cm. longa, summa ambitu etiam rotundata palmatispinosa ad 2–4 cm. reducta. *Caput* terminale maximum, longe pedunculatum, 12(–15) cm. diametro, haud cornutum. *Involucrum* parziale c. 5 cm. longum, e phyllis c. 22 compositum; penicillus 15–18 mm. longus, setis albis anguste linearibus fasciculatis et ramosis multiradiatus; phylla flavescenti-virentia, tenuissima, glabra (intimis exclusis) superne glandulosa et paulum recurvata; phylla externa penicillo ad 2-plo longiora, lanceolato-lineariter inferne valde attenuata setis glabris ad 10 mm. longis longissime fimbriata, superne setis brevibus firmis marginata; phylla mediana lineari-lanceolata apice valde attenuata setis adpressis barbellatis longe fimbriata, inferne margine glabra vel pauciter longifimbriata; phylla intima lanceolata, exacte libera, superne setis barbellatis longis adpresse pectinata. *Corolla* pallide viridis, 25 mm. longa, infra medium in lacinias lineares fere 15 mm. longas fissa. *Achenia* submatura 16 mm. longa, dense aureo-sericea, pilis adpressis 2 mm. longis dimidium inferius pappi occultantibus. *Pappus* 4 mm. longus e setis firmis barbellatis aureis ad basin liberis dense compositus.

PROV. ANTALYA (Lycia). Tahtali Dağ, 2,000–2,200 m., limestone screes, terminal heads, 12–15 cm. across, flowers pale green, 17 Aug. 1947, *Davis & Bilger* (D. 14156).

PROV. MUĞLA, Dist. Fethiye (Lycia). Baba Dağ, 1,600–1,800 m., screes above the Cedars, 1½–2 ft. tall, flowers pale green, 30 July 1947, *Davis & Bilger* (D. 13651, holo. K; iso. E).

The nearest ally of this magnificent species appears to be *E. pannosus* Rech. fil. from Cilicia, from which it shows numerous differences. In *E. Emiliae* the indumentum—especially that of the leaves—is curious, since it consists of three kinds of hairs; very fine interlaced hairs, spreading more or less smooth gland-tipped hairs, and spreading eglandular strongly barbellate hairs—the latter particularly abundant on the lower sides of the petioles. *E. pannosus* has only fine, densely interlaced hairs. *E. Emiliae* differs further from it in the forms of the basal leaves, these being more deeply pinnatifid with large triangular segments alternating with smaller lobes; the leaves are very thick and rigid, with extremely prominent nervature, and the rachis deeply convex below; the very large partial involucre are pale yellowish green, unmarked with brown outside; the outer and median phyllaries are very attenuated, without any abrupt dilation, and bear shortly stalked glands in the upper part; the innermost phyllaries are completely free. The base of the plant is clad in the very thick, lanate bases of the dead leaves.

The plant was first discovered by Professor O. Schwarz on Cal Dağ near Nifköy in the district of Fethiye (*in litt.*). He had intended naming it after his wife, Emilia, but due to the loss of his specimens during the war the species was never described, and I therefore take this opportunity to validate Professor Schwarz's intended epithet.

E. Emiliae probably has the largest heads of any Echinops in the Orient, and this, combined with its dwarf stature and jade-coloured flowers, should make it a striking plant for the rock garden; ripe seed, however, is still to be obtained before we can see it in our gardens. A photograph of the species *in situ* has appeared elsewhere (J. Roy. Hort. Soc. lxvii, fig. 34: 1951).

Echinops heterophyllus P. H. Davis, sp. nov. (Sect. *Ritro*. Endl.)—Fig. 1, II.

Affinis *E. Tournefortii* Led. et *E. pannoso* Rech. fil.; a priori (typo) statura nana, foliis superne sparsim araneosis superioribus valde simplicibus (haud bipinnatifidis), phyllis externis involucri partialis infra partem dilatam vix fimbriatis, penicillo paucius radiato divergit; ab altera indumento foliorum diverso, foliis inferioribus fere bipinnatisectis sinubus rectis spinulosis provisus, phyllis involucri partialis magis attenuatis, externis infra partem dilatatam haud fimbriatis, intimis liberis, setis phyllorum vix barbellatis recedit.

Herba perennis, nana, alpina. *Caulis* erectus, validus, plerumque solitarius, 15–40 cm. altus, 6–10 mm. latus, sulcatus, breviter lanatus, eglandulosus, dense 8–12-foliatus, 1–3-capitatus, ad imum basibus fibroso-laceratis petiolorum vetustorum vestitus. *Folia* heteromorphica, inferne dense et brevissime albo-lanata, superne sparse araneosa, haud vel paulo scabridula, eglandulosa, nervis prominentibus indumento occultatis provisa; folia basalia et caulina inferiora fere bipinnatisecta, 18–40 cm. longa (petiolo incluso), 10–20 cm. lata, fere ad rachidem alatum breviter multispinulosam in segmenta 5–9-juga divisa; segmenta primaria in lacinias triangulari-lanceolatas spina eburnea 3–10 mm. longa terminatas profunde pinnatifida, sinubus inter lacinias rectis brevissime multispinulosis; petioli basales sparse spinosi ad basin in vaginam ovatam spinulosam dilatati, caulini inferiores basi valde ampliati semiamplexicaules; folia caulina mediana et superiora simplicia, sessilia, ad basin cordata semiamplexicaulia, ambitu oblongo-lanceolata, 7–15 cm. $\times$ 3.5–8.0 cm., spinosa-dentata vel (praesertim in foliis medianis) in lobos triangulares etiam ad medium pinnatilobata, sinubus inter lobos brevissime spinulosis. *Caput* terminale 7–8 cm. diametro, haud cornutum. *Involucrum* parziale 30–35 mm. longum, e phyllis c. 18 compositum; penicillus pauciradiatus, 10–12 mm. longus, albidus, setis simplicibus vel subramosis ad basin connatis longioribus ad phylla extima transeuntibus; phylla glabra, nitida, eglandulosa, stramineo-virentia, inferne brunnescentia, superne paulum recurva valde attenuata; phylla externa 18–22 mm. longa, tenuia, ad medium vel ultra abrupte subdilatata, superne plerumque longissime attenuata setis longis vix barbellatis adpresse fimbriata, infra partem dilatatam plerumque haud fimbriata; phylla intermedia simillima sed apice magis attenuata, infra medium dilatata; phylla intima libera, lineari-lanceolata, in parte superiore longe et adpresse fimbriata. *Corolla* cyanea, 20–22 mm. longa, laciniis tubum aequantibus. *Pappus* achenii junioris 2 mm. longus, setis ad medium concretis.—Fl. ad finem Aug.–Sept.

PROV. HAKKÄRI (Kurdistan). Kara Dağ (above Çölemerik), 3,000 m., rocky slopes, plant usually with one thick 1–3 headed stem, 16 Aug. 1954, *Davis & O. Polunin* (D. 24261); Cilo Dağ below Cilo Yayla, 2,700 m., rocky slope, 10 Aug. 1954, *Davis & O. Polunin* (D. 24255); Cilo Tepe, 3,000 m., widely scattered on rocky slopes, 8 Aug. 1954, *Davis & O. Polunin* (D. 24094).

IRAQ. Erbil Liwa (Kurdistan): Arl Gird Dagħ (=Helgurd Dagħ of Bornmüller), 1,900 m., metamorphic rocks, Astragalus zone, occasional, 23 Aug. 1948, *Gillett* 12471 (holo K); *ibid.*, on stony hillside, 2,550 m., 24 July 1932, *Guest* 2937.

This new species from "Kurdistan" is related both to *E. Tournefortii* Led. and *E. pannosus* Rech. fil., though probably more closely to the former. From the type of *E. Tournefortii* (based on cultivated material that originated from Ararat) it differs in its dwarf stature, sparse cobwebbed indumentum of its upper leaf-surface, strikingly simple leaves in the upper half of the stem (instead of bipinnatifid), outer involuclral phyllaries not fimbriated below the dilated portion, and fewer-rayed pencil. From *E. pannosus* it is distinguished by the sparse indumentum of the upper leaf surface, lower leaves nearly bipinnatisect with straight spinulose sinuses between the pinnatifid segments, more attenuated involuclral phyllaries, the outer ones not fimbriated below the dilatation, the innermost quite free, and the marginal setae of the phyllaries scarcely barbellate.

E. heterophyllus grows at higher altitudes than any other species of *Echinops* I have seen in Turkey. Its dwarf stature, and simple upper leaves contrasted with the nearly bipinnatisect lower ones (similar to the lower leaves of *E. heldreichii* Boiss.) give it a very characteristic facies. It blooms exceptionally late: though collected in mid-August, none of my Turkish gatherings was quite in bloom, so that Gillet's specimen from Iraq has been made the holotype.

The new species is evidently the plant referred to (and briefly described) as an unnamed form of *E. Tournefortii* by Nábělek (in Publ. Fac. Sci. Univ. Masaryk, No. 52, 27 : 1925) who collected it on Cilo Dağ. A note on Guest's gathering was published by Blakelock (in Kew Bull. 1949, 53). In *E. Tournefortii*, *E. heterophyllus*, *E. pannosus* and *E. Emiliae* the recurving of the involuclral phyllaries gives the young heads a "curly" appearance that is lacking in the straight-involuclred *E. Onopordum* described below.

***Echinops Onopordum* P. H. Davis, sp. nov.** (Sect. *Ritro* Endl.)—Fig. 1, III.

Species insignis, ut videtur affinis *E. pannoso* Rech. fil. sed foliis inferioribus lobis brevioribus et sinubus spinosis provisus, involuclro pentagono phyllis rectis adpressis minus attenuatis inter alia differt.—Folia inferiora magna, simplicia, flaccida, pinnatilobata, utrimque albo-lanata eis *Onopordi leptolepidis* DC. valde similia.

Herba perennis basi lignescens e fissuris praeruptorum dependens. *Caules* erecti, c. 1 m. alti, inferne 1 cm. lati, sulcati, c. 15-foliati, albo-lanati, eglandulosi, superne sparsim ramosi paucicapitati, basi foliis emarcidis vestiti. *Folia* omnia simplicia, indumento albo-lanato eglanduloso subtus densissimo nervos prominentes occultante; folia basalia et caulina inferiora 30–50 cm. longa (vel paulo ultra), lamina petiolum spinosum 4–6-plo superante ambitu elliptica subplana 10–25 cm. lata nec crassa nec rigida nec scabra solum ad tertiam partem vel prope ad medium lobata, lobis plerumque septenis utrimque enatis late rotundato-triangularibus lobulis brevibus spinis stramineis inaequalibus 1–10 mm. longis infirme armatis, sinubus inter lobos rotundatis spinosis; folia caulina mediana et superiora minora, 6–30 cm. longa, sessilia (vel infima attenuata), validius spinosa, basi cordata semiamplexicaulia, superiora recurva, summa diminuta. *Caput* apice ramorum 12–18 cm. longorum solitarium, c. 5 cm. diametro, haud cornutum. *Involuclrum commune* capitis reflexum, e phyllis parvis spatulatis glabris 5–7 mm. longis laciniatis compositum,

Involucrum parziale capitulorum 20–25 mm. longum, ambitu anguste ovato-oblongum, pentagonum; penicillus pauciradiatus brevis, sordide eburneus 5–7 mm. longus e setis angustissime linearibus subsimplicibus inferne connatis compositus; phylla 25–35, adpressa, recta, crassa, subconniventia sed omnia libera, glabra, extra subnitida, superne sordide eburnea setis valde barbellatis longe et dense pectinata, inferne pallide griseo-fusca extimis exclusis haud pectinata; phylla externa spathulata, acuta, penicillo sublongiora; phylla mediana cuneato-oblonga, superne lanceolata; phylla intima libera, anguste elliptico-lanceolata, intus valde convexa nigro-fusca nitida. *Corolla* (eminus spectata sed haud collecta) albidula. *Achenia* 9 mm. longa, 2 mm. lata, dense flavido-sericea, pilis valde adpressis 2–3.5 mm. longis sub lente barbellatis superne pappum occultantibus. *Pappus* vix 2 mm. longus, setis in fasciculos coalitis, infra medium omnibus concretis coronulam rigidam flavidam formantibus. Floret Jul.–Aug.

PROV. ANTALYA., Dist. Kemer (Lycia). Tahtali Dağ between Kesme Boğaz and Kuzdere, 450 m., hanging from vertical N.W. cliffs in *Pinus Brutia* forest, flowering only on overhangs, flowers white, 15 Aug. 1947, *Davis & Bilger* (D. 14213); Kesme Boğaz at foot of Tahtali Dağ, 50–100 m., on precipitous slopes (seeded down from cliff above?), 8 July 1949, *Davis Bilger & Attila* (D. 15153); Tahtali Dağ, on cliff between Kesme Boğaz and Kuzdere, 8 July 1949, *Davis, Bilger & Attila* (D. 15154, holo. K; iso. E).

E. Onopordum is a very distinct, evidently relict species that has no close relative. It probably comes nearest to *E. pannosus* Rech. fil. (known only from the type gathering) which it approaches in habit, leaf shape and indumentum; but in the new species the lower leaves are larger and more flaccid, with shorter broader lobes having a spiny sinus between them. (In the holotype of *E. pannosus*, which has kindly been sent on loan from the Vienna Museum, the basal leaves are divided to 2/3 or 3/4 into narrowly triangular lobes separated by curved spineless sinuses); the involucre is strikingly different, the bracts being straight, adpressed and subconnivent (instead of recurved above) and much dumpier with a far less attenuated apex, so that they form a hard, 5-sided involucre; both species have long barbellate setae at the margin of the involucre bracts, and a very poorly developed "pencil."

In the form of its involucre *E. Onopordum* recalls *E. microcephalus* Sibth. & Sm., although in that species the phyllaries are fewer, smaller, thinner in texture, narrower and more attenuated. In vegetative characters the two species are so widely different that I consider them to be no more than distantly related.

The lower leaves of the new species show a remarkable resemblance to those of *Onopordon leptolepis* DC. and to *O. insigne* Holmboe—hence the specific epithet. *E. Onopordum* grows on inaccessible limestone cliffs where specimens could only be dislodged after prolonged stoning and a dangerous climb.

1890



PLATE 2. *Senecio sandrasicus* P. H. Davis.

Senecio sandrasicus P. H. Davis, sp. nov. (Sect. *Jacobaea* (Thunb.) DC.)—Plate 2.

Valde affinis *S. ambiguus* DC. (incl. *S. taygeteo* Boiss. et Heldr.) sed caulibus brevioribus, pedunculis longis, corymbo 3–12-capitato, involucris et ligulis paulo majoribus divergit.

Planta perennis, caudice brevi lignoso caules plures floriferas et turiones steriles breviter elongatos emittente. *Caules* floriferi herbacei sed inferne indurati, a basi ad apicem 15–22-foliati, erecti, 20–55 cm. alti, ad medium 1.5–2.5 mm. lati, superne in corymbum laxum 8–13 cm. latum 3–12-capitatum ramosi, ut pedunculi adpresse farinoso-tomentosi. *Folia* caulina heteromorpha, adpressissime tomentosa, infra dense incana, superne canescentia; inferiora 5–8 cm. longa, lamina ovato-oblonga obtusa 4–6 cm. longa utrimque obscure 4–6-sinuato-dentata petiolum subaequante; intermedia sublyrata, lobo terminali majore obtuso saepe ad medium pinnatilobato (interdum sinuato-dentato) ambitu oblongo lobulis late triangularibus obtusis subintegris inferioribus etiam breviter oblongis 2–3-lobulatis munito, petiolo lobis oblongis obtusis 1–2 utrimque praedito; superiora subsessilia, pinnatifida (interdum obscure sinuato-dentata), 3–4.5 cm. longa, lobis inferioribus saepe fere ad rachidem attingentibus; summa diminuta, anguste oblonga, subintegra, ad basin auriculata. *Pedunculi* ascendentes, ultimi 1.5–6.5 cm. longi, 0.5–0.75 mm. lati, squamis lanceolatis minutis 8–15 praediti. *Involucrum* obconico-hemisphaericum, 9–10 mm. longum, 12–13 mm. latum, basi squamis paucissimis vix calyculatum; phylla c. 14, oblonga, farinoso-tomentosula, acuta, membranaceo-marginata, ad basin subgibbosa. *Corolla* florum hermaphroditum disci 6.5–7.0 mm. longa, in lobos anguste triangulares vix 1 mm. longos fissa; ligula florum femineorum late oblonga, 6 mm. longa, 2.5–2.75 mm. lata, brevissime tridenticulata. *Achenia* glabra, vix matura 1.5 mm. longa, brunnea. *Pappus* e pilis conformibus mollibus scabris albis compositus, vix maturus 6 mm. longus. Fl. Jul.

PROV. MUĞLA., Dist. Köyceğiz (Caria). Sandras Dağ above Ağla, 1,300 m., on rocky serpentine slopes, perennial, woody at base, 22 July 1947, Davis & Bilger (D. 13561, holo. E; iso. K).

Before the systematic position of *S. sandrasicus* can be discussed, some notes are required on *S. cineraria* DC. and its close allies. In habit these "suffruticose" groundsels appear to fall into two groups. Their constituent taxa are annotated below, without always committing myself to their taxonomic rank; in some cases material is so limited that there is doubt as to which group they belong.

1. *Plants with a branched, shrubby base, a tendency to have the leaves crowded near the base of the flowering stems, and with sterile shoots bearing a rosette of leaves:*

(a) *S. cineraria* DC., from maritime rocks in the western Mediterranean; var. *ceratophyllus* Fiori appears to be no more than a trivial variant that occurs with the type.

(b) *S. bicolor* Tod. which, in the same habitat, replaces *S. cineraria* in the Ionian islands and the Cyclades, but whose range overlaps with it in S. Italy; it might well be treated as a subspecies of *S. cineraria*.

(c) *S. Cineraria* var. *nebrodensis* Fiori in Sicily, which might also be treated as a geographical subspecies of *S. Cineraria*.

(d) *S. Cineraria* var. *Plattii* Meikle (Kew Bull. 1954, 142 : 1954), recently described from maritime rocks in Chios, probably belongs to this group, though basal portions are lacking.

(e) *S. gnaphalodes* Sieber, a very distinct species confined to rocky places in the hills of E. Crete and Karpathos.

2. *Plants indurated at the base (though not shrubby), flowering stems uniformly leafy, and sterile shoots (when present) not having the leaves crowded into rosettes:*

(f) *S. sandrasicus* P. H. Davis, from S.W. Anatolia, where it grows at 1,300 m. on the serpentine slopes of Sandras Dağ in Caria.

(g) *S. ambiguus* DC. probably belongs here, though its basal parts have not been examined. It was described from Sicily (Etna), but a specimen has also been seen from Lipari. Assuming that *S. ambiguus* does belong to this group, I have included the montane *S. taygeteus* (Greece: Mt. Taygetus; Euboea) within it; the latter is undoubtedly indurated at the base.

(h) *S. gibbosus* DC., from sandy places in Sicily and Calabria, is a tall species that apparently belongs here, though the basal parts are lacking.

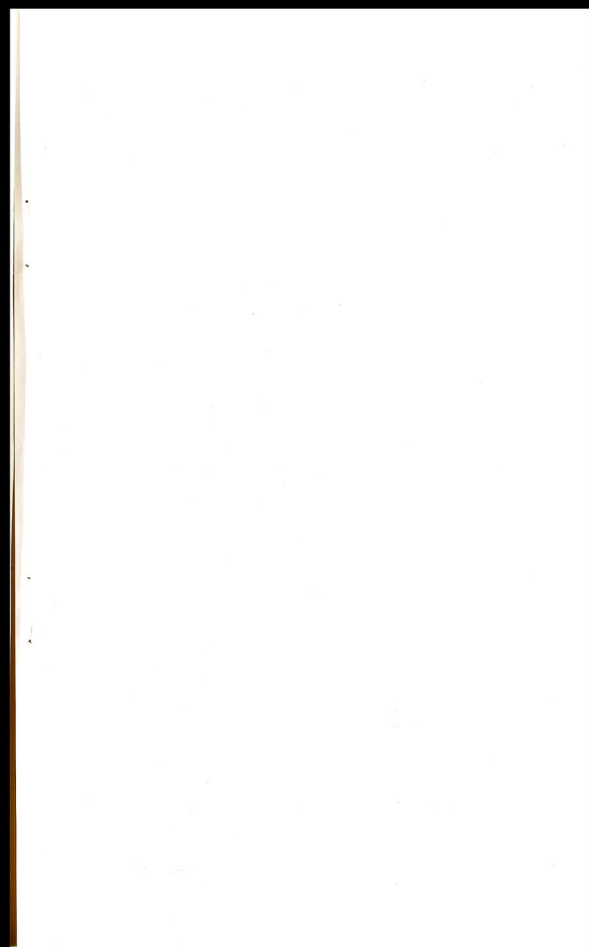
No material has been seen of *S. Cineraria* var. *chrysanthemifolius* Fiori (Calabria and Messina) or *S. Mouterdei* Arènes (Lebanon), and from their descriptions I cannot tell to which of my two groups they belong.

The Greek *S. taygeteus* Boiss. et Heldr. usually differs from the Sicilian *S. ambiguus* DC. only in its somewhat less hairy involucre, and in the more triangular and fewer-toothed lobes of the terminal leaf-segment. But in their allies these characters are very variable, and comparison with the better known *S. Cineraria* (including its eastern race, *S. bicolor*) suggests that it is better to include the Greek plant within *S. ambiguus*; I am very doubtful if subspecific rank should be assigned to it, since the *differentiae* are not constant now that material is available from Euboea.

In this difficult group, the habit of the plant, the shape of the inflorescence and the size of the head often provide better taxonomic criteria than leaf-form. Therefore, very close to *S. ambiguus* (and indeed to *S. Cineraria*) though *S. sandrasicus* undoubtedly is, specific rank has been assigned to it. The purely quantitative differences referred to in the diagnosis can be tabulated as follows:—

<i>S. ambiguus</i>	<i>S. sandrasicus</i>
Stems 50–75 cm. tall.	Stems 20–55 cm. tall.
Peduncles 0.6–1.8 (–2.5) cm.	Peduncles 1.5–6.5 cm.
Corymbs 35–60 (–135)-headed.	Corymbs 3–12-headed.
Involucre 9–11 mm. broad.	Involucre 12–13 mm. broad.
Ligules 4–5 mm. long,	Ligules, 6 mm. long,
1.5–1.75 mm. broad.	2.5–2.75 mm. broad.

In its leaf form—which shows considerable variation in the one rather large gathering of *S. sandrasicus*—the new species resembles Greek material of *S. ambiguus* rather than Sicilian specimens,





Herb. Type Specimen

HERB. HORT. BOT. REG. KEN.

Helichrysum chasmolycicum P. H. Davis
 Turkey: Prov. Antalya (Lycia). Defnet pough
 near "Yeni" def. (between bullhead def. &
 "Yeni" def.) 1000 m. summit of volcanic
 & changing cliffs dominant phylla
 (stone).

11-1949 P. H. Davis 1949. *Helichrysum*
 11-1949 P. H. Davis 1949. *Helichrysum*

PLATE 3. *Helichrysum chasmolycicum* P. H. Davis.

[to face page 77]

More material is required of these attractive *Senecios*. In particular we need specimens that include the basal portion of the plant, a range of leaf shape, and ecological notes. It is in Sicily, where plants described as *S. Cineraria*, *gibbosus*, *nebrodensis*, *chrysanthemifolius* and *bicolor* all occur, that collecting is particularly needed. In Britain the introduced *S. Cineraria* hybridises with *S. Jacobaea* L., and in Italy the former crosses with *S. erraticus* Bertol.; it is therefore possible that hybridisation, as well as eco-geographical isolation, has played a part in the evolution of the group, and may account for its puzzling taxonomy in the south of Italy. Fiori's treatment of all the Italian taxa as varieties of *S. Cineraria* (Fiori, Nuova Fl. Anal. Italia, ii, 594 : 1927) is an unsatisfactory *cri de coeur* that a botanist's holiday in Sicily might do something to answer.

***Helichrysum chasmolycicum* P. H. Davis, spec. nov.** (Sect. *Staechnadina* DC.).—Plate 3.

Affinis *H. orientali* (L.) DC., sed foliis rosularum obovato-ellipticis distinctius petiolatis, capitulis numerosissimis triplo minoribus, phyllis externis acutis recedit.

Herba perennis eximie saxicola, basi ramoso-suffruticosa. *Radix* crassa, lignosa, cortice longitudinaliter fissa. *Rami* infra rosulas lignosi, 5–10 mm. lati, foliis emarcidis persistentibus vestiti. *Indumentum* foliorum et caulium et pedunculorum dense et adpresse albo-lanatum, eglandulosum. *Folia* rosularum congesta; lamina late obovato-elliptica, obtusa, 2.0–3.5 cm. longa, 1–2 cm. lata, in petiolum 1–2 cm. longum inferne dilatatum amplexicaulem breviter attenuata. *Caulis* floriferi erecti, 10–15 cm. alti, 1–2 mm. lati, regulariter foliosi. *Folia caulina* oblongo-linear, superne latiora, 12–35 mm. longa, 2–12 mm. lata, obtusa vel acuta, sessilia, etiam subamplexicaulia, internodiis longiora. *Panicula* terminalis, corymbosa, 3.5–5.0 cm. lata, 40–90-capitata, e pedunculis primariis 10–12 linearibracteatis 17–15 mm. longis (superne in pedunculos ultimos breves scarioso-bracteatos divisus) composita. *Capitula* inter se approximata, parva, 4 mm. longa, 3.5 mm. diametro, obconico-hemisphaerica, circa 25-flora; phylla citrina, c. 40, regulariter aucta, 4–5-subseriata, concava; quoad infima pars hyalina late elliptica integra acuta quam pars basalis opaca araneosa 3–4-plo longior; in phyllis mediis pars hyalina erosula subobtusa, basi opaco duplo longior; in phyllis intimis pars hyalina oblonga obtusa erosula in partem opacam aequilongam decurrens. *Receptaculum* hemisphaericum. *Flosculi* 2.0–2.2 mm. longi, lutei; tubus superne dilatatus in lobos triangulares recurvos brevissime quinquifidus. *Setae pappi* immaturi scabrae, superne subdilatatae, 2 mm. longae. *Ovarium* sub lente minute papillosum. *Achenia* ignota.—Fl. Jul.–Aug.

PROV. ANTALYA (Lycia). Soğut yaylâ near Sivri Dağ (between Çalbali Dağ and Çakılar), 1,300 m., in crevices of vertical and overhanging limestone cliffs, dominant, phyllaries lemon-yellow, 16 July 1949, *Davis, Bilger & Attila* (D. 15429, holo. K; iso. E); Çalbali Dağ near Fesliken yaylâ, 1,800 m., dominant on vertical and overhanging limestone cliffs, heads yellow, 14 July 1949, *Davis, Bilger & Attila* (D. 15359).

The new species is most closely related to *H. orientale* (L.) DC., endemic to the Aegean area where it extends as far east as the islands of Samos and

Karpathos. *H. chasmolycicum* differs from its ally in its broadly obovate-elliptical rosette leaves with a more distinct petiole, much smaller, more numerous capitula (40–90 in the panicle, instead of 7–21), and acute outermost phyllaries. Boissier placed *H. orientale* in his series (?) *Oligophylla* of Sect. *Staechadina*, and describes the series as having 25 (–30) phyllaries. But in the material of *H. orientale* that I have examined there are about 50 phyllaries (as in series *Imbricata*)—slightly more than in *H. chasmolycicum*.

CAMPANULACEAE

Campanula bipinnatifida P. H. Davis, spec. nov. (Sect. *Medium* Subsect. *Triloculares* Ser. *Rupestres* Boiss.).

Affinis *C. teucrioidi* Boiss. sed caulibus 1–7-floris e collo radices crassi verticalis enatis, indumento hispidulo, foliis rosularum bipinnatifidis, floribus majoribus, corolla extra pubescente facile distinguenda.

Planta perennis, indumento caulium et foliorum et calycum hispidulo e pilis patentibus rigidulis 0.5–1.0 mm. longis composito. *Radix* crassa, verticalis, 7–10 mm. lata. *Folia rosularum* basium paucarum petiolata; lamina profunde bipinnatifida, ambitu ovato-oblongo, 12–22 mm. longa, 7–13 mm. lata, utrimque in lacinias primarias 3–7 inaequales ad medium obtuse pinnatifidas (infimis integris exclusis) profunde divisa; petiolus 3–15 mm. longus. *Caules* e basibus rosularum enati, prostrati, 5–10 cm. longi, fere 1 mm. lati, purpurascens, in dimidio superiore 1–7-flori. *Folia caulina* profunde et simpliciter pinnatifida, 6–13 mm. longa, sessilia, ambitu oblongo-ovato, internodiis breviora, lacinii oblongo-lanceolatis integris vel paucidentatis. *Flores* in axillis foliorum superiorum solitarii, secundi, erecti, breviter pedicellati (pedicellis foliaceo-bracteolatis), vel etiam subsessiles, inferiores inter se distantes, superiores approximati. *Calyx* in statu florifero c. 10 mm. longus; laciniae triangulari-lanceolatae, acutae, 7 mm. longae, appendicibus duplo longiores; appendices in fructu valde accretae, inflatae, elevatim reticulato-nervosae, 6–7 mm. longae, basi obtusae, lacinias ± aequantes. *Corolla* anguste campanulato-infundibularis, 15 mm. longa, lilacino-caerulea, lacinii calycis 2–2.5-plo longior; lobi late ovati quartam partem tubi aequantes; tubus extra pubescens. *Filamenta* 3–5 mm. longa, in duabus partibus inferioribus ovata ciliata, superne linearia glabra. *Antherae* 4–5 mm. longae, lineares. *Stylus* inclusus, 11 mm. longus, pilosus, apice trifidus. *Capsula* vix nutans; valvulae basilares tres appendicibus calycis occultatae. *Semina* late oblongo-ovato, fusca, 1.25 mm. longa, 0.75 mm. lata.

PROV. DENİZLİ (Caria). Baba Dağ above Kadiköy, 1,900 m., mainly on a band of schistose sloping rocks at the foot of N. limestone precipice; perennial, flowers lavender-blue; 23 Aug. 1950, Davis & Heywood (D. 18410, holo. E; iso. K).

This distinctive new species is related to the rare Lydian endemic, *C. teucrioides* Boiss., which is known only from the loose schist screes of Boz Dağ (ancient Tmolus) above Ödemiş. *C. bipinnatifida* differs from it in habit, the stems springing from the collar of a thick tap root instead of being borne on slender subterranean caudices—an adaptation of *C. teucrioides* to its unstable habitat. Other characters distinguishing the new

species from its ally are the several-flowered stems, hispidulous indumentum (instead of adpressed-puberulent), more dissected, larger leaves (the basal ones being bipinnatifid instead of simply pinnatifid), larger flowers and pubescent corolla. *C. bipinnatifida* is as rare as its relative, and shows a similar rock preference; it is only known from the narrow band of schistose rock that runs along the foot of the limestone cap of Baba Dağ in Caria (ancient Salbacus). The type specimen is powdered with mica crystals.

Boissier describes the capsule of *C. teucrioides* as nodding, but the herbarium specimens examined do not suggest that this is the case; in the two species the stems are prostrate, and both flowers and fruits appear to be more or less erect—i.e. at right angles to the stem.

Tracheliopsis pubicalyx, P.H. Davis, sp. nov.

Valde affinis *T. tubulosae* (Boiss.) Buser et *T. fruticulosae* O. Schwarz et P. H. Davis; a priore statura nana, foliis et floribus paulo minoribus, imprimis calycibus minutissime pubescentibus divergit; ab altera habitu minus fruticoso, foliis angustis, indumento caulium et calycum haud villosulo recedit.

Planta perennis, saxatilis, basi compacte fruticulosa caudices numerosos breves nodulosos emittens. *Caules* floriferi erecti, fragiles, tenues, 5–10 cm. longi, 0.5 mm. lati, sparsim aspero-pubescentes; internodia foliis duplo breviora. *Folia* caulina infima obovata vel elliptica diminuta emarcida, alia anguste elliptico-oblonga subintegra vel sparsim denticulata, acuta, 7–16 mm. longa, 2–5 mm. lata, firma, adpresse scabro-pubescentia, inferne uninervosa saepe glabrescentia. *Inflorescentia* multiflora, corymbosa, compacta, 12–20 mm. lata, e cymulis in axillis foliorum summorum composita. *Pedicelli* bracteolati, flores aequantes. *Calyx* ut pedicellus minutissime pubescens, laciniis triangulari-lanceolatis integris tubum turbinatum aequantibus munitus. *Corolla* tubulosa (3.5) 4–4.5 mm. longa, glabra, lobis triangularibus porrectis sextam partem tubi aequantibus praedita, lactea, saepe deinde pallide caerulescens. *Filamenta* anguste linearia, pilosula, antheris linearibus longiora. *Stylus* corolla saltem duplo longior, superne minute pilosulus apice 2–3-fidus. *Capsula* ignota.

PROV. KONYA, Dist. Ermenek (Cilicia Trachea). Hamitseydi Boğaz between Sarivadi and Beşküyü (between Eremenek and Anamur); flowers milk white, often fading pale bluish; calyx puberulent, 16 Aug. 1952, P. H. Davis 16244 (holo. K; iso. E, Ankara).

T. pubicalyx is very closely related to *T. tubulosa* (Boiss.) Buser and *T. fruticulosa* Schwarz & Davis, but differs from both in its minutely pubescent calyx. In addition to the characters cited in the diagnosis, the leaves are narrower than is usual in Turkish material of *T. tubulosa*, and the corolla often fades pale bluish; the flowers of both its allies remain milk white. *T. pubicalyx* retains its diagnostics in cultivation and falls well outwith the range of variation found in the variable *T. tubulosa*, in which Turkish specimens are generally smaller flowered than those from Lebanon.

T. tubulosa, the only relatively wide-ranging species in this genus of chasmophytes, extends interruptedly from Caria, through the Taurus, to Lebanon. It seems possible that both *T. fruticulosa* and *T. pubicalyx* have been derived from it by eco-geographical isolation at higher altitudes.

Whereas *T. tubulosa* grows from near sea-level (Beirut) to 1,300 m., the new species occurs at 1,500–1,700 m. in Cilicia Trachea, and *T. fruticulosa* at 1,800–2,200 m. in the west part of the Lycian Taurus. *T. antilibanotica*, confined to the high Anti-Lebanon (2,400–2,600 m.) is less closely related but may well be derived from the same stock.

While investigating the status of *T. pubicalyx*, I came across type material of *Campanula Shephardi* Post. There is no doubt that this is a *Tracheliopsis*, and that it is very closely related to *T. Postii* Boiss. (described from Hamath in N. Syria) of which the holotype has kindly been sent on loan from Geneva. No mention is made of *C. Shephardi* by Dinsmore in the 2nd edition of Post's Flora of Syria, Lebanon and Sinai, but the citation of "Amanus" under *T. Postii* suggests that Dinsmore may have considered *C. Shephardi* (described from "Amanus") to be the same plant. So far as flowering material is concerned, both taxa are known only from single gatherings. *T. Postii* is unique in its genus in having toothed sepals—often a good taxonomic character in *Campanula*; it also has a shorter inflorescence and smaller flowers than those of *C. Shephardi*. Flower size, however, shows considerable variation in *T. tubulosa*. In other characters the two taxa appear identical, and cannot be distinguished out of flower. Provisionally I prefer to treat *C. Shephardi* as a subspecies of *T. Postii*—a species very distinct in habit from other species in the genus—and make the new combination here:—

***Tracheliopsis Postii* (Boiss.) Buser subsp. *Shephardi* (Post) P. H. Davis, comb. et stat. nov.**

Syn. *Campanula Shephardi* Post in Bull. Herb. Boiss. i, 25 (1893).

The content and affinities of this very natural but ill-defined genus were discussed by the writer in Hooker's *Icones Plantarum* (tab. 3498 : 1950). Here is a key to the seven taxa now included within it:—

1. Style exerted:
 2. Calyx glabrous:
 3. Leaves oblong-elliptical, 10–30 mm. long; stems 8–20 cm.; inflorescence many-flowered *T. tubulosa* (Boiss.) Buser
 3. Leaves orbicular, up to 4 mm. long; stems 1–2.5 cm.; inflorescence few-flowered *T. antilibanotica* Davis
 2. Calyx hairy:
 4. Corolla lobes nearly as long as tube; leaves grey-tomentose below, median ones over 3 cm. long:
 5. Sepals toothed; inflorescence as broad as long; corolla 8–10 mm. long *T. Postii* (Boiss.) Buser subsp. *Postii*
 5. Sepals entire; inflorescence oblong; corolla 12 mm. long *T. Postii* subsp. *Shephardi* (Post) Davis
 4. Corolla lobes much shorter than tube; leaves adpressed-pubescent or glabrescent below, less than 2 cm. long.
 6. Calyx villosulous; leaf length $1\frac{1}{2}$ –2 × breadth *T. fruticulosa* Schwarz & Davis
 6. Calyx minutely pubescent; leaf length 4–6 × breadth *T. pubicalyx* Davis
1. Style included *T. myrtifolia* (Boiss. & Heldr.) Schwarz & Davis

BORAGINACEAE

***Alkanna Attilae* P. H. Davis, sp. nov.**

Affinis *A. incanae* Boiss. sed basi magis ramosa procumbente, indumento foliorum monomorphico e pilis longis adpressis composito, nuculis paulo longioribus minus abrupte curvatis rostro breviora recedit.

Herba perennis, alpina, haud violaceo-tincta. *Caudices* prostrati vel procumbentes, ramosi, inter lapides elongati, laxè multirosulati, cortice deinde nigricante. *Folia rosularum* oblanceolata, acuta, in petiolum sensim attenuata, 2.5–5 (7) cm. longa, 3–7 (11) mm. lata, uninervosa, pilis albis monomorphice incurvis vix 1 mm. longis sub lente minutissime papilliferis adpresse strigulosa, canescentia. *Caules* floriferi procumbentes, simplices, ad inflorescentiam bifidi, 3–7 cm. longi, pilis patentibus incurvis hispiduli, in cincinnum densum fructiferum 3–6 cm. longum abeuntes. *Folia caulina* lineari-oblonga, obtusa vel subacuta, sessilia, 10–15 (30) mm. longa, 2–5 (8) mm. lata, indumento ut in foliis rosularibus et bracteis et calycibus vestita. *Bracteae* lineari-oblongae, calyce $1\frac{1}{2}$ –2-plo longiores. *Calyx* 6 mm. longus, in lacinias lanceolato-lineares obtusiusculas adpresse strigulosas fissus, pedicello longior, in fructu ad 8 mm. longus. *Corolla* 12–15 mm. longa, glabra; tubus brunneo-aurantiacus, 9–11 mm. longus, 2 mm. latus; limbus azureus vel violaceo-azureus, patens, in lobos orbiculatos 2.5–3.5 mm. longos divisus. *Antherae* biseriatae, ellipticae, 1.25 mm. longae, in dimidium tubi superius insertae. *Stylus* 4–8 mm. longus. *Nuculae* valde incurvae, 2.5 mm. longae, 2.0 mm. latae, ex toto verruculis minimis conicis basi inter se distinctis dense obsitae, rostro deorsum sensim flexo, hilo haud stipitato, areola sinum occupante.—Fl. Jun.–Jul.

PROV. ANTALYA. Dist. Kemer (Lycia): Tahtali Dağ, 2,100–2,300 m., perennial, flowers blue-violet with golden brown tube, 10 July 1949, *Davis, Attila & Bilger* (D. 15059, holo. K; iso E); Çalbali Dağ (Bereket Dağ), 2,000–2,100 m., among rocks, fl. blue (azurea), 14 July 1949, *Davis, Attila & Bilger* (D. 15279).

A. Attilae is closely related to *A. incana* Boiss. and *A. areolata* Boiss., both being endemic to S.W. Anatolia. It differs from both in having a monomorphic indumentum, the leaves being covered with rather long sturdy adpressed hairs only (in the other two species these have beneath them an undercoat of very short hairs); in its much-branched decumbent base; and in its slightly longer (but not wider) nutlets which are more gradually curved, with a shorter, curved (not straight) beak. It differs further from *A. areolata* in its adpressed indumentum, somewhat shorter broader calyx segments, shorter flowering stems, and nutlets covered with minute, conical (instead of hemispherical) warts.

A. incana and *A. areolata* are very closely related; gatherings from Dedegöl Dağ in Pisidia (*Davis* 16060, *Davis* 16073) are intermediate between these two taxa; as their areas largely overlap, it is possible that hybridisation occurs. At any rate, their specific distinctiveness is perhaps open to question. So far as I know, they both grow at lower elevations than *A. Attilae*.

The new species is abundant on the rocky limestone slopes of Tahtali Dağ in Lycia, where it forms flopping silky mats above the Cedar line from 2,100–2,300 m. The gathering from the neighbouring Çalbali Dağ (Bereket Dağ) is not typical; it came from a rock cranny where the plant was somewhat drawn up.

This beautiful species is named after Mr. A. Attila, Curator of the University Botanic Garden in Istanbul, who is such an enthusiastic collector of Turkish plants.

***Omphalodes Ripleyana* P. H. Davis, sp. nov.**

Affinis *O. Luciliae* Boiss., sed lobis calycis basi latioribus in fructu valde accretis, corolla lactea, nuculis majoribus manifeste fimbriato-marginatis differt.

Planta perennis, saxatilis, glabra, pluriceps. *Caudices* basibus foliorum vetustorum persistentibus vestiti. *Folia basalia* petiolata; lamina oblongo-ovata, 3.5–7.0 cm. longa, 1.7–4.0 cm. lata, subobtusataque late mucronata, basi rotunda ad petiolum 3–9 cm. longum breviter attenuata, integra, glauca, textura tenuis, pallide pustulata. *Caules* floriferi ascendentes, in inflorescentiam parce ramosi vel simplices, 10–35 cm. longi, striata. *Folia caulina* ovata, 2–5 cm. longa, inferne petiolata, superne subsessilia, ea inflorescentiae diminuta, minus 1 cm. longa. *Racemus* laxus, secundus, 4–12-florus, irregulariter foliaceo-bracteatus, in fructu ad 10 cm. longus. *Pedicelli* fructiferi valde recurvi, 8–22 mm. longi. *Calyx* ad $\frac{2}{3}$ in lacinias late ovatas (vel in statu florifero interdum oblongo-ovata) uninerves fissus, 3 mm. longus, in fructu manifeste accretus, ad 6 mm. longus, persistens. *Corolla* lactea; tubus 2.5 mm. longus; limbus rotatus, fere ad basin in lobos circ. 3 mm. longos orbiculatos imbricatos fissus; fornice 0.75 mm. longi, breviter linguiformes, obtusissimi. *Antherae* oblongo-ovatae, 0.75 mm. longae, ad medium tubi affixae. *Stylus* 1 mm. longus. *Nuculae* late ovatae, depressae, 4 mm. longae, ventre scrobiculato-rugosae versus marginem pilosae, dorso planae longitudinaliter unilineatae subpilosae, margine introflexo 1–2 mm. alto eximie fimbriato provisae.—Fl. Jun.–Jul.

PROV. ANTALYA. Dist. Gebiz (Pisidia): Bozburun Dağ, near Taşli yayla, 1,700 m., on very shady limestone rocks, stems ascending, flowers white, 25 July 1954, *Davis & Bilger* (D. 15546); Bozburun Dağ near Kuruca ova yayla, 1,800 m., on very shady rocks of compact limestone (cavernicolous), leaves glaucous, flowers white, 25 July 1949, *Davis & Bilger* (D. 15680, holo. K; iso. E).

Hitherto *O. Luciliae* Boiss., confined to Greece and Anatolia, has maintained an isolated position in its genus, so that the discovery of a close ally is quite an event. The new species is primarily distinguished from *O. Luciliae* on floral characters: broader-based calyx lobes that are larger in fruit, milk-white corolla (instead of sky-blue), and larger nutlets with a conspicuous fimbriated margin. In addition to these diagnostics (which are maintained in cultivation), *O. Ripleyana* is usually a more robust plant with ascending stems bearing more numerous flowers with a smaller corolla-limb.

O. Ripleyana is so far known only from Bozburun Dağ in Pisidia. The two species are ecologically separated. Whereas *O. Luciliae* ranges from 1,900–2,800 m. in Turkey, *O. Ripleyana* grows at 1,700–1,800 m., favouring more sheltered cavernous rocks than those occupied by its ally higher up on the same mountain.

The new species appears to be more advanced in its floral characters than *O. Luciliae*, and it seems probable that it has evolved from the latter, more widespread species. The typical form of *O. Luciliae* (var. *Luciliae*) predominates in Greece and extends in Turkey from Lydia to Pisidia; it is largely replaced further east by var. *cilicica* Brand with broader basal leaves that are truncate or subcordate at the base. The species has not been recorded from the intervening Isaurian Taurus. The distribution of the varietal taxa is not mutually exclusive, since var. *Luciliae* apparently grows with the dominant var. *cilicica* on Bulgar Dağ (Siehe 505, p.p.—Edinburgh sheet!); similarly, a plant resembling var. *cilicica* occurs in Greece (Parnassus, Guicciard!). In leaf shape *O. Ripleyana* resembles the typical variety of *O. Luciliae* that grows on Bozburun Dağ.

It is a pleasure to name this plant after Mr. H. D. Ripley, whose enthusiasm and wide knowledge of the Mediterranean flora did so much to foster my early interest in the plant life of that region.

SANTALACEAE

Thesium scabriflorum P. H. Davis, sp. nov. (Sect. *Euthesium* A.DC.).

Affinis *T. maritimo* C. A. Meyer sed caulibus abbreviatis, foliis angustioribus ut caulibus et floribus dense scabridulis, tubo perigonii lobos subaequante differt.

Planta perennis, procumbens, glaucescens, ex toto (etiam pars externa perigonii) pilis brevissimis patentibus sub lente cylindrico-conicis dense scabridula. *Radix* crassus, verticalis. *Caudex* lignescens, in caudiculos numerosos breves squamigeros ramosus. *Caulis* 5–9 cm. longi, 1 mm. lati, acute angulati, rigidi, procumbentes, simplices, in paniculam racemiformem secundam oblongo-linearem e ramulis brevibus 1–3-floris compositam abeuntes. *Folia* caulina (et bracteae) linearia, carnosula, 7–15 mm. longa, 1–1.25 mm. lata, acuta, breviter mucronata, uninervia; bracteae floribus 2–3-plo longiores, superne $\pm$ aequantes. *Flores* unibracteati et bibracteolati, bracteolis duplo longiores. *Perigonium* supra ovarium 5–5.5 mm. longum, vix infra medium quinquifidum; tubus 2.5 mm. longus, subdilatatus; lobi 2.5–3 mm. longi, anguste ovato-oblongi, intus albi, extra pallide virescentes. *Stamina* prope basin loborum perigonii affixa; filamenta 1 mm. longa; antherae oblongae, 0.8 mm. longae, a pilis ad lobos cohaerentes. *Stylus* 4 mm. longus. *Fructus* fere maturi ovoideo-globosi, 3.5 mm. longi, inter nervos longitudinales nervulis transversis et obliquis elevatim reticulati, perigonium persistens lobis erectis subinvolutis apice vix inflexis subaequantes.—Fl. Jun.

PROV. KONYA, Dist. Cihanbeyli. Yavşan Memlehasi near Tuz Gölü; procumbent; flowers white; 8 June 1952, Davis & Dodds (D. 18662, holo. K; iso. E).

The new Thesium, remarkable for its dense, short, scabrid indumentum (even on the flowers), is related to *T. maritimum* C. A. Meyer described from the sandy shores of the Caspian at Baku. In addition to its indumentum, *T. scabriflorum* differs from the latter in its narrower leaves (1-1.25 mm. wide, instead of 1.5-2.75 mm.), and longer perianth tube which is nearly as long as the lobes (instead of about $\frac{1}{3}$ as long).

The isotype of *T. maritimum* in the Kew herbarium has only one incomplete flower left on it, but there can be little doubt that *Sintenis* 3973 (Anatolia : Tossia, in collibus nudis ad Kanak-Tschesme—sub '*T. crassifolium*') belongs to this species, although the specimens of *Sintenis* are more diffuse, with 1-7 flowers (instead of 1-3) on the raceme branchlets.

T. scabriflorum was only seen near the Central Anatolian salt lake, Tuz Gölü, where it was a rare component of the *Artemisia fragrans* steppe. *T. lycanicum* Bornm. & Andr. was described from saline steppes in the same region, but this is a virgate, subaphyllous plant related to *T. tauricola* Boiss. et Hausskn. ex Boiss., and is not allied to the new species.

CYPERACEAE

Carex melanorrhyncha Nelmes, sp. nov. (Sect. *Atratae* Kunth).

Affinis *C. oliganthae* Steud., sed spicis magis numerosis brevioribus, utriculis minoribus praecipue differt.

Planta laxae caespitosa. *Rhizoma* $\pm$ breve et tenue. *Caules* erecti vel paulo curvati, 10-16 cm. alti, 1-1.5 cm. lati, laeves. *Folia* basalia et subbasalia, caulibus paulo vel multo breviora, 2-4 mm. lata, plana vel subplana, recta vel paulo curvata. *Spicae* c. 5-8, superiores erectae vel suberectae, inferiores valde divaricatae, ebracteatae, gynaeandreae, plerumque ovoideae vel subglobosae vel interdum breviter cylindricae, 4-8 mm. longae, 3-5 mm. latae, in caput densum ambitu pyramidatum vel $\pm$ oblongum 10-17 mm. longum et 9-16 mm. latum ebracteatum confertae. *Glumae femineae* lanceolatae vel ovato-lanceolatae, $\pm$ cymbiformes, acuminatae, apice plerumque acutae, interdum obtusae, 2.5-3.0 mm. longae, glabrae colore $\pm$ spadiceae ad basin atque ad nervam medianam pallidiores; nervus medius ipse plerumque ad apicem attingens; haud vel vix excurrens. *Utriculi* $\pm$ elliptici, basi et apice attenuati, complanati vel complanato-trigoni, interdum paulo inflati, 2.5-3.0 mm. longi, c. 1 mm. lati, membranacei, enervosi vel tenuissime plurinervosi, vix vel angustissime marginati, glabri, recti, maturitate moderatim vel manifeste divaricati, inferne pallidi, superne vel ad apicem aurantiaci, basi breviter stipitati; rostrum infra complanato-attenuatum, supra complanato-cylindricum et tenuissimum, c. 1 mm. longum, superne (sed haud inferne) paulo marginatum, glabrum, rufescenti-nigrum, dorso tenuissime sulcatum, apice integrum vel brevissime bidentulatum. *Achenia* obovata vel elliptico-obovata, complanata vel complanato-trigona, perbrevisse rostrata. *Stylus* tenuis. *Stigmata* tria.

PROV. RIZE. Dist. İkizdere: Cermanin Tepe above Cimil, 3,100 m., by tarn, 29 Aug. 1952, *Davis & Dodds* (D. 21065, holo. K; iso. E).

The new sedge is closely related to the Caucasian *C. oligantha* Steud., which has been recorded for Turkey by Krechetovich (Fl. S.S.S.R., iii, 269 : 1935). It differs from that species mainly in its more numerous, shorter spikes and smaller utricles.