

A NEW SPECIES IN THE GENUS *BROMUS*

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The material here named *Bromus lusitanicus* Sales & P. M. Smith, *sp. nov.* (Gramineae) was discovered and collected during 1982–83 at Souzelas near Coimbra (central Portugal). It shows marked affinities to *B. racemosus* L. and *B. pseudosecalinus* P. M. Smith. These species form a complex of annuals which have 3-veined lower glumes, 5-veined upper glumes, subterete spikelets, margins of lemma more or less inrolled in fruit, and the awn terete, straight or curved, arising just below the apex of the lemma, although sometimes absent.

## INTRODUCTION

During the course of an investigation into the circumscription and evolutionary relationships of the small-lemma species of *Bromus* sect. *Bromus*, the results of which are being published separately, some new Portuguese collections came under investigation. These comprised, for the most part, mixtures of small-lemma, glabrous-spikelet variants of *Bromus hordeaceus* L. (Smith, 1968a) or were referable to *B. pseudosecalinus* P. M. Smith. However, in the material provisionally named as *B. pseudosecalinus* there were some specimens not easily referable either to it or to other brome-grass species of section *Bromus* which were the subject of a brief note (Paiva & Sales Machado, 1983), in which it was suggested that a new taxon might need to be recognized.

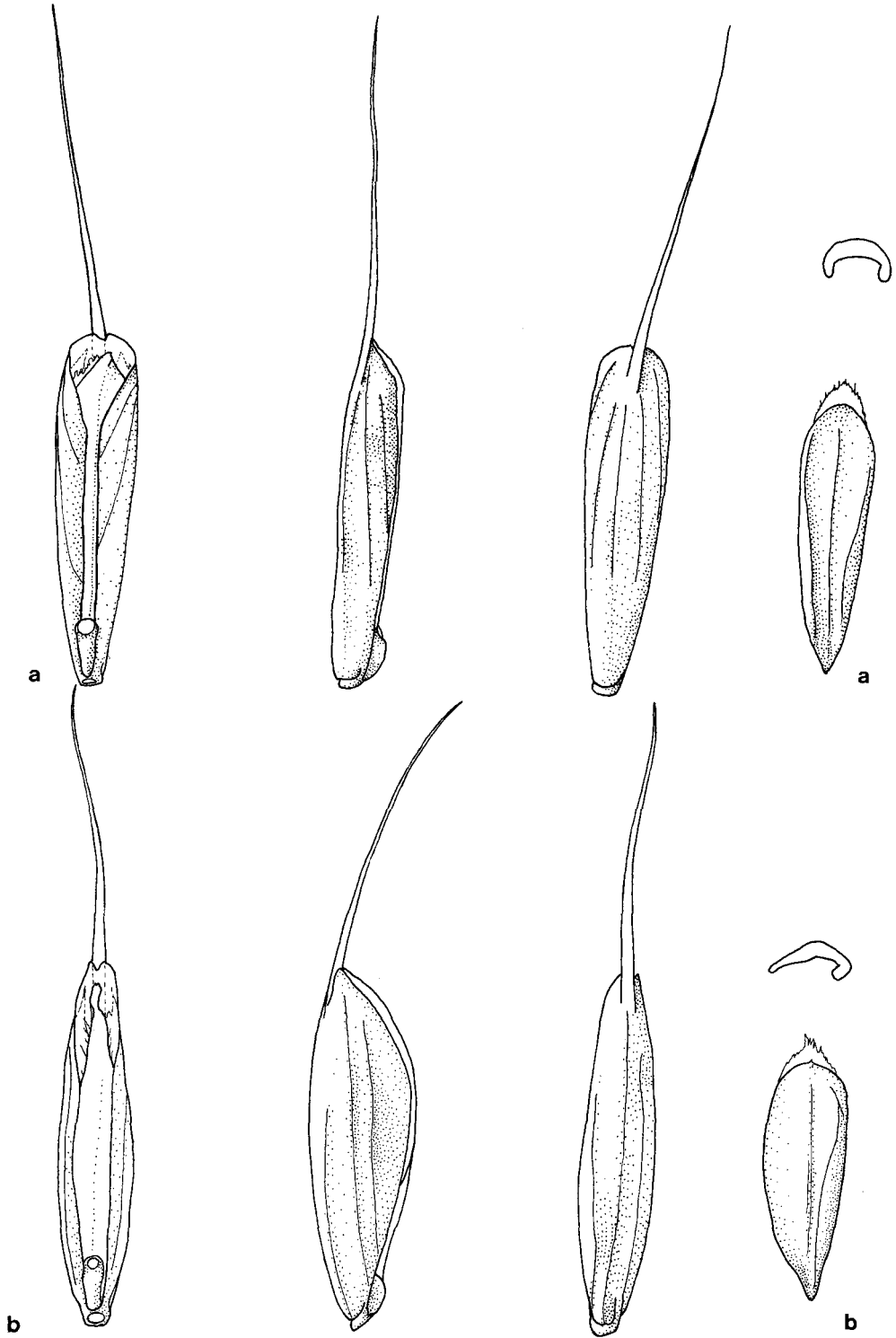
***Bromus lusitanicus* Sales & P. M. Smith, *sp. nov.***

Gramen annuum. Culmi erecti, 60–80cm alti, vaginis foliisque breviter pubescentibus. *Panicula* rigida, erecta, contracta, lanceolata, 50–130 × 5–20mm. *Rami* paniculae tenues, plerumque simplices, ascendentes, recti, 5–20mm longi. *Spiculae* teretes, lanceolato-attenuatae, puberulentes, 12–18 × 5.5–6.5mm. *Glumae* inaequales; inferior angusti-lanceolata, 4.5–5.5mm; superior ovato-lanceolata, 5.5–6.5mm. *Lemma* corneum, lanceolatum, 7–8mm, quam palea longius vel subaequale, obscure nervosum, apud maturitatem divaricatum, apice obtusum, marginibus angustis hyalinis prope apicem lemmatis obtuse angulosis, infra angulum marginalem involutum apprimè ad fructus maturitatem, primo in dorso leviter curvum postea rectum angulo parvo prope apicem evoluta. *Arista* recta, aliquando curva vel exiliter undulata, 7–9mm. *Palea* bicarinata, nervis viridius ciliatis. *Antherae* 1.5–2mm. *Caryopsis* tenuis, aliquantum involuta, 5.5–6mm. (Figs 1a & 2a).

A *B. racemoso* rachilla longiore, spicula majore lanceolato-attenuata, dorso lemmatis angulato differt; a *B. pseudosecalino* glumis, spiculis lemmatibus majoribus, apice lemmatis obtuso differt.

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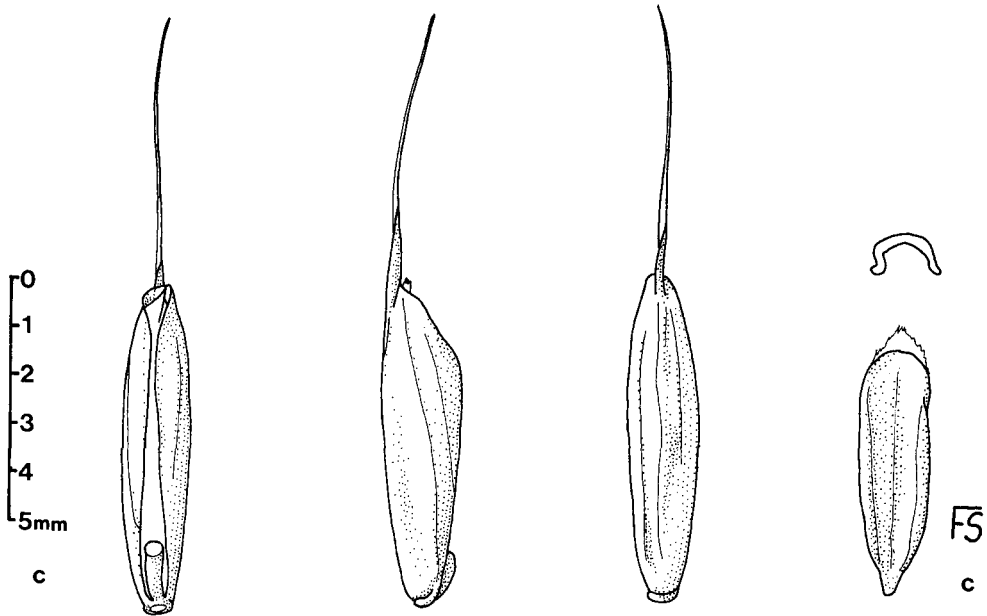


FIG. 1 (opposite and above). Ventral, lateral and dorsal views of the floret, and ventral views of the caryopsis of: a, *Bromus lusitanicus*; b, *B. racemosus*; c, *B. pseudosecalinus*.

Type: Portugal: Souzelas, nr Coimbra, growing in damp soil between a road and a stream, 70m, vi 1983, *F. Sales* s.n. (holo. E, iso. K).

*Bromus lusitanicus* clearly belongs to the group of species which includes *B. pseudosecalinus*, *B. racemosus*, and somewhat more distantly, *B. commutatus* Schrader and *B. secalinus*. Their lemmas and glumes have a horny texture and their veins, because they are recessed into the surrounding green tissue, are obscure. Even on drying they do not usually become obviously raised. The lemma and glume mesophyll layers of these species are relatively thicker than in some other species (e.g. the *B. hordeaceus* group, Smith, 1972) which are 'papery' in texture. Some species with the papery texture character have lemmas which can become almost translucent at maturity (e.g. *Bromus lepidus* Holmb.).

The group of closest affinity among those discussed here comprises *B. pseudosecalinus*, *B. lusitanicus* and *B. racemosus* (Figs 1 and 2). They are so closely similar in general morphology that it is hard to believe that there is not also a close evolutionary relationship. When young all three have a characteristic convexity or inflation of the upper part of the lemma which nevertheless imbricates closely with succeeding florets in the spikelet (Fig. 2). This form, which here is so regular that it seems, a little fancifully, to have been produced in the same mechanical press or stamping machine, does not occur in other species—except for immature forms of *B. secalinus*.

This related group of species can be keyed out as follows:

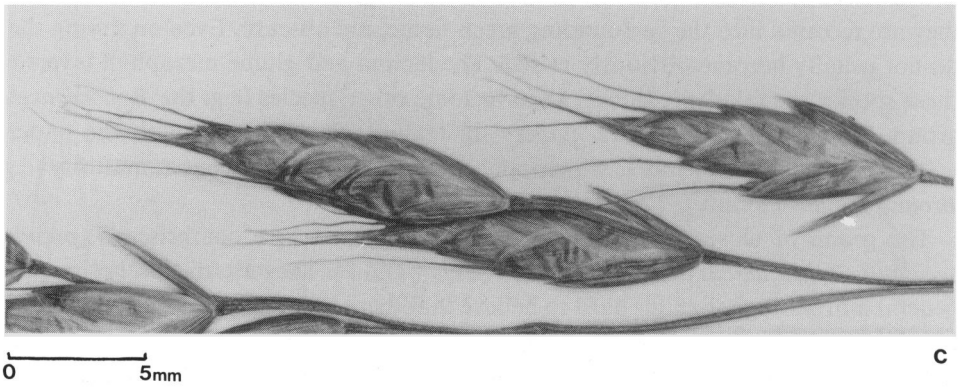
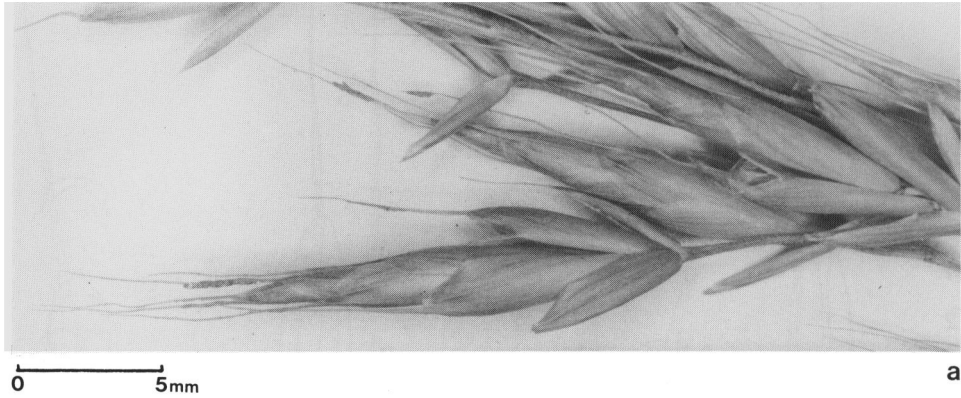


Fig. 2. Spikelet details of: A, *Bromus lusitanicus*; B, *B. racemosus*, C, *B. pseudosecalinus*.

1. Lemma 5.5–6.5mm; awn 2–6mm; lower glume 4.5mm, upper 5.5mm; palea equal to lemma — **B. pseudosecalinus** P. M. Smith
- + Lemma 6.5–8mm; awn 7–9mm; lower glume 5–6mm, upper 6–7mm; palea shorter than lemma, occasionally subequal \_\_\_\_\_ 2
2. Spikelet ovate, 10–15 × 3–5mm; rachilla 1mm; back of mature lemma round, tip acute; caryopsis shorter than palea \_\_\_\_\_ **B. racemosus** L.
- + Spikelet lanceolate-attenuate, 12–18 × 5–6.5mm; rachilla 1.5mm; back of mature lemma straight with an angle near the obtuse tip; caryopsis equalling palea \_\_\_\_\_ **B. lusitanicus** Sales & P. M. Smith

Three areas of relevance, the comparative ecology, geography and karyology of these three species, must await further field work. The ecology of *B. lusitanicus* cannot solely be judged on the basis of a few gatherings in one area though, if it proves to be exclusively a plant of wet places, this would mark it out from both its apparent nearest neighbours. *B. pseudosecalinus* is usually found in dry, ruderal or arable habitats, whereas *B. racemosus* is generally ruderal, though it sometimes occurs in water meadows. Further, the great difficulty of communicating the quite subtle characters of panicle and spikelet of these three species must mean that they are commonly overlooked by collectors. Perhaps their eyes are dulled by the abundance of *B. hordeaceus* populations! This difficulty is not unusual in this group and has already been discussed in relation to *B. racemosus* and *B. commutatus* (Smith, 1973). Because of this, reliable data on distribution of *B. pseudosecalinus*, *B. lusitanicus* and *B. racemosus* may be slow to accumulate. Since it was described (Smith, 1968b) *B. pseudosecalinus* has been collected more often, probably not because it is spreading, but because collectors are increasingly aware of its existence. It is now known by the present authors from Britain, Ireland (Smith, 1980), Israel and Portugal.

It is unfortunate that the well-formed caryopsides of *B. lusitanicus* were no longer viable by the time the species was formally named. Chromosome counts have therefore not been possible. The count of  $2n = 14$  recorded by Paiva & Sales Machado (1983) related to an element in the collection that was in fact *B. pseudosecalinus*.

The potential phylogenetic significance of *B. lusitanicus* is that it may be another candidate for the diploid parentage of the tetraploid *racemosus-commutatus-secalinus* group. *B. commutatus* is here recognized as a species, not as a subspecies of *B. racemosus* (see Ammann, 1981). Using serological studies of proteins, Smith (1968b, 1972) showed that *B. pseudosecalinus* was appreciably distinct from other species (including *B. arvensis*, one of its putative diploid parents). The serological properties of *B. lusitanicus* seed proteins are as yet undetermined.

Generally speaking, the lemma shape and spikelet-form characters of *Bromus* species are highly conservative and hence give reliable features for circumscription and identification. The latter character is related to the relative lengths of succeeding rachilla internodes, which seem unusual in *B. lusitanicus* but must await further gatherings to be properly evaluated.

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