

# The high complexity of Micronetinae Hull, 1920 (Araneae, Linyphiidae) evidenced through ten new cave-dweller species from the Morocco

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## ABSTRACT

The Museum of Natural Sciences of Barcelona is the repository of a set of samples of spiders captured during a prolonged period of time in various caves of the Moroccan Atlas. Seventeen species of *Lepthyphantes* Menge, 1866 “*sensu lato*” were found within this material, ten of them new to science: *Lepthyphantes almoravidus* Barrientos n. sp., *Lepthyphantes biospeleologorum* Barrientos n. sp., *Lepthyphantes ensiferus* Barrientos n. sp., *Lepthyphantes fadriquei* Barrientos n. sp., *Lepthyphantes imazigheni* Barrientos n. sp., *Lepthyphantes lamellatus* Barrientos n. sp., *Lepthyphantes leknizii* Barrientos n. sp., *Lepthyphantes sasi* Barrientos n. sp., *Palliduphantes banderolatus* Barrientos n. sp. and *Palliduphantes megascapus* Barrientos n. sp. We offer the description of the aforementioned species, as well as the description of the unknown male of *Lepthyphantes taza* Tanasevitch, 2014. We also discuss the affinities found between these and other related Mediterranean species, as well as their possible location within the Micronetinae genera currently described.

## RÉSUMÉ

*La grande complexité des Micronetinae Hull, 1920 (Araneae, Linyphiidae) mise en évidence par dix nouvelles espèces provenant des grottes du Maroc.*

Un ensemble d'échantillons collectés sur une longue période de temps dans plusieurs grottes de l'Atlas marocain est déposé au Musée des Sciences naturelles de Barcelone. Ce matériel comprend 17 espèces de *Lepthyphantes* Menge, 1866 “*sensu lato*”, dont 10 sont nouvelles pour la science : *Lepthyphantes almoravidus* Barrientos n. sp., *Lepthyphantes biospeleologorum* Barrientos n. sp., *Lepthyphantes ensiferus* Barrientos n. sp., *Lepthyphantes fadriquei* Barrientos n. sp., *Lepthyphantes imazigheni* Barrientos n. sp., *Lepthyphantes lamellatus* Barrientos n. sp., *Lepthyphantes leknizii* Barrientos n. sp., *Lepthyphantes sasi* Barrientos n. sp., *Palliduphantes banderolatus* Barrientos n. sp. et *Palliduphantes megascapus* Barrientos n. sp. Nous décrivons ici ces espèces, ainsi que le mâle inconnu de *Lepthyphantes taza* Tanasevitch, 2014. Nous discutons également des affinités que nous avons trouvées entre ces espèces et d'autres espèces affines de la région méditerranéenne, et de leur possible appartenance aux genres de Micronetinae actuellement décrits.

## KEY WORDS

*Lepthyphantes*,  
*Palliduphantes*,  
North of Africa,  
Atlas Mountains,  
troglobic fauna,  
new species.

## MOTS CLÉS

*Lepthyphantes*,  
*Palliduphantes*,  
Afrique du Nord,  
montagnes de l'Atlas,  
faune troglobie,  
nouvelles espèces.

## RESUMEN

*La complejidad de los Micronetinae Hull, 1920 (Araneae, Linyphiidae) evidenciada a través de diez nuevas especies de cuevas de Marruecos.*

El Museu de Ciències Naturals de Barcelona es depositario de un conjunto de muestras obtenidas en diversas cuevas de la cordillera del Atlas marroquí, entre las que se encuentran 17 especies de *Lepthyphantes* Menge, 1866 “*sensu lato*” cuyos datos se detallan aquí. De ellas, diez resultaron nuevas para la ciencia: *Lepthyphantes almoravidus* Barrientos n. sp., *Lepthyphantes biospeleologorum* Barrientos n. sp., *Lepthyphantes ensiferus* Barrientos n. sp., *Lepthyphantes fadriquei* Barrientos n. sp., *Lepthyphantes imazigheni* Barrientos n. sp., *Lepthyphantes lamellatus* Barrientos n. sp., *Lepthyphantes leknizii* Barrientos n. sp., *Lepthyphantes sasi* Barrientos n. sp., *Palliduphantes banderolatus* Barrientos n. sp. y *Palliduphantes megascapus* Barrientos n. sp. Se ofrece la descripción de todas ellas, así como la correspondiente al macho inédito de *Lepthyphantes taza* Tanasevitch, 2014. Como consecuencia del análisis realizado, se ofrece una discusión preliminar de las afinidades de estas especies, entre sí y con otras especies que se encuentran en el contexto mediterráneo más próximo, así como su posible ubicación en el conjunto de géneros actualmente descritos de Micronetinae.

## PALABRAS CLAVE

*Lepthyphantes*,  
*Palliduphantes*,  
Norte de África,  
Cordillera del Atlas,  
fauna troglobia,  
Nuevas especies.

## INTRODUCTION

Morocco is a mountainous country located in the Maghreb region of North Africa. Geographically, it is characterised by a lengthy Atlantic Ocean coastline in the west, a Mediterranean Sea coastline in the north, and large tracts of desert and a rugged mountainous interior dominated by the Atlas mountain range (Fig. 1). The Atlas mountain range extends eastward, crossing Algeria and Tunisia, with some summits reaching 4000 meters high. The northeastern Atlas Mountains connect also with the Rif mountain range in an east-west orientation. Within this mountainous complex, numerous karstic accidents occur, including caves that are largely unexplored and/or biologically understudied. However, a few caves have been the subject of attention by various biospeleologists’ teams and researchers, especially since the second half of the 20th century. One of them is the *Associació Catalana de Bioespeleologia* (BIOSP), which has been carrying out expeditions to Morocco since 1970 with special attention given to the Central Atlas area. Overcoming numerous difficulties, BIOSP campaigns to Morocco have continued to this day, with more than 200 Atlas mountain caves explored. Samples have been deposited in the Museu de Ciències Naturals de Barcelona and have remained unpublished until now.

The majority of these samples were collected between 2001 and 2016, and specimens belonging to *Lepthyphantes* Menge, 1866 “*sensu lato*” in particular were obtained from 33 localities. A detailed list of these caves and their relative location are given in Fig. 1.

Other samples captured as a result of international biospeleological expeditions have been deposited in several European museums, mainly the Muséum d’Histoire naturelle de Geneva (Switzerland), with corresponding sporadic publications. Within the literature regarding Moroccan *Lepthyphantes* “*sensu lato*” collections, Machado (1940), Denis & Dresco (1957), Brignoli (1978), Ribera (1983), Deeleman-Reinhold

(1984), Bosmans (1985, 2006) and Tanasevitch (2014) should be mentioned.

## THE GENUS *LEPTYPHANTES* “*SENSU LATO*”

The genus *Lepthyphantes* was created by Menge in 1866. For many years and still today, the genus has served as a “catch-all” for many species of Micronetinae Hull, 1920 that share a similar morphology, the phylogeny then available being too unresolved to include them in other recently described genera. The current catalogue consists of 167 Holarctic and Ethiopian species (World Spider Catalog 2018), with the majority Palaearctic. Many of these species are waiting for a new analysis that would allow their taxonomic relocation.

The first serious attempt to simplify *Lepthyphantes* is found in Simon’s *Faune de France* (1929), which divides the genus into five groups. This grouping was supported by Lockett & Millidge (1953), Wiehle (1956), Brignoli (1971, 1978, 1979), Bosmans (1978), Wunderlich (1985) and Tanasevitch (1987), among others. This phylogenetic structure was challenged by addition of new genera by Saaristo & Tanasevitch (1993) and subsequent works, including Wunderlich (1993)’s description of *Megalepthyphantes* Wunderlich, 1994. However, the most solid contributions in this regard are those of Saaristo & Tanasevitch (1996, 1999, 2000, 2001) who reconsidered Micronetinae, redefined *Lepthyphantes* “*sensu stricto*” and described several new genera. Unfortunately, these reconsiderations were made apart from the Mediterranean diversity.

## THE *LEPTYPHANTES* IN MOROCCO

The countries of the Maghreb (and Morocco in particular) have been explored in an unbalanced manner. Many of the available data are due to biospeleological expeditions, ignoring the external fauna. Simon (1884), Machado (1940), Denis & Dresco (1957), Brignoli (1978) and Tanasevitch (2014) provide Moroccan data of this type. Exceptions to these circumstances are the works of Wunderlich (1980), Bosmans (1985, 1991) and Bosmans & Bouragba (1992),

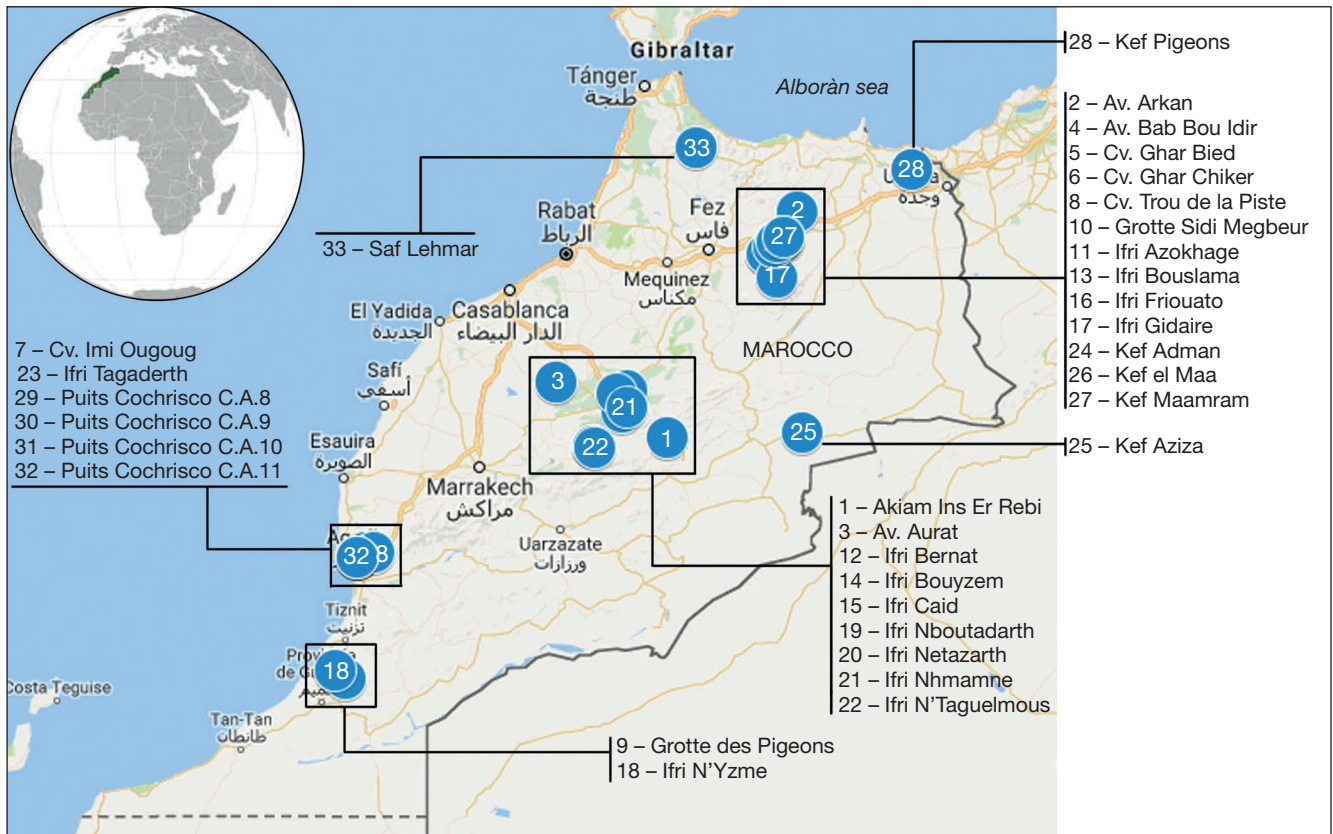


Fig. 1. — Indicative locations of the caves prospecting in Morocco by the BIOSP group, in which samples of Micronetinae Hull, 1920 have been obtained: 1, Akiam Ins Er Rebi; 2, Av. Arkan; 3, Av. Aurat; 4, Av. Bab Bou Idir; 5, Cv. Ghar Bied; 6, Cv. Ghar Chiker; 7, Cv. Imi Ougoug; 8, Cv. Trou de la Piste; 9, Grotte des Pigeons; 10, Grotte Sidi Megbeur; 11, Ifri Azokhage (= Riviere Chara); 12, Ifri Bernat; 13, Ifri Bouslama; 14, Ifri Bouyzem; 15, Ifri Caid; 16, Ifri Friouato; 17, Ifri Gidaire; 18, Ifri N'Yzme; 19, Ifri Nboutadarth; 20, Ifri Netazarth; 21, Ifri Nhamme; 22, Ifri N'Taguelmous; 23, Ifri Tagaderth (= Ifri Laghar); 24, Kef Adman; 25, Kef Aziza; 26, Kef el Maa; 27, Kef Maamram; 28, Kef Pigeons; 29, Puits Cochrisco C.A. 8; 30, Puits Cochrisco C.A. 9; 31, Puits Cochrisco C.A. 10; 32, Puits Cochrisco C.A. 11; 33, Saf Lehmar. (More details in Appendix I).

which mainly focus on Algeria and gather information on both the external and cave-fauna of the two neighboring countries (Tunisia and Morocco). It is also worth highlighting the work of Bosmans (2006), which broadly summarizes the North African information available.

If we limit our attention to only Moroccan Micronetinae, the balance at present is as follows: *Canariphantes homonymus* (Denis, 1934), *Canariphantes zonatus* (Simon, 1884), *Lepthyphantes aelleni* Denis, 1957, *Lepthyphantes brevihamatus* Bosmans, 1985, *Lepthyphantes longihamatus* Bosmans, 1985, *Lepthyphantes longipedis* Tanasevitch, 2014, *Lepthyphantes maurusius* Brignoli, 1978, *Lepthyphantes pieltaini* Machado, 1940, *Lepthyphantes ritae* Bosmans, 1985, *Lepthyphantes taza* Tanasevitch, 2014, *Megalepthyphantes brignolii* Tanasevitch, 2014, *Palliduphantes cadiziensis* (Wunderlich, 1980) and *Tenuiphantes tenuis* (Blackwall, 1852). Of these thirteen species, it is noteworthy that eight have been described and remains as *Lepthyphantes "sensu lato"*, with *L. longipedis* and *L. taza* described by Tanasevitch (2014). The data of *C. homonymus*, *C. zonatus* and *L. ritae* correspond to external fauna and have not been found to date in the cave environment.

## MATERIAL AND METHODS

Among the material captured in the caves visited by BIOSP 751 specimens belong to Linyphiidae Blackwall, 1859. An important part of this material can be assigned to the genus *Lepthyphantes "sensu lato"* (60♂, 151♀, and 162 immatures). All the material is deposited in the Museu de Ciències Naturals de Barcelona with the references that are detailed in Appendix I and in the section "studied material" for each species. The samples were obtained by direct capture. The material is preserved in 70% ethanol and was analysed according to normal methodology carried out through observation by binocular microscope (Wild M10).

For the new species and a few previously identified species a more exhaustive study protocol was followed, with individualization and clarification by means of 10% KOH of the genitalia. The separated pieces are conserved in microvials associated with the main sample or in permanent preparations with identical labelling. These manipulations were considered essential for the morphological analysis and illustrations.

The interpretation of the structures follows the terminology proposed by Saaristo & Tanasevitch (1996) and assist by Hormiga (2000) for the whole Micronetinae; for a better understanding we will use the same abbreviations.

ABBREVIATIONS

*Female genitalia*

aw	anterior wall of epigyne;
bc	bursa copulatrix;
dps	distal part of scape;
lw	lateral wall of epigyne;
lwp	lateral wall process;
mpps	median part of scape;
pmp	posterior median plate;
ps	proscape;
psb	basal part of scape;
re	receptacula;
st	stretcher.

*Male genitalia*

ap	apical part of paracymbium;
apo	anterior pocket of paracymbium;
dra	distal radical apophysis;
dsa	pit hook or distal supratergular apophysis;
e	embolus;
eb	basis of the embolus;
ep	embolus proper;
ex	apex of the embolus;
fgl	Fickert's gland;
lc	lamella characteristic;
mp	middle part of paracymbium;
pp	proximal part of paracymbium;
ppo	posterior pocket of paracymbium;
r	radix;
sa	median or supratergular apophysis;
ta	terminal apophysis.

*Used in text*

juv.	inmatures;
Cv.	cave;
Av.	chasm;
C.A.	Puits Cochrisco is a karst complex, consisting of several caves and entrances;
C.A.n	The different numbers indicated with the prefix "C.A." for example, C.A.8) correspond to several entries in this complex.

*Institutions*

BIOSP	Associació Catalana de Bioespeleologia, Barcelona;
MHNG	Muséum d'histoire naturelle de Geneva, Geneva (formerly NNHG);
MCNB	Museu de Ciències Naturals de Barcelona, Barcelona (formerly MCNB);
KBIN-IRSNB	Royal Belgian Institute of Natural Sciences, Bruxelles.

MEASUREMENTS

The measures of the legs are given in the form of a polynomial, whose terms correspond to the different pieces, i.e., (femur + patella + tibia + metatarsus + tarsus). All measurements are in millimetres. In addition to the samples collected by BIOSP and in order to differentiate their characters with those presented by the samples deposited in the MCNB, some types and paratypes deposited in other institutions were reviewed, as follows:

*KBIN-IRSNB Dienst Patrimonium/Departement. Entomologie, Bruxelles*

*Lepthyphantes brevihamatus* Bosmans, 1985; paratypes IG27782; Maroc, Haut Atlas, Ait Mohammed/ S. d'Azilal, grotte Fri Bernate; 1500 m; 22.VIII.77 (B. Deeleman, leg.).

*Lepthyphantes longihamatus* Bosmans, 1985; paratypes IG27782; Maroc, Haut Atlas, Imilchil/ N. de Tinerhir, grotte Achia inz Rebi; 2500 m; 22.VIII.77 (B. Deeleman leg.). *Lepthyphantes longihamatus* Bosmans, holotype (male), IG27782; Maroc, Haut Atlas, Imilchil, N. de Tinerhir, grotte Achia inz Rebi; 2500 m; 22-VIII.77 (B. Deeleman leg.).

*Lepthyphantes ritae* Bosmans, 1985; IG27782; Algerie, Zemmouri; 5 m, 13.IV.82; litter of *Pinus halepensis*. *Lepthyphantes ritae* Bosmans, 1985; R. Bosmans det. 1984, IG27782; Maroc; 10 km, E. Chechaouen; 500 m, *Quercus suber* forest, 15.V.1984, R. Bosmans leg.

*NNHG, Department of Arthropodology and Entomology, Geneva*

*Lepthyphantes longipedis* Tanasevitch, 2014; paratypes; 2 ♀; Morocco, Beni Mellal, Jbel Ibel Ighnayene; 22.VI.1982; leg. Strinati; Ji11/ 22-6-82; Araisnès. *Lepthyphantes longipedis*; Holotype ♂; Morocco, Beni Mellal, Jbel Ibel Ighnayene; 20.VI.1982; leg. Strinati/ Ji7; 20.VI.1982; *Lepthyphantes longipedis* Tanasevitch; det Tanasevitch, 2014; NO TYPES!; Ji7 Maroc; Moyen Atlas, Jbel Ighnayene, between Beni Mellal and Ouauizaght, grotte "kef du Calmar coince"; 11-14.VII.1982.; leg. J. Delore, P. Jolivet & T. Marchand. *Lepthyphantes coliginis* n. sp. [sic, in the label] ♂♀ paratypes; P.Brignoli det. 1984; Morocco Ji7. 2x coll. Mus. Geneva. *Lepthyphantes longipedis*; paratypes 1♂, 3♀; Morocco, Beni Mellal, Jbel Ibel, Ighnayene; 20.VI.1982; leg. P. Strinati.

*Lepthyphantes maurusius* Brignoli, det. A. Tanasevitch, 2014; No type/ grotte de Sidi Mejbeur, Taza, Maroc, 30.IX.1979; P. Strinati et V. Aellen. *Lepthyphantes maurusius*; Br. Brignoli det, 1983. *Lepthyphantes maurusius* [sic, in the label]; ♀ holotype; P. Brignoli det. 1977. *Lepthyphantes maurusius* Brignoli; det. Brignoli, 1977; grotte de Sidi Mejbeur, Taza, Maroc, 2-5-1974; Thibaud & Strinati. *Lepthyphantes maurusius* Brignoli det, 1983; Mar 78-19; Maroc, Moyen Atlas, Grotte de Sidi Mejbeur/ 4.VI.1978/ leg. P. Strinati.; Mar. 78-19.

RESULTS

Until today, and among the material captured by BIOSP, it has not been possible to analyze specimens of *Canariphantes homonymus*, *Canariphantes zonatus* and *Lepthyphantes ritae*, as well as the exclusive troglobionts *Lepthyphantes longipedis*, *Lepthyphantes pieltaini* and *Megalepthyphantes brignolii*, all of which are previously mentioned from Morocco. However, specimens of 17 specific taxa were obtained from the BIOSP campaigns.

The following section alphabetically lists by genera and species the different taxa represented in the Collection of the MCNB, indicating in each case the studied material and specifying their diagnosis and distribution. The new species include a formal description, with special emphasis on their genital traits. The descriptions are accompanied by figures and (if possible) complementary pictures.

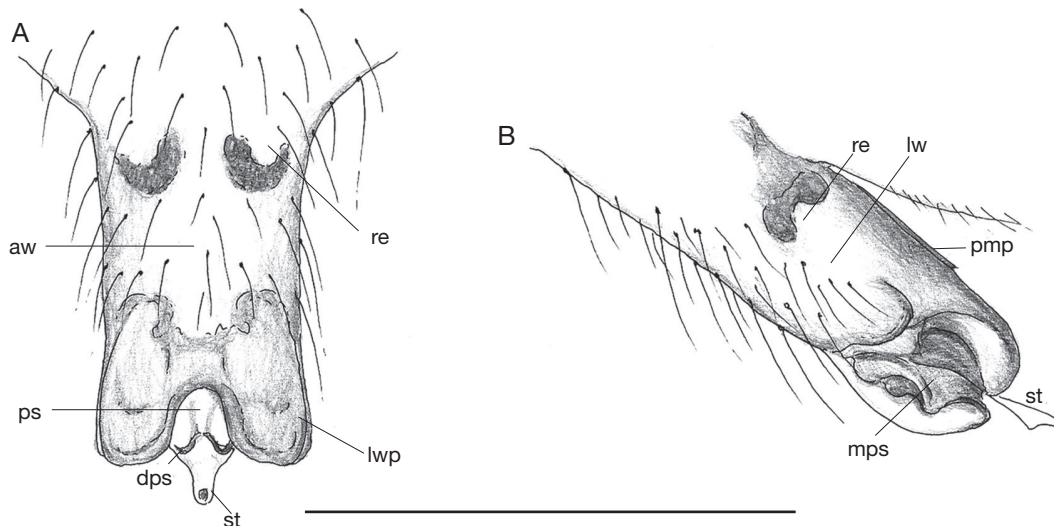


FIG. 2. — *Leptyphantes almoravidus* Barrientos n. sp., genital organs: epigyne, **A**, ventral view; **B**, lateral view. Abbreviations: see Material and methods. Scale bar: 0.5 mm.

Order ARANEAE Clerck, 1757  
 Family LINYPHIIDAE Blackwall, 1859  
 Subfamily MICRONETINAE Hull, 1920  
 Genus *Leptyphantes* Menge, 1866 “sensu lato”

*Leptyphantes aelleni* Denis, 1957

MATERIAL EXAMINED. — **Morocco**. 1♂, 1♀; Ifri Friouato, Bab Bou Idir, Taza; 28.VIII.1970; O. Escolá leg.; MZB 73-2903 • 2♀, 1 juv.; Kef el Maa, Taza; 9.V.2002; F. Fadrique & O. Escolá leg.; MZB 2003-0198 • 1♀, 3 juv.; Kef Pigeons, Takerboust, Berkane, Oriental region; 23.VIII.2013; F. Fadrique leg.; MZB 2016-0034 • 1♀; Ifri Bouslama, Bab Bou Idir, Taza; 14.IX.2016; F. Fadrique leg.; MZB 2016-4062.

DIAGNOSIS. — As in Bosmans (2006: figs 6-10) the males are easily recognized by the shape of their lamella characteristica; it is long and “C” curved, laminar, and with subtriangular and slightly toothed distal part. In its posterior median part the paracymbium presents a thick and sharp denticle and its anterior branch is irregular and digitiform. The females have an elongated epigyne, which narrows characteristically in its basal third and expands again in the distal part; the distal portion of the scape protrudes in the central area of the latter. According to our observations and the data provided here, *L. aelleni* could be related to other species of the Moroccan Atlas, such as *L. maurusius*, *L. taza* and *L. almoravidus* Barrientos n. sp.

DISTRIBUTION. — *Leptyphantes aelleni* is known from the chasm of Kaf el Bouk, from which comes the holotype (Denis & Dresco 1957) and from the cave of Friouato (Bosmans 2006). With the new data, the number of caves in which it is found is expanded; so that in addition to the Taza region, the species is also in the Eastern region.

*Leptyphantes almoravidus* Barrientos n. sp.  
 (Figs 2; 13A, B)

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TYPE MATERIAL. — **Holotype**. **Morocco**. 1♀; Ifri Netazarth, Fariata, Tagzirth, Béni-Mellal; 20.V.2004; F. Fadrique leg.; MZB 2017-0665.

DIAGNOSIS. — The epigyne is in an oblique disposition (in relation to the ventral surface of opisthosoma); of similar width from its base to the end. The opening of bursa copulatrix is distal. The lateral walls are rounded and leave a front notch showing a reduced scape. The proscape is small, not very sclerotized, with a wide distal notch; the distal stretcher of the scape is present in front and under. *L. almoravidus* resembles the scape of *L. aelleni*, although in this case the structure (as a whole) is shorter and keeps a similar width.

ETYMOLOGY. — During the 11th and 12th centuries the Almoravids were the great rulers of the Maghreb, extending their influence throughout the southern half of the Iberian Peninsula. Now we dedicate this species to the memory of those monk-soldiers, who arose from the nomads of the Sahara.

DISTRIBUTION. — *L. almoravidus* Barrientos n. sp. is known exclusively from the type locality.

DESCRIPTION

*Female (holotype)*

**Body**. Total body length: 1.80. Carapace: 0.78 long by 0.69 wide; color very uniform, yellowish and with pale brown tints. Eyes reduced and without pigments; ocular lenses reduced and slightly protruding. Chelicerae: 0.44 long; coloration slightly more intense than the carapace; three small teeth on promargin and none on retromargin. Long and thin legs; yellow, like the carapace, but distal parts lighter. Measurements (some articles missing): leg I (1.86 + 0.29 + without + without + without), leg II (1.81 + 0.29 + 1.86 + 1.68 + 0.98), leg III (1.57 + 0.25 + 1.32 + 1.22 + 0.73), and leg IV (1.71 + 0.27 + without + without + without). Opisthosoma 1.32 long by 1.03 wide, grayish-white, without dorsal pattern, but covered with a fine pilosity.

**Female genitalia**. Epigyne developed and protruding (Figs 2; 13A, B), showing an oblique disposition with respect to the ventral surface of opisthosoma by elongation of anterior wall. Its basal part straight and keeping a similar width

towards the end. Posterior wall also elongate with opening of bursa copulatrix distal. Median plate poorly sclerotized; in its basal zone, receptacula visible by transparency. Lateral walls, and especially anterior wall, with scattered hairs. Distal parts of lateral walls clearly rounded, leaving a mid-cut that shows a reduced scape. Proscapae small, little sclerotized, with a wide distal notch; in front and under it, strecher of distal scape visible. Middle part of the scape practically hidden.

*Male*

Unknown.

*Leptyphantes biospeleologorum* Barrientos n. sp.  
(Figs 3; 13C, D)

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TYPE MATERIAL. — **Holotype.** Morocco. 1♀; Ifri Bouyzem, Aglefth, Taglefth, Azilal; 15.V.2004; F. Fadrique leg.; MZB 2017-0660.  
**Paratypes.** Morocco. 2♀; same locality and date as the holotype; MZB 2017-0661.

OTHER MATERIAL. — **Morocco.** 4 juv.; same locality and date as the holotype; MZB 2017-0662.

DIAGNOSIS. — The epigyne is broad and small, protruding on the ventral side of the epigastrium. The bursa copulatrix has a very short front edge; the lateral edges expand and separate to accommodate the scape; the posterior wall differentiates a median plate, narrow in the center and rounded on the sides. The proscapae is wide and flattened, with rounded contour and a notch in the anterior part; a short and rounded strecher in the distal part of the scape, but flanked by two rounded expansions. By the morphology of its epigyne (and without information on the male copulatory bulb) this species has some affinities with *L. brevihamatus*, *L. longihamatus* and, in general, with the entire “*ifer* group”, in which probably it should be placed.

ETYMOLOGY. — This species is dedicated, in a general way, to all the biospeleologists. Anonymously they use part of their time to develop an exciting and hard (sometimes risky) activity, in pursuit of the forms that inhabit the caverns. Without their generous dedication, this small job would not have been possible.

DISTRIBUTION. — This species is exclusively known from the type locality.

DESCRIPTION

*Female (holotype)*

**Body.** Total body length 2.30. Carapace: 0.93 long by 0.83 wide; yellowish brown color, and with a tenuous pigmentary pattern formed by five radial gray bands and one marginal in thoracic area. Cephalic part with some scattered hairs. Eyes developed and well pigmented; arranged in two transversal lines, with individual black areolas in each eye. Chelicerae : 0,39 long; coloration slightly more intense than the carapace; with three equidistant teeth on the promargin, the basal one somewhat smaller; retromargin unarmed. Legs long and thin; brown color, like the caparace; coloration gradually lost from the tibia towards apex. Measurements: leg I (1.47 + 0.27 +

1.57 + 1.35 + 0.86), leg II (1.30 + 0.29 + 1.22 + 1.27 + 0.83), leg III (1.00 + 0.27 + 0.98 + 0.91 + 0.64), and leg IV (1.37 + 0.29 + 1.20 + 1.27 + 0.93). Opisthosoma 1.42 long by 1.00 wide; gray-white color, without dorsal pattern, but entirely covered with a fine hairiness.

**Female genitalia.** Epigyne (Figs 3; 13C, D) with a transverse development, protruding little in ventral side of epigastrium. Its basal part showing a wide bursa copulatrix, with a very short anterior wall; lateral walls expanding and separate to accommodate the scape; posterior wall wide and reinforced by a sclerotized median plate, narrowed in the center and rounded on the sides. Anterior and lateral walls with a thick, sparse and well-arched hairiness. Scape starting from the anterior part of the bursa, and with a wide and flat proscapae, rounded on the sides and with a notch on its distal part (connecting with the middle part); fertilization ducts visible in submarginal position. Median part of scape inflected and hidden under the proscapae; the distal part, turning towards it again, dilating and showing below the proscapae; strecher short and rounded, but flanked by two rounded expansions. Distal part usually curved outwards, so that its distal part approaches the proscapae.

*Male*

Unknown.

*Leptyphantes brevihamatus* Bosmans, 1985

MATERIAL EXAMINED. — **Morocco.** 2♂, 8♀, 7 juv.; Ifri Caid, Ait M’Hammed, Azilal; 28.VIII.1970, O. Escolá leg.; MZB 73-2904 • 1♀; same locality; 29.VIII.2013; J. Comas leg.; MZB 2014-7290 • 2♂, 4♀; same locality; 29.VIII.2013; L. Auroux leg.; MZB 2016-0036 • 1♂, 1♀, 5 juv.; same locality; 3.IX.2013; F. Fadrique leg.; MZB 2016-0038 • 1♀, 1 juv.; same locality; 3.IX.2013; F. Fadrique leg.; MZB 2016-0039 • 16♀, 19 juv.; Ifri Bernat, Ait M’Hammed, Azilal; 25.IV.1984; O. Escolá leg.; MZB 73-2910 • 7♂, 7♀, 5 juv.; same locality; 28.IX.1985; O. Escolá leg.; MZB 73-2912 • 7♂, 8♀, 5 juv.; same locality; 1.X.1985; O. Escolá leg.; MZB 73-2913 • 1♂, 1♀; Ifri Nboutadarth, Tagleft, Azilal; 14.V.2004; F. Fadrique leg.; MZB 2004-0657 • 1♀; Ifri Bouyzem, Aglefth, Taglefth, Azilal; 20.IX.2016; F. Fadrique leg.; MZB 2016-4065 • 2♂, 1♀, 2 juv.; Ifri Bernat, Ait M’Hammed, Azilal; 24.VIII.1972; O. Escolá leg.; MZB 83-4001.

DIAGNOSIS. — The characters indicated by Bosmans (1985) are especially useful. The male, although very close to that of *L. longihamatus*, can be easily distinguished by the shape of its supratergular process (simple and non-bifid); the paracymbium is strongly curled in its median part. The females can be distinguished more easily; the proscapae is clearly rounded, without a median notch distally, and the strecher (distal part of the scape) is short and protrudes very little below. This species is clearly included in the “*ifer* group”.

DISTRIBUTION. — The holotype comes from the cave Ifri Bernat, Ait Mohammed, Azilal (Bosmans 1985) and has also been collected in the Ifri el Kaid cave (Tanasevitch 2014). Our data confirm the presence of this species in both localities and add two more cavities; all of them in the Azilal region, in the Moroccan high Atlas.

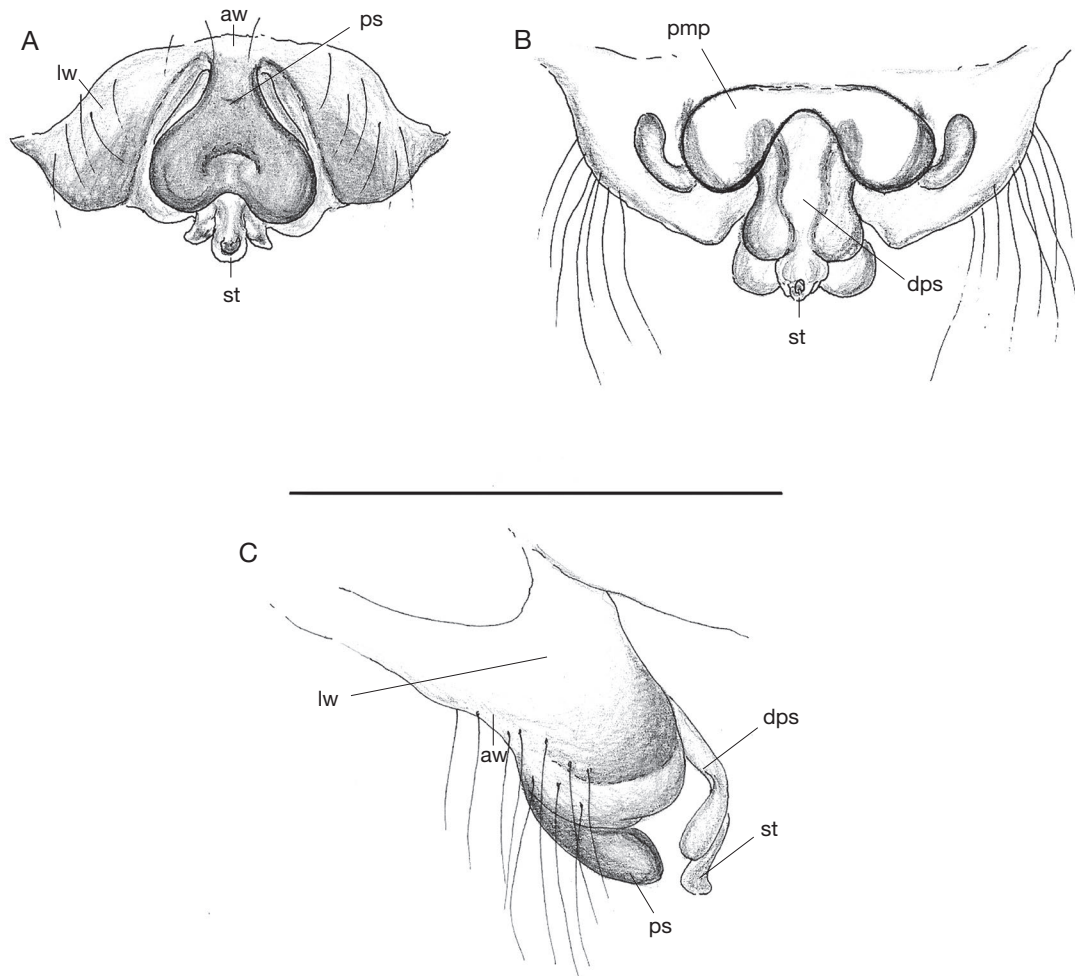


FIG. 3. — *Leptyphantes biospeleologorum* Barrientos n. sp., genital organs: **A-C**, epigyne: ventral view (**A**), posterior view (**B**), lateral view (**C**). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

*Leptyphantes ensiferus* Barrientos n. sp.  
(Figs 4; 13H-J)

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**TYPE MATERIAL.** — **Holotype.** Morocco. 1♂; Grotte des Pigeons [=Khefel Hmam (Arabic name), =Ifri Itbirn (Berber name)], Souk el Tleta el Akhsass, Guelmim; 28.VII.2003; F. Fadrique, J. Esquius & A. Ighious leg.; MZB 2013-2956.

**Paratypes.** Morocco. 3♀; same locality and date as the holotype; MZB 2017-0658 • 5♂, 4♀; same locality as the holotype; 15.X.2015; L. Auroux leg.; MZB 2015-8632.

**OTHER MATERIAL.** — **Morocco.** 2 juv.; same locality and date as the holotype; MZB 2017-0659 • 1♂, 7♀, 3 juv.; same locality as the holotype; 15.X.2015; F. Fadrique leg.; MZB 2017-0210 • 1 juv.; same locality as the holotype; 15.X.2015; L. Auroux leg.; MZB 2017-1478 • 2♂, 7♀, 4 juv.; same locality as the holotype; 15.X.2015; F. Fadrique leg.; MZB 2017-0209 • 1♀, 9 juv.; same locality as the holotype; 15.X.2015; F. Fadrique leg.; MZB 2015-8635 • 1♂, 9♀, 3 juv.; same locality as the holotype; 15.X.2015; L. Auroux leg.; MZB 2015-8636.

**DIAGNOSIS.** — The paracymbium is very broad and subquadrangular, due to the development of its middle part; it presents a pair of sharp denticles in its proximal area; the apical part is very short. In the bulb, the development and shape of the lamella characteristica stand out. It is a well-sclerotized process that is oriented forward and outward; it is clearly curved distally and shows a laminar structure in a semicircle like a sickle. The epigyne is very developed and outstanding on the ventral side, almost perpendicular to the surface of the body, due to lengthening of the basal area. The scape is large, but there is no special development of the proscape; the whole set describes a very characteristic “S” path that fills the back of the epigyne. If we stick to the structural features of the epigyne, *L. ensiferus* Barrientos n. sp. would be a species close to *L. fagei* Machado, 1939; but if we look at male genital structures (clearly illustrated for this second species in Hormiga & Ribera 1990), the differences are evident. Consequently, *L. ensiferus* Barrientos n. sp. remains in an uncertain systematic position.

**ETYMOLOGY.** — The name refers to the falciform aspect of the embolic division of the lamella characteristica, in the copulatory bulb; its “sickle” shape is especially visible in a lateral observation.

**DISTRIBUTION.** — The samples come from a single cavity, located in the province of Bou Izakarn, south of Agadir.

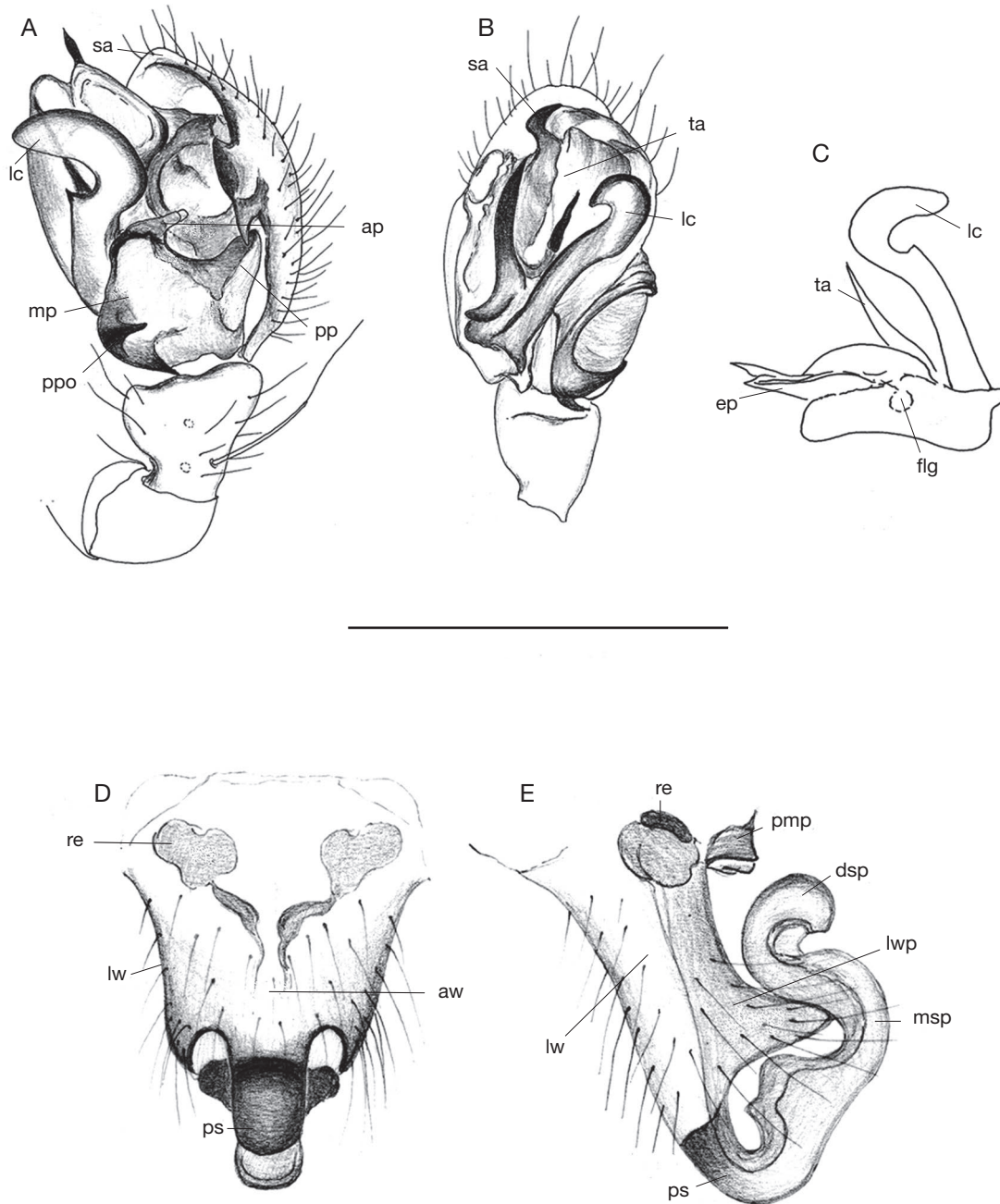


FIG. 4. — *Lepthyphantes ensiferus* Barrientos n. sp., genital organs: **A, B**, male copulatory bulb, retrolateral view (**A**), ventral view (**B**); **C**, schema of the embolic division; **D, E**, epigyne, ventral view (**D**), lateral view (**E**). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

DESCRIPTION

*Male (holotype)*

Total body length 2.20. Carapace: 0.93 long, 0.78 wide, coloration yellow-amber, pale and uniform, a little more intense in the anterior cephalic area, with a few scattered hairs. Eyes relatively small, but developed and with black areolas. Chelicerae: 0.46 (stem length), with three teeth on the promargin (basal tooth clearly separated from the two distal) and a denticle on the retromargin; same color as the carapace, but more intense. Legs pale yellow-amber; covered

with a fine, short and very regular hairiness; long and thin; measurements: leg I (1.47 + 0.29 + 1.47 + 1.47 + 0.95), leg II (1.47 + 0.29 + 1.37 + 1.27 + 0.83), leg III (1.18 + 0.24 + 0.98 + 1.03 + 0.76), and leg IV (1.32 + 0.29 + 1.47 + 1.37 + 0.86). Opisthosoma: length 1.13, width, 0.83 matte grayish-white, without dorsal pigmentary pattern and covered with long scattered hairs.

Palp and copulatory bulb (Figs 4A-C; 13J). Paracymbium very wide, subquadrangular, due to the great development of its proximal part, very broad at base, subtriangular distally



and without basal pilosity; middle part with a pair of acute denticles, quite close, in the posterior area, and little excavated in its anterior part; the apical part very short and narrowing in a straight fingering. Bulb ventrally and laterally emphasizing the development of the lamella characteristic; a consistent process, starting from the back of the radix, orienting forward and outward; slightly curved, and showing distally, a clearly laminar structure describing a semicircle, like a broad-leaved sickle (arrangement particularly clear in a retrolateral observation). On ventral side, the suprategular apophysis curved, sharp and well sclerotized visible at the anterior end. Radix (Fig. 4C) developing, in front of the lamella characteristic, another long and acute process, well sclerotized, and slightly curved, the terminal apophysis. Embolus located in front of the radix, forming three translucent and sublaminar points; one of them, embolus proper, allowing to glimpse the route of the canal, starting from Fickert's gland (fgl).

*Female (paratype [MZB 2017-0658])*

**Body.** Total body length 2.50. Carapace: 0.98 long by 0.78 wide, yellow-amber, with a brown and bright tint; no pigmentary pattern; coloration more intense in the cephalic area, which has some scattered hairs. Eyes developed, in standard disposition and with black areolas. Chelicerae 0.46 long, with a somewhat more intense coloration than the carapace; with three small teeth on the promargin (the two distal clearly separated from the basal) and only one on the retromargin. Legs yellowish, somewhat paler than the carapace, long and thin; measurements: leg I (1.52 + 0.34 + 1.47 + 1.44 + +0.88), leg II (1.37 + 0.34 + 1.35 + 1.35 + 0.83), leg III (1.13 + 0.27 + 1.08 + 1.08 + 0.64), and leg IV (1.27 + 0.29 + 1.37 + 1.32 + 0.78). Opisthosoma 1.42 long by 1.03 wide, yellowish white, without dorsal pigmentary pattern and with strewn long hairs.

**Female genitalia.** Epigyne (Figs 4D, E; 13H, I) very developed and protruding in the ventral side of epigastrium, almost perpendicular to the surface of opisthosoma. Basal zone elongate, formed by the anterior and lateral walls of the bursa copulatrix, opening backward; these walls with a long and scattered hairiness. Posterior wall developing the median plate, semicircular and sclerotized, on which the distal part of the scape rests. Lateral walls not forming "wings", although they distally expand in two triangular points closing the flanks of the bursa copulatrix. Scape relatively large; starting from the anterior wall of the bursa, so that lateral walls with a notch, rounded on each side, delimit the beginning. No specific development of the proscape, because it is limited to change direction, leaning towards the opisthosoma wall (only in a posterior observation appearing a little more dilated and rounded). Middle part of the scape oriented towards the inside of the bursa copulatrix, but maintaining a curvature in "C" so that the distal part is oriented outwards; scape route easily observable laterally. Entire escape greatly sclerotised and looking as a rigid structure, but allowing to observe by transparency the route of the fertilization ducts.

*Lepthyphantes fadriquei* Barrientos n. sp.  
(Figs 5; 13E-G)

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**TYPE MATERIAL.** — **Holotype.** Morocco. 1♂; Kef Aziza, Boudenib, Meknès; 28.VIII.1970; O. Escolá leg.; MZB 73-2905.

**Paratypes.** Morocco. 3♀; same locality and date as the holotype; MZB 72-5577 • 1♀; same locality; 2.VI.2001; F. Fadrique & O. Escolá leg.; MZB 2001-0414.

**OTHER MATERIAL.** — **Morocco.** 3 juv.; same locality and date as the holotype; MZB 72-5578.

**DIAGNOSIS.** — In its posterior middle part, the paracymbium presents a very developed elongation, acute and curved towards the external side; its apical branch is narrow, straight and lanceolate. In the radix a sharp, spiny tip develops at its posterior end. The lamella characteristic consists of a long and narrow projection, which gradually sharpens towards the tip, maintaining a progressive curvature. The terminal apophysis, equally long and narrow, describes a curved path, parallel to the lamella characteristic, and somewhat longer. The epigyne is wide at its base and perpendicular to the surface; it narrows progressively distally where a proscape with an elliptical contour, flanked by the lateral walls, stands out. The set of the scape describes a structure in "S" (easily seen in side view). The morphology of the epigyne resembles that of *L. ensiferus* Barrientos n. sp.; however, the structure of the male genitalia separates the two species, which places *L. fadriquei* Barrientos n. sp. in an uncertain position in the group of Micronetinae.

**ETYMOLOGY.** — We dedicate this species to Floren Fadrique, the main promoter of the latest biospeleological surveys in Morocco; without his generosity, initiative and dedication on the ground (before, during and after each expedition) we would not have many of the interesting samples of this small study.

**DISTRIBUTION.** — *L. fadriquei* Barrientos n. sp. is known only from the type locality, a cavity of the province of Meknès, in the high Moroccan Atlas.

**DESCRIPTION**

*Male (holotype)*

**Body.** Carapace: 0.81 long, by 0.68 wide; coloration pale yellow uniform and without additional pigmentary pattern. Some hairs scattered in the cephalic area. Without eyes. Chelicerae: 0.39 (length of stem), with three teeth, short and separated on the promargin; unarmed retromargin. Legs of the same color as the carapace; relatively long and thin; measurements: leg I (1.32 + 0.25 + 1.42 + 1.32 + 0.78), leg II (1.22 + 0.22 + 1.25 + 1.13 + 0.64), leg III (1.13 + 0.20 + 0.81 + 0.91 + 0.59), and leg IV (1.27 + 0.25 + 1.08 + 1.18 + 0.64). Opisthosoma missing.

**Palp and copulatory bulb** (Figs 5A-C; 13G). In the paracymbium, posterior middle part particularly well developed; prolonged by a long sharp projection and curved outwards (Fig. 5A, B); proximal part wide and trapezoidal, with some hairs in its basal area; middle part marked by two protrusions or dilatations: one just mentioned in the posterior part and one in the anterior part, thick and blunt, delimiting the anterior pocket; from the anterior pocket, the apical branch narrow, straight, somewhat spatulate, and relatively short. Ventrally bulb showing on its prolateral side the basal structure of the

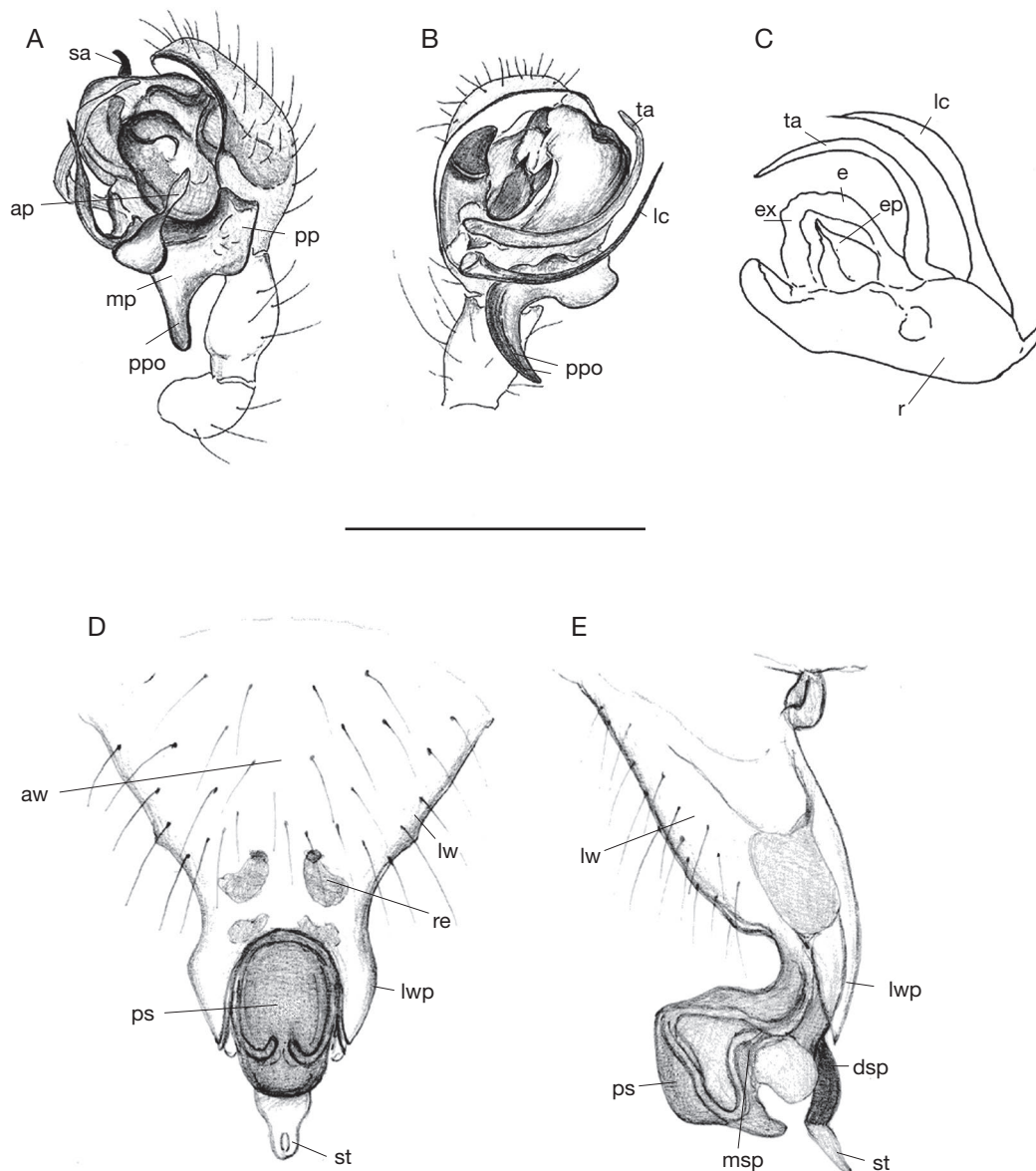


FIG. 5. — *Lephyphantes fadriquei* Barrientos n. sp., genital organs; **A, B**, male copulatory bulb, retrolateral view (**A**), ventral view (**B**); **C**, schema of the embolic division; **D, E**, epigyne, ventral view (**D**); idem, lateral view (**E**). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

embolic division (Fig. 5C), the radix. Radix with a sharp and spiny process in its posterior part, and immediately afterwards, on its internal side, the lamella characteristic. Lamella consisting of a long and narrow projection, progressively sharpened toward the tip, maintaining a progressive curvature. Terminal apophysis parallel to the lamella characteristic, equally long and narrow, and describing a curved path of somewhat greater length; these two similar structures running parallel. Embolus complex, arising from the anterior part of the radix; with a laminar expansion, thin and transparent, as protective element of the embolus proper. Supratergular apophysis as a sharp process in front and below the terminal apophysis and lamelle characteristic; sharp, sclerotized, thicker and curved (Fig. 5A).

*Female (paratype [MZB 2001-0414])*

**Body.** Total body length: 2.15. Carapace: 0.88 long by 0.64 wide, yellow, very light, without pigmentary pattern; some scattered hairs in the cephalic part. Completely blind; without eyes or areolated remains. Chelicerae: 0.37 of length and a coloration more intense than carapace; with three tiny, equidistant teeth on the promargin; no teeth on the retromargin. Legs yellowish, very pale, long and thin; measurements: leg I (1.42 + 0.29 + 1.37 + 1.27 + 0.86), leg II (1.27 + 0.27 + 1.32 + 1.27 + 0.83), leg III (1.22 + 0.25 + 0.93 + 1.03 + 0.64), and leg IV (1.320 + 0.27 + 1.24 + 1.22 + 0.78). Opisthosoma 1.22 long by 0.78 wide, yellowish white, uniform and without pigmentary pattern, covered with fine, long, scattered and colorless hairs.

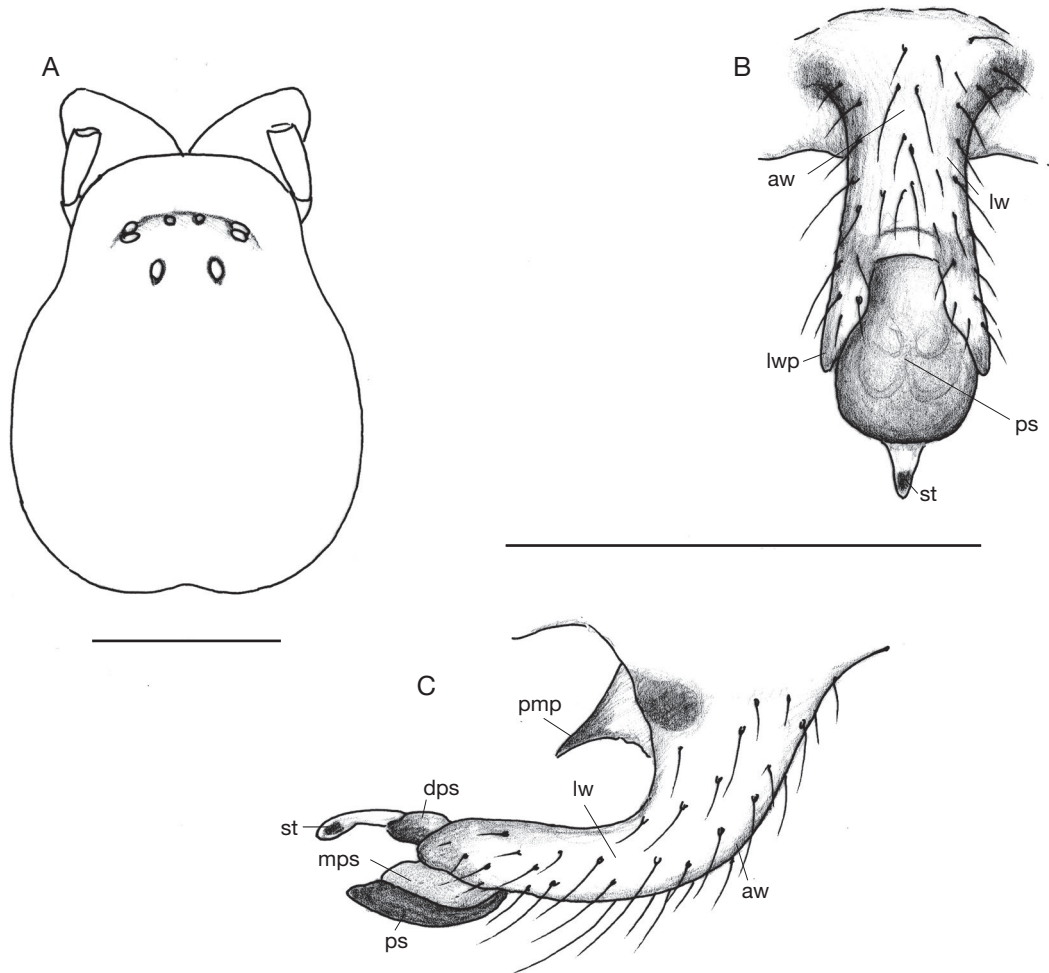


FIG. 6. — *Leptyphantes imazigheni* Barrientos n. sp., carapace and genital organs: **A**, carapace; **B**, **C**, epigyne, ventral view (**B**), lateral view (**C**). Abbreviations: see Material and methods. Scale bars: 0.5 mm.

**Female genitalia.** Epigyne (Figs 5D, E; 13E, F). Epigyne very developed and outstanding, in relation to the size of the opisthosoma; almost perpendicular to epigastrum surface. Its basal part narrowing progressively and formed by the anterior wall and the lateral walls, covered with long and scattered hairs. Distally, scape voluminous; proscape drawing a smooth surface with an elliptical contour; proscape framed between the extensions of the lateral walls. In the margins of the proscape, the fertilization ducts well visible. Scape: middle part located practically below the proscape; distal part oriented outward again, forming a narrow point (stretcher) protruding below. Entire set describing in a small space a double directional change in the shape of an “S”, which can be seen in a lateral view (Fig. 5E). By transparency through the anterior wall of the epigyne, the receptacula observed in the pedunculated area, near the scape base.

*Leptyphantes imazigheni* Barrientos n. sp.  
(Figs 6; 14A, B)

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**TYPE MATERIAL.** — **Holotype.** Morocco. 1♀; Av. Bab Bou Idir, Bab Bou Idir, Taza; 17.IX.2016; F. Fadrique leg.; MZB 2016-4078.

**DIAGNOSIS.** — The epigyne is well developed on the ventral side of the epigastrum. Its basal part lengthens and narrows distally, while curving backwards (forming a right angle). The side walls form a pair of short “wings” that protect the scape. The proscape is narrow and rounded, somewhat domed; the distal part of the scape forms a projection (stretcher) protruding below the proscape. The structure of the epigyne resembles that of *L. taza*, a species with which it could have some relationship. However, the curvature of the entire structure makes *L. imazigheni* Barrientos n. sp. a different species.

**ETYMOLOGY.** — Imazighen is the name that designates the first settlers of North Africa. Throughout their history these peoples have

suffered numerous invasions and dominations. In spite of everything, the imazighen currently maintain their identity. We dedicate to them this small species that lives in the depths of the Maghreb.

**DISTRIBUTION.** — *L. imazigheni* Barrientos n. sp. is exclusively known from the type locality.

**DESCRIPTION**

*Female (holotype)*

**Body.** Total body length 2.84. Carapace: 1.22 long by 0.83 wide; yellowish brown, ambarine tint, somewhat more intense in the cephalic part bearing a few hairs. Eyes reduced and depigmented (Fig. 6A); ocular lenses present, but reduced and slightly paler. Chelicerae: 0.56 long, with coloration somewhat more intense than the carapace; three teeth on the promargin, the basal smallest and more separated. Legs brown, like the carapace, long and thin; coxa and trochanter somewhat paler; measurements: leg I (2.11 + 0.42 + 2.06 + 1.93 + 1.15), leg II (2.00 + 0.40 + 1.86 + 1.84 + 1.10), leg III (1.52 + 0.34 + 1.32 + 1.47 + 0.83), and leg IV (1.81 + 0.38 + 1.86 + 1.86 + 1.05). Opisthosoma 1.47 long by 1.10 wide, gray-white color, without dorsal pattern, but entirely covered with a fine hairiness.

**Female genitalia.** Epigyne (Figs 6B, C; 14A, B) very developed and protruding in the ventral side of epigastrium. Its basal part elongate and slightly narrowed distally, while curving backwards (forming a right angle); opening of the bursa copulatrix thus displaced distally. Pilosity of epigyne walls short but clearly distinct; hairs long and well areolated at their base. Posterior wall with a median plate, little visible by the arrangement of the structure itself. Lateral walls elongate forming a pair of short “wings” protecting the scape. Scape originating from the anterior part of the bursa copulatrix, from which it is separated by a furrow. Proscapae narrow with a rounded contour, somewhat domed on its external face; flexing forward, hidden by the wings of the lateral walls (middle part of the scape) and backwards (distal part), narrowing and lengthening by a fingering (stretcher) that protrudes below the proscapae.

*Male*

Unknown.

*Leptyphantes lamellatus* Barrientos n. sp.  
(Figs 7; 14D-F)

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**TYPE MATERIAL.** — **Holotype.** Morocco. 1 ♂; Ifri Nhamme, Aglefth, Taglefth, Azilal; 20.IX.2016; F. Fadrique leg.; MZB 2016-4160.  
**Paratypes.** Morocco. 1 ♀; same locality and date as the holotype.

**OTHER MATERIAL.** — **Morocco.** 2 juv.; same locality and date as the holotype; MZB 2017-0664.

**DIAGNOSIS.** — The paracymbium is especially wide in its proximal part; at the junction with the median part it extends through a small spiny projection; the apical part is digitiform and curved in inverted “C”. The bulb has a lamella characteristic flattened, curved 90°

distally, where it is finely serrated and fluted. The terminal apophysis and the basal lobe of the embolus are in the form of submembranous and transparent sheet, with a denticulate border. The epigyne is small and simplified. The proscapae is flattened and rounded, wider than long, and with a posterior notch in the folding area. The middle and distal parts of the scape cannot be observed, as they are practically hidden under the proscapae; only the distal part of the stretcher is visible. In general, the genital structures are simplified, but sufficiently different to support the definition of a new species of the *afri* group, particularly diversified in the Maghreb. By the shape of its proscapae, the new species seems close to *L. longibamatus* and perhaps also to *L. longipedis*.

**ETYMOLOGY.** — The chosen name highlights the structure of the lamella characteristic; it has a flattened and laminar appearance, with its distal edge finely serrated. It is easily observable in the bulb at rest.

**DISTRIBUTION.** — This species is exclusively known from the type locality, a cave in the province of Azilal, in the high Atlas of Morocco.

**DESCRIPTION**

*Male (holotype)*

**Body.** Total body length: 2.60. Carapace: 1.17 long, by 0.90 wide, brown yellowish, and uniform. Eyes developed and with independent black areolas. Chelicerae with a stem 0,54 long, with two unequal teeth on the promargin. Legs yellow amber, almost uniform; thin and longer than in the female; measurements: leg I (1.96 + 0.34 + 2.40 + 1.91 + 1.22), leg II (1.86 + 0.32 + 1.86 + 2.40 + 0.86), leg III (1.62 + 0.27 + 1.57 + 1.32 + 0.83), and leg IV (1.86 + 0.32 + 1.91 + 1.96 + 0.89). Opisthosoma: 1,57 long by 0,93 width, grayish, without dorsal pigmentary pattern although with some hint of gray macules; covered with scattered brown hairs.

**Palps and copulatory bulb (Figs 7A-C; 14F).** Tibia and tarsus (cymbium) without notable elements, although the latter presents laterally the paracymbium and lodges a voluminous bulb in its ventral face. Paracymbium wide and trapezoidal in its proximal zone; in the junction with the middle part an acute spinous protrusion delimiting the posterior pocket. Apical part considerably narrowed, having distally the shape of a curved and blunt fingering; the whole set curved in a regular “C”. At rest, bulb with on its retrolateral side, a lamella characteristic wide and laminar, D-shaped, toothed and finely fluted distally; this structure characteristic and easily observed. From the radix a submembranous terminal apophysis and the embolus; embolus apical lobe with a transparent membrane with with a denticulate border. Main lobe of embolus protected by this membranous lobe; more sclerotised and terminated by a sharp tooth. In the anterior part of the resting bulb, distal part of suprategular apophysis visible, having the shape of an acute and sclerotised projection.

*Female (paratype)*

**Body.** Total body length 2.55. Carapace: 1.18 long by 0.98 wide, yellow-amber uniform color, bright tone (like the male), without clear pigmentary pattern. Eyes well developed in regular arrangement (two transversal lines) and with independent black areolas. Chelicerae: 0.54 long and coloration similar to carapace; with two teeth on the promargin, separated and of

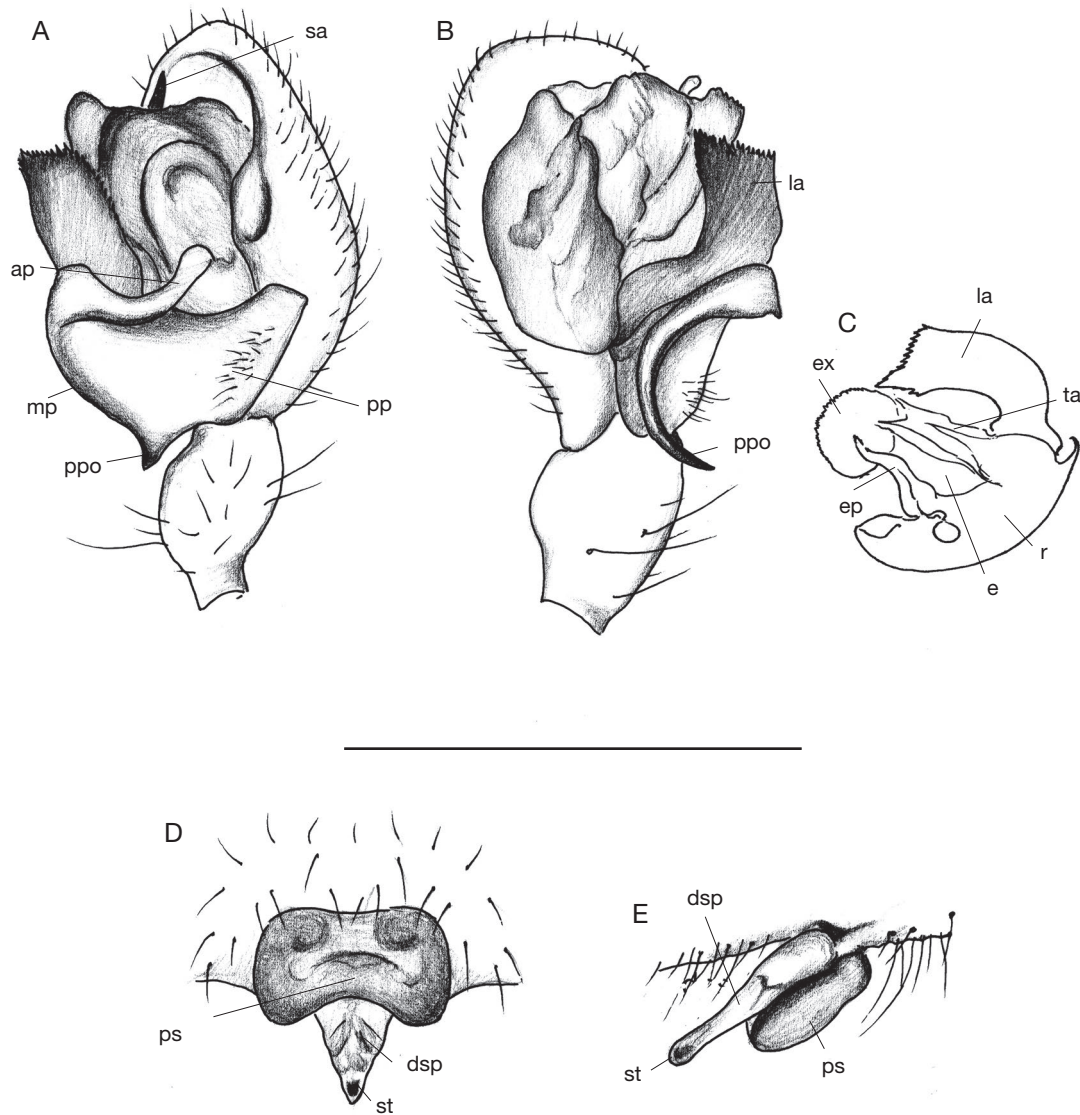


FIG. 7. — *Leptyphantes lamellatus* Barrientos n. sp., genital organs: **A, B**, male copulatory bulb, retrolateral view (**A**), ventral view (**B**); **C**, diagram of the embolic division; **D, E**, epigyne, ventral view (**D**), lateral view (**E**). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

different size as in male. Legs yellow-amber, like carapace, long and thin; measurements: leg I ( $1.96 + 0.34 + 1.86 + 1.86 + 1.13$ ), leg II ( $1.91 + 0.32 + 1.59 + 1.62 + 1.13$ ), leg III ( $1.62 + 0.27 + 1.32 + 1.40 + 0.78$ ), and leg IV ( $1.86 + 0.32 + 1.81 + 1.71 + 0.88$ ). Legs covered with a fine hairiness accompanied by some spines. Opisthoma 1.52 long by 1.03 wide, opaque white, without pigmentary pattern; some dark spots distally, covered with dark scattered hairs.

**Female genitalia.** Epigyne (Figs 7D, E; 14D, E) with a simplified structure, of reduced size, on the ventral side of epigastrium; extending backwards on postepigastrium. Unlike in other species of the *afer* group, epigyne little protruding from opisthosomal surface. Proscape flattened and with rounded contours, wider than long; well sclerotized and showing a posterior notch in the folding zone. Median and distal parts of scape hidden under the proscape. Distal part more devel-

oped, but pressed against the previous two, so that it gives the flattened image mentioned above; distal part protruding in triangular point below the proscape.

*Leptyphantes leknizii* Barrientos n. sp.  
(Figs 8; 14C)

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**TYPE MATERIAL.** — **Holotype.** Morocco. 1♀; Kef Admam, Merhraoua, Taza; 19.VII.2012; F. Fadrique leg.; MZB 2016-0173.

**DIAGNOSIS.** — The epigyne is small and perpendicular to the surface of the epigastrium; it has a wide bursa copulatrix in its basal part, closed behind by a subquadrangular median plate. The scape shows a rigid proscape with a rounded and flat contour (the semicircular path of the fertilization ducts can be reached at its edges); the middle

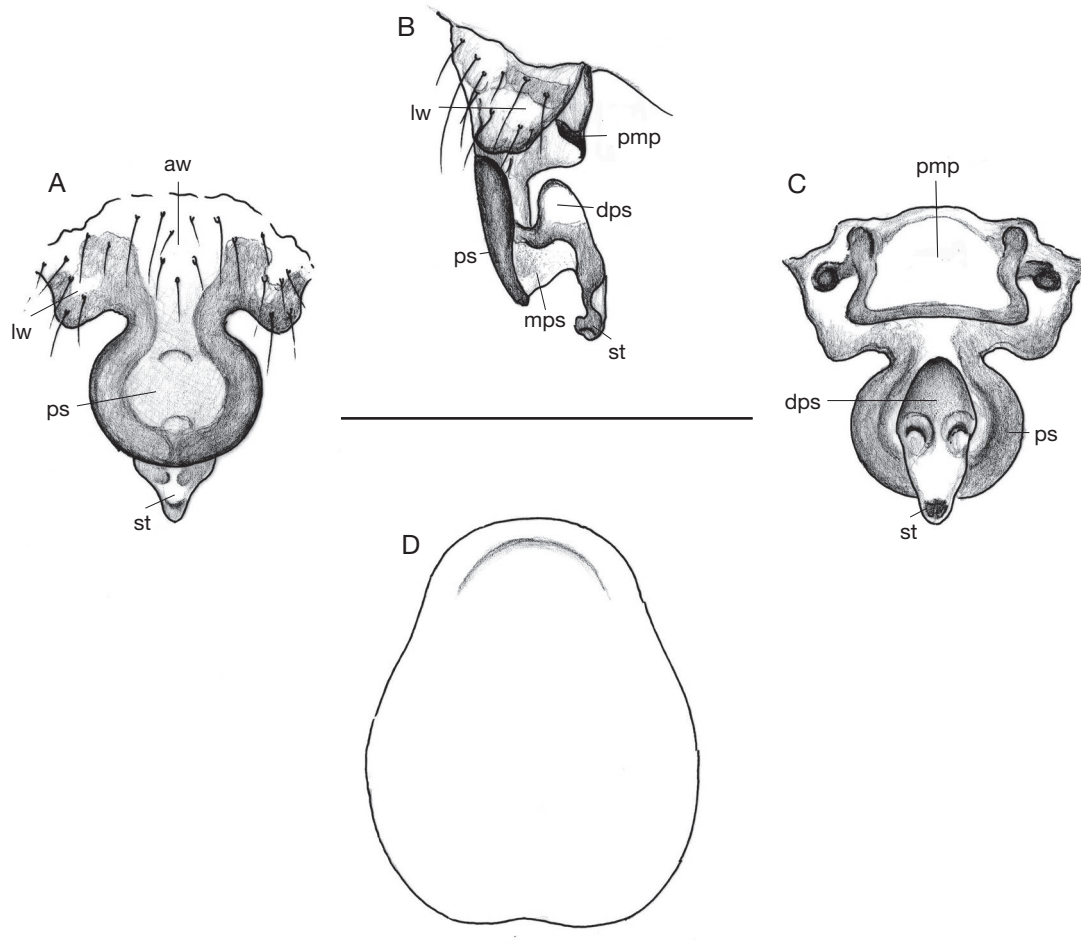


FIG. 8. — *Leptyphantes leknizii* Barrientos n. sp., genital organs: **A-C**, epigyne, ventral view (**A**), lateral view (**B**), posterior view (**C**); **D**, carapace. Abbreviations: see Material and methods. Scale bars: 0.5 mm.

and distal parts of the scape are reduced; the latter presents small, distal projection that protrudes slightly below the proscape. Following the characterization made by Bosmans (2006), this species is very close to *L. afer* (Simon, 1913); it differs from this species by presenting a practically round proscape (instead of oval) and being completely blind.

**ETYMOLOGY.** — We dedicate this species to Mehkram Lekmizi, Moroccan biospeleologist, who has been a fundamental support in the development of the expeditions of the last two years (2015 and 2016).

**DISTRIBUTION.** — It is exclusively known from the type locality.

**DESCRIPTION**

*Female (holotype)*

**Body.** Total body length: 3.13. Carapace: 1.27 long by 0.98 wide, pale brown, yellowish, bright with a few hairs in the cephalic area. Without eyes (Fig. 8D). Chelicerae: 0.78 in length and with the same coloration as the carapace. Legs brown, like the carapace, but distal articles lighter; long and thin; measurements: leg I (2.15 + 0.42 + 2.15 + 2.06 + 1.13),

leg II (2.10 + 0.39 + 1.81 + 1.96 + 1.08), leg III (1.71 + 0.34 + 1.27 + 1.81 + 1.03), and leg IV (1.86 + 0.42 + 1.81 + 1.91 + 0.93). Opisthosoma 1.86 long by 1.17 wide, whitish gray, without dorsal pattern, but entirely covered with a fine hairiness.

**Female genitalia.** Epigyne (Figs 8A-C; 14C) very small, with basal part showing a bursa copulatrix, wider than long. Lateral walls and posterior wall well developed, with a medial plate. Scape originating from the anterior part of the bursa copulatrix, not separated from the bursa copulatrix by a furrow; proscape rigid with a rounded and flat contour (its tegument well sclerotized but showing the fertilization ducts, which follow a semicircular route next to the edges of the proscape); median part of the scape quite small, so that it is immediately linked to the distal part; distinctly more narrow than the proscape and quite sclerotised; stretcher with a small blunt finger-shaped projection, without lateral wings, at the base of which begin the fertilization ducts.

*Male*

Unknown.

*Leptyphantès longihamatus* Bosmans, 1985

MATERIAL EXAMINED. — Morocco. 1♀; Akiam Ins Er Rebi, Agoudal, Ouarzazate; 23.IX.2016; C. Fontgивell leg.; MZB 2016-4071 • 1♂, 1♀, 13 juv.; same locality; 23.IX.2016; F. Fadrique leg.; MZB 2016-4075 • 1♂, 3♀; same locality; 23.IX.2016; F. Fadrique leg.; MZB 2016-4115 • 1♂, 3 juv.; Ifri Bouyzem, Aglefth, Taglefth, Azilal; 20.IX.2016; F. Fadrique leg.; MZB 2016-4079.

DIAGNOSIS. — In his description, Bosmans (1985) indicates that it is a species very close to *Leptyphantès afer* (Simon, 1913), *Leptyphantès venereus* Simon, 1913 and *Leptyphantès emarginatus* Fage, 1931, but it is distinguished from them by its copulatory organs, especially the spine of the patella, the paracymbium with a single posterior tooth, a small lamella characteristica, the clearly trimmed proscapae, the very long stretcher and the deep cleft of the median plate.

DISTRIBUTION. — The holotype comes from the cave Akiam Ins Er Rebi, Imilchil (Bosmans 1985); to this locality is added the one indicated by Tanasevitch (2014), Ifri el Caid, Ait Mohammed. The first belongs to the province of Ouarzazate and the second to Azilal; both are located in the high Atlas of Morocco. Our data confirm its presence in the type locality and add a new one, the Ifri Bouyzem cave, in Azilal.

*Leptyphantès maurusius* Brignoli, 1978

MATERIAL EXAMINED. — Morocco. 1♀; Grotte Sidi Megbeur, Sidi Megbeur, Taza; 16.IX.2016; F. Fadrique leg.; MZB 2016-4053.

DIAGNOSIS. — According to Brignoli (1978) the epigyne is characteristic, although typical of the species close to the “*pinicola* group”. It will be necessary to confirm this relationship. There is obviously a group of taxa comprising “Spanish-Moroccan forms”, such as *L. aelleni*, *L. taza*, *L. imazigheni* Barrientos n. sp., *L. phallifer* Fage, 1931, *L. fagei* Machado, 1939 and even *L. lorifer* Simon, 1907, which could be related. Among them *L. maurusius* can be easily distinguished by its epigyne and the opening of the bursa copulatrix, which is oriented outwards, instead of backwards or towards the posterior walls.

DISTRIBUTION. — *L. maurusius* is only known from the type locality (Brignoli 1978), the cave of Sidi Mejbeur, in the Taza region (high Atlas of Morocco). The data of Tanasevitch (2014) and those given in the present work confirm its presence in the above-mentioned cave.

*Leptyphantès sasi* Barrientos n. sp.  
(Figs 9; 14G-I)

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TYPE MATERIAL. — Holotype. Morocco. 1♂; Av. Arkan, Merhraoua, Taza; 19.V.2002; F. Fadrique leg.; MZB 2003-0435.

Paratypes. Morocco. 2♀; same locality and date as the holotype; MZB 2017-0657 • 2♀; Ifri Gidaire, Jbel Bou Iblane, Merhraoua, Taza; 19.IX.2016; C. Fontgивell leg.; MZB 2016-4076.

OTHER MATERIAL. — 1 juv.; Ifri Gidaire, Jbel Bou Iblane, Merhraoua, Taza; 19.IX.2016; C. Fontgивell leg.; MZB 2017-1479.

DIAGNOSIS. — The paracymbium is domed in its middle part, with a pair of short denticles on its lower edge; the apical part is narrow, with a sinuous and finger-shaped apex. The lamella characteristica is bifurcated basally: inner branch narrow, laminar and ending in tip; outer branch also laminar, widening progressively and with a series of sclerotized tips in its distal edge. The anterior wall of the epigyne

is strongly curved backwards; the lateral walls lengthen on the sides forming a pair of subtriangular “wings”, which protect the proscapae. The proscapae expands after a brief basal narrowing, making a well sclerotized subcircular structure. Because of its female genital traits, *L. sasi* Barrientos n. sp. recalls *L. djazairi* Bosmans, 1985, always within the characteristics of the “*afer* group”. The structures shown by the male copulatory bulb are more complex to relate; the basal fusion of the lamella characteristica and terminal apophysis constitutes a characteristic feature; but as a whole it resembles those presented by *L. aelleni*.

ETYMOLOGY. — This species is dedicated to the speleologist Francisco Sas Planas, recently deceased, one of the main promoters of the Moroccan expeditions in its beginnings (years 1968-1970); this little tribute and our gratitude for him.

DISTRIBUTION. — The samples studied come from two nearby caves located in Merhraoua, in the high Atlas of Morocco (Taza region).

## DESCRIPTION

*Male (holotype)*

**Body.** Total body length: 2.80. Carapace: 1.37 long, by 1.03 wide, yellow-amber, uniform. Hairs scattered in the cephalic area, up to the eyes. Eyes relatively small, but visible and surrounded by a small black areola. Chelicerae with 0.61 long stem, with three equal-sized teeth on the promargin and one tooth (smaller and followed by three denticles) on the retro-margin. Legs yellow-amber; relatively long and thin; measurements: leg I (1.76 + 0.37 + 2.06 + 1.86 + 1.13), leg II (1.71 + 0.34 + 1.62 + 1.52 + 1.03), leg III (1.27 + 0.32 + 1.42 + 1.32 + 0.54), and leg IV (1.62 + 0.34 + without + without + without). Opisthosoma 1.42 long, 1.08 wide, matt white, grayish and without dorsal pigmentary pattern. Long and brown hairs scattered on its surface.

**Palp and copulatory bulb** (Figs 9A-C; 14I). Paracymbium thick and clearly domed in its middle zone (Fig. 9A), whose lower edge is delimited by a pair of short denticles; proximal part wide; upper end rounded, with a group of short hairs at its base; middle part domed, making the two pockets, one posterior and one anterior (this specially developed); apical part of paracymbium narrowing progressively, so that its end is sinuous and finger-shaped. Bulb as on Fig. 9A, B: with the lamella characteristica attached at its base to the terminal apophysis. Terminal apophysis straight, narrow, laminar, and distally pointed; outer branch (lamella characteristica, located next to the paracymbium) also laminar but widening and progressively curved accompanying the surface of the bulb. Distal part of the lamella characteristica of subtriangular contour, presenting a series of sclerotized tips related to a clear striation at least in its distal half; apex darker with denticulate margins. Radix (Fig. 9C) distally differentiating a spiny and acute prolongation. Embolus complex protruding from the middle zone of the latter prolongation. Main part of embolus simple, narrow at base and widened at its distal area that is laminar, except at the black point where the duct is opened; accompanied by a laminar structure, narrow at base, which also dilates at its apex making a translucent sheet, protecting the distal part of the main part of the embolus. Fickert's gland clearly visible. Supratergular apophysis sclerotized and with several acute tips, protruding in the anterior part of the bulb, under the complex of the embolic division.

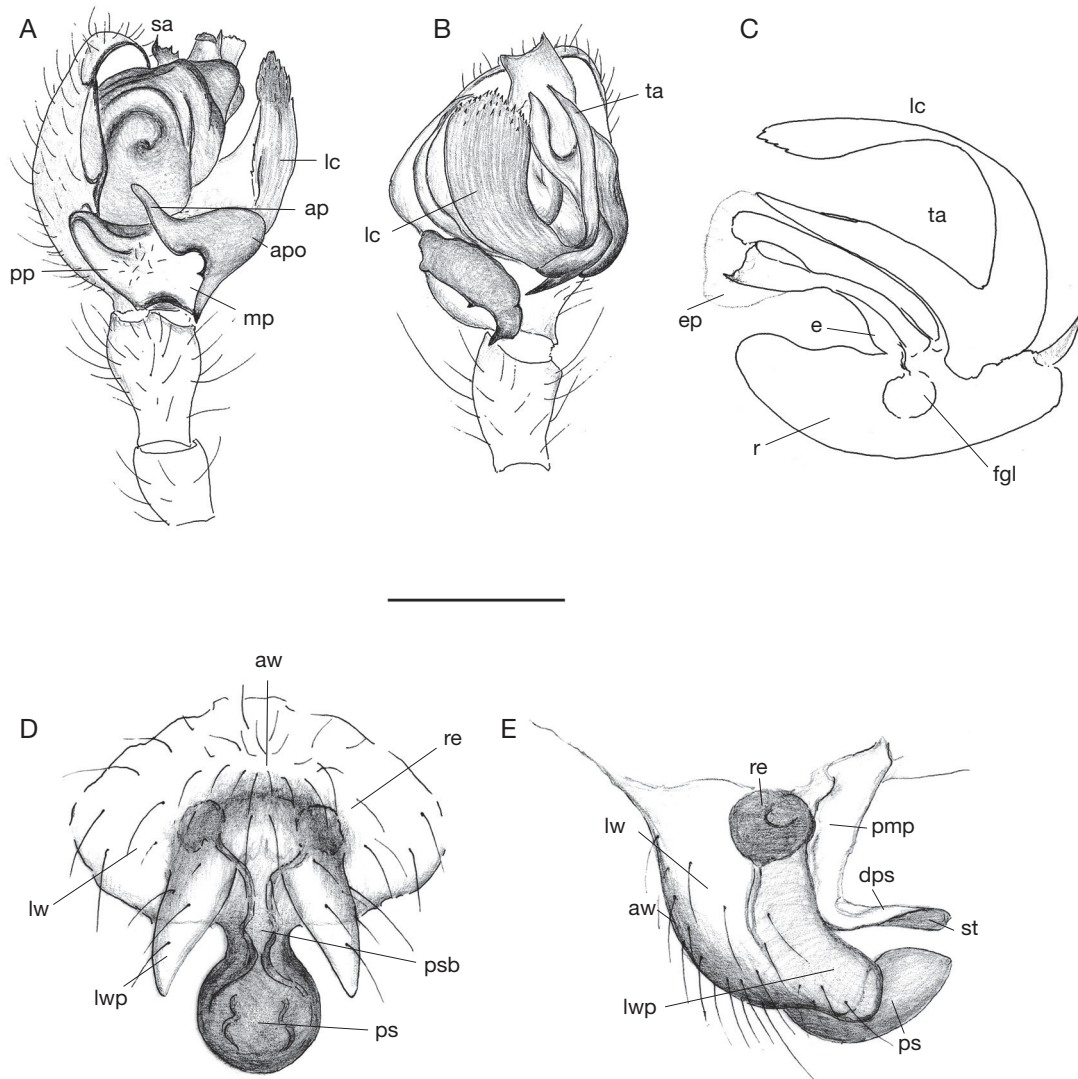


FIG. 9. — *Lephyphantes sasi* Barrientos n. sp., genital organs: **A, B**, male copulatory bulb, retrolateral view (**A**), ventral view (**B**); **C**, schema of the embolic division; **D, E**, epigyne, ventral view (**D**), lateral view (**E**). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

*Female (paratype [MZB 2017-0657])*

**Body.** Total body length: 3.38. Carapace: 1.18 long by 0.78 wide, yellow-amber, very clear and uniform, without pigmentary pattern; some hairs scattered in the cephalic part. Eyes reduced, but present and slightly areolated, in typical disposition. Chelicerae: 0.69 long, with the same coloration as the carapace, but somewhat more intense; with three equal-sized teeth on the promargin, regularly spaced, and one on the retromargin (accompanied by three punctate dentils in a row). Legs long and thin as in the male, yellow-amber, a bit more intense than the carapace; measurements: leg I (1.93 + 0.39 + 2.06 + 1.96 + 1.13), leg II (1.76 + 0.34 + 1.81 + 1.37 + 0.76), leg III (1.62 + 0.32 + 1.44 + 1.32 + 0.71), and leg IV (1.76 + 0.34 + 1.79 + 1.74 + 0.78). Opisthosoma: 1.71 long by 1.08 wide, matt grayish-white, uniform and without dorsal pigmentary pattern; covered with numerous thin and scattered hairs, brown and quite long.

**Female genitalia.** Epigyne (Figs 9D, E; 14G, H) standing out on the ventral side of the epigastrum; almost perpendicular to the surface of the opisthosoma, with the opening of the bursa copulatrix looking back. Basal part bulging and elongate in front and on the sides. Anterior wall, with a long and scattered hairiness, curved back giving a rounded profile. Lateral walls also elongate forming on each side a pair of subtriangular “wings”, protecting the flanks of the proscape; in the basal zone, receptacula seen by transparency. Posterior wall short and with a narrow median plate. Proscapae originating from the anterior wall of the bursa copulatrix, between the two expansions of the lateral walls. Near its base, proscapae widening after a brief basal narrowing, giving a well-sclerotized subcircular contour structure. Middle part of the scape curved and placed under the proscapae, hidden and facing forward; slightly sclerotized and curved again to give the distal part, very short, which also does not protrude from the proscapae; strecher observed laterally below it. Fertilization ducts observed by transparency.



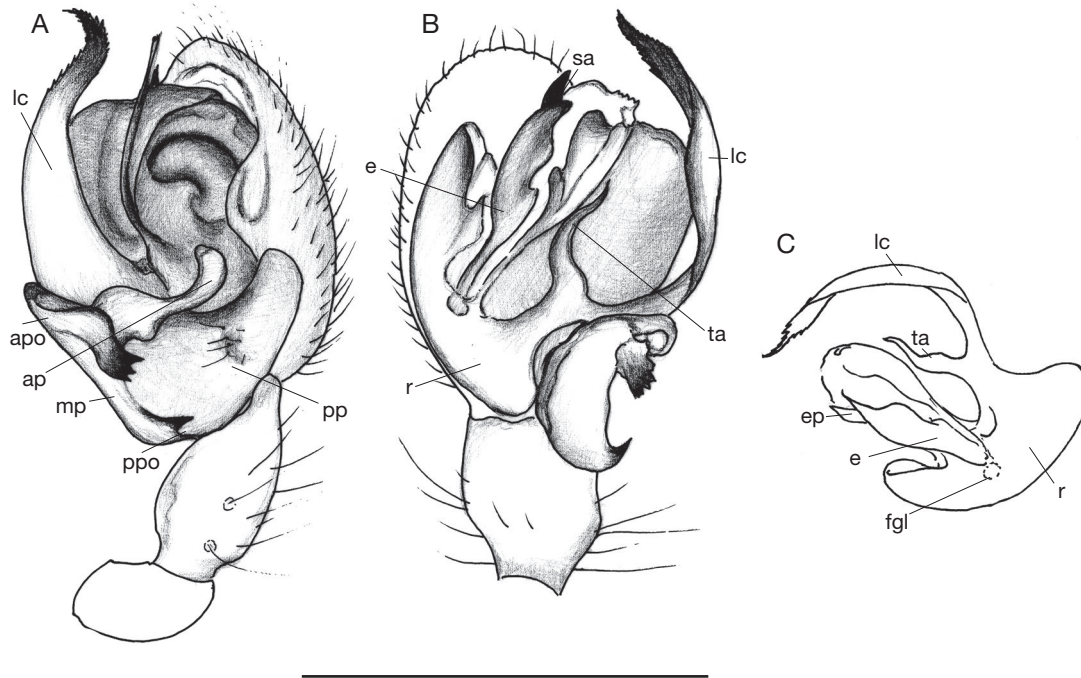


FIG. 10. — *Leptyphantes taza* Tanasevitch, 2014, male genital organs: A-C, male copulatory bulb, retrolateral view (A), ventral view (B), embolic division (C). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

*Leptyphantes taza* Tanasevitch, 2014  
(Fig. 10)

**MATERIAL EXAMINED.** — **Morocco.** 1♀, 2 juv.; Cv. Trou de la Piste, Tabhairte, Taza; 3.IX.2009; A. Faille leg.; MZB 2010-1837 • 1♀; same locality; 1.VIII.2012; F. Fadrique leg.; MZB 2014-7288 • 5♀, 2 juv.; same locality; 15.IX.2016; F. Fadrique leg.; MZB 2016-4080 • 1♂, 1♀; Ifri Azokhage (= Riviere Chara), Tabhairte, Taza; 15.IX.2016; F. Fadrique leg.; MZB 2016-4087.

**DIAGNOSIS.** — The paracymbium is narrow; it presents an acute denticle in the proximal part of its middle zone, and a laminated prolongation with three points in its anterior part; the apical part is finger-shaped and bent distally. In the bulb, the lamella characteristic is fused at the base with the terminal apophysis, making a bifurcated structure: the terminal apophysis is short, narrow and sinuous; the lamella characteristic is narrow and extends forward on the outer side of the bulb, apically denticulated at on the margins. The female is characterized by the peculiar conformation of the epigyne: the walls of the bursa copulatrix protrude, moving its opening away from the epigastric wall. The lateral walls differentiate an elongated process (“wings”) on each side, flanking a reduced proscape, as well as the rest of the scape, which is not very apparent. *Leptyphantes taza* could be related to a set of species from the Maghreb, *L. aelleni*, *L. maurusius*, *L. imazigheni* Barrientos n. sp. and *L. sasi* Barrientos n. sp. (although in the latter there are features in the female genitalia that bring it closer to the “*afer* group”).

**DISTRIBUTION.** — This species was only known from the type locality (Tanasevitch 2014). We add other caves here in the same region of Chara, south of Taza, in the Moroccan Atlas.

**DESCRIPTION**  
*Male*

**Body.** Total body length: 2.63. Carapace: 1.02 long and 0.96 wide, pale brown yellowish, uniform. Scattered hairs in the

cephalic area, up to the eyes. Eyes relatively small, but visible and surrounded by a black areola. Chelicerae with 0.36 long stem, with three teeth (one bigger) and a minor denticle on the promargin; on the retromargin a small slightly denticulated edge. Legs pale brown yellowish; lighter in distal articles (metatarsus and tarsus); relatively long and thin; measurements: leg I (2.11 + 0.38 + 2.24 + 1.92 + 1.06), leg II (1.95 + 0.35 + 1.89 + 1.79 + 1.02), leg III (1.79 + 0.32 + 1.47 + 1.44 + 0.90), and leg IV (1.92 + 0.35 + 1.86 + 1.86 + 0.99). Opisthosoma, length 1.60, width, 0.90, pale yellow, whitish and without dorsal pigmentary pattern.

**Palp and copulatory bulb** (Fig. 10A-C). Paracymbium narrow; proximal part wide, with rounded edges and small hairs; middle part with an acute denticle at the posterior end (which closes the posterior pocket) and a laminated three-pronged denticle at the anterior end (which in turn delimit the posterior pocket); apical part finger-shaped, bent distally. With the bulb at rest: radix well visible ventrally on prolateral side. Lamella characteristic fusing at the base with the terminal apophysis, protruding from the back, so that it appears as a bifurcated structure. Anterior branch short, narrow and sinuous; posterior branch laminar, narrow, longer and extending forward on the outer side of the bulb; distal part darker, with denticulate margins. Embolus emerging from the middle part of the radix; quite complex: main part simple, laminar, widened in its middle part and finished in a black bifurcated tip; accompanied, from the base, by a sheet becoming translucent and protecting distally the main part. Fickert’s gland visible in the radix. Suprategular apophysis sclerotised, pointed and curved, protruding below the embolus and facing forward.

Genus *Palliduphantes* Saaristo & Tanasevitch, 2001

*Palliduphantes banderolatus* Barrientos n. sp.  
(Figs 11; 15A-C)

[urn:lsid:zoobank.org:act:958764B5-F3BC-48FE-968C-03E3B45A7258](https://doi.org/10.21203/rs.3.rs-1000000/v1)

**TYPE MATERIAL.** — **Holotype.** Morocco. 1♂; Ifri N'Yzme, Ait Abdallah, Tarudant; 16.X.2015; L. Auroux leg.; MZB 2015-8578. **Paratypes.** Morocco. 1♂, 2♀; same locality and date as the holotype; MZB 2017-0666 • 1♂; Puits Cochrisco C.A.10, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane; 18.X.2015; C. Fontgivel leg.; MZB 2015-8592.

**OTHER MATERIAL.** — **Morocco.** 2 juv.; same locality and date as the holotype; MZB 2017-0667 • 1♀; Puits Cochrisco C.A.9, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane; 18.X.2015; L. Auroux leg.; MZB 2017-0217 • 1♀; same locality; 18.X.2015; L. Auroux leg.; MZB 2017-0221 • 1♀; same locality; 18.X.2015; L. Auroux leg.; MZB 2017-0222 • 1♀; Puits Cochrisco C.A.10, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane (Morocco); 18.X.2015; F. Fadrique leg.; MZB 2017-0211 • 1♀; Puits Cochrisco C.A.11, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane (Morocco); 18.X.2015; L. Auroux leg.; MZB 2017-0214.

**DIAGNOSIS.** — The proximal part of the paracymbium is narrow; the middle part is wider and has an anterior denticle, long and sharp; the anterior part is wide and has rounded contours. In the bulb, the lamella characteristica is elongated and narrow, ending in a sharp point; in a subterminal position, it presents a flat and laminar denticle terminated in two points, like a banderole. The epigyne protrudes on the ventral side of the epigastrium; the posterior wall bears a middle plate, with two juxtaposed rounded areas; the lateral walls protect the scape. The scape is narrow, elongated and almost completely hidden; the proscape, barely individualized, is oriented towards the back, and can be clearly observed in side view; middle and distal parts of the scape describing an inflection in “S” near the median plate. Although the shape of the lamella characteristica individualizes *P. banderolatus* Barrientos n. sp., its structures relate it to other species of the genus, originated from caves of the Iberian Peninsula, such as *P. cortesi* Ribera & De Mas, 2003, *P. lorifer* (Simon, 1907) or *P. cadiziensis* (Wunderlich, 1980), among others.

**ETYMOLOGY.** — The name refers to the shape of the lamella characteristica, narrow and elongated at its base, and dilated in an expansion that recalls a “banderole”, in its distal part.

**DISTRIBUTION.** — The localities in which this new species has been captured are located in Ait Abdallah, province of Taroudant, Anti-atlas, in southern Morocco.

**DESCRIPTION**

*Male (holotype)*

**Body.** Total body length 1.91. Carapace, 0.83 long and 0.69 wide, brown yellowish, and uniform. Hairs scattered in the cephalic area, up to the eyes. Eyes developed and areolated of black. Chelicerae: 0.39 long of the basal portion, with three teeth on the promargin. Legs yellow amber, a bit more intense in the basal parts and in the first legs (femora I and II); relatively long and thin; measurements: leg I (1.22 + 0.27 + 1.25 + 1.17 + 0.73), leg II (1.13 + 0.27 + 1.08 + 1.08 + 0.69), leg III (0.95 + 0.24 + 0.83 + 0.83 + 0.44), and leg IV (1.13 + 0.27 + 1.08 + 1.15 + 0.69). Opisthosoma, length 1.00 and

width 0.69, pale grayish color, without dorsal pigmentary pattern, but covered with brown hairs scattered throughout the integument.

**Palp and copulatory bulb** (Figs 11A-C; 15C). Proximal part of paracymbium narrow and with parallel sides, with some short hairs; middle part noticeably wider and flattened, with a long, sharp denticle in the anterior area, and only one more pronounced ridge on its posterior margin; so that the “pockets” are poorly marked; anterior part also wide, with rounded contours, and extended backwards by a laminar curved structure. Bulb as on Figure 11A, B: lamella characteristica clearly visible elongated and narrow, ending in a sharp, slightly curved tip; in a subterminal position, with a flat and laminar denticle, finished in two points, like a banderole. Radix revealing the Fickert’s gland and distally developing a small sharp tip (only visible with the expanding bulb). Terminal apophysis emerging from radix middle part, sublaminar and rounded. Embolus in more distal position, with two sclerotized tips and protected by a laminar protrusion. Below the radix, forward and clearly visible at the anterior end, the suprategular apophysis, curved and pointed, protruding.

*Female (paratype [MZB 2017-0666])*

**Body.** Total body length 1.86. Carapace, 0.78 long by 0.66 wide, with a uniform yellow-amber brown color, without pigmentary pattern, but with some hairs scattered on the cephalic part. Eyes well developed, in regular arrangement (two transversal lines) and areolated of black. Chelicerae: 0.42 of length, same coloration as the carapace; with three separate teeth on the promargin and of similar size (as in the male). Legs yellow-amber, like the carapace, long and thin; measurements: leg I (1.32 + 0.34 + 1.32 + 1.22 + 0.83), leg II (1.22 + 0.32 + 1.15 + 1.13 + 0.73), leg III (1.05 + 0.29 + 0.83 + 0.93 + 0.54), and leg IV (1.30 + 0.29 + 1.17 + 1.08 + 0.69). Legs covered with a fine hairiness accompanied by some spines. Opisthosoma, 0.98 long by 0.73 wide, dark gray, without a defined pigmentary pattern, but with some diffuse macules, paler and transverse, on its dorsal side. Covered with numerous scattered hairs, dark and quite long.

**Female genitalia.** Epigyne (Figs 11D-F; 15A, B) standing out on the ventral side of the epigastrium, leaning backwards on the surface of the postepigastrium. This arrangement resulting from the lengthening of the anterior wall of the bursa copulatrix (which thereby opens backwards). Anterior wall with a long and scattered hairiness, easy to see, as well as by transparency the two receptacula in the basal area. Posterior wall with the medial plate, consisting of two juxtaposed rounded areas. Lateral walls not forming “wings”, but protecting the scape and with an abundant pilosity, like the anterior wall. Scape narrow, elongated and almost completely hidden, since inflected immediately and oriented backwards. In this way, proscape slightly differentiated and oriented backwards, narrowing and elongated, being easily observed laterally. Middle part of the scape and distal part

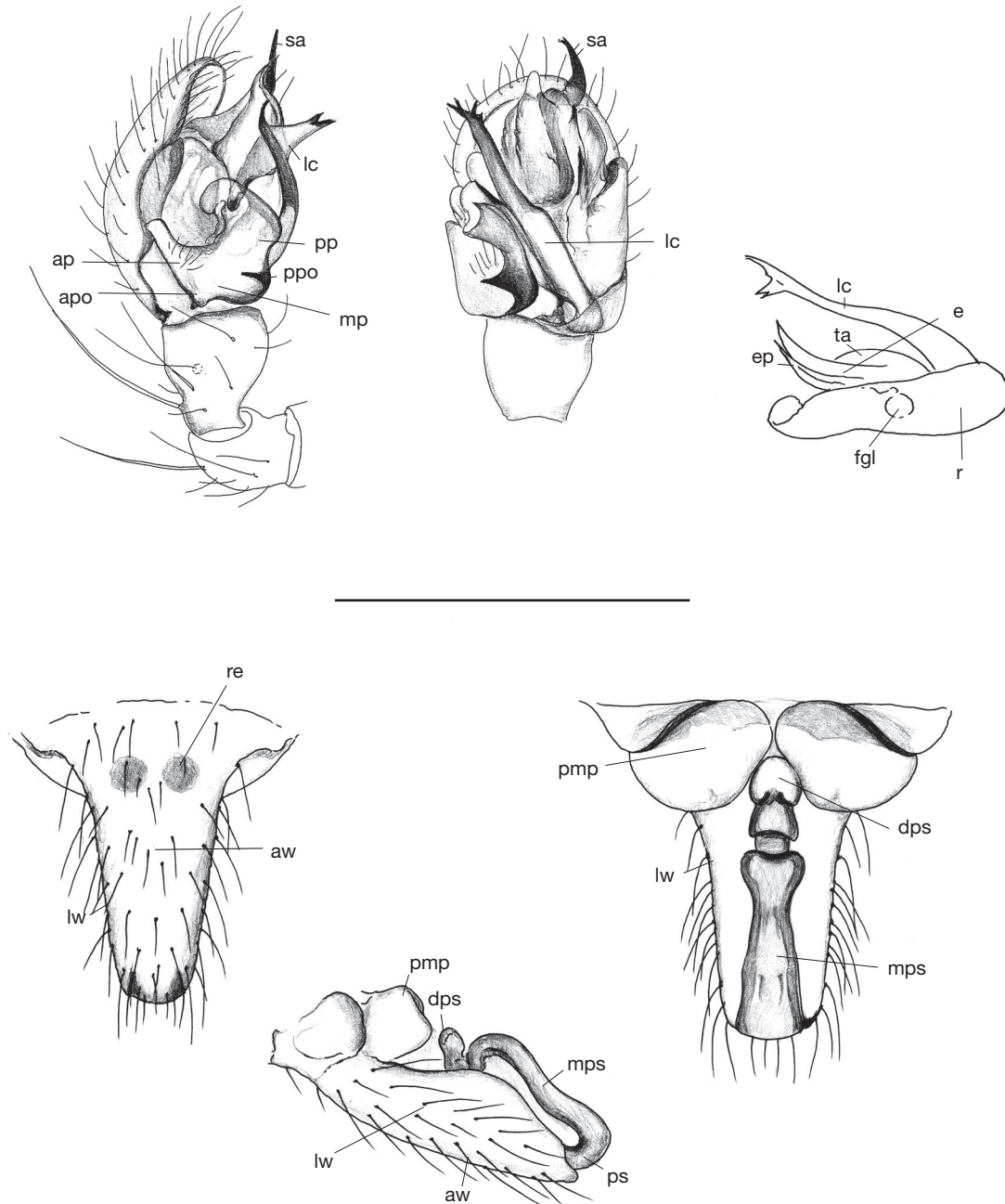


FIG. 11. — *Palliduphantes banderolatus* Barrientos n. sp., genital organs: **A, B**, male copulatory bulb, retrolateral view (**A**), ventral view (**B**); **C**, schema of the embolic division; **D-F**, epigyne, ventral view (**D**), lateral view (**E**), posterior view (**F**). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

small, forming an inflection in “S” that is close to the median plate of the posterior wall.

### *Palliduphantes cadiziensis* (Wunderlich, 1980)

**MATERIAL EXAMINED.** — **Morocco.** 5♂, 5♀, 8 juv.; Kef Maamram, Ras El Maa, Taza; 16.IX.2016; F. Fadrique leg.; MZB 2016-4116 • 1♀; same locality; 16.IX.2016; C. Fontgivell leg.; MZB 2016-4061 • 1♀; Av. Bab Bou Idir, Bab Bou Idir, Taza; 17.IX.2016; F. Fadrique leg.; MZB 2016-4063 • 1♂; same locality; 17.IX.2016; F. Fadrique leg.; MZB 2016-4091.

**DIAGNOSIS.** — From the description of Wunderlich (1980) we extract the following characters: Lamella characteristic of the male bulb elongated and bifurcated distally; embolus pointed. Thick and protruding epigyne; scape strongly curved, with its narrow distal part. The carapace and the legs are yellowish or ochre-yellowish in color. Eyes are areolated in black. Opisthosoma gray to dark gray, often with some paler spots.

**DISTRIBUTION.** — Although the type locality (Algeiras, Cádiz) is located in the south of Spain (Wunderlich 1980), this species has been mentioned later in several localities of Morocco (Bosmans 2006), including in the region of Taza, in the two cavities that we have previously indicated.

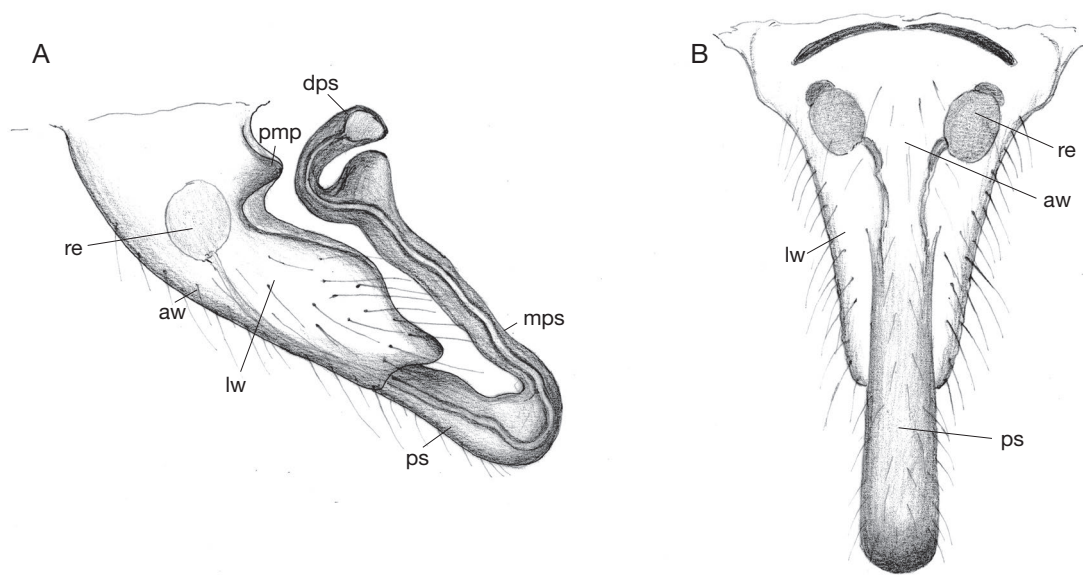


Fig. 12. — *Palliduphantes megascapus* Barrientos n. sp., genital organs; **A**, **B**, epigyne, retrolateral view (**A**); ventral view (**B**). Abbreviations: see Material and methods. Scale bar: 0.5 mm.

*Palliduphantes megascapus* Barrientos n. sp.  
(Figs 12; 15D-F)

[urn:lsid:zoobank.org:act:885DDD66-4851-4A1D-BC5E-812B5D20ADBE](https://doi.org/10.21203/rs.3.rs-1234567/v1)

**TYPE MATERIAL.** — **Holotype.** Morocco. 1 ♀; Puits Cochrisco C.A.8, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane; 27.IX.2016; C. Fontgivell leg.; MZB 2016-4101.

**Paratypes.** Morocco. 3 ♀; same locality and date as the holotype; MZB 2017-0668.

**OTHER MATERIAL.** — **Morocco.** 1 ♀; Ifri Laghar (= Ifri Tagaderth, = Al Andalus), Tizgui N'Chorfa, Agadir Ida Ou Tanane; 23.VII.2003; J. Esquius leg.; MZB 2003-1261 • 2 ♀; same locality; 23.VII.2003; F. Fadrique & J. Esquius leg.; MZB 2003-1288 • 1 ♀; same locality; 13.X.2015; F. Fadrique leg.; MZB 2015-8618 • 1 ♀; Puits Cochrisco C.A.10, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane; 26.VII.2003; F. Fadrique & J. Esquius leg.; MZB 2013-2950 • 1 ♀, 1 juv.; Cv. Imi Ougoug, Assif N'Talma, Immouzzar, Agadir Ida Ou Tanane; 27.VII.2003; F. Fadrique leg.; MZB 2013-2949.

**DIAGNOSIS.** — The epigyne is very developed, occupying a large part of the middle ventral zone of opisthosoma. Its anterior and lateral walls are lengthened and oriented backwards. The scape acquires a great development. The proscape is narrow, elongating backwards, the middle part is very long, almost reaching the opisthosomal wall, where it curves in “C” and connects with the distal part. The whole structure is very sclerotized. Its development and appearance is visible particularly laterally.

**ETYMOLOGY.** — The name of the new species refers to the enormous development of the female genitalia, in relation to the size of the opisthosoma, especially; to the length of the scape.

**DISTRIBUTION.** — The four cavities in which this species is found are in the province of Agadir Ida Ou Tanane (two in Tarhazoute [C.A.8 and C.A.10], one in Tizgui N'Chorfa [Ifri Laghar] and another in Immouzzar [Cv. Imi Ougoug]), in AntiAtlas, southern Morocco.

**DESCRIPTION**

*Female (holotype)*

**Body.** Total body length: 2.40. Carapace: 1.03 long by 0.83 wide, light brown, without additional pigmentation pattern, but with some hairs scattered on the cephalic part. Eyes developed and pigmented, with black areolas that meet the eyes MA, LA and LP; arranged in the two typical transverse lines. Chelicerae: 0.42 in length and with a similar coloration to that of carapace; three teeth on the promargin (the basal much smaller and separated from the others) and unarmed retromargin. Brown legs, with darker femurs, long and thin; measurements: leg I (1.37 + 0.27 + without + without + without), leg II (1.30 + 0.27 + 1.22 + 1.17 + 1.59), leg III (1.15 + 0.22 + 0.93 + 0.95 + 0.22), and leg IV (1.40 + 0.25 + 1.30 + 1.22 + 0.73). Opisthosoma, 1.37 long by 1.08 wide, more or less uniform grayish, and without dorsal pigmentation pattern, but covered with thin and scattered hairs.

**Female genitalia.** Epigyne (Figs 11A, B; 15D-F) highly developed and protruding on the ventral side of the epigastrium, tilted backwards and covering the central half of the postepigastrium. Its basal part elongate in front and on the sides, orienting itself towards the back; bursa copulatrix opening in its distal part. Anterior and lateral walls with a scattered and clearly distinct pilosity, with some long hairs areolated at their base. Posterior wall with a middle plate, not very visible because arranged against the opisthosomal surface. The side walls not forming “wings”, although they cover the base of the scape. Proscape quite narrow and not very individualized; merging with the end of the anterior wall and elongate backward, giving a rather voluminous structure. Middle part of the scape bending and facing forward. Entire scape narrowed, elongated and well sclerotized. Near the back wall, distal part

of the scape widening and curved again, describing a “C. The whole structure forming a rigid and narrow structure revealing the fertilization ducts by transparency. The two receptacles also observed, at the base of the structure.

#### Male

Unknown.

Genus *Tenuiphantes* Saaristo & Tanasevitch, 1996

#### *Tenuiphantes tenuis* (Blackwall, 1852)

MATERIAL EXAMINED. — **Morocco.** 2♂, 2♀, 4 juv.; Puits Cochriscio C.A.9, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane; 18.X.2015; L. Auroux leg.; MZB 2015-8587 • 1♀, 1 juv.; same locality, 18.X.2015, L. Auroux leg.; MZB 2017-0218 • 6♂, 6♀, 3 juv.; Ifri Bouyzem, Aglefth, Taglefth, Azilal; 20.IX.2016; F. Fadrique leg.; MZB 2016-4117 • 1 juv.; same locality; 20.IX.2016, F. Fadrique leg.; MZB 2016-4068 • 1♂, 2 juv.; Puits Cochriscio C.A.9, Azour ou Aghroud, Tarhazoute, Agadir Ida Ou Tanane; 26.VII.2003; F. Fadrique & J. Esquius leg.; MZB 2016-0046 • 1♀, Ifri Bouyzem, Aglefth, Taglefth, Azilal; 15.V.2004; F. Fadrique leg.; MZB 2016-0049 • 2♂, 3♀, 14 juv.; Av. Aurat, Aït M’Hammed, Azilal; 26.VIII.1972; O. Escolá leg.; MZB 83-3973.

DIAGNOSIS. — The medial part of the paracymbium has a pair of separated teeth of similar length. The lamella characteristic of the male bulb has a short and wide distal denticle. In the epigyne, the visible part of the scape has the shape of an anchor in its posterior end, in the middle separating two lateral semicircular projections. Frequently, the opisthosoma presents black spots in the form of circumflex accents, especially marked in its posterior half.

DISTRIBUTION. — *T. tenuis* has been cited from a large number of localities in the Maghreb area, especially from Algeria and Morocco (Bosmans 2006). It is a common species in the Iberian fauna and with a wide distribution in Europe (Nentwig *et al.* 2018).

#### DISCUSSION

The data provided here represent direct and not methodical catches. These catches, when analysing species by species, are relatively scarce. However, as a whole the data provided here are a unique addition to Micronetinae literature and in some cases they confirm some species previously recorded from Moroccan caves. The number of novelties captured by BIOSP is surprising, but it is also clear that among the taxa there seem to be some morphological relationships that are strengthened when positioned in their geographical context.

First, we must highlight the presence of ten taxonomic novelties in a set of seventeen different species that fit into the genus *Leptyphantes* “*sensu lato*” and *Palliduphantes*. This situation is partly explained by the fact that BIOSP has visited a large number of caves over an extended period of time, many of them previously unsurveyed. It is also necessary to note there is both considerable and unexamined diversity in the Atlas Mountains. Thus, the descriptions in the present work of ten new species are potentially only a fraction of an even greater possible diversity.

It is premature to speculate on how, when, and from which species the diversification of these indisputably related forms took place. But perhaps it is now worth risking a discussion of possible relationships in an attempt to clarify the *Leptyphantes* “*sensu lato*” phylogeny.

#### THE SO-CALLED “AFER GROUP”

Page (1931; 1945) highlighted the existence of considerable morphological affinity between some species of the Mediterranean basin, without defining or delimiting any group. Later, Brignoli (1971) dedicated an extensive discussion to this question by speaking clearly of an “*afér group*” by placing at the head of *Leptyphantes afér* Simon, 1913. Brignoli insisted that the most obvious character of relationship in this group is the morphology of the epigyne in females and the paracymbium and lamella characteristic in males. Bosmans (1985; 2006) described several species that he placed without discussion in Brignoli’s “*afér group*”. In a similar manner Hormiga & Ribera (1990) took advantage of the description of *Leptyphantes bidentatus* Hormiga & Ribera, 1990 to compile the Mediterranean species that can be included in this group. Identical information is found in the work of Saaristo & Tanasevitch (1993). We do not find any discussion of the “*afér group*” in this 1993 work, just an implicit acceptance and the list of species included within the group; an attitude that Tanasevitch (2014) repeated when studying samples deposited in the Geneva Museum.

Now, when studying the same taxa collected in Morocco, we find previously known species (*L. breviamatus*, *L. longiamatus*) as well as new ones (*L. sasi* Barrientos n. sp., *L. biospeleologorum* Barrientos n. sp., *L. lamellatus* Barrientos n. sp. and *L. leknizii* Barrientos n. sp.) which are clearly related at least by the structure of the epigyne. In all of these taxa it is possible to recognize the basic morphological features enunciated by Brignoli. However, in the species for which we have adult males (*L. sasi* Barrientos n. sp. and *L. lamellatus* Barrientos n. sp.) the morphology of the paracymbium and lamella characteristic differs from the pattern enunciated for the group. It is therefore extremely complex to ensure a close relationship between all these species, requiring a more detailed analysis of all these structures.

#### PINIPHANTES?

Many species remain catalogued (World Spider Catalog 2018) in the genus *Leptyphantes* (*sensu* Menge, 1866). Among them are several spiders captured in caves and hollows in the mountainous areas of Morocco and Algeria (Denis & Dresco 1957; Brignoli 1978; Tanasevitch 2014). Some authors (Bosmans 1985) have attempted to bring them within some morphological proximity to *Piniphantes pinicola* (Simon, 1884) so they would be candidates for inclusion in the genus *Piniphantes* Saaristo & Tanasevitch, 1996. However, these confounding groups of Moroccan and Algerian spiders also have common characteristics, suggesting a close relationship (Bosmans 2006; Tanasevitch 2014). These comments apply mainly to *L. aelleni* and other Atlas species such as *L. maurusius* and *L. taza*. The males of these two former species were not known (the one



FIG. 13. — **A, B**, Epigyne of *Leptyphantes almoravidus* Barrientos n. sp. in ventral (**A**) and lateral (**B**) views; **C, D**, epigyne of *Leptyphantes biospeleologorum* Barrientos n. sp. in dorsal (**C**) and lateral (**D**) views; **E, F**, epigyne of *Leptyphantes fadriquei* Barrientos n. sp. in lateral (**E**) and ventral (**F**) views; **G**, male copulatory bulb of *L. fadriquei* Barrientos n. sp. retrolateral views; **H, I**, epigyne of *Leptyphantes ensiferus* Barrientos n. sp. in lateral (**H**) and dorsal (**I**) views; **J**, male copulatory bulb of *Leptyphantes ensiferus* Barrientos n. sp. in retrolateral view.

of the first remains unpublished). However, the morphology of the epigyne displays a few traits that can be valued as key elements of a possible relationship, such as the length of the

basal structure, the elongation of its walls (anterior, lateral and posterior) which carry the bursa copulatrix, the location of the scape to a distal position, and finally the considerable



FIG. 14. — **A, B**, Epigyne of *Lepthyphantes imazigheni* Barrientos n. sp. in lateral (**A**) and ventral (**B**) views; **C**, epigyne of *Lepthyphantes leknizii* Barrientos n. sp. in dorsal view; **D, E**, epigyne of *Lepthyphantes lamellatus* Barrientos n. sp. in lateral (**D**) and ventral (**E**) views; **F**, male copulatory bulb of *Lepthyphantes lamellatus* Barrientos n. sp. in retrolateral view; **G, H**, epigyne of *Lepthyphantes sasi* Barrientos n. sp. in lateral (**G**) and ventral (**H**) views; **I**, male copulatory bulb of *Lepthyphantes sasi* n. sp. in retrolateral view.

reduction of the scape (comparable with the scape of other groups of *Lepthyphantes*).

Among the material that we have analysed and consider novel is a male of *L. taza* and females of *L. almoravidus* Barrientos

n. sp. and *L. imazigheni* Barrientos n. sp. (albeit unfortunately unaccompanied by corresponding males). The comparative morphology of *L. aelleni* and *L. taza* males give support to a close relationship in both the structure of the paracymbium,



FIG. 15. — **A, B**, epigyne of *Palliduphantes banderolatus* Barrientos n. sp. in lateral (**A**) and ventral (**B**) views; **C**, male copulatory bulb of *P. banderolatus* Barrientos n. sp. retrolateral view; **D-F**, epigyne of *Palliduphantes megascapus* Barrientos n. sp. in lateral (**D**) and ventral (**E** and **F**) views.

and the form of the lamella characteristica and the rest of the structures of the embolic division. Both clearly differ for the same structures with *Piniphantes pinicola*, as well as the diagnostic features of this genus.

In our opinion *L. aelleni*, *L. maurusius*, *L. taza*, *L. almoravidus* Barrientos n. sp. and *L. imazigheni* Barrientos n. sp. are possibly related due to the structure of their male and female genitalia. Therefore, these species could be integrated into a natural group, incorporated geographically in the high Mo-

roccan Atlas. *Lepthyphantes ajoti* Bosmans, 1991 and *L. exvaginatus* Deeleman, 1984, perhaps could be added to this group (Bosmans 2006) although we were unable to examine specimens of these two species.

#### PALLIDUPHANTES IN NORTH AFRICA

Saaristo & Tanasevitch (2001) included 47 species in the new genus *Palliduphantes* (in addition to other 16 that are synonymized). Of these, nine are found in the Iberian fauna,



four in the Canarian fauna, two in the Algerian and Tunisian fauna, and only one in the Moroccan fauna, *P. cadiziensis* (Wunderlich, 1980). Subsequently several other species have been described: three for the Iberian fauna (Ribera *et al.* 2003), two for the Algerian fauna (Bosmans 2006) and one for Tunisian fauna (Bosmans 2003). Most of the 58 species currently considered in the genus *Palliduphantes* (World Spider Catalog 2018) are found in the western Palearctic zone and primarily in Mediterranean countries. Therefore, considering the size, characteristics and position of Morocco, the description of only two species of *Palliduphantes* is probably an underrepresentation.

The morphology of the paracymbium and the lamella characteristic of the male of *P. banderolatus* Barrientos n. sp. conform well to the diagnostic characters of *Palliduphantes* (Saaristo & Tanasevitch, 2001). On the contrary, the female has an elongated epigyne that is loosely consistent with the one described by Wunderlich (1987) for *P. longiscapus* (Wunderlich, 1987) of Gran Canaria, or the one presented by *P. longiseta* (Simon, 1884) of Corsica (Muller & Heimer 1991; Bosmans & Colombo 2015). In any case, the consistency and layout of the scape (together with the characters of the male) make *P. banderolatus* Barrientos n. sp. a clearly independent species. Such a greater length of the female genital structures is also seen in a second species from the south of Morocco, *Palliduphantes megascapus* Barrientos n. sp., of which the male remains unknown. Therefore the assignment of *P. megascapus* Barrientos n. sp. to *Palliduphantes* is still provisional. However, taking into account the morphology of its epigyne, the relationship between *P. banderolatus* Barrientos n. sp. and *P. megascapus* Barrientos n. sp. seems to be beyond doubt.

UNCERTAIN POSITION OF *L. FADRIQUEI* BARRIENTOS N. SP.  
PROXIMITY BETWEEN *L. ENSIFERUS* BARRIENTOS N. SP. AND  
*L. FAGEI* MACHADO, 1939?

Although the above groupings of possible morphological affinities are debatable, the comments made could be useful in later considerations. However, two of our ten new species (*L. ensiferus* Barrientos n. sp. and *L. fadriquei* Barrientos n. sp.) are difficult to place. When considering the conformation of female genitalia, *Lepthyphantes ensiferus* Barrientos n. sp. seems to have an especially close morphological relationship with an Iberian species, *Lepthyphantes fagei*, although there is a significant difference in the male structures of both species. It is possible, albeit less probable, that *L. fadriquei* Barrientos n. sp. could be grouped with these two forms. In this scenario however the male genitalia of *L. fadriquei* Barrientos n. sp. seems to be even more dissimilar from the features presented by *L. ensiferus* Barrientos n. sp. and *L. fagei*. It is therefore appropriate to include *L. ensiferus* Barrientos n. sp. and *L. fadriquei* Barrientos n. sp. within the vaguer grouping of *Lepthyphantes* “sensu lato”.

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## APPENDIX

APPENDIX I. — Analyzed samples of the genus *Lepthyphantes* Menge, 1866 “sensu lato”, collected by the BIOSP group in their expeditions in Morocco and deposited in the *Museu de Ciències Naturals de Barcelona*. Abbreviations: **H**, holotype; **P**, paratype.

Samples	Types	Species	♂	♀	juv.	TOT	Date	Locality	Region	Collector
2003-0198		<i>Lepthyphantes aelleni</i> Denis, 1957	0	2	1	3	09.V.2002	Kef el Maa, Taza	Taza	F. Fadrique & O. Escolà
2016-0034			0	1	3	4	23.VIII.2013	Kef Pigeons, Takerboust, Berkane	Oriental Region	F. Fadrique
2016-4062			0	1	0	1	14.IX.2016	Ifri Bouslama, Bab Bou Idir	Taza	F. Fadrique
73-2903			1	1	0	2	28.VIII.1970	Ifri Friouato, Bab Bou Idir	Taza	O. Escolà
2004-0657		<i>L. brevihamatus</i> Bosmans, 1985	1	1	0	2	14.V.2004	Ifri Nboutadarth, Tagleft	Azilal	F. Fadrique
2016-0036			2	4	0	6	29.VIII.2013	Ifri Caid, Ait M'Hammed	Azilal	L. Auroux
2016-0038			1	1	5	7	03.IX.2013	Ifri Caid, Ait M'Hammed	Azilal	F. Fadrique
2016-0039			0	1	1	2	03.IX.2013	Ifri Caid, Ait M'Hammed	Azilal	F. Fadrique
2014-7290			0	1	0	1	29.VIII.2013	Ifri Caid, Ait M'Hammed	Azilal	J. Comas
2016-4065			0	1	0	1	20.IX.2016	Ifri Bouyzem, Aglefth, Tagleft	Azilal	F. Fadrique
73-2904			2	8	7	17	28.VIII.1970	Ifri Caid, Ait M'Hammed	Azilal	O. Escolà
73-2910			0	16	19	35	25.04.1984	Ifri Bernat, Ait M'Hammed	Azilal	O. Escolà
73-2912			7	7	5	19	28.IX.1985	Ifri Bernat, Ait M'Hammed	Azilal	O. Escolà
73-2913			7	8	5	20	01.X.1985	Ifri Bernat, Ait M'Hammed	Azilal	O. Escolà
83-4001			2	1	2	5	24.VIII.1972	Ifri Bernat, Ait M'Hammed	Azilal	O. Escolà
2016-4071		<i>L. longihamatus</i>	0	1	0	1	23.IX.2016	Akiam Ins Er Rebi, Agoudal	Ouarzazate	C. Fontgivell
2016-4075			1	1	13	15	23.IX.2016	Akiam Ins Er Rebi, Agoudal	Ouarzazate	F. Fadrique
2016-4079			1	0	3	4	20.IX.2016	Ifri Bouyzem, Aglefth, Tagleft	Azilal	F. Fadrique
2016-4115			1	3	0	4	23.IX.2016	Akiam Ins Er Rebi, Agoudal	Ouarzazate	F. Fadrique
2016-4053		<i>L. maurusius</i> Brignoli, 1978	0	1	0	1	16.IX.2016	Grotte Sidi Megbeur, Sidi Megbeur	Taza	F. Fadrique
2016-4101	H	<i>Palliduphantes megascapus</i> Barrientos n. sp.	0	1	0	1	27.IX.2016	Puits Cochrisco C.A. 8, Azour Ou Aghroud, Tarhazout	Agadir Ida Ou Tanane	C. Fontgivell
2017-0668	P		0	3	0	3	27.IX.2016	Puits Cochrisco C.A. 8, Azour Ou Aghroud, Tarhazout	Agadir Ida Ou Tanane	C. Fontgivell
2003-1261			0	1	0	1	23.VII.2003	Ifri Laghar (= Ifri Tagaderth), Tizgui N'Chorfa	Agadir Ida Ou Tanane	J. Esquius
2003-1288			0	2	0	2	23.VII.2003	Ifri Laghar (= Ifri Tagaderth), Tizgui N'Chorfa	Agadir Ida Ou Tanane	F. Fadrique & J. Esquius
2013-2949			0	1	1	2	27.VII.2003	Cv. Imi Ougoug, Assif N'Talma, Immouzzer	Agadir Ida Ou Tanane	F. Fadrique
2013-2950			0	1	0	1	26.VII.2003	Puits Cochrisco C.A.10, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	F. Fadrique & J. Esquius
2015-8618			0	1	0	1	13.X.2015	Ifri Tagaderth [= Al Andalus, = Ifri Laghar (2003)] (*)	Agadir Ida Ou Tanane	F. Fadrique
73-2905	H	<i>L. fadriquei</i> Barrientos n. sp.	1	0	0	1	28.VIII.1970	Kef Aziza, Boudenib	Meknès	O. Escolà
72-5577	P		0	3	0	3	28.VIII.1970	Kef Aziza, Boudenib	Meknès	O. Escolà
2001-0414	P		0	1	0	1	02.VI.2001	Kef Aziza, Boudenib	Meknès	F. Fadrique & O. Escolà
72-5578			0	0	3	3	28.VIII.1970	Kef Aziza, Boudenib	Meknès	O. Escolà
2013-2956	H	<i>L. ensiferus</i> Barrientos n. sp.	1	0	0	1	28.VII.2003	Grotte des Pigeons, Souk el Tleta el Akhsass	Guelmim	F. Fadrique, J. Esquius & A. Ighious
2017-0658	P		0	3	0	3	28.VII.2003	Grotte des Pigeons, Souk el Tleta el Akhsass	Guelmim	F. Fadrique, J. Esquius & A. Ighious
2015-8632	P		5	4	0	9	15.X.2015	Grotte des Pigeons (=Khef el Hmam, = Ifri Itbirn) (**)	Guelmim	L. Auroux
2017-1478			0	0	1	1	15.X.2015	Grotte des Pigeons (=Khef el Hmam, = Ifri Itbirn) (**)	Guelmim	L. Auroux
2017-0659			0	0	2	2	28.VII.2003	Grotte des Pigeons, Souk el Tleta el Akhsass	Guelmim	F. Fadrique, J. Esquius & A. Ighious
2017-0210			1	7	3	11	15.X.2015	Grotte des Pigeons (=Khef el Hmam, = Ifri Itbirn) (**)	Guelmim	F. Fadrique
2017-0209			2	7	4	13	15.X.2015	Grotte des Pigeons (=Khef el Hmam, = Ifri Itbirn) (**)	Guelmim	F. Fadrique

Samples	Types	Species	♂	♀	juv.	TOT	Date	Locality	Region	Collector
2015-8635		<i>L. ensiferus</i> Barrientos n. sp.	0	1	9	10	15.X.2015	Grotte des Pigeons (= Khef el Hmam, = Ifri Itbirn) (**)	Guelmim	F. Fadrique
2015-8636			1	9	3	13	15.X.2015	Grotte des Pigeons (= Khef el Hmam, = Ifri Itbirn) (**)	Guelmim	L. Auroux
2003-0435	H	<i>L. sasi</i> Barrientos n. sp.	1	0	0	1	19.V.2002	Av. Arkan, Merhraoua	Taza	F. Fadrique
2017-0657	P		0	2	0	2	19.V.2002	Av. Arkan, Merhraoua	Taza	F. Fadrique
2016-4076	P		0	2	0	2	19.IX.2016	Ifri Gidaire, Jbel Bou Iblane, Merhraoua	Taza	C. Fontgivell
2017-1479			0	0	1	1	19.IX.2016	Ifri Gidaire, Jbel Bou Iblane, Merhraoua	Taza	C. Fontgivell
2016-0173	H	<i>L. leknizii</i> Barrientos n. sp.	0	1	0	1	19.VII.2012	Kef Admam, Merhraoua	Taza	F. Fadrique
2017-0660	H	<i>L. biospeleologorum</i> Barrientos n. sp.	0	1	0	1	15.V.2004	Ifri Bouyzem, Aglefth, Taglefth	Azilal	F. Fadrique
2017-0661	P		0	2	0	2	15.V.2004	Ifri Bouyzem, Aglefth, Taglefth	Azilal	F. Fadrique
2017-0662			0	0	4	4	15.V.2004	Ifri Bouyzem, Aglefth, Taglefth	Azilal	F. Fadrique
2017-0665	H	<i>L. almoravidus</i> Barrientos n. sp.	0	1	0	1	20.V.2004	Ifri Netazarth, Fariata, Tagzirth	Béni-Mellal	F. Fadrique
2016-4078	H	<i>L. imazigheni</i> Barrientos n. sp.	0	1	0	1	17.IX.2016	Av. Bab Bou Idir, Bab Bou Idir	Taza	F. Fadrique
2016-4160	H	<i>L. lamellatus</i> Barrientos n. sp.	1	0	0	1	20.IX.2016	Ifri Nhmamne, Aglefth, Taglefth	Azilal	F. Fadrique
2017-0663	P		0	1	0	1	20.IX.2016	Ifri Nhmamne, Aglefth, Taglefth	Azilal	F. Fadrique
2017-0664			0	0	2	2	20.IX.2016	Ifri Nhmamne, Aglefth, Taglefth	Azilal	F. Fadrique
2001-0420		<i>L. sp.</i> juv. indet.	0	0	1	1	28.V.2001	Ifri N'Taguelmous, Aït M'Hammed	Azilal	F. Fadrique & O. Escolà
2001-0422			0	0	1	1	28.V.2001	Ifri Caid, Aït M'Hammed	Azilal	F. Fadrique & O. Escolà
2003-0343			0	0	1	1	16.V.2002	Cv. Ghar Bied, Ain el Ouda	Taza	F. Fadrique
2010-1834			0	0	2	2	03.IX.2009	Ifri Azokhage (= Riviere Chara), Tabahirte	Taza	F. Fadrique
2010-1839			0	0	2	2	04.IX.2009	Cv. Ghar Chiker, Taza	Taza	A.Faille
2010-1872			0	0	1	1	03.IX.2009	Cv. Trou de la Piste, Tabahirte	Taza	F. Fadrique
2010-1895			0	0	2	2	01.XII.2009	Saf Lehmar, Mago	Xauen	F. Fadrique
2016-4066			0	0	5	5	15.IX.2016	Riviere Chara (= Ifri Azokhage), Tabahirte	Taza	F. Fadrique
2016-4073			0	0	4	4	17.IX.2016	Av. Bab Bou Idir, Bab Bou Idir	Taza	F. Fadrique
2017-1413			0	0	1	1	16.IX.2016	Grotte Sidi Megbeur, Sidi Megbeur	Taza	F. Fadrique
2016-4114			0	0	6	6	23.IX.2016	Akiam Ins Er Rebi, Agoudal	Ouarzazate	F. Fadrique
2010-1837		<i>L. taza</i> Tanasevitch, 2014	0	1	2	3	03.IX.2009	Cv. Trou de la Piste, Tabahirte	Taza	A.Faille
2014-7288			0	1	0	1	01.VIII.2012	Cv. Trou de la Piste, Tabahirte	Taza	F. Fadrique
2016-4080			0	5	2	7	15.IX.2016	Cv. Trou de la Piste, Tabahirte	Taza	F. Fadrique
2016-4087			1	1	0	2	15.IX.2016	Riviere Chara (= Ifri Azokhage), Tabahirte	Taza	F. Fadrique
2015-8578	H	<i>P. banderolatus</i> Barrientos n. sp.	1	0	0	1	16.X.2015	Ifri N'Yzme; Ait Abdallah	Tarudant	L. Auroux
2017-0666	P		1	2	0	3	16.X.2015	Ifri N'Yzme; Ait Abdallah	Tarudant	L. Auroux
2015-8592	P		1	0	0	1	18.X.2015	Puits Cochrisco C.A.10, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	C. Fontgivell
2017-0667			0	0	2	2	16.X.2015	Ifri N'Yzme; Ait Abdallah	Tarudant	L. Auroux
2017-0217			0	1	0	1	18.X.2015	Puits Cochrisco C.A.9, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	L. Auroux
2017-0221			0	1	0	1	18.X.2015	Puits Cochrisco C.A.9, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	L. Auroux
2017-0222			0	1	0	1	18.X.2015	Puits Cochrisco C.A.9, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	L. Auroux
2017-0211			0	1	0	1	18.X.2015	Puits Cochrisco C.A.10, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	F. Fadrique
2017-0214			0	1	0	1	18.X.2015	Puits Cochrisco C.A.11, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	L. Auroux
2016-4061		<i>P. cadiziensis</i> (Wunderlich, 1980)	0	1	0	1	16.IX.2016	Kef Maamram, Ras El Maa	Taza	C. Fontgivell
2016-4063			0	1	0	1	17.IX.2016	Av. Bab Bou Idir, Bab Bou Idir	Taza	F. Fadrique
2016-4091			1	0	0	1	17.IX.2016	Av. Bab Bou Idir, Bab Bou Idir	Taza	F. Fadrique
2016-4116			5	5	8	18	16.IX.2016	Kef Maamram, Ras El Maa	Taza	F. Fadrique

Samples	Types	Species	♂	♀	juv.	TOT	Date	Locality	Region	Collector
2016-0046		<i>Tenuiphantes tenuis</i> (Blackwall, 1852)	1	0	2	3	26.VII.2003	Puits Cochrisco C.A.9, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	J. Esquiús & F. Fadrique
2016-0049			0	1	0	1	15.V.2004	Ifri Bouyzem, Aglefth, Taglefth	Azilal	F. Fadrique
2015-8587			2	2	4	8	18.X.2015	Puits Cochrisco C.A.9, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	L. Auroux
2017-0218			0	1	1	2	18.X.2015	Puits Cochrisco C.A.9, Azour ou Aghroud, Tarhazoute	Agadir Ida Ou Tanane	L. Auroux
2016-4068			0	0	1	1	20.IX.2016	Ifri Bouyzem, Aglefth, Taglefth	Azilal	F. Fadrique
2016-4117			6	6	3	15	20.IX.2016	Ifri Bouyzem, Aglefth, Taglefth	Azilal	F. Fadrique
83-3973			2	3	14	19	26.VIII.1972	Av. Aurat, Ait M'Hammed (* Tizgui N'Chorfa. Agadir Ida Ou Tanane (**) Souk el Tleta el Akhsass	Azilal	O. Escolà