

SOME NEW PARONYCHIAS FROM TURKEY

MOHAMMAD NAZEER CHAUDHRI

(*Botanical Museum and Herbarium, Utrecht*)

(received December 30th, 1965)

This paper forms a part of the general study of the Subtribe *Paronychiinae* undertaken by the author for his doctoral dissertation. The publication of the new taxa, in a separate form, has been necessitated by the fact that the Flora of Turkey, covering the Family *Caryophyllaceae*, is to be published in the near future, at any rate before the author can present a consolidated account of the results of his own study of the group.

The present paper deals only with the diagnosis and description of the new taxa, presented in a rather conventional manner, and no attempt is made to go into details of the various morphological and taxonomic problems pertaining to the genus *Paronychia* as a whole. Such problems will, of course, be taken up in the general revision of the group.

Almost all the new taxa described here, though very distinct and well-marked, are known from one or two gatherings only, mostly from one locality, and thus seem to be endemic. It must, however, be pointed out, in this connection, that so far as the genus *Paronychia* is concerned, Turkey is, undoubtedly, the richest region in the whole world; and notwithstanding the extensive collections made by Sintenis, Bornmüller, Davis and others, there still remain large areas of the country virtually untouched and unbotanized. Moreover, some of the previously described and better known species, such as *Paronychia cephalotes* (M. B.) Bess., *P. arabica* (L.) DC., and *P. polygonifolia* (Vill.) DC., which are quite widespread in the adjoining areas, have been recorded during the nineteenth century (there being no record for these species during the past sixty-five years) from one or two places only. The apparent endemism of the new taxa might, therefore, be ascribed to the scantiness of the material rather than to any other factor.

The author takes this opportunity to express his deepest gratitude to Prof. Dr. J. Lanjouw, who not only allowed him to make use of all the available facilities for work in his Institute, but also, very kindly, helped him receive financial support, in the form of a scholarship, awarded by the Ministry of Science and Education, Government of the Netherlands, and thus enabled him to undertake this study. The author also wishes to express his thankfulness to the following: Dr. Miss Mennega, who helped him get the material on loan from the various herbaria; Dr. K. U. Kramer, who, despite his multifarious preoccupations, corrected the latin text; Miss de Wilde, who, apart from being a source of constant encouragement, helped in obtaining the relevant literature; Miss Boterenbrood, who, very kindly, translated the labels of the Russian sheets; Miss Hupkens-v. d. Elst and Mr. Schipper, for making the excellent illustrations; and Miss Sprey, who, in

spite of a heavy pressure of official work, helped in typing out the manuscript.

Thanks are also due to the Directors and Curators of the various herbaria, who sent the material on loan; and to Miss Hanna Czecczot, who helped in the study of the type specimens of her two species of *Paronychia*.

Material from the following herbaria was examined: Budapest University (BPU); Copenhagen (C); Edinburgh (E); Geneva (G); Halle (HAL); Hamburg (HBG); Jerusalem (HUJ); Jena (JE); Leiden (L); Lund (LD); Stockholm (S); Stuttgart (STU); Tbilisi (TGM); Utrecht (U); Vienna (W); Vienna University (WU); Zürich (Z).

All species described here are small perennial herbs and belong to *Paronychia* sect. *Anoplonychia* Fenzl.

1. *Paronychia galatica* Chaudhri sp. nov. (Plate IV, Fig. 10)

Planta prostrata vel breviter decumbens. Caulis ramosissimus. Rami validi, internodiis 5–9 mm longis, dense breviterque pilosiusculi. Folia anguste elliptica vel lanceolata 3–6 × 1.5–2 mm, apice acuta, facie appresse hirta, pilis marginalibus rigidioribus. Stipulae lanceolatae 3–4 × 1–1.5 mm, foliis plerumque breviores, deinde valde dissectae, binae in nodo. Capitula 6–8 mm lata, terminalia lateralique. Bractae oblique oblatae, acutae, 5 × 3–4 mm, flores superantes. Flores anguste ellipsoidei, omnino dense et appresse pilosiusculi, sepala subaequalia, atrovirescentia, lanceolata vel anguste ovata, apice acuto, pilosissimo. Petala 0.6–0.75 mm longa, filiformia, staminibus paulo breviora. Antherae validae, oblongae, 0.4–0.5 × 0.25 mm., pallide brunneae, filamentis subaequales. Ovarium ovoideum, 1 × 0.6 mm. Styli bini, erecti, 0.75 mm longi.

Type: Turkey, Cankiri, alt. 800 m. P. H. Davis 21508 (U, holotype; E, isotype), collected 5–6–1954.

Distribution and Ecology: Endemic in Northern Turkey. Growing on very eroded gypsaceous hills, alt. 800 m.

2. *Paronychia dudleyi* Chaudhri sp. nov. (Plate III, Fig. 8).

Planta compacta, caespitosa, caulis ramosissimus, lignosus, nodosus. Rami intertexti, capitulis crebris operiti. Internodia 2–5 mm longa, imprimò pubescentes, deinde glabrescentes. Folia anguste oblonga vel oblanceolata, 3–5 × 1–1.75 mm, apice obtusa vel subobtusa, puberula, folia novella recurvata, stipulae 3–4 × 1–1.5 mm, lanceolatae, plerumque foliis paulo breviores vel subaequales, sed ad apices ramulorum longiores. Capitula globosa 6–10 mm lata, creberrima, plantam fere obtegentia, confluentia. Bractae oblique ovatae, 4–5 × 3–4 mm, flores superantes sed non obtegentes. Flores ellipsoidei, 2.5–3.25 mm longi, dense et adpresse pubescentes. Sepala subinaequalia, lanceolata vel anguste oblonga, acuta, interiora scaphoidea. Petala stamina superantia, 0.8–0.9 mm longa. Ovarium ovoideum, styli bini erecti, 0.6–0.7 mm longi. Fructus calyce obtectus, pericarpium annulo collari manifesto.

Type: Turkey, Prov. Eskişehir, Ankara to Sivrihisar, 20–30 miles from Polatli, alt. 1000 m. Dudley, D. 36024 (U, Holotype; E, Isotype), collected on 21–6–9162.

Distribution and Ecology: Endemic, known only from the type locality, but reported to be common there.

Limestone, Artemisia steppe, alt. 1000 m.

3. *Paronychia angorensis* Chaudhri sp. nov. (Plate V, Fig. 12).

Planta compacta, caespitosa, radice crassa, longa, simplici. Caules basi ramosissimi, sat breves. Internodia inferiora brevia, superiora longiora, pubescentia vel glabrescentia. Folia anguste oblonga-oblancoolata, $2-3.5 \times 0.5-1$ mm, appresse pubescentia, nitidissima, valde decurvata. Stipulae lanceolatae, foliis fere aequales, deinde valde fissae. Capitula 5-10 mm lata, globosa, terminalia, confluentia. Bractaeae oblique oblongae, 4×3 mm, flores superantes. Flores anguste oblongi-ellipsoidei, 2-2.5 mm longi, dense et appresse pubescentes, nitidissimi. Sepala fere omnia aequalia, anguste oblonga, sat carnosae, apice subobtusae, ciliiferae. Petala 1-1.25 mm longa, staminibus longiora. Ovarium ovoideum, stylis binis, erectis. Fructus calycem omnem replens.

Type: Turkey, Vilayet Ankara, Beynam. P. H. Davis 13103 (U, holotype; E, isotype), collected 5-7-1947.

Distribution and Ecology: Endemic in the northwestern region of Turkey, west of Ankara. "Steep shaley slope facing south in woods".

Paratype: Turkey, Vilayet Ankara, Beynam. De Koster, de Wall Repelaer, Croockewit and Maas Geesteranus, s.n. (U), collected 23-6-1951.

4. *Paronychia cataonica* Chaudhri sp. nov. (Plate III, Fig. 7).

Planta caespitosa, compacta, prostrata. Caulis ramosissimus, basi lignosus. Rami longi, validi. Internodia 4-8 mm longa, valida, puberula vel deinde subglabrescentia. Folia elliptica, $3-4 \times 1.5-2$ mm, adpresse pubescentia, crassiuscula. Stipulae lanceolatae, $4-5 \times 1.25-1.5$ mm, folia superantes, binae in nodis sed deinde fissae. Capitula creberrima, coalescentia, 7-10 mm lata. Bractaeae oblique ovatae, $5-6 \times 3-4$ mm, flores superantes. Flores ellipsoidei, 3-3.25 mm longi, omnino adpresse pilosi, sepala crassa, plurima aequalia, suboblonga vel anguste elliptica, apice obtusa et ciliata. Petala filiformia 0.9 mm longa; filamentis iis paulo longiora, 1 mm longa; antherae oblongae, aurantiacae, 0.4×0.25 mm, ovarium ovoideum, styli bini, erecti. Calyx fructu dimidio longior.

Type: Turkey, Prov. Malatya, Malatya-Maras, 70 km from Malatya, alt. 1450 m, collected 9-6-1960. Stainton and Henderson 5489 (U, holotype; E, isotype)

Distribution and Ecology: Endemic in the type locality, around Malatya. "Growing on wasteground along roadside," alt. 1400 m.

Paratype: Prov. Malatya, Gurun-Darende, alt. 3500 ft., calc. steppe. P. H. Davis 21937 (E), collected on 19-6-1954.

5. *Paronychia turcica* Chaudri sp. nov. (Plate IV, Fig. 9).

Planta compacta, caespitosa, suffrutescens; caulibus basi lignosis, ramosissimis, nudis, induratis, valde intricatis. Rami validi. Internodia brevia, 1-2 mm longa, glabrescentia, subtus foliis et stipulis obtecta. Folia elliptica vel anguste obovata, $3-3.5 \times 1.5-2$ mm, crassiusculo-carnosa, valde approximato-imbricata, puberula, obtusa, stipulae lanceolatae, $5-6 \times 1.5-2$ mm, folia multo superantes. Capitula ovoidea vel globosa, 13-17 mm lata, terminalia, copiosa et crebra. Bractaeae oblique et late ovatae, acutae, $7-8 \times 3-4$ mm, flores multo superantes. Flores ellipsoideo-oblongi, $2.75-3 \times 1.5-2$ mm, adpresse pubescentes vel puberuli, sepala inter se aequalia, oblonga, obtusa, sat lata (1 mm), perspicue trinervia. Petala 0.75 mm longa. staminibus subaequalia. Filamenta 0.6-0.7 mm longa. Antherae validae, $0.4-0.5 \times 0.25$ mm, oblongae, aurantiaco-brunneae, ovarium ovoideum,

0.5–0.6 mm, styli bini, erecti, 1 mm longi. Fructus ovoideus vel globosus, calyce dimidio brevior.

Type: Turkey, Prov. Bitlis/Van; Mt. S. E. of Pelli by 10 km, alt. 9000 ft. P. H. Davis 22565 and O. Polunin (E), collected 8–7–1954.

Distribution and Ecology: Endemic in the eastern region of Turkey. Growing at quite high altitudes. 9000 ft.

6. *Paronychia paphlagonica* Chaudhri sp. nov. (Plate III, (Fig.6))

Planta prostrata, basi suffrutescens; caulibus basi ramosissimis; ramis divaricatis, Internodia puberula vel glabriuscula, 5–10 mm longa. Folia elliptico-oblonga, 5–7 × 2–2.5 mm, post anthesin crassiuscula vel rigida, glabrescentia vel glabra, margine hirta, apice plerumque plus minus obtusa (sed ad apices ramulorum acuta), costa prominente. Stipulae lanceolatae, 3–4 × 1.5–2 mm, foliis subaequales. Capitula 8–12 mm lata, terminalia et lateralialia, copiosa, crebra. Bractee latissime et oblique ovatae vel oblique suborbiculares, 6–7 × 4–5 mm, floribus duplo majores. Flores 3 mm longi, ellipsoideo-oblongi (basi attenuata), Sepala glabrescentia vel glabra, margine apiceque hirta, inter se aequalia, elliptico-oblonga, obtusiuscula, margine scarioso et nervis conspicuis. Petala 1–1.2 mm longa, stamina paulo superantes. Antherae validae, styli bini, erecti. Fructus calycem replens, sed sepalis supra conniventibus.

Type: Turkey (Northern), Kastamonu, alt. 1100 m. P. H. Davis 21774a (E), collected 9–6–1954.

Distribution and Ecology: Endemic, confined to the type locality. Growing on hills, alt. 1100 m.

7. *Paronychia lycica* Chaudhri sp. nov. (Plate I, Fig. 3)

Planta satis parva sed compacta. Radix longa, subsimplex. Radices accessoriae numerosi. Folia elliptica vel obovata, 3–4 × 1.5–2 mm, utrinque dense hirta, apice acuta vel obtusiuscula. Stipulae laceolatae, plerumque folia subaequant. Capitula 8–13 mm lata, ovoideo-rotundata, compacta et crebra. Bractee suborbiculares, floribus multo majores. Flores ellipsoideo-oblongi, 2–2.5 mm longi, calyx adpresse pubescens, crassiusculo-subcarnosus. Sepala inter se aequalia, oblonga, obtusa, apice prominente ciliata, margine scarioso distincto. Petala filiformia, 1 mm longa. Antherae validae, ellipsoideae. Styli bini, erecti. Fructus calycem replens.

Type: Turkey, Prov. Antalya, distr. Lycia, Colbali Dag, near Cukur Ardic Yayla, alt. 1700 m. P. H. Davis 15389 (E), collected 15–7–1949.

Distribution and Ecology: Endemic, known only from the type locality. Growing at rather high altitude, 1700 m.

8. *Paronychia sintenisii* Chaudhri sp. nov. (Plate V, Fig. 13).

Planta prostrata, compacta, basi lignosa, incrassata, nuda, valde ramosissima. Rami compacti, breves, dense foliosi, nodosi. Internodia brevissimo. Folia anguste obovata vel spatulata, basi attenuata, valde approximato-imbricata; valde adpresse pubescentia, pilis nitentibus. Stipulae anguste oblongae, 3–4 × 1–1.75 mm, folia inferiora aequantes, folia superiora paulo superantes, valde conspicuae, capitula parva sed copiosa et crebra, 5–7 mm lata, ovoidea, terminalia; Bractee suborbiculares, 4 × 4 mm, floribus duplo longiores. Flores ellipsoideo-oblongi, 2–2.5 × 1–1.5 mm, adpresse pubescentes vel pilosi, pilis nitentibus. Sepala inter se aequalia, oblonga, obtusa et apicem versus pilis erectis, margine membranaceo

prominente. Petala 1 mm longa, filiformia, stamina paulo superantia. Antherae minutae. Ovarium ovoideum, styli bini, erecti. Fructus ampulliformis, calycem replens, stylis exsertis.

Affinis *Paronychiae chionaeae* Boiss. a qua habitu, forma foliorum, stipularum, bractearum, florum et fructuum differt.

Type: Turkey, Mt. Ida (Kaz Daghi), N 39° 43', E 26° 48'. P. Sintenis 418/418a (LD, holotype; G, W, E, isotypes), collected 1-8-1883.

Distribution and Ecology: The species seems to be distributed over the northern part of Greece and extends to the north-western coastal strip of Turkey, around Kaz Daghi. Growing in rocky places.

Paratype: Greece, Macedonia occidentalis, distr. Kosani, in monte Vourinon, in declivibus orientalibus, subst. serpent. in saxosis, alt. 1800 m. K. H. Rechinger 17493 (W), collected 7-7-1956.

9. *Paronychia davisii* Chaudhri sp. nov. (Plate I, Fig. 2)

Planta divaricato-prostrata, basi lignosa et ramosissima. Radices accessoriae nullae. Rami longi. Internodia pubescentia-puberula vel glabriuscula. Folia elliptica vel anguste oblonga, 3-4 × 1-2 mm, dense pilosa, pilis nitidissimis, obscure carinata. Stipulae anguste lanceolatae, folia plerumque subaequantur (vel paene aequantes ad apices ramulorum). Capitula compacta, terminalia, globosa, 12-22 mm lata, distincta. Bractae late elliptico-rotundatae, 4-6 × 3-4 mm flores occultantes. Flores 2.75-3.25 mm longi, anguste oblongi, dense et adpresse pilosi, pilis nitidissimis, sepala inter se aequalia (sed post anthesin paene subaequalia), anguste oblonga, apice obtusiuscula et ciliata, margine membranaceo prominente. Petala 0.8-0.9 mm longa. Stamina brevissima. Ovarium ovoideum, styli bini, erecti, apicibus stigmatosis aliquantum divergentibus. Fructus ampulliformis, calycem replens; sepala conniventia.

Type: Turkey, Vilayet Antalya, Takhtali Dag (Kemer), alt. 2200 m. P. H. Davis 14121 (E), collected 16-8-1947.

Distribution and Ecology: Endemic, known only from the type locality. Growing on rocky slopes and screes, alt. 2200 m.

10. *Paronychia mughlai* Chaudhri sp. nov. (Plate VI, Fig. 14).

Planta compacta, prostrata, laxe caespitosa. Caulis basi ramosissimus. Internodia herbacea, 5-10 mm longa, dense pilosa. Folia anguste obovata 4-6 × 1.5-2.5 mm, omnino dense et adpresse pilosa, sat crassiuscula. Stipulae lanceolatae-suboblongae, 3-5 × 1.5-2 mm, plerumque foliis breviores sed ad apices ramulorum iis subaequales vel paulo longiores, binae in nodo, deinde aliquantum fissae. Capitula 10-12 mm lata, globosa, terminalia, crebra sed distincta. Bractae late ovatae 5-7 × 3-5 mm, flores omnes operientes. Flores ellipsoidei, 3-3.25 mm longi, dense villosi. Sepala anguste oblonga, apice obtuso-pilosa, inter se paulo inaequalia. Petala filiformia, 1 mm longa. Stamina brevia. Ovarium ovoideum, stylis binis, erectis, longis. Sepala conniventia.

Type: Turkey, Prov. Mughla, Mughla to Kale, 16 km, from Mughla, alt. 1250 m, Dudley D. 35084 (E, holotype). collected 28-5-1962.

Distribution and Ecology: Endemic in the south-western region of Turkey. Growing on limestone cliffs and screes. alt. 1250 to 2100 m.

Paratypes:

- 1) Prov. Denizli (Caria), Boz Dag alt. 1829-2132 m Screes. P. H. Davis 13393 (E,U), collected 16-7-1947.

- 2) Cilician Taurus, Burujik, Kuçuk Kur, "Limestone rocks and screes", alt. 5500 ft. E. K. Balls 1345 (E,K), collected 9-6-1934.

11. **Paronychia kotschyana** Chaudhri sp. nov. (Plate I, Fig. 1).

Planta prostrata, laxe caespitosa, suffruticosa, caules basi lignosi, indurati, ramosissimi. Rami validi, divaricati, nodosi. Internodia brevissima, puberula vel glabrescentia, plerumque foliis et stipulis oblecta. Folia elliptica vel anguste obovata, $4-6 \times 1.5-2.5$ mm, basi attenuata, apice acuta, dense et adpresse pilosa, pilis albis, longis, nitidis mollisque, (folia) valde approximata-imbricata. Stipulae $4-5 \times 2$ mm, suboblongae, foliis inferioribus subaequales, superiores ad apices ramulorum paulo superantes. Capitula ovoidea, 15-16 mm lata, terminalia et distincta. Bractee ovatae, $7-8 \times 6-7$ mm, floribus multo majores. Flores oblongi, 3.5×2 mm, valde et adpresse pubescentes. Sepala inter se aequalia, anguste ovata vel lanceolata, acuta, perspicue trinervia, margine scarioso prominente. Petala filiformia 1.25 mm longa, stamina superantia. Ovarium ovoideum, 1×0.6 mm. Styli bini, erecti. Fructus maturus ampulliformis, sursum attenuatus, stylis exsertis.

Differt a *Paronychia chionaea* Boiss. habitu, forma et structura foliorum, stipularum, bractearum, sepalorum, et fructuum.

Type: Turkey ("Syria borealis"), Mt. Amanus, prope Beilan Theodor Kotschy 66 (S, holotype; JE, L, C, isotypes) collected 23-6-1862, alt. 2000 ft.

Distribution and Ecology: Endemic in the Amanus and Cassius mountain ranges, in the southern strip of Turkey just west or north-west of Syria. Inhabiting calcareous rocks, alt. 2000-5500 ft.

Paratypes:

- 1) Ed. Boissier, S. N. (G), Mt. Cassius, collected 5-7-1846
- 2) Manoog Haradjian 3136 (G, W, S, E), Mt. Cassius, 4-5500, collected 6-1909.
- 3) Labillardiere S. N. (G), "Syria", collected-1787.

12. **Paronychia amani** Chaudhri sp. nov. (Plate II, Fig. 5).

Planta compacta, prostrata, basi lignosa, suffruticosa, caulibus ramosissimis, nodosis, ramis intricatis. Folia satis parva, crassiuscula, elliptica, basi attenuata $2.5-3 \times 1.5$ mm, adpresse pubescentia, valde approximata, recurvata. Stipulae lanceolatae, $4-5 \times 1-1.5$ mm, folia multo superantes, conspicuae. Capitula 8-12 mm lata, copiosa, crebra. Bractee $7 \times 5-6$ mm, late ovatae vel suborbiculares, floribus multo majores. Flores ellipsoideo-oblongi, 3-3.25 mm longi, sepala crassiuscula, puberula, nitidissima, inter se aequalia, elliptico-oblonga, apice acuta (vel subacuta). Petala filiformia, 1-1.1 mm longa. Filamenta 1.25 mm longa, antherae validae, $0.4-0.5 \times 0.25$ mm, oblongae, aurantico-flavae. Ovarium ovoideum vel coniforme, 1×0.5 mm. Styli bini, 0.8 mm longi, erecti. Fructus ellipsoideus, $2.5-2.75 \times 1.5$ mm, calycem fere replens.

Affinis *Paronychiae chionaeae* Boiss. a qua differt structura foliorum, stipularum, bractearum et sepalorum.

Type: Turkey, ("Syria borealis"), Montis Amanus, region d' Hasan veyli, 4-5500' Manoog Haradjian 2276 (G, holotype; W, isotype), collected 7-1908.

Distribution and Ecology: It seems to extend from the Amanus mountains to the central region (Prov. Kayseri) of Turkey. Inhabits rather high altitudes, 4-5500'.

Paratype: Turkey, Kayseri. Heillbronn and M. Bas Osman s. n. (G), collected 7-1941.

13. **Paronychia carica** Chaudhri sp. nov. (Plate VI, Fig. 15).

Planta compacta et caespitosa, prostrata, basi ramosissima, ramis validis, intricatis. Internodia brevia, puberula vel glabriuscula. Folia anguste elliptico-oblanccolata vel anguste obovata, $3-6 \times 1-2$ mm, dense et adpresse pubescentia, acuta vel obtusa. Folia vetustiora crassiuscula. Stipulae lanceolatae, $3-4.5 \times 0.75-1.25$ mm, folia inferiora subaequant, folia superiora ad apices ramulorum superantes. Capitula 10-12 mm lata, ovoidea, terminalia, copiosa et crebra. Bractae oblique ovatae, 6×5 mm, flores occultantes. Flores oblongi vel anguste ellipsoidei, dense et adpresse pilosi, pilis mollis, nitidis. Sepala distincte inaequalia, 2 exteriora anguste oblonga, acuta, erecta, et manifesta longiora, tertium intermedium, et 2 (rarius 3) interiora breviora, oblongo-obtusa, concava, margine scarioso inflexo, apice ciliata. Petala 1 mm longa, stamina paulo superantia. Antherae validae, oblongae, pallide brunneae, styli bini, erecti, 1 mm longi, sepala apicibus conniventibus.

Statura *P. chionaeae* Boiss., a qua differt structura calycis, sepalis distincte inaequalibus.

Type: Turkey, Buba Dagh, S. of Denizli, Erik Wall s. n. (S, holotype; LD, isotype), collected 30-5-1935.

Distribution and Ecology: Endemic in the westernmost part of Turkey. Inhabiting calcareous rocky places, alt. 800 m.

14. **Paronychia condensata** Chaudhri sp. nov. (Plate IV, Fig. 11).

Planta compacta, dense caespitosa, condensato-pulvinata, prostrata. Radix lignosa, ramosissima, caules basi lignosi, ramosissimi, intertexti. Internodia 2-6 mm longa, pubescentia vel puberula, subtus foliis et stipulis obtecta. Folia oblonga vel anguste elliptica, vel spatulata, $2-3 \times 0.75-1.25$ mm, basi attenuata, adpresse hirta vel pubescentia, apice subobtusa. Stipulae lanceolatae $3-4 \times 1-1.25$ mm, folia superantes, prominentes. Capitula pauciflora 5-7 mm lata, ovoidea, copiosa et crebra, terminalia et lateralialia. Bractae late ovatae vel oblique oblongae 5.5×4 mm, floribus duplo majores. Flores 2-2.5 mm longi, ellipsoidei-oblongi, adpresse hirtae vel pubescentes. Sepala inter se aequalia, elliptico-oblonga, apice subobtusa. Petala filiformia, 0.75-0.8 mm longa. Filamenta 0.6 mm longa, antherae 0.4×0.2 mm, oblongae, aurantico-flavae. Ovarium ovoideum, 0.5 mm, styli bini, erecti, 0.6-0.7 mm longi. Fructus calycem replens.

Type: Turkey, Nigde; W. Siehe 83 (JE, holotype; G, WU, isotypes), collected 6-7-6-1897.

Distribution and Ecology: Endemic, known only from the type locality. Growing at an altitude of 1100 m.

15. **Paronychia kemaliya** Chaudhri sp. nov. (Plate II, Fig. 4).

Planta prostrata, divaricata, suffrutescens. Radices accessoriae copiosae et prominentes. Caules basi lignosi, ramosissimi. Rami longi, patentes. Folia elliptica vel obovata, basi attenuata, $3-5 \times 1.5-2$ mm, adpresse pubescentia, apice acuta vel subobtusa, nervis conspicuis. Stipulae anguste lanceolatae, $4-6.5 \times 1-1.5$ mm, folia superantes, valde fissae. Capitula 12-15 mm, lata, ovoideo-globosa, terminalia, copiosa. Bractae oblique et late ovatae 6-7.5 mm, acutiusculae. Flores 3-3.5 mm longi, ellipsoidei, basi angusti. Sepala inter se aequalia, adpresse pubescentia, margine hirta, oblonga, apice acuta vel acutiuscula, conspicua ternaria, margine scarioso angusto. Petala filiformia, 0.8 mm longa. Filamenta 0.75

mm longa, antherae $0.5 \times 0.25-0.3$ mm, validae, oblongae, pallide brunneae ovarium ovoideum vel coniforme 0.75×0.5 mm. Styli bini, erecti.

Differt a *Paronychia chionaca* Boiss. caulibus laxè divaricatis, et structura foliorum, stipularum, calycis.

Type: Turkey, Kemaliye ("Egin", Jokardidagh). Paul Sintenis 2495 (LD, holotype; JE, G, Z, isotypes), collected 6-6-1890

Distribution and Ecology: Endemic, known only from the type locality. Inhabits rocky and stony localities.

16. ***Paronychia kurdica* Boiss. subspecies *haussknechtii* Chaudhri subsp. nov.** (Plate VIII, Fig. 17).

Planta compacta, caespitosa, caulibus basi ramosissimis. Folia crassiuscula, $2-4 \times 1-1.5$ mm, anguste oblonga, obtusa, valde approximata-imbricata, plerumque velutino-pubescentia, sed ad apices ramulorum hirsuta. Capitula parva, 5 mm lata, sed copiosa, crebra et dense congesta. Bractee ovatae, $2.5-3 \times 2.5$ mm, flores paulo superantes sed suboccultantes, circa flores convolutae. Flores oblongi, $2-2.5$ mm longi, hirsutiusculi, sepala subinaequalia, exteriora breviter recurva. Fructus calycem replens, annulo collari pericarpium nullo.

Differt a *P. kurdica* Boiss. subsp. *kurdica* foliis valde imbricatis, bracteis parvis, sepalis subinaequalibus et breviter recurvatis, annulo collari pericarpium nullo.

Type: Turkey, "Syr. bor.", m. Saff Dagh. C. Haussknecht s. n., (JE), collected 27-6-1865.

Distribution and Ecology: Endemic in southern Turkey, northwest Syria, and Lebanon. Growing on limestone hills, screes, and rocks.

Paratypes: Turkey, Gaziantep. E. K. Balls, 2201 (E, S), 29-4-1935. M. Haradjian, 144 (G); 1253 (G, W, E), collected 6-1907. C. Haussknecht, S. N. (JE), 15-16-6-1865. Herb. Post, 260 (G), 3-6-1882; 4 (G), 6-1884.

Syria, Khan Assal (ad occident. ab Aleppo), Erik Wall, S. N. (S), 31-5-1933, alt. 360 m.

Lebanon, Stermal-Churbino, P. H. Davis, 5832 (E), 24-4-1943.

17. ***Paronychia kurdica* Boiss. subspecies *montis-munzur* Chaudhri subsp. nov.** (Plate VII, Fig. 18).

Planta laxè caespitosa. Internodia longa et pubescentia. Folia anguste oblongo-oblancoolata, basi attenuata, apice acuto, pilosa vel pubescentia-puberula. Bractee ovato-acuminatae, flores superantes. Sepala anguste lanceolata, pilosissima, apice acuto-ciliata et valde recurvata.

Differt a *P. kurdica* Boiss. subsp. *kurdica* foliis acutis, sepalis anguste lanceolatis, acutis, et valde recurvatis.

Type: Turkey, Prov. Tunceli, Munzur Dagh, above Ovacik, alt. 1900 m. Davis and Hedge, D 31180 (U, holotype; E, isotype), collected 16-7-1957.

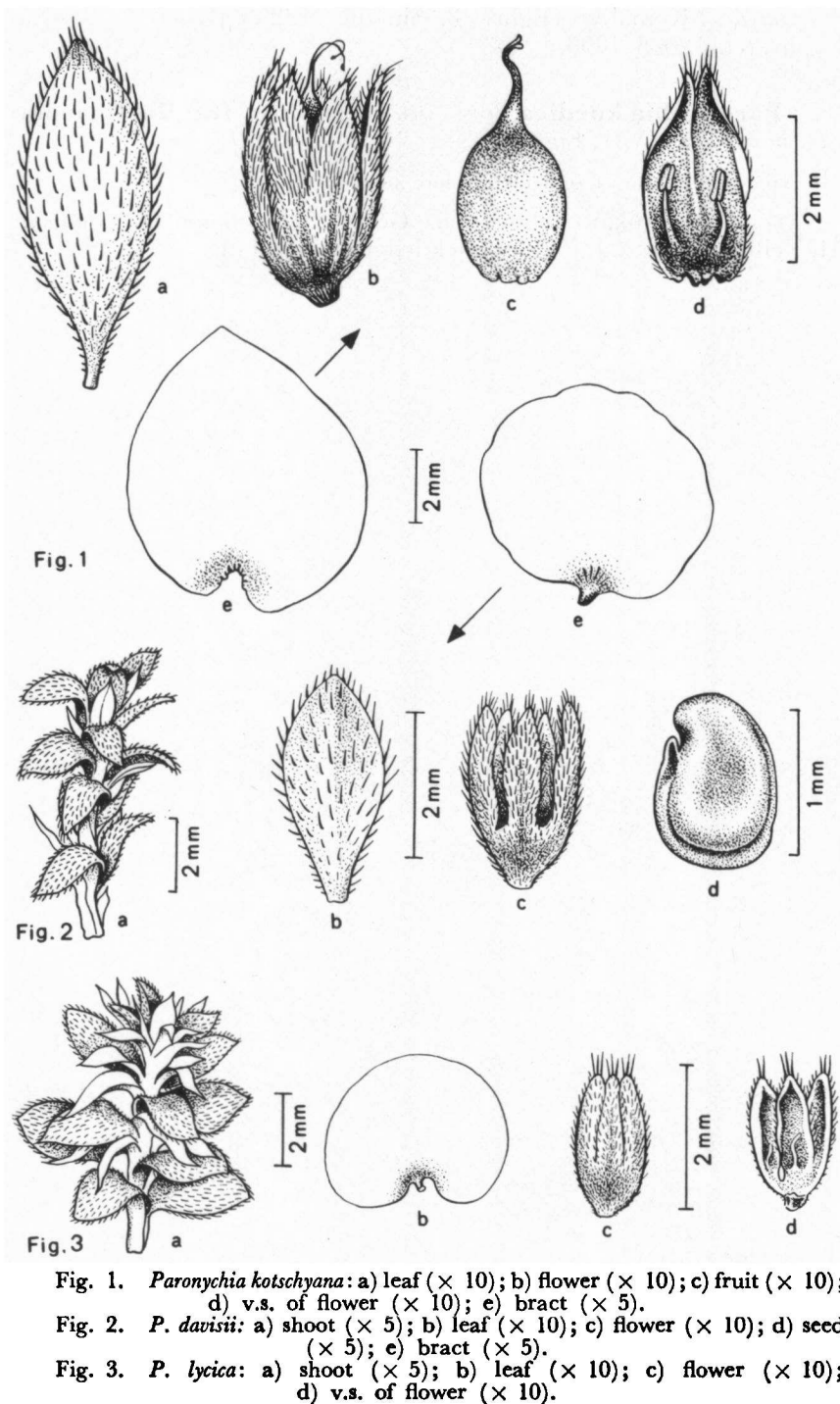
Distribution and Ecology: Confined to the central to north-central region of Turkey, from Munzur dagh to Nallihan west of Ankara. Growing on rocky limestone slopes, up to 1900 m.

Paratype: Kemaliye (Egin), P. Sintenis, 2323 (JE), in saxosis ad Euphratem, 20-5-1890.

18. **Paronychia kurdica** Boiss. ssp. *kurdica* var. **fragilis** Chaudhri var. nov. (Plate VII, Fig. 16).

A typo differt habitu fragilissimo, colore aureo-viridi.

Type: Prov. Ankara, above Tuz Gölü, 25 km north of Kochisar. McNeill, 326 (E), 29-7-1956, rock ledges, alt 900 m.



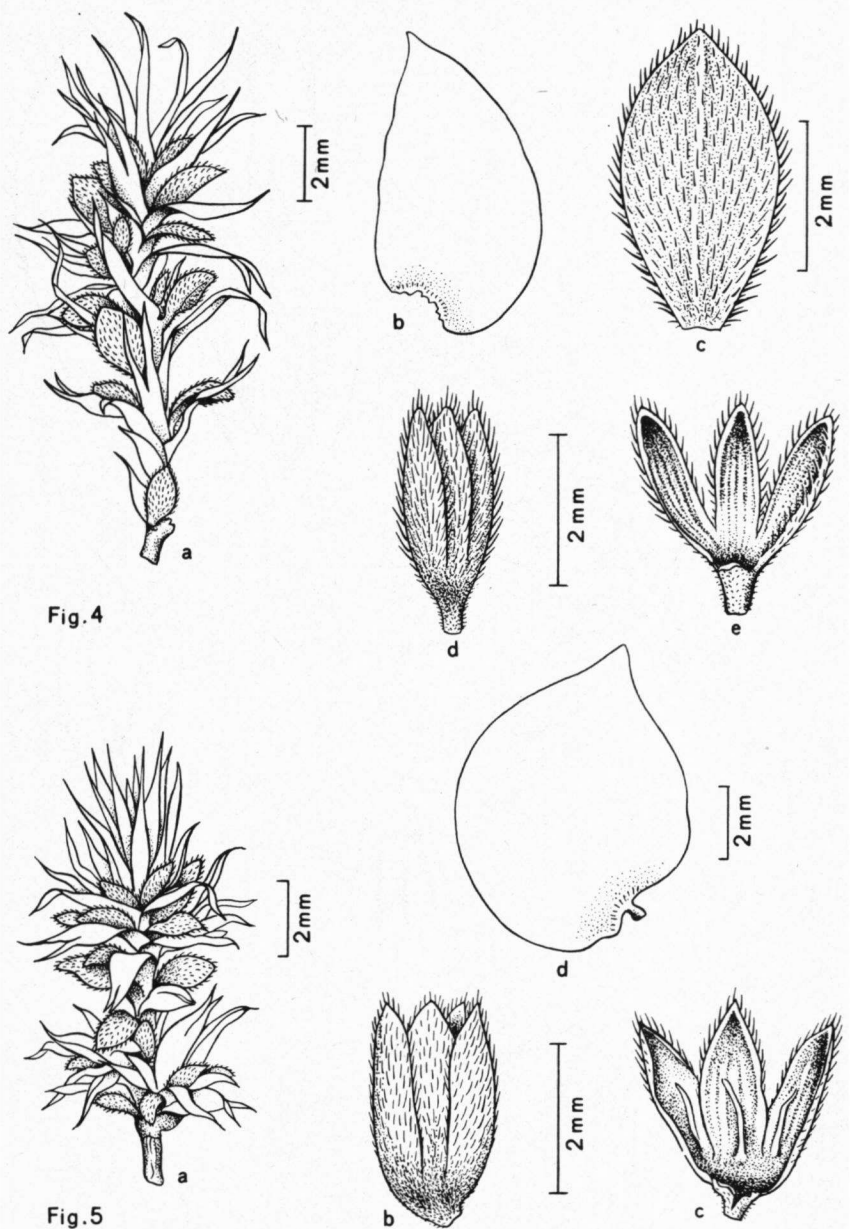


Fig. 4

Fig. 5

Fig. 4. *Paronychia kemaliya*: a) shoot ($\times 5$); b) bract ($\times 5$); c) leaf ($\times 10$); d) flower ($\times 10$); e) v.s. of flower ($\times 10$).
 Fig. 5. *P. amani*: a) shoot ($\times 5$); b) flower ($\times 10$); c) v.s. of flower ($\times 10$); d) bract ($\times 5$).

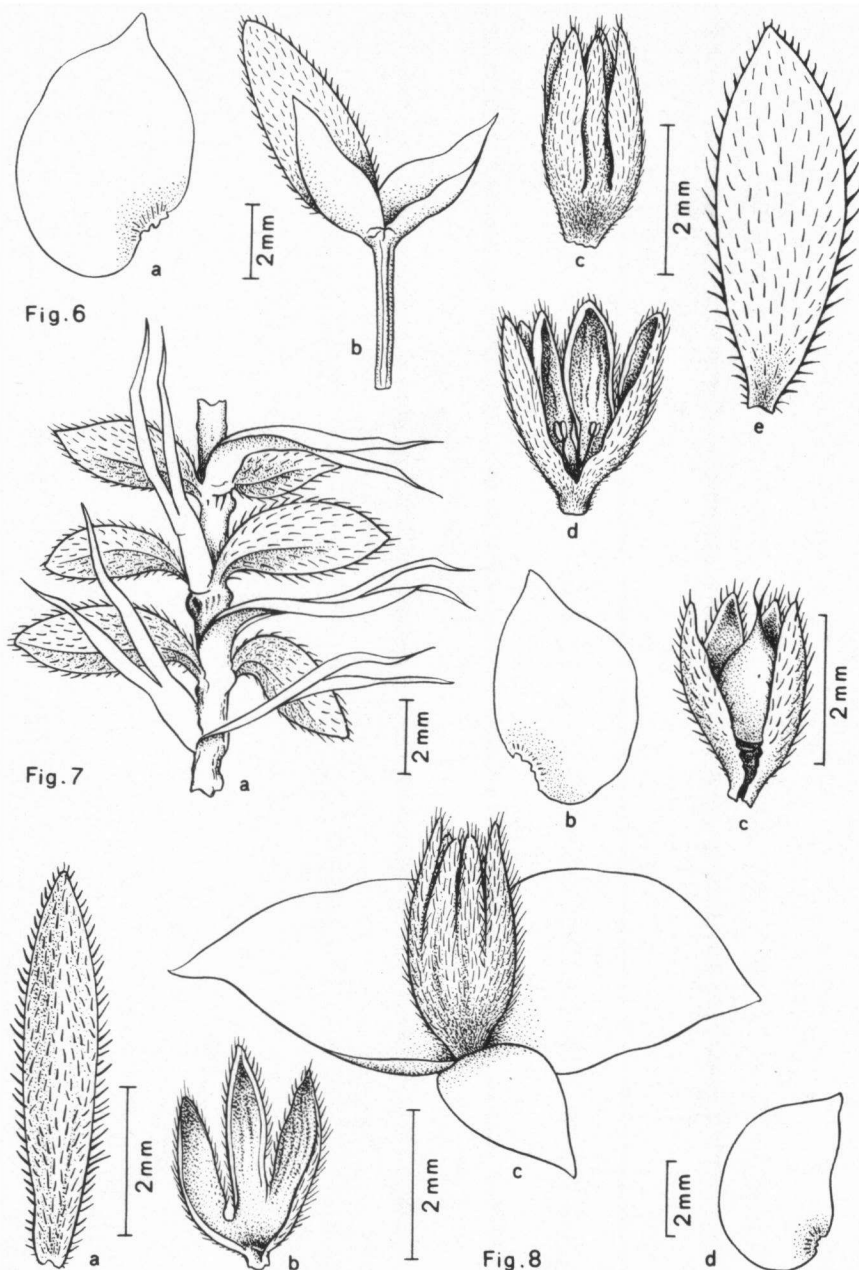


Fig. 6. *Paronychia paphlagonica*: a) bract ($\times 5$); b) a part of shoot ($\times 5$); c) flower ($\times 10$); d) v.s. of flower ($\times 10$); e) leaf ($\times 10$).
 Fig. 7. *P. cataonica*: a) shoot ($\times 5$); b) bract ($\times 5$); c) flower (dissected) ($\times 10$).
 Fig. 8. *P. dudleyi*: a) leaf ($\times 10$); b) v.s. of flower ($\times 10$); c) flower with bracts ($\times 10$); d) bract ($\times 5$).

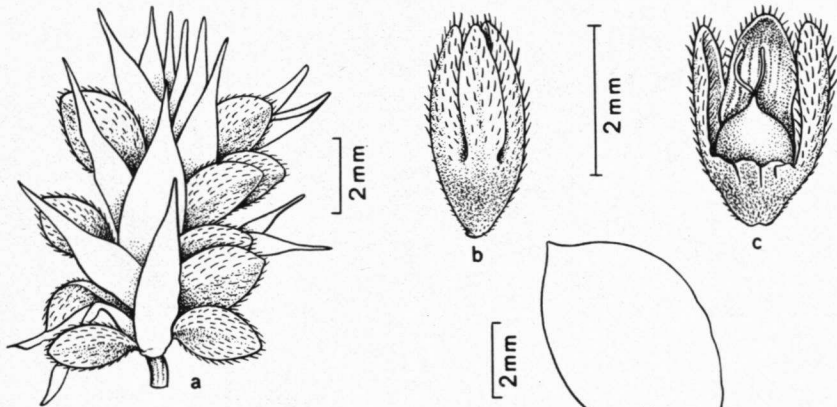


Fig.9

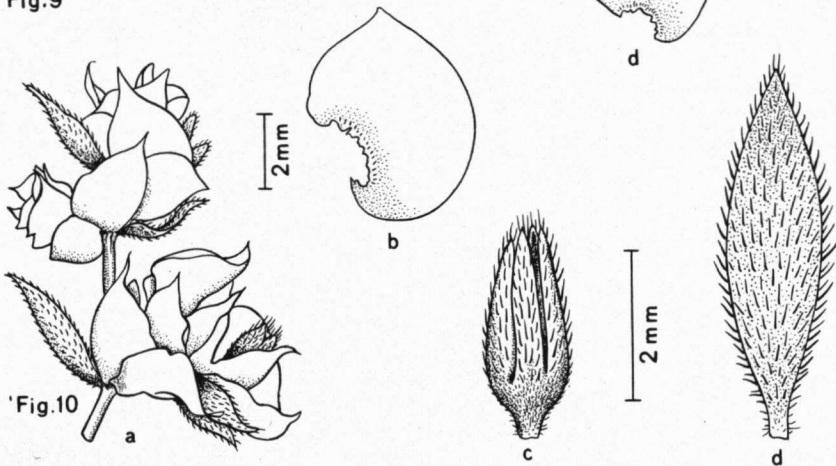


Fig.10

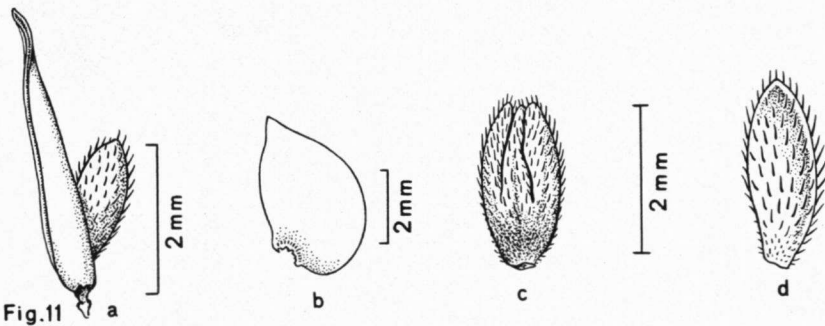


Fig.11

- Fig. 9. *Paronychia turcica*: a) shoot ($\times 5$); b) flower ($\times 10$); c) v.s. of flower ($\times 10$); d) bract ($\times 5$).
 Fig. 10. *P. galatica*: a) shoot ($\times 5$); b) bract ($\times 5$); c) flower ($\times 10$); d) leaf ($\times 10$).
 Fig. 11. *P. condensata*: a) leaf with stipule ($\times 10$); b) bract ($\times 5$); c) flower ($\times 10$); d) a leaf ($\times 10$).

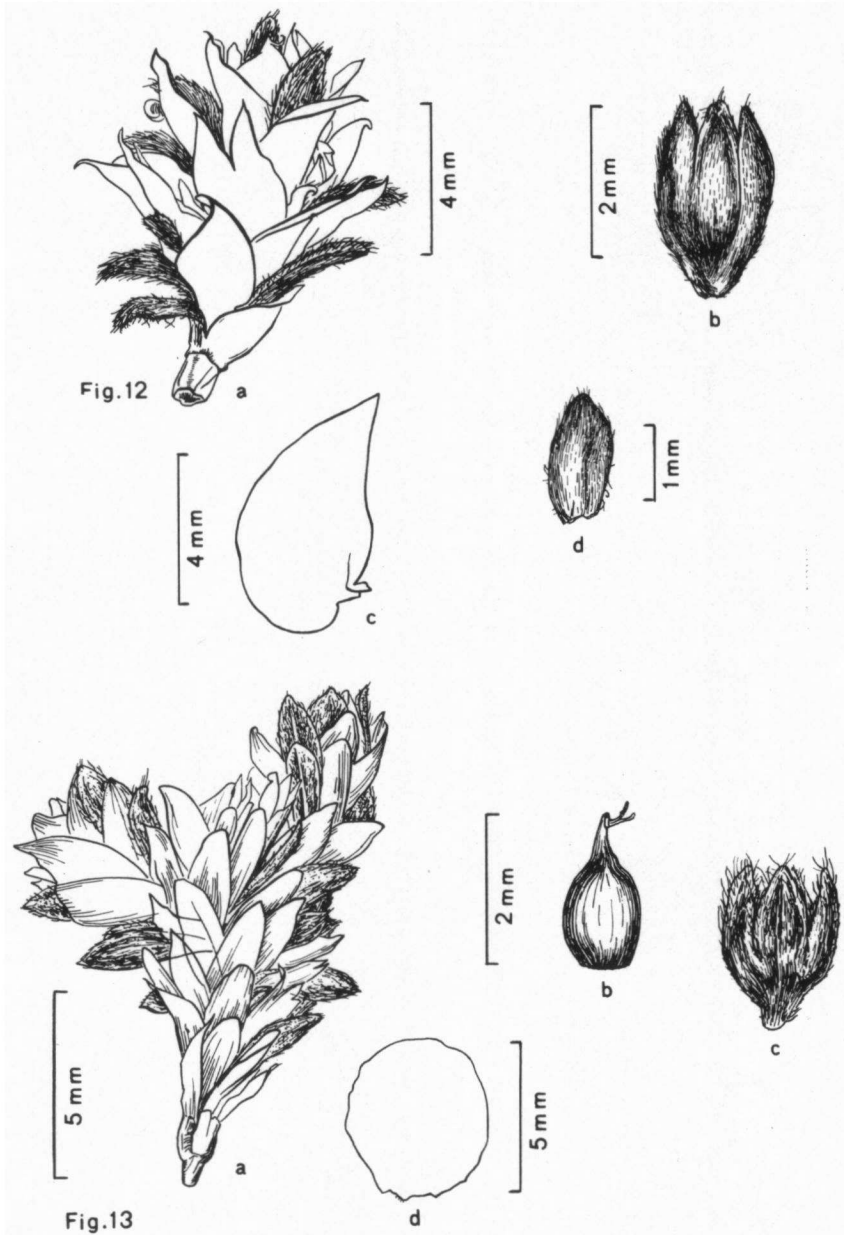


Fig. 12. *Paronychia angorensis*: a) shoot ($\times 5$); b) flower ($\times 10$); c) bract ($\times 5$); d) leaf ($\times 10$).

Fig. 13. *P. sintensisii*: a) shoot ($\times 5$); b) fruit ($\times 10$); c) flower ($\times 10$); d) bract ($\times 4$).

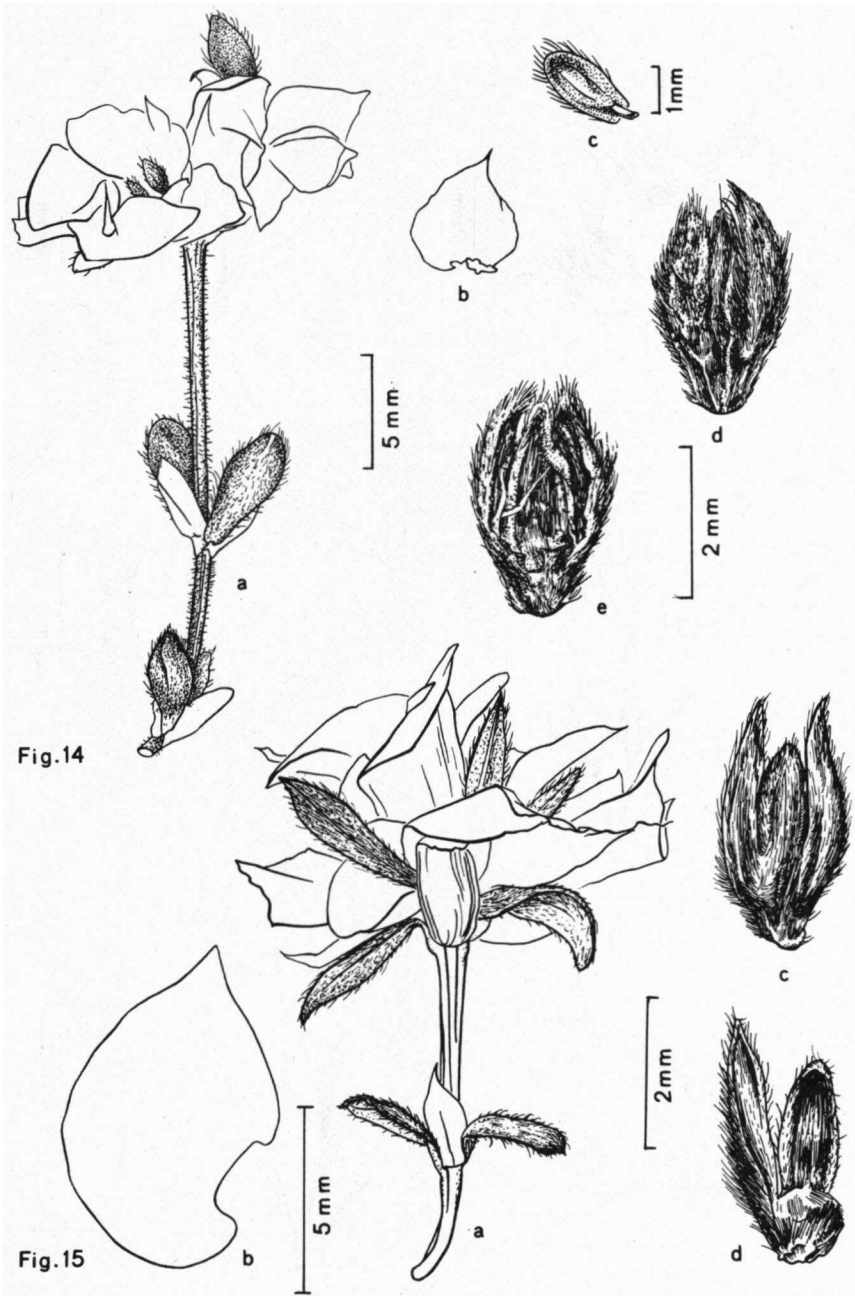


Fig. 14. *Paronychia mughlaei*: a) shoot ($\times 3$); b) bract ($\times 3$); c) leaf ($\times 6$); d) and e) flower, outside and inside view ($\times 10$).

Fig. 15. *P. carica*: a) shoot ($\times 5$); b) bract ($\times 5$); c) and d) sectional view of flower, outside and inside respectively ($\times 10$).

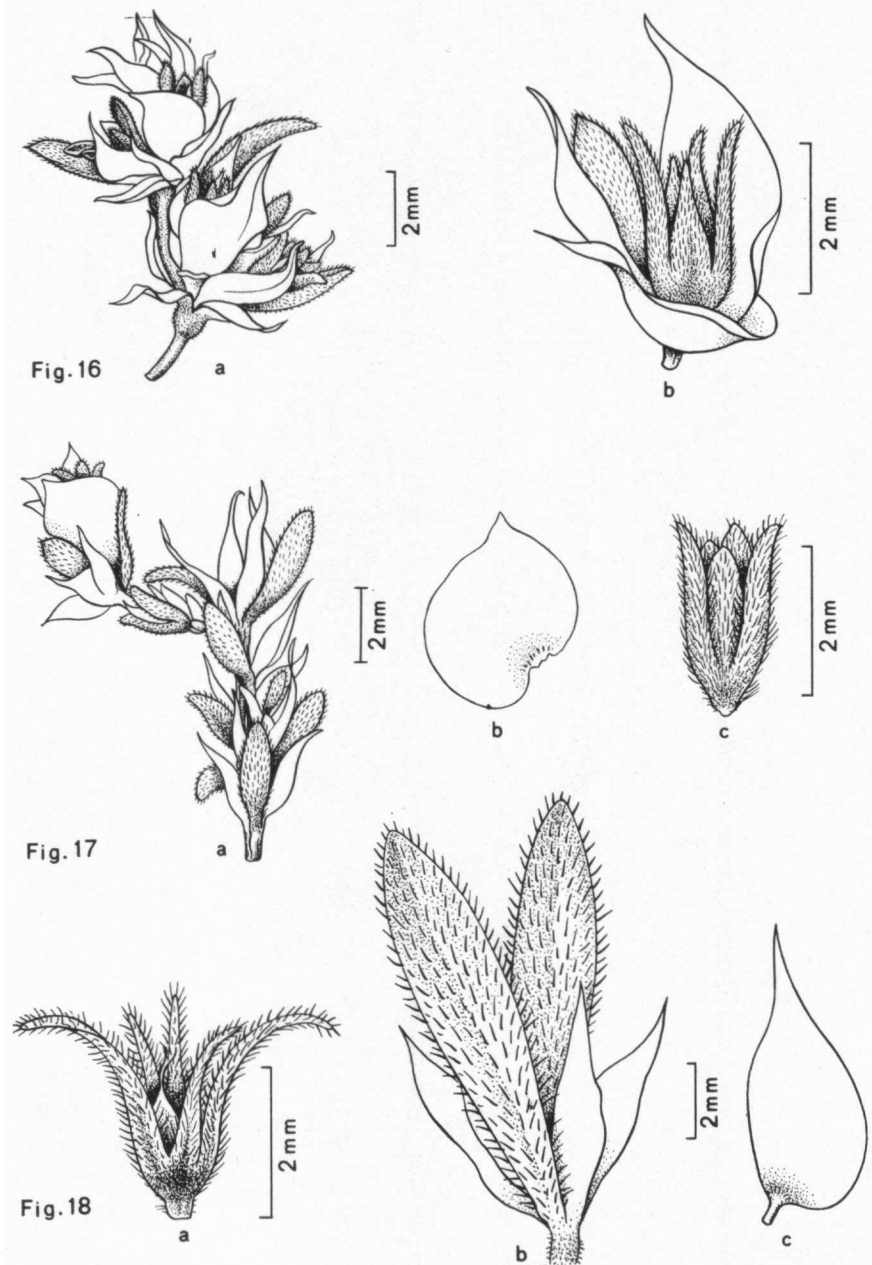


Fig. 16. *Paronychia kurdica* Boiss., var. *fragilis*: a) shoot ($\times 5$); b) a part of shoot ($\times 10$).

Fig. 17. *P. kurdica*, ssp. *haussknechtii*: a) shoot ($\times 5$); b) bract ($\times 5$); c) flower ($\times 10$).

Fig. 18. *P. kurdica*, ssp. *montis-munzur*: a) flower ($\times 10$); b) leaves with stipules ($\times 5$); c) bract ($\times 5$).