

What is *Bromus rubens* subsp. *kunkelii*?

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Abstract. *Bromus rubens* subsp. *kunkelii* (H. Scholz) H. Scholz is the accepted name of a possible taxon omitted in the treatment of the genus *Bromus* in *Flora iberica*. In this paper, the reasons for this omission are explained, and the taxonomic value of the taxon is discussed.

Keywords: Poaceae, *Bromus*, *Anisantha*, Iberian flora, Canary Islands, Morocco, Taxonomy, Nomenclature.

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Introduction

During tasks of ordering and determining herbarium material from the main collection of University of Seville (international acronym: SEV, Thiers, 2025), two folders appeared with abundant material of *Bromus rubens* L. identified by H. Scholz as *Anisantha rubens* (L.) Nevski. These plants were included in the final boxes, corresponding to the material not yet mounted. This lot caught my attention because a good part of it was identified as *B. rubens* subsp. *kunkelii* (H. Scholz) H. Scholz (taxon accepted in POWO, 2025) and each sheet contained a revision label handwritten by Dr. Scholz himself and dated 2004. This name is striking, as it does not appear in the chapter dedicated to the genus *Bromus* in *Flora iberica* (Acedo & Llamas, 2021), nor is it included in the index of volume 19(2) where this genus is described (Romero Zarco *et al.*, 2021). These specimens lacked the corresponding revision label for the *Flora iberica* project (2025), however, many of them had been collected in Andalusia (southern Spain). The rest came from Morocco (see Appendix 1). The plants were part of loan 55/03 sent to Berlin on 4-12-2003 and returned to Seville on 4-03-2013, after the death of Dr. Scholz in 2012 (SEV herbarium archive).

The herbarium material had not yet been computerized at the date of shipment. When it arrived in Seville it was computerized, including in the records both the prior determination and any subsequent revisions that had been made. This computerization took place throughout April 2014 (F. Salgueiro, curator, pers. comm.).

This work has two objectives: 1) to investigate the taxonomic status of *Anisantha rubens* subsp. *kunkelii* and 2) to find out the reason for the omission of that name in *Flora iberica* volume 19.

Materials and Methods

This contribution is the result of a morphological study of the specimens mentioned in the introduction

at SEV Herbarium laboratory. The studied material of the subsp. *kunkelii* is listed in the Appendix 1. The morphological characteristics investigated are primarily the same as those mentioned by H. Scholz in his works. Data on loan shipments of the genus *Bromus* were obtained from the archives of the same herbarium.

Results and Discussion

In the SEV herbarium, the greatest activity in the collection, preparation and inclusion of plants took place between the 1970s and 1990s, leading to an accumulation of work in the so-called “chain” of tasks: pressing, drying, poisoning (or freezing), labeling, numbering, mounting and inclusion, tasks to which the computerization of the specimens was later added. Under the direction of Prof. Salvador Talavera (Hinojos, Huelva, 1945–2021), this process was accelerated by delaying the assembly of the plants for better times. These plants were included unmounted in the final sheets but were arranged in separate boxes at the end of the corresponding genera, sometimes ordered and sometimes not so much (F.J. Salgueiro, pers. comm.). This decision facilitated the rapid loan of materials for study in the various centers participating in the *Flora iberica* project.

Thanks to the efforts of the technical staff and researchers associated with the herbarium and the aforementioned project, a large portion of the collections were reviewed or identified by experts. The participants were committed to reviewing at least the materials from the so-called “basic herbaria,” among which SEV stands out for its importance in understanding the flora of Andalusia and for the collections studied in several taxonomic monographs and floristic theses. However, some authors who participated in the project, sometimes due to the urgency of manuscript submission deadlines and other times to avoid the effort of reviewing many



Figure 1. Holotypus of *Bromus madritensis* subsp. *kunkelii* H. Scholz. Curators Herbarium B (2000+). Digital specimen images at the Herbarium Berlinense. [Dataset]. Version: 23 Feb 2025. Data Publisher: Botanic Garden and Botanical Museum Berlin. <http://ww2.bgbm.org/herbarium/> [<https://herbarium.bgbm.org/object/B100168317>, image ID: 233935.]

specimens, did not fully comply with this commitment, and some genera were totally or partially excluded from their review. In the case at hand, the reviewers had already consulted part of the material for a monograph (Acedo & Llamas, 1999), but among the

species studied from the SEV herbarium were neither *Bromus madritensis* nor *B. rubens* (loan 14/93, April 21, 1993, SEV archive). Later, for the preparation of the manuscript on the genus *Bromus* for Flora iberica, instead of requesting all the material or a selection



Figure 2. Herbarium specimen revised in 2004 by H. Scholz as *Anisantha rubens* subsp. *kunkelii* (H. Scholz) H. Scholz. Herbarium SEV bar-code 203618.

of species, they requested only a list of records for the genus *Bromus* (letter from Félix Llamas, March 4, 2014, SEV archive). The corresponding file was sent to him on March 7, 2014. This way of proceeding brought with it some deficiencies that were already criticized in a previous work (Romero Zarco, 2023). In F. Llamas' application, no names were mentioned

under *Anisantha*, as he was possibly unaware that Scholz had reviewed specimens accepting this generic name. The materials in question were studied within the framework of the Biogeo project, directed by Prof. B. Valdés (cf. Valdés, 2005) and developed between 2002 and 2005, although its results were only partially published due to lack of funding. Prof.

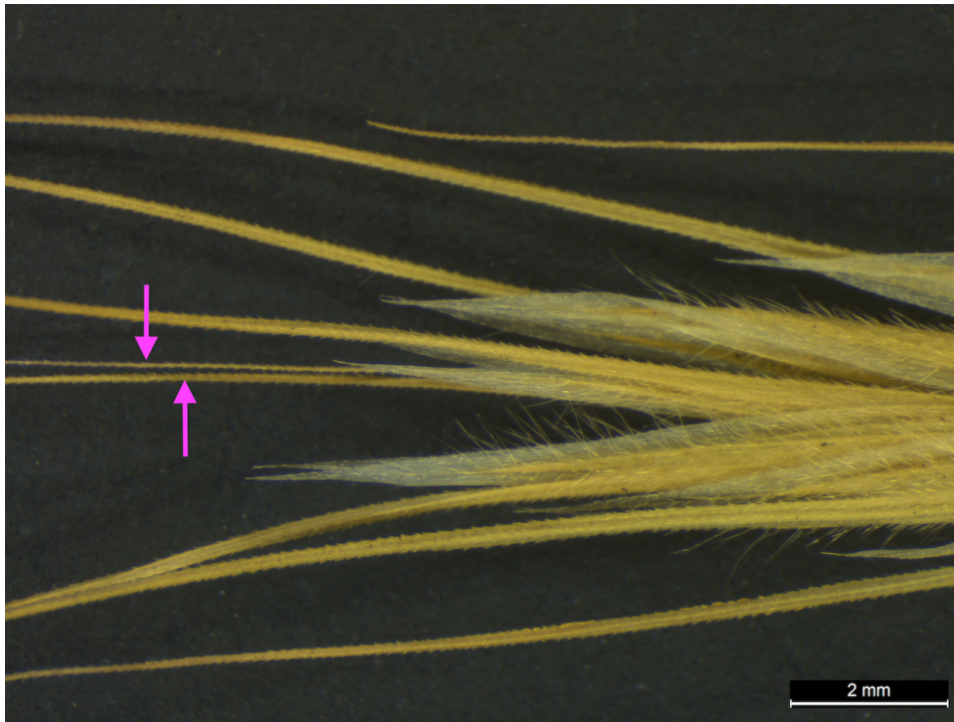


Figure 3. Apical part of a spikelet in *Bromus rubens* subsp. *kunkelii*. The arrows mark the position of the awns of two apical sterile florets.

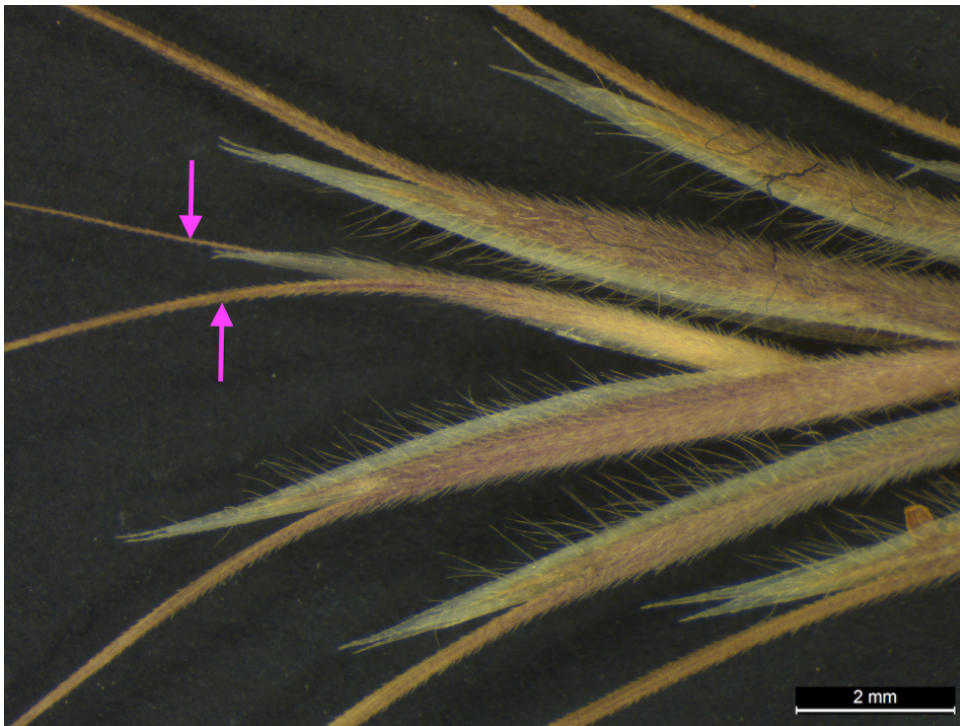


Figure 4. Apical part of a spikelet in *Bromus rubens* subsp. *rubens*. The arrows mark the position of the awns of two apical sterile florets.

Valdés commissioned Prof. Scholz to review several genera of grasses, including *Bromus* sensu lato, but the reviewed specimens remained in Prof. Scholz's laboratory for more than 9 years and were not accessible to other researchers until their return.

At the time the information required for the SEV material was sent to Prof. Llamas (University of León), the sheets studied by Prof. Scholz were already included in the herbarium and its database. However, for technical reasons, the sent list

showed only the name corresponding to the first determination at the beginning of each record, which coincided with the search term, which was none other than "Bromus" and subsequent determinations were not incorporated. At that time, the current version of the Herbar program (GBIF, 2025) had by default the option to list only the first determination (F.J. Salueiro, pers. comm.). This partly explains why these materials were not studied for *Flora iberica*.

To assess the taxonomic status of this forgotten subspecies, the morphological characteristics of the material of *Bromus rubens* sensu lato available at SEV (Spain and Morocco) have been analyzed, and the result is as follows.

Bromus rubens* subsp. *kunkelii (H. Scholz) H. Scholz in Willdenowia 25: 578 (1996)
 Basonym: *Bromus madritensis* subsp. *kunkelii* H. Scholz in Willdenowia 11: 251 (1981)
 ≡ *B. kunkelii* (H. Scholz) H. Scholz in Mitteilungsab. Botaniker-Tagung Wien 1984: 137 (1984)
 ≡ *Anisantha rubens* subsp. *kunkelii* (H. Scholz) H. Scholz in Willdenowia 36: 660 (2006)
 Holotype: Kanarische Inseln: Gran Canaria, Barranco al [sic] Vaca, 300 m, 22. 3. 1971, Kunkel 13896 (B): <https://herbarium.bgbm.org/object/B100168317>

The holotype (Figure 1) consists of three flowering stems with dense, greenish panicles. The SEV herbarium material studied includes well-developed specimens, such as two of the type specimens, along with others of limited development, both of the same greenish hue and with straight awns (Figure 2). Both the type and the majority of the SEV material were collected in late winter or spring, between February 27 and June 1, with a predominance of collections between March and April (see Appendix 1).

In the original description and in the dichotomous key of Scholz (1981), two differential characters of *Bromus madritensis* subsp. *kunkelii* are highlighted with respect to *B. rubens* and other related taxa. Regarding *B. madritensis* subsp. *madritensis*, Scholz highlights the higher density of the panicle in subsp. *kunkelii*, a character shared with *B. rubens*. With respect to the latter species, he points out the absence or smaller size of a tuft of sterile apical flowers, a characteristic that it would share with *B. madritensis* subsp. *madritensis*. Although subsp. *kunkelii* is more like *B. rubens*, he decided to subordinate it to *B. madritensis*, considering the latter trait more important. This decision was later changed by himself.

Comparing the details of the spikelets of the material identified by H. Scholz as *Anisantha rubens* subsp. *rubens* and *A. rubens* subsp. *kunkelii*, it can be seen that in the second case the spikelets are not mature and, as a consequence, the apical sterile lemmas have not yet elongated and do not stand out from the fertile flowers, which are still very close; the fertile lemmas remain green and straight and the caryopses are immature or have not yet begun to form (Figure 3). This difference is mainly due to a phenological state of immaturity, but it has also been observed that part of the material consists of stunted specimens that have possibly remained in that state due to a lack of resources. When *B. rubens* specimens reach their normal development and mature, the group of apical sterile lemmas clearly appears at the apex of the spikelet, the lemma of fertile flowers curves towards the back and darkens, and the awn also curves dorsally (Figure 4).

In my opinion, these plants do not deserve any taxonomic recognition and *Anisantha rubens* subsp. *kunkelii* should be added to the list of synonyms of *Bromus rubens* in the strict sense.

Acknowledgments

Dr. Francisco Javier Salgueiro, curator of the SEV herbarium, has contributed to the resolution of this mystery with his data and valuable experience.

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Appendix 1

SEV herbarium material revised by H. Scholz (2004) as *Anisantha rubens* subsp. *kunkelii*:

All localities from Morocco are grouped according to the official provinces established in 2015 (in bold); however, the original content of the labels has been respected.

Al Hoceïma Province. Al-Hoceïma, Baie de Al-Hoceïma, 12-IV-1988, A. Acchal & al., loc. 18/88 (SEV 203895). Entre Targuist et Bab-Tizichen, cultives, terrain acide, 18-V-1989, Z. Díaz & al., loc. 29 (SEV 203618). De Targuist à Al-Hoceïma: Marrabout Sidi Zemauri, 12-IV-1988, A. Acchal & al, loc. N°. 14/88

(SEV 203681). Region 15 [13] (Imzourene) 8 km S of Al Hoceima, on main road into Al Hoceima, 300 m, 27-II-1994, S.L. Jury 13544 & al. (SEV 203790). S of Al-Hocima, 45-50 km, hills, marls & limestones, 400 m.s.m., 1-VI-1993, M.A. Mateos & B. Valdés BV 877/93 (SEV 203839). **Guercif Province**. Region 16 (Kert Ganc) on main road to Guercif, 4 km SE of Saka, 690 m, 7-III-1994, T.M. Upson 14129 & al. (SEV 203897). **Larache Province**. Region 1 (Tanger), road to Mokrissèt from Pont du Loukkos, 660 m, 21-IV-1995, S.L. Yury 16569 & al. (SEV 203906). **Moulay Yacoub Province**. Entre Fès y Aïn-Kamsara, a 5 km de Aïn-Kansara, taludes margosos, 370 m.s.m., 8-IV-1984, J.M. Montserrat & B. Valdés 2656/94 (SEV 203862). **Nador Province**. Nador, de Monte-Arrui a Saka, Plaine de Gareb, 14-IV-1988, A. Acchal & al., loc. 25/88 (SEV 203680). Región 17 (Gareb), c. 14 km N of Melilla road to Cap des Trois Fourches, 20 m, 6-III-1994, T.M. Upson 14016 & al. (SEV 203895); ídem, 210

m (SEV 203781). **Taurirt Province**. Between Taurirt and El Aioun, near the crossing to Nador, 450 m, 28-V-1993, M. Etlafski & al. BV 81/93 (SEV 203700). SPAIN. Provinces in bold; label content original. **Almería**. Cruce a Urcal, límite provincial con Murcia, ramblas, 10-III-1988, Z. Díaz & al., loc. N°. 11/88 (SEV 203677); ídem, cultivos de almendros y ciruelos, 10-III-1988, loc. N°. 10/88 (SEV 203677). Entre Vélez Rubio y Puerto Lumbreras, cruce a Santa María de Nieva [Huércal-Overa], 9-III-1988, Z. Díaz & al., loc. N°. 6/88 (SEV 203675). **Cádiz**. Olvera, base de la Sierra de Lijar, 30STF 8989, 500 m.s.m., 19-IV-1983, A. Aparicio & S. Silvestre (SEV 203737). **Grenade**. Pantano de Cubillas [Albolote], V-1981, [without collector] (SEV 203793). **Huelva**. Los Marines, 8-VI-1984, García & al. (SEV 203879). Valdezufre, 27-IV-1984, García & al. (SEV 203893). **Málaga**. Cortes de la Frontera, Sierra de los Pinos, 700-1000 m.s.m., 29-V-1984, A. Aparicio & S. Silvestre (SEV 203806).