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DICRANOPALPUS CAUDATUS DRESCO, 1948: NOT A SYNONYM OF *DICRANOPALPUS RAMOSUS* (SIMON, 1909) BUT A VALID SPECIES AFTER ALL (ARACHNIDA, OPILIONES)

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Abstract: *Dicranopalpus caudatus* Dresco, 1948, formerly considered a synonym of *Dicranopalpus ramosus* (Simon, 1909), is revalidated based on a comparative characterisation of both taxa by studying specimens from the Iberian Peninsula, France, England and The Netherlands. Until now, *D. caudatus* has been confirmed for Spain, Portugal and England. Both species show allopatric distributions in the Iberian Peninsula, with *D. caudatus* distributed along the western, southern and eastern Iberian coasts and *D. ramosus* only on the northern Cantabrian coastal strip. In contrast, both species seem to be sympatric in southern England. However, the current status of *D. caudatus* in England needs to be assessed, since it was last recorded 30 years ago. Diagnostic characters, illustrations and distribution maps are provided for both species.
Key words: Opiliones, *Dicranopalpus*, revalidation, Iberian Peninsula, southern England.

***Dicranopalpus caudatus* Dresco, 1948 no es un sinónimo de *Dicranopalpus ramosus* (Simon, 1909) sino una especie válida, después de todo (Arachnida, Opiliones)**
Resumen: Estudiando especímenes procedentes de la Península Ibérica, Francia, Inglaterra y Holanda, se revalida *Dicranopalpus caudatus* Dresco, 1948, anteriormente considerada un sinónimo de *Dicranopalpus ramosus* (Simon, 1909), en base a una caracterización comparativa de ambos taxones. Hasta ahora, *D. caudatus* ha sido confirmada para España, Portugal e Inglaterra. Ambas especies muestran áreas de distribución alopátricas en la Península Ibérica, con *D. caudatus* repartida por una ancha franja que sigue la costa occidental, meridional y oriental, mientras que *D. ramosus* ha colonizado solamente la Cornisa Cantábrica. Por el contrario, ambas especies parecen ser simpátricas en el sur de Inglaterra, aunque la situación actual de *D. caudatus* requiere reevaluación, ya que no se ha encontrado desde hace más de 30 años. Se proporcionan caracteres diagnósticos, ilustraciones y mapas de distribución para ambas especies.
Palabras clave: Opiliones, *Dicranopalpus*, revalidación, Península Ibérica, sur de Inglaterra.

Introduction

Dicranopalpus ramosus (Simon, 1909) is a conspicuous harvestman species, allegedly of Ibero-Maghrebian origin, that has invasively spread across Western-Europe during the last few decades (see references below). Both sexes are characterised by their resting position (legs held parallel and stretched out sideways) and extremely elongated patellal apophysis, giving the pedipalps a forked appearance. Females develop a distinct protuberance on the back end of the opisthosoma. Because the species has been regarded as easily identifiable -especially in European countries where no other *Dicranopalpus* species occur- most attention has concentrated on its invasive nature, seemingly without a need to further verify morphological details. We herein reveal that it is not justified to consider *D. caudatus* and *D. ramosus* conspecifics by analysing historical accounts on both species and by re-examining specimens mostly from the Iberian Peninsula and additional material from France, southern England and The Netherlands. We revalidate *D. caudatus* by comparing it with *D. ramosus* and provide diagnostic characters. Finally, an appeal is made to other researchers to check their *Dicranopalpus* collections in order to verify our findings and clarify the historical as well as the current distribution of both species dealt with here.

Historical accounts on the identity of *D. ramosus* and *D. caudatus*

The genus *Dicranopalpus* Doleschall, 1852 belongs to the superfamily Phalangioidea (suborder Eupnoi) and presently has no family assignment (Crawford, 1992). Apart from *D. ramosus*, four other *Dicranopalpus* species are known from the Iberian Peninsula: *D. pyrenaeus* Dresco, 1948 from the Pyrenees, *D. martini* (Simon, 1878) (= *D. cantabricus* Dresco, 1953) from the Cantabrian Mountains and Central Iberian System, *D. pulchellus* Rambla, 1960 from the south-western corner of Iberia and *D. bolivari* Dresco, 1949 (= *D. dispar* Rambla, 1967) from the Central Iberian System (Dresco, 1953; Rambla, 1959, 1960, 1967a; Staręga, 1973). These species have distinct penial and/or pedipalpal morphology and cannot be confused with *D. ramosus* s.l.

In 1909 Simon described *Dicranochirus ramosus* from Morocco. Although he stated that it was present "*En grand nombre*", his description was succinct and no mention was made of male or female characters (according to Staręga (1973) Simon's material -or what had remained of it- consisted of a male and three females). Simon referred to it as related to *Dicranopalpus* Doleschall, 1852 but did not illustrate the species. In 1948 Dresco described *Dicranopalpus caudatus* based on a female collected by C. Mazarredo from the Serra da Estrela, Portugal. It was characterised by a large dorsal protuberance on the opisthosoma, but no measurements were provided. Rambla (1965) redescribed *D. caudatus* from specimens from La Floresta, near Barcelona, presenting a first illustration of the male penis, which has a simple, cylindrical truncus and an outward-pointing stylus; she also studied a female from the Serra da Estrela (also collected by C. Mazarredo, probably at the same time and location as Dresco's holo-

type). Subsequently, in 1973 Staręga redescribed *D. ramosus* based on the Moroccan type material, selecting a male as lectotype and synonymising it with *D. caudatus* (without actually seeing neither the female holotype of *D. caudatus* nor the specimens of Rambla's redescription). The penis of this single male specimen available to him, had "a -hardly visible!- dorsal cavity in the distal third portion of the approximate tube-shaped truncus" ("Corpus fast röhrchenförmig, mit einer dorsalen Einsenkung im apikalen Drittel (kaum sichtbar!)") and a downward-pointing stylus (Staręga, 1973: Fig. 3-5). We were unable to examine this male lectotype in the Paris collections, but herein uphold this taxon because Staręga's redescription and figures match with European *D. ramosus*. Martens (1978: Fig.711-713) as well as Hillyard & Sankey (1989: Fig. 29d, e) presented illustrations of specimens from southern England with an identical penial morphology as *D. caudatus* from Rambla (1965). Other figures (Wijnhoven, 2009, 2013) from Dutch specimens belong to the '*D. ramosus* type' with truncus cavity. Summarising, the references suggest that two penial types are represented within the current taxon of *D. ramosus*: the '*caudatus* type' (Rambla, 1965; Martens, 1978; Hillyard & Sankey, 1989) and the '*ramosus* type' (other references).

Historical accounts on the distribution of *D. ramosus* and *D. caudatus*

The Moroccan type specimens of *D. ramosus* were collected in 1907 in Mogador (currently Essaouira), Morocco (Simon, 1909). Iberian records of *D. caudatus* are from the Serra da Estrella, Portugal (Dresco, 1948; Rambla, 1967b) and Barcelona, Spain (Rambla, 1965). After the synonymisation of *D. caudatus* by Staręga (1973), *D. ramosus* was recorded from coastal regions of Catalonia, Levante and Murcia (Rambla, 1977, 1986) and an isolated sierra (San Juan de la Peña) in the southern slope of the Central Pyrenees (Rambla, 1985). Recently, it has been recorded from Asturias, Cantabria and Basque Country (Merino-Sáinz *et al.,* 2013). Sankey & Storey (1969) reported *D. caudatus* from France and southern England (Hove near Brighton, Sussex; Bournemouth, Hampshire; with first English records dating from 1957); Wheatley (1971) mentioned it from Helston and the Lamorna Valley (Cornwall). Hillyard & Sankey (1989) stated that "since its British discovery at Bournemouth in 1957 this species has established many thriving colonies in the south." In the context of our current re-evaluation, however, the identity of the specimens mentioned by these authors remained in most cases obscure and therefore it has been one of our aims to re-examine some of the material (see Material examined and Geographic distribution).

Since around 1990 *D. ramosus* has been steadily moving north along the Atlantic coast, initially avoiding the Central-European region. In France there are additional records from the south-western Atlantic regions from the departments of Pyrénées-Atlantiques and Landes (Rambla 1986, Delfosse 2004) and the Mediterranean department of Pyrénées-Orientales (Rambla, 1986; Delfosse, 2004; Ledoux *et al*., 1996; Ledoux & Emerit, 2006), first records in north-eastern France in 2004 (Iorio, 2007) and recently also records from several eastern departments (Delfosse & Iorio, in prep.). Thus far, the species has been recorded as new to the Netherlands in 1993 (Cuppen, 1994; Noordijk *et al*., 2007), Belgium in 1994 (Slosse, 1995; Vanhercke, 2004), Ireland in 1994 (Cawley, 1995), Scotland in 2000 (Hillyard, 2000; Davidson, 2012; Nicholson, 2014; Usher, 2014), Germany in 2002 (Schmidt, 2004, with European distribution map; http://spiderling.de/arages/index2.htm, visited December 2014), Denmark in 2007 (Toft & Hansen, 2011; Enghoff *et al*., 2014) and Sweden in 2012 (Jonsson, 2013).

Material examined

Abbreviations: CP, C. Prieto; CRBA, collection Maria Rambla, Centre de Recursos de Biodiversitat Animal, Universitat de Barcelona; HW, H. Wijnhoven; ZUPV, Zoological collection of the Departamento de Zoología y Biología Celular Animal, Universidad del País Vasco; CJM, collection J. Martens, Institut für Zoologie, Johannes Gutenberg-Universität Mainz.

Dicranopalpus caudatus

Portugal. 1M {ZUPV4587}, Bragança: Largo S. Bartolomeu (Bragança, 29TPG872295, 800m), 20.10.2009, leg. J. Benhadi. 1J {ZUPV3336}, Miranda do Douro: Picote (Bragança, 29TQF220845, 630m), 06.09.2001, leg. P. Cardoso. 1F {ZUPV4515}, Valverde: Herdade da Mitra (Evora, 29SNC8565, 220m), 16.03.2007, leg. S. Henriques. 1M {ZUPV4521}, ibid., 03.12.2004, leg. S. Henriques. 1F {CRBA3627}, Serra da Estrela (Guarda, 29TPE07), leg. Mazarredo. 1J {ZUPV4128}, Serra da Estrela: Seia: Cabeça (Guarda, 29TPE0664, 550m), XI.1999, leg. Grosso-Silva.

Spain. 1F, 1J {CRBA3613}, Petrel: Sierra Carrascal (Alicante, 30SXH96), leg. Español. 1F, 3J {CRBA500}, St.Llorenç: C. Triangle (Barcelona, 31TDG175142), 04.05.1969. 2F {CRBA3624}, Sant Cugat del Vallés: La Floresta (Barcelona, 31TDF2686), leg. M.Rambla. 2M {CRBA3628}, ibid., 25.09.1965, leg. M.Rambla. 2F {CRBA3623}, Viladecaballs (Barcelona, 31TDG1201), 30.10.1966. 1M {ZUPV3023}, Begués: Les Burigues (Barcelona, 31TDF0 75740, 361m), 09.12.2004, leg. CP, J. Fernández & M. Higuera. 2F, 1J {CRBA3612}, St. Pere de Roda (Girona, 31TEG1385), 09.09.1964. 1M, 1J {CRBA1270}, San Juan de la Peña (Huesca, 30TXN90), 08.07.1980 (a male specimen with female aspects such as opisthosomal protuberance and pedipalpal plumose setae). 1F {CRBA2232}, Estepona: Los Reales (Málaga, 30SUF0240), 23.02.1974, leg. Outerelo. 1M {CJM 4038}, Mijas: surroundings (Málaga, 30SUF5351W4.38 N36.36, 600m), 15.12.1987, leg. W. Heinz. 1M, 2J {CRBA3614}, Sierra Carrascoy (Murcia, 30SXG59). 1F, 2J {CRBA1273}, Beceite: Monroyo (Teruel, 31TBF5019), 05.08.1976. 1F, 1J {CRBA3610}, without locality (Valencia). 1F {ZUPV3076}, Galende: Cárdena (Zamora, 29TPG8366, 1300m), 11.09.2004, leg. J. M. Alberdi. 1M {ZUPV3093}, ibid., 30.10.2004, leg. J. M. Alberdi. 1F {ZUPV4031}, Río Madera (E:J, 30SWH34-35-, 1210m), 14.11.2004, leg.D. Corral.

United Kingdom. 1M, 1F {CJM 847}, Brighton: Hove (West Sussex, 30UXB93), 09.1967 (Sankey ded. 10.1967). 1F {CJM 2809}, Bath: Combe (North Somerset, 30UWB49), 26.10.1984 (J. Senkly ded. 1987).

Dicranopalpus ramosus

France. 1M, 3F {HW col.}, Bayeux (Calvados, 49.16N 0.41E, 43 m), 23.09.2014, leg. HW. 1M {HW col.}, Bordeaux (Gironde, 44.53N, 00.35E), 25.09.2014, leg. HW. 1F (dried) {CRBA2229}, Gavarnie (Hautes -Pyrénées, 30TYN43), 15.09.1980. 1M {CJM 6351}, Lit-et-Mixe (Landes), 30.08.1994, leg. N. Bauer. 1M {CJM 6352}, ibid., 07.09.1994, leg. N. Bauer. 2F {CJM 6354}, Saint-Julien-en-Born (Landes), 02.09.1994, leg. N. Bauer. 1F {CJM 595}, Biarritz: Forêt de St. Peé (Pyrénées-Atlantiques,), 07.09.1967, leg. JM. 1M {ZUPV3016}, St.Jean-de-Luz: Golf Chantaco (Pyrénées-Atlantiques, 30TXP109038, 16m), 05.12.2004, leg. CP, J. Fernández & M.Higuera. 1M {ZUPV3496}, Larceveau: Hosta (Pyrénées-Atlantiques, 30TXN556804, 450m), 29.10.2005, leg. K. Altonaga. 1F {ZUPV4579}, Mongelos (Pyrénées-Atlantiques, 30TXN501845, 234m), 15.08.2010, leg. K. Altonaga.

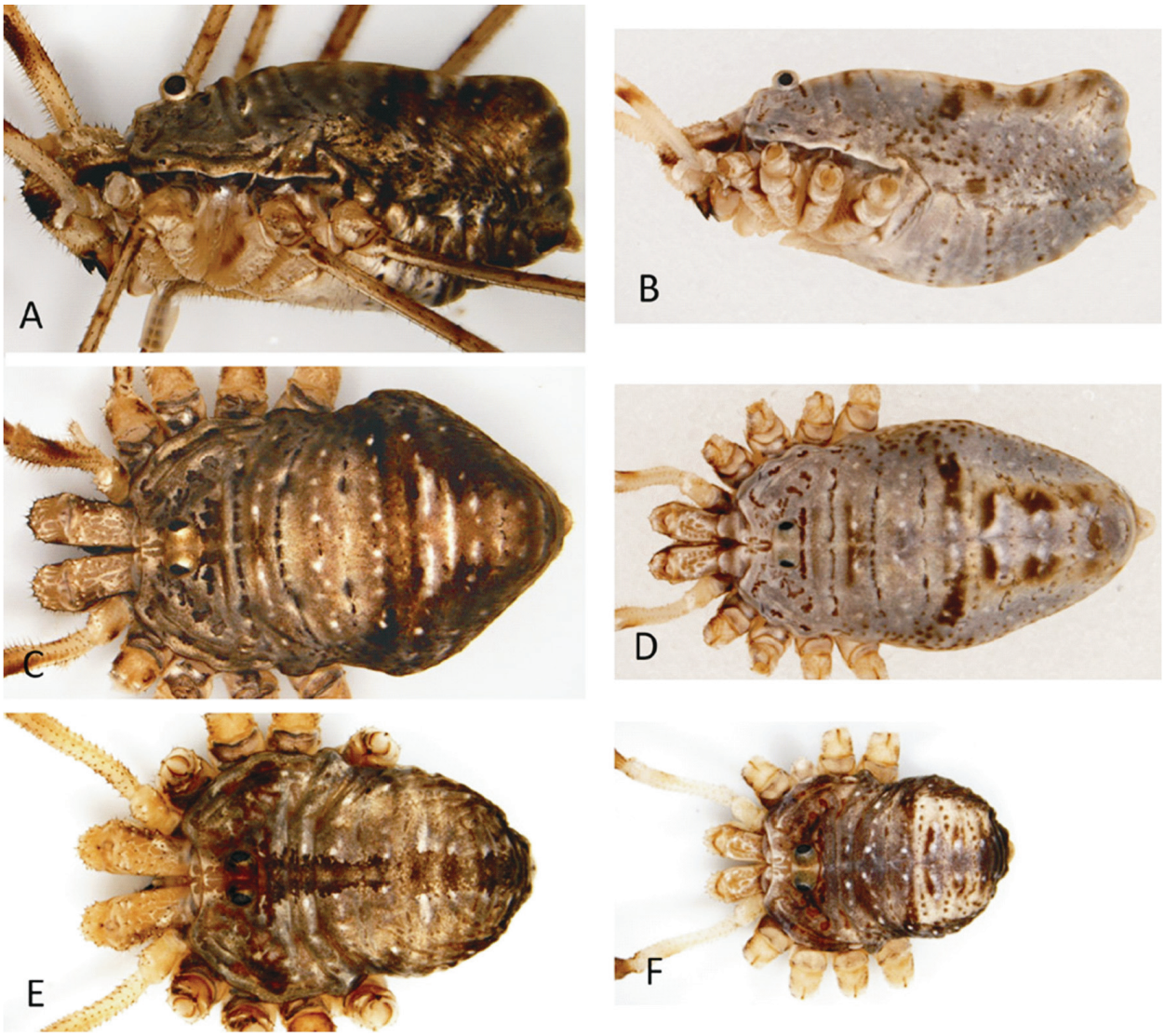


Fig. 1. *Dicranopalpus,* lateral view (A, B), dorsal view (C-F). *D. ramosus*, A, C, female (Laukariz 4806), E. male (Larceveau 3496). *D. caudatus* B, D. female (Galende 3076) F. male (Galende 3093).

Netherlands. 8M, 3F {HW col.}, Nijmegen (31UFT979470, 35m), at walls of a cemetery, 12.01.2014, leg. HW. 4M, 4F {ZUPV5097}, same site, 28.12.2013, leg. HW.
Spain. 1J {ZUPV4681}, Izarra: Belunza (Alava, 30TWN094561, 620m), 03.07.2008, leg. J. C. Iturrondobeitia. 1M, 1J {ZUPV4805}, Poo de Llanes: camping (Asturias, 30TUP554098, 20m), 03. 08.2012, leg. I. Palacios. 1F {ZUPV1959}, Carranza: Ambas-aguas (Bizkaia, 30TVN7187, 220m), 22.07.2003, leg. J.Fernández & A. Alabau. 6M {ZUPV1884}, Górliz: Astondo (Bizkaia, 30TWP 042076, 50m), 29.08.2003, leg. CP. 1J {ZUPV1958}, Górliz: Eloísa Artaza (Bizkaia, 30TWP051070, 30m), 15.08.2004, leg. CP. 1F {ZUPV4185}, ibid., 15.08.2008, leg. CP. 16M, 8F, 1M subad {ZUP V4995-4997}, Gorliz: Pinar de Astondo (Bizkaia, 30TWP0 44078, 40m), 29.08.2013, leg. CP. 1F, 1J {ZUPV4806}, Mungia: Laukariz (Bizkaia, 30TWN124973, 90m), 26.08.2012, leg. I. Palacios. 3J {ZUPV1734}, Nachitua (Bizkaia, 30TWP3103, 200m), 18.07.1981, leg. R. Martín. 1F {ZUPV3823}, Abaltzisketa: Barrio Larraitz (Gipuzkoa, 30TWN733654, 390m), 30.09.2006, leg. J. A. Galarraga. 1F {ZUPV4808}, P. N. Aiako Harria: Bosq. Oieleku (Gipuzkoa, 30TWN96-89-, 500m), 21.08.2012, leg. X. Pagola. 1F {ZUPV 1721}, S.Sebastián (Gipuzkoa, 30TWN89), 11.1995, leg. A. Castro. 1F {ZUPV1745}, S.Sebastián: Ayete (Gipuzkoa, 30TWN 818954, 98m), 15.08.1998, leg. A. Castro. 1F {ZUPV824}, Echalar: km 69 dl C-133 (Navarra, 30TXN0788, 50m), 13.09.1988, leg. R. Gorrotxategi. 1F {ZUPV4812}, Orokieta (Navarra, 30TXN008628, 0m), 12.09.2012, leg. J. C. Iturrondobeitia.
United Kingdom. 1M, 6F, 4J {CRBA3603-3605}, Clacton on Sea (Essex), summer 1970, leg. Hicks.

Comparative characterisation of *Dicranopalpus ramosus and D. caudatus*

The examined material confirms the presence of two penial types (Fig. 4). Females are also clearly distinct in the two species. The general appearance of *D. caudatus* is that of a small and delicate species, almost giving the impression of a juvenile or subadult of *D. ramosus*. Especially when placed side by side *D. caudatus* in every aspect is conspicuously smaller than *D. ramosus* (Fig. 1; Table I).

Colouration and dorsum. Background colour of *D. ramosus* yellowish-brown. Most males have a distinct black transverse band running across the eyes which has given them the nickname 'Zorro' (e.g. Fig. 1 in Wijnhoven, 2013). Males rarely have a dark median longitudinal stripe on the opisthosoma. The colour pattern of females usually is more contrasting with a characteristic pattern of silvery and black

Table I. Discriminative features of males *D. ramosus* (n=6) and *D. caudatus* (n=4). Measurements in mm.

	D. ramosus	*D. caudatus*
Body length	3.12-4.12	2.10-2.97
Length leg femur I	5.80-6.24	4.35-4.95
Length patellar apophysis	0.95-1.22	0.77-0.92
Length pedipalpal tibia	1.50-1.83	1.17-1.25
Ratio pedipalpal apophysis/tibia	0.63-0.68	0.66-0.73
Penis length	2.03-2.25	1.40-1.45
Penis truncus	Fusiform, with dorsal cavity	Cylindrical, solid, no cavity
Penis stylus	Slender, ventral setae near top	Robust, lateral setae in midsection
Angle truncus/stylus	0-5º	30-40º

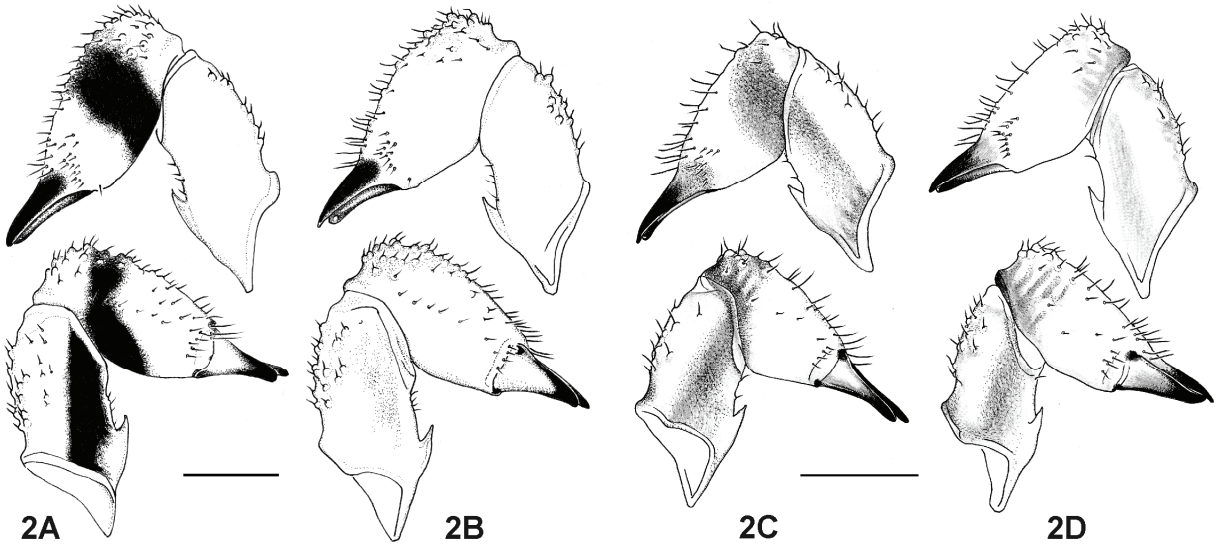


Fig. 2. Right Chelicera of *Dicranopalpus ramosus* (A, B) and *D. caudatus* (C, D). Top median view, bottom lateral view. A, C: Female. B, D: Male. Scale bars 0.5 mm. (Figures A and B have been previously published in Wijnhoven 2013).

transverse patches on the abdomen; occasionally with a black median longitudinal stripe. This species is highly variable in coloration with animals getting darker and more reddish-brown when aging. In December to February especially females may have gone almost deep reddish grey-black.

Compared to *D. ramosus* the background colour of *D. caudatus* is shinier, more silvery. Our male specimens are yellowish brown, mostly with a silvery-yellow, black-spotted dorsum. The black transverse band across the eye tubercle area is indistinct. Females silvery-greyish brown with one or more dark transverse bars on the opisthosoma and a rather vague pale median longitudinal stripe.

Females of both species develop a distinct hump on the dorsal tergites, which is more pronounced in *D. caudatus* females; moreover, the venter of *D. caudatus* females is clearly swollen (Fig. 1A, B; Martens, 1978: Fig. 717).

Chelicerae. Smaller in *D. caudatus* (compare scale bars in Fig. 2) and with a less pronounced armature of tubercles. Colouration in *D. ramosus* distinctly sexually dimorphic, lateral side with a glossy black longitudinal band (Fig. 2a) in the female while they are uniformly yellowish-brown in the male. In *D. caudatus* colouration more intersexually uniform, female with indistinct darker longitudinal band.

Pedipalps. *D. caudatus* has smaller pedipalps (Fig. 3a, b, e), femoral apophysis shorter and thicker in both sexes (Fig. 3l), patellal apophysis longer relative to the tibia (Table I). Tibia mediodistally with small, but distinct apophysis (Fig. 3i), which is no more than a rounded projection in *D. ramosus* (Fig. 3j). This feature is more prominent in females than in males. In both species the females have plumose glandular setae on the pedipalpal femur, femoral apophysis (Fig. 3k, l), patella (including the whole surface of its apophysis) and the tibia (Fig. 3i, j).

Legs. Legs are shorter in *D. caudatus*. Male leg III in both species provided with numerous bipterate setae (Wijnhoven, 2013: Fig. 2, 3, 5c, d and 10) on metatarsus and proximal tarsomeres. In *D. ramosus* male leg IV also has some bipterate setae (about 100), but none were found in *D. caudatus* male leg IV.

Penis. Although the penial morphology in both species is clearly different (Fig. 4), there are anatomical similarities: truncus base heavily sclerotised bearing two dorsally curved lateral projections serving as attachment sites for extrinsic penial muscles (Wijnhoven, 2013); stylus with grouped sensory setae.

Dicranopalpus ramosus is characterised by a long and slender fusiform truncus with a fusiform dorso-distal cavity, opening to the exterior via a single, simple median slit with the length of the cavity, which is confirmed by cross sections (Fig. 4a; Wijnhoven, 2013). With a large intrinsic penial muscle approximately in the basal 4/5th of the truncus. Glans more rectangular in lateral view with a bulge above the stylus (Fig. 4c). Stylus slender, bent downwards, in resting position almost parallel to the truncus (Table I). Close to the stylus top with a ventral cluster of setae (Fig. 4e), dorsally with two or three pairs of minute teeth (rudimentary in some individuals).

Penis of *D. caudatus* smaller, truncus almost cylindrical, no dorsal cavity present (Fig. 4b). Glans more rounded, stylus

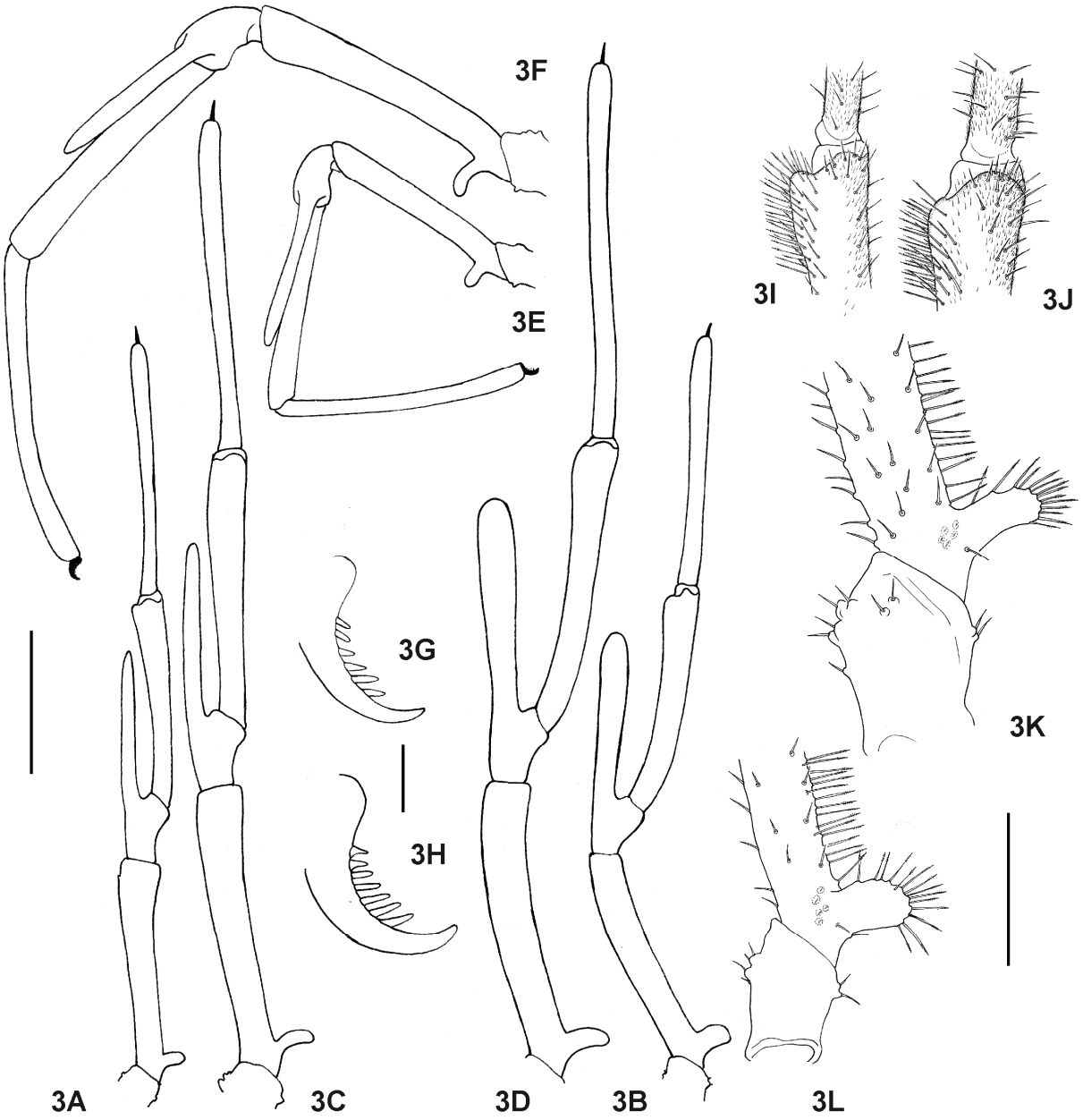


Fig. 3. Right pedipalp of *Dicranopalpus ramosus* (C, D, F, H, J, K) and *D. caudatus* (A, B, E, G, I, L). *D. ramosus*: C. Male, dorsal view. D. Female, dorsal view. F. Male, lateral view. H. Claw. J. Tibia/tarsus, dorsal view. K. Trochanter and base of femur, lateral view. *D. caudatus*: A. Male, dorsal view. B. Female, dorsal view. E. Male, lateral view. G. Claw. I. Tibia/tarsus, dorsal view. L. Trochanter and base of femur, lateral view. Scale bars A-F 1.0 mm, G-H 50 µm, I-L 0.5 mm.

and stylus tip more robust, pointing outwards, in resting position making an angle of 30º to 40° with the truncus (Fig. 4d; Table I). Midsection of the stylus with a cluster of setae, placed on an indistinct lateral knob (Fig. 4f).

Seminal receptacles. Most characteristic in *D. ramosus* are the long tubular receptacles attached to an 'm'-shaped apical structure (Fig. 5a). In *D. caudatus* the tubular receptacles are smaller, they attach to a globular structure, 'm'-shape less distinct (Fig. 5b).

Geographical distribution

From our morphological evaluation the geographical distributions of both species emerge (Fig. 6, 7; Table II). On the Iberian Peninsula *Dicranopalpus caudatus* has been verified from several provinces of the Spanish Mediterranean coast and some Portuguese districts, suggesting a continuous broad distribution along the coastal zone, avoiding the central regions of the peninsula. From southern England two records of *D. caudatus* are confirmed: the male and female from Hove, donated by the late J. Sankey to J. Martens (CJM 847, September 1967) which were figured in Martens (1978: Fig. 711-718); one female (CJM 2809, 26-10-1984) from Combe, Bath.

Dicranopalpus ramosus has been recorded from the eastern Cantabrian region (Spanish provinces of Asturias, Bizkaia, Gipuzkoa, Navarra and the French department of Pyrénées-Atlantiques), north along the French coast (departments of Landes and Gironde) and further inland. As mentioned before, its rapid colonisation of Western Europe has received considerable attention and has been well documented (Fig. 7).

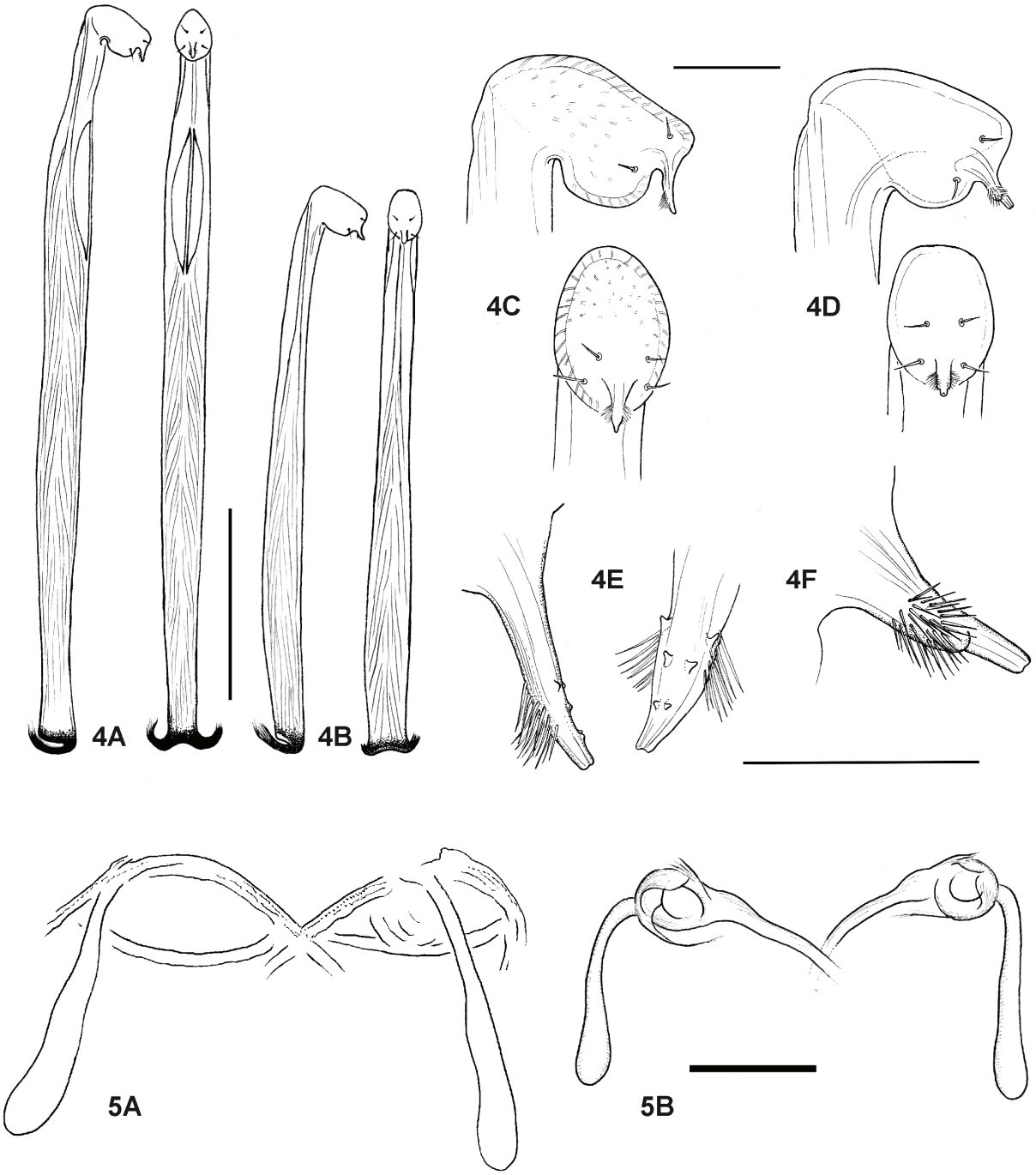


Fig. 4. Penis of *Dicranopalpus ramosus* (A, C, E) and *D. caudatus* (B, D, F). *D. ramosus*: A. Penis, left lateral view, right dorsal view. C. Glans, lateral and dorsal view. E. Stylus, lateral and dorsolateral view. *D. caudatus*: B. Penis, left lateral view, right dorsal view. D. Glans, lateral and dorsal view. F. Stylus, lateral view. Scale bars A-B 0.5 mm, C-D 0.1 mm, E-F 50 μm. **Fig. 5.** Seminal receptacles of *Dicranopalpus ramosus* (A) and *D. caudatus* (B). Scale bar 50 μm.

Conclusions and discussion

Based on the present morphological study, we herein revalidate *Dicranopalpus caudatus* Dresco, 1948. Although we did not see Dresco's type, a revalidation is corroborated by the cited historical accounts as well as by the exclusive occurrence of *D. caudatus* in the type locality. Since Staręga (1973) did not have the opportunity to study the male specimen of Rambla's *D. caudatus* (Rambla, 1965) he could not judge the differences in penial morphology. His peculiar remark "kaum sichtbar!" ("hardly visible!") referring to the penial truncus cavity of the Moroccan male *D. ramosus* syntype suggests that he was well aware of the inconsisten-cies of his own findings with those of Rambla (1965). As we recognize now, figure 4 of Rambla (1965; *D. caudatus*) as well as figures 3-5 of Staręga (1973; *D. ramosus*) are rather accurate, enabling a historical reconstruction of this taxonomic inaccuracy. On the other hand, Rambla accepted the action of Staręga and used the name *D. ramosus* throughout her subsequent publications (e.g. Rambla, 1977, 1986) although the majority of her samples proved to be *D. caudatus*.

As mentioned earlier, the genus *Dicranopalpus* (superfamily Phalangioidea) presently has no family assignment but

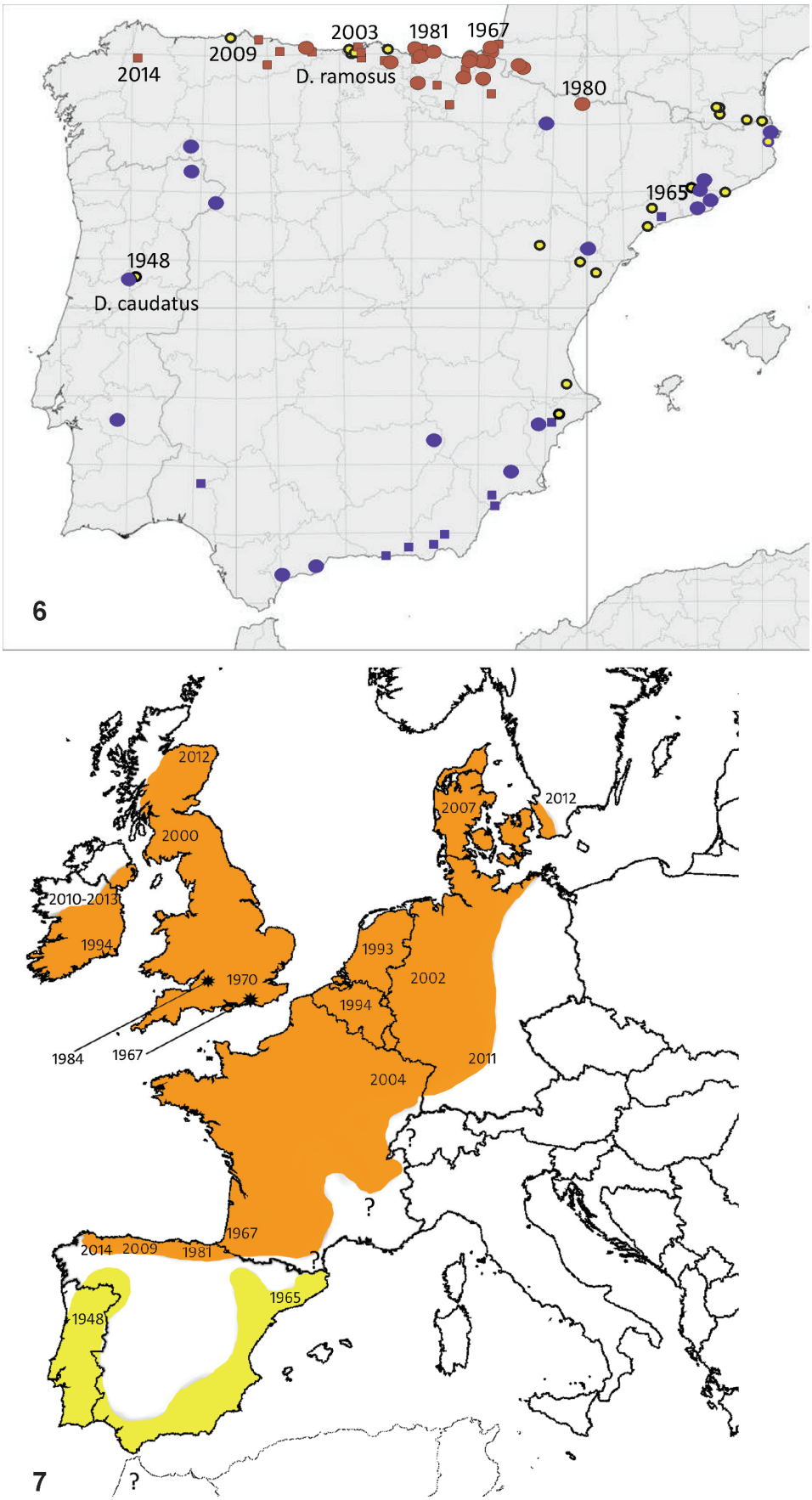


Fig. 6. Records of *Dicranopalpus caudatus* (blue dots ●) and *D. ramosus* (red dots ●) based on new or revised records. Years are of confirmed records. Included are also records based on photo-identifications (small squares ■ ■ of the corresponding colour; see Table II) and unconfirmed bibliographical citations of *D. ramosus*/*D. caudatus* (● small yellow dots). **Fig. 7.** Reconstruction of the European distributions of *Dicranopalpus ramosus* (orange grey ▮) and *D. caudatus* (yellow grey ▮ and two asterisks in southern England) and the years of first recording in each country or region (references in text).

Table II. Photographical records of *Dicranopalpus* housed on the website 'Insectarium Virtual' (http://www.biodiversidadvirtual.org/insectarium/). For each record, locality, biotope, country, province or department, coordinates, altitude, date, photographer, sex (J=juvenile) and image number are provided. Source http://www.biodiversidadvirtual.org/insectarium/Dicranopalpus-group.-cat19686.html FR: France; SP: Spain; F: female; J: juvenile; M: male.

Locality	Biotope		Province	Coordinates	Altitude	Date	Photographer	Sex	Image
***Dicranopalpus caudatus* Dresco, 1948**									
Tibi	Mediterranean shrubland	SP	Alicante	30SYH084643	837	08/12/2012	Germán Muñoz	F	429771
Adra	Shrubs with Cistus, thorns, pines	SP	Almería	30SVF97		27/12/2014	Francisco Rodriguez	F	662078
Enix	Pines, oaks, rosemary, esparto	SP	Almería	30SWF340829	940	02/02/2013	Francisco Rodriguez	F	436666
Desierto de Tabernas		SP	Almería	30SWF510973	318	27/12/2012	Francisco Rodriguez	M	432471
La Garnatilla	Growing of tropical fruit	SP	Granada	30SVF606664	283	11/03/2012	Manuel López	J	317153
Minas de Riotinto	Building wall	SP	Huelva	29SQB123745	417	19/12/2011	David Marquez	M	301842
Minas de Riotinto	Mediterranean woodland	SP	Huelva	29SQB123745	417	01/02/2012	André Burgers	M	307583
Aguilas	Arid scrub on rocky coastline	SP	Murcia	30SXG255402	36	17/11/2012	Jose Carrillo	F	424561
Lorca	Crag with Mediterranean scrub	SP	Murcia	30SXG210554	582	22/01/2012	Jose Carrillo	F	305980
Lorca	Mediterranean scrub.	SP	Murcia	30SXG211554	557	04/11/2012	Jose Carrillo	F	420765
Vistabella	Clear in pine forest	SP	Tarragona	31TCF545630	133	24/12/2012	Martin R. Hoffmann	M	432214
***Dicranopalpus ramosus* (Simon 1909)**									
Anglet	House wall	FR	Pyr.-Atlant.	30TXP212152	22	20/07/2012	Javier Soto	M	382758
Nanclares de Gamboa		SP	Álava	30TWN355536	500	17/08/2007	Luis Fernandez	M	26954
Santa Cruz de Campezo	Urban environment.	SP	Álava	30TWN530242	582	10/08/2011	Carlos González	M	259943
Cereceda	Country house	SP	Asturias	30TUP174058	183	22/08/2013	Juan M. Casanova	F	505225
Gijón	East-facing wall of a house	SP	Asturias	30TTP889241	74	13/08/2011	Luis M. Lafuente	F	260120
Gijón	Gardens	SP	Asturias	30TTP884219	34	24/08/2013	Marián Alvarez	F	517224
Purón	Field area with oak, hazel, etc.	SP	Asturias	30TUP616050	64	15/08/2012	Luis Javier Arnela	M	392938
Soto de Agues	Bushes in wetland.	SP	Asturias	30TTN994861	439	11/08/2012	Rubén de Blas	F	397147
Bakio	Garden wall near a river	SP	Bizkaia	30TWP155084	8	02/10/2011	Juancar Dieguez	M	278743
Bakio	Wall on oak hill near the coast	SP	Bizkaia	30TWP155084	8	15/08/2012	Juancar Dieguez	M	389774
Bilbao	Wall under sunny meadow	SP	Bizkaia	30TWN062893	200	23/10/2010	Juancar Dieguez	M	168612
Cayón	Riparian forest	SP	Cantabria	30TVN306942	133	27/08/2008	C.Juárez & P.do Rego	F	50995
Mortera	Garden, house wall	SP	Cantabria	30TVP250105	58	30/06/2009	Thomas Rickfelder	F	176885
Ramales de la Victoria	House wall in the village	SP	Cantabria	30TVN623894	87	13/09/2013	Francisco Javier Martin	M	531013
Villaescusa	Scrubs	SP	Cantabria	30TVP307007	45	21/08/2012	C.Juárez & P.do Rego	F	392329
San Sebastián	Wall in a street near the beach	SP	Gipuzkoa	30TWN807962	12	06/08/2012	Luis Javier Arnela	M	391920
Tolosa	Front of the house	SP	Gipuzkoa	30TWN753771	110	17/08/2012	Mikel Ormazabal	J	395313
Vilalba	Stone slab on rural road	SP	Lugo	29TPH067939	450	07/10/2013	Manuel Sanmartín	M	521748
Pamplona	Nettles on a shaded river bank	SP	Navarra	30TXN117412	416	13/08/2009	José Manuel Nieto	F	95100

is placed in the so-called *Dicranopalpus*-group, containing seven genera (Crawford, 1992; Pinto-da-Rocha & Giribet, 2007). So far, the systematic relationships between these taxa have not been analysed nor has *Dicranopalpus* been included in phylogenetic studies based on morphological and/or molecular data (Giribet *et al*., 2002; Hedin *et al*., 2012; Sharma & Giribet, 2014). *Dicranopalpus ramosus* and *D. caudatus* show a mosaic of morphological features also present in diverse taxa of Phalangioidea and sister groups. For example, plumose pedipalpal setae have been reported for many adult Phalangioidea, Caddoidea, and for some juvenile Eupnoi, as well as for Ischyropsalidoidea, indicating that the presence of plumose setae is plesiomorphic for Palpatores (Giribet *et al*., 2002; Hunt & Cokendolpher, 1991). Furthermore, the presence of a cheliceral ventral spur (Phalangiidae/ Oligolophinae) and a toothed pedipalpal claw (Sclerosomatidae) are plesiomorphic characters (Hunt & Cokendolpher, 1991). A long apophysis on the pedipalpal patella occurs in *Megistobunus* Hansen, 1921 (Phalangiinae) from the Gulf of Guinea (Hansen, 1921). And some central Asian Gyinae (Sclerosomatidae, but see Hedin *et al.,* (2012) which place *Gyas* in the Phalangiidae clade) like *Rongsharia* (Roewer, 1957) have a pedipalpal apophysis. Another feature *Rongsharia* shares with *D. caudatus* and *D. ramosus* is the brush of setae basally on the penial stylus. These morphological similarities were noticed by Martens (1982), who stressed that also the penial morphology of *Dicranopalpus* appears to point towards phylogenetic relationships with Gyinae. In this respect his remark (Martens, 1982, p. 317) "Der reich strukturierte Truncus von *Rongsharia* hat bei *Dicranopalpus* indes keine Entsprechung." ("However, the elaborately structured truncus of *Rongsharia* has no equivalent in *Dicranopalpus*.") is of particular interest, since in *D. ramosus* such an 'equivalent' structure can be pointed out now, being the dorsal truncus cavity with central slit. This would support Martens' view to situate *Dicranopalpus* closer to Gyinae. Hedin *et al.* (2012) summarise that "several major biogeographic puzzles remain. First, do European sclerosomatids (excluding *Gyas*) represent a monophyletic regional fauna, despite the heterogeneous taxonomic nature of this group (e.g., including leiobunines, sclerosomatines, the enigmatic *Dicranopalpus* group, etc.)? Our small sample hints at this possibility (...), but a much more comprehensive taxon sample is needed to test this hypothesis. Second, what are the biogeographic origins and affinities of the diverse central Asia fauna (e.g., Himalayas; Martens, 1973, 1982, 1987)?"

The apparently allopatric geographical distributions of *D. ramosus* and *D. caudatus* on the Iberian Peninsula further support our conclusions (Fig. 6, 7), with *D. caudatus* widely distributed along the Mediterranean and western Atlantic regions of Iberia, and *D. ramosus* occurring only in the Cantabrian region (including the adjacent French Pyrenees and further north). Some photographic records from Andalusia also suggest a continuous occurrence of *D. caudatus* along its coastal zones. Its presence in the French department of the Pyrénées Orientales (referred to as *D. ramosus* by Rambla, 1986; Ledoux *et al.,* 1996; Ledoux & Emerit, 2006 and Delfosse, 2004) seems plausible because we confirmed *D. caudatus* from Sant Pere de Roda (province of Girona) close to the French border. The only far inland *D. caudatus* record in San Juan de la Peña (Rambla, 1985) may be explained by the southern Ebro basin, acting as an inland dispersal route for Mediterranean species. Juveniles (probably belonging to *D. caudatus*) have been found in the Ebro basin (e.g., Monegrillo, in Zaragoza province, 30TYM1513, 9.10.1994, leg. J. A. Pinzolas).

The findings of *D. caudatus* in southern England as early as 1957 are intriguing and rather puzzling. Two exclusive hypotheses are possible: it is an indigenous species that had been overlooked or it is a recent introduction. The latest additions to the British harvestmen fauna are *Sabacon viscayanus* Dresco, 1952, discovered in 1982 from Wales (Martens, 1983) and *Nemastomella bacillifera* (Simon, 1879), discovered in 1988 from Devon (Smithers & Hogg, 1991). Both share a similar distribution in the Cantabro-Pyrenean region of the Iberian Peninsula and both have been considered introductions from the Pyrenees (Hillyard, 2005). The phalangiid *Paroligolophus meadii* (Pickard-Cambridge, 1890) was regarded a British endemic until Martens (1978) reported it from the Cantabrian Mountains. However, an indigenous status for these three species cannot yet be excluded, as they have been collected in (semi)natural biotopes and there are no synanthropic records (Hillyard, 2005). The role of southern Great Britain as a glacial refuge, as demonstrated by Coope (1979) for Carabidae (Coleoptera), also supports this hypothesis. Yet, it is still premature to propose *D. caudatus* as a native species for England, as the possibility of an introduction from the Iberian Peninsula cannot be excluded. Then again, an introduction within a short time span of two congeneric species would seem highly unlikely. A further complicating factor is that *D. caudatus* may have been overrun, and perhaps replaced by *D. ramosus* during the 1980s and 1990s, thus 'blurring' its true identity. Yet, both species have been confirmed for Britain, with the latest record of *D. caudatus* dating back to 1984. Whether this species managed to survive in some area would be particularly interesting to assess.

In Spain *Dicranopalpus ramosus* is restricted to the eastern Cantabrian region. Interestingly, the oldest French records are from 1967, a female from Biarritz, Pyrénées-Atlantiques (Sankey & Storey, 1969) and from 1974, two females from Arcachon, Gironde (Rambla, 1986). An additional record, a female from Gavarnie, Hautes-Pyrénnées dated 1980 (see Material), while the oldest Cantabrian record, three juveniles from the province of Bizkaia, dates back to 1981. Towards the west, it has been recorded from Muros de Nalón (province of Asturias; Merino-Sáinz, 2012) and it has been photographed in the province of Lugo, in Galicia (Fig. 6). According to these data, we hypothesise that colonisation of the Cantabrian region occurred from east to west and started in southern France. This may indicate that *D. ramosus* originates in Morocco and has been introduced into Europe in southern France approximately in the 1960s, from where it dispersed east along the French Pyrenees (collected in 1980 from Hautes-Pyrénées) and north along the Atlantic coasts of France, reaching Arcachon (department of Gironde) before 1974 (Rambla, 1985). Possibly it crossed to Great Britain during this period. However, all this remains to be confirmed. Therefore, we herein do make an appeal to European harvestman researchers (especially from France and England) to check their *Dicranopalpus* collections in order to verify our findings and clarify the current distribution of *D. caudatus*. Also data on habitat, altitude, and phenology are required.

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