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# A new species of *Stipa* sect. *Leiostipa (Poaceae)* from SW Spain

**Abstract**

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*Stipa serena,* a new species of *S.* sect. *Leiostipa* belonging to the *S. clausa* group, is described from the provinces of Badajoz and Ciudad Real in southwestern Spain. Its morphological and anatomical characteristics are compared with those of other members of the *S. clausa* group.

Additional key words: *Gramineae, Stipa clausa,* morphology, anatomy, taxonomy

## Introduction

*Stipa* sect. *Leiostipa* Dumort. is strongly represented in the western Mediterranean area (Trabut 1889; Maire 1953; Moraldo 1986; Scholz 1991, 1996, 1998; Vázquez & Devesa 1997, 2002; Vázquez & Ramos 2007) and almost half the species of *Stipa* L. in the southern Iberian Peninsula belong to this section (Amaral Franco & Rocha Alfonso 1998; Talavera 1987; Vázquez & al. 1996a-b, 1999). Among its representatives are a good number of narrowly distributed species that are restricted to specific habitats in arid regions. This is also true of taxa in the NW African-Iberian *S. clausa* group, *S. clausa* var. *matritensis* F. M. Vázquez & Devesa (1996b) and *S. cazorlensis* (F. M. Vázquez & Devesa) F. M. Vázquez, H. Scholz & Sonnentag (Vázquez & al. 1999).

In the course of our study of the floristic diversity of Extremadura, we discovered unusual plants of the *Stipa clausa* group. We compared them with respect to the relevant morphological and anatomical features with the known taxa of the *S. clausa* group, using herbarium material of members of the group from the southern Iberian Peninsula and Morocco preserved at BC, GDA, GDAC, HSS, MA, SEV and UNEX (herbarium abbreviations following Thiers 2008+).

The morphological and anatomical comparison revealed that the plants discovered differ sufficiently from the two known species of the *Stipa clausa* group to merit recognition as a separate species. This species is described in the present paper as new to science and delimited from the other two species of the group.

***Stipa serena*** F. M. Vázquez & Pérez-Chiscano, **sp. nov.**
Holotype: Spain, Extremadura, Badajoz, Quintana de la Serena, 30STH69, 22.5.2008, *J. L. Pérez-Chiscano & F. M. Vázquez* (HSS 38666; isotypes: B, HSS, MA, herb. Perey-Chiscano).

Species Hispaniae meridionalis incola similis *Stipa clausae* et *S. cazorlensis* differt a *S. clausa* callo breviore, (2.2–)2.5–3 mm (nec (3–)3.5–5 mm) longo, apice lemmatis scabrido (nec laevi) et lodiculis inaequalibus (nec

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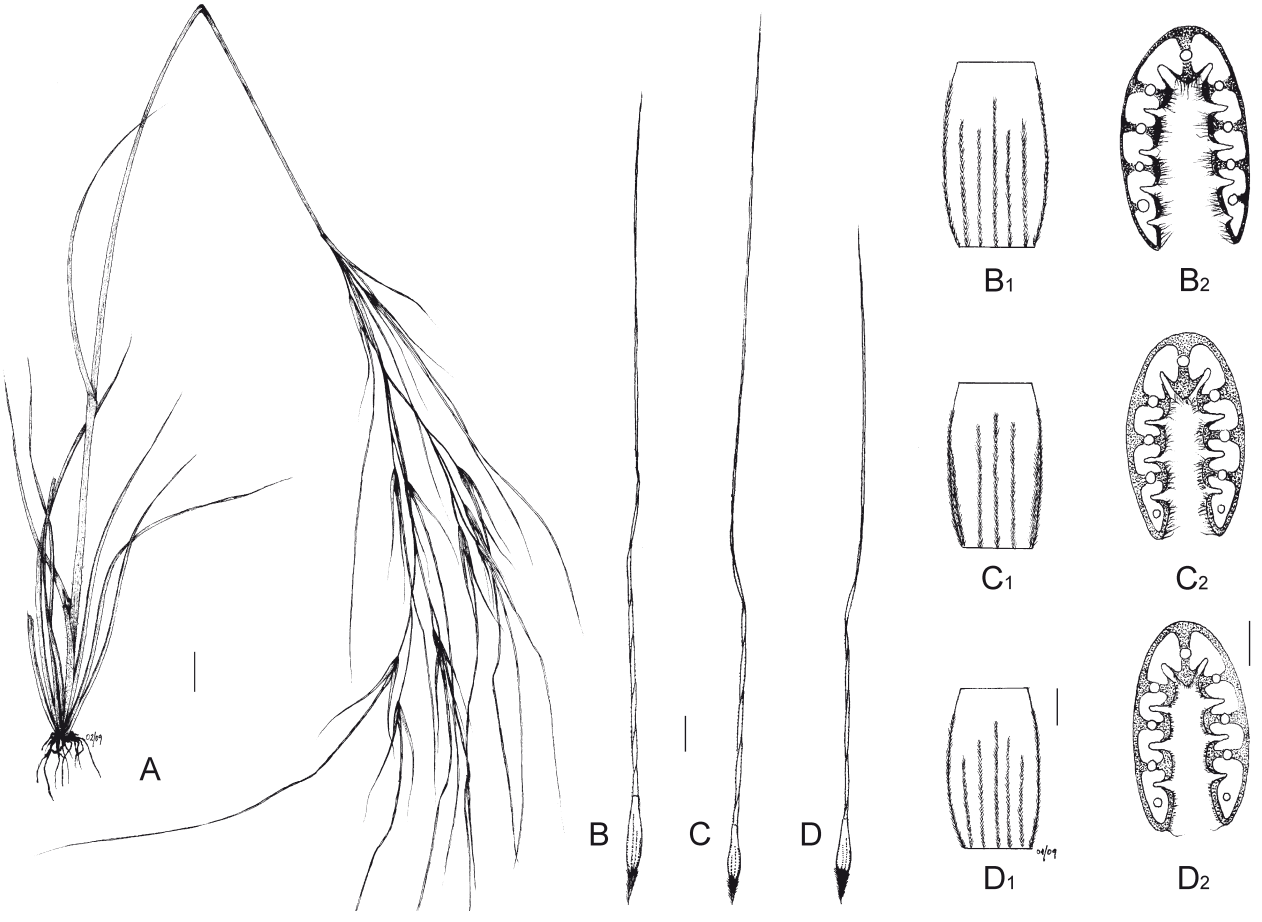



Fig. 1. A: *Stipa serena,* habit; B–D: awns, lemma hair distribution and blade section in the *S. clausa* group: B = *S. clausa,* C = *S. serena,* D = *S. cazorlensis*; $_1$ = lemma hair distribution, $_2$ = blade section. – Scale bars: A = 0.7 cm, B–D = 1 cm, $_1$ = 2 mm, $_2$ = 0.5 mm.

aequalibus); a *S. cazorlense* foliorum lamina adaxali pubescenti (nec scabrida), arista (25–)28–34(–36) mm (nec (1.7–)19–25(–28) mm) longa et lodiculis inaequalibus (nec aequalibus).

*Description. — Culms* up to 130 cm. *Leaves* with sheaths scabrid to pubescent, ligules of cauline leaves up to 2.2 mm, truncate, scabrid; blades convolute, 0.8–1.4 mm in diameter, adaxial surface pubescent of hairs to c. 1 mm long, abaxial surface glabrous or scabrid, blades of the cauline leaves up to 24 cm, those of the vegetative shoots up to 28 cm. *Panicle* up to 65 cm, lax. *Glumes* subequal, linear, mostly green, usually five-veined, midvein setulose; lower glumes (50–)53–65(67) mm, upper glumes (52–)55–67(–70) mm. *Anthecia* 15–17 mm; calluses (2.2–) 2.5–3 mm acute; lemmas (12.5–)13–14 mm, with five lines of hairs up to 3 mm (two lines condensed); awn (25–)28–34(–36) cm, bigeniculate, scabrid;

Table 1. Main morphological and anatomical differences between *Stipa cazorlensis, S. clausa* and *S. serena*.

| **Characters** | ***S. clausa*** | ***S. serena*** | ***S. cazorlensis*** |
|---|---|---|---|
| Awn length [cm] | (22–)24–30(–35) | (25–)28–34(–36) | (17–)19–25(–28) |
| Lemma length [mm] | 12–15(–16) | (12.5–)13–14 | 11–13(–14) |
| Callus length [mm] | (3–)3.5–5 | (2.2–)2.5–3 | (2–)3–4(–5) |
| Lemma pubescence (Fig. $1B_1$–$D_1$) | 7 lines (independent) | 5 lines (two condensed) | 7 lines (independent) |
| Lemma apex | scabrid | glabrous | glabrous |
| Anterior lodicules | equal | unequal | equal |
| Anther apex | glabrous to pilose | glabrous | glabrous to pilose |
| Silica and suber cells of the lemma (Fig. 2) | unequal | subequal | unequal |
| Length of hairs on adaxial leaf surface | up to 3.5 mm | up to 1 mm | up to 0.6 mm |
| Length of hairs on adaxial leaf margin | as on the surface | as on the surface | longer than on the surface |
| Sheath indumentum in lower leaves | glabrous to scabrid | scabrid to pubescent | glabrous |

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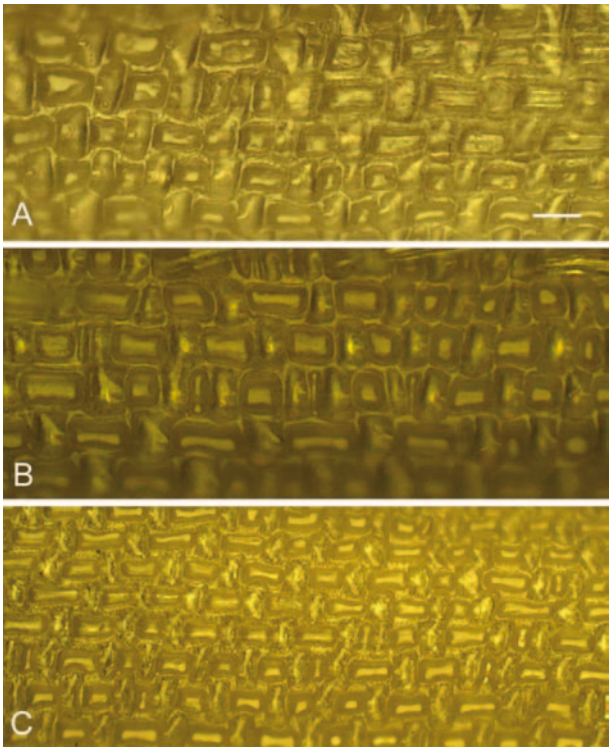



Fig. 2. Lemma surfaces of taxa in the *Stipa clausa* group – A: *S. serena* (HSS 38643); B: *S. clausa* (HSS 949); C: *S. cazorlensis* (HSS 7595). – Scale bar: 1 µm.

column twisted; paleas 12–14 mm, with a fine pubescent line; lodicules three, the two anterior unequal; anthers 7–8.5 mm, yellow, without hairs; ovary with three styles and stigmas. Probably cleistogamous.

Flowering April to June.

*Etymology.* — The epithet refers to Quintana de la Serena, the provenance of the type collection.

*Distribution and habitats.* — The species is so far known from the provinces of Badajoz and Ciudad Real in southern Spain. It was found growing at altitudes of 300–700 m with a mean annual precipitation of less than 500 mm and high annual thermal contrast (min. of −4 °C, max. of 45 °C), in open areas of grassland on sandy, acid soil dominated by spring ephemerals, such as *Medicago* spp., *Trifolium* spp., *Vulpia* spp., *Bromus* spp. and *Anthemis* spp. The populations met each counted 12–45 individuals and occupied c. 300–750 $m^2$.

*Further specimen seen.* — Spain: Badajoz: Campanario, 22.5.2008, *J. L. Pérez-Chiscano & F. M. Vázquez* (HSS 38644; 38643*). – Ciudad Real: Cabañeros [39° 27'58"N, 4°50'25"E], 5.6.1990, *J. Á. Devesa & R. Tormo* (UNEX 14419)

*Delimitation*. — Besides *Stipa serena* also *S. clausa* and *S. cazorlensis* occur in the Extremadura. *S. clausa* has leaf blades that are pubescent of up to c. 3.5 mm long hairs on the adaxial surface, calluses (3–)3.5–5 mm long, and awns (22–)24–30(–35) cm long. *S. cazorlensis* has leaf blades that are scabrous on the upper surface and with longer hairs on the margins, calluses (2–)3–4(–5) mm long, and awns (17–)19–25(–28) cm long. In the latter two species, the lemmas have seven lines of hairs and the anterior lodicules are equal. *S. serena* has leaf blades that are pubescent of up to c. 1 mm long hairs on the upper surface, calluses (2.2–)2.5–3 mm long, and awns (25–)28–34(–36) cm long. It differs from both *S. clausa* and *S. cazorlensis* in having lemmas with only five lines of hairs and unequal anterior lodicules. Close examination reveals that the marginal two of the five lines represent two fused lines each (Fig. $1C_1$).

The morphological and anatomical differences between the three taxa are summarized in Table 1.

**Key to the species of the *Stipa clausa* group in the Iberian Peninsula and N Africa**

1. Lemma with 5 lines of hairs; anthers with glabrous apex; anterior lodicules unequal; sheaths of the lower leaves scabrid to pubescent . . . . . *S. serena*
– Lemma, with 7 lines of hairs; anthers with glabrous or pilose apex; anterior lodicules equal; sheaths of the lower leaves glabrous or scabrid . . . . . 2
2. Awns (17–)19–25(–28) cm long; lemmas 11–13 (–14) mm long; sheaths of the lower leaves glabrous . . . . . *S. cazorlensis*
– Awns (22–)24–30(–35) cm long; lemmas 12–15 (–16) mm long; sheaths of the lower leaves glabrous or scabrid . . . . . *S. clausa*

**Other material studied** (* = specimen used for anatomical studies)

*Stipa cazorlensis.* — Morocco: Sok-et-Tnin, Beni Hadifa, 26.5.1927, *P. Font Quer* (BC 67643).
Spain: Almería, Sierra de María, 18.9.2001, *S. Jacobs, P. Peñailillo & al.* (HSS 7595*); Granada, Sierra de Baza, cerca de Narváez, 7.7.1984, *J. Torres, G. Blanca & C. Morales* (GDAC 26160); Pantano de Cubillana, 31.5.1987, *C. Morales* (GDAC 27811); Parque Natural Sierra del Castril, 15.7.1992, *C. Morales & C. Passera* (GDAC 37578); Puebla de Don Fadrique, 5.7.1979, *P. F. Cannon & al.* (SEV 53236); Sierra de Parapanda, 16.9.1985, *Aroza & Socorro* (GDA 19805); Jaén, Los Arenales, Cazorla, 19.7.1979, *J. L. González & al.* (MA 480635); Cambil, 28.4.1990, *F. M. Vázquez* (UNEX14864* holotype).

*Stipa clausa.* — Spain: Ávila, Barco de Ávila, 27.5.1990, *F. M. Vázquez* (UNEX 14407); San Lorenzo, 27.5.1990, *F. M. Vázquez* (HSS 948*); Cáceres, La Garganta, 6.7.2006, *S. Ramos & F. M. Vázquez* (HSS 26758*); Madrid, Aranjuez, 9.6.1991, *F. M. Vázquez* (UNEX 14421); Casa de Campo, without date, *M. Lagasca* (MA 185145 lectotype); Rascafría, 16.6.1990, *S. García & F. M. Vázquez* (HSS 949*); Palencia, Quintanar del Puerto, 9.7.1990, *F. M. Vázquez* (UNEX 14420); Segovia, Coca, 23.5.2006,

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