Chrysanthemum praeteritum Horwood: its Provenance, Taxonomy and Allied Species

BY

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For many years plants of an undescribed species of *Tanacetum* (*Pyrethrum*) masqueraded in cultivation under such names as *P. Aucherianum*, *P. densum* and *P. densiflorum*. Horwood described this species in 1933 as *Chrysanthemum* (*Pyrethrum*) *praeteritum*, basing it on a cultivated type (cult. in Hort. Bot. Reg. Kew., June 1912). The country of origin was unknown, but from the apparent affinities it was possible to say '*verosimiliter Oriens*.'

It was not until 1947 that some light was shed on the origin of *Chrysanthemum praeteritum*. Amongst the specimens collected that year by Mr. Peter H. Davis on his expedition to Anatolia* were several numbers of *Pyrethrum*; a study showed them to consist of two distinct taxa whose affinities were doubtless with *P. densum*. A search through the Kew Herbarium showed that one of the forms agreed closely with Horwood's species; I have therefore decided to amend the latter so as to accommodate the Anatolian material.

Before discussing the taxonomy and relationships of *C. praeteritum* a note on generic nomenclature is required. It is generally admitted to-day that the 'genus' *Pyrethrum* has little claim to generic status, and should be incorporated in either *Chrysanthemum* or *Tanacetum*—but in which is a matter of opinion. I prefer to treat *Pyrethrum* as a section of the genus *Tanacetum* from which no clear barriers separate it.† The genus *Chrysanthemum* is differentiated from both these groups by important achenial characters as demonstrated by Briquet (1916).‡ Pursuing Briquet's interpretation, *Tanacetum* comprises two sections which may be designated *Pyrethrum* (subdivided into subsections *Eupyrethrum* and *Parthenium*) and *Tanacetum*. This is essentially the same as Boissier's classification, although he employed, for quite invalid reasons, the generic name *Pyrethrum* rather than *Tanacetum*. Boissier's Sect. *Leucoglossa* is more or less equivalent to Subsect. *Parthenium*, while his sections *Leucogymnocline* and *Xanthogymnocline* are transitional between Subsect. *Parthenium* and Sect. *Tanacetum*. Boissier's sections are not, moreover, very clearly distinguishable. The *Eupyrethrum* group is not represented in the Orient; it is centred essentially in the Iberian Peninsula. Oriental species with monocephalic inflorescences are interesting in that they appear to form a link with Subsect. *Eupyrethrum*.

A key to the paramorphs of *T. praeteritum* and *T. densum* which are recognised in this paper is appended overleaf.

* Davis, P. H., A Journey in South-West Anatolia, in J. R. Hort. Soc. **74** (3–4) 106 (1949).

† cf. Boissier (Fl. Or. **3**, 337: 1875) "... nullum plane discrimen genericum inter *Pyrethrum* et *Tanacetum* adest, achaenia simillima et in speciebus affinibus transitus inter ligulas manifestas et flosculos femineos tubulosos vix ligulatos dicendos observantur."

‡ Briquet apud Briquet & Cavillier in Burnat, Fl. Alpes Marit. **6** (1) 119 (1916).

A. Ligules of ray florets white. Inflorescence subcorymbose with few capitula, or flowering stems unbranched with solitary capitula. Capitula large, 1·5–2·5 cm. in diameter (Lycia) . . . *T. praeteritum*

B. Leaves oblong or oblong-elliptical. Flowering stems unbranched with solitary capitula. Ligules of ray florets 3–6 mm. long (Baba Dağ, Teke Dağ, Çalbali Dağ) . . . . . subsp. *praeteritum*

BB. Leaves oblong-obovate. Flowering stems branched forming a lax corymb of few capitula. Ligules of ray florets 9 mm. long (Girdev Dağ) subsp. *massicyticum*

AA. Ligules of ray florets yellow. Inflorescence usually corymbose with numerous capitula. Capitula small, 0·5–1·0 cm. in diameter (Syria, Amanus, Armenia) . . . . . *T. densum*

C. Habit erect, not rooting from lower branches. Leaves narrowly elliptical or elliptical-oblong. Inflorescence moderately branched forming a fairly loose corymb of c. 6–12 capitula.

D. Pinnae of leaves obtusely crenate, not divided to the base (Syria) subsp. *densum*

(Branches of corymb elongated, c. 6 cm. long, naked. Ray and disc florets slightly winged . . . *T. densum* var. *syriacum*)

DD. Pinnae of the leaves divided to the base into oblong-lanceolate pinnules which are acute at the apex (Armenia). . subsp. *eginense*

CC. Habit creeping, rooting from the lower branches. Leaves subrotund, broadly elliptical. Inflorescence considerably branched forming a very compact corymb of c. 10–18 capitula (Amanus) . . subsp. *amani*

Tanacetum praeteritum (Horw.) Heywood, comb. nov. — *Chrysanthemum* (*Pyrethrum*) *praeteritum* Horwood in Kew Bull. 1933 (1) 44 (1933).

Species valde distincta Sectionis *Pyrethri* (Zinn) Reichb.; *T. denso* (Lab.) Heywood similis pinnis foliorum juniorum connexis folia indivisa aemulantibus sed habitu robustiore, foliis saepius majoribus, inflorescentia laxe subcorymbosa vel capitulis solitariis majoribus, ligulis albis, statim dignoscenda.

Subsp. **praeteritum**—*T. praeteritum* (Horw.) Heywood *sensu stricto*.

Suffrutex, caudiculis e radice lignosa crassis induratis ramuligeris, superne raro bifurcatis, ascendentibus, cortice longitudinaliter fisso; planta tota breviter dense albido-tomentosa, ut videtur heterophylla. *Rami novelli* 1–2 pollicares interdum subtortuosi dense fasciculato-foliosi. *Caules floriferi* erecti, rigidi, simplices, (7·5) 15–25 (30) cm. alti, monocephali. *Ramuli steriles* breves foliosi cum caulibus floriferis intermixti. *Folia ramulorum sterilium* rosulata; lamina rigida, plerumque oblonga vel oblongo-elliptica, saepe ad basin ± abrupte truncata (rarius in petiolum brevem sensim attenuata), (1·0) 1·4–2·5 (3·0) cm. longa, (4) 5–9 (10) mm. lata, apice subacuta, utrinque versicolor, vena media supra depressa infra prominente; pinnatisecta pinnis oblongis vel lineari-lanceolatis tomento connexis in lobulos rotundos pinnatim crenato-divisis folium indivisum simulantibus (ut in foliis novellis *Tanaceti densi*). *Folia caulium floriferorum* eis praecedentibus subsimilia, sed inferiora sunt longiora usque 3·5–4·0 cm. atque omnia pinnis

distantibus haud villoso-connexis praedita—folia forma eadem cum foliis ramulorum sterilium interdum intermixta—superne sensim diminuta; superiora segmentis ± coalitis ea ramulorum sterilium simulantia. *Caules floriferi* tenues plerumque simplices, monocephali. *Capitula* majuscula unacum ligulis radiantibus 1·5–2·0 cm. diametro, c. 6–7 mm. alti, receptaculo paulum elevato-conico. *Phylla involucri* imbricata omnia ± dense albido-tomentosa; *extima* minima (quam interna 2–3-plo breviora) indurata ovata apice acutiuscula margine scariosa, ciliata; *externa* ovato-lanceolata, apice latius marginata; *interna* lanceolata vel oblongo-lanceolata minus indurata, apice obtusiuscula, in appendicem hyalinam laceratam spathulatam producta; *intima* oblonga vix indurata, appendice ut in internis. *Flosculi marginales* ligulati albi vel cremei, radiantes, lamina oblonga apice ± truncata obsolete 3-lobata, fere oblinguiforme, 3–6 mm. longa, 1·5–2·5 mm. lata, post anthesin reflexa. *Flosculi disci* c. 3 mm. longi achaenia vix superantes, dentibus inaequalibus 5 obtusiusculis membrana alba crassa marginatis. *Achaenia* paulum dissimilia—*radii* compressa leviter curvata subquadriquetra vel subtriquetra 5–7-costata prismatica vel oblongo-obconica, costis albidis, sulcis glandulis paucis munitis;—*disci* regulariter 7–8-costata, prismatica vel obconica; omnia pappo brevissimo crenato-dentato coronuliforme praedita, cellulis mucilaginiferis nullis nec stiiis resiniferis.—Floret (Jun. in cult.) Jul.–Aug.

ANATOLIA.—*Prov. Muğla, distr. Fethiye* (*Lycia*): Baba Dağ (Anticragus) above Akbel yaylâ, rocks, 1,800 m., 30 July 1947, Davis 13662; *Prov. Antalya, distr. Kemer* (*Lycia*): Teke Dağ near Ovacik, rocks, single-headed, ligules white, 1,200 m., 12 July 1949, Davis 15221; *ibid.*, Çalbali Dağ near Çukur Ardiç yaylâ, dominant, always single-headed, white flowers, 1,700 m., 15 July 1949, Davis 15383; *ibid.*, Çalbali Dağ, often dominant on limestone slopes, always single-headed, flowers white, 1800–2,200 m., 14 July 1949, Davis 15321.

The above subspecies is based on the cultivated plants and Davis's Lycian gatherings from Baba Dağ, Teke Dağ and Çalbali Dağ; it is to be regarded as the typical form of the species. Since there are certain discrepancies between the cultivated and wild material, and inadequacies in the original description, a full subspecific diagnosis has been given.

Subsp. **massicyticum** Heywood, subsp. nov.

A subsp. *praeterito* caulibus floriferis robustioribus longioribus (26–32 cm. alti) superne ramosis corymbum laxum et incompositum formantibus; foliis oblongo-obovatis; ligulis flosculorum radii elongatis (9 mm. longis) distinguitur.

Folia ramulorum sterilium plerumque oblong-obovata (tertia parte supera maxima, quadruplo latiore quam longa) basin versus in petiolum brevem (7–9 mm.) sensim attenuata, (1·5) 1·75–2·0 (2·4) cm. longa, (6) 7–8 (10) cm. lata, apice subrotunda. *Caules floriferi* tertia parte superiore ramosi subcorymbum laxum formantes capitulis 2–3, pedunculis 7–9 cm. longis. *Capitula* unacum ligulis radiantibus 2·5 cm. diametro, c. 7 mm. alta. *Flosculi marginales* ligulati albi radiantes, lamina obovato-oblonga (9 mm. longa, 3–4 mm. lata) post anthesin reflexa involucrum subaequante.—Floret Jul.–Aug.

ANATOLIA.—*Prov. Muğla, distr. Fethiye* (*Lycia*): Girdev Dağ,* S. side, 2,000 m., ligules white, 8 August 1947, Davis 13827 (*holotypus in Herb. Kew.; isotypus in Herb. Edin.*); *ibid.*, above Düğer, 1,600 m., 6 August 1947, Davis 13805; *ibid.*, 2,200 m., ligules white, 3 August 1947, Davis 13788.

On Girdev Dağ the species appears to form a distinct population notable for its subcorymbose inflorescence which distinguishes it from subsp. *praeteritum*. It is described above as a new subspecies.

The affinities given by Horwood for *T. praeteritum* are misleading. In the diagnoses he states "affine *C. Aucheriano* DC., a quo differt habitu diffuso, caulibus ramosioribus, foliis haud bipinnatis et capitulis minoribus." There is in my opinion no justification for relating it to *Chrysanthemum Aucherianum* apart from the fact that it has been in cultivation under that name. The undoubted affinities are with the *T. densum–cadmeum* group. It should be noted that *T. praeteritum* comes into the Sect. *Leucoglossa* ("caules corymbosis") of Boissier's synopsis of the oriental species of *Pyrethrum* because of its large capitula, although subsp. *praeteritum* might be more correctly placed in Sect. *Leucogymnocline* ("ligulae . . . albae disco breviores"). The *densum–cadmeum* group belongs to the Sect. *Xanthogymnocline*. *T. praeteritum* clearly breaks down this disposition of species, but it was probably not meant by Boissier to be more than a convenient arrangement.

Only in *T. densum* is the connection of the leaf segments by indumental hairs, so as to simulate an undivided leaf, developed to an extent comparable with the condition in *T. praeteritum*. Boissier in his description of the former species regards the 'pseudo-entire' leaves as being in the young condition, later producing the more open, distantly-segmented, lobed leaf. In *T. densum* this would indeed appear to be the case, but in *T. praeteritum* it is more doubtful—the connected leaves form the basal rosettes, whereas the open leaves are cauline except for a few intermixed with the rosettes. Observations of plants in cultivation should clarify this point.

The distribution of *T. praeteritum* in Lycia is interesting: subsp. *praeteritum* occurs only on the coastal mountain ranges; subsp. *massicyticum* is confined, as far as is known, to the inland range of Girdev Dağ. Davis suggests that this dispersion is probably explained by the effect of a maritime climate on the vegetation of the seaward mountains, giving them relatively uniform ecological conditions and allowing a similar flora to develop. Thus the same form (subsp. *praeteritum*) jumps in its distribution from one coastal range to another, missing out the more continental range between. Many other species do the same.

Tanacetum praeteritum forms an important constituent of certain zones of vegetation in the area it occupies; on Çalbali Dağ, for instance, subsp. *praeteritum* is often dominant on the limestone slopes from about 1,700 to 2,200 m., and its collector informs me that it seems to be constantly single-headed and of uniform facies.

Seeds collected by Davis have established both subspecies of this attractive species in cultivation. It seems to have no particular soil preferences, even growing well on fairly acid soil in the Rock Garden of the Royal Botanic Garden in Edinburgh. Until the introduction of this new seed, the plants

* Also known as Eren Dağ, and part of the western Ak Dağ range (ancient Massicytus, from which the subspecific epithet is taken).

in cultivation were apparently all members of a clone and consequently showed considerable uniformity.

Tanacetum densum (Labillardière) Heywood, comb. nov. — *Pyrethrum densum* Lab., Ic. Pl. Syr. Rar., Dec. iii, 12, tab. 8 (1809)—*Chrysanthemum densum* (Lab.) Boissier, Fl. Or. **3,** 348 (1875).

Subsp. **densum**—*T. densum* (Lab.) Heywood, *sensu stricto.*

Syria.—Sine loco exacto—*Labillardière* (*typus in Herb. Webb. apud Herb. Flor.; isotypus in Herb. Kew.*); sine loco—1846, Pinard; summit of Mt. Hermon, Oct. 8, 1868, G. E. Post; top of Hermon, Osborne 109; c. Zebdaine prope Damascum, frequens per rupium parietes Antilibani alt. 6,000 ped., Kotschy, It. Syr. (1855) 123; Sahel (between Nebk and Falita) 1,410 m., 21 June 1943, Davis 6588.

During the investigation of *T. praeteritum* a study was made of *T. densum.* It is a polymorphic species—some variations have been named, others deserve naming.

The typical plant is known from type material and from Labillardière's figure (the specimens coming from Syria without a precise indication of locality); Davis kindly examined the type of *Pyrethrum densum* for me in the Herbarium Webbianum at the Erbario di Firenze and made the following notes:

"There are three 'type' sheets—eight specimens are several-headed and two one-headed, otherwise identical. The plants do not root below. The lower conferted leaves are ± ellipitical; the upper conferted leaves are considerably longer, elliptical oblong, with the segments of the pinnae ovate ± obtuse. Peduncles 0·5–2·5 cm. long. Flowering stems 10–25 cm. tall with capitula 5–7 mm. broad. The involucral indumentum is subsericeous-tomentose, ± tawny."

The typical subspecies is confined to Syria. Davis's collections from the Antilebanon are of unusually spindly plants—all the parts are slender and elongated giving the impression of a normal plant that has been etiolated. The plants collected by Kotschy from the vicinity of Zebdaine are notable for possessing single-headed inflorescences with only one trace of an abortive corymb—otherwise they do not diverge from the typical. But plants raised in cultivation from Davis's Antilebanon seed bear individually either single-headed or several-headed stems.

T. densum (Lab.) Heywood, var. **syriacum** (Boiss.) Heywood, stat. nov.—*Pyrethrum syriacum* Boiss., Diag. Ser. 1 (11) 24 (1849); Fl. Or. **3,** 348 (1875) *in syn.*

Turkey.—Aintab, Aucher-Eloy, Herb. d'Or. No. 3478.

Above Aintab (Gaziantep)—then in Syria—Aucher-Eloy found a curious form of *T. densum* in which the branches of the corymb are considerably elongated. Boissier (1849) described this plant as *Pyrethrum syriacum*, but later (1875) reduced it to the synonymy of *P. densum.* I feel that the form does deserve recognition, but not at specific level; its precise status is uncertain. Accordingly I have recombined it with *Tanacetum densum* as a variety.

Boissier's differentiae (1849 *l.c.*) are worth quoting: "Affine facie, magnitudine capitulorum, longitudine ligularum *P. denso* quod a nostra planta distinguitur segmentis foliorum multo minutius et confertius lobulatis

semper revolutis in foliis junioribus adeo continguis ut folium indivisum simulent, caule minore, involucri phyllis latioribus brevioribus, pedunculis foliosis nec nudis." To this I would add that both the ray and disc flowers are slightly winged laterally in var. *syriacum*, and the peduncles (branches of the corymb) are c. 6 cm. long.

An identical specimen in the Kew Herbarium is labelled "*Pyr. achillaefolium*, in Monte Tauro, Montbret, 1834," but it is obviously from the same gathering as the type, if not from the same plant.

Subsp. **eginense** Heywood, subsp. nov.

A typo foliis majoribus, bipinnatisectis, pinnis in pinnulis oblongis lanceolatis apice acutis confertim et pectinatim sectis (fere ut in *T. cadmeo**), indumento, praesertim inflorescentiae, dense et longe velutinoso inter alia recedit.

ARMENIA TURCICA.—Egin, Erzsehervit Dagh (?), in rupestribus, 6 June, Sintenis, It. Or. 1890 No. 2599 (*holotypus in Herb. Kew.; isotypus in Herb. Edin.*).

The representatives of *T. densum* from Armenia, collected by Sintenis, are markedly different from the Syrian plants. Their main difference is foliar—the pinnae are divided to the base into oblong-lanceolate pinnules which are acute at the apex. This is quite unlike the obtuse crenation of the pinnae found in subsp. *densum*. Moreover the pinnules are not joined together by pannous wool so as to give the leaves an undivided smooth appearance, but stand up in the vertical plane; they appear too crowded and numerous to be able to lie flat in the horizontal plane as in typical *densum*. This leaf condition resembles very closely that obtaining in *T. cadmeum*. Another notable feature is the very dense and shaggy indumentum especially of the inflorescence. Bornmüller (1944 *l.c.*) records Sintenis's specimens from Armenia with the comment—"Stimmt mit Exemplaren von Hermon (Libanon; Bornm. No. 854) gut überein." I have not seen Bornmüller's Hermon plants and cannot therefore contradict his statement, but all the other plants of *T. densum* I have examined from Mt. Hermon are normal for subsp. *densum* and quite different from the Armenian gathering. I can only suggest that Bornmüller had not compared the specimens closely. My own opinion is that Sintenis's plants form the basis of a good subspecies.

Subsp. **amani** Heywood, subsp. nov.

A typo (subsp. *denso*) habitu radicante caulibus parte inferiore radices edentibus, foliis latioribus rotundioribus, caulibus floriferis superne multo magis ramosis corymbum compactum capitulis (6) 10–18 (20) formantibus distinctum.

A *T. praeterito* sensu lato imprimis ligulis luteis, corymbo pluricephalo, capitulis minoribus recedit.

Folia ramulorum sterilium (1·1) 1·5–2·0 (2·5) cm. longa, 0·75–1·2 cm. lata. *Capitula* 0·5–0·7 (1·0) cm. diametro, ligulis flosculorum radii 1–1·5 (2·0) mm. longis.

ANATOLIA.—Prov. Adana, distr. Bahçe (N. Amanus): Dildil Dağ, Atlik yaylâ, 1,700–1,800 m. (flowers said to be yellow) 26 August 1949, Davis 16368 (*holotypus in Herb. Kew.; isotypus in Herb. Edin.*); *ibid.*, above Atlik yaylâ,

* **Tanacetum cadmeum** (Boiss.) Heywood, comb. nov.—*Pyrethrum cadmeum* Boiss. Diag., Ser. 1 (4) 10 (1844)—*Chrysanthemum cadmeum* (Boiss.) Bornm., in Fedde, Repert. **89** (2) 343 (1944).

1,900 m., 27 August 1949, Davis 16427; *ibid.*, between Gökçayir and Atlik yaylâ, 1,600 m., 26 August 1949, Davis 16541; *ibid.*, Mont. de Düldül, 1,500–2,000 m., Juillet 1911, Haradjian Pl. Syr. Bor. 3800.

The collections of Davis from Dildil Dağ appear to form a distinct geographic population which combines some of the features of both *T. densum* and *T. praeteritum*, although distinguishable from each of them. In general facies the Dildil Dağ plants resemble *T. praeteritum* more closely; this is evidently due to their stronger creeping habit and their larger and broader leaves. The colour of the ligules, according to the local guides, is yellow; specimens collected by Haradjian in 1911 from the same locality confirm this as far as can be detected in dried material. As ligule colour is a constant distinguishing feature of the two species, I think the yellow rays must be taken as weighting the evidence, otherwise quite equally divided, for attaching the Dildil Dağ plants to *T. densum* rather than to *T. praeteritum*. Obviously they can be considered as constituting a transitional form between the two species.

Haradjian's material from Dildil Dağ agrees very closely with Davis's number 16427. The plants tend to be smaller-leaved than usual, with the corymbs not fully developed. The segments of the pinnae are obtuse at the apex, but they are divided to the midrib and not simply crenate as in normal *densum* and *praeteritum*.

There is a certain amount of variation in Davis's gatherings of subsp. *amani*, probably accounted for by diverse habitat conditions, but he found the characteristic facies to be uniform. The subspecies has a distinct geographical area and is clearly definable.

It may be possible to accommodate here a gathering by Haradjian from Akher Dağ* (near Maraş, north-east of the main Amanus range) which possesses the compact, shaggy, many-headed corymb character of subsp. *amani;* the leaves attain the proportions found in *T. praeteritum*, agreeing in shape with subsp. *praeteritum*.

The following table sets out the characters distinguishing *T. densum* subsp. *amani* from both subsp. *densum* and *eginense* and also from *T. praeteritum*.

Differs from *T. densum* subspp. *densum* and *eginense*	Differs from *T. praeteritum*
Creeping habit, manifestly rooting at the base.†	Ligules of ray flowers yellow (?), very small.
More robust, stronger stems.	Capitula smaller.
Leaves rounder and broader.	Bracts of involucre without typical wide scarious margins, and not produced into broad appendages.
Corymbs more branched, many headed, and compact.	Corymbs much more branched, many-headed and compact.

* Akher dağ, 6,000 ft., Juillet 1907, Pl. Syr. Bor. No. 1604.

† In cultivation *T. densum* subsp. *densum* produces a few weak adventitious roots when growing under favourable conditions.

There remains the following variation to consider:

Pyrethrum densum β *Pichleri* Barbey, in Bull. Soc. Vaud. Sc. Nat. 4 (1805). "Capitula submajora, ligulae oblongo-spathulatae obsolete trilobae involucro sublongiores."

Hab. in monte Alidagh Lyciae (*Pichler*).

I have not seen material of this form. The description suggests that it may refer to *T. praeteritum*. Its locality—in Lycia—supports this view, since *T. praeteritum* is known to grow in this area while *T. densum* is probably confined to Syria, the Amanus and Armenia. That ligule colour is not given is negative evidence.

ADDENDUM

During the preparation of the above paper it was found that the following new name is required:

Tanacetum pectiniforme Heywood, nom. nov.

Syn. *Pyrethrum pectinatum* Haussk. (in Sint. exsicc. No. 1001, *nomen*) ex Bornmüller in Mitt. Thur. Bot. Ver. n.s. **20,** 16 (1904–5).
Chrysanthemum pectinatum (Haussk. ex Bornm.) Bornm. in Fedde, Repert., **36,** 350 (1934); op. cit., Beihefte **89** (2) 340 (1944).

Non *Chrysanthemum pectinatum* L., Sp. Pl., ed. 2, 1255 (1762),

nec *Pyrethrum pectinatum* Hoffmansegg et Link, Fl. Port., **2** tab. 103 (1820),

nec *Pyrethrum pectinatum* Fisch. ex Turcz., in Bull. Soc. Nat. Moscow, **19,** 180 (1846).

In view of the synonymy quoted above and the unstable state of generic nomenclature in this group, I have thought it unwise to adopt the epithet *pectinatum* under *Tanacetum*.