ON THE NOMENCLATURAL TYPE OF *BROMUS INTERMEDIUS* SUBSP. *DIVARICATUS* (*POOIDEAE*, *POACEAE*)

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ABSTRACT: *Bromus intermedius subsp. divaricatus* (*Poaceae*), currently treated as *B. hordeaceus subsp. divaricatus* has been interpreted by several authors as a new taxon based on "two different validating descriptions". Consequently, two different proposals for nomenclatural typification have been published. When considered as a name validated by a description published by Lloyd in 1844, the lectotype was designated Romero Zarco in 2023 from a specimen housed at ANG. Alternatively, when treated as a new taxon based on a validating diagnosis published by Bonnier and Layers, the lectotype is a poorly rendered illustration included in *Tableaux Synoptiques* noted with the letter "D" and published by Bonnier & Layens in 1894, with an epitype designated as a specimen preserved at BM (barcode BM001067302), both typifications proposed by Llamas and Acedo in 2019. Which of these is effective and correct under the International Code of Nomenclature of algae, fungi, and plants? **Keywords**: *Bromus hordeaceus* subsp. *Divaricatus*; *Bromus lanceolatus*; *Gramineae*; lectotype; neotype; nomenclature; original material; syntype; typification.

RESUMEN: Sobre el tipo nomenclatural de *Bromus intermedius* subsp. *divaricatus* (*Pooideae*, *Poaceae*). *Bromus intermedius* subsp. *divaricatus* (*Poaceae*), actualmente tratado como *B. hordeaceus* subsp. *divaricatus*, ha sido interpretado por varios autores como un nuevo taxón basado en "dos descripciones válidas diferentes". En consecuencia, se han publicado dos propuestas distintas de tipificación. Cuando se considera como un nombre validado por una descripción publicada por Lloyd en 1844, el lectotipo fue designado por Romero Zarco en 2023 a partir de un espécimen conservado en el herbario ANG. Alternativamente, cuando se trata como un nuevo taxón basado en un diagnóstico válido publicado por Bonnier y Layens, el lectotipo es una ilustración de mala calidad incluida en los *Tableaux Synoptiques*, señalada con la letra "D" y publicada por Bonnier & Layens en 1894, con un epitipo designado como un espécimen conservado en el herbario BM (código de barras BM001067302), siendo ambas tipificaciones propuestas por Llamas y Acedo en 2019. ¿Cuál de estas es válida y correcta según el Código Internacional de Nomenclatura para algas, hongos y plantas? **Palabras clave**: *Bromus hordeaceus* subsp. *divaricatus*; *Bromus lanceolatus*; *Gramineae*; lectotipo; neotipo; nomenclatura; material original; sintipo; tipificación.

INTRODUCTION

The genus *Bromus* L. (*Pooideae*, *Poaceae*) comprises approximately 200 species distributed worldwide but mainly in temperate regions of the northern hemisphere. The taxonomy and nomenclature of this genus are complex and challenging (SORENG & al., 2022). The anual brome-grasses in general provide considerable problems with respect to the status and delimitation of the taxa (ACEDO & LLAMAS, 1997, 1999). *Bromus hordeaceus* L. s.l. is a highly variable species, characterized by significant morphological plasticity (AINOUCHE & al., 1999; SPALTON, 2001; BOMANOWSKA & al., 2013). It is an annual weed native to the Mediterranean Basin, now widely distributed across the globe (POWO, 2025). This high morphological variability has led to the recognition of eight subspecies (SCHOLZ, 2008).

Bromus hordeaceus subsp. *divaricatus* (Bonnier & Layens) Kerguélen is an annual plant distributed across the Azores, Canary Islands, Madeira, Cyprus, East Aegean Islands, France, Italy, Spain, Morocco, and Turkey (ACEDO & LLAMAS, 2021; POWO, 2025). From a nomenclatural standpoint, several authors (see e.g., LLAMAS & ACEDO, 2019; ROMERO ZARCO, 2023) have proposed two different lectotypifications. However, according to the International Code of Nomenclature for algae, fungi, and plants (TURLAND & al., 2025), a name can have only one effective lectotype.

The aim of this paper is to analyze the effective typification of the name *Bromus hordeaceus* subsp. *divaricatus* in accordance with the provisions of the International Code of Nomenclature of algae, fungi, and plants (*Madrid Code*, TURLAND & al., 2025).

MATERIAL AND METHODS

This contribution is based on the analysis of relevant literature (including protologues) and the examination of specimens housed at ANG and BM (herbarium codes according to THIERS, 2025). The nomenclatural articles cited throughout the text follow the Madrid Code (TURLAND & al., 2025; hereafter referred to as the *ICN*).

RESULTS AND DISCUSSION

The name *Bromus intermedius* subsp. *divaricatus* Bonnier & Layens, currently treated as *B. hordeaceus* subsp. *divaricatus* (Bonnier & Layens) Kerguélen, has been interpreted in two ways:

1) As a new taxon validly published by reference to a previously published description by LLOYD (1844: 315)

(see KERGUÉLEN, 1981; ROMERO ZARCO, 2023); or

2) As a new taxon accompanied by a brief description, a poorly executed illustration (see fig. 1), and the citation "*B. divaricatus* Lloyd" in the protologue published by BONNIER & LAYENS (1894: 369) (see LLAMAS & ACEDO, 2019, 2021).

KERGUÉLEN (1975: 104) stated that Lloyd's type material was housed at herbarium NTM and cited two localities "Pornic, Saint Brevin" mentioned by Lloyd. However, LLAMAS & ACEDO (2019) later reported that no original material is preserved at NTM. Consequently, these authors designated as the lectotype of the name the illustration included in the BONNIER & LAYENS's *Tableaux Synoptiques* (1894: 369) and noted with the letter "D" (fig. 1), due to the absence of original specimens studied by Bonnier and Layens (STAFLEU & COWAN, 1976, 1979). In addition, they selected as epitype a specimen consistent with the protologue and collected by Lloyd, preserved at BM, with barcode BM001067302 (Fig. 2).

In contrast, ROMERO ZARCO (2023) designated as a "new lectotype" a specimen preserved at ANG, arguing that it represents a syntype: "Consideramos conveniente proceder a reemplazar la lectotipificación anterior por otra basada en un buen ejemplar de la colección original de J. Lloyd. El artículo 9.12 del código vigente (TURLAND & al., 2025) establece la prioridad de un sintipo sobre cualquier ilustración. Entendemos que la mención de '*Bromus divaricatus* Lloyd.' [sic] que hacen Bonnier & Layens otorga la condición de sintipo al material utilizado por J. Lloyd en su descripción. Por tanto, la lectotipificación de Acedo & Llamas no se beneficia de la prioridad que se establece en el art. 9.19 y debe ser reemplazada" [trans.: "We consider it appropriate to replace the previous lectotypification with another based on a good specimen from J. Lloyd's original collection. Article 9.12 of the current Code (TURLAND & al., 2025) establishes the priority of a syntype over any illustration. We understand that the mention of '*Bromus divaricatus* Lloyd' by Bonnier & Layens grants syntype status to the material used by J. Lloyd in his description. Therefore, the lectotypification by Acedo & Llamas does not benefit from the priority established in Art. 9.19 and must be replaced].

However, upon examining Lloyd's protologue, it is evident that Art. 9.6 of the *ICN* does not apply, and neither Note 2 nor Note 3 of Art. 40 is satisfied. Consequently, the application of Art. 9.12, as cited by ROMERO ZARCO (2023), is not valid in this context. Lloyd's protologue only includes geographic provenance: "c. de Préfail, à Pornic; Saint-Michel, Saint-Brevin, Chamoulin, Mesquer. AC." Therefore, Art. 9.19*(c)* does not apply (see Art. 9 Note 10). In conclusion, if *Bromus intermedius* subsp. *divaricatus* was validly published by reference to Lloyd's earlier description (1844), then the effective lectotype is the illustration in BONNIER & LAYENS (1894) labeled "D" (fig. 1), and the epitype remains the BM specimen (barcode BM001067302, fig. 2).

ROMERO ZARCO (2023) also stated: "El basiónimo de este nombre [*B. hordeaceus* subsp. *divaricatus* (Bonnier & Layens) Kerguélen] fue atribuido por Bonnier & Layens a J. Lloyd y publicado inicialmente como subespecie de *B. intermedius* Guss." [trans.: "The basionym of this name was attributed by Bonnier & Layens to J. Lloyd and initially published as a subspecies of *B. intermedius* Guss."]. However, the name *B. divaricatus* Lloyd is an illegitimate later homonym of *B. divaricatus* Rohde ex Loisel. (*ICN* Art. 52.1) and therefore cannot serve as a basionym (*ICN* Art. 6.10). While Art. 41.4 would permit the name to be treated as a new combination or new rank if "*B. divaricatus* Lloyd" were legitimate, this condition is not met. Furthermore, under Art. 41.4, the name published by Bonnier & Layens cannot be interpreted as a new combination based on Lloyd 's name, as there is no indication that this was the authors' intent.

Accordingly, the original material for the name must be sought among the elements used by Bonnier & Layens, not those of Lloyd, contrary to what ROMERO ZARCO (2023) suggests. Nonetheless, *Bromus intermedius* subsp. *divaricatus* can be treated as a new taxon based on the brief diagnosis published by Bonnier & Layens in 1894: "*Bromus intermedius* subsp. *divaricatus* Lloyd ex Bonnier & Layens". In the key to the genus *Bromus*, they published the name "*B. divaricatus* Lloyd" as a subordinate taxon of *B. intermedius* Guss., accompanied by the diagnosis "(Parfois inflorescence compacte toujours dressée D et ligules à poils fins)" and an illustration labeled "D". This satisfies the requirements of Art. 38.1 of the ICN for valid publication. Additionally, on page VIII of the *Tableaux Synoptiques de la Flore de la France*, Bonnier & Layens clearly indicate that characters in parentheses refer to subspecies. Therefore, under Art. 24.4 of the *ICN*, it is evident that *Bromus intermedius* subsp. *divaricatus* was validly published as the name of a new subspecific taxon, and should be cited as *Bromus intermedius* subsp. *divaricatus* Lloyd ex Bonnier & Layens or just to *B. intermedius* subsp. *divaricatus* Bonnier & Layens.

In LLOYD (1844: 315), the name "*B. divaricatus*" is followed by the uncertain attribution "Rohde? DC. Fl. Fr. 5: 276?" and a full description. Lloyd noted: "Dans les échantillons que j'ai vus du *B. divaricatus* l'arête est insérée à 3–4 mil. du sommet; les épillets sont lancéolés et les pédoncules allongés. Celui-ci se rapproche du *B. squarrosus*, tandis que ma plante est si voisine du *B. mollis* qu'il est difficile de l'en distinguer avant la contorsion des arêtes. Pour cette raison, je proposerais, si c'est une espèce nouvelle, de l'appeler *B. molliformis*". Thus, "*B. molliformis* Lloyd" was not validly published as it was proposed as a provisional name. It was later validated as *Bromus molliformis* J. Lloyd ex Billot in Fl. Gall. & Germ. Exsicc. (Haguenau) 2: Cent. 14. 1854.

Meanwhile, *B. divaricatus* Rohde ex Loisel. had already been described by Loiseleur-Deslongchamps in 1809, based on material collected in southern France: "Elle habite dans les champs en Provence, où elle a été trouvée par M. Rohde; je l'ai reçue de Toulon, par M. G. Robert, et MM. Artaud et Requien me l'ont envoyée des environs d'Arles et d'Avignon. La variété β, que j'ai vue dans l'herbier de M. Desfontaines, a également été trouvée par M. Rohde à Hyères près de Toulon […]". LOISELEUR (1809) also cited Rohde's herbarium material with the name *Bromus divaricatus*. Here, we designate as the lectotype of *B. divaricatus* Rohde ex Loisel. the specimen collected by Rohde in 1808 and preserved at BM, with barcode BM001067299. Currently, *B. divaricatus* Rohde ex Loisel. is considered a heterotypic synonym of *B. lanceolatus* (ROMERO ZARCO, 2015; POWO, 2025).

CONCLUSIONS

There is no such name as "*Bromus divaricatus* J. Lloyd". Bonnier & Layens may have intended "*Bromus divaricatus* sensu J. Lloyd, non Rohde ex Loisel.", but as

the later name is not apparently mentioned by Bonnier & Layens we cannot be sure. There is scant but adequate descriptive material in Bonnier & Layens's account and as the name is at subspecific rank and possibly cited names are at species rank there is no legitimacy problem.

Bromus hordeaceus subsp. **divaricatus** (Lloyd ex Bonnier & Layens) Kerguélen, Bull. Soc. Échange Pl. Vasc. Eur. Occid. Bassin Médit. 18: 27. 1981

≡ *Bromus intermedius* subsp. *divaricatus* Lloyd ex Bonnier & Layens, Tabl. Syn. Pl. Vasc. France: 369. 1894 [basionym]

Lectotype (designated by Llamas & Acedo in Phytokeys 121: 62. 2019): Illustration "D" published by Bonnier & Layens in Tabl. Syn. Pl. Vasc. Fl. Fr. 369. 1894 (Fig. 1).

Epitype (designated by Llamas & Acedo in Phytokeys 121: 62. 2019): [France]: Pornichet, Loire Inférieure [Loire-Atlantique], sea shore, June 25 1856, *Lloyd s.n.*, BM barcode BM 001067302 (Fig. 2).

Bromus lanceolatus Roth, Catal. Bot. 1: 18. 1797

Lectotype (designated by Smith in Davis, Fl. Turkey 9: 286. 1985): "Habitat in Europa australi", s.d., *Kitaibel s.n*., B-W 2139-01-0. Isolectotype: B-W 2139-02-0 (image of the lectotype and isolectotype available at https://ww2.bgbm.org/Herbarium/specimen.cfm?Barcode=BW02139000)

= *B. divaricatus* Rohde ex Loisel., J. Bot. (Paris) 2: 214. 1809

Lectotype (**designated here**): [France] "Nizza et Toulous in graminosis et olivetis Etiam Monspelii lectus", 1808, *Rohde s.n*., BM barcode BM001067299 (Fig. 3).

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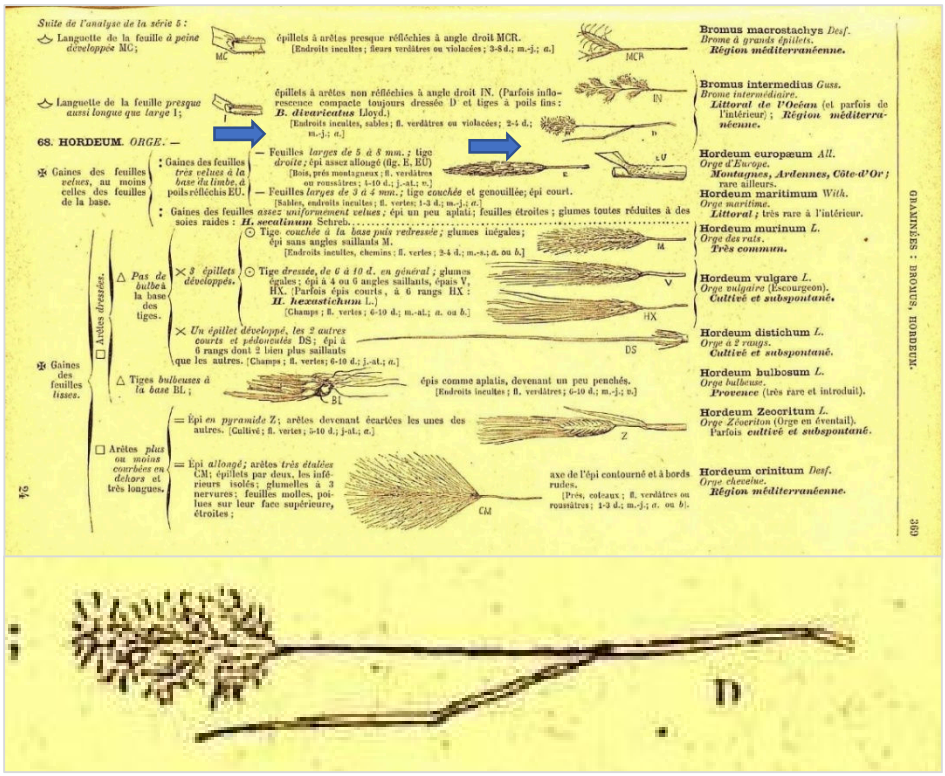

Fig. 1. Illustration "D" published in *Tableaux Synoptiques* by Bonnier & Layen (1894), designated as the lectotype of *Bromus intermedius* subsp. *divaricatus* Lloyd ex Bonnier & Layens [≡ *B. hordeaceus* subsp. *divaricatus* (Bonnier & Layens) Kerguélen] by Llamas & Acedo in 2019.

Fig. 2. Epitype of *Bromus intermedius* subsp. *divaricatus* Lloyd ex Bonnier & Layens (≡ *B. hordeaceus* subsp. *divaricatus* (Bonnier & Layens) Kerguélen), designated by Llamas & Acedo in 2019 (BM 001067302). © Herbarium BM, reproduced with permission.

Fig. 3. Lectotype of *Bromus divaricatus* Rohde ex Lois., designated in this paper, specimen collected by Rohde in 1808 (BM 001067299). © Herbarium BM, reproduced with permission.

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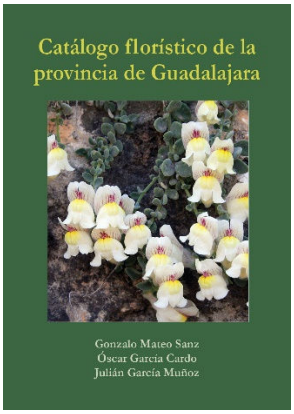

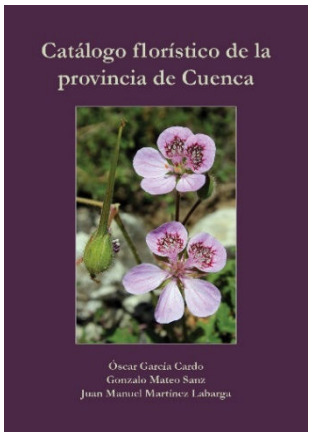

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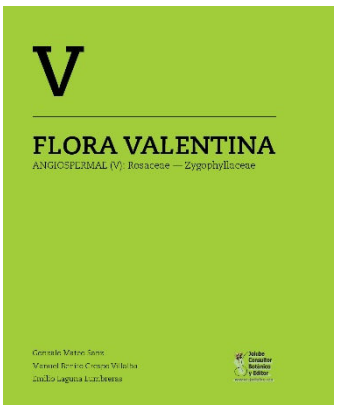

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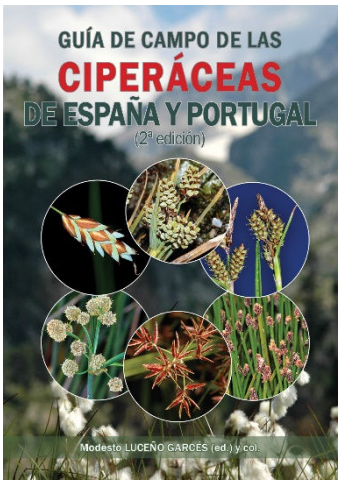

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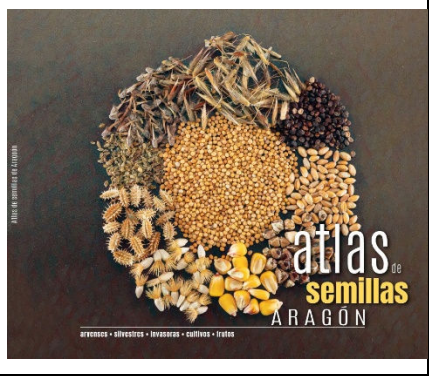

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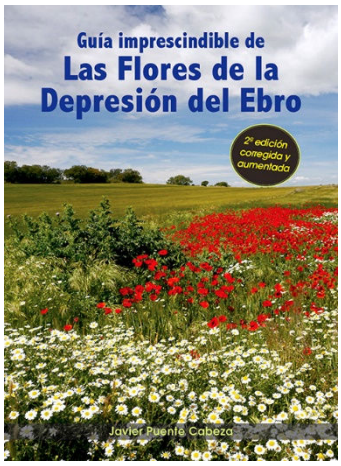

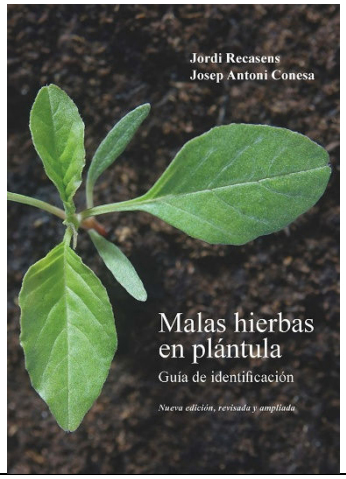

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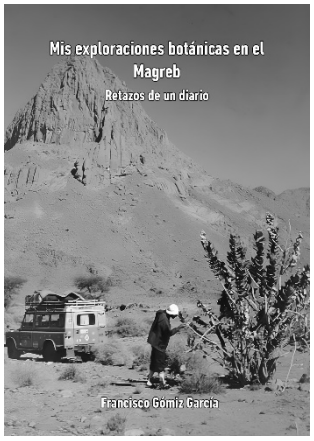

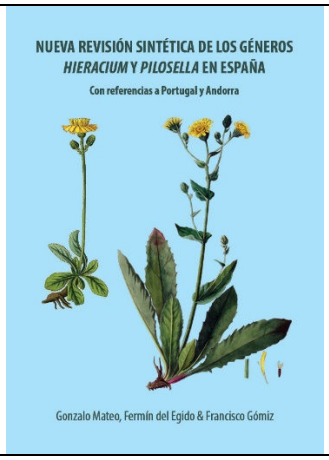

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