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Venhuis, C.; Oostermeijer, J.G.B.

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Distinguishing colour variants of *Serapias perez-chiscanoi* (Orchidaceae) from related taxa on the Iberian Peninsula

by

Caspar Venhuis [1] & J. Gerard B. Oostermeijer [2]

[1] Derde Goudsbloemdwarsstraat 21, 1015 KA Amsterdam, The Netherlands. casvenhuis@gmail.com
[2] Institute for Biodiversity and Ecosystem Dynamics (IBED), Universiteit van Amsterdam, Science Park 904, 1098 XH Amsterdam, The Netherlands. j.g.b.oostermeijer@uva.nl

Abstract

Venhuis, C. & Oostermeijer, J.G.B. 2011. Distinguishing colour variants of Serapias perez-chiscanoi (Orchidaceae) from related taxa on the Iberian Peninsula. *Anales Jard. Bot. Madrid* 68(1): 49-59.

Serapias perez-chiscanoi has a stable and uniform appearance with green flowers. Throughout its distribution area, however, plants have been found with deviant pink to red flowers that show similarities with other taxa that are occasionally pale flowered. *S. perez-chiscanoi* is easy to differentiate from *S. cordigera* subsp. *cordigera* by the colour of the flowers (*S. cordigera* subsp. *cordigera* has red to purple flowers) and the fact that the hypochile dimensions of *S. perez-chiscanoi* are significantly smaller. It is, however, more difficult to distinguish it from individuals of *S. cordigera* subsp. *gentilii* with pale flowers, which occur frequently. The two taxa differ in colour pattern and floral dimensions, especially the hypochile length, which is shorter in *S. perez-chiscanoi*. Pale-flowered individuals of another species, *S. parviflora*, are easily distinguished by their significantly smaller flowers. *S. perez-chiscanoi* occurs in Spain in the autonomous regions of Extremadura and Castilla-La Mancha and in Portugal, *S. cordigera* subsp. *gentilii* seems to occur along the coastal regions of SW Portugal, while *S. cordigera* subsp. *cordigera* and *S. parviflora* are distributed throughout the Iberian Peninsula.

Keywords: Orchidaceae, *Serapias perez-chiscanoi*, *Serapias cordigera* subsp. *gentilii*, flower colour, floral dimensions, Spain, Portugal.

Resumen

Venhuis, C. & Oostermeijer, J.G.B. 2011. Distinción de variantes en color de Serapias perez-chiscanoi (Orchidaceae) en relación con táxones de la Península Ibérica. *Anales Jard. Bot. Madrid* 68(1): 49-59 (en inglés).

La *Serapias perez-chiscanoi* tiene una apariencia estable y uniforme con flores verdes. Sin embargo, a lo largo de su área de distribución, se han encontrado ejemplares de flores con coloraciones desviantes de color rosa hasta rojo que muestran similitudes con otros táxones que presentan ocasionalmente flores pálidas. *Serapias perez-chiscanoi* es fácil de diferenciar con respecto a *S. cordigera* subsp. *cordigera* por el color de las flores (*S. cordigera* subsp. *cordigera* tiene flores de rojizas hasta púrpura) y por las dimensiones significativamente más pequeñas del hipoquilo de *S. perez-chiscanoi*. Sin embargo es más difícil hacer una distinción con respecto a *S. cordigera* subsp. *gentilii*, ya que los individuos de este taxon presentan flores pálidas, lo que ocurre con frecuencia. Estos dos táxones se diferencian por el patrón de colores y por las pequeñas dimensiones de las piezas florales, especialmente el tamaño del hipoquilo más corto en *S. perez-chiscanoi*. Los individuos de flores pálidas de *S. parviflora* se pueden distinguir fácilmente gracias a sus flores de pequeño tamaño. *Serapias perez-chiscanoi* se localiza en España en las comunidades autónomas de Extremadura y Castilla-La Mancha y en Portugal, *S. cordigera* subsp. *gentilii* se puede encontrar en las zonas costeras del suroeste de Portugal, mientras que *S. cordigera* subsp. *cordigera* y *S. parviflora* se encuentran en la mayor parte de la Península Ibérica.

Palabras clave: Orchidaceae, *Serapias perez-chiscanoi*, *Serapias cordigera* subsp. *gentilii*, color de las flores, dimensiones de las flores, España, Portugal.

Introduction

In 1976 Jose Luis Pérez Chiscano discovered deviant *Serapias* plants along the Guadiana river basin in Extremadura (Spain). After a twelve-year study, Pérez Chiscano (1988) described these plants as a new species, *Serapias viridis* Pérez Chiscano. Acedo (1990), however, found that the same name had been used for a Brazilian species by Vellozo (1825). To avoid confusion, the Spanish species was renamed *S. perez-chiscanoi* C. Acedo. Pérez Chiscano & al. (1991) reported that only some eight populations of this species were known, all located in the Guadiana river basin in Extremadura. However, due to an increased interest in this species, many new populations were found in Extremadura during the past ten years (Venhuis & al., 2006). Furthermore, the species was also found in Castilla-La Mancha (Venhuis & al., 2006), and also in Portugal (Jansen, 1993). Observations on these recently found populations have increased our knowledge of the species. One new aspect is that plants with deviant reddish flower colours were found among the "normal" *S. perez-chiscanoi* individuals that have pale green flowers, or pale green flowers with a red venation. In this article, we describe the variation in flower colour in *S. perez-chiscanoi* and the differences and similarities in morphology and geographic distribution with other *Serapias* taxa.

Material and methods

In 2004 and 2010, we obtained morphological data for populations of *Serapias cordigera* subsp. *cordigera* L., *S. cordigera* subsp. *gentilii* C. Venhuis, P. Venhuis & Kreutz, *S. perez-chiscanoi* and *S. parviflora* Parl. in Spain and Portugal. For both subspecies of *S. cordigera*, we measured 25 plants, from one population of subsp. *cordigera* in Extremadura, and likewise for subsp. *gentilii* in the Algarve. With *S. perez-chiscanoi* we measured 75 plants from three populations in Extremadura (Spain), and 5 plants from a population in mid-western Portugal. For *S. parviflora*, 50 plants were measured from two populations (Algarve and Extremadura) (Table 1). The latter data is not included as this species is morphologically readily distinctive from the other taxa. According to the analyses by Venhuis & al (2007), the dimensions of the epichile and hypochile are the most distinctive characters, and so in each population we measured the width and length of both the epichile and hypochile (Fig. 1).

Table 1. Sampled populations of the studied *Serapias* taxa.

Species	Location	Region	Country
S. cordigera subsp. *cordigera*	Badajoz	Extremadura	Spain
S. cordigera subsp. *gentilii*	Cotifo	Algarve	Portugal
S. perez-chiscanoi	Badajoz	Extremadura	Spain
S. perez-chiscanoi	Aljucén	Extremadura	Spain
S. perez-chiscanoi	Trujillanos	Extremadura	Spain
S. perez-chiscanoi	Ereiras	Beira Litoral	Portugal

Results and discussion

Variation in flower colour

Serapias perez-chiscanoi in Extremadura has a fairly uniform morphology and flower colour. The plants can be divided into two extremes, which present "green" or "red veined" variants. In the green variation (Fig. 2a, b), the leaves, stem, bracts, ovary, gynostegium, lamellae, flowers and veins are all pale green, with whitish hairs on the labellum. The lateral lobes of the flowers are yellowish and greenish. The "red veined" variation (Fig. 2c, d) is also greenish but with a red venation on the leaves, stem, bracts and ovary. It also has red veins and reddish hairs on the labellum and pinkish to reddish lateral lobes and lamellae. Intermediate colour variations occur very frequently (Venhuis & al., 2004).

In Portugal, most of the known populations mainly comprise the "red veined" variation. A population of about 80 flowering plants in C Portugal contained in-

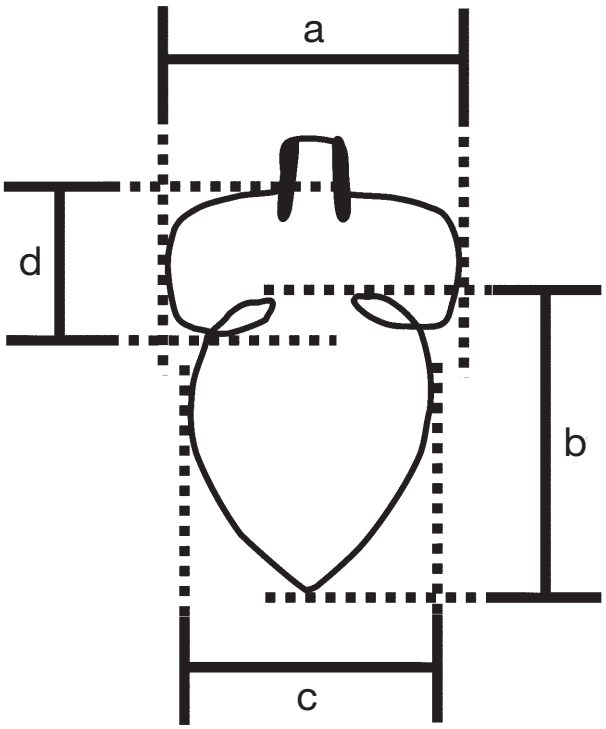

Fig. 1. Measured floral dimensions of the labellum: **a,** hypochile width; **b,** epichile lenght; **c,** epichile width; **d,** hypochile lenght.

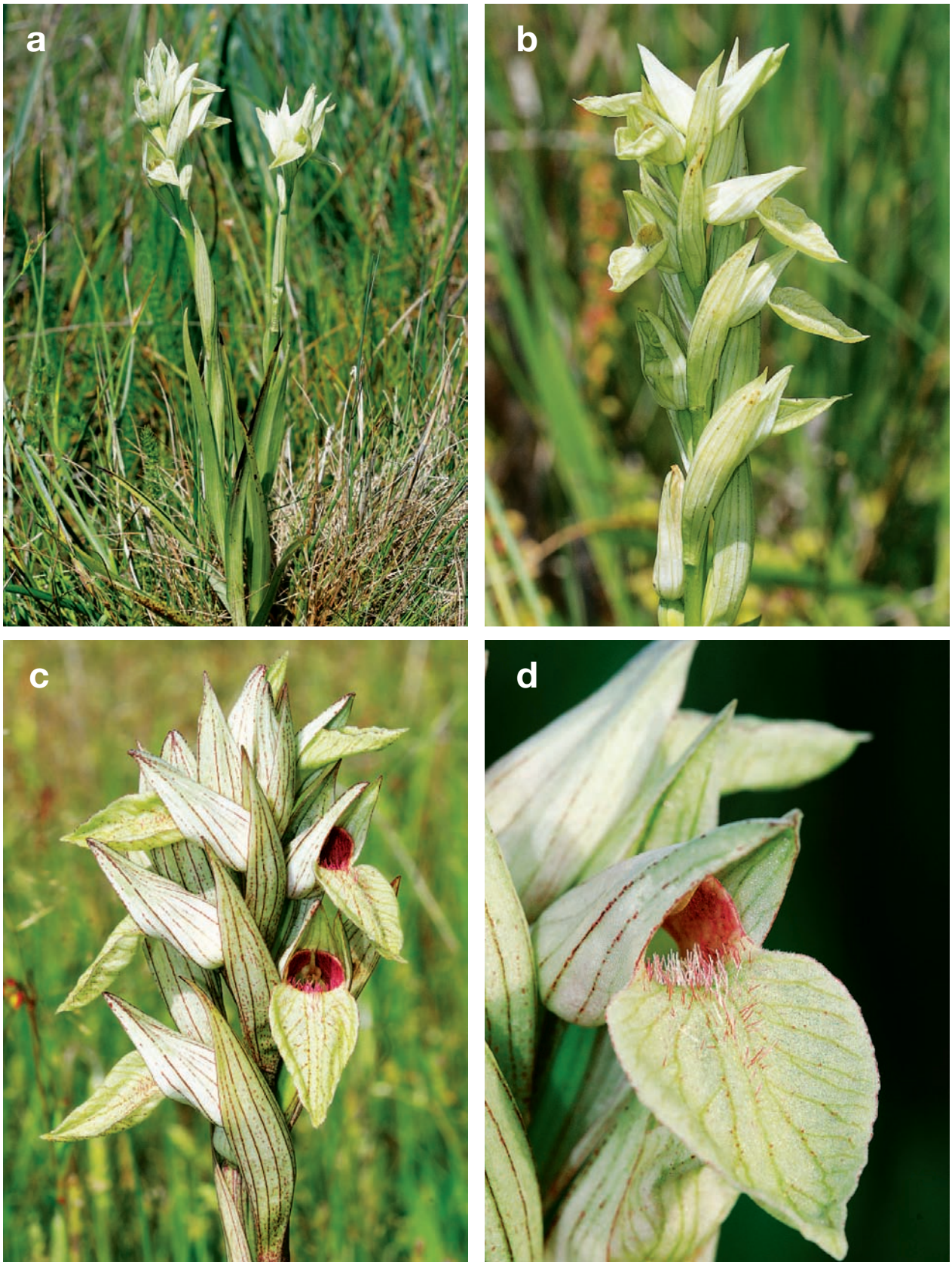

Fig. 2. a, *Serapias perez-chiscanoi,* Obando, Extremadura, Spain, 27-IV-2007; **b,** *S. perez-chiscanoi,* Trujillanos, Extremadura, Spain, 29-IV-2010; **c,** *S. perez-chiscanoi,* Vila Nova da Baronia, Baixo Alentejo, Portugal, 23-IV-2007; **d,** *S. perez-chiscanoi,* Alange, Extremadura, Spain, 30-IV-2010. All photographs: C. Venhuis.

Fig. 3. a, *Serapias perez-chiscanoi,* Ereiras, Beira Litoral, Portugal, 1-V-2010; **b,** *S. perez-chiscanoi,* Ereiras, Beira Litoral, Portugal, 1-V-2010; **c,** *S. perez-chiscanoi,* Ereiras, Beira Litoral, Portugal, 1-V-2010; **d,** *S. perez-chiscanoi,* Ereiras, Beira Litoral, Portugal, 25-IV-2011. All photographs: C. Venhuis.

dividuals with three flower colour variations. About ten plants were of the "green" variation, whilst some 50 plants were quite similar to the "red veined" variation, but differed from it by a bright red hypochile and lateral lobes, an epichile that was both greenish and pinkish, and the sepals, petals and bracts were also often slightly pinkish (Fig. 3a, b). The most deviant plants, however, about 20 individuals, had a bright red labellum (hypochile, lateral lobes and epichile), red petals and red veins on all plant parts. In addition, the bracts and sepals were pinkish (Fig. 3c, d).

Hybridization

Although hybridization cannot be excluded, the occurrence of hybrids is unlikely. The pollinia of *S. perez-chiscanoi* flowers disintegrate very rapidly onto their own stigmatic surface, often before the flowers open (Perez Chiscano & al., 1991), and so the possibility that intact pollinia are transferred to another flower is limited. Moreover, *S. perez-chiscanoi,* is a diploid (Bernardos & al., 2004), while *S. lingua* L., a species with which it is frequently sympatric, is tetraploid (D'Emerico & al., 2000), so that the difference in ploidy level makes cross-fertility unlikely. In contrast, *S. perez-chiscanoi* very rarely co-occurs with the diploid *S. cordigera*, which makes hybridisation between these two species also highly unlikely. Nevertheless, hybrids between *S. perez-chiscanoi* and both *S. lingua* and *S. cordigera* have been reported. A hybrid between *S. perez-chiscanoi* and *S. lingua* was mentioned by Wallenwein & Breier (1992) and was described subsequently as *S.* × *venhuisia* by Vázquez (2009). However, the photo in Wallenwein & Breier (1992), is clearly of *S. lingua*; Vázquez did not provide any photographs. Furthermore, Venhuis & al. (2004) and Vázquez (2009) suggested hybridization between *S. perez-chiscanoi* and *S. cordigera*. This putative hybrid was based on a plant near Aljucén (Venhuis & al., 2004), from the same population as the photographs presented in this paper (Fig. 4a, b). The inflorescences of these very rare individuals contained salmon-pink and pink flowers, and it is noteworthy that flower colour varied within single plants. However, morphological measurements on the flowers of these 'hybrid' individuals revealed floral dimensions identical to *S. perez-chiscanoi*, and since the other putative parent, *S. cordigera*, did not occur in the vicinity, and no morphological character of any other *Serapias* species was present, we now conclude that these plants probably represent a pink-flowered form of *S. perez-chiscanoi* rather than a hybrid.

Related species

In the south-western part of the Iberian Peninsula about seven taxa of *Serapias* occur, which can be divided into two main groups based on their flower size: the *S. vomeracea* group and the *S. parviflora* group (Venhuis & al., 2007). In this region, the *S. vomeracea* group includes *S. cordigera* subsp. *cordigera*, *S. cordigera* subsp. *gentilii*, *S. perez-chiscanoi* and *S. occidentalis* C. Venhuis & P. Venhuis. The occurrence of *S. vomeracea* subsp. *vomeracea* in SW Spain and Portugal is uncertain (Venhuis & al., 2007), and the taxonomic status of the new species, *S. maria* F.M. Váquez (Váquez, 2008), needs further study since the dimensions of morphological characters of this species overlap to a large extent with those of *S. occidentalis*. Further research on these taxa is necessary to determine their occurrence and taxonomic status respectively.

Taxa belonging to the *S. parviflora* group are *S. parviflora*, *S. strictiflora* Welwitsch ex Vega and *S. lingua*. Furthermore, two varieties of *S. strictiflora* are found in our region: var. *elsae* (P. Delforge) C. Venhuis & P. Venhuis, and var. *distenta* Presser. In the field, *S. perez-chiscanoi* is easy to distinguish from most other co-occurring *Serapias* taxa on the basis of flower colour or floral dimensions. However, some taxa that occasionally have pale flowers, such as *S. cordigera* subsp. *gentilii* and *S. parviflora*, resemble *S. perez-chiscanoi*, and the differences between such individuals and *S. perez-chiscanoi* are clarified below.

Differences with S. cordigera *subsp.* cordigera

Serapias cordigera subsp. *cordigera* is presumed to be the parental species of *S. perez-chiscanoi*, and both taxa are similar morphologically (Venhuis & al., 2007) and closely related according to molecular studies (Bellusci & al., 2008). Nevertheless, *S. cordigera* subsp. *cordigera*, with its dark red to purple flowers with a large, heart-shaped epichile (Fig. 4c, d) is easily distinguished in the field from *S. perez-chiscanoi.* It can also be distinguished on the basis of three other features: 1) epichile position, 2) emergence of the lateral lobes and 3) inflorescence architecture. The epichile of *S. cordigera* subsp. *cordigera* is normally positioned parallel to the stem (i.e., pointing downwards), whereas the epichile of *S. perez-chiscanoi* is generally positioned at an angle of about 45-90 degrees to the stem (pointing more or less outwards). In *S. cordigera* subsp. *cordigera*, the lateral lobes protrude from the casco, whereas in *S. perez-chiscanoi* the lateral lobes remain hidden inside the hood. The flowers in *S. cordigera* subsp. *cordigera* are placed more or less opposite each other, whilst those of *S. perez-chiscanoi* are positioned close together and in a spi-

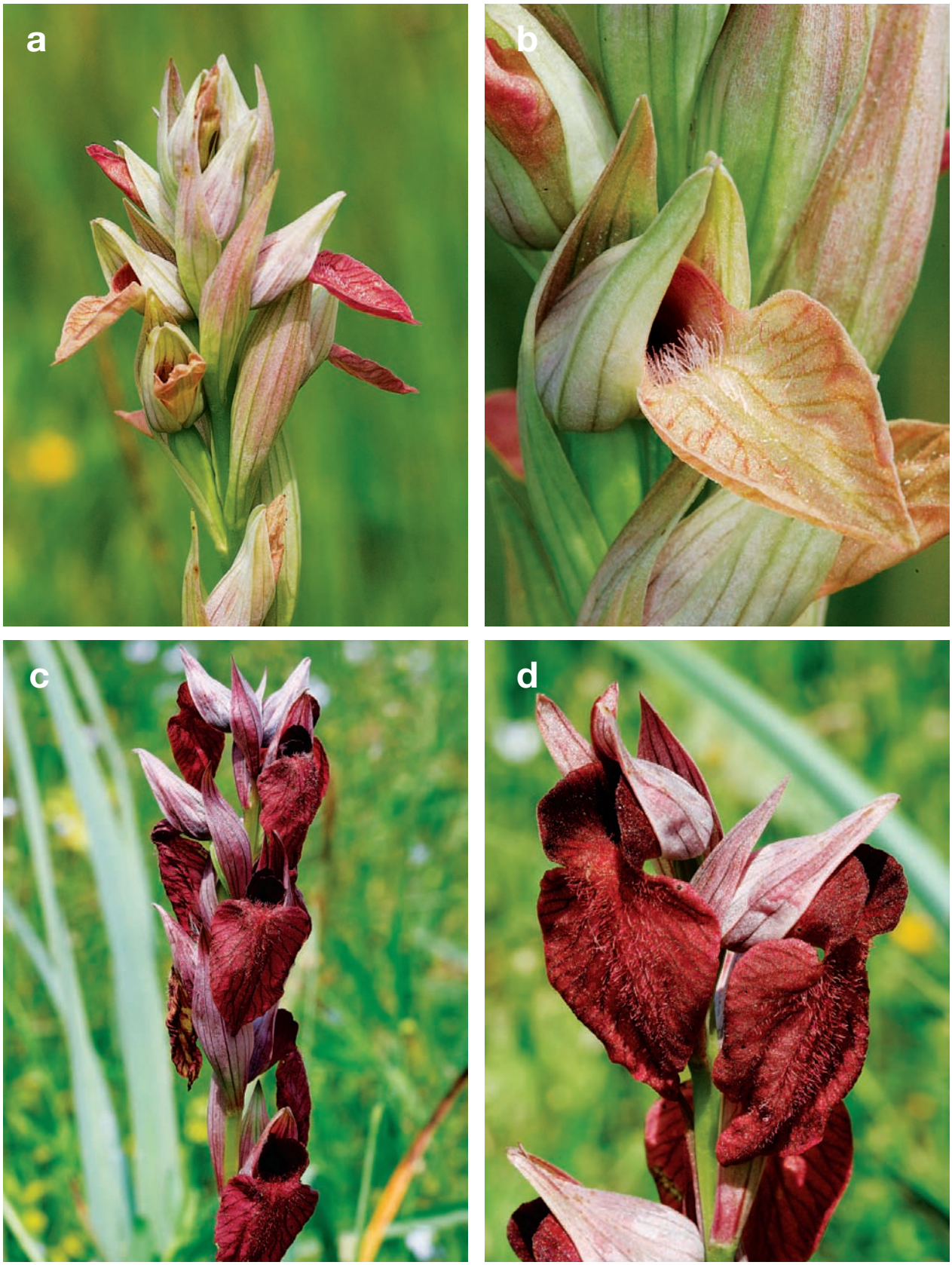

Fig. 4. a, *Serapias perez-chiscanoi,* Aljucén, Extremadura, Spain, 28-IV-2010; **b,** *S. perez-chiscanoi,* Aljucén, Extremadura, Spain, 28-IV-2010; **c,** *S. cordigera* subsp. *cordigera,* Badajoz, Extremadura, Spain, 30-IV-2010; **d,** *S. cordigera* subsp. *cordigera,* Badajoz, Extremadura, Spain, 30-IV-2010. All photographs: C. Venhuis.

Fig. 5. a, *Serapias cordigera* subsp. *gentilii,* Barranco do Velho, Algarve, Portugal, 13-IV-1995; **b,** *S. cordigera* subsp. *gentilii,* Galaxos, Algarve, Portugal, 27-IV-2010; **c,** *S. cordigera* subsp. *gentilii,* Barranco do Velho, Algarve, Portugal, 26-IV-2010; **d,** *S. cordigera* subsp. *gentilii,* Barranco do Velho, Algarve, Portugal, 17-IV-1995. Photographs: **a, d,** D. Tyteca; **b, c,** C. Venhuis.

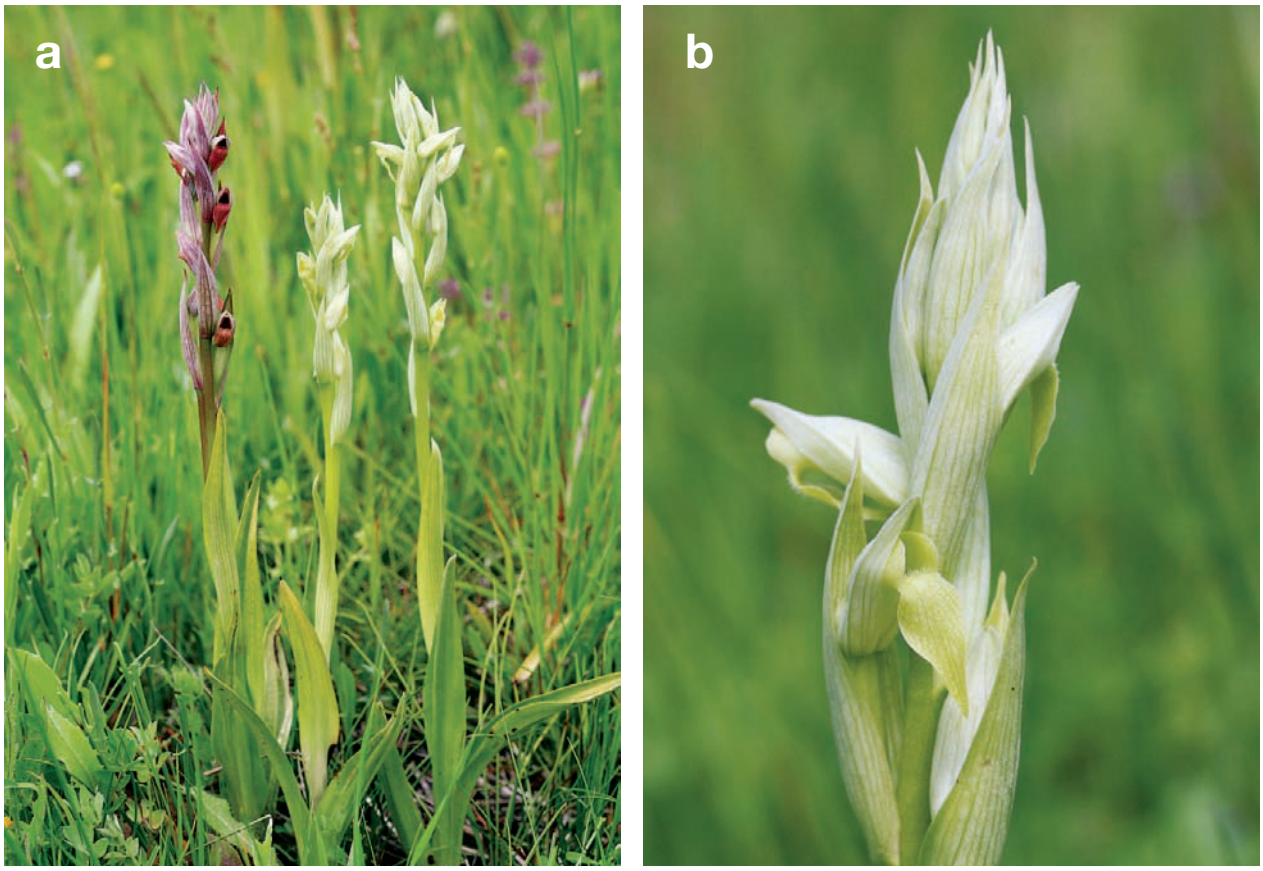

Fig. 6. a, *Serapias parviflora,* Aldeia dos Palheiros, Baixo Alentejo, Portugal, 23-IV-2007; **b,** *S. parviflora,* Aldeia dos Palheiros, Baixo Alentejo, Portugal, 23-IV-2007. Photographs: C. Venhuis.

ral, which gives the inflorescence a "twisted" appearance.

Although there is a small overlap in the epichile dimensions between *S. cordigera* subsp. *cordigera* and *S. perez-chiscanoi*: length (18)23-30(36) mm and (14)16-18(21) mm respectively, and width (13)17-24(29) mm and (10)12-13(15) mm respectively, *S. cordigera* subsp. *cordigera* can be distinguished from *S. perez-chiscanoi* on the basis of the non-overlapping hypochile dimensions: length (10)11-14(17) mm and (6)7-8(9) mm respectively, and width (18)21-27(31) mm and (14)16-18(19) mm respectively (Fig. 7).

Differences with S. cordigera *subsp.* gentili

Serapias cordigera subsp. *gentilii* (Fig. 5a-d) is sometimes difficult to differentiate from *S. perez-chiscanoi* because it occasionally has pale flowers that resemble the latter species. Most flowers of *S. cordigera* subsp. *gentilii* are red, but in many populations some plants with pale flowers occur, which vary from red with white edges (resembling *S. nurrica* Corrias), or completely pink, pink with yellow and pink with reddish veins, to yellowish, greenish or whitish (resembling *S. perez-chiscanoi*). In addition, several features that are present in *S. cordigera* subsp. *cordigera* are absent in *S. cordigera* subsp. *gentilii* and in *S. perez-chiscanoi*: the position of the epichile in the latter taxa generally points more or less outwards (although frequently downwards), and the inflorescence is, when there are many flowers, quite dense and spiralled and the edges of the epichile are often curled upwards. Furthermore, *S. cordigera* subsp. *gentilii*, like *S. perez-chiscanoi*, seems to be autonomously self-pollinating (Venhuis & al., 2007). It differs from *S. perez-chiscanoi*, however, by lateral lobes that generally emerge from the hood in contrast to *S. perez-chiscanoi* in which the lateral lobes are always completely hidden inside it. Although the flowers of *S. cordigera* subsp. *gentilii* generally have a colour pattern quite different from *S. perez-chiscanoi*, some individuals have flowers with a greenish epichile that may superficially look similar. But in comparison with the "green" variation of *S. perez-chiscanoi*, these flowers have a red hypochile, while in comparison with the "red" variation of that taxon, they lack the reddish hairs on the labellum

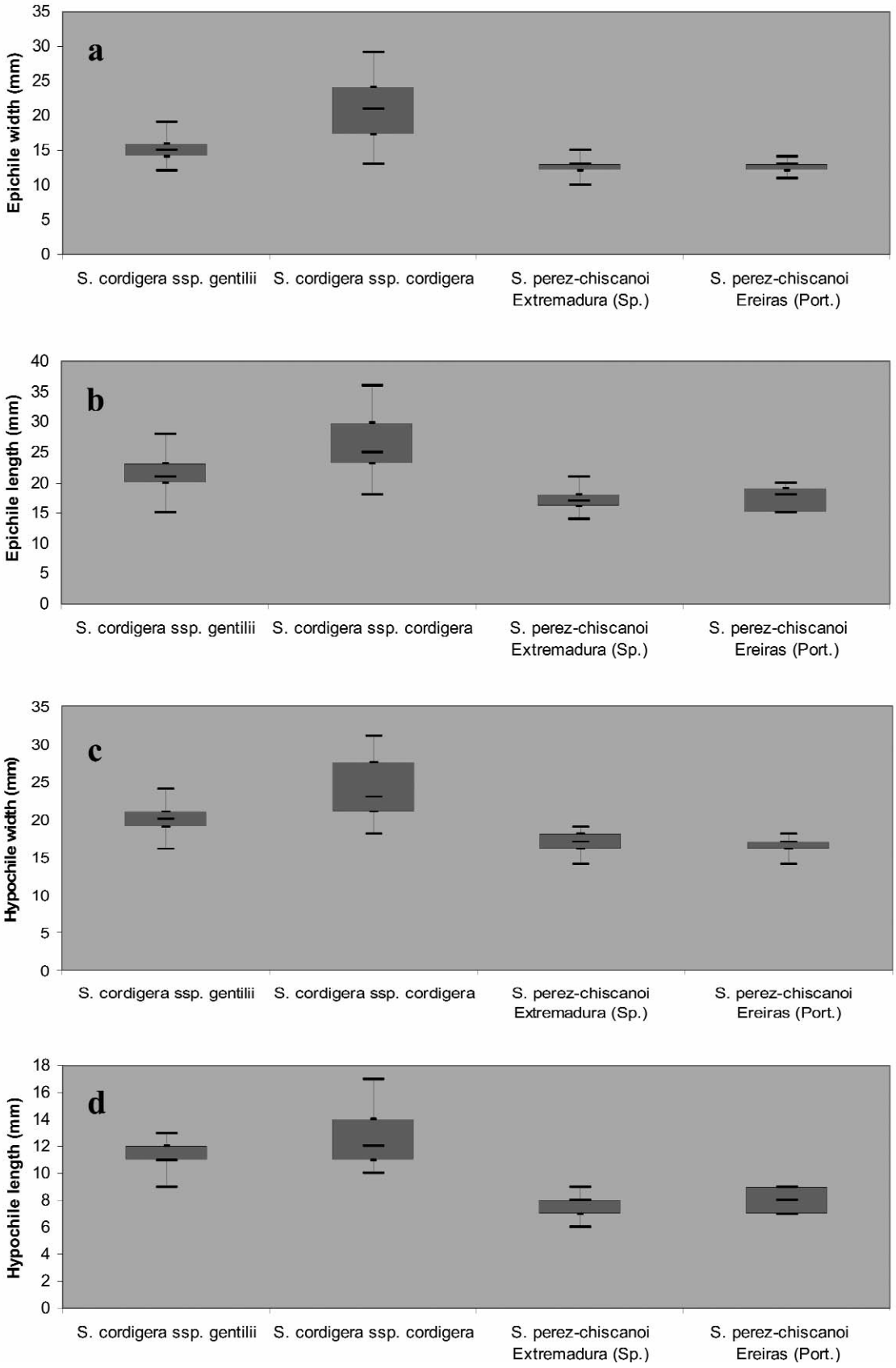

Fig. 7. Boxplots of *Serapias cordigera* subsp. *gentilii, S. cordigera* subsp. *cordigera, S. perez-chiscanoi* from Extremadura and *S.perez-chiscanoi* from Portugal (Ereiras). Outliers and extremes were not removed. **a,** epichile width; **b,** epichile length; **c,** hypochile width; **d,** hypochile length.

and the red venation on all plant parts. The red-flowered *S. perez-chiscanoi*, which until now was known from only one locality, is also very similar to the flowers of some plants of *S. cordigera* subsp. *gentilii* but differs from the latter subspecies by a striking red venation on all plant parts.

Most floral features are unhelpful to distinguish between these taxa, and the only character that separates *S. cordigera* subsp. *gentilii* from *S. perez-chiscanoi* is the length of the hypochile, which in *S. cordigera* subsp. *gentilii* is (9)11-12(13) mm, and in *S. perez-chiscanoi* is (6)7-8(9) mm (Fig. 7). All floral dimensions as well as the flower colour of *S. cordigera* subsp. *gentilii* are more or less intermediate between *S. cordigera* subsp. *cordigera* and *S. perez-chiscanoi*.

Differences to S. parviflora

Serapias parviflora is generally easily distinguished from *S. perez-chiscanoi* by its very small flowers. In the studied area, specimens of *S. parviflora* with pale pink and yellowish/greenish flowers (Figs. 6a, b) frequently occur, but these resemble *S. perez-chiscanoi* in colour only. Both taxa can be readily distinguished on the basis of three of the four labellum dimensions: Epichile length in *S. parviflora* ranges from (7)9-11(12) mm and in *S. perez-chiscanoi* from (14)16-18(21) mm, the epichile width in *S. parviflora* falls between (2)4-6(6) mm and in *S. perez-chiscanoi* between (10)12-13(15) mm. Furthermore, *S. parviflora* differs from *S. perez-chiscanoi* in hypochile width (8)10-11(13) mm and (14)16-18(19) mm respectively. Hypochile length does not differ: (5)7-8(9) mm and (6)7-8(9) mm, respectively.

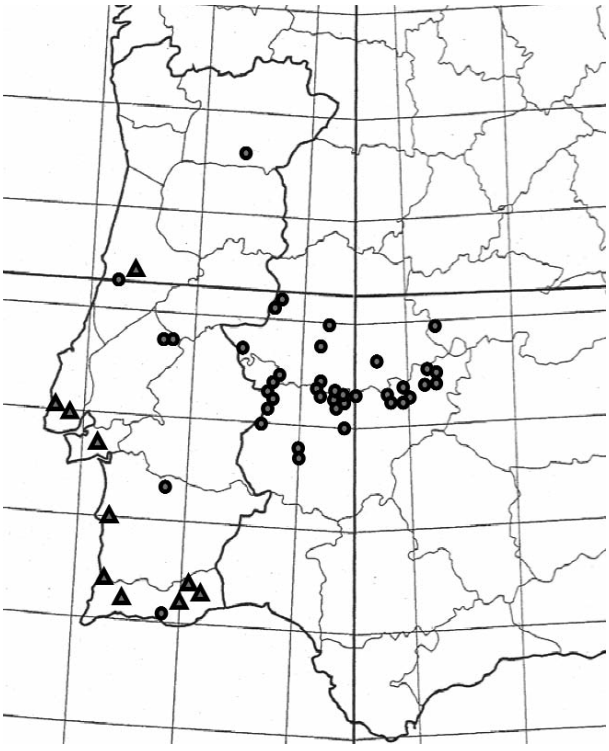

Fig. 8. Distribution map of *Serapias perez-chiscanoi* and *S. cordigera* subsp. *gentilii*. All known populations are presented, including populations that have already disappeared (● *S. perez-chiscanoi*; ▲ *S. cordigera* subsp. *gentilii*).

Distribution

Serapias perez-chiscanoi is a rare tongue-orchid, which was previously only known from the Guadiana river basin in Extremadura (Spain) (Pérez Chiscano, 1988; Pérez Chiscano & al., 1991; Delforge, 2002). After a field study, Venhuis & al. (2004) reported six new populations, and after intensive searches during the last five years by, amongst others, employees of the regional government of Extremadura, several new populations were found along the river basin of the Tajo and also south of the Guadiana river basin in Extremadura (Venhuis & al., 2006), which increases the total number of populations known in Extremadura to around 30 (Fig. 8). Yet another population was found in Castilla-La Mancha (Venhuis & al., 2006). In the Algarve (Portugal), Jansen (1993) found a population that disappeared soon after its discovery. And we have seen a population in the Baixo Alentejo province that was discovered by M. Pereira, and also four other populations that were discovered by either J. Moura, J. Pessoa and J. Monteiro, in the provinces of Beira Litoral and Ribatejo in the central part of Portugal and in the province of Trás-os-Montes e Alto Douro in northern Portugal (Fig. 8).

Serapias cordigera subsp. *cordigera* is found throughout the Iberian Peninsula, sometimes only locally but often abundantly. *Serapias parviflora* also occurs in the entire Iberian Peninsula, but is much more widespread and often abundant. *Serapias cordigera* subsp. *gentilii* is found predominantly along the coastal regions of the Algarve but also extends further north. The distribution map (Fig. 8) is based on populations seen by us, and photos, and also on literature, in which it was cited as a variety of *S. cordigera*.

Identification key

Here, we present a concise key for the identification of species from the large flowered *S. vomeracea* group in the SW Iberian Peninsula. It will be clear from this article that the identification of the different species is not too difficult, despite the considerable variation in flower morphology, flower colours and venation patterns. More research on the relationships

between the morphological variation and the pollination ecology in *S. perez-chiscanoi* is underway.

Identification key for the *Serapias vomeracea* group in the southwestern part of the Iberian Peninsula

1. Ratio epichile width/hypochile length = 0.6-1.2 .... **S. occidentalis**
1. Ratio epichile width/hypochile length = 1.3-2.1 ..... **2**
2. Hypochile length (6)7-8(9) mm ..... **S. perez-chiscanoi**
2. Hypochile length (9)10-14(17) mm **3**
3. Epichile broad and heart-shaped, purple, with no divergent edges; pollinia coherent ..... **S. cordigera** subsp. **cordigera**
3. Epichile slender, usually pale, often with divergent edges; pollinia friable ..... **S. cordigera** subsp. **gentilii**

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References

Acedo, C. 1990. Serapias perez-chiscanoi, nom. nov. *Anales del Jardin Botánico de Madrid* 47(2): 510.

Bellusci, F., Pellegrino, G., Palermo, A.M. & Musacchio, A. 2008. Phylogenetic relationships in the orchid genus Serapias L. based on noncoding regions of the chloroplast genome. *Molecular Phylogenetics and Evolution* 47: 986-991.

Bernardos, S., Tyteca, D. & Amich, F. 2004. Cytotaxonomic study of some taxa of the subtribe Orchidinae (Orchidoideae, Orchidaceae) from the Iberian Peninsula. *Israel Journal of Plant Sciences* 52: 161-170.

Delforge P. 2002. *Guía de las Orquídeas de España y Europa.* Lynx Ediciones, Barcelona, Spain.

D'Emerico, S., Pignone, D. & Scrugli, A. 2000. Giemsa C-banded karyotypes in Serapias L. (Orchidaceae). *Botanical Journal of the Linnean Society* 133: 485-492.

Jansen H. 1993. Serapias viridis Pérez Chiscano in Portugal! *Mitteilungsblatts des Arbeitskreises Heimische Orchideen Baden-Württemberg* 10: 50-53.

Pérez Chiscano, J.L. 1988. Nueva especie de Serapias L. en Extremadura (España). *Monografias del Instituto Pirenaico de Ecologia, Homenaje a Pedro Montserrat, Jaca y Huesca*: 305-309.

Pérez Chiscano, J.L., J.R. Gil Llano & F. Duran Oliva. 1991. *Orquídeas de Extremadura.* Fonda Natural, Madrid.

Tyteca, D. 1997. The orchid flora of Portugal. *Journal Europäischer Orchideen* 29(2/3): 185-581.

Vázquez Pardo, F.M. 2008. Annotations to the Orchidaceae of Extremadura (SW Spain). *Journal Europäischer Orchideen* 40(4): 699-725.

Vázquez Pardo, F.M. 2009. Revisión de la familia Orchidaceae en Extremadura (España). *Folia Botanica Extremadurensis* 3: 5-368

Vellozo, J.M. da C. 1825. *Florae fluminensis.* Senefelder, Rio de Janeiro, Brasil.

Venhuis, C., Oostermeijer, J.G.B. & Tonk, J.Th.P. 2004. Conservation biology of Serapias perez-chiscanoi Acedo in the Guadiana river basin in Extremadura (Spain). *Eurorchis* 16: 49-63.

Venhuis, C., Oostermeijer, J.G.B. & Cornado Garcia, M. 2006. Serapias perez-chiscanoi: legal protection and distribution. *Eurorchis* 18: 88-91.

Venhuis, C., Venhuis, P., Oostermeijer, J.G.B. & van Tienderen, P.H. 2007. Morphological systematics of Serapias L. (Orchidaceae) in Southwest Europe. *Plant Systematics and Evolution* 265: 165-177.

Wallenwein, F. & Breier, W. 1992. Bemerkungen zu einigen Arten der Gattung Serapias L. aus Spanien. *Mitteilungsblatts des Arbeitskreises Heimische Orchideen Baden-Württemberg* 24(1): 115-121.

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