Taxonomic review of some Drassodes species from Greece and other East Mediterranean countries (Araneae: Gnaphosidae)

Taxonomic review of some *Drassodes* species from Greece and other East Mediterranean countries (Araneae: Gnaphosidae)

Eli Chatzopoulou & Maria Chatzaki

ABSTRACT Contrib. Nat. Hist. 12: 349–359.

This paper summarizes the results of a study on the Drassodinae collections of the National Museum of Natural History of Paris, France and of the Natural History Museum of the University of Crete, Greece. *Drassodes alexandrinus* (O.P. Cambridge, 1874) is proposed as a new synonym of *D. lutescens* (C.L. Koch, 1839), based on an extensive examination of specimens from insular and continental Greece and from adjacent East Mediterranean countries. Further synonymizations are proposed: *D. carinatus* Strand, 1906 is placed in the synonymy of *Haplodrassus dalmatensis* (L. Koch, 1866), and *D. oreinos* Chatzaki, 2002 is placed in the synonymy of *D. albicans* (Simon, 1878). The above results change the catalogue of the *Drassodes* species recorded on Crete and reduce the percentage of endemism in the area.

Introduction

The genus *Drassodes* is one of the most diverse genera of the family Gnaphosidae worldwide. In Greece it is the second species richest genus, together with *Haplodrassus* (10 species) and following *Zelotes* (28 species). Quite a number of species earlier described as belonging to this genus were either misidentified or transfered to other genera that were created later as subgroups of this large genus (for example *Haplodrassus*, *Leptodrassus*, *Leptodrassex* etc.). Because of the simplicity of the genitalic characters, the distinction of species becomes difficult, especially in the case of very closely related species. Very often taxonomists have created new species based on very small differences between specimens, mainly because most of the time they did not have a high number of vouchers, hence intraspecific variation could not be detected. In a recent revision on the Gnaphosidae of Crete, Chatzaki & al. (2002a, b) came up with 3 new combinations (transfers to other genera), 3 synonymizations

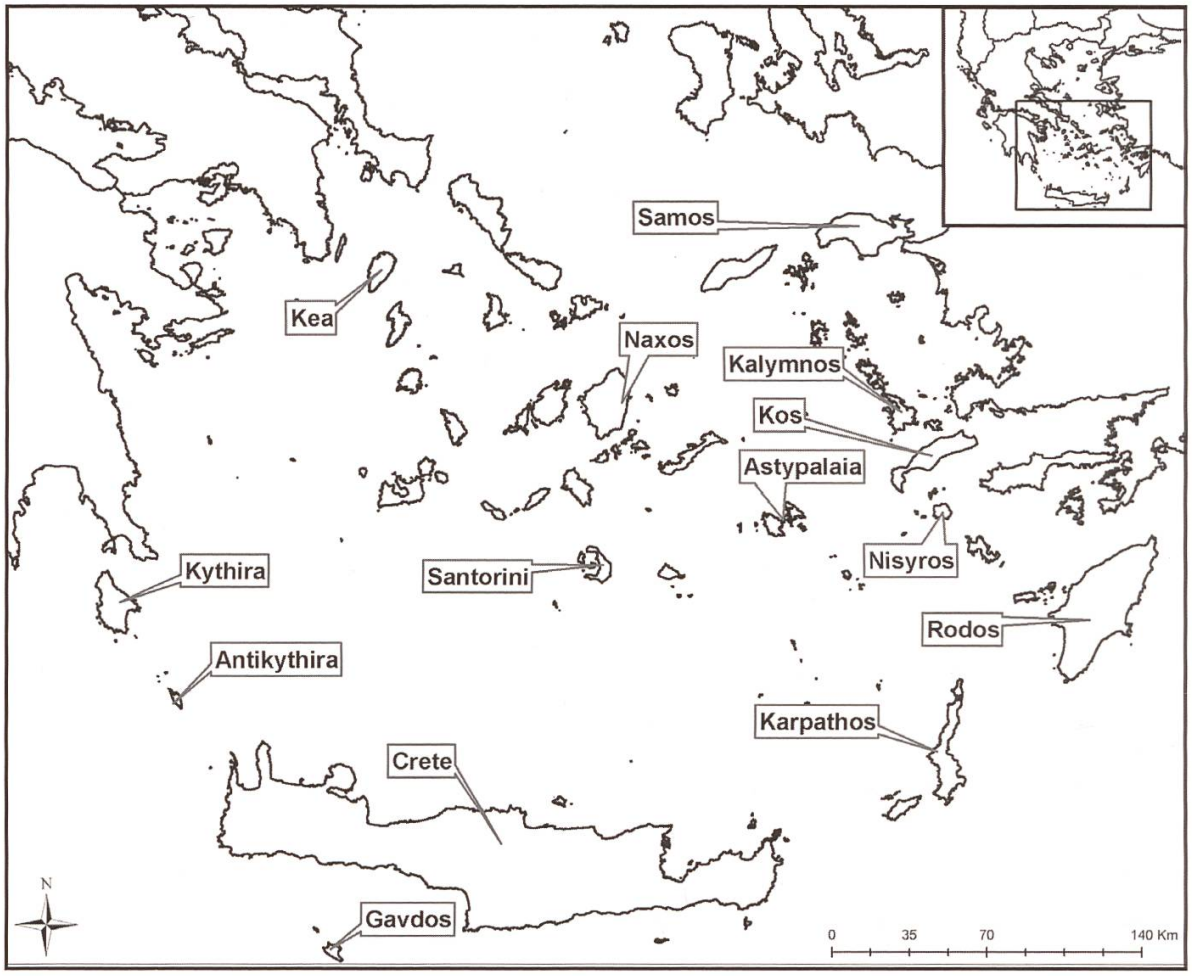


Fig. 1. Map of sampling localities in Greece.

and 1 new species of *Drassodes* from Crete, resulting in a total number of only 4 species on the island. Levy (2004) defined 12 new synonyms within this genus, thus reducing the total number of the existing species in the East Mediterranean area as well.

In this paper some of the *Drassodes* species occurring in the area of Greece and neighboring regions are reviewed, based on the close examination of specimens from insular and continental Greece and from adjacent East Mediterranean countries. The examination of comparative material at the National Museum of Natural History of Paris (MNHN) led to the proposal of further synonymizations.

Materials and Methods

Material comes from multiple expeditions by members of the Natural History Museum of the University of Crete (NHMC) using either pitfall trapping or hand collecting. The islands reported here are shown in Fig. 1. Material from

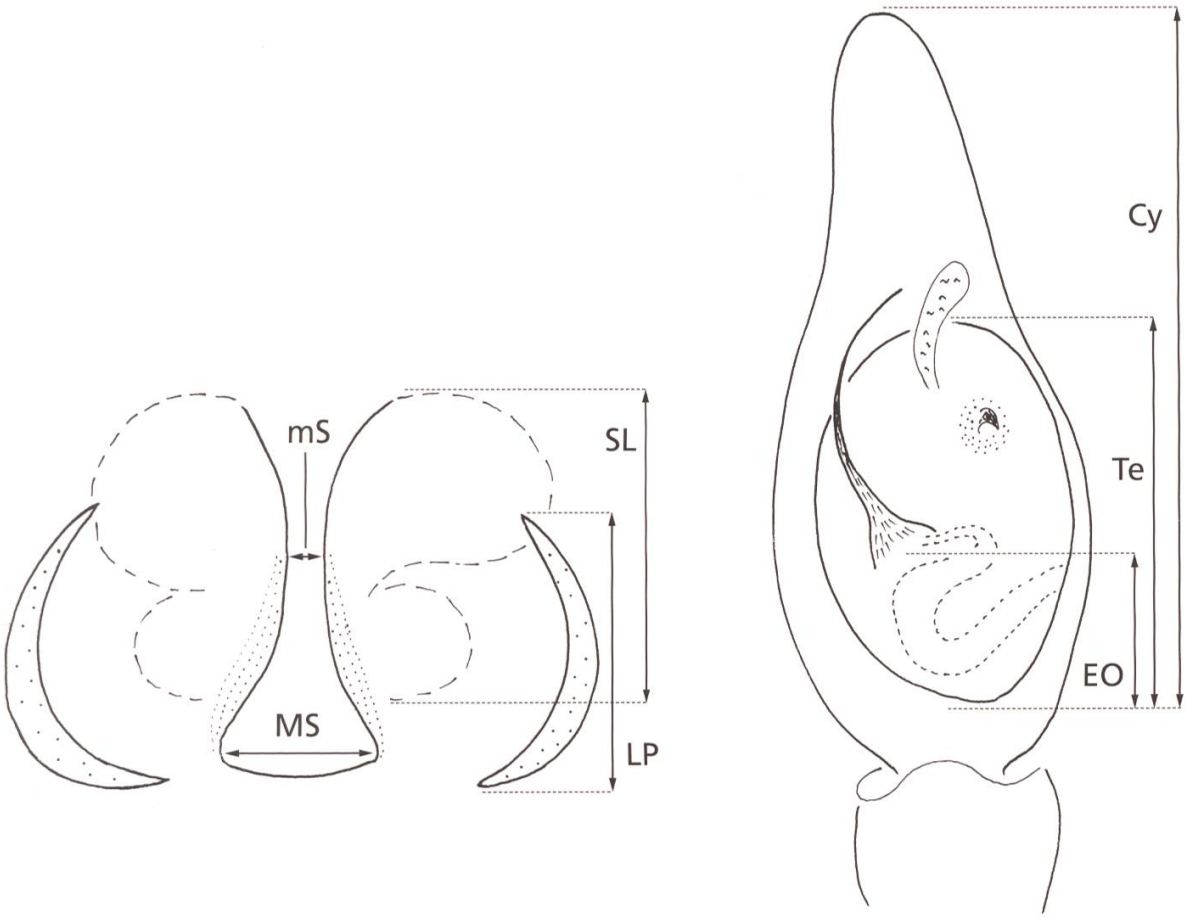


Fig. 2. Sketch of *Drassodes* genitalia with abbreviations measured for morphometric analyses. – ♂: Embolic origin (EO), Tegulum length (Te), Cymbium length (Cy). – ♀: Septum width, maximum (MS) and minimum (mS), Lateral pouches length (LP) Spermathecae length (SL).

adjacent countries was loaned by several colleagues: material from Bulgaria was loaned by Mr. Dolanský, material from Syria was loaned by Dr. Řezáč and material from Israel was loaned by the late Dr. Gershom Levy.

The following morphometric measurements were needed for the taxonomic analysis (see Fig. 2): ♂ – Embolic origin (EO), Tegulum length (Te), Cymbium length (Cy), Pedipalpal tibia length measured laterally (Ti). ♀ – Septum width, maximum (MS) and minimum (mS), Lateral pouches length (LP), Spermathecae length (SL).

All drawings were made by the last author.

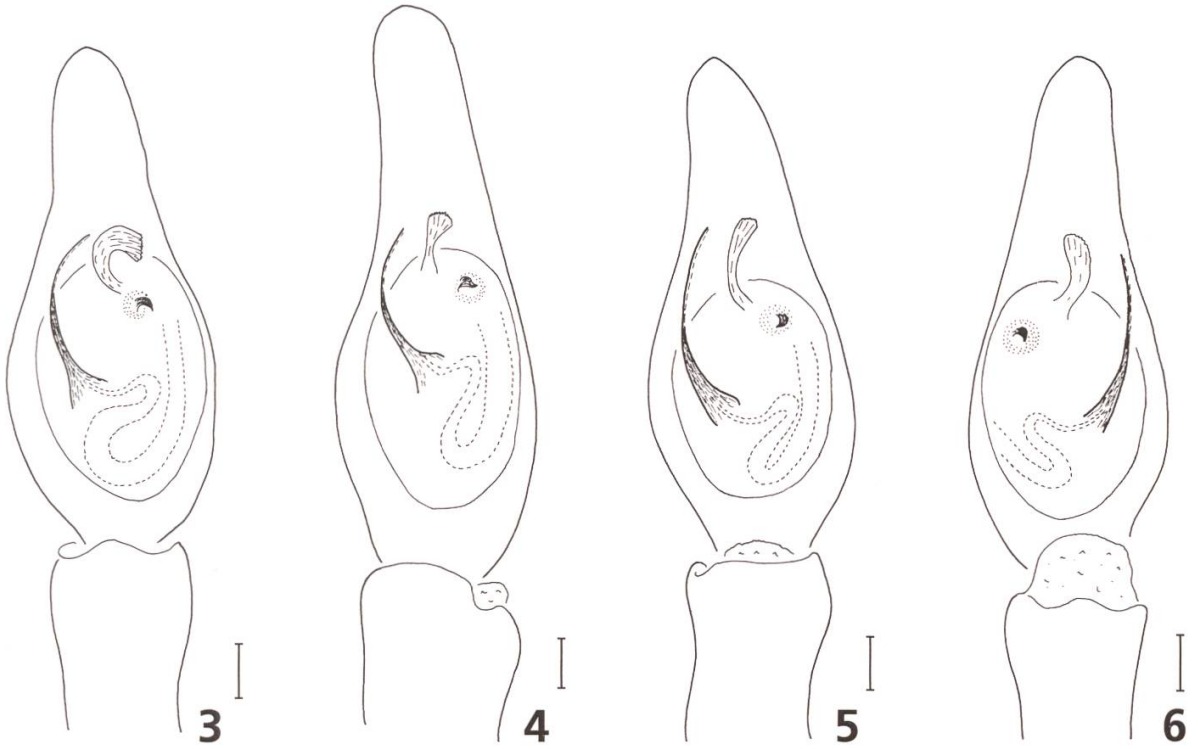
Only relevant primary and secondary citations were considered in the lists of synonymies for each species. For a complete list, compare Platnick (2009).

Results and Discussion

***Drassodes lutescens* (C.L. Koch, 1839)** (Figs. 3–13)

Drassus alexandrinus O. P.-Cambridge, 1874; O. P.-Cambridge (1874): 393, pl. 51, fig. 18; **new synonymy.**
Drassodes alexandrinus (O. P.-Cambridge, 1874); Levy (2004): 16, figs. 40–45.

Material examined: GREECE: Kriti: Moni Vrondisiou (16/4/99–09/6/99, NHMC81.2.10.15 – 2 ♂ 1 ♀); Panagia Almyri (26/1/–02/7/00, NHMC 81.2.1565.6 – 1 ♂); Gramvousa (26/4–26/6/96, NHMC81.2.10.11 – 1 ♂ 1 ♀); Elafonisi (30/12/96–14/3/97, NHMC81.2.321.4 – 2 ♂ 2 ♀); Achendrias (08/6/–04/8/99, NHMC81.2.910.19 – 1 ♂ 4 ♀); Mt. Youchtas (06/6/–02/7/96, NHMC81.2.1762.8 – 10 ♂ 4 ♀). Gavdos: Fanari (27/7–10/11/96, NHMC81.2.129.2 – 7 ♂); Vatsiana (14/6/–24/8/97, NHMC81.2.474.7 – 4 ♀); Lavrakas sanddunes (26/7–09/11/96, NHMC81.2.132.8 – 1 ♂). Kythira: Mermygaris (10/4/96, – 1 ♂). Antikythira: Potamos, 700 m W (27/3–05/8/01, NHMC81.2.2406 – 3 ♀). Kea: Koundouros (21/4/06, NHMC81.2.8487 – 1 ♀). Naxos: Moutsouna (01/5/06–02/7/06, NHMC81.2.9209 – 2 ♂ 3 ♀). Santorini: Profitis Ileias (17/5–24/8/03, – 44 ♂ 7 ♀). Samos: Psili Ammos (02/5/06–06/7/06, NHMC81.2.9207 – 1 ♀). Rodos: Prasonisi (13/5–08/7/06, NHMC81.2.8467.1 – 5 ♂ 2 ♀). Kos: Kefalos (12/5–23/8/01, NHMC81.2.2223 – 6 ♀). Karpathos: Pyles–Volada (26/6–09/9/01, NHMC81.2.1772 – 1 ♂ 1 ♀). Nisyros: Moni Evangelistrias, road of Palaiokastro (01/5–01/6/05, NHMC81.2.8403.15 – 1 ♀); Nikia to Avlaki – phrygana maquis (01/5–05/6/05, NHMC81.2.8405.19 – 7 ♂); Nikia to Avlaki – phrygana (01/5–05/6/05, NHMC81.2.8406.22 – 1 ♀); Gyali islet (30/4–05/6/05, NHMC81.2.8401.21 – 1 ♀); Kandeliousa islet (03/5–06/6/05, NHMC81.2.8408.10 – 5 ♂ 2 ♀); Pacheia (or Passas) islet (03/5–06/6/05, NHMC81.2.8409.9 – 7 ♂); Pergousa islet (05/5–06/6/05, NHMC81.2.8410.10 – 10 ♂ 1 ♀). Kalymnos: near Emporeios (06/4–09/6/05, NHMC81.2.8419.16 – 3 ♂ 1 ♀); Opposite Agia Aikaterini monastery (06/4–09/6/05, NHMC81.2.8420.16 – 37 ♂ 3 ♀); Stimenia, at the end of the road (06/4–09/6/05, NHMC81.2.8422.11 – 19 ♂ 2 ♀); Pserimos islet, NW part – phrygana (01/4–07/6/05, NHMC81.2.8411.17 – 8 ♂); Pserimos islet, SE part – old cultivations near the beach, phrygana (02/4–07/6/05, NHMC81.2.8412.23 – 1 ♂); Pserimos islet, cultivations (02/4–07/6/05, NHMC81.2.8413.17 – 1 ♂); Plati islet – *Juniperus macrocarpa* (03/4–08/6/05, NHMC81.2.8415.13 – 14 ♂ 5 ♀); Plati islet – *Juniperus oxycedrus* (31/3–08/6/05, NHMC81.2.8416.12 – 8 ♂); Kalavros islet (04/4–10/6/05, NHMC81.2.8424.20 – 72 ♂ 4 ♀); Agia Kyriaki islet (04/4–



Figs. 3–6. ***Drassodes lutescens*** **– male palp. 3. Crete, Elafonisi (left palp), 4. Gavdos islet (left palp), 5. Rodos (left palp), 6. Naxos (right palp). Scale bars = 0.1 cm.**

10/6/05, NHMC81.2.8425.14 – 21 ♂ 3 ♀); Telendos islet (05/4–10/6/05, NHMC81.2.8426.16 – 5 ♂ 3 ♀). Astypalaia: Chora to Maltezana, shortly after the narrowest part of the islet (24/4–13/6/05, NHMC81.2.8431.13 – 5 ♂ 3 ♀); Stream after Agios Ioannis church (27/4–13/6/05, NHMC81.2.8437.13 – 3 ♂); Koutsomytis islet (24/4–11/6/05, NHMC81.2.8433.11 – 3 ♂); Kounoupoi islet (24/4–11/6/05, NHMC81.2.8434.13 – 1 ♂); Ofidousa islet (24/4–12/6/05, NHMC81.2.8435.19 – 1 ♂ 1 ♀); Pontikousa islet (26/4–12/6/05, NHMC81.2.8436.10 – 1 ♂).

Remarks: The similarity between *D. lutescens* and *D. alexandrinus* was already stressed by Levy (2004). He illustrated both species and representatives of both sexes with great detail (figs. 33–39 and 40–45 respectively). The main differences between the two species are as follows: in males of *D. alexandrinus* the tibia/cymbium ratio is smaller, the tibial apophysis (if present) is tiny and the filamentous part of the embolus is placed at the lower third of tegulum (in *D. lutescens* it is found at the upper third of tegulum). In females the lateral caps (pouches in Chatzaki & al. 2002b) are larger, enclose the two spermathecae (lower and higher) and reach the epigastric furrow, and the median septum is narrower than that of *D. lutescens*.

Levy also reported that, according to the drawings of Chatzaki & al. (2002b; 613, figs. 23–26), *D. lutescens* from Crete was misidentified and should be placed under the name of *D. alexandrinus*. Based on this remark Bosmans & Chatzaki (2005) doubted the identity of the Greek records of *D. lutescens*

mS/MS	Loc.	LP/SL	Loc.	EO/Te	Loc.	Cy/Ti	Loc.
0.20	CRT	0.33	SM	0.20	CRT	0.71	GVD
0.20	CRT	0.35	NS	0.25	GVD	0.75	ISR
0.20	CRT	0.44	GVD	0.25	CRT	0.75	CRT
0.20	CRT	0.45	CRT	0.31	ISR	0.76	ISR
0.25	GVD	0.47	KRP	0.33	ISR	0.91	CRT
0.25	CRT	0.50	CRT	0.34	GVD	0.91	NS
0.29	CRT	0.50	CRT	0.35	NS	0.96	GVD
0.29	CRT	0.53	CRT	0.38	CRT	1.08	CRT
0.29	CRT	0.57	NS	0.40	CRT	1.09	CRT
0.33	CRT	0.57	CRT	0.40	CRT	1.10	CRT
0.33	CRT	0.59	CRT	0.41	CRT	1.12	GVDP
0.33	CRT	0.62	NS	0.42	CRT	1.13	CRT
0.33	GVDP	0.63	CRT	0.43	YALI	1.13	CRT
0.33	GVDP	0.63	KEA	0.43	CRT	1.13	CRT
0.33	CRT	0.67	CRT	0.43	CRT	1.15	CRT
0.33	CRT	0.67	CRT	0.44	NX	1.15	CRT
0.40	CRT	0.67	GVDP	0.44	CRT	1.15	CRT
0.40	CRT	0.67	CRT	0.45	CRT	1.16	CRT
0.40	CRT	0.67	CRT	0.47	NS	1.19	CRT
0.43	NS	0.67	NS	0.47	CRT	1.20	CRT
0.43	CRT	0.67	CRT	0.48	GVDP	1.21	CRT
0.50	NS	0.67	CRT	0.48	CRT	1.23	GVD
0.50	YALI	0.67	CRT	0.48	CRT	1.25	CRT
0.50	RD	0.67	RD	0.50	GVD	1.28	YALI
0.50	RD	0.69	SYR	0.50	CRT	1.29	CRT
0.50	CRT	0.71	CRT	0.50	CRT	1.29	CRT
0.50	ISR	0.73	CRT	0.50	CRT	1.33	GVDP
0.50	CRT	0.73	CRT	0.50	CRT	1.33	CRT
0.50	CRT	0.75	RD	0.52	CRT	1.33	CRT
0.60	CRT	0.77	CRT	0.53	CRT	1.34	CRT
0.60	CRT	0.77	GVD	0.56	CRT	1.34	NX
0.60	CRT	0.77	GVD	0.57	GVDP	1.35	NS
0.60	CRT	0.79	CRT	0.58	GVD	1.37	YALI
0.60	CRT	0.79	NX	0.67	YALI	1.43	GVD
0.67	KEA	0.80	CRT				
0.73	SYR	0.83	CRT				
0.75	KRP	0.83	CRT				
0.75	NX	0.83	ISR				
0.80	NS	0.85	CRT				
1.00	CRT	0.86	CRT				
1.00	CRT	0.86	CRT				
1.00	SM	0.91	CRT				
0.43	CRT	0.92	CRT				

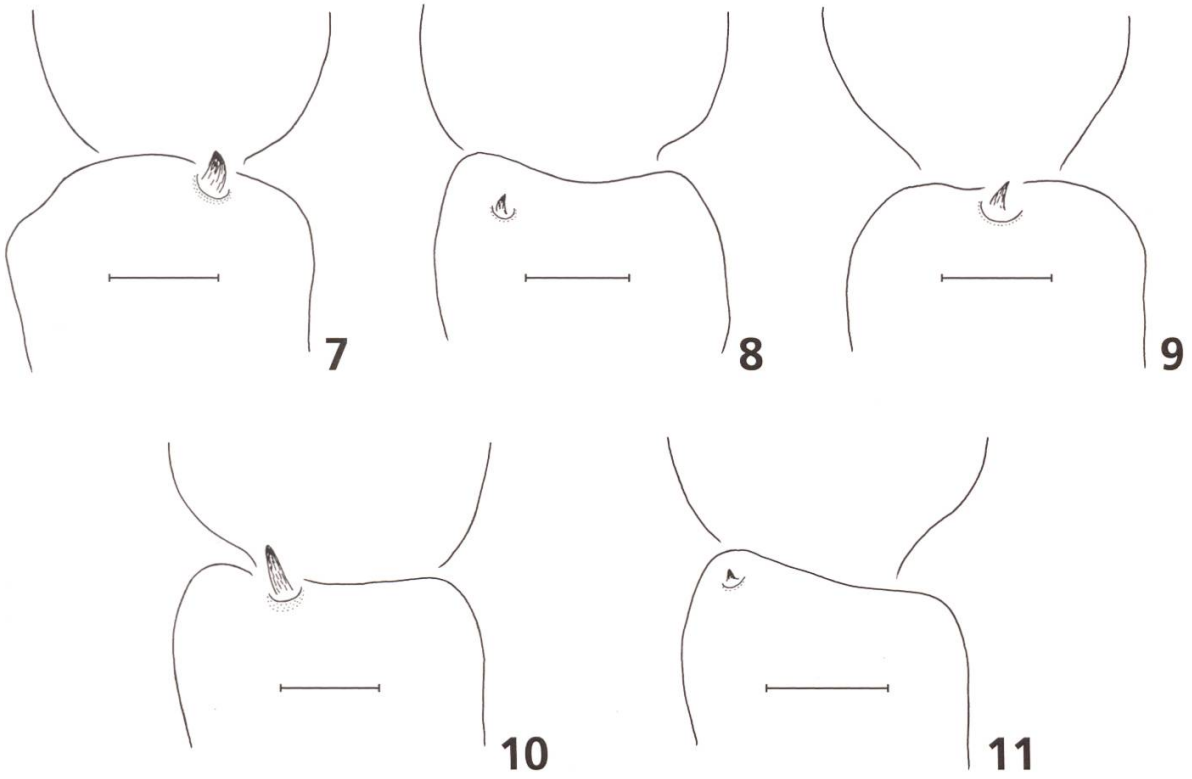
EB/Te: 0.44 (0.2–0.67)

Cy/Ti: 1.14 (0.71–1.43)

mS/MS: 0.44 (0.2–1)

SL/LP: 0.67 (0.33–0.92)

Tab. 1. Ratios of morphometric measurements of 34 male and 43 female specimens of *D. lutescens*. The average and range of each ratio are also shown. The following abbreviations are used: a) Embolic origin: EO; Tegulum length: Te; Cymbium length: Cy; Tibia length: Ti; Maximum septum width: MS; Minimum septum width: mS; Lateral pouches length: LP; Spermathecae length: SL, to indicate the morphometric characters measured and b) Greece: CRT – Crete, GVD – Gavdos, GVDP – Gavdopoula, KRP – Karpathos, NS – Nisyros, RD – Rodos, SM – Samos, YALI – Yali, NX – Naxos, KEA – Kea; Israel: ISR; Syria: SYR, to indicate the localities.

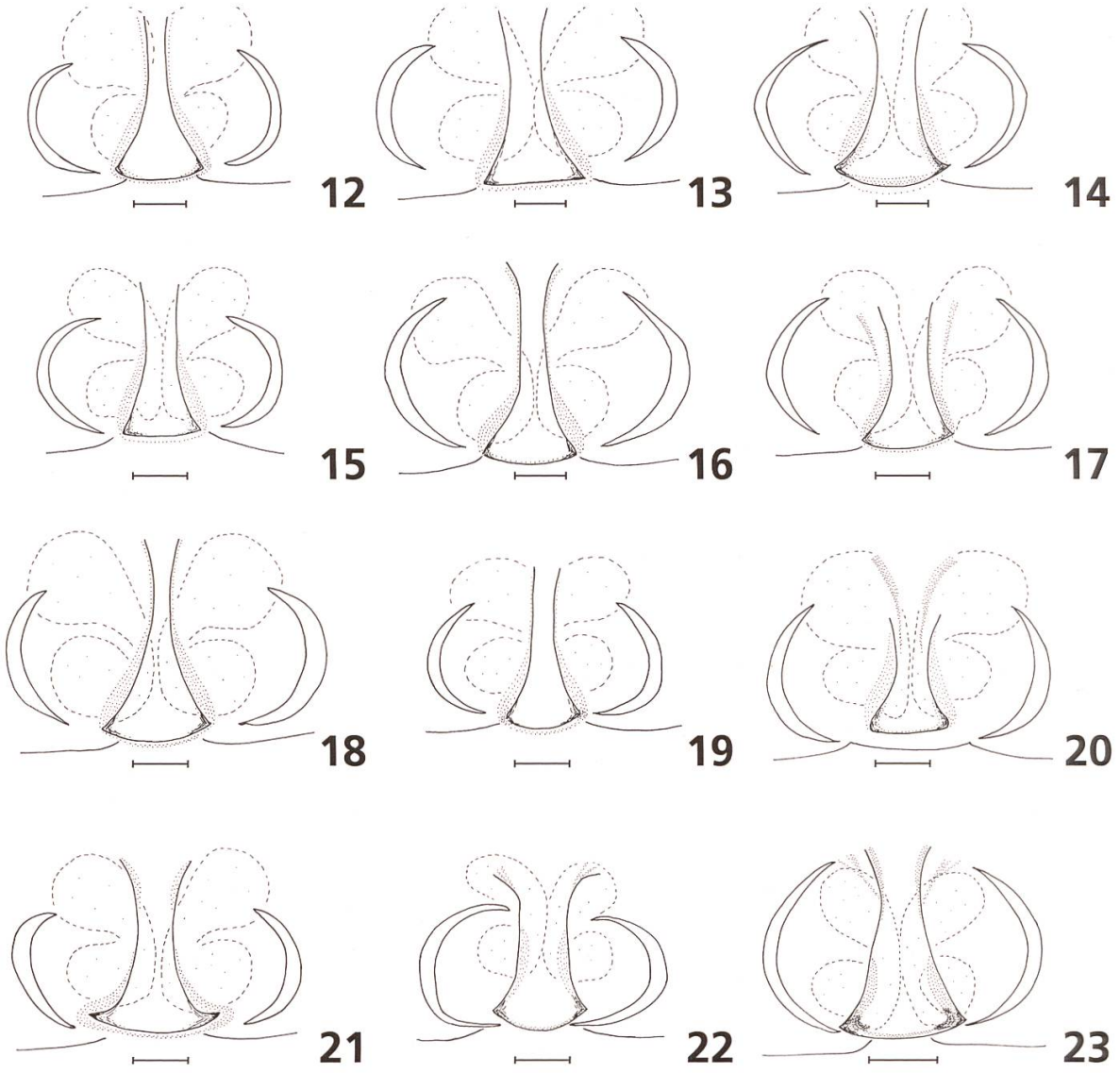


Figs. 7–11. *Drassodes lutescens* – male tibial apophysis. 7. Crete, Elafonisi (right palp), 8. Gavdos islet (left palp), 9. Naxos (right palp), 10. Crete, Mt. Youchtas (left palp), 11. Rodos (left palp). Scale bars = 0.1 cm.

and pointed out the need of a re-examination of this material. Vouchers from many Greek islands and from adjacent countries were re-examined or examined for the first time in detail, in order to give an answer to this problem.

Very few individuals from the Greek region strictly follow the distinctive characters of *D. alexandrinus* as illustrated by Levy, except for the dentition of the chelicerae, which is identical in all individuals examined and follows the dentition of *D. alexandrinus*. A great variation of all other characters of the male and female genital organs produces an actual gradient among specimens, and is the reason why the two species are considered to be synonymous.

Male pedipalp (Figs. 3–11, Tab. 1): cymbium/tibia ratio ranges from 0.71 to 1.43, but in most individuals the cymbium is longer than the tibia (27 out of 34 individuals). The size of the tibial apophysis ranges from tiny to quite apparent (Figs. 7–11). However, this distinction does not constantly follow the respective placement of the embolus (tiny in the specimens in which the embolus originates at the lower part of the tegulum and larger in the specimens in which the embolus originates at the higher part of the tegulum). The embolus of most individuals examined is placed at the middle third of the tegulum with few exceptions (5 out of 34 male individuals) in which the embolus is placed at the lower third of the tegulum. As already reported, the shape of



Figs. 12–23. ***Drassodes lutescens*** **– epigyne. 12. Gavdos islet, 13. Crete, Achendrias, 14. Crete, Gramvousa, 15. Crete, Elafonisi, 16. Antikythira, 17. Naxos, 18. Kea, 19. Rodos, 20. Samos, 21. Bulgaria, 22. Syria, 23. Israel. Scale bars = 0.1 cm.**

the sperm duct inside the bulb is variable, deviating from a simple upright U–shaped duct (Figs. 4–5) to more complicated sigmoid, laterally directed loops leading to a longer embolus originating from a more basal part of the tegulum (Figs. 3, 6). Shape and size of the membranous lamella are not constant.

Epigyne (Figs. 12–23, Tab. 1): sides of median septum range from almost parallel and wide apart (mS/MS = 1, Figs. 15, 17, 22) to conical, being very close at the upper part of the epigyne and very broad at the basal part (mS/MS = 0,2, Figs. 16, 18). This feature leads to a variety of shapes. The lateral pouches almost touch the epigastric furrow and/or the lower edges of the median septum in most of cases examined. Their upper part is always situated below the upper rim of the median septum or hardly reaches this height (most extreme in the specimen from Israel, Fig. 23, and the specimen from Naxos,

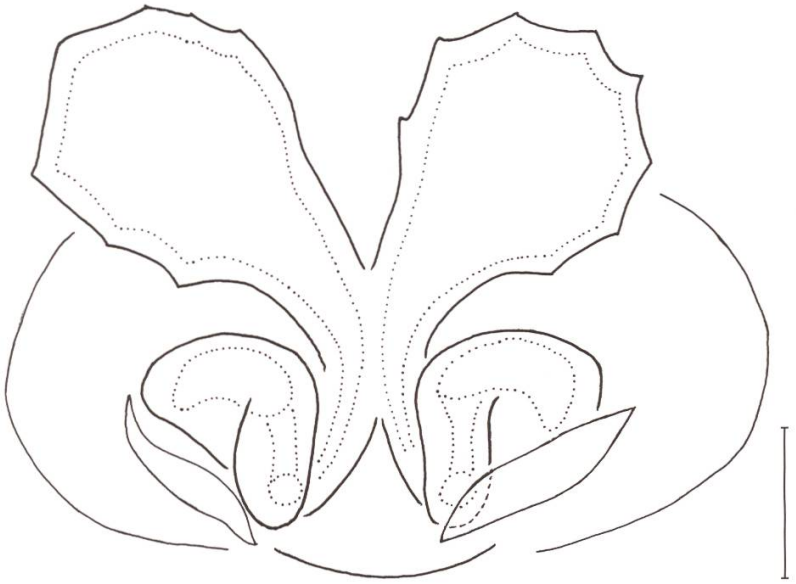


Fig. 24. *Drassodes lutescens* – vulva. Astypalaia. Scale bar = 0.1 cm.

Fig. 17, and the specimen from Samos, Fig. 20). The variation presented by the specimens examined is in fact due to the degree of sclerotization of these two structures and the height of the two compartments they form (LP), relative to the height of the two spermathecae of the vulva (SL). At one extreme (*D. lutescens* according to Levy (2004; fig. 38), and Fig. 22 in the present study) the two compartments do not enclose the upper spermathecae (LP/SL = 0,33), while at the other extreme (*D. alexandrinus* according to Levy (2004; fig. 44) and Fig. 23 in the present study) the upper spermathecae are fully enclosed in them (LP/SL = 0,92). As in males, within the Greek populations there are all the intermediate relative positions of these two extreme forms.

Vulva (Fig. 24): structures of all specimens examined are not different between extreme epigynal forms. The only variation observed is in the relative sizes of the two sets of spermathecae, upper and lower, as illustrated in Figs. 12–23.

In any case, even with the strictest morphological criteria, Greek populations cannot be attributed to one of the two species, as females resemble more *D. lutescens* (lateral pouches covering only part of the upper spermathecae) and males resemble more *D. alexandrinus* (embolus originating from basal half of tegulum). In the morphometric measurements (Tab. 1) the gradient recorded is irrelevant to the geographical location in which specimens were found. In view of the difficulty to clearly separate the two species, the existence of intermediate forms in any of the distinctive characters and the fact that the structures of the genital organs in both sexes are basically the same, it is proposed that *D. alexandrinus* and *D. lutescens* are in reality one species which keeps the name of the earlier created *D. lutescens*.

Distribution: Mediterranean countries, South Urals, Pakistan, Afghanistan, Oman.

***Haplodrassus dalmatensis* (L. Koch, 1866)**

Drassodes carinatus Strand, 1906; Strand (1906): 609; **new synonymy**.

Material examined: MNHN, AR 9471, 1 ♀, Ethiopia.

Remarks: The examination of a voucher specimen of the female of *D. carinatus* Strand, 1906 from the Natural History Museum of Paris (MNHN, AR 9471, Ethiopia, 1 ♂) fully conform to the characters of *H. dalmatensis* without any doubt. Since this voucher comes from a topotypic locality (the type was not available to the authors) a new synonymy is proposed.

***Drassodes albicans* (Simon, 1878)**

Drassodes oreinos Chatzaki, 2002; Chatzaki & al. (2002b): 615, figs. 29–31, 38–39, 71; **new synonymy**.

Material examined: Crete, several localities above 1200 m, including type (Chatzaki & al. 2002b) Spain, Sierra Nevada, Veleta (MNHN, AR 9356, 3 ♀); without any locality (MNHN, AR 9362, 4 ♀).

Remarks: *Drassodes albicans* was described by Simon (1878) from south-western areas of Europe (Spain, France and Corsica). It was further recorded from three areas in Greece by Strand (1917): from the islands Kos and Kriti (=Crete) and from continental Greece (Sterea Ellada, Fokida, Mt. Korax). The description was based on female individuals only. The genitalic characters of this species are identical to those of *D. oreinos* Chatzaki, 2002 (Chatzaki & al. 2002b; 615, figs. 29–31, 38–39, 71), a species recorded only from the high mountains of Crete. Because of this clear preference to mountain habitats, the record of *D. oreinos* from Kos (Strand 1917) – where high elevations are not present – is doubtful. A closer examination of all old specimens is needed in order to decide if there are misidentifications among the older records or not.

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