

On some introduced species in Belgium: new spiders detected and new records

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Abstract

This article deals with different species of exotic spiders encountered in Belgium by the author. Two new species for Belgium are revealed: *Salticus mutabilis* Lucas, 1846 and *Spermophorides mediterranea* (Senglet, 1973). Additional records are also presented for the species *Oecobius amboseli* Shear & Benoit, 1974 and *Oecobius navus* Blackwall, 1859. The status of these species in Belgium is discussed.

Samenvatting

Dit artikel behandelt verschillende soorten exotische spinnen die de auteur in België heeft aangetroffen. Twee nieuwe soorten voor België worden gemeld: *Salticus mutabilis* Lucas, 1846 en *Spermophorides mediterranea* (Senglet, 1973). Er worden ook bijkomende gegevens gepresenteerd voor de soorten *Oecobius amboseli* Shear & Benoit, 1974 en *Oecobius navus* Blackwall, 1859. De status van deze soorten in België wordt besproken.

Résumé

Le présent article traite de différentes espèces d'araignées exotiques rencontrées en Belgique par l'auteur. Deux nouvelles espèces pour la Belgique sont révélées: *Salticus mutabilis* Lucas, 1846 et *Spermophorides mediterranea* (Senglet, 1973). Des signalements supplémentaires sont également présentés pour les espèces *Oecobius amboseli* Shear & Benoit, 1974 et *Oecobius navus* Blackwall, 1859. Le statut de ces espèces en Belgique est discuté.

Introduction

The spider species naturally inhabiting Belgium consists of a diverse group of more than 700 species (BOSMANS & VAN KEER 2017). While the Belgian spider fauna has been well-documented, the ongoing exploration of its ecosystems continues to yield discoveries. Year after year, previously unlisted species are identified within the country's borders. Notably, since the publication of BOSMANS & VAN KEER's comprehensive list in 2017, two other species have recently been detected as new to Belgium (JANSSEN & CREVECOEUR 2020; LAMBRECHTS & VAN KEER 2023), although more data would be welcome to determine their status in our country. Such newly documented species may be inherently rare, thriving in habitats or regions that have received limited or no prior exploration. Alternatively, some species may be expanding their natural range due to the effects of climate change. Finally, some exotic species might be inadvertently introduced through human activities.

Addressing the latter scenario, BOSMANS & VAN KEER (2017) pointed out that the number of exotic spider species observed in Belgium significantly increased, rising from 27 to 34 species between 2009 and 2017. The present article contributes to the growing corpus knowledge by introducing two new spider species, which are considered non-native to Belgium. Additionally, it presents fresh data on two other known introduced species.

Material and methods

All spiders were collected at different times and locations in Belgium (see Fig. 1), all by hand. Specimens are deposited at the Royal Belgian Institute for Natural Sciences, Brussels (RBINS IG-34723/001-008).

Photos of specimens *in vivo* were taken using a Canon reflex 5D Mark III, Canon MP-E 65mm f/2.8 1-5x lens, or Canon EF 100mm f/2.8L Macro IS USM and Canon Speedlite 550EX Flash with a homemade diffuser. Some photos were taken with an Apple iPhone 13 Pro (HD format: 1920x1080) *in situ* or through the ocular of a Zeiss Stemi 2000 stereomicroscope. Photographs of specimens and genitalia immersed in ethanol 70% were taken with a DFC500 camera mounted on a Leica MZ16A and piloted with the Leica Application Suite software (LAS ver. 4.13). Some photos are available on the website "Les araignées de Belgique et de France" by Pierre Oger (<https://arachno.piwigo.com/>). The photos of *Salticus mutabilis* were also published on the forum of "Le Monde des insectes" (<https://www.insecte.org/forum/viewtopic.php?t=79517>). All observations are also recorded in the web platform WAARNEMINGEN.BE (2023).

The distribution map was drawn with SimpleMappr, an online tool to produce publication-quality point maps (SHORTHOUSE 2010) and the satellite map was obtained with <https://satellites.pro/> ©OpenStreetMap contributors. Illustrations were assembled and edited in Photoshop CS5 (white balance and level adjusted).

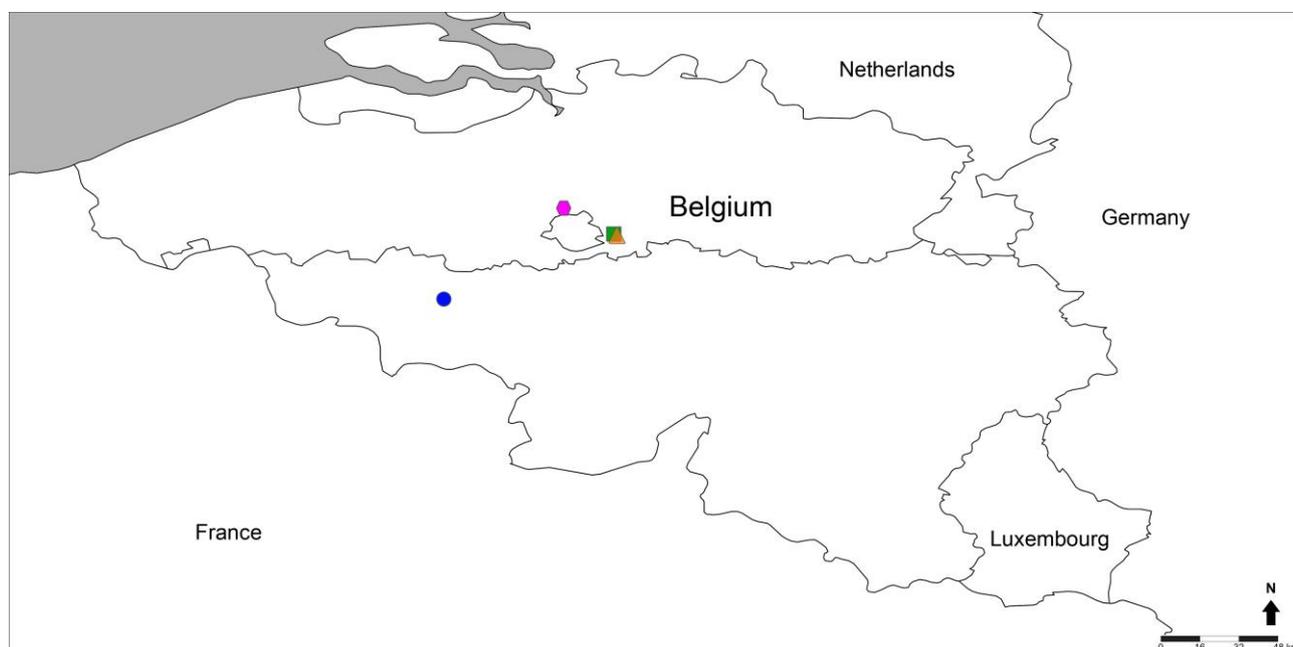


Figure 1: Distribution localities in Belgium of species records detailed in this paper. Orange triangle = *Oecobius amboseli* Shear & Benoit, 1974, Royal Museum for Central Africa (Tervuren); pink hexagon = *Oecobius navus* Blackwall, 1859, botanic garden (Meise); blue circle = *Spermophorides mediterranea* (Senglet, 1973) (Pholcidae), Pairi Daiza (Brugelette); green square = *Salticus mutabilis* Lucas, 1846 (Salticidae), Royal Museum for Central Africa (Tervuren).

Results

Oecobiidae Blackwall, 1862

***Oecobius* Lucas, 1846**

***Oecobius amboseli* Shear & Benoit, 1974**

This African species was first recorded from Belgium in 2014 (HENRARD et al. 2014). This spider was first detected from Duffel from a single male, and later from Tervuren, where a population appears to survive in the basement of the African Palace (Ex. Colonial Palace) of the Royal Museum for Central Africa (RMCA) (Fig. 2). Some years later, the species was also discovered in another building of the RMCA: the "C.A.P.A."

building. Males and females (Fig. 3) still occur there in the corridors of the basements (pers. obs., 2023), where is stored most of the alcohol collection of the museum.

Due to quite humid condition there, mould develop well, attracting numerous kind of small arthropods, possibly supplying the spider with food. It is worth noting that the population in the basement of the African Palace is still present (pers. obs., 2023). The species, also introduced in Denmark and the Netherlands, only occurs inside buildings (TOFT & WUNDERLICH 2012, IJLAND 2013, HENRARD et al. 2014, EL-HENNAWY 2016, NENTWIG 2023), where it is able to breed. As discussed in BOSMANS & VAN KEER (2017) and VAN KEER (2022), the spider is therefore considered as an "imported species that breeds with us". It presents local establishments, but naturalisation cannot be considered due to its strong (dependent) anthropic affinity (see discussion).

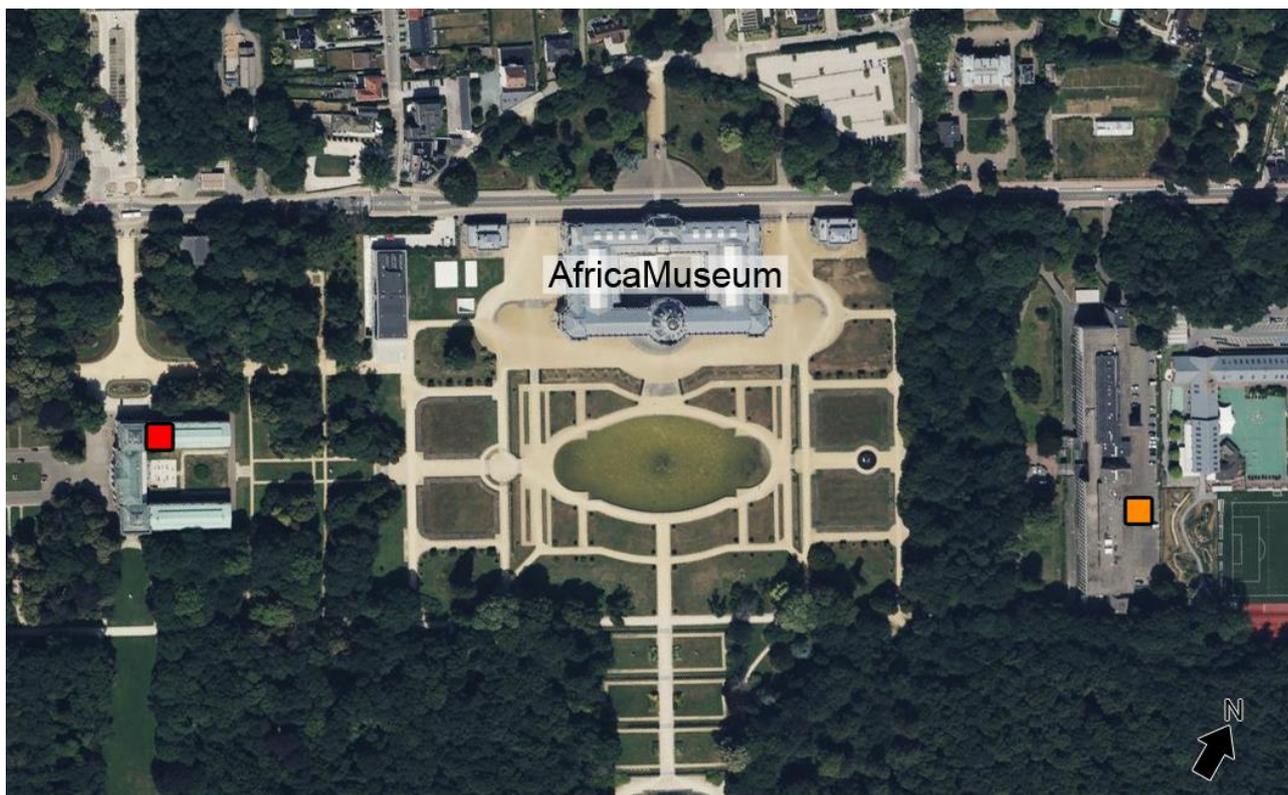


Figure 2: Satellite view showing the known (red square: African Palace) and the new (orange square: "C.A.P.A" building) locations of *Oecobius amboseli* population found at the Royal Museum for Central Africa (AfricaMuseum).

Identification

See SHEAR & BENOIT (1974), EL-HENNAWY (2004), HENRARD et al. (2014).

Remarks

Numerous individuals were observed in the basement, mostly in corners of walls and windowsills. The Figure 3 shows a couple found on the 08.04.2016. They were observed under stereomicroscope in order to confirm their identity, then relocated.

Material examined

BELGIUM • 1♂, 1♀; Tervuren, Royal Museum for Central Africa, "C.A.P.A" building; 50°49'52.0"N 4°31'23.6"E; 08.IV.2016; in the basement corridor of the building; A. Henrard leg.; hand catch and relocated after identification; waarnemingen.be/observation/291676824 • 1♂, 1♀; data as previous; 24.X.2023; AH_20231024_01; waarnemingen.be/observation/291676093; RBINS IG-34723/007 • 2♀♀; data as previous, African Palace (ex-Colonial Palace); 50°49'43.3"N 4°30'55.0"E; 24.X.2023; in the cellar of the

building, on the floor, with egg sac; AH_20231024_02; waarnemingen.be/observation/291676233; RBINS IG-34723/008.



Figure 3: *Oecobius amboseli* Shear & Benoit, 1974, living individuals (male on the left and female on the right) photographed on the wall of the basement corridor of the "C.A.P.A" building of the Royal Museum for Central Africa (08.04.2016).

Global distribution

Egypt, Ethiopia, Kenya, Uganda, Rwanda. Introduced to Denmark, the Netherlands, Belgium.

***Oecobius navus* Blackwall, 1859**

The species *Oecobius navus* is known from different localities in Belgium: from Neerlinter and from Duffel, where it was found inside buildings (VAN KEER 1992; HENRARD et al. 2014). It was also reported as "*Oecobius annulipes*" (probably misidentification) from Tervuren by Rudy Jocqué (see JOCQUÉ 1984, 1988; RANSY & BAERT 1983) but the material he examined could not be traced, preventing the identity from being re-verified (HENRARD et al. 2014).

A new locality in Belgium is recorded here. Several individuals were observed in the Desert greenhouse of the Botanical Garden (Meise), and three random females were collected (Fig 4). Similarly to the previous species cited in this paper, these are probably not viable outside the protected environment of heated greenhouses or other buildings (VAN KEER 2007). *Oecobius navus* can therefore be considered as an imported species, with local establishments and naturalisation cannot be considered due to its strong (dependent) anthropic affinity in Belgium (see discussion).

Identification

See ROBERTS (1995), WUNDERLICH (1995). The females found in Meise can be distinguished from *O. amboseli* by the more contrasted habitus (Fig. 4 A-C) and their epigynes provided with a long scape (Fig. 4D-F; vs. no scape but wide atrium, see HENRARD et al. 2014, fig. 6A-D).

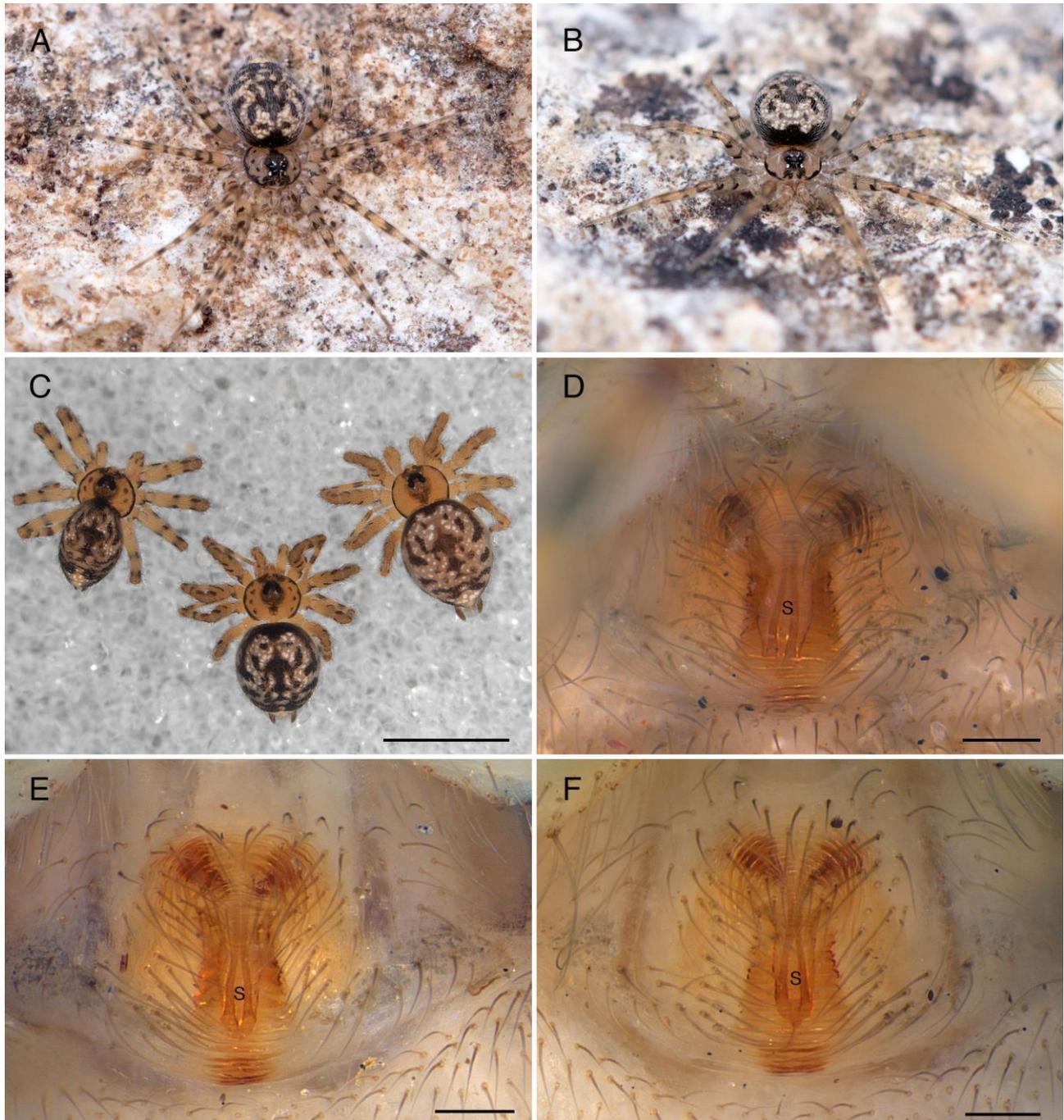


Figure 4: *Oecobius navus* Blackwall, 1859, females found in the Desert greenhouse of the Botanical Garden (Meise). **A-B.** Two different living females. **C.** Collected individuals as seen under alcohol. **D-F.** Respective epigynes, ventral view. Abbreviations: S = scape. Scale bars: C = 2 mm; D-F = 0.1 mm.

Material examined

BELGIUM • 3♀; Meise, Botanical Garden; 50°55'30.0"N 4°19'48.0"E; 07.IV.2019; Inside the Plant Palace building, in the desert greenhouse; A. Henrard leg.; hand catch; AH_20190407_01; waarnemingen.be/observation/291677727; RBINS IG-34723/002.

Pholcidae C. L. Koch, 1850
***Spermophorides* Wunderlich, 1992**

***Spermophorides mediterranea* (Senglet, 1973)**

New record for Belgium. *Spermophorides* represents a quite diverse pholcid group comprising 34 species (WSC 2023), mainly distributed around the Mediterranean and in the Canaries (itself harbouring 23 species; see WUNDERLICH 1992, 1999). *S. mediterranea* is, as its name suggests, typically a Mediterranean species. An overview of its current distribution can be viewed via the Global Biodiversity Information Facility (GBIF 2023) portal online: <https://www.gbif.org/species/2150501>.

Its presence in Belgium was first detected in the Pairi Daiza wildlife park (Brugelette) in 2021 during a familial event. A male (Fig. 5D) was collected by chance inside the "Oasis" building in its web within an ornamental plant (undetermined). Two year later, the author visited the park again and, at the same place, observed and collected other individuals (of both sexes) among Agave plants (Fig. 5A-C, E-F). One can reasonably suggest that these spiders were imported alongside the exotic plants, which are abundant in the Mediterranean region and are commonly used for ornamental purposes within the park.

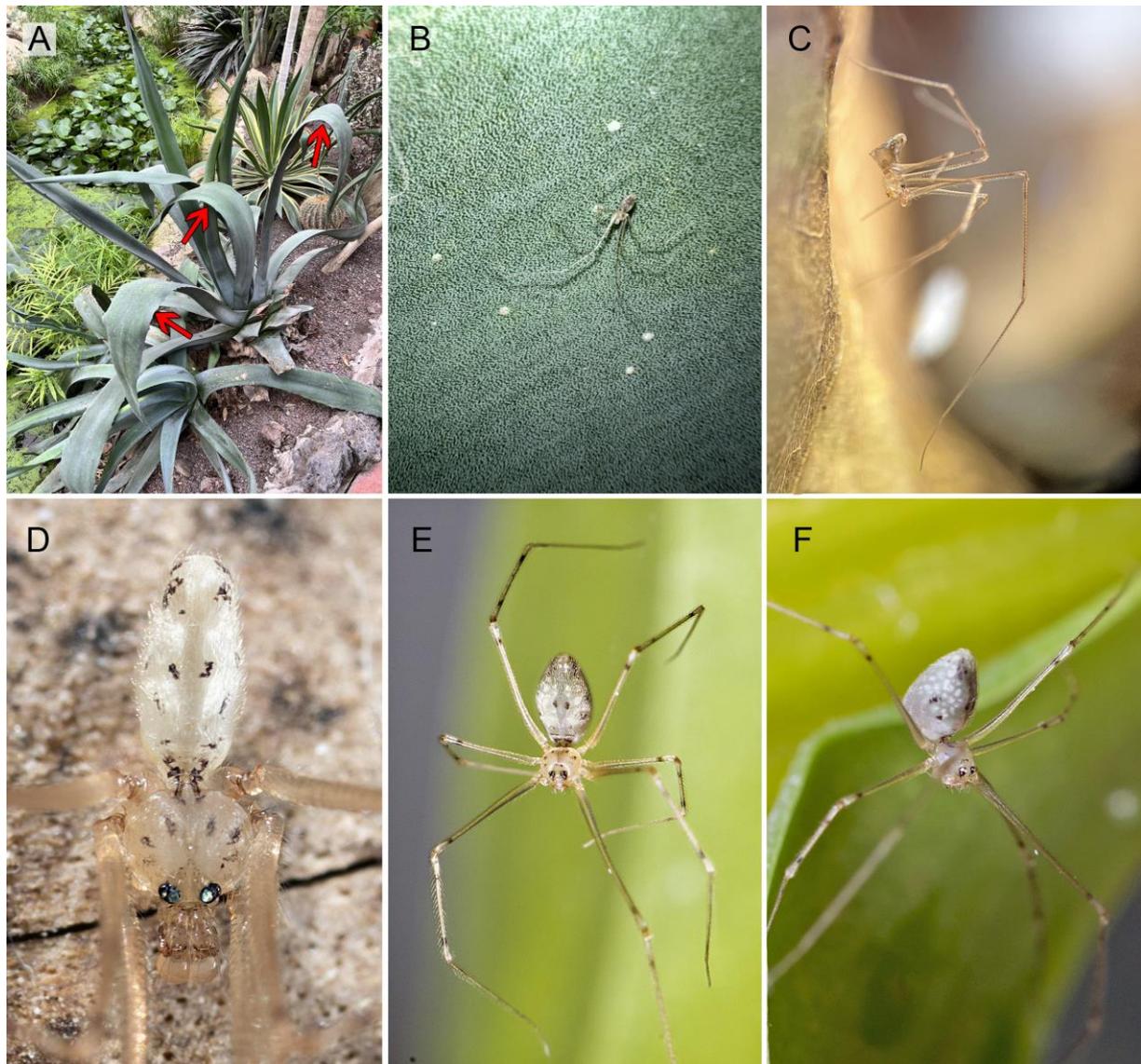


Figure 5: *Spermophorides mediterranea* (Senglet, 1973), photographs of some individuals found at the Pairi Daiza animal park (Brugelette), inside the "Oasis" building. **A.** Typical plant (*Agave americana*) where most of the spiders were found, especially under the agave leaves (red arrows). **B.** Male subadult found in situ in 2023 (AH_20230729_03). **C.** Same, adult, after having moulted a few breeding days later. **D.** Male collected in 2019 (AH_20210821_01). **E-F.** Female collected in 2023 (AH_20230729_01).

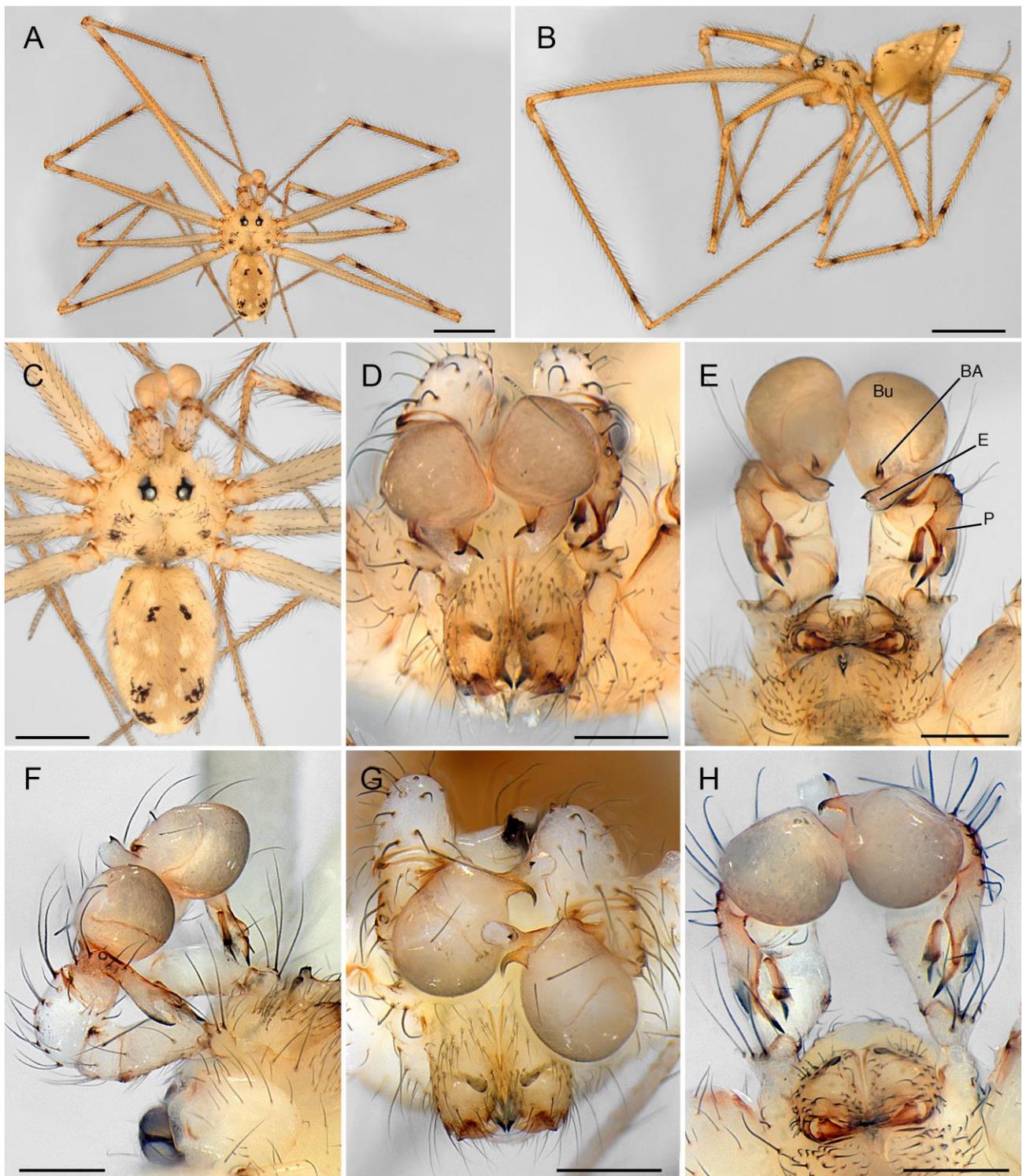


Figure 6: *Spermophorides mediterranea* (Senglet, 1973), males. **A-E.** Male collected in 2011 (AH_20210821_01). **F-H.** Male collected in 2023 (AH_20230729_03). **A, C.** Habitus, dorsal view. **B.** Habitus, lateral view. **D, G.** Chelicerae and palps, frontal view. **E, H.** Idem, ventral view. Abbreviations: BA = bulbal apophysis; Bu = bulbus; E = embolus; P = procurus (paracymbium). Scale bars: A-B = 1 mm; C = 0.5 mm; D-H = 0.2 mm.

A viable population seems to be maintained in the "Oasis" thanks to the greenhouse conditions that prevail there. Therefore *S. mediterranea* can be considered as an imported species that can breed with us, but with local establishment. However naturalisation cannot be considered due to its strong (dependent) anthropic affinity in Belgium (see discussion).

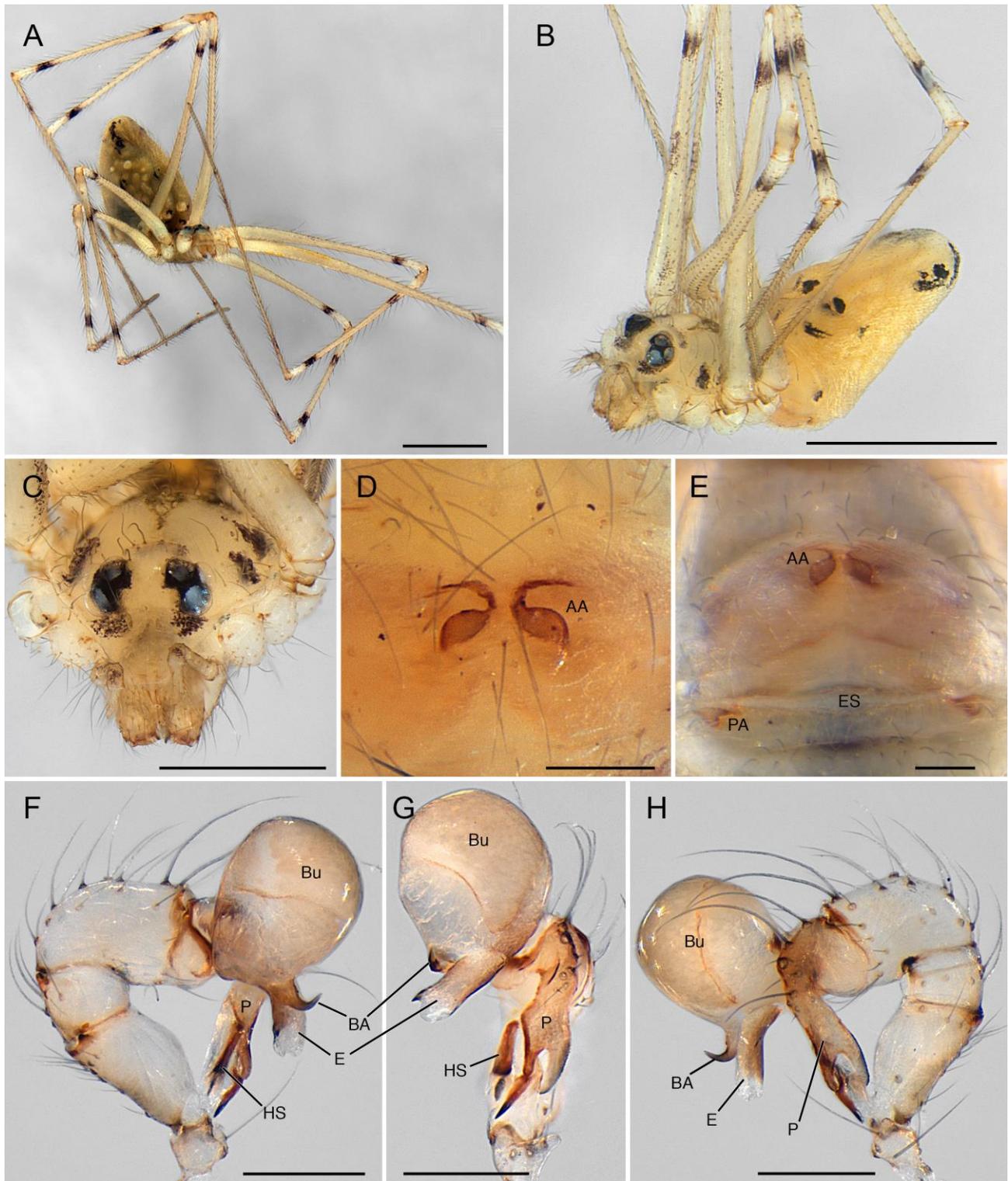


Figure 7: *Spermophorides mediterranea* (Senglet, 1973). **A, E.** Female collected in 2023 (AH_20230729_01). **B-D.** Another female collected in 2023 (AH_20230729_02). **F-H.** Male palp collected in 2011 (AH_20210821_01). **A.** Habitus, antero-lateral view. **B.** Habitus, lateral, slightly oblique view. **D-E.** Epigynes, ventral view. **F.** Palp, prolateral view. **G.** Palp, frontal view. **H.** Palp, retrolateral view. Abbreviations: AA = anterior anchoring alveolus; BA = bulbal apophysis; Bu = bulbus; E = embolus; ES = epigastric slit; HS = hinged sclerite; P = procurus (paracymbium); PA = posterior anchoring alveolus. Scale bars: A-B = 1 mm; C = 0.5 mm; D-E = 0.1 mm; F-H = 0.2 mm.

Identification

See SENGLLET (1973, 2001). *Spermophorides mediterranea* can be distinguished from other pholcidae species found in Belgium by the elevated, conical shape of its abdomen (Figs 5C-F, 6B, 7A-B), the chelicerae (Figs 6D-H, 7C) provided with a pair of strong teeth and multiple apophyses (in males), and its genitalia.

Females are distinguished from other congeneric Mediterranean species by the thick shape of the anterior anchoring alveolus of the genital plate and the widely separated posterior anchoring alveolus (Fig. 7D-E).

Males of Mediterranean species share very similar palp, but *S. mediterranea* is easily distinguished by its palpal procurus (or paracymbium) and the shape of its various appendages (Figs 6D-H, 7F-H).

Remarks

The male AH_20210821_03 (RBINS IG-34723/005) was collected subadult (Fig. 5B) and moulted two days later in the tube (Fig. 5C). It was then quickly killed afterwards, after a few photos had been taken. The fresh moult may explain the twisted position of the bulbus (Fig. 6F-H), in comparison with the other male AH_20210821_01 (RBINS IG-34723/003) found at the same place and which presents a similar position (Figs. 6D-E, 7F-H) than those illustrated in the literature (i.e. SENGLLET 1973, 2001).

Material examined

BELGIUM • 1♂; Brugelette, Domaine de Cambron - Pairi Daiza; 50°35'12.2"N 3°53'14.2"E; 21.VIII.2021; Inside building "Oasis", tropical green house, in its web within ornamental plant; A. Henrard leg.; hand catch; AH_20210821_01; waarnemingen.be/observation/291678532 • RBINS IG-34723/003. 1♀; data as previous; 29.VII.2023; in its web under leaf of *Agave* plants; AH_20230729_01; waarnemingen.be/observation/291679156; RBINS IG-34723/004 • 1♀; data as previous; AH_20230729_02; waarnemingen.be/observation/291679156; RBINS IG-34723/005 • 1♂; data as previous; AH_20230729_03; waarnemingen.be/observation/291679156; RBINS IG-34723/006.

Global distribution

Spain, France (including Corsica). Introduced to Belgium.

Salticidae Blackwall, 1841

Salticus Latreille, 1804

Salticus mutabilis Lucas, 1846

New record for Belgium. *Salticus mutabilis* Lucas, 1846 is a Mediterranean species. During a sunny day in spring 2011, a male was (Fig. 8) found on the walls of the African Palace (formerly Palais des Colonies), an annex building to the Royal Museum of Central Africa in Tervuren. After more than 10 years later, no more individuals have been observed in this location, which is the author's workplace. The author concludes that this observation represents a fortuitous introduction. According to BOSMANS & VAN KEER (2017) and VAN KEER (2022), the spider can therefore be considered as an imported species, without establishment (i.e. no viable population) in Belgium.

Identification

See METZNER (1999). The male *Salticus mutabilis* found in Tervuren can be distinguished from the other three *Salticus* species found in Belgium — i.e. *Salticus cingulatus* (Panzer, 1797), *Salticus scenicus* (Clerck, 1757) and *Salticus zebraneus* (C.L. Koch, 1837) — by its relatively paler habitus (Fig. 8A-B) provided with two longitudinal rows of 6 small darker spots on the abdomen and by its palp (Fig. 9A-E), provided with slender, tapered RTA, slightly bent apically and the triangular embolus with large base and small dorsal, blunt extension.

Material examined

BELGIUM • 1♂; Tervuren, African Palace building, Royal Museum for Central Africa, 50°49'43.5"N 4°30'54.6"E, 26.IV.2011, on the exterior wall of the building, A. Henrard leg., hand catch; AH_20110411_01; waarnemingen.be/observation/291677408; RBINS IG-34723/001.

Global distribution

Macaronesia, Europe, North Africa, Turkey, Caucasus. Introduced to Argentina and Belgium.

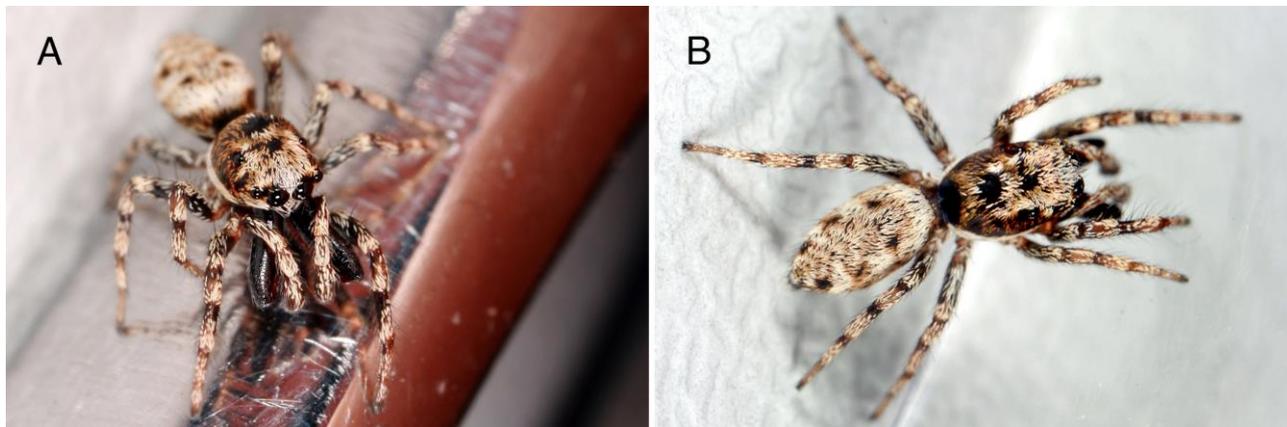


Figure 8: *Salticus mutabilis* Lucas, 1846, the male individual found on the wall of the African Palace (RMCA). **A.** Habitus in vivo, roughly frontal view. **B.** Idem, dorsal.

Discussion

Excluding *Salticus mutabilis*, all the species discussed in this article have been found within indoor settings and controlled conditions, typically environments maintained at a constant temperature and/or humidity. It is highly probable that these species were introduced alongside exotic ornamental plants. Just as BOSMANS & VAN KEER (2017) qualified *Oecobius amboseli* and *O. navus*, *Spermophorides mediterranea* can also be categorised as "introduced species that have been found to breed in our country". VAN KEER (2022) delves into the challenge of determining the status of exotic species imported into Belgium and proposes that "naturalization occurs when a species persists in more than one location for a certain number of years (a minimum of 10 years) without direct human intervention".

In this context, *Saitis barbipes* (Simon, 1868), recently document from Belgium by (HENRARD and DRUMONT 2022) may be an example of an introduced species seemingly successfully establishing (i.e., naturalising) in Belgium (see also VAN KEER 2022). Its origin in Belgium remains uncertain, but it is not inconceivable that it ended up here via imports, and that it subsequently also reached the country via natural area expansion. Whatever, this species has demonstrated its ability to persist over many generations in various locations and diverse habitats in Belgium (although primarily in human-altered environments). It would not be surprising that, taking in account its natural ability to breed in Belgium (i.e. without human help or facilities), that this species will be later integrated in the Belgian arachnofauna.

Conversely, the species discussed in this paper are confined to specific localities and exclusively inhabit indoor environments controlled by humans. It's likely that these species cannot thrive beyond the sheltered confines of temperature-controlled greenhouses or other indoor structures (VAN KEER 2007). Consequently, despite their long-standing presence (as seen in the case of *Oecobius amboseli*), these species cannot be considered integrated into the Belgian fauna. They must be regarded as locally established alien species (i.e. inclusion in section "Species introduced and breeding with us").

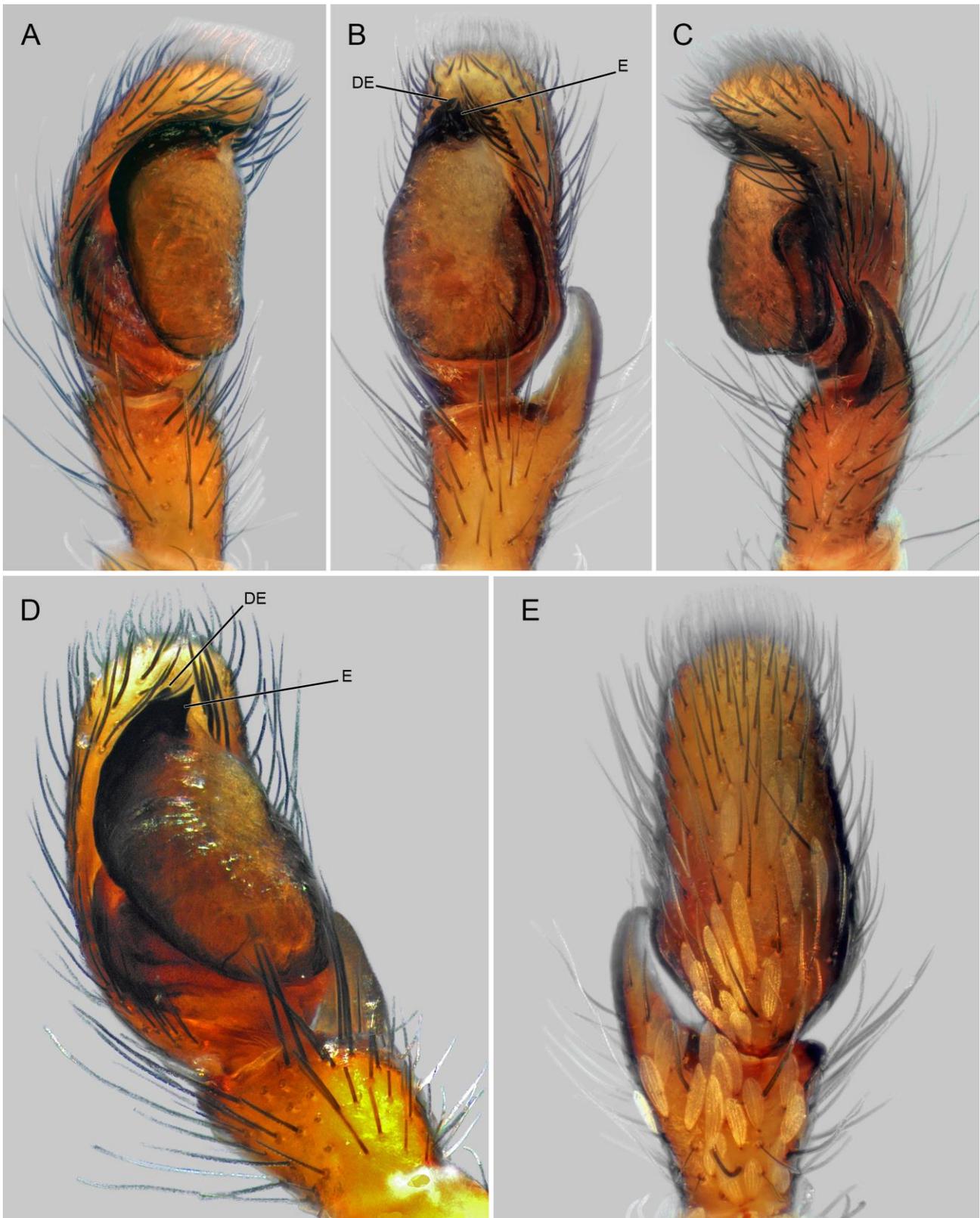


Figure 9: Male palp of *Salticus mutabilis* Lucas, 1846 (AH_20110426-01). **A.** Prolateral view. **B.** Ventral view. **C.** Retrolateral view. **D.** Vento-prolateral view. **E.** Dorsal view. Abbreviations: DE = dorsal extension of embolus; E = embolus. No scales provided.

Conclusion

To conclude on a completely different note, it would be interesting to consider conducting specific inventory campaigns (in our case, focusing on spiders), not only in the Pairi Daiza animal park but also in other parks in Belgium, whether they are public or private. These parks use exotic plants imported for decorative purposes and have facilities maintaining greenhouse-like conditions. It is therefore highly likely that some exciting discoveries still await us in such places.

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