

Typification of four Linnaean names in the genus *Euphorbia* (Euphorbiaceae)

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Abstract. The lectotypification of four Linnaean names in the genus *Euphorbia*: *E. exigua*, *E. exigua* var. *acuta*, *E. paralias*, and *E. segetalis* is discussed. The designation of the nomenclatural types is based on the consultation of Linnaeus's original material and the literature cited in the respective protologues. The name *E. exigua* had previously been "lectotypified" by Jafri & El-Gadi in 1982 on a specimen kept in LINN. However, Linnaeus cited in the protologue a specimen from the Joachim Burser Herbarium, currently preserved at UPS-BURSER. According to the ICN (International Code of Nomenclature for algae, fungi, and plants), this is a syntype which must be chosen as the lectotype. The name *E. exigua* var. *acuta* is lectotypified using a specimen preserved in the Clifford Herbarium at BM and is treated in this paper as a heterotypic synonym of *E. exigua* var. *exigua*. The name *E. paralias* had previously been "lectotypified" by Geltman in 2015 (repeated in 2020) on a specimen kept in S-LINN. However, this specimen is not original material for the name. The lectotype of *E. paralias* is designated in this paper from a specimen preserved at S-LINN according to the ICN. Finally, the name *E. segetalis* is lectotypified using a Morison illustration.

Keywords. Burser Herbarium, Clifford Herbarium, lectotype, Linnaeus, nomenclature, syntype.

Resumen. Se discute la lectotipificación de cuatro nombres linneanos del género *Euphorbia*: *E. exigua*, *E. exigua* var. *acuta*, *E. paralias* y *E. segetalis*. La designación de los tipos nomenclaturales se basa en la consulta del material original de Linneo y en la bibliografía citada en los respectivos protólogos. El nombre *E. exigua* había sido previamente "lectotipificado" por Jafri & El-Gadi en 1982 sobre un espécimen conservado en LINN. Sin embargo, Linneo citó en el protólogo un espécimen del Herbario de Joachim Burser, conservado actualmente en UPS-BURSER. Según el ICN (Código Internacional de Nomenclatura para algas, hongos y plantas), este espécimen en UPS es un sintipo que prevalece en la elección del lectotipo y debe elegirse como tal. El nombre *E. exigua* var. *acuta* se lectotipifica utilizando un espécimen conservado en el Herbario de Clifford en BM y se trata en este artículo como un sinónimo heterotípico de *E. exigua* var. *exigua*. El nombre *E. paralias* había sido previamente "lectotipificado" por Geltman en 2015 (repetido en 2020) a partir de un espécimen conservado en S-LINN. Sin embargo, este espécimen no es material original para el nombre. El lectotipo de *E. paralias* se designa en este trabajo a partir de un espécimen conservado en S-LINN de acuerdo con el ICN. El nombre *E. segetalis* se lectotipifica utilizando una ilustración de Morison.

Palabras clave. Herbario de Burser, Herbario de Clifford, lectotipo, Linneo, nomenclatura, sintipo.

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INTRODUCTION

Euphorbia L. (Euphorbiaceae) is one of the largest genera of flowering plants with about 2,100 species and a worldwide distribution, but is especially diverse in arid and semi-arid regions of the tropics and subtropics (Webster 1994; Govaerts & al. 2000; Frodin 2004; Bruyns & al. 2006; Riina & al. 2013; Riina & Berry 2024; POWO 2024). Life forms within the genus vary from annual herbs to shrubs and large trees. Analyses of molecular data show that there are four well-defined clades within the genus, which are now treated as subgenera (Bruyns & al. 2006; Zimmermann & al. 2010): *E. subg. Chamaesyce* Raf. (Yang

& al. 2012); *E. subg. Euphorbia* (Dorsey & al. 2013); *E. subg. Esula* Pers. (Riina & al. 2013); *E. subg. Athymalus* Neck. ex Rchb. (Peirson & al. 2013).

The rich morphological variability of *Euphorbia* (Horn & al. 2012) has attracted human interest around the world since ancient and even prehistoric times (Hargreaves 1981; Schultes 1987; Pauketat & al. 2002). Members of *Euphorbia* are readily distinguishable by their milky latex and specialized inflorescences (cyathia) (Govaerts & al. 2000; Horn & al. 2012; Riina & Berry 2024). In the genus, several species have a relevant economic importance, either as ornamental and domestic plants, for their appreciated

latex, or for their use in folk medicine throughout the centuries (Rizk 1987; Schultes 1987; Ernst & al. 2015; Riina & Berry 2024).

From the nomenclatural point of view, typification must be the starting point of any taxonomic study, especially in a difficult genus such as *Euphorbia*. The author who has described more species within this genus has been Linnaeus, with 70 published names. Effective typifications exist for most of these names (see e.g., Jarvis 2007; Geltman 2015, 2020). However, some Linnaean names, e.g., *E. segetalis*, and *E. exigua* var. *acuta*, are untypified and other (e.g., *E. exigua* and *E. paralias*) were not correctly typified and all of them are examined here. This nomenclatural act is necessary for the correct application of these names in this taxonomically difficult group.

Euphorbia exigua is the type of *E. sect. Exiguae* (Geltman) Riina & Molero ($\equiv$ *E. subsect. Exiguae* Geltman in Novosti Sist. Vyssh. Rast. 32: 101. 2000) (Riina & al. 2013), the name *E. exigua* var. *acuta* is treated as heterotypic synonym of *E. exigua* s. str. *Euphorbia segetalis* belongs to *E. sect. Paralias* Dumort., Fl. Belg.: 87. 1827 ($\equiv$ *Tithymalus* subg. *Paralias* (Dumort.) Raf., Fl. Tellur. 4: 115. 1838 $\equiv$ *E. subg. Paralias* (Dumort.) Prokh. in Komarov, Fl. URSS 14: 308. 1949) and the type is *E. paralias*. The purpose of this paper is to contribute to the stability of the nomenclature by the lectotypification of these four names.

MATERIALS AND METHODS

This study follows the methods described in detail by Turland & Jarvis (1997). The present work is based on the examination of relevant literature and on the study of the specimens conserved in LINN, S-LINN, OXF, and UPS (UPS-BURSER) (herbarium codes according to Thiers 2024 [continuously updated]). For the selection of types, protologues have been compared with original material, and the most complete, informative specimens or illustrations were selected. The identity of the designated lectotypes was verified with the current use of their respective names.

RESULTS AND DISCUSSION

The case of *Euphorbia exigua*

Linnaeus (1753: 456) described *Euphorbia exigua* providing a short diagnosis “EUPHORBIA umbella trifida: dichotoma, involucellis lanceolatis, foliis linearibus” taken from Wiman (1752: pages 19–20 [species no. 29]), fol-

lowed by the polynomial “*Euphorbia inermis, foliis alternis linearibus acutis, umbella universali trifida, partialibus dichotomis diphyllis*” cited from Linnaeus (1738: 199; 1748: 143), Van Royen (1740: 197), Dalibard (1749: 156–157), and associated with the variety *acuta*, and followed by the synonyms “*Tithymalus* s.[ive] *Esula exigua*” cited from Bauhin (1623: 291) and “*Esula minima tragi*” cited from Dalechamps (1653: 520 [not 1656]).

The protologue also includes the variety *retusa* cited through the polynomial “*Tithymalus* s.[ive] *Esula exigua, foliis obtusis*” cited from Bauhin (1620: 133 [miscited as “132”]; 1623: 291) and indicated with “ β ”, and followed by the synonym “*Tithymalus exiguus saxatilis*” cited from Bauhin (1620: 133 [miscited as “132”]; 1623: 291) and Magnol (1676: 259, t. 258), and indicated with the symbol “ γ ” and followed by the reference “*Burs. XVI: 55*”. The β and γ indicates that the protologue includes two varieties, the variety β named *retusa*, and the unnamed γ . The protologue also includes information about the origin of the two varieties: “*Habitat in Lusatia, Gallia, Helvetia, Hispania inter segetes; β . Monspelii in saxosis. γ . Paduae & Masiliae*”.

Among the original elements, the references to Magnol (1676: t. 258) and Dalechamps (1653: 520) quoted by Linnaeus in the protologue provide illustrations “*Tithymalus exiguus saxatilis B prodr*” (Fig. 1) and “*Esula petite, de Tragus*” (Fig. 2), respectively, that can be considered original elements and therefore eligible as lectotype of the name *Euphorbia exigua*.

Sennikov & Geltman (2013: 178) typified the named variety beta *E. exigua* var. *retusa* L. from a specimen collected by Loeffling in Spain and preserved at LINN (*Löffling* 372, Herb. Linn. no. 630.29; image available at <https://linnean-online.org/6273/#?s=0&cv=0>), and proposed the conservation of *E. retusa* Forssk. (in Fl. Aegypt.-Arab.: 93. 1775) (type: Egypt, Cairo, 1762, Forsskål 1280, C barcode C10002246) against *E. retusa* (L.) Forssk. (in Fl. Aegypt.-Arab.: 93. 1775), the basionym of which is *E. exigua* var. *retusa*. This proposal was recommended (see Committee for Spermatophyta in Taxon 63: 1361. 2014; Wiersema & al. 2018+), however, the name *E. exigua* var. *retusa* may still be used at infraspecific rank if desired.

For the name *Euphorbia exigua* var. *acuta*, according to Jarvis (2007), as this varietal epithet is associated with the part of the protologue equivalent to *E. exigua* (rather than the named and unnamed varieties beta and gamma), it is synonymous with var. *exigua*, and homotypic with it. However, the polynomial mentioned by Linnaeus “*Euphorbia inermis, foliis alternis linearibus acutis, umbella universali trifida, partialibus dichotomis diphyllis*” is associated with



Fig. 1. Original element of *Euphorbia exigua* L., illustration “*Tithimalus exiguus saxatilis B prodr*” published by Magnol (1676: t. 258).

520 Liure XVI. de l'Histoire des Plantes,

Esula saunage, de Tragus.

Liu. I. c. 160.

Liu. I. c. 160.
L. 1. 1. 1.

tion de la *Benedicta*, & aux pillules purgatives : car elle purge autant que la *petite Esula*. Aucuns estiment que c'est l'*Alyon* de Dioscoride: les autres la prennent mal à propos pour le *Turbith noir*, qu'Aëturius a prins pour la *Pityusa*, comme nous avons dit. Toutefois ce n'est pas la *Pityusa*, combien qu'elle luy retire fort, à raison dequoy elle a esté nommée *Esula rare*. Tragus met trois autres especes d'*Esulas*: dont l'une est *saunage*, & croist parmy les bois sablonneux, faisant la tige haute quasi d'une coudée, avec des belles ombelles plus rouges que les autres. L'autre est douce & croist aux montagnes & vallées ombrageuses & humides du pais de Suisse : & a la tige, la fleur, les fueilles, la racine, & le suc blanc, comme lait, si semblables aux *Tichymales*, qu'il est mal-aisé de la bien discerner. Toutefois son lait & sa racine sont doux. Sa graine est ronde, jaune, ressemblant au millet : & a accoustumé de fortir de ses gouffes quand elle est meure. Le mesme Tragus met encor une autre especes de *petite Esula*, laquelle on treuve en Automne en certaines terres apres moissons. Cette plante a une paume de hauteur, & est branchuë ; & fait les fueilles fort menues, semblables à celles du *Thym*. Sa graine est encloëe en des gouffes miparties en trois. Au surplus Dioscoride dit, que la racine de la *Pityusa* prinse au poids de deux dragmes avec d'eau miellée purge par le bas. Quant à la graine il n'en faut prendre qu'une dragme ; & du suc une cueillerée. Il le faut incorporer en farine, & le reduire en pillules. Quant au suc, la vraye dose est de trois dragmes. Plin

Esula douce, de Tragus.

Liu. 24 c. 6.

Liu. 8.
des simpl.

en dit bien davantage : La decoction de sa racine, dit-il, prinse au poids d'une hemine purge par le bas les humeurs phlegmatiques, & les bilieuses. Autant en fait une cueillerée de sa graine appliquée en suppositoire. La decoction de ses fueilles cuites en vinaigre mondifie les eschaques de la teste. En y adjoustant de la decoction de Rue elle est singuliere aux mammelles, & pour appaiser les tranchées du ventre ; mesme contre les morsures des serpens, & à toutes apostumes qui commencent à venir. Aucuns, dit Galien, estiment que la *Pityusa* est une especes de *Tichymale*, pource

Esula petite, de Tragus.

Fig. 2. Original element of *Euphorbia exigua* L., illustration "Esula petite, de Tragus" published by Dalechamps (1653: 520).

the name *acuta* and with the reference of *Hortus Cliffortianus* (Linnaeus 1738: 199) cited in the protologue from Linnaeus. This reference is also associated with a specimen preserved in the Clifford Herbarium at BM (with barcode BM000628681). The Clifford Herbarium includes plants that were newly cultivated in Europe at the time of collection, as well as specimens from collectors around the world. Linnaeus worked at Clifford's estate near Haarlem between 1735 and 1737, and described the plants growing there and wrote the *Hortus Cliffortianus* (1738), a precursor of his *Species Plantarum* (1753). The specimen BM000628681 can be treated as original material used by Linnaeus to describe his *Euphorbia exigua* var. *acuta* (see also Radcliffe-Smith in Meikle 1985: 1443). The sheet at BM bears a complete and well-developed plant, and is annotated “*Tithymalus*. / ~~minor ex procumbens~~ / ~~H.L. foliis pini~~ / *exiguus, erectus* / *Euphorbia* / *exigua*” (Fig. 3). This specimen is designated as the lectotype of the name *Euphorbia exigua* var. *acuta* (see below).

Euphorbia exigua was lectotypified by Jafri & El-Gadi (1982: 39) with the specimen Herb. Linnaeus no. 630.27 (LINN), and this typification was subsequently accepted by Jarvis (2007) and Geltman (2020). The sheet at LINN bears a complete plant, with leaves and flowers, and is annotated “29 *exigua*” by Linnaeus at the base of the sheet. However, Linnaeus explicitly cited a specimen in the protologue, i.e., “Burs. XVI: 55”, which is currently preserved in Burser's herbarium (UPS no. V-174929 at UPS-BURSER) in volume XVI: 55 (see also Juel 1923: 99). This specimen is a syntype and, according to Art. 9.12 of the ICN, syntypes have precedence in lectotype designation over other original material (except isotypes) (see Turland & al. 2018). As it is the only syntype, it must inevitably be chosen as the lectotype for this name.

Therefore, according to Art. 9.12 of the ICN, Jafri & El-Gadi's type, cited by Jarvis (2007), must be replaced by the specimen in the Burser Herbarium, vol. XVI: 55. The sheet Herb. Burser XVI: 55 (UPS no. V-174929) bears two plants, with leaves and flowers, with a label annotated as “V / *Tithymalus exiguus saxatilis* Baúh. / Prope Monspelim in monte saxoso / unde Bauhino transmisi. / 55.” (Fig. 4).

Juel (1923) comments on some aspects related to the origin and identity of the specimen preserved in Burser's herbarium, as follows: “BAUH. Prod., 133, sagt von dieser Art nur: ‘circa Monspelim locis asperis provenit.’ LINNÉ führt in Sp. pl. I, 456, BAUH:S Art als *Euphorbia exigua* γ . an, und zitiert dann: ‘Burs. XVI. 55.’ Seine Angaben über die Fundorte seiner Var. β . und γ . sind verwechselt: ‘Paduas et Massiliae’ gehört zu β ., ‘Monspelim in saxosis’ zu γ ., wie es aus einem Vergleich mit BAUH. Prodr. hervorgeht.

BURS:S Exemplar besteht aus jungen Individuen einer *E. exigua* L. mit schmalen und spitzen Blättern”.

In conclusion, because Burser's material at UPS-BURSER (XVI: 55) (now UPS no. V-174929) has been cited in the protologue by Linnaeus, and both (protologue and specimen) are linked, it is syntype (according to the ICN Art. 9.6) and has precedence in lectotype designation over unmentioned specimens (e.g., Herb. Linnaeus no. 630.27 at LINN) and cited illustrations (e.g., “*Tithymalus exiguus saxatilis*” in Magnol 1676 and “*Esula minima tragi*” in Dalechamps 1653: 520) according to Art. 9.12 of the ICN. It is therefore the obligate lectotype and accordingly designated here as such.

Fortunately, this specimen clearly represents the traditional concept and current application of the name *Euphorbia exigua* s. str., showing relevant diagnostic characters of the species (e.g., stem leaves linear, ray and raylet leaves narrowly triangular, slightly enlarged at base) (see, e.g., Prokhanov 1949; Khan 1964; Benedí & al. 1997; Tison & al. 2014; Pignatti 1982). Moreover, the newly designated lectotype does not change the application of the Linnaean name *Euphorbia exigua* subsp. *exigua*.

***Euphorbia exigua* L., Sp. Pl.: 456. 1753 subsp. *exigua*.**
Type (lectotype designated here): Herb. Burser XVI: 55 (UPS no. V-174929 [digital image!]). Fig. 4.

Euphorbia exigua var. *acuta* L., Sp. Pl.: 456. 1753. Type (lectotype designated here): Herb. Clifford 199, *Tithymalus* 17 (BM, barcode BM000628681 [digital image!]). Fig. 3.

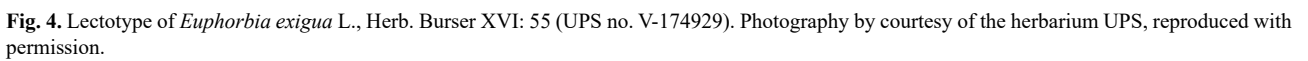
Euphorbia exigua var. *retusa* L., Sp. Pl.: 456. 1753. Lectotype (designated by Sennikov & Geltman in Taxon 62: 178. 2013): Spain, s.d., Löffling 372, Herb. Linn. no. 630.29 (LINN [digital image!]). Image of the lectotype available at <https://linnean-online.org/6273/#?s=0&cv=0>

The case of *Euphorbia paralias*

Jafri & El-Gadi (1982: 44) treat two specimens at LINN (Herb. Linn. nos. 630.44 and 630.45) as the type of *E. paralias*, but none of these specimens in this herbarium are Linnaean original material for this name (Jarvis 2007). Similarly, the specimen Herb. Linn. no. 199.15 (S-LINN) (image available at <https://linnaeus.nrm.se/botany/fbo/e/eupho/euphpar2.html.en>) indicated by Geltman (2015: 130; 2020: 65) as the “lectotype” is not original material (see Jarvis 2007). This herbarium sheet bears a poorly preserved specimen that is annotated at the base of the sheet as “37. *Paralias*”, and on the verso as “It. M. Káhl [= Iter Mårten Kähler] / a Linné P. / *Paralias*”. According to Jarvis (2007: 214-215, 600), this material was sent by Kähler and



Fig. 3. Lectotype of *Euphorbia exigua* var. *acuta* L., Herb. Clifford 199, *Tithymalus* 17 (BM, barcode BM000628681). Photography by courtesy of the herbarium BM, reproduced with permission.



did not reach Linnaeus until after 1753 (see Jarvis 2007: 214–215, 600). There are more than 50 herbarium sheets of mostly Mediterranean species in the Linnaean Herbarium that Linnaeus received from Mårten Kähler, many of which can be correlated with the manuscript list “*Italica Koehleri*” in LINN, thought to date from 1757. Among Kähler’s listed names can be found the name *E. paralias* (image available at <https://linnean-online.org/162314/#?#/1&s=0&cv=1&z=-0.0932%2C0%2C1.1865%2C1.6044>). Therefore, the “lectotype” designated by Geltman (2015: 130) (see also Geltman 2020: 65) is ineffective according to ICN Art. 9.3.

Linnaeus (1753: 458) described *E. paralias* providing the diagnosis “EUPHORBIA umbella subquinquefida: bifida, involucellis cordato-reniformibus, foliis sursum imbricatis”, cited from Wiman (1752: page 31 [species no. 53]), followed by three synonyms: (1) “*Euphorbia inermis*, foliis setaceo-linearibus confertis, umbella universali multifida, partialibus ramosae bifidis” cited from Linnaeus (1737: 200 [no. 22]), Van Royen (1740: 193); (2) “*Tithymalus maritimus*” from Bauhin (1623: 291) and Dodoëns (1616: 370, f. I. 2); and (3) “*Tithymalus paralios*” from Mattioli (1586: 962). The protologue includes as locality “*Habitat in Europae arena maritima*”. Mattioli (1586: 962) and Dodoëns (1616: 369, 370) provided illustrations that can be considered original material used by Linnaeus to describe *E. paralias* and are identifiable with the species.

According to Jarvis (2007: 513), there are three herbarium sheets with specimens that are part of the original material: a sheet is preserved in the Burser Herbarium at UPS (linked to the Bauhin synonyms) (see Savage 1937), another sheet is preserved at Clifford Herbarium at BM (linked to the synonyms taken from Linnaeus’s *Hortus Cliffortianus* published in 1737 on page 200), and finally there is a sheet preserved in the Linnaean herbarium at S-LINN.

The sheet Herb. Burser XVI(2): 39 (UPS no. V-174912) bears a specimen well-preserved, and a label annotated as “*Tithymalus maritimus* / *Monspeli* et *Liborni*”. The sheet Herb. Clifford: 200, *Euphorbia* 22 (now barcode BM000628687) bears a complete and well-preserved specimen annotated as “*Tithymalus* / *cyparissias*. / *paralias* / *Euphorbia* / *Cyparissias* / 23”, “25”, and “p. 200. *Euphorbia* 22” (see below).

Finally, the sheet S-LINN 199.13 bears a complete and well-developed plant and is annotated “*Euphorbia* / 37. *Paralias* / Sp. pl. 458”, and on the verso “Herb. Alstroemerii / *Euphorbia paralias* Linn / Dahl a Linné P.” (image available at <http://linnaeus.nrm.se/botany/fbo/e/eupho/euppar1.html.en>). Anders Dahl received specimens from both Linnaeus and his son, and also made his own collec-

tions in the Uppsala Botanic Garden. Many of these are now to be found in the Linnaean collection at S, annotated with a characteristic form on the verso of each sheet, and often with the words “Dahl a Linne P.”, added by him (Jarvis 2007: 200). Accordingly, S-LINN 199.13 can be considered an original material used by Linnaeus to describe his species, and therefore eligible as lectotype.

Although these three specimens (at BM, UPS and S-LINN 199.13) are undoubtedly original material of *E. paralias*, the specimen Herb. Clifford: 200, *Euphorbia* 22 (BM000628687) can be identified as belonging to *E. aleppica* L. A lectotypification of this name on the plant preserved of this sheet at BM would be nomenclaturally disruptive because this plant is inconsistent with the current usage of the name *Euphorbia paralias*.

In conclusion, among all the originals elements mentioned, specimens at UPS-BURSER, BM and S-LINN, and illustrations of Mattioli (1586: 962) and Dodoëns (1616: 369, 370), I designate the specimen at S-LINN as the lectotype of *E. paralias*. This specimen is a complete and informative element, and matches with the traditional concept and current use of the name, showing some diagnostic features (e.g., glabrous, glaucous, somewhat fleshy, leaves 3–30 × 2–15 mm, lowest ones obovate-oblong, middle ones elliptic-oblong and upper ones ovate; all entire, adaxially concave, imbricate; ray-leaves like the upper cauline, raylet-leaves suborbicular-rhombic to reniform, strongly adaxially concave, rays 3–6, glands emarginated) (e.g., Radcliffe-Smith & Tutin 1968; Radcliffe-Smith 1982; Benedí & al. 1997; Tison & al. 2014).

***Euphorbia paralias* L., Sp. Pl.: 458. 1753.** Type (lectotype designated here): Herb. Linn. no. 199.13 (S-LINN; code S 09-28595) (image of the lectotype available at <http://linnaeus.nrm.se/botany/fbo/e/eupho/euppar1.html.en>)

The case of *Euphorbia pinea*

In the protologue of *E. pinea*, Linnaeus (1767: 524) provided, with the number “64”, the phrase name “E. [Euphorbia] umbella quinquefida: dichotoma, involucel. [involucellis] cordatis, fol. [foliis] linearibus acuminates confertis, caps. laeviusculis”. This polynomial is quasi a verbatim copy of either Linnaeus polynomial of *E. segetalis* (1753: 458) cited from Wiman (1752: page 22 [species no. 34]) “EUPHORBIA umbella quinquefida: dichotoma, involucellis cordatis acutis, foliis lineari-lanceolatis, ramis floriferis”.

The name has been treated as *E. pinea* or *E. segetalis* var. *pinea* (L.) Lange (in Willk. & Lange, Prodr. Fl. His-

pan. 3: 499. 1877) (see Riina & al. 2013). However, there is no consensus on the taxonomic value of this taxon, and the name *E. pinea* is currently treated as a synonym of *E. segetalis* (Benedí & al. 1997). I was unable to locate any original material in the Linnaean or Linnaean-linked herbaria, and there appear to be no extant original elements (Jarvis 2007). Given the absence of original material its application is clearly uncertain (see Benedí 1997). It is recommended to be rejected as a nomen ambiguum.

***Euphorbia pinea* L., Syst. Nat., ed. 12, 2: 333. 1767, nomen ambiguum.**

The case of *Euphorbia segetalis*

Linnaeus (1753: 458) described *E. segetalis* providing the short diagnosis “EUPHORBIA umbella quinquefida: dichotoma, involucellis cordatis acutis, foliis linearilanceolatis, ramis floriferis”, cited from Wiman (1752: page 22 [species no. 34]), followed by five synonyms: (1) “*Euphorbia inermis*, foliis alternis linearibus acutis, partialibus umbellae ovato-rhombeis, petalis bicornibus” cited from Linnaeus (1748: 142), as “*Hort. ups.* 142.* [that * is important and something Linnaeus used to indicate that this publication has a detailed description for the species]; (2) “*Euphorbia inermis*, foliis linearibus acutis ad umbellam quinque isocelibus, ad umbellulas ter dichotomas ovato-trigonis” cited from Sauvages (1751: 46); (3) “*Tithymalus annuus*, lunato flore, linariae folio longiore” from Morison (1699: 339, sect. 10, t. 2, fig. 3); (4) “*Tithymalus maritime affinis*, linariae folio” from Bauhin (1623: 291); and finally the synonym (5) “*Tithymalus segetum longifolius*” from Ray (1724: 312). The protologue includes as locality “*Habitat in Mauritania*”. Morison (1699: sect. 10, t. 2, fig. 3) provided an illustration (Fig. 5) that can be considered original material used by Linnaeus to describe *E. segetalis* and is identifiable with the species.

In 1752 was published “Specimen academicum quo *Euphorbia* ejusque historia naturalis et medica praeside ... Carolo Linnaeo ... sistit Johannes Wiman”, a Dissertation of Johannes Wiman (published by Höjer in Upsala) that was cited extensively by Linnaeus under the *Euphorbia* species named in *Species Plantarum* (1753) (see Wiman 1752); the reference there uses the species number in the dissertation (e.g., in this case “Diss. euph. 34”) rather than the page number (Jarvis 2007: 90).

I have not been able to locate any original material in any Linnaean or Linnaean-linked herbaria (see Jarvis 2007). Therefore, the only extant original material eligible for typification of the name *E. segetalis* is the illustration of Morison (1699: sect. 10, t. 2, fig. 3). Linnaeus’s diagnosis

matches with the Morison illustration except for the inflorescences (“umbella quinquefida”) that is not highlighted in the figure. However, this general character is not considered diagnostic of the species as currently recognized. In conclusion, the illustration “*Tithymalus Linariae folio longiore*” published by Morison is designated as the lectotype for the name *Euphorbia segetalis* (see Fig. 5).

Fortunately, Morison’s illustration matches with the traditional concept and current use of the name, showing some diagnostic features (e.g., leaves linear to linear-lanceolate, entire, ray-leaves elliptic-oblong, raylet-leaves deltate-rhombic, obtuse; base cuneate to subcordate) (see e.g., Prokhanov 1949; Khan 1964; Radcliffe-Smith & Tutin 1968; Radcliffe-Smith 1982; Benedí & al. 1997; Tison & al. 2014).

After searching Robert Morison’s own material of *E. segetalis* in his herbarium (Morisonian Herbarium, in OXF), a relevant sheet has been found: Morison III. 339 no. 3. However, the Morison Herbarium was not used by Linnaeus, and so Morison’s specimens do not form original material (see Jarvis 2007), but are of interest because they served as voucher specimens for Morison’s illustrations. This sheet contains a specimen with leaves and inflorescences. On the sheet, the label on the bottom left is in the hand of Jacob Bobart the Younger (1641–1719), who was the editor of and primary contributor to volume 3 of Morison’s work. The label is annotated as “*Tithymalus annuus lunato flore / Linariaefolio longiore. 3 H. Oxfr. 339. / Tithymalus maritime affinis Linariae / folio. CBP. 291*” (Fig. 6). The annotations on the bottom in red and black ink are in the hand of George Claridge Druce (1850–1932), whilst ‘M.P.H. II, 339. no 3 HEFG’ is in the hand of Henry Edward Fowler Garnsey (1826–1903) (Stephen Harris, OXF, pers. comm.). The specimen is clearly identifiable as Linnaeus’s *E. segetalis* and matches with the current application of the name.

***Euphorbia segetalis* L., Sp. Pl.: 458. 1753. Type (lectotype designated here): [illustration] “*Tithymalus Linariae folio longiore*” in Morison, Pl. Hist. Univ.: sect. 10, t. 2, fig. 3. 1699. Fig. 5.**

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AUTHORSHIP CONTRIBUTION STATEMENT

P. Pablo FERRER-GALLEGO: Conceptualization, Data curation, Investigation, Writing—original draft, Writing—review & editing.

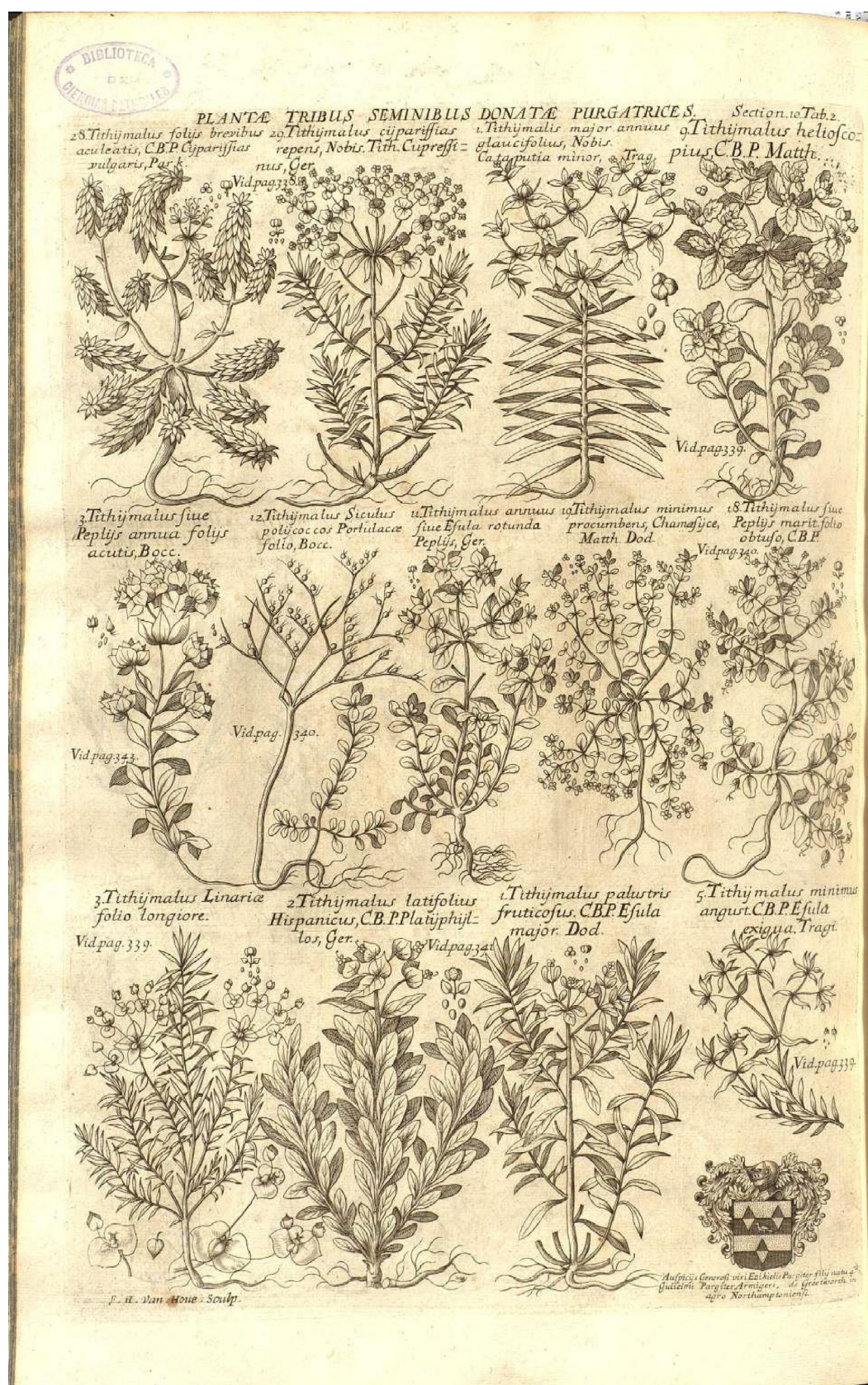


Fig. 5. Lectotype of *Euphorbia segetalis* L., illustration “*Tithymalus Linariae folio longiore*” published by Morison (1699: sect. 10, t. 2, fig. 3).



Fig. 6. Specimen of *Euphorbia segetalis* preserved at Morisian Herbarium, in OXF (Morison III. 339 no. 3), a voucher specimen for Morison's illustration "*Tithymalus Linariae folio longiore*" published by Morison (1699: sect. 10, t. 2, fig. 3).

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