

## New species and records of afrotropical Linyphiidae (Araneae)

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### Summary

Two new afrotropical linyphiid spiders are described, *Ceratinopsis raboeli* n. sp. (♂♀) from Kenya and *Oedothorax nazareti* n. sp. (♂) from Ethiopia. The male of *Mecynidis muthaiga* Russell-Smith & Jocqué, 1986 is here described for the first time.

New records are given of *Afroneta brevistyla* Holm, 1968, *Araeoncus praeceps* Holm, 1962, *Lepthyphantes biseriatus* Simon & Fage, 1922, *L. falcatus* Bosmans, 1979, *L. kenyensis* Bosmans, 1979, *L. kekenboschi* Bosmans, 1979, *L. nigropicta* Bosmans, 1979, *Mecynidis muthaiga* Russell-Smith & Jocqué, 1986, *Metaleptyphantes perexiguus* (Simon & Fage, 1922), *M. machadoi* Locket, 1968 and *Microlinyphia sterilis* (Pavesi, 1883).

### Introduction

Information on African linyphiid spiders has increased rapidly during the last twenty years. More than 300 species of linyphiids are now known from the Afrotropical region and more than two-thirds of these have been recorded from eastern Africa, where the afroalpine and afroalpine areas have been particularly well investigated. Only scattered information is available from the lowlands.

In connection with a study of the afroalpine linyphiid fauna of the Eastern Arc mountains in Tanzania, I received some interesting East African material from a number of different sources. This material is described here. It contains two new species of linyphiids and the male of *Mecynidis muthaiga* Russell-Smith & Jocqué, 1986. In addition, a number of new records from East Africa are given.

### Descriptions

All measurements are in mm.

Abbreviations used in the descriptions and figures: ALE = anterior lateral eyes, AME = anterior median eyes, E = embolus, ED = embolic division, EM = embolic membrane, F = femur, FD = fertilisation duct, L = lamella, Mt = metatarsus, O = genital opening, P = patella, PLE = posterior lateral eyes, PME = posterior median eyes, PT = protegulum, SA = suprategular apophysis, T = tibia, t = tarsus, TA = terminal apophysis, TM = position of trichobothrium on metatarsus.

AMNH = American Museum of Natural History, New York, USA; MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, Mass., USA; MNP = Muséum National d'Histoire naturelle, Paris, France; MRAC = Musée Royal de l'Afrique Centrale, Tervuren, Belgium; NRS = Naturhistoriska Riksmuseet, Stockholm, Sweden; ZMUC = Zoological Museum, University of Copenhagen, Denmark.

Unless otherwise stated, material is deposited in the Zoological Museum, University of Copenhagen.

## Genus *Ceratinopsis* Emerton, 1882

### *Ceratinopsis raboeli* n. sp. (Figs. 1-6)

*Type material*: Male holotype: KENYA; Kinja, Lake Naivasha, 1950 m, 8 September 1981. Female allotype: Same locality, 13 November 1981. Paratypes: Same locality: 12-17 September 1981 (1♂, 1♀, 15 juv.), 1-27 November 1981 (6♂, 5♀, 56 juv.), 15 December 1981 (4♂, 2♀, 22 juv.). All material swept-netted in *Acacia* woodland by Dr J. Rabøl.

### Male holotype

Total length 1.80; carapace 0.77 long, 0.68 wide; ocular area 0.33 wide. *Colour*: Sternum, carapace, chelicerae and legs orange-brown. Legs suffused with black on tibia, metatarsus and tarsus. Ocular area black. Abdomen yellowish white with a black ring around spinnerets. Spinnerets black. *Carapace and Abdomen*: Without modifications. *Eyes*: In dorsal view, anterior row recurved, posterior row straight or slightly recurved. AME 0.039, AME-AME 0.033, AME-ALE 0.052, ALE 0.052, ALE-PLE touching, PLE 0.046, PLE-PME 0.065, PME 0.039, PME-PME 0.052. *Chelicerae*: 0.33 long. Anterior margin with 4 teeth. *Clypeus*: 0.21 high (4 × diam. ALE). *Sternum*: Wider than long (0.43 long, 0.45 wide). *Leg measurements*:

	F	P	T	Mt	t	Total
I	0.60	0.20	0.52	0.46	0.38	2.16
II	0.59	0.20	0.48	0.52	0.38	2.17
III	0.50	0.18	0.36	0.42	0.31	1.77
IV	0.67	0.20	0.55	0.56	0.36	2.34

Spines not visible. TM I 0.52, TM II 0.41, TM III 0.47, TM IV absent. *Palpus* (Figs. 1-4): Tibia in lateral view with large, forward-bent dorsal apophysis (Fig. 1). Mesal side with tooth-like apophysis (Fig. 2). Seen dorsally, tibia is broad at base, laterally produced into long curved apophysis (Fig. 4). Patella mesally with 2 small teeth (Fig. 4). Bulbus typical for genus, with coiled embolus, anterior end of which is turned backwards into final coil. Posterior, radical part of embolus pointing straight backwards, not bent as in many other African species of *Ceratinopsis*, and provided with tooth (Fig. 3, A).

### Female allotype

Total length 1.80; carapace 0.73 long, 0.63 wide; ocular area 0.30 wide. *Colour*: As male. *Carapace and Abdomen*: Without modifications. *Eyes*: In dorsal view, anterior row recurved, posterior row straight or slightly recurved. AME 0.017, AME-AME 0.025, AME-ALE 0.043, ALE 0.034, ALE-PLE touching, PLE 0.034, PLE-PME 0.034, PME 0.034, PME-PME 0.034. *Chelicerae*: 0.34 long. Anterior margin with 4 teeth. *Clypeus*: 0.33 high (9.7 × diam. ALE). *Sternum*: As male. *Leg measurements*:

	F	P	T	Mt	t	Total
I	0.60	0.28	0.49	0.49	0.38	2.24
II	0.59	0.20	0.43	0.48	0.36	2.06
III	0.52	0.20	0.36	0.41	0.31	1.80
IV	0.66	0.20	0.52	0.50	0.34	2.22

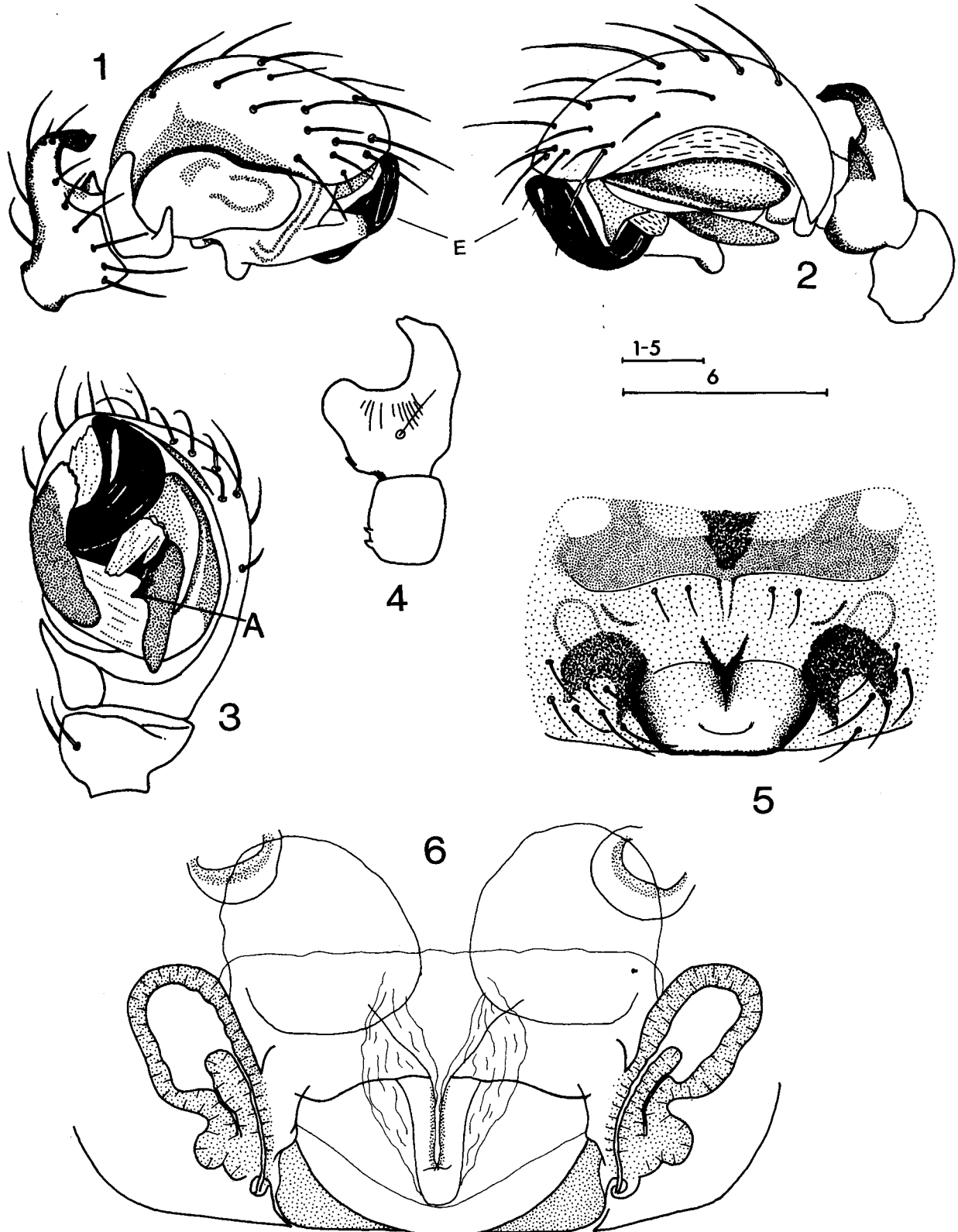
## Chaetotaxy:

	TM	Proximal tibial spines	
		Position	Length (∅)
I	0.46	—	—
II	0.41	0.19	0.9
III	0.45	0.19	1.1
IV	—	0.24	1.0

Epigyne: Fig. 5. Vulva: Fig. 6.

*Etymology*: The species is named after the collector, Dr J. Rabøl.

*Diagnosis*: The male is easily distinguished from that of all other African species of *Ceratinopsis* by the shape of the male palpal tibia and the radical part of the



Figs. 1-6: *Ceratinopsis raboeli* n. sp. 1 Male palp, lateral view; 2 Male palp, mesal view; 3 Male palp, ventral view (A = tooth); 4 Male palpal tibia, dorsal view; 5 Epigyne, ventral view; 6 Vulva, ventral view. Scale lines = 0.1 mm (Figs. 1-5), 0.01 mm (Fig. 6).

embolus. The female is distinguished by the outline of the epigyne and the detailed structures of the vulva. All specimens of the type series are similar in colour, with a very conspicuous orange-brown carapace and a lighter yellowish white abdomen with a black spot on and around the spinnerets.

### Genus *Oedothorax* Bertkau, 1883

#### *Oedothorax nazareti* n. sp. (Figs. 7-12)

*Type material*: Male holotype. ETHIOPIA; Shoa Administrative Province, Nazaret, 2400 m, 22 June 1985. Under stone in cultivated farmland, leg. N. Scharff.

#### *Male holotype*

Total length 2.20; carapace 1.09 long, 0.70 wide; ocular area 0.37 wide. *Colour*: Carapace and chelicerae dark brown, striae and fovea suffused with grey. Margin of carapace with grey band. Ocular area black. Sternum darker than carapace and suffused with grey. Legs yellowish brown. Abdomen dorsally dark grey, ventrally grey with yellowish white branchial opercula. Spinnerets yellowish brown.

*Carapace* (Figs. 7-8): With a conical cephalic lobe rising between PME, which are situated at base of lobe. Top of lobe and ocular area with a number of strong, short bristles. Frontal part of cephalic lobe above clypeus strongly convex. *Eyes*: In dorsal view, anterior row recurved, posterior row procurved. AME 0.043, AME-AME 0.043, AME-ALE 0.043, ALE 0.077, ALE-PLE 0.009, PLE 0.068, PLE-PME 0.043, PME 0.060, PME-PME 0.18. *Chelicerae*: 0.43 long. Anterior margin with 5 teeth. *Clypeus*: 0.18 high (2.33 × diam. ALE). *Sternum*: 0.55 long, 0.53 wide. *Leg measurements*:

	F	P	T	Mt	t	Total
I	0.76	0.27	0.59	0.40	0.49	2.51
II	0.67	0.25	0.56	0.49	0.45	2.42
III	0.63	0.24	0.49	0.49	0.38	2.23
IV	0.83	0.25	0.77	0.71	0.45	3.01

#### *Chaetotaxy*:

	Tibial spines				
	TM	Proximal		Distal	
		Position	Length (∅)	Position	Length (∅)
I	0.62	0.18	0.85	0.72	1.16
II	0.57	0.19	1.42	0.73	1.14
III	0.63	0.20	2.14	—	—
IV	0.65	0.25	2.61	—	—

Legs I and II with weakly developed spines dorsally. Dorsal spines on legs III and IV well developed. All legs with long strong spines ventrally (femur, tibia, metatarsus and tarsus).

*Palpus* (Figs. 9-12): Dorsolateral margin of tibia with 3 apophyses of different sizes. Dorsal margin of tibia with long apophysis, strongly curved laterally (Fig. 9). Bulbus with well-developed bifid protégulum (Fig. 10). ED with long twisted frontal embolar apophysis. Embolus with enlarged sclerotised base, attached to lateral side of ED (Fig. 12).

*Etymology*: The species is named after the type

locality, the town of Nazaret c. 80 km south of Addis Ababa.

*Diagnosis*: The species is placed in *Oedothorax* on the basis of the TM value, the number of tibial spines, the presence of a cephalic lobe and conformation of the bulbus, especially the embolic complex. The shape of the male palpal tibia is not typical for *Oedothorax*. *O. nazareti* n. sp. is easily recognised by the shape of the cephalic lobe and the male palpal tibia, which differs from that of other African representatives of this genus.

### Genus *Mecynidis* Simon, 1894

The afrotropical genus *Mecynidis* was originally established by Simon (1894) for the type species *M. dentipalpis* Simon, 1894. Simon placed the genus in the family Theridiidae, but it was transferred to the Linyphiidae by Levi (1964). Seven species have been assigned to *Mecynidis*.

#### *Mecynidis muthaiga* Russell-Smith & Jocqué, 1986 (Figs. 13-22)

The material from Lake Naivasha includes several specimens of *Mecynidis muthaiga*, a species hitherto known only from the original description of an incomplete female. Russell-Smith & Jocqué (1986) were unable to give a complete description of the species, and leg measurements on the holotype could only be made on the first pair of legs, as all others had been broken off.

The present material, which is in good condition and comprised both sexes, has been compared with the holotype and all paratypes (MRAC 163.255 and 163.263) of *M. muthaiga* (from Nairobi, Kenya) and found to be identical. The abdominal colour pattern of the female is very variable; no two specimens in either the type series or in the material from Lake Naivasha have the same pattern. The total size of the specimens is also variable, probably because females are more or less filled with eggs, but the length/width ratios of female carapaces of the type material and Naivasha material are similar (types: mean 1.55, range 1.48-1.64; Naivasha: mean 1.57, range 1.56-1.59).

According to the type description there should be 4 cheliceral teeth on both anterior and posterior sides of the chelicerae. I can see only 3 on the posterior side of the holotype, and this is in accordance with the Naivasha material. Structures of epigyne and vulva are identical. A description of the male and a supplementary description of the female are given below.

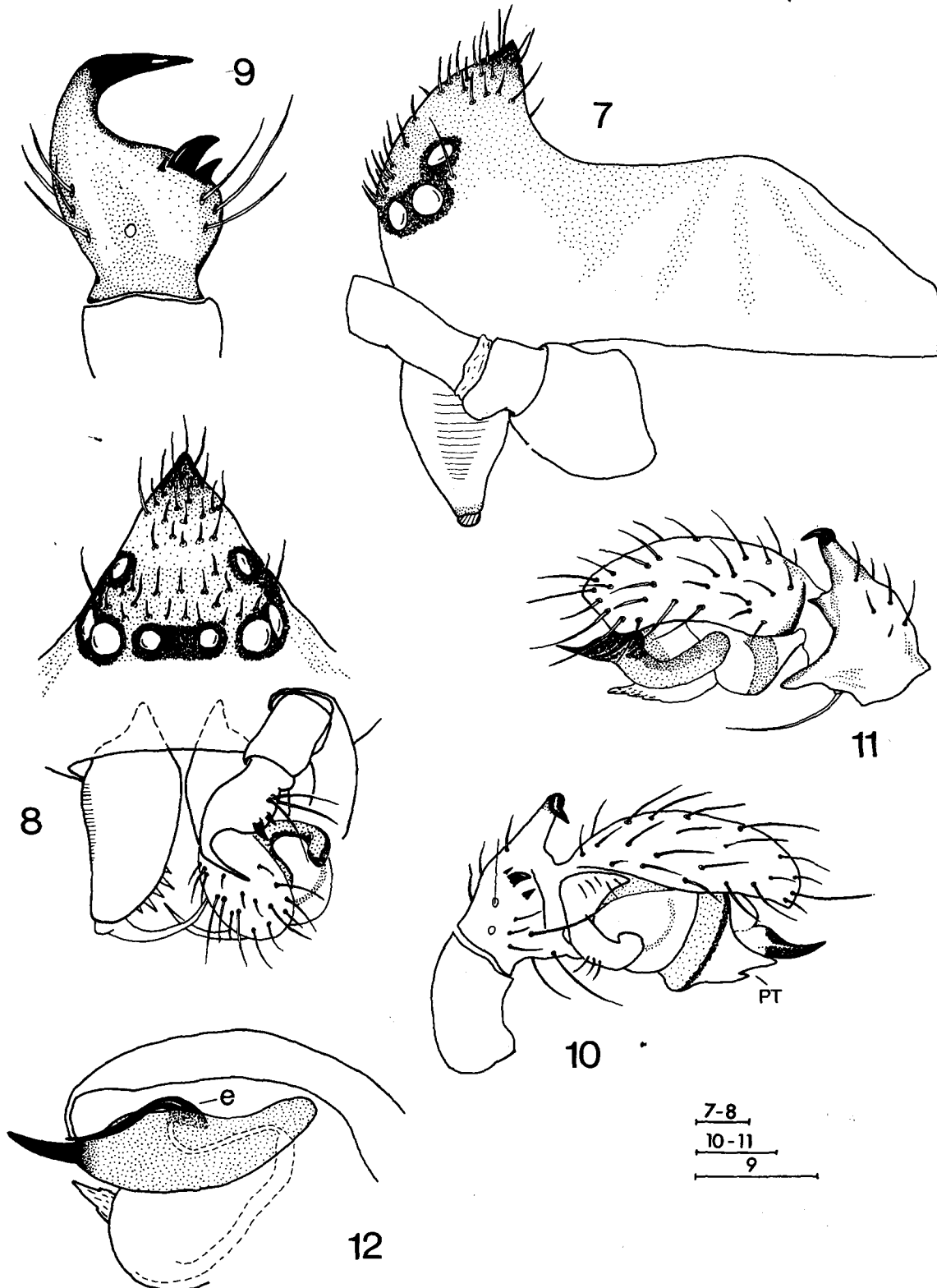
#### *Material examined*

*Types*: Female holotype: KENYA; Nairobi, Muthaiga, 1 January 1978 (MRAC 163.255); 5 female paratypes: same locality, garden at Muthaiga in trees and shrubs, 1 January 1978 (MRAC 163.263). *Other material*: KENYA; Kinja, Lake Naivasha, 1950 m, 7 November 1981 (2♂, 4♀). Sweep-netted in *Acacia* woodland by Dr J. Rabøl.

*Male*

Total length 2.50; carapace 1.38 long, 0.83 wide; ocular area 0.53 wide. *Colour*: Carapace and chelicerae dark orange-brown. Sternum of same colour but with dark grey margin. Legs yellowish white. Abdomen grey with small white blotches dorsally. *Carapace* (Fig. 16):

Without modifications but distinctly warty. *Eyes*: In dorsal view, anterior row recurved, posterior row straight or slightly recurved. AME 0.078, AME-AME 0.039, AME-ALE 0.10, ALE 0.085, ALE-PLE touching, PLE 0.078, PLE-PME 0.13, PME 0.065, PME-PME 0.085. *Clypeus*: 0.23 high. *Chelicerae*: 0.58



Figs. 7-12: *Oedothorax nazareti* n. sp. 7 Male carapace, lateral view; 8 Male carapace, frontal view; 9 Male palpal tibia, dorsal view; 10 Male palp, lateral view; 11 Male palp, mesal view; 12 ED, mesoventral view,  $\times 120$ . Scale lines = 0.1 mm (Figs. 7-8, 10-11), 0.01 mm (Fig. 9).

long. Anterior margin with chitinised ridge near base of fang and 2 teeth more proximally. Posterior margin with 4 small teeth. *Sternum*: 0.65 long, 0.58 wide. Triangular and with narrow (less than diam. coxa IV) extension between coxae IV. *Leg measurements*:

	F	P	T	Mt	t	Total
I	1.30	0.29	1.12	1.25	0.71	4.67
II	1.16	0.28	0.94	1.10	0.63	4.11
III	0.90	0.25	0.57	0.78	0.46	2.96
IV	1.26	0.28	0.94	1.16	0.62	4.26

*Chaetotaxy*: Tibiae each with one spine.

	Tibial spines		
	TM	Position	Length (∅)
I	0.20	0.09	0.71
II	0.22	0.10	0.62
III	0.29	0.12	0.60
IV	—	0.13	0.67

Trichobothrium and its socket on metatarsus difficult to see. Tibial spines small and only proximal clearly visible. Femur I 0.9 times carapace length; tibia I 12.3 times as long as wide. *Palpus* (Figs. 13-15): Femur widened, ventrally with 4 large teeth, all with small hairs; dorsally with numerous small teeth, some with small hairs (Fig. 15). Tibia as wide as long, or slightly wider than long, widest distally and with strong hairs at distal margin; dorsal hairs longest, but not as long as bulbus. Cymbium length/width 1.6; mesal side with ventral extension at base. Paracymbium simple, rather flat plate, widest at base. Bulbus laterally dominated by heavily coiled ED, situated under tegulum in proximal part of bulbus (Fig. 13). Embolus long, thin and spirally coiled (more than 4.5 times). EM visible between spirals, clearly visible when bulbus viewed from mesal side (Fig. 14). Terminal apophysis broad and membranous. SA long, pointed and bent in a slender hook. Lamella with broad base, provided with dorsal extension and long, slightly sinoid extension pointing backwards and upwards and with small hook at tip (Fig. 14).

#### Female

Total length 4.00 (other material 2.90-3.50) (measured from clypeus to tip of abdominal tubercle); carapace 1.33 long, 0.85 wide; ocular area 0.48 wide. *Colour*: Carapace, legs and chelicerae as male. Sternum dark brown. Abdomen grey with white blotches in a characteristic pattern (Figs. 17-18), but very variable. *Carapace*: Without modifications. Smooth with a few warts in cephalic area. *Eyes*: In dorsal view, anterior row recurved, posterior row straight or slightly recurved. AME 0.060, AME-AME 0.043, AME-ALE 0.094, ALE 0.085, ALE-PLE touching, PLE 0.072, PLE-PME 0.094, PME 0.068, PME-PME 0.072. *Clypeus*: 0.17 high (2 × diam. ALE). *Chelicerae*: 0.60 long. Stridulating ridges very fine and closely set. Anterior margin with 4 teeth, posterior margin with 3 small teeth. *Sternum*: 0.75 long, 0.58 wide. Triangular with narrow extension between coxae IV (less than diam. coxa IV). *Leg measurements*:

	F	P	T	Mt	t	Total
I	1.53	0.34	1.26	1.36	0.81	5.30
II	1.36	0.36	1.06	1.22	0.73	4.73
III	0.99	0.28	0.62	0.83	0.49	3.21
IV	1.46	0.29	1.05	1.32	0.69	4.81

*Chaetotaxy*:

	Tibial spines				
	TM	Proximal		Distal	
		Position	Length (∅)	Position	Length (∅)
I	0.24	0.07	1.18	0.56	1.07
II	0.23	0.08	1.38	—	—
III	0.27	0.11	1.28	—	—
IV	—	0.11	broken	—	—

Trichobothrium and socket on metatarsi difficult to see. Tibial spines small, only proximal clearly visible. Femur I 1.2 times carapace length; tibia I 11.5 times as long as wide. *Epigyne*: Fig. 19. *Vulva* (Figs. 20-22): Shown in ventral, dorsal and lateral views, to facilitate interpretation of internal structures. Female genitalia have been compared with type material and there is no doubt about the identity.

*Diagnosis*: The palpus of *M. muthaiga* Russell-Smith & Jocqué, 1986 is very similar to that of *M. spiralis* Jocqué & Scharff, 1986 (holotype examined) and *M. dentipalpis* (Simon, 1894) (lectotype examined). The female can be recognised by the characters given by Russell-Smith & Jocqué (1986, holotype description) and the male is easily recognised by the combination of the male palpal embolus, which is strongly coiled (more than 4.5 times), and the characteristic lamella.

*Distribution and habitat*: Until 1986, only two species of the genus *Mecynidis* were known from the southern part of Africa (the type species *M. dentipalpis* Simon, 1894 from South Africa and *M. laevitarsis* Miller, 1970 from Angola). An additional five new species of this genus have recently been discovered in Kenya and Tanzania (Jocqué & Scharff, 1986; Russell-Smith & Jocqué, 1986), and in the collection of the Zoological Museum in Copenhagen there is another undescribed female *Mecynidis* from Cameroon in West Africa. Thus this genus has a wide distribution in the Afrotropical region.

#### Other species recorded

##### *Afroneta brevistyla* Holm, 1968

*Material examined*: KENYA; Mt. Kenya, 3190 m, "Mountain forest, clearing in the forest between meteorological clearing and timberline on Naro Moru track", 9 January 1975 (1♂), leg. Dr T. Kronstedt (NRS).

*Distribution and habitat*: Known from montane areas in Tanzania, Kenya, Cameroon and Zaire, where it has been recorded at altitudes between 1800 and 3190 m.

##### *Araeoncus praeceps* Holm, 1962

*Material examined*: KENYA; Kakamega, Kakamega Forest, 11 October 1973 (1♀), leg. R. Buskirk (MCZ).

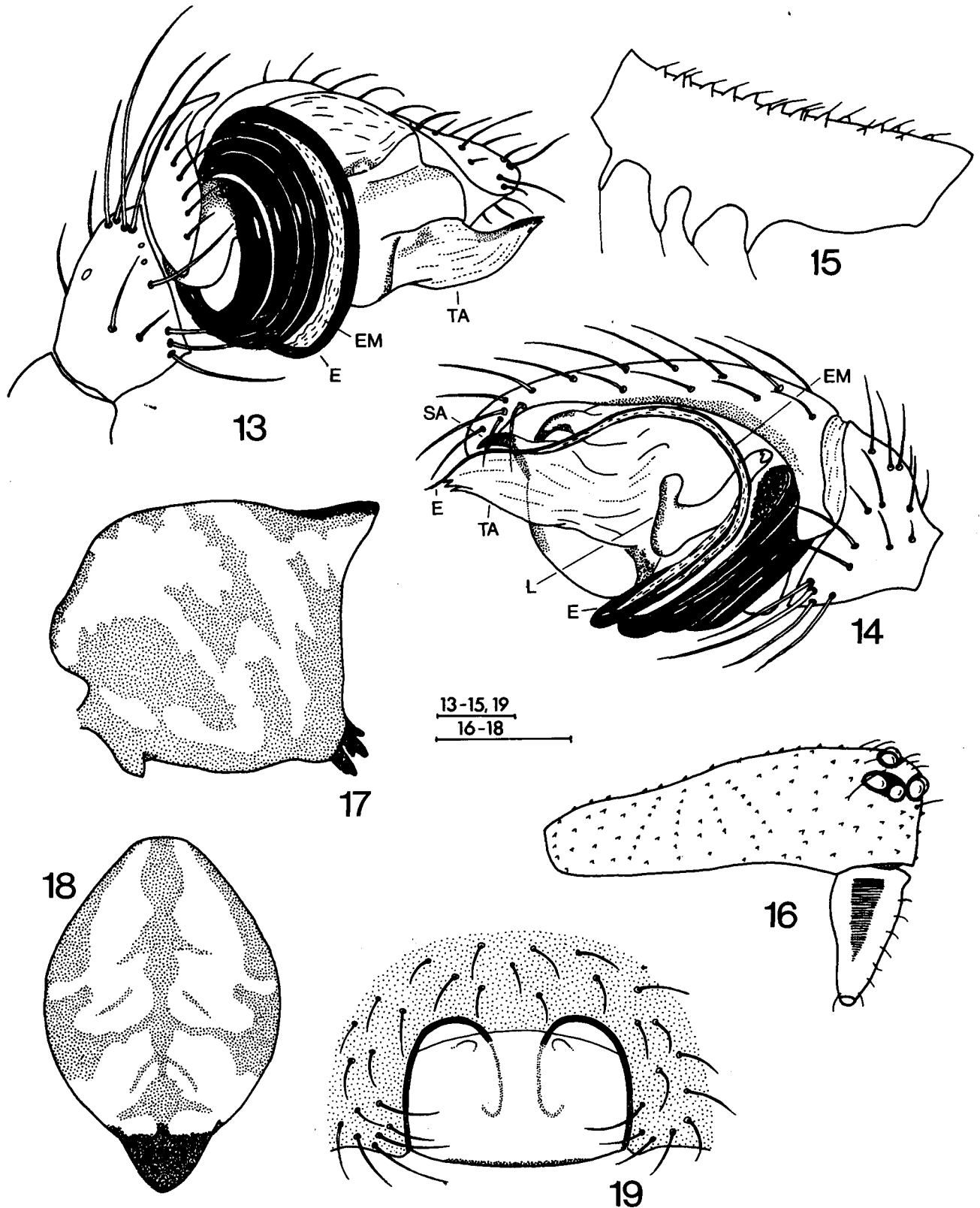
*Distribution and habitat:* Known from forest areas in Kenya and Tanzania.

*Lepthyphantes falcatus* Bosmans, 1979

*Material examined:* KENYA; Mt. Kenya, "sifting of mosses on trunks in mountain rain forest (*Hyp.-Hag.*)

zone", 3200 m, 10 January 1972 (6♂, 2♀, 4 juv.), leg. Dr T. Kronestedt (NRS).

*Distribution and habitat:* Known only from Mt. Kenya, where it has been recorded in vegetation of *Hypericum*, *Erica* and *Hagenia* at altitudes between 3200 and 3750 m.



Figs. 13-19: *Mecynidis muthaiga* Russell-Smith & Jocqué, 1986. 13 Male palp, dorsolateral view; 14 Male palp, mesal view; 15 Male palpal femur, lateral view; 16 Male carapace, lateral view; 17 Female abdomen, lateral view; 18 Female abdomen, dorsal view; 19 Epigyne, ventral view. Scale lines = 0.1 mm (Figs. 13-15, 19), 1.0 mm (Figs. 16-18).

***Lepthyphantes kenyensis* Bosmans, 1979**

*Material examined:* KENYA; Mt. Kenya, Naro Moru Track, 3500 m, 2 July 1979 (1♀), leg. N. Scharff (ZMUC). Mt. Kenya, Naro Moru Track, 3380 m, "Erica region. Investigation of rotten *Senecio*", 10 January 1972 (1♀), leg. Dr T. Kronestedt (NRS).

*Distribution and habitat:* Known only from Mt. Kenya, where it has been recorded among *Senecio*, *Alchemilla* and *Festuca* at altitudes between 3280 and 3900 m.

***Lepthyphantes biseriatus* Simon & Fage, 1922**

*Material examined:* KENYA; Mt. Kenya, Naro Moru Track, 3500 m, 2 July 1979 (1♂, 1♀), leg. N. Scharff (ZMUC). Mt. Kenya, 3380 m, "Erica region. Investigation of rotten *Senecio*", 10 January 1972 (1♂, 1♀), leg. Dr T. Kronestedt (NRS).

*Distribution and habitat:* Known only from Mt. Kenya, where it has been recorded in and above the *Erica* zone at altitudes between 3350 and 5368 m.

***Lepthyphantes kekenboschi* Bosmans, 1979**

*Material examined:* KENYA; Mt. Kenya, 3190 m, "Mountain rain forest clearing in the forest between meteorological clearing and timberline on Naro Moru track", 9 January 1975 (1♂), leg. Dr T. Kronestedt (NRS).

*Distribution and habitat:* Known only from Mt. Kenya, where it has been recorded in *Podocarpus*, *Hagenia*, *Erica* and *Acanthus* litter at altitudes between 3050 and 3410 m.

***Lepthyphantes nigropicta* Bosmans, 1979**

*Material examined:* KENYA; Mt. Kenya, 3190m, "Mountain rain forest clearing in the forest between meteorological clearing and timberline on Naro Moru track", 9 January 1975 (1♀), leg. Dr T. Kronestedt (NRS).

*Distribution and habitat:* Known only from Mt. Kenya where it has been recorded from *Hagenia*, *Erica* and *Podocarpus* litter and in grasses from the upper mountain rain forest belt and above (between 2550 and 3410 m).

***Metaleptyphantes perexiguus* (Simon & Fage, 1922)**

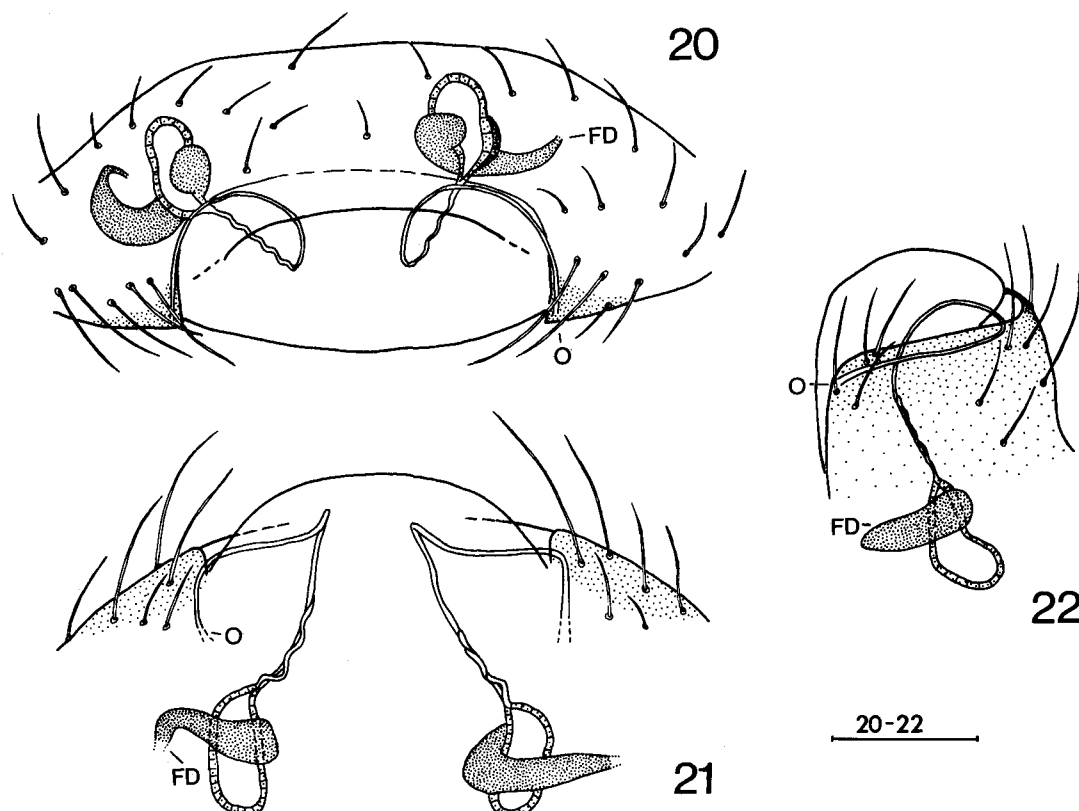
*Material examined:* ANGOLA; Toca-Mai, 45 km E. Dundo, 11 November 1972 (1♂), leg. A. de B. Machado, D. H. Kistner & R. J. Swift # 2581 (AMNH).

*Distribution and habitat:* Widespread in the Afrotropical region in all kinds of habitats.

***Metaleptyphantes machadoi* Locket, 1968**

*Material examined:* TANZANIA; Minziro Forest Reserve, W. Lake (Kagera) Region, July 1987 (1♂), pitfall trap in forest leaf litter, leg. Dr K. M. Howell (ZMUC).

*Distribution and habitat:* First record from Tanzania. Otherwise known from Uganda, Nigeria, Angola (type loc.), Cameroon and Gabon. Litter in primary and secondary forest, cultivated fields, papyrus swamp, bushland and riverine woodland.



Figs. 20-22: *Mecynidius muthaiga* Russell-Smith & Jocqué, 1986. **20** Vulva, ventral view; **21** Vulva, dorsal view; **22** Vulva, lateral view. Scale line = 0.01 mm.

***Microlinyphia sterilis* (Pavesi, 1883)**

*Material examined:* KENYA; Lake Naivasha, Kinja, 1950 m, 22-27 August 1981 (3♀), 24 October 1981 (1♂, 3♀), 7-21 November 1981 (2♂, 3♀). All material sweep-netted in *Acacia* woodland by Dr J. Rabøl (ZMUC).

*Distribution and habitat:* Widely distributed in the Afrotropical region where it occurs in various habitats above 1000 m.

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