

## CONTENTS

Introduction .....	2
Abbreviations .....	5
Materials and methods .....	6
Acknowledgements .....	6
Taxonomy .....	6
<i>Latrodectus</i> Walckenaer .....	6
<b>LATRODECTUS GEOMETRICUS-GROUP</b> .....	10
<i>Latrodectus geometricus</i> C.L. Koch .....	11
<i>Latrodectus rhodesiensis</i> Mackay .....	23
<b>LATRODECTUS TREDECIMGUTTATUS-GROUP</b> .....	27
<i>Latrodectus cinctus</i> Blackwall .....	28
<i>Latrodectus indistinctus</i> O.P.- Cambridge .....	33
<i>Latrodectus karrooensis</i> Smithers .....	39
<i>Latrodectus pallidus</i> O.P.- Cambridge .....	43
<i>Latrodectus renivulvatus</i> Dahl .....	46
<i>Latrodectus tredecimguttatus</i> (Rossi) .....	52
Opsomming .....	57
References .....	57

## INTRODUCTION

The genus *Latrodectus* Walckenaer 1805 are widely known, but a difficult genus taxonomically, because of the similarity in the male palps, female genitalia, general morphology and the intraspecific colour variation. This is also the reason why Levi (1959) lumped most of the species under *L. mactans*. Subsequently Levi (1983) acknowledged that, "For some time it has been apparent that all my conclusions were wrong." Other workers in the field (Abalos, 1962, Abalos & Báez, 1967, Kaston, 1970, Martindale, 1980 & 1980b, Martindale & Newlands, 1982 and Schmidt, 1990) came to the same conclusion when they tried crossing experiments.

The genus *Latrodectus* was established by Walckenaer in 1805 for *Aranea tredecimguttatus* (= *A. 13-guttatus*) Rossi, 1790. The first mention of *Latrodectus* in Africa is that of Walckenaer (1805) for *L. tredecimguttatus* in Egypt, and subsequently *Latrodectus* has been reported from all over Africa. The first endemic species of *Latrodectus*, *L. cinctus*, was described by Blackwall, 1865 from Mozambique. Dahl (1902) added two species to the

list, with *L. stuhlmanni* from Togo and *L. renivulvatus* from Namibia. In 1905 O. P.-Cambridge described another two species, namely *L. concinnus* and *L. indistinctus* from the Cape Province, followed by *L. incertus* described by Lawrence (1927) from Namibia. Smithers (1944) made a detailed study of the intraspecific variation in colour patterns and shape of external genitalia as found in *L. indistinctus* and *L. geometricus*. He came to the conclusion that *L. concinnus* is a synonym of *L. geometricus*. The latter is a cosmopolitan species originally recorded from the Americas. Smithers (1944) also recognized a subspecies of *indistinctus* from the Karroo, *L. i. karrooensis*, based on the different colour patterns it possess and the construction of the nest.

Roewer (1942), in compiling his catalogue, listed 21 species and eight subspecies for *Latrodectus*. When Levi (1959) did a world wide revision of *Latrodectus* he reduced the number of species to six and recognized only the following species, namely *geometricus* Koch, *mactans* (Fabricius), *pallidus* P.-Cambridge, *curacaviensis* (Muller), *hystrix* Simon and *dahli* Levi. Levi (1959) recommended that certain well-known species be retained as subspecies, for example *L. mactans tredecimguttatus* and *L. m. hasselti*. This study of his was based mainly on the structure of the genitalia, internal and external. After the revision of Levi (1959), only three species were listed from Africa, namely *pallidus*, *mactans* and *geometricus*. In 1972 Mackay added a sibling species of *geometricus* from Zimbabwe, *L. rhodesiensis*, to the list.

Martindale & Newlands (1982) did some breeding and other biological experiments to compare "*mactans*" populations of South Africa (from Roodepoort and Tzaneen), Israel (Jerusalem), Australia (Central Victoria) and America (Texas). They found that the taxon *L. mactans* represents a complex of distinct genetic species and they proposed the resurrection of the name *L. indistinctus* for the South African species. They also suggested that future studies may reveal that the name *L. cinctus* should be preferred and that more than one 'black'-*Latrodectus* species may be found here. This observation that more than one species was involved was confirmed by Dr. G.J. Müller of the Pharmacology Department, Tygerberg Hospital (pers. comm.), who observed that the 'black'-*Latrodectus* of the Transvaal differ from the species in the western Cape.

Because of the medical importance of this genus it was felt that a revision was of the utmost importance. References to *Latrodectus* and their envenomation are numerous and Abalos & Báez (1967) refers to 923 papers that are mentioned in a theses by Sampayo in 1942. References that are relevant to Latrodectism in Africa are: de Meillon & Gear (1947); Desportes (1937); Dippenaar-Schoeman & Newlands (1980); Finlayson (1936); Finlayson (1937a,b,c); Finlayson (1956); Finlayson & Hollow (1945); Gaud & Delesalle (1949); Maretic (1965, 1971 & 1987); Martindale (1980 & 1980b); Martindale & Newlands (1982); Müller (1993); Müller, Koch, Kriegler, Van der Walt & Van Jaarsveld (1989); Müller, Kriegler, Van Zyl, Van der Walt, Dippenaar & Van Jaarsveld (1992); Newlands (1975, 1976 & 1978); Newlands & Atkinson (1988); Prins & Le Roux (1986); Rayner (1987); Schmidt (1987); Smithers (1944); and Zumpt (1968). The above mentioned publications are those that could be found in the literature and may not be all the publications that exist on the medical aspects of the African species of *Latrodectus*. The work by Desportes (1937) and Gaud & Delesalle (1949) both deal with *Latrodectus* from

Morocco. Unfortunately I have been unable to obtain these and am therefore unable to comment on them. The work by Maretic (1965, 1971 & 1987) and Schmidt (1987) are general reviews of other publications, including those done on the genus in southern Africa. The rest of the publications mentioned above, deal with the southern African species. Most of the southern African research on the medical aspects of the 'black'-*Latrodectus* species were done on *L. indistinctus* in the western Cape. Only Martindale & Newlands (1982) did original research on '*L. renivulvatus*' venom. All the studies on the southern African species compare the 'black'-*Latrodectus* specie with *L. geometricus*, but so far no studies have been done on the venom of the other species. The fact that the 'black'-*Latrodectus* in southern Africa is not only represented by *L. indistinctus* poses a problem with the toxicological research done so far, as the only species that can be positively linked to a specific study is *L. indistinctus*, in the study done by Müller (1993), for witch there are voucher specimens deposited in the NCA. Although Martindale and Newlands (1982) mentions working on specimens from Roodepoort and Tzaneen it can not be absolutely sure that these were all *L. renivulvatus*, as there are a possibility that *L. cinctus* could also be found in the Tzaneen area and no voucher specimens were kept of these specimens so far as could be ascertained. A lot of work still need to be done on the venom of the 'black'-*Latrodectus* species and *L. rhodesiensis* because the venom of these species probably differ from that of *L. indistinctus* and *L. geometricus*. It is very important that in all future toxicological studies voucher specimens should be deposited at a reputable study collection so that the taxonomic position of the species could always be verified. Specimens mentioned in medical case studies in journals should also be treated as voucher specimens.

In early publications colour patterns and abdominal setation were seen as the most important characters for distinguishing between the different species. In later publications the emphasis were switched to the morphology of the genitalia. It now appears that these two methods should be combined. In the females colour patterns are of little use for the four species *L. cinctus*, *L. indistinctus*, *L. renivulvatus* and *L. tredecimguttatus*. It is very difficult to distinguish between the females of *L. cinctus* and *L. indistinctus* except for the difference in size and distribution. Morphologically it is even more difficult to distinguish externally between *L. cinctus* and *L. renivulvatus*, as they are the same size and have an overlapping distribution. The exceptions here are *L. karrooensis* where the T-shaped marking is constant and *L. pallidus* where the uniform white abdomen is constant. The seminal receptacles and the spermathecae are the best character to separate *L. geometricus*, *L. rhodesiensis* and *L. renivulvatus* from the rest of the species. *L. tredecimguttatus* is distinguished from *L. indistinctus* and *L. cinctus* by the bifurcated small setae on the dorsal abdomen and four loops of the spermathecal ducts, of which loop four is situated between loop two and loop three. Colour patterns on the dorsum of the abdomen of males seem to be the most constant character and may be used as the distinguishing character, with the exception of *L. geometricus* and *L. rhodesiensis* and to some extent *L. indistinctus*, but in these cases the palps are very distinct especially in the length of the embolus. Although the embolus length is easily discernable there may be some problems with this character as the embolus sometimes break off during copulation.

A problem area encountered during this study was the inability to find some type specimens. The type species that could not be obtained were that of *L. geometricus*, *L. tredecimguttatus* and *L. pallidus immaculata*. This problem was circumvented by assuming that the work done during recent studies of these species (Abalos, 1980, Levy & Amitai, 1983, Brignoli, 1984 and Müller, 1985) are correct. Another problem that was encountered was the similarity of the female genitalia and the male palps of some species. This problem of the similarity of the female genitalia and the male palps of some species were solved by looking for other distinguishing characters, such as colour variation, abdomen spination, measurements of body parts, habits and habitats.

This revision of *Latrodectus* has resulted in the recognition of eight species for Africa. The use of characters other than sexual characters, as advised by Levi (1983), to determine species were found to be necessary. The males of *L. cinctus* and *L. renivulvatus* were described for the first time and now all eight species are known from both sexes. It was also found that *L. stuhlmanni* is a synonym for *L. cinctus* and *L. insertus* is a synonym for *L. renivulvatus*, while *L. karrooensis* is elevated from a subspecies of *L. indistinctus* to a species.

## ABBREVIATIONS

### Abbreviations of Museums and Institutes

- AM: Albany Museum, Grahamstown (F. Gess)  
 AMNH: American Museum of Natural History, New York (N.I. Platnick)  
 MCZ: Museum of Comparative Zoology, Harvard University, Cambridge (H.W. Levi)  
 MNHN: Muséum National d'Histoire Naturelle, Paris (C. Rollard)  
 MRAC: Musée royal de l'Afrique Centrale, Tervuren (R. Jocqué)  
 NCA: National Collection of Arachnida, Plant Protection Research Institute, Pretoria (A. Dippenaar)  
 NM: Natal Museum, Pietermaritzburg (P. Croeser, B. Lawrence)  
 NMBA: National Museum Bloemfontein, Arachnida (L.N. Lotz)  
 NMZ: National Museum Zimbabwe, Bulawayo (M. FitzPatrick)  
 SAM: South African Museum, Cape Town (H. Robertson, M. Cochrane)  
 SMWN: State Museum Windhoek, Namibia (E. Griffin)  
 TM: Transvaal Museum, Pretoria (C.K. Brain)  
 UMO: University Museum = Hope Entomological Collections, Oxford (I. Lansbury)  
 USNM: United States National Museum of Natural History, Smithsonian Institution, Washington (J.A. Coddington)  
 ZMB: Zoologisches Museum, Berlin (M. Moritz)  
 (No specimens could be obtained from the British Museum of Natural History (BMNH)).

### Other abbreviations

CW = Carapace width (at widest part)

F = Female

M = Male

TL = Total length (excluding legs)

T1 = Length of tibia I

### MATERIALS AND METHODS

As immature specimens cannot be identified with certainty this study was based on adult specimens. A total of 1436 adult specimens were examined. Specimens studied were preserved in alcohol and studied under a Zeiss stereo-dissecting microscope. The female internal genitalia were cut loose on three sides and flipped open and gently cleaned with a micropin. In a few cases the female genitalia were removed completely and then cleaned. The cleaning was done under alcohol. The male palps were studied while still attached to the specimens, except in the case of at least one specimen of each species where one of the palps was removed for detailed study, temporarily mounted in alcohol on a cavity slide covered with a coverglass. Loose genitalia and palps were placed in microvials with the respective specimens. Drawings were made with a drawing-tube connected to the microscope, except for the abdominal patterns and the illustrations with the keys which are stylized drawings. Measurements were made with a dial-caliper while the specimen were examined under the microscope. Where possible ten females and ten males of each species were measured for TL, CW and T1. The mean of the measurements taken are given with the range in brackets.

### ACKNOWLEDGEMENTS

I am indebted to A. Leroy, A. Russell-Smith and D. Visser for specimens that they donated to the NMBA collection. The Council and Director of the National Museum Bloemfontein are acknowledged for supporting this project. I also wish to thank the referees Dr. A.S. Dippenaar-Schoeman of the Plant Protection Research Institute, Pretoria, RSA and Mrs. E. Griffin of the State Museum, Windhoek, Namibia. Thanks are also due to all the people and institutions mentioned under the abbreviations, for the loan of specimens.

### TAXONOMY

#### *Latrodectus* Walckenaer

*Latrodectus* Walckenaer, 1805: 81. Type species designated by Latreille, 1810: 424; *Aranea* *tredecimguttatus* (= *A. 13-guttatus*) Rossi, 1790, Fauna Etrusca, 2:136, F type from Tuscany, Italy (as stated by Levi, 1959 and Levi & Levi, 1962: 23).

**Etymology:** The genus name *Latrodectus* is derived from Greek words meaning "secret biter" (Maretic, 1965).

**Diagnosis:** Separated from other theridiid genera by large colulus, absence of teeth on chelicerae, separated lateral eyes and characteristic genitalia.

### Description

Females large (ca. 7,25-20 mm), males much smaller (ca. 2,5-6,5 mm).

The carapace is pear shaped and wide in the thoracic region, with a median transverse fovea and is mostly brownish in colour.

The eyes are in two rows and separate from each other.

Abdomen is globular in the females and oblong in the males, with a shiny appearance. The setae on the dorsal surface of the female abdomen are distinct for the *geometricus* species-group and for species within the *tredecimguttatus* species-group. In the *geometricus* species-group the abdominal setae are fine setae of two lengths. The long setae being 0.5 mm and the short setae being 0.25 mm (Smithers, 1944). In the *tredecimguttatus* species-group there are three types of abdominal setation, with *L. pallidus* only having sparse short setae, *L. tredecimguttatus* having long, robust, bent setae and short bifurcated setae and all the other species of this species-group having two lengths of robust, simple setae. The background colour of the abdomen ranges from a light cream to black. Orange to red markings are usually visible on the abdomen, ventrally, dorsally or both. The dorsal abdominal pattern is diagnostic in the males of the *tredecimguttatus* species-group (e.g.: Figures M, R, S, T, U & V).

The leg formula is 1423 and the tarsus of the fourth leg has a distinct comb of serrated setae.

External female genitalia are relatively similar in the different species in that the opening is variably oval, wider than long (e.g.: Figures 1b, 3b, 4b, 7b, 10b, 11c, 12b & 16b). Internal female genitalia are similar in having two dumb-bell shaped seminal receptacles and coiled connecting ducts of varying lengths (e.g.: Figures 1a, 3a, 4a, 7a, 10a, 11b, 12a & 16a).

Male palps consist of a modified cymbium, subtegulum, coiled tegulum, median apophysis, radix, small conductor and a long coiled embolus. The length of the embolus is diagnostic in some species (e.g.: Figures N, O & P).

### Key to the species of *Latrodectus* in Africa

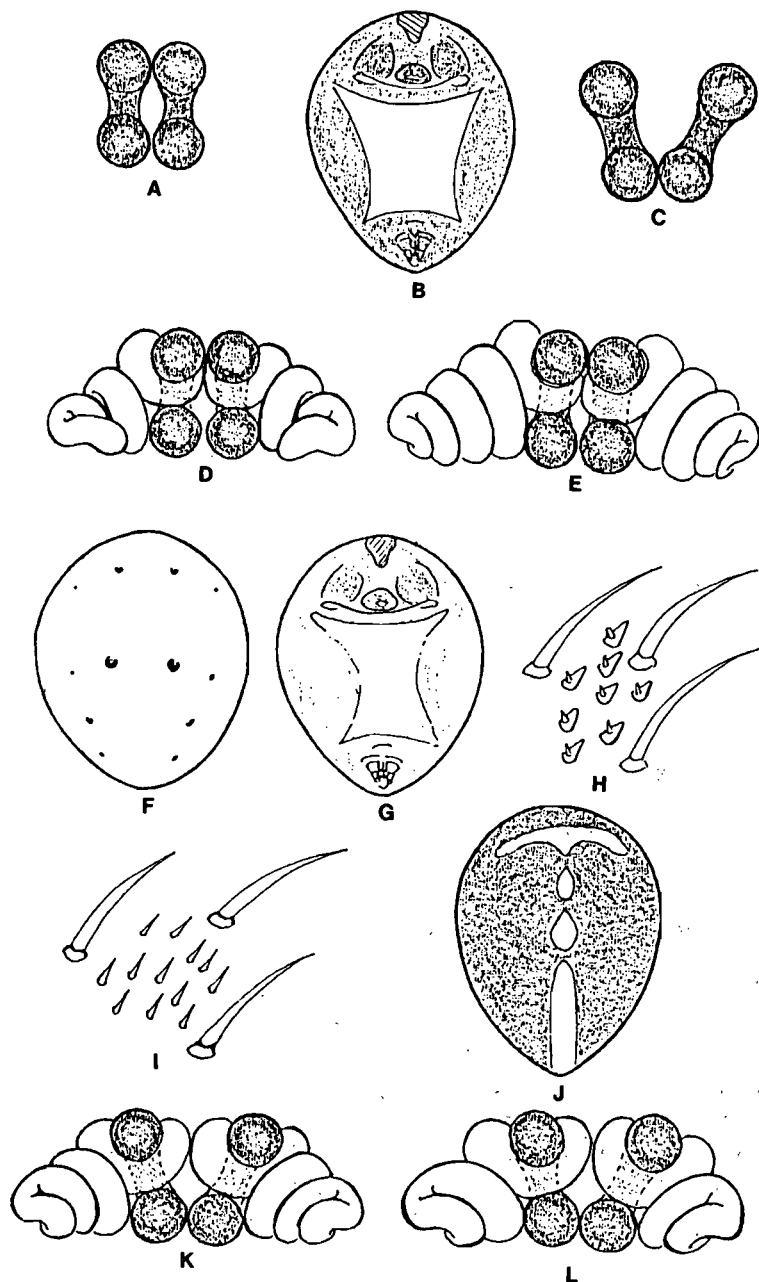
#### Females

1. Seminal receptacles parallel (Figure A), abdomen with red or orange-red hourglass marking on ventrum (Figure B) ..... 2
- Seminal receptacles in a V-formation (Figure C), abdomen without red or orange-red hourglass marking on ventrum ..... 3

2. Spermathecal ducts with three loops (Figure D) ..... *geometricus*  
Spermathecal ducts with five loops (Figure E) ..... *rhodesiensis*
3. Abdomen mostly white or off-white with dark brown spots in rows (Figure F), white to yellowish hourglass marking on ventrum (Figure G) ..... *pallidus*  
Abdomen mostly brown to black ..... 4
4. Short abdominal setae bifurcate (Figure H) ..... *tredecimguttatus*  
Short abdominal setae simple (Figure I) ..... 5
5. Abdomen with red T-shaped marking on dorsum (Figure J) ..... *karroensis*  
Abdomen without red T-shaped marking on dorsum ..... 6
6. Spermathecal ducts with four loops (Figure K) ..... *renivulvatus*  
Spermathecal ducts with three loops (Figure L) ..... 7
7. Carapace width less than 3,8 mm ..... *cinctus*  
Carapace width more than 3,8 mm ..... *indistinctus*

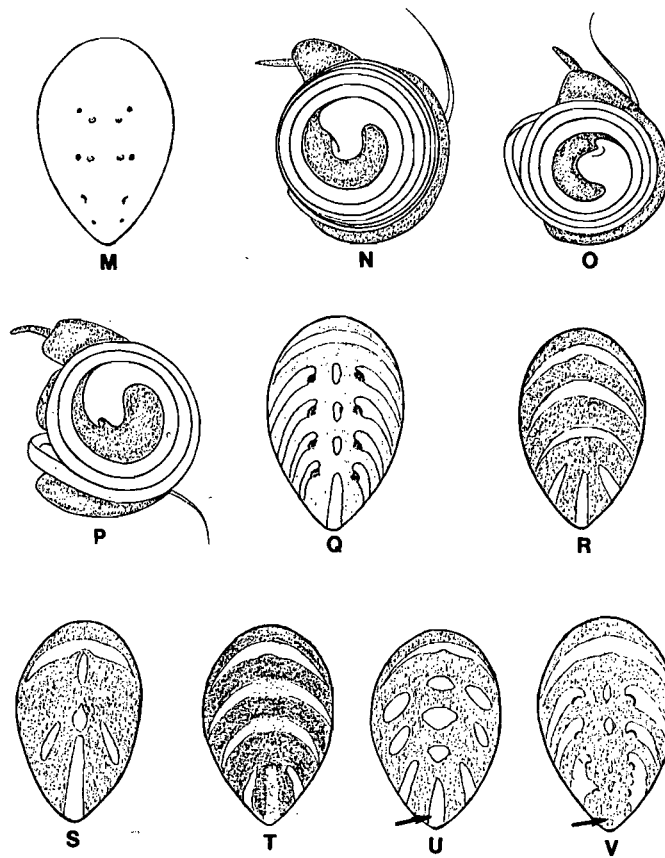
#### Males

1. Abdomen off-white with a few dark spots in rows on dorsum (Figure M) ..... *pallidus*  
Abdomen off-white to dark brown, with geometric patterns ..... 2
2. Embolus with five loops (Figure N) ..... *rhodesiensis*  
Embolus with four or less loops (Figure O) ..... 3
3. Embolus with four loops ..... 4  
Embolus with three loops (Figure P) ..... 5
4. Abdomen dorsally with broken light transverse areas on a dark background (Figure Q) ..... *geometricus*  
Abdomen dorsally with continuous light transverse areas on a dark background (Figure R) ..... *renivulvatus*
5. Abdomen dark with dorsally a orange-red T-shaped marking (Figure S) ... *karroensis*  
Dorsal abdominal pattern without T-shaped marking ..... 6
6. Abdomen with broken light dorsal transverse areas connected with indistinct light areas, anterior light transverse area continuous (Figure T) ..... *cinctus*  
Broken light dorsal transverse areas unconnected ..... 7
7. Abdomen medially on the posterodorsal part with a short, longitudinal, light area (Figure U); found north of the equator ..... *tredecimguttatus*  
Abdomen medially on the posterodorsal part with an indistinct longitudinal light area (Figure V); found south of the equator ..... *indistinctus*



Figures A-L: Figures to illustrate key to females.





Figures M-V: Figures to illustrate key to males.

### **LATRODECTUS GEOMETRICUS-GROUP**

Female members of this group are recognized by the parallel seminal receptacles of the internal genitalia (Figures 1a & 3a). The abdomen is light cream coloured to black, with geometric patterns dorsally (Figures 1d & 3d) and hourglass marking on the ventrum (Figure 2d). In the specimens with the black abdomen the pattern may be difficult to see. The abdomen is dorsally covered with long hair-like setae (Figure 2c). Males are recognized by the dorsal abdominal pattern (Figures 8a & 8b) and the more than three loops of the embolus (Figures 1c & 3c). The species included in the *Latrodectus geometricus* species-group are *L. geometricus* and *L. rhodesiensis*.

*Latrodectus geometricus* C.L. Koch, 1841  
(Figures 1a-d, 2a, 2c, 2d & 8a)

*Latrodectus geometricus* C.L. Koch, 1841: 117; F holotype from Colombia, in the collection of the ZMB, dried specimen, not seen; Roewer, 1942: 425; Smithers, 1944: 236; Bonnet, 1957: 2368; Keegan, 1955: 149; Levi, 1959: 21; Levi, 1967: 185; Abalos & Báez, 1967: 59; Lamoral, 1968: 1; Zumpt, 1968: 385; Mackay, 1972: 236; Levi & Randolph, 1975: 39; Abalos, 1980: 49; Levy & Amitai, 1983: 56; Müller, 1985: 27.

*Latrodectus concinnus* O.P.-Cambridge, 1905: 152; F and M holotype from Cape Town, South Africa, in the collection of the UMO, 1727 M - Devils Mt., Cape Town and 1728 3F & 1 immature - Table Mt., Cape Town, examined; synonymized by Smithers, 1944: 303.

*Latrodectus geometricus subalbicans* Caporiacco, 1949: 376; F holotype from Mackinnon Rd. 80km west of Mombassa, Kenya, depository unknown, synonymized by Levi, 1959: 21.

*Latrodectus geometricus modestus* Caporiacco, 1949: 376; F holotypes from Kebete and Nairobi, Kenya, depository unknown, synonymized by Levi, 1959: 22.

*Latrodectus geometricus obscuratus* Caporiacco, 1949: 377; F and M holotypes from Nairobi, Kenya, depository unknown, synonymized by Levi, 1959: 22.

**Diagnosis:** The main characters distinguishing this species from the other species (*L. rhodesiensis*) in this species group are the number of loops in the spermathecae ducts and in the embolus and the construction of the egg-sac. It also differs from *L. rhodesiensis* in the chromosome number. *L. geometricus* chromosome number = 18 (*L. rhodesiensis* = 16) (Martindale, 1980).

**Description:**

**Colour pattern:** The background colour of *L. geometricus* are veritable from cream to black. The dorsal abdominal pattern is the same as that of *L. rhodesiensis*, but not as distinctly outlined. In *L. geometricus* females the pattern consist of three medial triangular to quadrangular white to orange marks with darker center and border, of which the posterior one is arrow shaped extending from the spinnerets, and four bilateral white to orange transverse blotches with darker centers and borders and each with a notch on the dorso medial line containing a round black mark with indistinct contour (Figure 1d). The males have a similar pattern (Figure 8a). Ventrally the abdomen is marked with an hourglass shaped cream-orange to orang-red mark between the epigastric furrow and the spinnerets (Figure 2d). The black specimens may lead to incorrect identification, as were found in this study where some of the black specimens were labelled *L. mactans*. In Africa the differentiation is easy as the only adult *Latrodectus* species with a distinct hourglass marking under the abdomen and a geometric pattern on the dorsum of the abdomen is *L. geometricus* and *L. rhodesiensis*. It was proven by Heeres (1990, 1991 & 1993) that the cream to black abdominal background colour are variations of colour of the same species and not differently coloured species. Authors such as Smithers (1944) and Levi (1959) thought that this was the case, but no studies were done to prove it.

**Abdominal cetae:** The abdomen is dorsally covered with fine hairlike setae of two lengths but of the same type (Figure 2c).

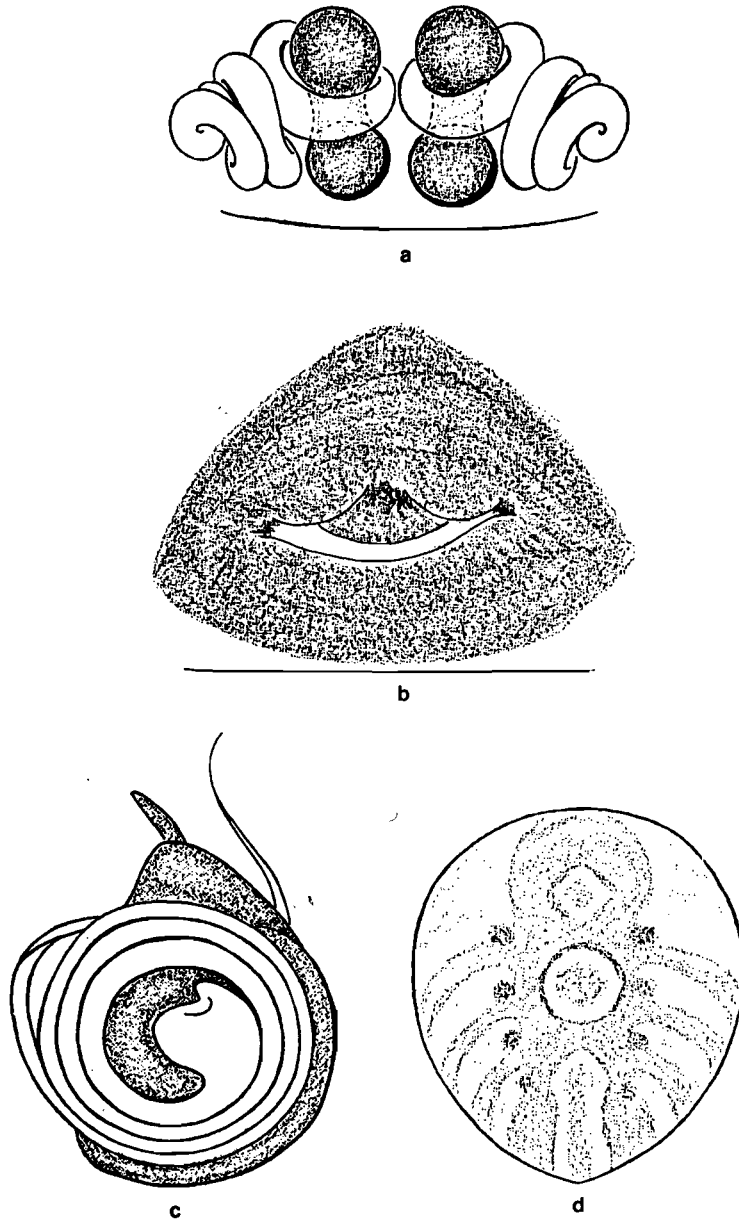


Figure 1(a-d): *Latrodectus geometricus* Koch: a. Female internal genitalia; b. Female external genitalia; c. Male palp showing embolus; d. Female abdominal pattern.

**Female genitalia:** Externally the epigynum is ovoid, wider than long. The copulatory opening has a curved posterior border and a lobed anterior border (Figure 1b). Internally there are two parallel dumbbell shaped spermathecae and the spermathecal ducts with three loops (Figure 1a). The first loop of the spermathecal ducts do not extend anterior of the spermathecae.

**Male palps:** In *L. geometricus* the embolus has four loops (Figure 1c).

**Egg sac:** The egg sac of *L. geometricus* differs from all other *Latrodectus* egg sacs in having a spiked appearance because of tufts of silk that are added to the outside of the egg sac (Figure 2a).

**Habit:** *Latrodectus geometricus* build webs in the general theridiid way, with a retreat from which delaying threads radiate. From the delaying threads to the ground sticky threads are laid down. According to Lamoral (1968) the retreat could either have one or two openings with the main one opening onto the delaying threads. The web is built at varying heights above the ground and can be in the veld or in and around buildings.

**Medical importance:** This species is three to four times less poisonous than *L. indistinctus*, but even so it is advisable to see a doctor if bitten by one (Müller, 1993, Müller, et al., 1989 & Müller, et al., 1992).

**Measurements:** (n = 10) F: TL = 10,84 (8,20 - 13,90); CW = 3,47 (2,50 - 4,30); T1 = 5,60 (4,45 - 7,00); and (n = 10) M: TL = 2,94 (2,65 - 3,25); CW = 1,02 (0,90 - 1,20); T1 = 2,18 (1,85 - 2,35).

**Material examined:** BOTSWANA: Xugana Island, Okavango Delta, 130km NNW. Maun, 1904S/2303E, Nov. 1980 (U. Wilmot & B.H. Lamoral), 1M (NM); CAMEROON: Metet, 0324N/1146E (G. Schwab), 4F (MCZ, 4 vials); ETHIOPIA: Addis Ababa, ca. 8km E. of ILCA Compound, 21 June 1987 (A. Russell-Smith), 1F (NMBA 6331); Edge of L. Langano, ca. 1600m, 9 June 1987 & 4 June 1988 (A. Russell-Smith), 3F (NMBA 6330, 6334); Wabde Shabele Hotel, L. Langano, 1600m, 1 Sept. & 26 Oct. 1988 (A. Russell-Smith), 2F (NMBA 6332, 6333); GHANA: Accra, Achimota, Apr.- June 1961 (C.P. Hinkley), 1M & 2F (MCZ, 3 vials); Mole Game Res. in NW. Ghana, summer 1974 (A. Macwilliam), 2F (MCZ); GUINEA: Lobé [Labé?], Guinée, 1964 (J. Dedycker), 3F (MRAC 127.270); KENYA: Br. E. Africa, 1909 (Mearns-Heller), 1F (USNM); Br. E. Africa, Wambugi (poss. Wamugi), 23 Oct. 1909 (E.A. Mearns, Roosevelt Exped.), 1F (USNM); L. Nakuru Nat. Park, vicinity of Lion Hill Lodge, 1800m, 22-23 Mar. 1989 (Coyle), 1F (AMNH); Nairobi, Muthaiga, 7 Jan. 1978 (A. Russell-Smith), 1M (NMBA 6329); MOZAMBIQUE: Museu de Alvarez Castro, Lorenzo Marques, July 1967, 1F (AM); NAMIBIA: Aminuis, S.W. Africa (S.A. Museum Exp.), 1F (SAM B9021); Aranos, 26 May 1986 (G. Schaum), F (NCA 87/803); Farm Hobas 374, 2717Da, 16 Oct. 1984 & 23 Oct. 1984 (C. Griswold & J. le Roux, separately), 2F (SMWN 39850, 39875); Halali, Etosha Nat. Park, 1902S/1628E, Dec. 1986, Feb.-Apr. 1987 & June 1987 (M. Paxton), 6F (SMWN 41257, 41318 & 41167); Katima Mulilo, E. Caprivi, 13 Apr. 1983 (C.H.G. Schlettwein), 1F (SMWN 39900); Klein Windhoek, 2217Ca, 3 Oct. 1990 (R. Lohmann), 1F (SMWN 42000); Mushare, 1837S/1653E, 7 May- 20 June 1986 (E. Griffin), 1M (SMWN 39482); Nomtele, S.W. Africa, Mar. 1923 (R.F. Lawrence), 1F (SAM B6284); Ochivello, Kaokoveld, 16 July 1982 (J. Coetzer), 1M & 1F (NCA 82/757); Okaukuejo Camp, Etosha

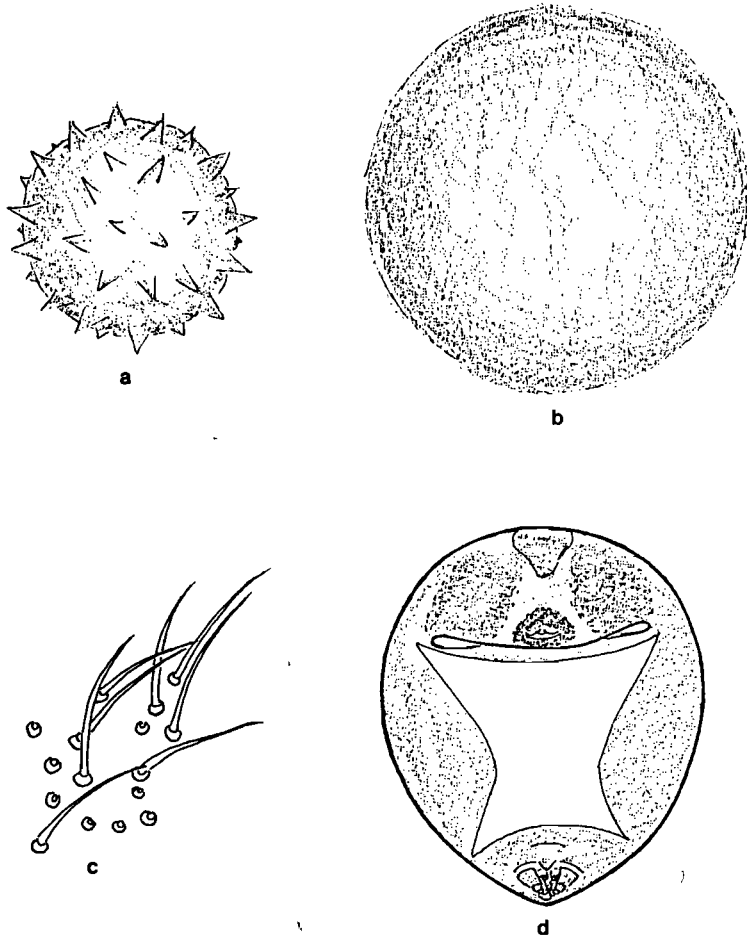


Figure 2(a-d): a. *Latrodectus geometricus* Koch egg sac; b. *L. rhodesiensis* Mackay egg sac; c. *L. geometricus* & *L. rhodesiensis* dorsal abdominal setae, circles indicating broken setae; d. *L. geometricus* & *L. rhodesiensis* ventral abdomen.

Nat. Park, 1915Bb, Mar. 1986 (T. Archibald), 1F (SMWN 41223); Omega Base, W. Caprivi Park, 1802S/2213E, 7 Apr. 1990 (E. Marais), 1F (SMWN 41797); Otjiwarango, S.W. Africa, 1921 (J.S. Brown), 2F (SAM B5724); Rosh Pinah, Luderitz Distr., SWA., 2716Dd, Dec. 1972 (A. Maritz), 1F (TM 10680); 10 km NW. Rosh Pinah, Luderitz Distr., 2716Dc, 13 Aug. 1990 (C. Roberts), 1M (SMWN 41928); Swakopmund, 2240S/1431E, 11 July 1988 (L.N. Lotz), 2F (NMBA 2953, 2954); Tsumkwe camp, Bushmanland, 1920Cb, 2 June 1983 (M. Griffin), 1F (SMWN 41574); Windhoek, 30 May 1969 (R.I. Gebhardt), 1F (AM); Dec. 1983 (D. Conradie), 3F (SMWN 41497, 41498, 41499); 10 June 1982, 1F (SMWN 41559); 6 Nov. 1988 (C. Mannheimer), 2F (SMWN 41999); RSA, CAPE PROV.: Albany, Grahamstown, 3055S/1922E, 29 Sept. 1989 (L.N. Lotz), 1F (NMBA 3275); Aliwal

North, 3041S/2642E, Dec. 1985 (Museum staff), 1F (NMBA 1329); Alicedale, Jan. 1917 (F. Cruden), 4M (AM); Ashton, Robertson Div., July 1914 (W.F. Purcell), 2F (SAM B4015); Beaufort West (S.H. Skaife), 1F (SAM B9282); Beaufort West, Karoo Nat. Park, 3218S/2229E, Dec. 1986 - Mar. 1987, (Museum staff), 1F (NMBA 2043); 4 Apr. 1989 (A. Leroy), 2F (NCA 89/720 & 89/737); Belmont, Kimberley (K. Orpen), 2F (SAM B9123, B9872); Bitterfontein, Namaqualand, Mar. 1939 (R. Smithers), 1F (SAM B9730); Boschberg Mts., Somerset East, 1939 (Lynes & Admiral), 3F (SAM B9667); Boschklouf, Cedarbergen, Clanwilliam Div., Dec. 1897 (C.L. Leipoldt), 1F (SAM X3594); Bot River (Smithers & Thorne), 2F (SAM B9272); Cave west of Bottelierskop, 18 Mar. 1986 (A.J. Prins & A. Roux), 1F (SAM C1272); Brandvlei, Bushmanland, 4 Aug. 1976 (J.N. van Niekerk), 1F (SAM C1269); Bredasdorp, 2km from Bredasdorp on Waenhuiskraal Rd., 3434S/2004E, 29 Oct. 1987 (Entomol. staff), 1F (NMBA 2674); Burgersdorp, Cape, Oct. 1907 (D.R. Kannemeyer), 1F (SAM B81); 2 miles Caledon side of Bot River (Smithers & Thorne), 2F (SAM B9237); Calvinia, Mar. 1939 (R. Smithers), 1F (SAM B9735); Calvinia, 10 km NW. Loeriesfontein, 3055S/1922E, 22 Oct. 1990 (L.N. Lotz), 1F (NMBA 5547); Calvinia, Loeriesfontein, 3058S/1926E, 23 Oct. 1990 (L.N. Lotz), 1M & 4F (NMBA 5502, 5551, 5552); Camps Bay Mountains, May 1901 (W.F. Purcell), 1F (SAM X8992); Cape Flats, 17 June 1922 (R.F. Lawrence), 4F (SAM B5729); Cape Point, Cape Peninsula, Jan. 1896 (R.M. Lightfoot), 1F (SAM X3434); Cape Town, June 1916 (F. Cruden), 1F (AM); Mar. 1965 (B.H. Lamoral), 2F (NM 9852); Nov. 1963 (J. Field), 2F (NM 9861); 24 Dec. 1973 (A.J. Prins), 1F (SAM C1268); 20 May 1988 (B. Newman), 1F (SAM C1934); Cape Town, Rondebosch Junior School, 1 Feb. 1981 (P. Lamoral), 1F (NM 13803); Cederberg Tourist Park, Kromrivier, 72 km SSE. of Clanwilliam, 3232S/1917E, 1-7 Nov. 1985 (C. Griswold, J. Doyen & T.M. Griswold), 1F (NM); Clanwilliam, Dwars Rivier 330, 3228S/1916E, 11 Mar. 1993 (L.N. Lotz), 1M & 1F (NMBA 6274); Clanwilliam, Theerivier, 3245S/1903E, 23 Dec. 1986 (C. Pieterse), 1F (NMBA 1973); Road between Clanwilliam and Springbok, Namaqualand, 10 Sept. 1980 (Sierwald), 1F (USNM); Conradie Home Cape Flats, Sept. 1920 (R. Smithers), 1F (SAM B9373); Cradock, 3210S/2537E, Dec. 1985- Feb. 1986 (Museum staff), 1F (NMBA 1416); 10 May 1986 (Museum staff), 1F (NMBA 1536); Nov. 1986 (Museum staff), 2F (NMBA 1956, 1957); De Aar, 2F (AM 1800); Devil's Peak, Cape Town, Aug. 1983 (M. Macpherson), 1F (SAM C1127); (H. Zinn), 1F (SAM B9489); (F. Purcell), 1M (M syntype of *L. concinnus*, UMO bottle 1727, 4379); Durbanville (R. Smithers), 5F (SAM B9506); East London, 1899 (J. Wood), 1F (SAM X7845); Eendekuil, C.P., 2F (MCZ, 2 vials); (Plague gang), 9F (SAM B8998, B9016, B9018, B9019, B9020, B9278, B9279); (Health Dept.), 15F (SAM B9058, B9059, B9060, B9062, B9063, B9076, B9077, B9079, B9080, B9082, B9083, B9084, B9086, B9087, B9089); Eisleben Road flats, 7 Aug. 1938 (R. Smithers), 2F (SAM B9362); 5 miles south of Elim, 3 Dec. 1937 (Barnard & Thorne), 2F (SAM B9217); Gardens, Cape Town, 20 Mar. 1912 (R.W.E. Tucker), 1F (SAM B1122); (K.H. Barnard), 5F (SAM B9010, B9012, B9013, B9050, B9051); Gordonia, Witdraai, 2658S/2041E, 14 Aug. 1986 (M. v. E. Steyn), 2F (NMBA 1906); Graaff-Reinet, 1F (AM 1910); Graaff-Reinet, Oct. 1915 (P.H. Whites), 2F (SAM B1645, B2461); Grahamstown, 3318S/2632E, 1900 (R.I. Pocock), 1F (AM); 23 Oct. 1938 (J. H.), 4F (AM); 20 Sept. 1981 (P.M.C. Croeser & P.G. Hawkes), 1F (NM); (J. Hewitt), 4F (SAM B9470, B9371); 21 & 25 Mar. 1979 (P.G. Hawkes), 4M & 1F (NM, 5 vials); Green Point, Cape Town (H. Pitcher), 1F (SAM B9283); Grootfontein,

Middelburg, July 1939 (A.L. Reyneke), 2F (SAM B9921); Gutverwacht Mission Station, Piquetberg Div., 1897 (R. Marks), 3F (SAM X2163); Hout Bay, Cape Peninsula, 24 Aug. 1939 (R. Smithers), 1F (SAM B9939); Kat River, Eendekuil (Muller Plague Gang), 12F (SAM B9150, B9151, B1952 & B9154); Kenilworth, 22 Sept. 1983 (I. Wanliss), 2F (SAM C1158); Kimberley, 2844S/2446E, (Power), 1F (SAM B9128); Sept. 1918 (J.H. Power), 1F (SAM B4197); June 1989, 1F (NMBA 3227); Kimberley, Nooitgedacht 66, 2836S/2437E, 21 May 1986 (C. Pieterse), 1F (NMBA 1551); King Williams Town, Sept. 1967 (B. Cleary), 1M (AM); Kirstenbosch, 3355S/1822E, 13 Feb. 1980 (C.A. Car), 2M (NMZ 1113); Kleinmond, Cape, Dec. 1965 (B. Lamoral), 1M (NM 9778); Klipheuwel, 18 Jan. 1939 (Tudhope), 1F (SAM B9677); Knysna (Barnard, Hesse & Thorne), 2F (SAM B9486); Knysna, Uitzicht Annex, 3400S/2320E, 8 Oct. 1988 (L.N. Lotz), 1F (NMBA 3004); Apr.-May. 1990 (M.D. Lotz), 3F (NMBA 5373); 17-28 Dec. 1990 (L.N. Lotz), 1M (NMBA 5554); Kogmanskloof, Montague Div., 27 Aug. 1908 (W.F. Purcell), 3F (SAM X6262); Ladismith, Gans Kop 136, 3339S/2101E, 28 Oct. 1987 (L.N. Lotz), 1F (NMBA 2603); La Plaisante, north bank of Breede River, Wolseley (T. Muller), 1M & 7F (SAM B9162); La Plaisante, south bank of Breede River, Wolseley (T. Muller), 1F (SAM B9163); Leeukoppie, Hout Bay, Aug. 1938 (R. Smithers), 2F (SAM B9343); Nov. 1938 (R. Smithers), 2F (SAM B9520, B9522); Lourensford farm, Hottentots Holland, Dec. 1901 (H. Hermann), 1F (SAM X11539); Lower slopes of Devil's Peak, above upper Mill St., July 1900 (W.F. Purcell), 2F (SAM X9010); Malmesbury, Cape Province, 26 Nov. 1938 (R. Smithers), 1F (B9577); Mamre, Malmesbury, 17 Nov. 1986 (G. Müller), F (NCA 87/58); Junction of Mamre and Malmesbury roads, 15 miles from (R. Smithers), 2F (SAM B9499); Marydale, 6 miles N. of Prieska, 2922Ac, 10 Dec. 1962, 1F (TM 14081); Merweville (R. Smithers), 1F (SAM B9106); Middelburg, Cape, 8 Sept. 1939 (R. Attwell), 7F (SAM B9999); Dec. 1990 (M. de Jager), F (NCA 91/2); Montague, June 1938 (R. Smithers), 1F (SAM B9323); Mountain Zebra Nat. Park, near Cradock, 23 Mar. 1976 (A.S. & N.J. Dippenaar), 1M (NCA 76/588); 22 Mar. 1989 (A. Leroy), F (NCA 89/770); Namaqualand, Mostertsvlei 534 Vonkelfontein, 3045S/1812E, 16-17 Mar. 1993 (L.N. Lotz), 1F (NMBA 6302); Near Montagu, May 1938 (R. Smithers), 4F (SAM B9306); Near Robertson, May 1938 (R. Smithers), 3F (SAM B9309); Newlands, Cape Town (de Koch), 1F (SAM B9040); Paarl, Cape Col., Oct. 1898 (W.F. Purcell), 1F (SAM X3985); Patentie [Patensie], Nov. 1938 (Barnard, Hesse & Thorne), 2F (SAM B9484); Philadelphia, Cape province, July 1939 (Smithers & Thorne), 7F (SAM B9929, B9930); Piketberg, Cape Province (C.H.?/J.H.? Colson), 8F (SAM B9397, B9875, B9876); Platteklip Gorge, Table Mountain, 3F (F Types of *L. concinnus*, UMO bottle 1728); Port Alfred, 14 May 1979 (R.A. Jubb), F (NCA 82/370); Port Elizabeth, Jan. 1899 (J.L. Drèje), 1F (SAM X5391); Oct. 1899 (T.S. Drege), 1F (SAM B9516); 1939 (Lynes & Admiral), 6F (SAM B9668, B9669, B9670); Prieska Div., 1909 (A.L. du Toit), 1F (SAM X14676); Red Hill, Simonstown, May 1939 (R. Smithers), 1F (SAM B9869); Rehouse, Port Elizabeth, Aug. 1913 (Paterson), 1F (SAM B175); 1F (AM 1685); Richmond, May 1939 (Barnard & Thorn), 1M & 1F (SAM B9828); Richtersveld, 3 Apr. 1988 (S. Nesor), F (NCA 88/860); Richtersveld, Reuning mine, 2807S/1654E, 6 Oct. 1991 (S. Louw), 1F (NMBA 5820); Rietpoel, near Caledon (Smithers & Thorne), 3F (SAM B9270); July 1938 (R. Smithers), 1F (SAM B9355); Riversdale, 1939 (Lynes & Admiral), 6F (SAM B9664, B9665, B9666); Rondebosch, 12 Jan. 1963 (J.H. Stone), 1M (MCZ); 1896 (G. Fisk), 1F (SAM X957); S.A.

Museum grounds, Cape Town (R. Smithers), 9M & 2F (SAM B9065, B9066, B9069, B9071, B9072, B9075, B9090, B9091, B9094, B9097, B9100); June 1901 (W.F. Purcell), 2M & 1F (SAM X8967); Nov. 1915 (R.W.E. Tucker), 1F (SAM B1967); 6 km SE. Scarborough, Cape Peninsula, 3409S/1820E, 5 Jan. 1985 (C. Griswold & T. Meikle-Griswold), 1F (NM); Scirftebergen (Skurftebergen), Cold Bokkeveld, Oct. 1937 (Barnard & Thorne), 1F (SAM B9174); Sea Point, Cape Town (E.S. Pency), 1F (SAM B9517); Signal Hill, Cape Town (Smithers & Thorne), 2M & 7F (SAM B9896); 29 Dec. 1901 (W.F. Purcell), 1F (SAM X12053); Simonstad, Muizenberg, 3406S/1829E, Oct. 1896 (W.F. Purcell), 1F (SAM X3501); 27 Oct. 1987 (L.N. Lotz), 2F (NMBA 2545); Swellendam, Nov. 1983 (J. V.), 1F (SAM C1935); St. Helena Bay, W. Cape coast, 1903 (J.E.C. Goold), 4F (SAM X9833); Steenberg's Cove, St. Helena Bay, May 1902 (J.E.C. Goold), 2F (SAM X11712); Stellenbosch, 23 Jan. 1939 (H.L. Arton), 1F (SAM B9683); Stellenbosch, 2 May 1977 (S. Nesor), F (NCA 77/939); Stompneus, St. Helena Bay, Jan. 1902 (J.E.C. Goold), 1M & 5F (SAM X11663, X11673); May 1902 (J.E.C. Goold), 5F (SAM X11684, X11685); Swellendam, Bontebok Nat. Park, 3404S/2027E, 30 Oct. 1987 (Entomol. staff), 1F (NMBA 2714); 12 Feb. 1992 (E. Visagie), 1F (NMBA 6007); Table Mountain above Kloof Nek, Nov. 1902 (W.F. Purcell), 1F (SAM X12464); Tamboerskloof, Cape Town, 18 Jan. 1939 (R. Kleinman), 1F (SAM B9675); The Kelders, Gansbaai (Barnard & Thorne), 2F (SAM B9208); Touws River, Cape Province, 3320S/2022E, Dec. 1905 (J. Paynter), 1F (SAM X14541); Tradouw Pass, 2000-4000ft, Swellendam, Nov. 1924 (K.H. Barnard), 1F (SAM C3058); Nov. 1928 (Lawrence & Hesse), 2F (SAM B6766); Upington, Namaqualand (Peers), 4F (SAM B9119, B9120, B9121, B9122); Van Schuurdrift, 2F (SAM B9645, B9646); (Smithers, Thorne & K.H.B.), 1F (SAM B9305); May 1938 (R. Smithers), 2F (SAM B9311); 13 Jan. 1939 (Smithers & Thorne), 1F (SAM B9674); Ventersbank, Middelburg, 13 Apr. 1989 (M. de Jager), F (NCA 90/65); Victoria West, Sept. 1983 (J. V.), 1F (SAM C1939); Vredenburg, Besters Kraal 38, 3250S/1755E, 24 Oct. 1987 (L.N. Lotz), 1F (NMBA 2397); 3 miles west of Vredendal, Sept. 1938 (Barnard & Thorne), 1F (SAM B9379); Vredendal, Groot Fontein 105, 3204S/1839E, 20 Oct. 1987 (Entomol. staff), 3F (NMBA 2235, 2236); Walvis Bay, May 1908 (J. Drury), 1M & 3F (SAM B2302); Warrenton, 5 Feb. 1980 (F.C. de Moor), F (NCA 81/583); Weltevreden School Cape Flats, July 1938 (R. Smithers), 1F (SAM B9364); Willowmore, 1903 (H. Brauns), 1F (SAM X12910); Witsand, May 1939 (R. Smithers), 1F (SAM B9823); Worcester, 28 Aug. 1900 (W.F. Purcell), 2F (SAM X7805); 1 June 1938 (R. Smithers), 3F (SAM B9300); Wynberg Hill (R. Smithers), 4F (SAM B9495); May 1939 (R. Smithers), 4M (SAM B9860); 24 Aug. 1939 (R. Smithers), 1F (SAM B9938); Wynberg, Silvertrees (R. Smithers), 2F (SAM B9132); Zuurberg Range, between. Port Elizabeth and Somerset, 1939 (Lynes & Admiral), 1F (SAM B9662); Zwartkopsaltpan [Swartkops Saltpan, Port Elizabeth ?], 15 Apr. 1954 (Dr. A. Penther), 1M & 2F (AM); RSA, NATAL: Banani, South Coast, 2 Mar. 1987 (G. van den Heever), 2F (NCA 89/125); Boston, 1946 (W.G. Rump), 1F (NM 4648); Empangeni, Zululand, 2845S/3154E, 20 Jan. 1982 (P.E. Reavell), 1F (NM); Hilton Rd., Oct. 1944 (R.F.L. & W.G.R.), 1F (NM 4265); Hluhluwe Game Reserve (R. Attwell), 1F (SAM B9901); Ixopo, 23 Stuarts Drive, 3009S/3003E, 31 Dec. 1990 (R. Hobson), 1F (NM); Krantzklouf, Natal, June 1915 (W. Bell-Marley), 1F (SAM B1241); Margate, Apr. 1940 (W.G. Rump), 1F (NM 2916); Middeldrift, Tugela R., Oct. 1940 (R.F. Lawrence), 1F (NM 3293); Near Krantzklouf, Natal, 4 Jan. 1915 (W. Bell-

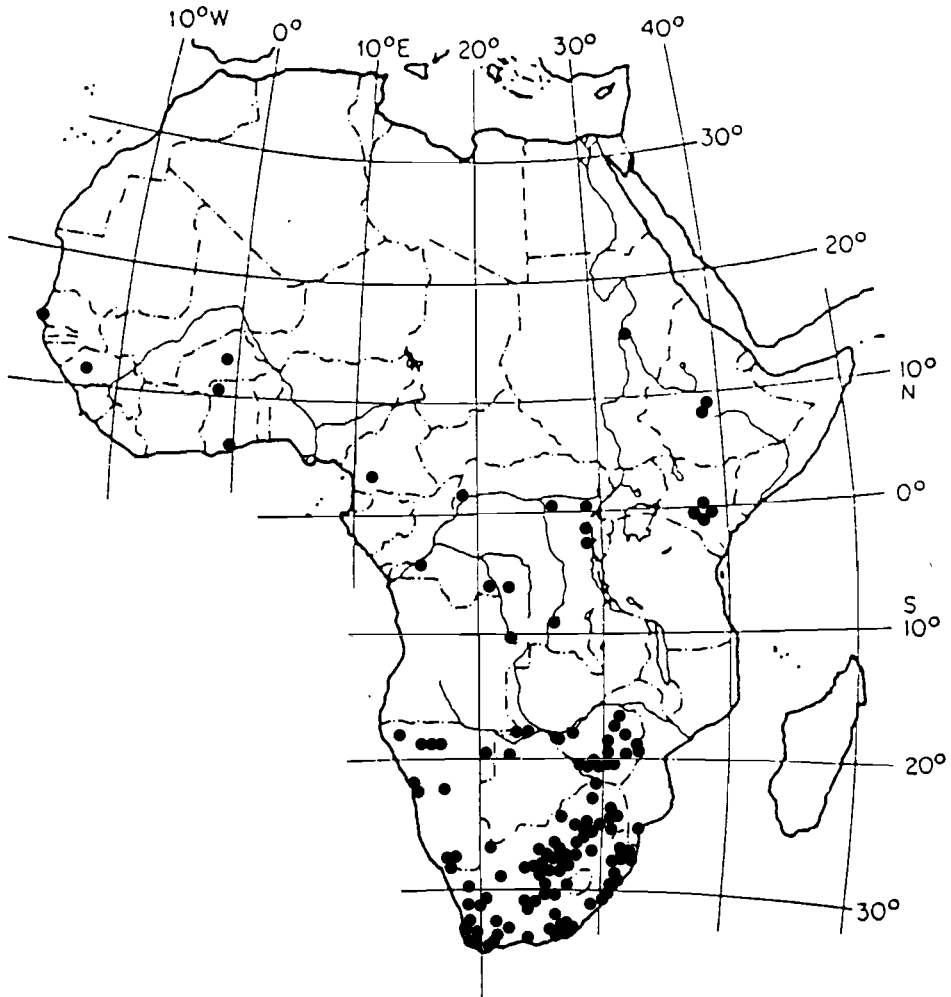


Marley), 1F (SAM B878); Pietermaritzburg, 2937S/3022E, Sept. 1910 (C. Akerman), 3F (NM 1886); Nov. 1917 (Alleson), 1F (NM 1934); Nov. 1943 (W.G. Rump), 1F (NM 4238); Aug. 1947 (R.F. Lawrence), 1F (NM 5242); Apr. 1951 (A. Lawrence), 4M & 7F (NM 5298, 5311, 5313); June 1951 (R.F. & A. Lawrence), 3F (NM 5471); July 1951 (A. Lawrence), 1M & 2F (NM 5644); Mar. 1968 (B.H. Lamoral), 2F (NM); 29 Jan. 1970 (B.H. Lamoral), 2F (NM); 13 Apr. 1983 (B. Muir), 1F (NM); 19 Jan. 1983 (M. Vermaak), 1F (NM 14168); 25 Mar. 1984 (C.E. Griswold), 2M & 1F (NM); 22 Apr. 1984 (B. Londt), 1F (NM); 16 Nov. 1987 (E. Bezuidenhout), 1F (NM); Pietermaritzburg, Bisley Valley SE. of, 28 July 1972 (B. Lamoral), 1M & 4F (NM 9875); 10 km from Pietermaritzburg, Muskhams Farm, old Wartburg Rd., 28 Feb. 1983 (M. Crosby), 1F (NM 14170); Pietermaritzburg, Montrose, 2937S/3022E, 29 Sept.- 12 Dec. 1983 (B. Londt & W. Cadman), 1F (NM); Pietermaritzburg, Winterskloof, May 1985 (N. Thomson), 1F (NM); Port Edward, Oribi Gorge, 16 Dec. 1971 (A.S. & N.J. Dippenaar), 1M & 1F (NCA 76/1182); Port Edward, 4 km NW. of, M. Walker's farm (subsection 3/A of lot 24 of Umlamvuna 10450), 3103S/3013E, 18 May 1983 (J. Stannard), 1F (NM); 24 May 1983 (J. Stannard), 1F (NM); Richmond, Jan. 1934 (D.M. Vyvian), 1F (NM 1926); Vryheid, 9 Apr. 1987 (A.S. Dippenaar), 3F (NCA 88/431); NE. of Ubombo, 2730S/3205E, 11-14 May 1972 (B. Lamoral), 1F (NM 12816); St. Lucia, 16 Dec. 1980 (M. Bruton), 1F (NCA 82/136); Umkomaas, 26 Dec. 1976 (T. Potgieter), 1M (NCA 77/277); RSA, O.F.S: Bloemfontein, 2908S/2610E, 22 Mar. 1982 (B. Rubidge), 2F (NMBA 194); 2 July 1985 (P. van der Merwe), 1F (NMBA 877); 18 July 1985 (E. Botha), 1F (NMBA 912); 21 Mar. 1986 (Museum staff), 1F (NMBA 1508); 8 Apr. 1986 (Museum staff), 1F (NMBA 1509); 20 Apr. 1986 (Museum staff), 1F (NMBA 1510); 12 May 1986 (Museum staff), 1F (NMBA 1541); 22 May 1986 (E. Wels), 1F (NMBA 1557); Sept. 1986 (A. van Rensburg), 1F (NMBA 1914); 1 Oct. 1987 (L.N. Lotz), 1F (NMBA 2183); 14 Oct. 1987 (E. v. Rooyen), 1F (NMBA 2188); 11 Jan. 1988 (Dickson), 6F (NMBA 2807); 21 Jan. 1988 (A. Wels), 1F (NMBA 2810); 8 Feb. 1988 (E. Visagie), 1F (NMBA 2822); 29 Feb. 1988 (S. Louw), 1F (NMBA 2831); 2 Mar. 1988 (L.N. Lotz), 1F (NMBA 2835); 7 May 1988 (Museum staff), 1F (NMBA 2867); 8 May 1988 (L.N. Lotz), 1F (NMBA 2869); 21 May 1988 (Museum staff), 1F (NMBA 2873); 20 Aug. 1988 (L.N. Lotz), 1F (NMBA 2975); 6 Oct. 1988 (S. Louw), 1F (NMBA 3001); Feb. 1989 (A. Wels), 1F (NMBA 3163); 15 Mar. 1989 (L.N. Lotz), 1F (NMBA 3176); 16 Nov. 1989 (J. de V. Jouber), 1F (NMBA 3299); 17 Nov. 1989 (L.N. Lotz), 2F (NMBA 3301); 5 Jan. 1990 (S. Louw), 1F (NMBA 3361); 5 July 1990 (Museum staff), 1F (NMBA 5387); 20 Aug. 1990 (E. Visagie), 1F (NMBA 5546); 13 Dec. 1990 (E. Visagie), 1F (NMBA 5553); 16 Jan. 1991 (L.N. Lotz), 1M & 1F (NMBA 5557, 5558); 19 Feb. 1991 (L.N. Lotz), 1F (NMBA 5560); 20 Feb. 1991 (L.N. Lotz), 5M & 2F (NMBA 5561, 5562); 25 Feb. 1991 (L.N. Lotz), 1F (NMBA 5563); 8 Mar. 1991 (L.N. Lotz), 1F (NMBA 5564); 20 Mar. 1991 (M. Lambrecht), 1F (NMBA 5565); 27 Mar. 1991 (L.N. Lotz), 1F (NMBA 5566); 30 Mar. 1991 (L.N. Lotz), 1F (NMBA 5568); 3 Apr. 1991 (L.N. Lotz), 2M & 5F (NMBA 5569, 5570, 5571); 16 Apr. 1991 (L.N. Lotz), 1F (NMBA 5572); 31 Apr. 1991 (L.N. Lotz), 1M & 1F (NMBA 5573); 2 May 1991 (L.N. Lotz), 1F (NMBA 5574); 6 May 1991 (Mr. Jaeger), 1F (NMBA 5575); 13 May 1991 (P.C. Zietsman), 1F (NMBA 5576); 16 May 1991 (L.N. Lotz), 1M & 1F (NMBA 5577); 20 May 1991 (A. Wels), 1F (NMBA 5582); 22 May 1991 (L.N. Lotz), 1F (NMBA 5583); 1 July 1991 (L.N. Lotz), 1M (NMBA 5584); 21 Sept. 1991 (L.N. Lotz), 1F (NMBA 5784); 19 Aug. 1991 (P.C.

Zietsman), 1F (NMBA 5786); 2 June 1991 (J. Irish), 1F (NMBA 5799); 20 Oct. 1991 (E. Visagie), 1F (NMBA 5824); 24 Oct. 1991 (L.N. Lotz), 2F (NMBA 5826); 11 Nov. 1991 (L.N. Lotz), 1F (NMBA 5838); 2 Dec. 1991 (L.N. Lotz), 1F (NMBA 5850); 6 Jan. 1992 (L. du Preez), 2F (NMBA 5866); 1 Feb. 1992 (D. de Swart), 1F (NMBA 6002); 17 Mar. 1992 (J. Irish), 1F (NMBA 6021); 5 Feb. 1992 (died 25 Feb. 1992) (L.N. Lotz), 1F (NMBA 6040); 11 May 1992 (D. de Swart), 1F (NMBA 6107); Bloemfontein, Glen, 2858S/2620E, 28 Mar. 1991 (L.N. Lotz), 1F (NMBA 5567); Boshof, O.F.S., 28 Aug. 1969 (S. du Plessis), 1F (MCZ); Boshof, Elliesdal 1062, 2818S/2531E, 18 Aug. 1987 (Entomol. staff), 1F (NMBA 2067); Brandford, Florisbad, 2846S/2605E, 1 May 1982 (R. Clarke), 1F (NMBA 31); 16 Apr. 1982 (Museum staff), 1F (NMBA 69); Apr. 1985 (Museum staff), 1F (NMBA 713); May 1985 (Museum staff), 1F (NMBA 805); 21 Oct. 1985 (Museum staff), 1F (NMBA 1108); Fairiedale farm, Wepener, (M. Filmer), F (NCA 89/944); Jagersfontein, 2925Cb, 30 Dec. 1973 (G. v d Berg), 1F (TM 10929); Jagersfontein, Klein Preezfontein 28, 2949S/2525E, 15 Apr. 1989 (L. Barkhuizen), 1M (NMBA 3213); Kroonstad, O.F.S., Oct. 1969 (J.H. Potgieter), 1F (MCZ); Luthof, Kroonstad Distr., 2729S/2739E, 1 June 1967 (G. Karny), 1F (MRAC 155.191); Phillipolis, on farm, Jan. 1972 (N. Genis), F (NCA 76/445); Villiers, 14 Apr. 1987 (M. Ebersohn), 2F (NCA 90/355); Virginia, 2805S/2654E, 2 Feb. 1991 (S. Els), 1F (NMBA 5559); 19 May 1991 (L.N. Lotz), 1M & 4F (NMBA 5578, 5579, 5580, 5581); RSA, TRANSVAAL: Barberspan, 16 Mar. 1986 (M. Filmer), 1M (NCA 87/494); 4 Apr. 1987 (M. Filmer), 3F (NCA 87/496, 87/497); Benoni, 31 Mar. 1987 (L. Lerwill), F (NCA 89/70); Brumeria, Pretoria, 30 Oct. 1990 (A. Brand), F (NCA 90/511); Burgershall, 19 Mar. 1987 (M. van den Berg), F (NCA 88/707); Crocodile R. & Marico R. junction, N.W. Transvaal, 22 Jan. to 20 Feb. 1918 (R.W.E. Tucker), 1M & 1F (SAM B3672 & B3674); Delmas (H. Botha), F (NCA 91/250); Dendron, Aug. 1970 (J. Viljoen), F (NCA 76/1733); Dunnottar, East-Rand, Mar. 1987 (A.S. Dippenaar), F (NCA 88/251); 20 Mar. 1987 (J. Warrens, NCA), F (89/34); Grasfontein, Pretoria, 18 May 1988 (V. Uys), F (NCA 88/666); Groenkloof Nat. Res., Pretoria, 20 Mar. 1988 (M. Filmer), F (NCA 88/411); Greefswald, Soutpansberg Distr., N. Tvl., 2229Ab, 29 June 1974 (A. Meyer), 1F (TM 10921); Groblersdal, Tvl., Mar. 1946 (D. Erasmus), 1F (NM 9825); Hekpoort, 13 Apr. 1987 (A.S. Dippenaar), F (NCA 88/399); Ilovo, Johannesburg, 2 Mar. 1965, 1F (AM H.25); 1 May 1965, 2M (AM H.38); Irene, 7 Mar. 1987 (A.S. Dippenaar), F (NCA 88/148); Johannesburg, 15 May 1988 (M. Filmer), F (NCA 88/567); 26 Sept. 1988 (M. Filmer), F (NCA 89/188); Kempton Park, 9 Oct. 1973 (Mrs. Visser), 1F (NCA 76/1713); 19 Oct. 1978 (C. Niewoudt), F (NCA 79/276); 8 June 1980 (H.C. Le Grange), 1F (NCA 81/572); Klerksdorp, 16 Apr. 1987 (M.T. de Klerk), F (NCA 88/923); 17 Apr. 1975 (B. Raubenheimer), 1F (TM 10976); Lydenburg, 2530Ab, 1897 (P.A. Krantz), 4F (TM 13298, 13299, 13300, 13302); 28 Dec. 1986 (M. Filmer), F (NCA 87/153); Lydenburg, Potloodspruit, 2502S/3028E, 2 June 1990 (N. Botma), 1F (NMBA 5386); Lynwood Glen, Pretoria, 15 Mar. 1987 (M. Vogt), F (NCA 88/250); Melville, Johannesburg, 28 Mar. 1988 (M. Wessels), 2F (NCA 89/124); Menlo Park, Pretoria, 26 Feb. 1987 (A.S. Dippenaar), F (NCA 88/240); Middelburg, 12 Apr. 1987 (A.S. Dippenaar), 2F (NCA 88/390); Monument Park Golf Course, 13 Apr. 1987 (A.S. Dippenaar), 3F (NCA 88/335); Mountain View, Pretoria (A.S. Dippenaar), 1M (NCA 88/395); Murrayfield, Pretoria, 17 Nov. 1989 (C. Eardley), F (NCA 90/135); Parktown North, Johannesburg, 22 Feb. 1987 (J. Felix), F (NCA 87/301); 27 Apr. 1987 (M. Filmer), F (NCA 87/740); Mar. 1988 (A.S.

Dippenaar), F (NCA 88/336, 88/396); 20 Mar. 1988 (M. Filmer), F (NCA 88/379); 28 Feb. 1988 (A.S. Dippenaar), F (NCA 88/432); 20 Apr. 1988, F (NCA 88/569); 14 May 1989 (M. Filmer), F (NCA 89/521); Pierneef, Pretoria, Oct. 1990 (V. Gouws), F (NCA 91/23); Pretoria, 4 Mar. 1969 (Van der Merwe), F (NCA 76/422); Nov. 1969 (N. van Jeney), 2F (MCZ); 5 June 1974 (H. van Ark), F (NCA 76/473); 6 Apr. 1976 (C.J. Cilliers), F (NCA 76/977); (V. Whitlock), 1F (NCA 76/1874); 29 Dec. 1976 (N. Hollings), F (NCA 76/2024); 25 Oct 1978 (Mrs. Botha), 1F (NCA 79/134); 21 Oct. 1978 (L.P. Louw), 1F (NCA 79/142); 15 Mar. 1979 (J. Ruelle), 3F (NCA 79/185); 22 Nov. 1979 (M. Stiller), 1F (NCA 80/27); 12 Oct. 1979 (B. Duncan), 1F (NCA 80/66); 15 Feb. 1980 (Mr. Potgieter), F (NCA 80/105); 18 Mar. 1980 (D. van Wyk), 3F (NCA 80/133); 4 Feb. 1981 (H. van Ark), 1F (NCA 81/13); 28 July 1980 (Mr. Potgieter), 1F (NCA 81/569); 7 Mar. 1980 (L. Venter), F (NCA 81/577); 12 Jan. 1983 (J. Bruijns), F (NCA 83/2); 26 Jan. 1983 (B. Vermeulen), 2F (NCA 83/121); 20 Apr. 1983 (Mr. Holmer), F (NCA 83/193); Dec. 1982 (B. Vermeulen), 2F (NCA 83/323); 16 Nov. 1983 (M. Bolton), F (NCA 83/366); 15 Jan. 1985 (Mrs. Bruijns), 2F (NCA 85/58); 17 Oct. 1985 (P. Muller), 1F (NM); Mar. 1987 (A.S. Dippenaar), F (NCA 88/118); 1 Apr. 1987 (A.S. Dippenaar), 3F (NCA 88/358); 15 Mar. 1987 (A.S. Dippenaar), F (NCA 88/375); 2 Apr. 1987 (G. Gelderblom), 2F (NCA 88/927); 22 Apr. 1987 (J.C. de Klerk), F (NCA 89/64); 29 Apr. 1989 (T. Travis), F (NCA 91/226); Pretoria, Brooklyn, Nov. 1969 (N. van Jeney), 3F (MCZ, 2 vials); 21 Nov. 1988 (B. Sunkel), 1F (NCA 89/2); Pretoria, Eldoraigine, Dec. 1979 (A. Bergman), 1F (NCA 81/612); 10 Apr. 1987 (A.S. Dippenaar), 1F (NCA 88/372); 5 Apr. 1987 (H.M. Boekkooi), 1F (NCA 88/402); Pretoria, Les Marais, Mar. 1978 (H. van Ark), 2F (NCA 78/398); Pretoria, Meyerton, 22 Apr. 1987 (L.D. van der Bank), F (NCA 89/45); Pretoria, Roodeplaat, Apr. 1981 (M. Bolton), F (NCA 82/285); Pretoria, Rooihuiskraal, 8 Mar. 1983 (B. Maritz), 5F (NCA 83/196); Pretoria, Uniegebou, 9 Jan. 1978 (A.S. Dippenaar), 2F (NCA 78/287); Roodeplaatdam Nat. Res., 20 Sept. 1988 (Arachnol. Sect. NIPB), F (NCA 89/99); Rus-de-Winter, "Enkeldoorn", 6 Aug. 1974 (A.S. Dippenaar), 1F (NCA 76/285); Rustenberg Tvl., Apr. 1939 (Stegman), 1F (SAM B9815); Sesmylspruit, 18 Apr. 1988 (A.S. Dippenaar), 1M & 1F (NCA 88/361); Sinoville, Pretoria, 21 Feb. 1987 (J.M. Mulders), 1M (NCA 90/382); 3 Mar. 1987 (L. van Vuuren), F (NCA 91/208); Smitsdrift, Pietersburg (B. Möller), 1F (AM); Stilfontein (J. Cormack), 1F (NM 9826); Sunnyside, Pretoria, 23 Feb. 1987 (L. van Heerden), F (NCA 90/408); Syfergat, Leeudoringstad, 12 Feb. 1987 (D. Keetch), F (NCA 87/470); Tzaneen, Letaba Distr., 2330Cc, Sept. 1978 (J. Tosen), 1F (TM 11377); Valhalla, Pretoria, 2528Cd, 14 July 1975 (T. Mostert), 1F (TM 10993); Vergeval, Ngotshe Distr., 2723S/3142E, 1 May 1967 (N. de L. Genis), 1F (MRAC 155.181); 23 May 1967 (N. de L. Genis), 1F (MRAC 155.182); 3 May 1967 (A. Schoeman), 5F (MRAC 155.184, 155.185, 155.188, 155.189, 155.190); Villieria, Pretoria, 20 Feb. 1974 (Mr. van As), 1F (NCA 76/417); 27 Apr. 1975 (L. du Preez), 2F (TM 10977); Wierda Park, Johannesburg (A.S. Dippenaar), 2F (NCA 88/169); SENEGAL: Dakar Peninsula, Senegal, W. Africa, June 1945 (E.H. Newcomb), 1F (AMNH); SUDAN: Khartoum, Apr. 1962 (J.L. Cloudsley-Thompson), 1M & 1F (MRAC 130.680); SWAZILAND: Henwoods Halt, May 1939 (C.A. Major), 9F (SAM B9842, B9902 & B9903); TRANSKEI: Kentani Dist. (H.P. Abernethy), 1F (SAM B53); Lady Frere, Mar. 1905 (Du Toit), 1F (SAM X14430); Port St. Johns, Aug. 1903 (A.S. Weisbecker), 1F (SAM X13071); Umtata (R. Attwell), 1F (SAM B9392); Nov. 1972 (Mrs. Hall), 1F (NM 9877); UPPER VOLTA: Ouagadougou, Haute Volta, Apr.-

May 1965 (B. Roman), 2F (MRAC 128.085); ZAIRE: Albertville, 27 Nov. 1954 (H. Bomans), 1F (MRAC 085.524); Bokuma, July 1952 (R.P. Lootens), 1F (MRAC 083.325); Costermansville, Dec. 1949 (J.M. Babilon), 1F (MRAC 069.139); Geti, 0112N/3011E, 1939 (Randons), 60F (MRAC 027.379, 057.486); Katanga, terr. de Jadotville, Kasampi, Oct. 1956 (Mission Bacq Z.), 1F (MRAC 090.519); Kisenge, Dilolo, 1963 (A. Regnard), 1F (MRAC 126.034); Kisenge, Lualaba, 1964 (A. Regnard), 4F (MRAC 127.093); Leopoldville [Kinshasa], Congo Belge, Sept. 1956 (N.L.H. Krauss), 1F (AMNH); Mongbwalu, July 1938 (Scheitz), 1F (MRAC 001.582); 1 Feb. 1937 (Scheitz), 1F (MRAC 027.385); Tshuapa-Ikela, 1955 (R.P.P. Lootens), 1F (MRAC 086.016); ZIMBABWE: Bulawayo, 2010S/2835E, Feb. 1963, 1F (NMZ 925); July 1980 (G. Allen), 1F (NMZ 1080); Mar. 1948, 1F (NMZ 1111); 14 Nov. 1966, 1F (NMZ 1358); Mar. 1983 (King), 1F (NMZ 1747); 17 Feb. 1987 (M. & R. McElroy), 1F (NMZ 5313); Bulawayo, Burnside, 2028Ba, 1-4 Mar. 1988 (D. Erwee), 1F (NMZ 7348); Bulawayo, Kumato, 2010S/2835E, 3 May 1982 (R. Chandler), 1F (NMZ 1627); Bulawayo, Matsheumhlope, 2010S/2835E, 3 Nov. 1979 (C.A. Car), 1F (NMZ 543); Bulawayo, Nat. Hist. Museum, 2028Ba, 5 Jan. 1988 (R. Chahwanda), 2F (NMZ 7242); Bulawayo, 'Pise de Terra', 2010S/2835E, 8 Nov. 1948, 2F (NMZ 1341); Bulawayo, Saursetown, 2028Ba, 4 Nov. 1984 (R. Chahwanda), 1F (NMZ 2447); Chimanimani Mt., W. bank of Haroni R., 1933Cc, 1 May 1984 (J. Roff), 1M & 2F (NMZ 2162, 8646); Dichwe Forest, Nr. Mhangura, 1730Aa, 8 Oct. 1980 (C. Car & E. Pinhey), 1F (NMZ 5732); Doddieburn Ranch, 1,5 km NE. of Doddieburn H.Q., 2129Ad, 13 Dec. 1985 (J. Minshull), 1M (NMZ 4277); Esigodini, Falcon College, 2028Bd, 10 Feb. 1984 (J. Roff), 1F (NMZ 2056); 28 Oct. 1983 (J. Roff), 1F (NMZ 2057); 15 Nov. 1983 (J. Roff), 1M (NMZ 2060); 17 Mar. 1984 (M. Bing), 1F (NMZ 2203); 22 Mar. 1984 (J. Roff), 2F (NMZ 2204, 2210); Essexville, 2018S/2857E, 10 Dec. 1981 (J. Roff), 1F (NMZ 1583); Harare, 1731Cc, 4 May 1984 (A. Mkondo), 1M & 1F (NMZ 2242); Harare, Melbourine, 1731Cc, 21 Apr. 1990 (L. Ellis), 1F (NMZ 8575); Hillcrest School, 1832Dc, 16 Nov. 1984 (S. v.d. Pyll), 1F (NMZ 2718); Katombora campsite, 1725Cd, 25 Aug. 1986 (Falcon College-N.H.M.Z.), 1F (NMZ 4718); 5 Sept. 1986 (Falcon College-N.H.M.Z.), 1F (NMZ 5163); Kazungula, 1725Cd, 31 Aug. 1986 (Falcon College-N.H.M.Z.), 1F (NMZ 5012); Marondera, 1831Ba, Dec. 1984 (J. Seegers), 1F (TM 14684); Mushandike Sanctuary, 2030Ba, June 1988 (N. Monks), 1F (NMZ 7336); Noelvale, Zvishavane, 2030Ac, 15-16 Dec. 1984 (M. Bing), 2F (NMZ 2898, 2910); Plumtree, 2027S/2752E, 10 Nov. 1948, 1F (NMZ 1162); Queenskop, 3 miles W. of Umtali, Jan. 1902 (Patrick), 1F (SAM X12537); Salisbury [Harare], Lochinvar, 1750S/3105E, 20 June 1968 (P.A. Sinclair), 1F (NMZ 1408); Salisbury [Harare], Rhodesia (N. Wells), 1F (NM); Apr. 1917 (R.W.E. Tucker), 1M (SAM B3100); Mar. 1969 (I.R. Mackay), 1F (MCZ); 12 Mar. 1969 (I.R. Mackay), 2F (MCZ); 5 Apr. 1969 (I.R. Mackay), 1F (MCZ); May 1969 (I.R. Mackay), 1F (MCZ); 17 Jan. 1970 (I.R. Mackay), 1F (MCZ); 24 Feb. 1970 (I.R. Mackay), 1M (MCZ); 26 Feb. 1970 (I.R. Mackay), 1M (MCZ IRM 77); 24 Mar. 1970 (I.R. Mackay), 1F (MCZ); 8 Sept. 1970 (I.R. Mackay), 1F (MCZ); 16 Sept. 1970 (I.R. Mackay), 1F (MCZ); 23 Feb. 1971 (I.R. Mackay), 1M (MCZ); 15 Feb. 1972 (I.R. Mackay), 1M (MCZ); Selukwe, 1940S/30E, 1 July 1948, 1F (NMZ 142); Sitangani Pan, Panda, Masuie Forestry Area, 1825Ba, 16 Apr. 1988 (Falcon College-N.H.M.Z.), 1F (NMZ 6667); Umtali, Rhodesia, 11 July 1970 (I.R. Mackay), 4M & 14F (MCZ, 13 vials); 12 July 1970 (I.R. Mackay), 1F (MCZ); 14 July 1970 (I.R. Mackay), 1M & 1F (MCZ); Uplands Farm, Iron Mine Hill, Lalapanzi Distr.,



Map 1: Distribution of the *Latrodectus geometricus* Koch specimens that were examined.

1930Ad, 10 Dec. 1984 (G. Allen), 1F (NMZ 3672); 13 Jan. 1985 (G. Allen), 1F (NMZ 3679); 28 Jan. 1985 (G. Allen), 1F (NMZ 3688); Vumba Rd. Mutare, 1832Dc, 8 Jan. 1984 (Mr. Carter), 1F (NMZ 2040); Zambizi R., downstream from Mlibgi towards Zambizi Mission, 1727Cc, 21-25 May 1988 (A. Ellert), 1F (NMZ 6415); SOUTH AMERICA: Resistencio Chaco, South America, 14 May 1893 (J.B. Daguerra), 1F (SAM B9490); Rio Grande de Norte Brayie (Mus. of Comp. Anatomy), 1F (SAM B9136).

**Distribution:** Occurring widely except for the northern parts of the Palearctic and Nearctic and the southern polar regions. Specimens were examined from the following countries in African: Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Republic of South Africa, Senegal, Sudan, Swaziland, Transkei, Upper Volta, Zaire and Zimbabwe (Map 1).

*Latrodectus rhodesiensis* Mackay  
(Figures 2b, 2c, 2d, 3a-d & 8b)

*Latrodectus rhodesiensis* Mackay, 1972: 236; M holotype and F paratype from Salisbury [Harare], Zimbabwe, in the collection of the NM (studied). Paratypes in the collections of the BM (not seen) and the MCZ (studied).

**Diagnosis:** The main characters distinguishing this species from the other species (*L. geometricus*) in this species group are the number of loops in the spermathecae ducts and in the embolus and the construction of the egg-sac. It also differs from *L. geometricus* in the chromosome number. In *L. rhodesiensis* the chromosome number = 16 (*L. geometricus* = 18) (Martindale, 1980).

**Description:**

**Colour pattern:** The background colour of *L. rhodesiensis* are veritable from cream to cream-brown. The dorsal abdominal pattern is the same as that of *L. geometricus*, but the outlined is more distinct. In *L. rhodesiensis* females the pattern consist of three medial triangular to quadrangular white to orange marks with distinctly marked center and border, of which the posterior one is arrow shaped extending from the spinnerets, and four bilateral white to orange transverse blotches with distinctly marked centers and borders and each with a notch on the dorso medial line containing a distinct round black mark with indistinct contour (Figure 3d). The males have a similar pattern (Figure 8b). Ventrally the abdomen is marked with an hourglass shaped cream-orange to orang-red mark between the epigastric furrow and the spinnerets (Figure 2d).

**Abdominal cetae:** The abdomen is dorsally covered with fine hairlike setae of two lengths but of the same type (Figure 2c).

**Female genitalia:** Externally the epigynum is ovoid, wider than long. The copulatory opening has a curved posterior border and a lobed anterior border (Figure 3b). Internally there are two parallel dumbbell shaped spermathecae and the spermathecal ducts with four loops (Figure 3a). The first loop of the spermathecal ducts extends anterior of the spermathecae.

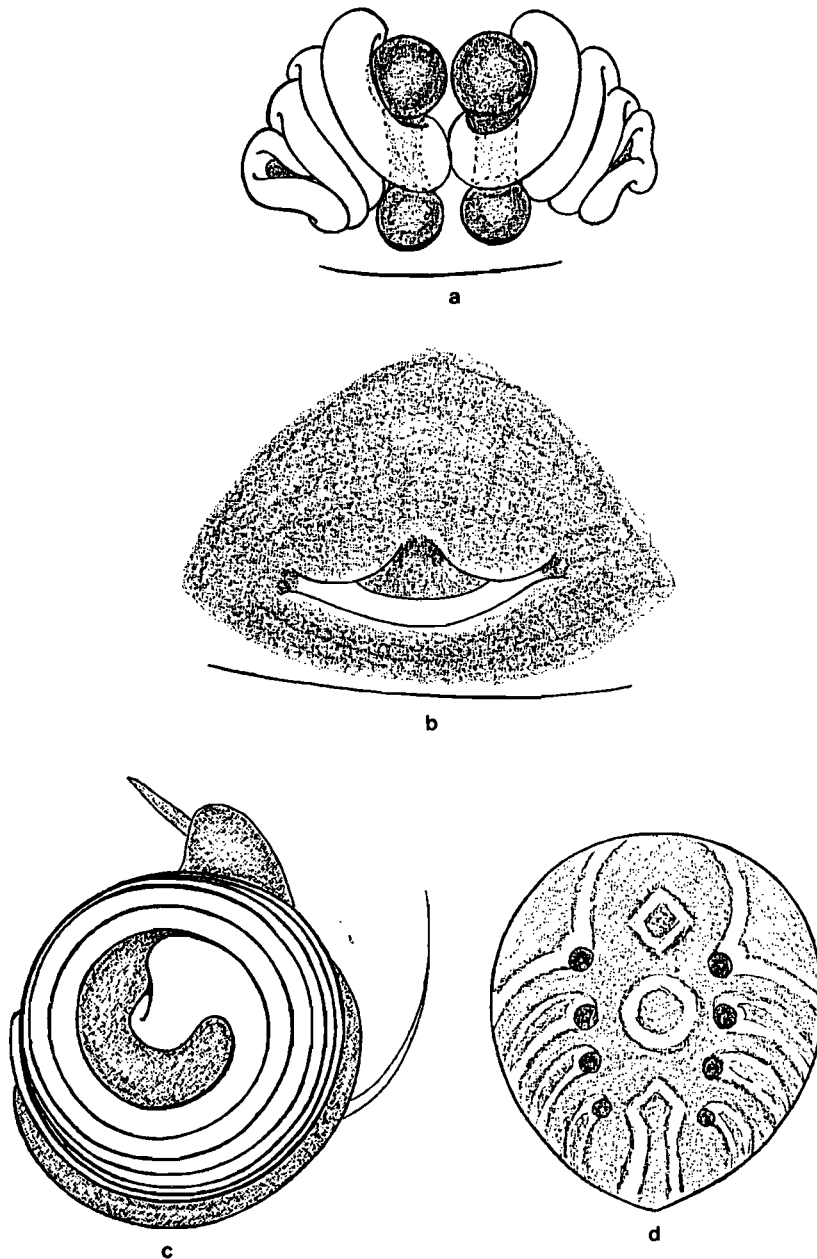


Figure 3(a-d): *Latrodectus rhodesiensis* Mackay: a. Female internal genitalia; b. Female external genitalia; c. Male palp showing embolus; d. Female abdominal pattern.

Male palps: In *L. rhodesiensis* the embolus has five loops (Figure 3c).

Egg sac: The egg sac of *L. rhodesiensis* differs from that of *L. geometricus* in having a smooth appearance and in being about two and a half times larger than that of *L. geometricus* (Figure 2b).

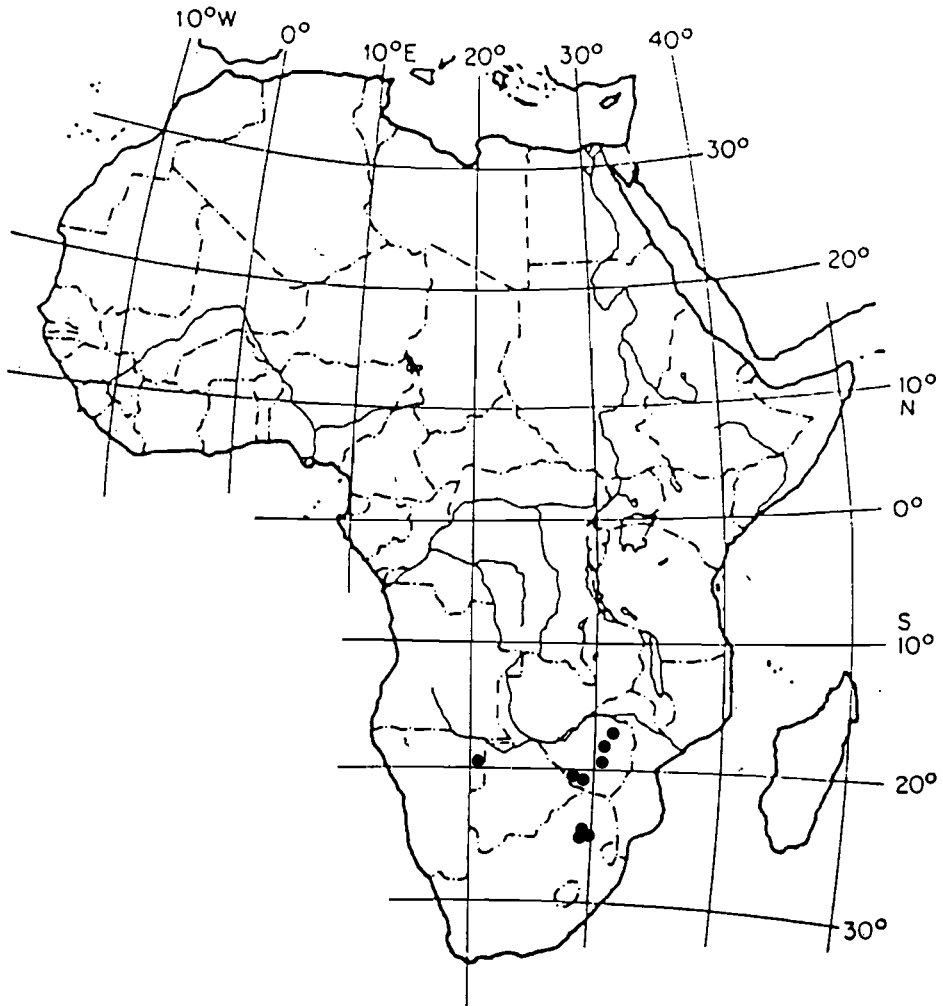
Habit: According to Mackay (1972) the web of *L. rhodesiensis* is constructed in the same way as that of *L. geometricus*. The web is constructed in the general theridiid way, with a retreat from which delaying threads radiate. From the delaying threads to the ground sticky threads are laid down. The web is built at varying heights above the ground and can be in the veld or in and around buildings.

Medical importance: The venom of this species has not been tested so far, but even so it is advisable to see a doctor if bitten by one (Müller, 1993).

Measurements: (n = 10) F: TL = 10,35 (8,85 - 12,85); CW = 3,29 (2,65 - 3,70); T1 = 5,35 (4,80 - 5,70); and (n = 10) M: TL = 3,09 (2,60 - 3,75); CW = 1,17 (1,00 - 1,35); T1 = 2,44 (2,00 - 2,85).

Material examined: NAMIBIA: Tsumkwe, CDM Camp, 1920Cb (M. Brits), 1F (SMWN 41613); RSA, TRANSVAAL: Callinan, Rayton, 2544S/2832E, 13 Jan. 1991 (M.J. Louw), 1F (NMBA 5555); Pretoria, 9 Mar. 1975 (J. Coetzer), 1F (NCA 76/186); (K. Coetzee), 1F (NCA 88/65); Pretoria dist., Kameeldrift, 2532S/2818E, 7 May 1967 (A. Matthee), 1F (MRAC 155179); Pretoria, Roodeplaat, 2536S/2821E, 7 Oct. 1991 (D. Visser), 3M & 3F (NMBA 5821); Rust de Winter, 8 Jan. 1986 (D. Hanekom), 1F (NCA 86/9); ZIMBABWE: Bulawayo, 2010S/2835E, 16 Nov. 1979 (K. McGeoch), 1F (NMZ 699); Apr. 1966, 1F (NMZ 780); Jan. 1969, 1F (NMZ 896); Nov. 1979 (A. Thompson), 1F (NMZ 899); Mar. 1961, 1F (NMZ 1299); Mar. 1948, 1F (NMZ 1307); 14 Nov. 1966, 2F (NMZ 1358); Bulawayo, Burnside, 2010S/2835E, 1-4 Mar. 1988 (D. Erwee), 1F (NMZ 7348); Bulawayo, Gestetner Workshop, 2010S/2835E, 2 Jan. 1985 (S. Ngwenya), 1F (NMZ 2722); Bulawayo, Hillside, 2010S/2835E, 1 Apr. 1948, 1F (NMZ 1137); Bulawayo, Khumalo, 2010S/2835E, 12 Apr. 1948 (P.K. Pringle), 1F (NMZ 1309); Bulawayo, Matsheumhlope, 2010S/2835E, 13 Sept. 1972 (Mr. Wind), 1F (NMZ 959); Bulawayo, Morningside, 2010S/2835E, 7 Feb. 1987 (M. Mabiso), 1F (NMZ 5315); Bulawayo, Museum, 2010S/2835E, 25 Sept. 1972 (R. Mpala), 1F (NMZ 1093); 9 Jan. 1979 (T. Donnelly), 1F (NMZ 1409); 11 Nov. 198? (R.L. Chawanda), 1F (NMZ 1589); Bulawayo, Riverside, 2010S/2835E, Jan. 1985 (N. Hughes), 1F (NMZ 2746); Harare, 1731Cc, 4 May 1984 (A. Mkondo), 1F (NMZ 2242); Harare, Ratten Row, Pen Rose Hill, 1731Cc, 21 Apr. 1984 (L. Zondo), 2F (NMZ 2290); Lalapanzi distr., Uplands Farm, Iron Mine Hill, 1930Ad, 18 Dec. 1984 (G. Allen), 1F (NMZ 3676); 29 Dec. 1984 (G. Allen), 1F (NMZ 3701); Marondera, 1831Ba, 14 July 1984 (J. Seegers), 1F (TM 14683); Matopos, REPS, 2022S/2835E, 6 Oct. 1979 (S. Higgins), 1F (NMZ 499); Salisbury [Harare], Rhodesia, 7 Sept. 1917 (Rev. J. O'Neil), 2F (SAM B3841, B3841A); Jan. 1917 (Rev. J. O'Neil), 1F (SAM B3863); Mar. 1957 (N.L.H. Krauss), 3F (AMNH, 2 vials); 29 Dec. 1959 (C.N. Smithers), 1F (MCZ); 7 Feb. 1969 (I.R. Mackay), 1F (MCZ); Mar. 1969 (L.G. Diamondis), 1F (MCZ); 12 Mar. 1969 (I.R. Mackay), 1F (MCZ); 13 Aug. 1969 (I.R. Mackay), 1F (MCZ); 13 Aug. 1969 (died 16 Jan. 1971) (I.R. Mackay), 1F (MCZ); 15 Aug. 1969 (I.R. Mackay), 1M & 1F (MCZ, 2 vials); 15 Aug. 1969 (died 13 Sept. 1970) (I.R.





Map 2: Distribution of the *Latrodectus rhodesiensis* Mackay specimens that were examined.

Mackay), 1F (MCZ, IRM 44, paratype); 3 Jan. 1970 (I.R. Mackay), 1M & 1F (MCZ, 2 vials); 17 Jan. 1970 (I.R. Mackay), 1F (MCZ, IRM 55, paratype); 19 Jan. 1970 (I.R. Mackay), 1F (MCZ, IRM 14); 23 Jan. 1970 (I.R. Mackay), 1F (MCZ); 27 Jan. 1970, 1M (MCZ, IRM 129, paratype); 10 Feb. 1970 (I.R. Mackay), 1F (MCZ); 17 Feb. 1970 (I.R. Mackay), 2M (MCZ, IRM 127); 21 Feb. 1970 (I.R. Mackay), 1M (MCZ); 24 Feb. 1970 (I.R. Mackay), 1M (MCZ); 26 Feb. 1970 (I.R. Mackay), 1F (MCZ); 26 Feb. 1970 (I.R. Mackay), 1F (MCZ, IRM 79); 27 Feb. 1970 (I.R. Mackay), 1F (MCZ, IRM 80, paratype); 9 Mar. 1970 (I.R. Mackay), 2M & 1F (MCZ, 2 vials); 19 Mar. 1970 (I.R. Mackay), 2M (MCZ); 21 Mar. 1970 (I.R. Mackay), 1F (MCZ, IRM 93, paratype); 24 Mar. 1970 (I.R. Mackay), 1F (MCZ); 2 Apr. 1970, 1M (MCZ, IRM 98, paratype); 4 Apr. 1970 (I.R. Mackay), 1F (MCZ, IRM 94, paratype); 8 May 1970 (I.R. Mackay), 1F (MCZ, IRM 111, paratype); 30 May 1970 (I.R. Mackay), 1F (MCZ); 8 Sept. 1970 (I.R. Mackay), 2F (MCZ, IRM 160, IRM 161, paratypes); 16 Sept. 1970 (I.R. Mackay), 1F (NM, IRM 169); 21 Dec. 1970 (I.R. Mackay), 1F (MCZ); 18 Jan. 1971 (I.R. Mackay), 1F (MCZ); 18 Jan. 1971 (I.R. Mackay), 1F (NM, IRM 198, M holotype); 2 Feb. 1971 (I.R. Mackay), 1F (MCZ); 10 Mar. 1971 (I.R. Mackay), 2F (MCZ, 2 vials); 30 Mar. 1971 (I.R. Mackay), 1F (MCZ); 4 Apr. 1971 (I.R. Mackay), 1F (MCZ); 4 May 1979 (L. Davey), 2F (NMZ 599); Salisbury [Harare], Greendale, ca. 1750S/3102E, 17 Jan. 1970 (Willborg), 1F (NMZ 1304).

**Distribution:** The African distribution of the specimens examined is Namibia, Republic of South Africa (Transvaal) and Zimbabwe (Map 2).

#### *LATRODECTUS TREDECIMGUTTATUS*-GROUP

Members of this group are recognized by the V-formation of the seminal receptacles of the female genitalia (Figures 4a, 7a, 10a, 11a, 12a & 16a). The abdomen is dark brown to black, except for *L. pallidus* which has a light cream abdomen. Orange-red to red markings are found posterodorsally and a distinct hourglass shaped marking are absent from the venter of the abdomen, except for *L. pallidus* which lack the postero-dorsal orange-red to red markings and which has a hourglass marking on the venter of the abdomen. Unlike the orange-red hourglass marking of the *Latrodectus geometricus*-group the hourglass marking of *L. pallidus* is pale cream. The abdomen is dorsally covered with two different types of setae (Figures 5 & 14), except for *L. pallidus* which has only short setae (Figure 11e). The egg sacs of all the species in this species-group are all of the same general size and shape, and smooth on the outside. In this paper some of the previous names are reinstated and a subspecies is elevated to species level. The species included in the *Latrodectus tredecimguttatus* species-group are *L. cinctus*, *L. indistinctus*, *L. karrooensis*, *L. pallidus*, *L. renivulvatus* and *L. tredecimguttatus*.

*Latrodectus cinctus* Blackwall  
(Figures 4a-c, 5 & 6a-e)

*Latrodectus cinctus* Blackwall, 1865: 341; 1F holotype & 1 immature paratype from confluence of Shiré and Zambesi Rivers, Mozambique, in the collection of the UMO (B639, tube 5) (studied); F.P.-Cambridge, 1902: 256; Dahl, 1902: 45; Strand, 1908: 94; Levi, 1959: 26 (as *L. mactans*).

*L. stuhlmanni* Dahl 1902:45, F Holotype from Togo, [W. Africa (?)] (E. Africa (?) according to Roewer, 1942) (part of Ghana according to Broadley & Minshull, 1986), in the collection of the ZMB (8438 & 8438a) (studied) (new synonymy).

I have so far not been able to obtain the type description of *L. stuhlmanni* Dahl 1902, but the type itself was studied. It was found that the type material of *L. cinctus* and *L. stuhlmanni* resemble each other and no characters could be found to differentiate between them and I therefore consider *L. stuhlmanni* to be a junior synonym of *L. cinctus*.

**Diagnosis:** The females of this species is distinguished from *L. pallidus* and *L. tredecimguttatus* by the dorsal abdominal setae, from *L. renivulvatus* by the number of loops in the spermathecae ducts, from *L. karrooensis* by the abdominal pattern and from *L. indistinctus* by the width of the carapace and in some cases by the abdominal pattern of the immature specimens. The males can be distinguished from the other species in this species-group by the abdominal pattern and, in the case of *L. renivulvatus*, also by the length of the embolus. The males are described for the first time.

**Description:**

**Colour pattern:** Females: Abdomen is brownish-black with an oblong orange-red mark, variable in length, extending upwards from the spinners, and in some cases two to three curved transverse orange bands on the dorso anterior part (Figure 6a-c). The transverse bands are more distinct in the immature specimens (Figure 6b-d). In the very young immature specimens the dorsal background are light grey (Figure 6d). Smithers (1944, Figure 14) illustrates the colour pattern transformation of this species during development when he describes the '*L. indistinctus*' specimens from Petensie near Humansdorp in the southern Cape Province. Males: The dorsal abdominal pattern consists of a dark brown background with three orange transverse bands of which the posterior pair has indistinct central areas and two orange oblong marks posterior with an indistinct oblong mark in between (Figure 6e). The colour pattern of the males are the main character distinguishing this species from the other species in this species-group, except for *L. renivulvatus* which can also be distinguished from this species in the length of the embolus in addition to the colour pattern.

**Abdominal setae:** The dorsal abdominal setae consists of two types of setae, namely medium-long thick setae and short thick setae (Figure 5). This setation is the same for most of the species in this species-group, except for *L. pallidus* which has only sparse short setae and *L. tredecimguttatus* in which the short setae are bifurcated.

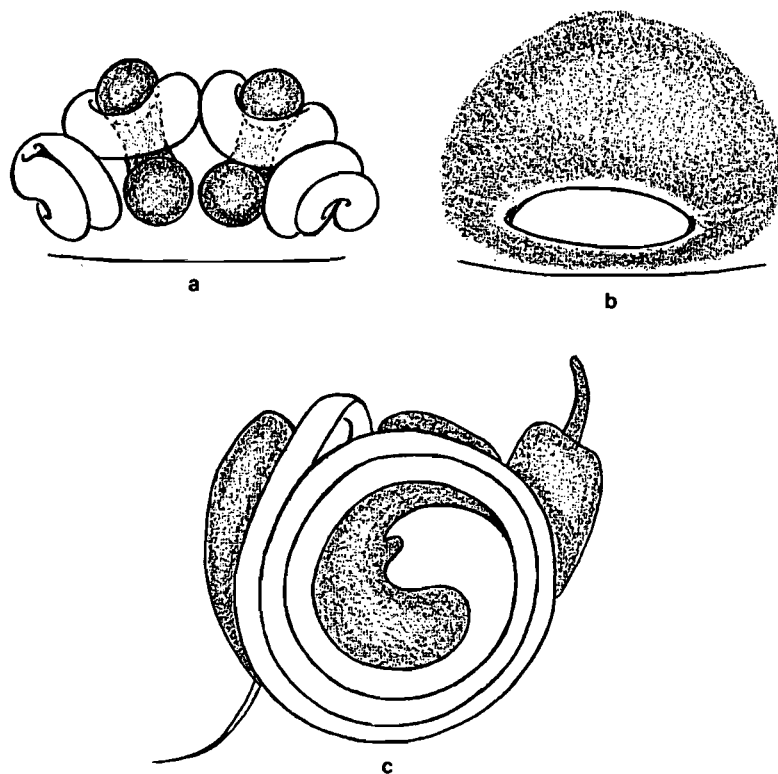


Figure 4(a-c): *Latrodectus cinctus* Blackwall: a. Female internal genitalia; b. Female external genitalia; c. Male palp showing embolus.

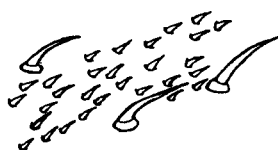


Figure 5: Dorsal abdominal setae of *Latrodectus cinctus* Blackwall, *L. indistinctus* O. P.-Cambridge, *L. karrooensis* Smithers & *L. renivulvatus* Dahl.

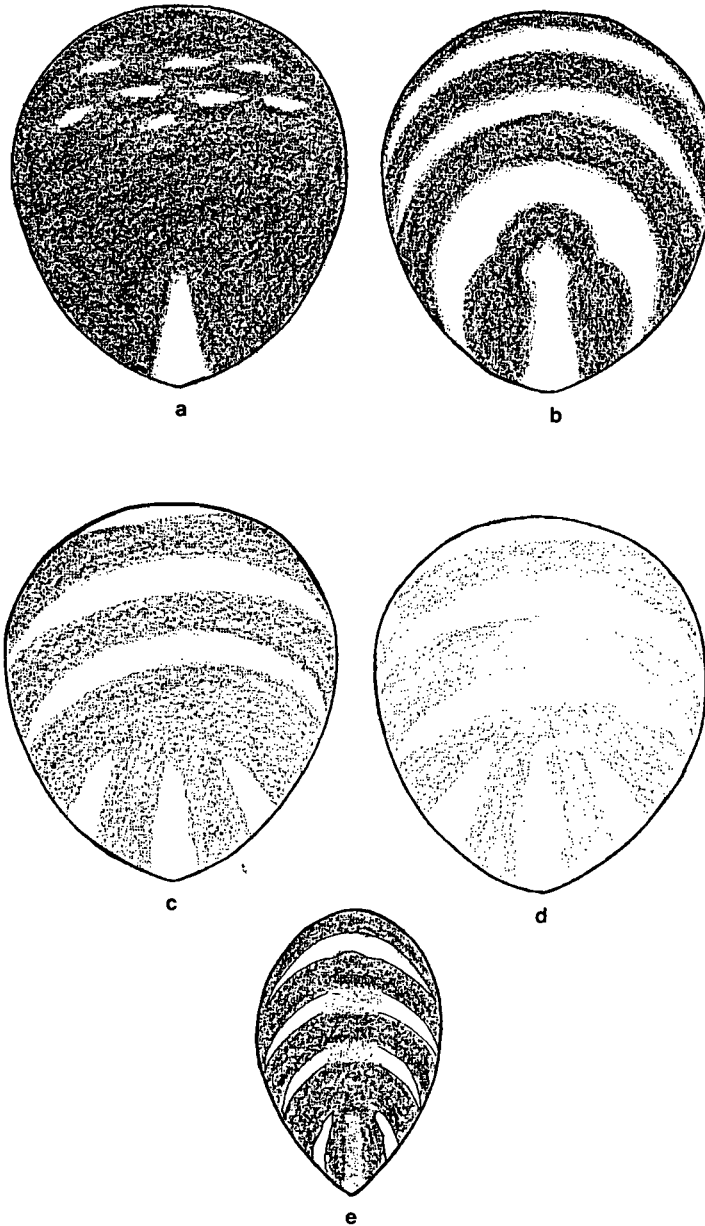


Figure 6(a-e): *Latrodectus cinctus* Blackwall: a. & b. Female abdominal pattern; b. - d. Immature abdominal pattern; e. Male abdominal pattern.

**Female genitalia:** As can be seen in Figure 4a the internal genitalia consists of two dumbbell shaped seminal receptacles with the posterior ends touching or almost touching and the anterior ends separated by parts of the spermathecae ducts. The spermathecae ducts have three loops as seen from the dorsal side. The three loops in the spermathecae ducts are the main character to distinguish *L. cinctus* from *L. renivulvatus*, as *L. renivulvatus* has four loops instead of three. Externally the epigynum is oval wider than long and the copulatory opening is a wide oval with the anterior and posterior sides smooth (Figure 4b).

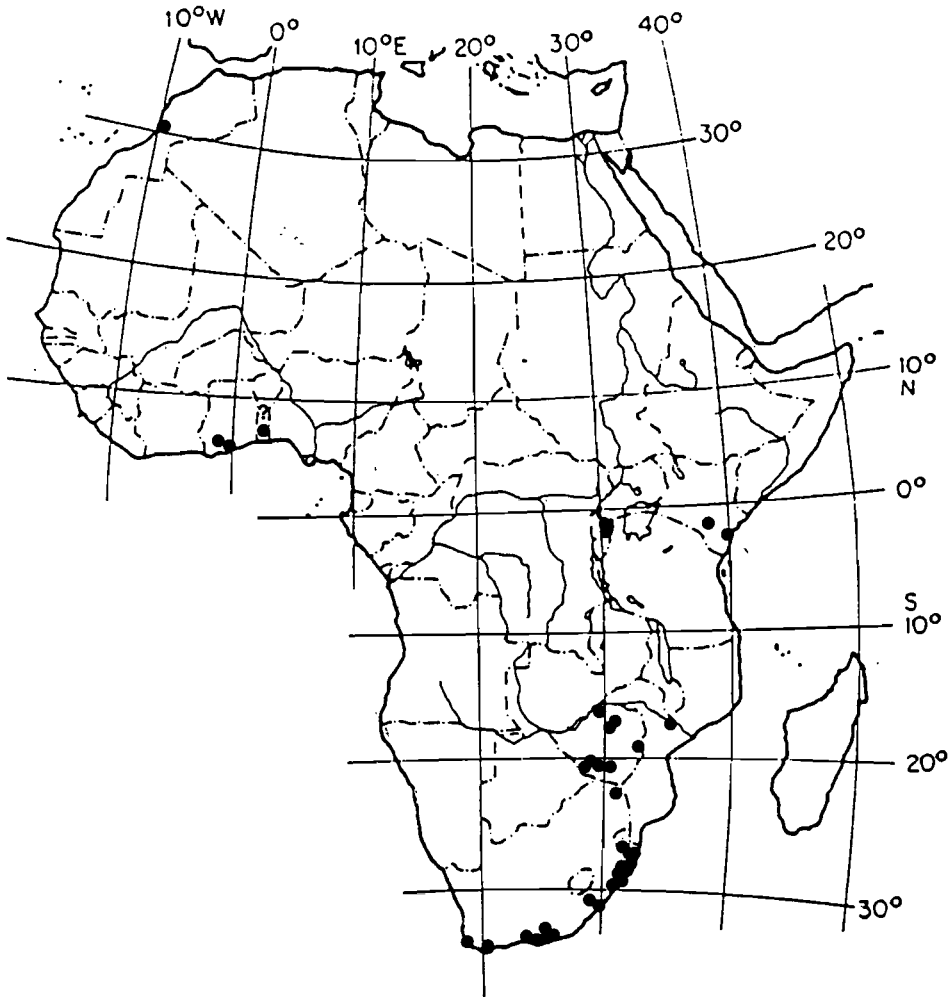
**Male palps:** As in most of the other species of this species group, the embolus has three loops (Figure 4c). In *L. renivulvatus* the embolus has four loops (Figure 12c).

**Habit:** No specific study has so far been done on the web and web sites of this species, but in general they are the same as that of *L. indistinctus*. The web is always close to the ground and seldom higher than half a meter. From the web a tunnel lead to a blind refuge. The refuge can be in a tuft of grass, in a low shrub, in an empty burrow or under a loose stone.

**Medical importance:** The venom of this species has so far not been studied, but it is probably close to that of *L. indistinctus* and medical treatment with the antiserum is advised.

**Measurements:** (n = 10) F: TL = 9,80 (7,25 - 12,45); CW = 3,49 (3,10 - 4,20); T1 = 4,12 (3,55 - 4,90); and (n = 10) M: TL = 3,35 (3,00 - 3,85); CW = 1,23 (1,05 - 1,35); T1 = 2,88 (2,20 - 3,50). The main distinguishing character between adult female *L. cinctus* and *L. indistinctus* is the CW. The average *L. cinctus* female CW is 3,15 mm (range: 3,10 mm - 3,80 mm; n = 43) while the CW of female *L. indistinctus* is 4,30 mm (range: 3,80 mm - 5,00 mm; n = 90).

**Material examined:** GHANA: Ajena, 50 miles NNE. of Accara, May 1961 (C.P. Hinckley), 1M (MCZ); Lagon, 22 June 1973 (J. Edmunds), 1F (MCZ); KENYA: Langata, Nr. Nairobi, 1600m, 14 Nov. 1982 (A. Russell-Smith), 1M (NMBA 6335); 29 Dec. 1985 (A. Russell-Smith), 1M (NMBA 6336); Malindi, Mida Creek, Mangrove coast, 5 Apr. 1965 (A. Cottrell), 1M (MCZ); MOROCCO: Agadir, 7-10 May 1974 (B. Malkin), 1F (AMNH); MOZAMBIQUE: Confluence of Shiré and Zambesi Rivers, S.E. Africa (J. Blackwall), 1F (UMO, holotype, B639 tube 5); RSA: CAPE PROVINCE: Belmont Valley, Grahamstown, 3318S/2632E, 5-8 Jan. 1986 (J.M. Carpenter), 1M (MCZ); Cradock, 21 July 1980, 1F (NCA 80/319); Enon, Uitenhage Distr., Oct. 1902 (J.A. O'Neil), 1F (SAM X12442); Fort Beaufort, 20 Jan. 1939 (R. Atwell), 2F (SAM B9681 & B9682); 3 miles W. of Grahamstown, 29 Nov. 1966 (J. Rozen), 1F (AMNH); Grahamstown, Gray Dam, 4 Mar. 1978, 1M (NCA 87/991); Kenton-on-Sea, Jan. 1968 (R. Tubb), 1F (AM); Klipheuwel, 7 June 1938 (Smithers, Barnard & KHB), 1F (SAM B9304); Patentie [Patensie], Nov. 1938 (Barnard, Hesse & Thorne), 2F (SAM B9483, B9515); Pipe Track above Camps Bay, 19 May 1902 (W.F. Purcell), 1F (SAM X12108); 8 miles east of Shaw's Pass on Elim Bredasdorp Rd., 3 Dec 1937 (Barnard & Thorn), 1F (SAM B9211); RSA: NATAL: Empangeni, 11 Apr. 1981, 1M (NCA 81/189); 9 miles on Greytown Rd., Mar. 1952 (R.F. Lawrence), 1F (NM 6864); Between Jozini and Ndum, 4 Apr. 1977, 1M (NCA 77/723); 14 km N. Margate, 6 Jan. 1977, 1M (NCA 77/257); Mhlopeni Nat. Res., 10 km



Map 3: Distribution of the *Latrodectus cinctus* Blackwall specimens that were examined.

SE. Muden, 2902S/3021E, 3 Feb. 1984 (P.M. Croeser), 1F (NM); Mkuzi Game Res., Zululand (R. Attwell), 2F (SAM B9900); Near Oribi Reservoir, 15 Apr. 1968 (P. & B. Lamoral), 2F (NM 9774); Pietermaritzburg, 1913 (C. Ackerman), 1F (NM 1900); Dec. 1937 (R.F. Lawrence), 1M & 2F (SAM B9234); Oct. 1942 (R.F. Lawrence & W.G. Rumo), 1F (NM 3834); Feb. 1966 (Van Zyl), 1F (NM 9827); Pietermaritzburg, Town Bush, Nov. 1977 (J. Londt), 1F (NM 9926); Shakaskraal, 23 Jan. 1980, 1M (NCA 81/443); Sordwana Bay, 272730S/323730E, 6 May 1981 (C.A. Car), 1M (SAM C587); Sordwana, Tongaland, NE. Zululand, 23 Apr. 1979, 1F (NCA 82/364); Sudwanabaai [Sordwana Bay] pad, Makatini vlakke, 4 Apr. 1977, 1M (NCA 77/620); NE. of Ubombo, 2730S/3205E, 11-14 May 1972 (B. Lamoral), 1F (NM 12816); RSA: TRANSVAAL: Louis Trichardt, Feb. 1928 (R.F. Lawrence), 1F (SAM B7186); RWANDA: P.N.A.K., lac Ihema, presqu'île au N., de la pêche, 29 Nov. 1985 (Jocqué, Nsengimana & Michiels), 1F (MRAC 164,766); P.N.A.K., Plaine du lac Nasho, savanne brûlée, 30 Nov. 1985 (Jocqué, Nsengimana & Michiels), 1F (MRAC 164,767); SWAZILAND: Henwoods Halt, May 1939 (C.A. Major), 1F (SAM B9843); TRANSKEI: Port St. Johns, Pondoland, 1901 (G. Shortridge), 1M (SAM X9797); Umtata, Sept. 1901 (Pegler), 1F (SAM X9257); ZIMBABWE: Bulawayo, 2028Ba, 22 Feb. 1985 (J. Minshall), 1M (NMZ 2726); Chinhoyi, 1730Ac, 9 Oct. 1980 (C.A. Car & E. Pinhey), 1M (NMZ 5746); Esquilingwe Weir, 2031Cd, 17 Apr. 1985 (J. Minshall), 1M (NMZ 3028); Ezigodini, Falcon Collage, 2028Bd, 5 Apr. 1984 (J. Roff), 1F (NMZ 2205); Mana Pools 1529Cb, 5 May 1984 (Z.S.E.S.), 1M (NMZ 2522); Matopos, Matabeleland, 1898 (R. Pillans), 1F (SAM X6249); Penhalonga, 1832Dc, 8 Mar. 1984 (S. van der Pyll), 1F (NMZ 2218); Salisbury [Harare], Rhodesia, 11 Feb. 1972 (I.R. Mackay), 1M (MCZ); TOGO: Togo (Stuhlmann), 1F (ZMB, holotype *L. stuhlmanni*, 8438 & 8438a).

**Distribution:** Specimens were examined from the following countries in African: Ghana, Kenya, Morocco, Mozambique, Republic of South Africa, Rwanda, Swaziland, Transkei, Zimbabwe and Togo (Togo is part of Ghana according to Broadley & Minshall, 1986.) (Map 3). The distribution of this species and that of its closest related species, *L. indistinctus*, is separate except in the Cape Peninsula where *L. cinctus* seem to occur in exceptional cases, as only two specimens were found west of 23° E. All the other specimens of *L. cinctus* were collected east of 24° E, while all the specimens of *L. indistinctus* were collected west of 23° E.

*Latrodectus indistinctus* O. P.-Cambridge  
(Figures 5, 7a-c & 8c-g)

*Latrodectus indistinctus* O. P.-Cambridge 1905: 154, F holotype Mamre Mission Station, Malmesbury Division, Cape Peninsula, S. Africa, in the collection of the UMO (1728, SAM 897) (studied); Smithers 1939: 33; Smithers 1943: 293; Smithers 1944: 263; Keegan, 1955: 150; Levi 1959: 27 (as *L. mactans*).

**Diagnosis:** The females of this species is distinguished from *L. pallidus* and *L. tredecimguttatus* by the dorsal abdominal setae, from *L. renivulvatus* by the number of



loops in the spermathecae ducts, from *L. karroensis* by the abdominal pattern and from *L. cinctus* by the width of the carapace and in some cases by the abdominal pattern of the immature specimens. The males can be distinguished from the other species in this species-group by the abdominal pattern and, in the case of *L. renivulvatus*, also by the length of the embolus.

#### **Description:**

**Colour pattern:** Females: Smithers (1944, Figures 12, 13 & 15) describe the abdominal colour pattern of *L. indistinctus* from the type locality (Mamre) and from Amalienstein near Ladismith, Cape. Unfortunately the specimens from Amalienstein could not be found in the SAM collection, but from the description and figures they belong to *L. indistinctus*. In general the abdominal pattern consist of a dark brown to black background with a medial longitudinal band or spot of orange-red posterodorsal (Figure 8d). There could also be white spots or indistinct transverse bands anterodorsal (Figure 8e). These white marks are more prominent in the immature specimens (Figure 8f-g). During the first developmental stages the dorsum of the abdomen could be completely white. Ventrally between the epigastric groove and the spinnerets of the adult females there are sometimes white transverse lines or blotches, particularly in the epigastric area, but never an hourglass mark. According to Smithers (1944) the first developmental stages of the immature specimens do have an hourglass mark, but this disappears as the spider grows. Males: The abdominal pattern of the males are ruffly the same as that of the *geometricus* species-group, but with a darker background and without the black spots and a distinct posterior median mark (Figure 8c). The pattern consist of a anterior transverse white to cream band and three pairs of lateral transverse white to cream bands. Between the lateral bands there are four to five white to cream spots in a longitudinal row (Figure 8c). The colour pattern of the males distinguish them from all the other species in this species-group.

**Abdominal setae:** The dorsal abdominal setae consists of two types of setae, namely medium-long thick setae and short thick setae (Figure 5). This setation is the same for most of the species in this species-group, except for *L. pallidus* which has only sparse short setae and *L. tredecimguttatus* in which the short setae are bifurcated.

**Female genitalia:** In both the publications by O.P.-Cambridge (1905) and Smithers (1944) no mention is made of the internal structure of the female genitalia. As seen in Figure 7a the internal genitalia consists of two dumbbell shaped seminal receptacles with the posterior ends touching or almost touching and the anterior ends separated by parts of the spermathecae ducts. The spermathecae ducts have three loops as seen from the dorsal side. The three loops in the spermathecae ducts are the main character to distinguish *L. indistinctus* from *L. renivulvatus*, as *L. renivulvatus* has four loops instead of three. In the case of *L. indistinctus* and *L. cinctus* females this is unfortunately not the case, as the only differentiating character that could so far be found is the carapace width. Externally the epigynum is oval wider than long and the copulatory opening is a wide oval with the anterior and posterior sides smooth (Figure 7b).

**Male palps:** As in most of the other species of this species group, the embolus has three loops (Figure 7c). In *L. renivulvatus* the embolus has four loops (Figure 12c).

**Habit:** The web and web sites of this species was studied by Lamoral (1968). The web is always close to the ground and seldom higher than half a meter. From the web a tunnel lead to a blind refuge with a thick silk wall. The refuge can be in a tuft of grass, in a low shrub, in an empty burrow or under a loose stone.

**Medical importance:** The venom of this species has been studied by Müller (1993), Müller, et al. (1989) and Müller, et al. (1992) and is three to four times stronger than that of *L. geometricus* (Müller, 1993). Treatment with the antivenin is advised if the spider has been positively identified and the symptoms and signs of latrodectism is severe enough, and the patient should be hospitalized for observation.

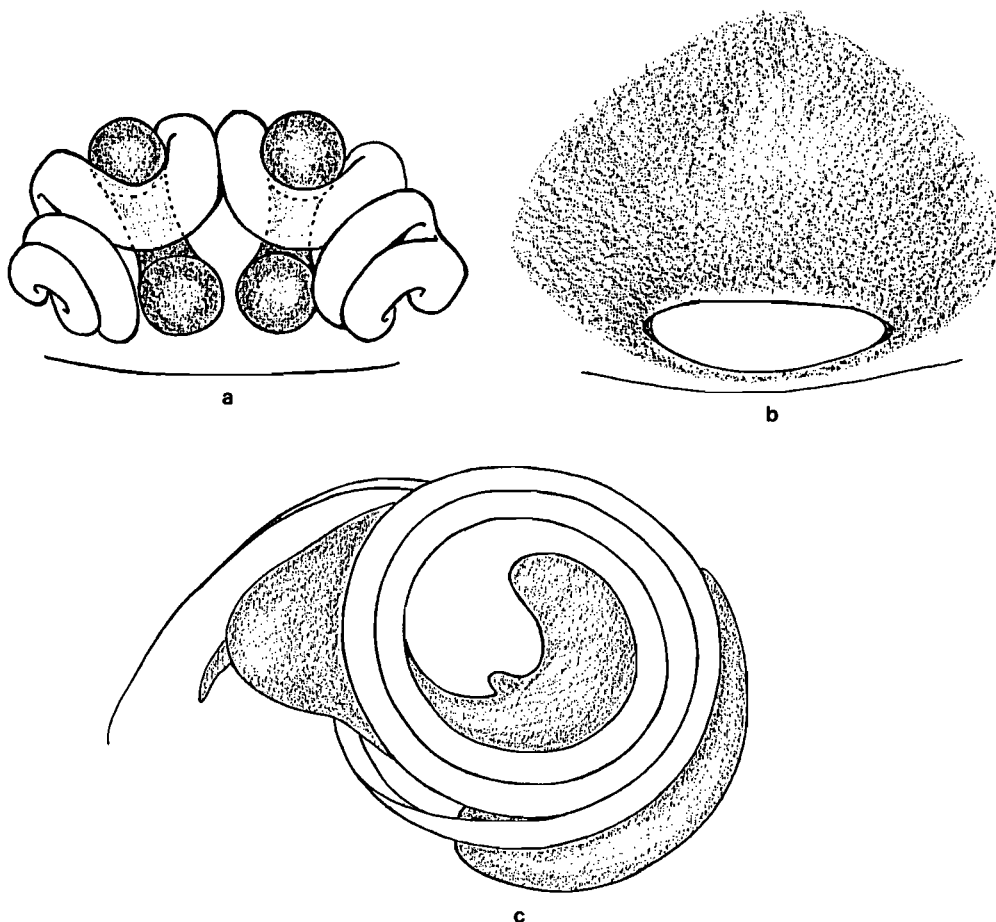


Figure 7(a-c): *Latrodectus indistinctus* O. P.-Cambridge: a. Female internal genitalia; b. Female external genitalia; c. Male palp showing embolus.

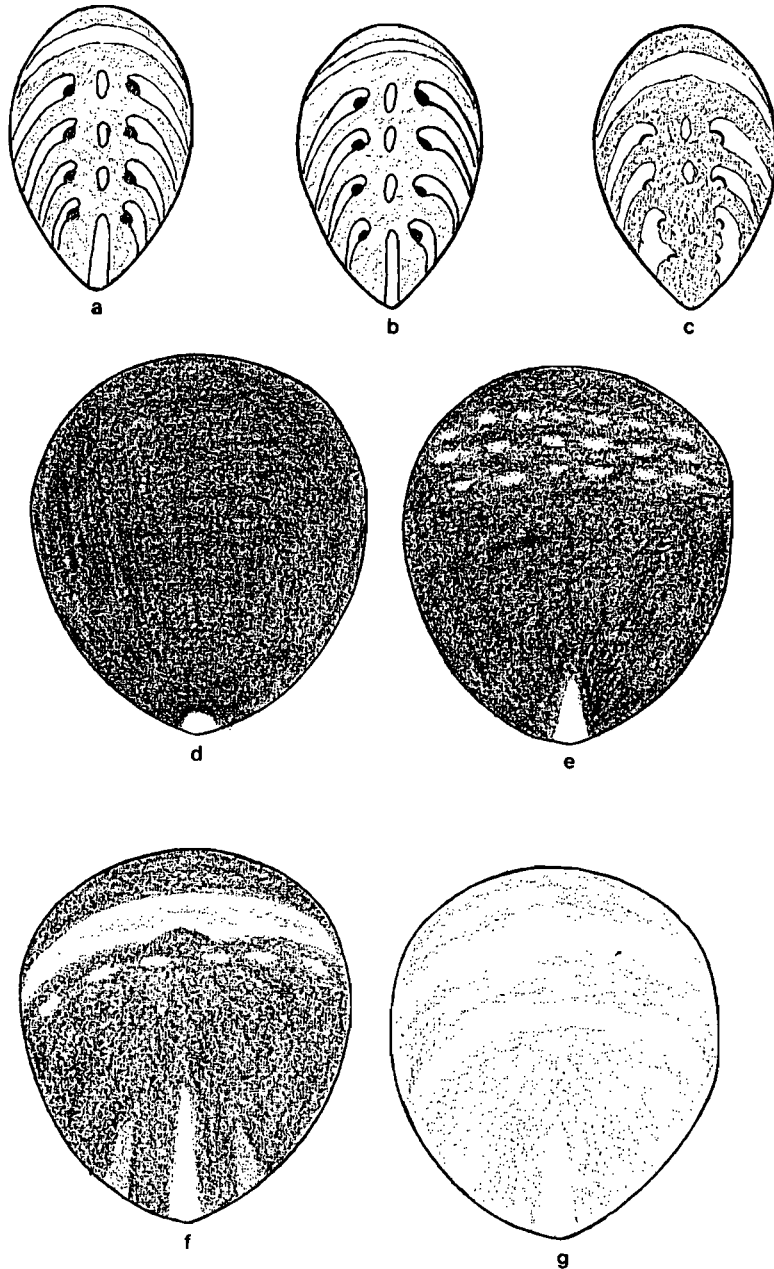
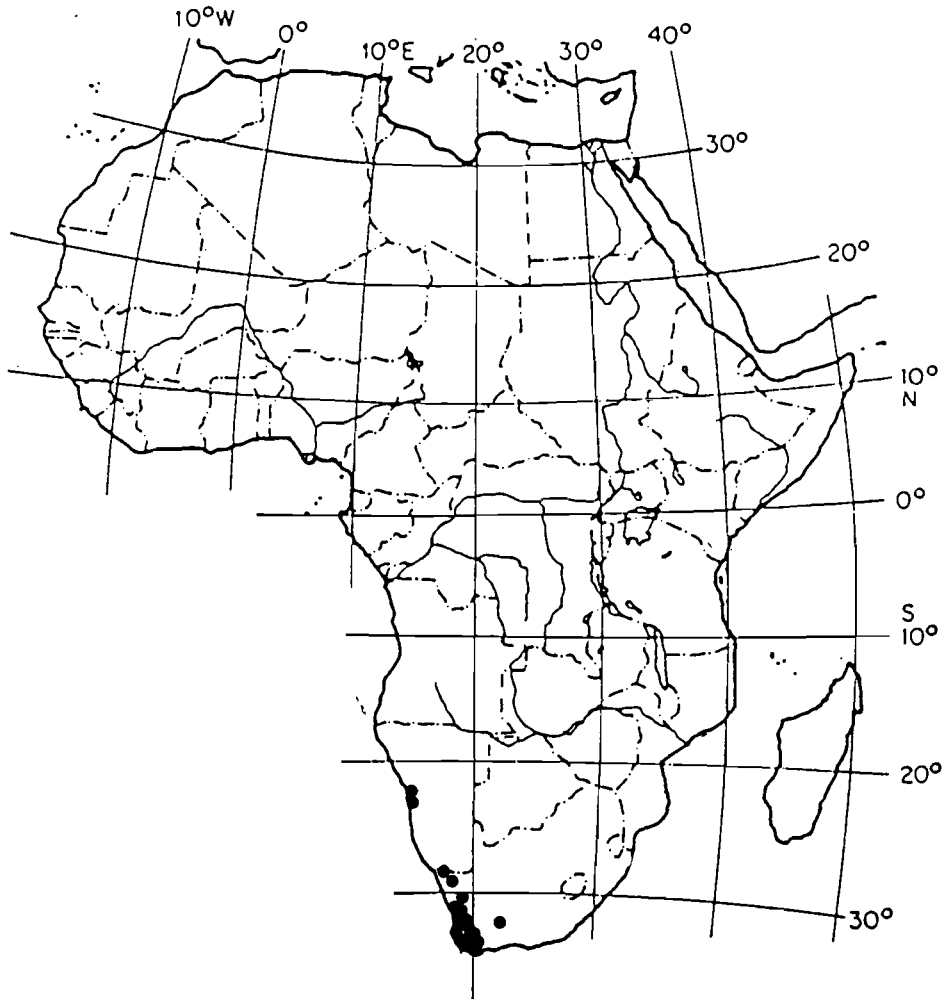


Figure 8(a-g): Abdominal patterns: a. *Latrodectus geometricus* Koch male; b. *L. rhodesiensis* Mackay male; c. *L. indistinctus* O. P.-Cambridge male; d. & e. *L. indistinctus* female; f. & g. *L. indistinctus* immature.

**Measurements:** (n = 10) F: TL = 13,22 (11,25 - 15,60); CW = 4,49 (4,10 - 5,00); T1 = 4,69 (4,50 - 5,00); and (n = 10) M: TL = 3,48 (2,60 - 4,15); CW = 1,51 (1,25 - 1,80); T1 = 2,93 (2,45 - 3,65). The average CW for *L. indistinctus* females are 4,30 mm (range: 3,80 mm - 5,00 mm; n = 90) compared to the CW of 3,15 mm (range: 3,10 mm - 3,80 mm; n = 43) of *L. cinctus*, and this is the main distinguishing character between these two species.

**Material examined:** NAMIBIA: Conception Bay, old mining camp, 1 Mar. 1976, 1F (SAM C1271); Conception Water, Diamond area #2, SWA, 12 Jan. 1973 (R. Buskirk), 3F (MCZ); S. of Walvis Bay, dyke on mud flats, 2214Cd, 11 MAR. 1992 (E. Griffin), 1M & 4F (SMWN 42649, 42650, 42652, 42654, 42655); RSA: CAPE PROVINCE: Agter Paarl, CP. (Barnard, Hesse & Thorne), 2F (SAM B9509); Altona, Philadelphia, CP., 13 Jan. 1939 (Smithers & Thorne), 13F (SAM B9405, B9406, B9407, B9408, B9410, B9412, B9637, B9638, B9640, B9641, B9642, B9643, B9644); 7 miles from Bot River, Calidon side, on main Rd., 26 Nov. 1937 (R. Smithers & Thorne), 1F (SAM B9199); 2 miles NE. of Bredasdorp, 3 Dec. 1937 (Barnard & Thorne), 1F (SAM B9215); Buffels Bay (R. Smithers), 1F (SAM B9104); Calvinia, 10 km NW. Loeriesfontein, 3055S/1922E, 22 Oct. 1990 (L.N. Lotz), 2F (NMBA 5549, 5550); Clanwilliam, Skerpheuwel 232, 3218S/1823E, 22 Oct. 1987 (A. Wels), 1F (NMBA 2305); Cape Flats, German Church, 26 Nov. 1937 (R. Smithers & Thorn), 1F (SAM B9203); Citrusdal, CP., 1F (MCZ); 2 miles from Durbanville on Bellville Rd. (R. Smithers), 3F (SAM B9224, B9225); 10 miles from Durbanville on Schuurdrift Rd. (R. Smithers), 2F (SAM B9226); Eendekuil, Mar. 1938 (Plague gang), 1F (SAM B9280); Faure, 24 Nov. 1937 (R. Smithers), 2M & 1F (SAM B9194); Goodwood, Feb. 1940, 1F (SAM C1238); Grootdrakenstein (R. Smithers), 1M & 1F (SAM B9190); Hermanus side of Shaws Pass, 24 Nov. 1937 (R. Smithers & Thorne), 1M & 1F (SAM B9195); Idas Valley, Stellenbosch, 24 Nov. 1937 (R. Smithers), 1M & 1F (SAM B9192); Joostenbergvlakte, Cape Town, 4 Feb. 1983 (J.V.), 5F (SAM B1933); Karoo Nat. Park, 3 Apr. 1989 (Leroy), 1F (NCA 89/710); Keerom, 20 miles E. Citrusdal, Feb. 1939 (C. Thorne), 1F (SAM B9756); Near Klappmuts, SW. Cape, 12 Nov. 1937 (R. Smithers), 1M (SAM B9185); Klipheuwel, 9 June 1938 (Smithers, Thorne & KHB.), 1F (SAM B9316); Langfontein, between Redlinghuis and Aurora, Sept. 1938 (Barnard & Thorne), 1M & 1F (SAM B9381); Leipoldville, 1938 (Barnard & Thorne), 1F (SAM B9377); Malmesbury, Cape Province (R. Smithers), 1F (SAM B9468); 7 miles from Malmesbury on Mamre Rd., 23 Feb. 1938 (R. Smithers), 1F (SAM B9223); Mamre Mission Station, Malmesbury Division, Cape Peninsula, 1F (UMO, holotype, 1728/ SAM B897); Nov. 1896, 2F (SAM X897, paratypes); Mamre, 10 Jan. 1964 (B. Lamoral), 3M & 20F (NM 9775); 14 Jan. 1964 (died 20 Oct 1964) (B. Lamoral), 1F (NM); 14 & 23 Jan. 1964 (B. Lamoral), 5F (MCZ); 23 Sept. 1986 (G. Müller), 1F (NCA 87/330); 17 Nov. 1986 (G. Müller), 3M & 2F (NCA 87/54, 87/56, 87/57); 30 Jan. 1989 (G. Müller), 2F (NCA 89/1118); 20 June 1991 (G. Müller), 18F (NCA 91/1034); Mamre Rd., 3 miles from railway crossing, 23 Feb. 1938 (R. Smithers), 1F (SAM B9221); 15 miles from junction of Mamre and Malmesbury roads, 20 Aug. 1938 (R. Smithers & Thorne), 1F (SAM B9465); 27 Aug. 1938 (R. Smithers), 1F (SAM B9141); Sept. 1938 (R. Smithers), 1F (SAM B9176); 8 Sept. 1938 (R. Smithers), 1F (SAM B9367); Matroosberg Mts., 3500ft, Jan. 1917 (R.W.E. Tucker), 3F (SAM B3010 & B3041, 3 vials); Namaqualand, 5 miles N. Bitterfontein, Mar. 1939 (R. Smithers), 1F (SAM B9729); Parowallei, 23 Sept. 1989



Map 4: Distribution of the *Latrodectus indistinctus* O. P.-Cambridge specimens that were examined.

(G. Müller), 1F (NCA 89/1122); Philadelphia, 5F (SAM B9028, B9031, B9647, B9653, B9656); Philadelphia W., 5 Dec. 1938 (Smithers & Thorne), 6F (SAM B9581, B9585, B9588, B9589, B9622, B9623); Philadelphia, CP., 1F (MCZ); 13 Jan. 1938 (Smithers & Thorne), 3F (SAM B9413, B9415, B9417); Porterville (R. Smithers), 1F (SAM B9220); Richtersveld, Paradyskloof summit, 2820S/1700E, 6 Oct. 1991 (S. Louw), 2F (NMBA 5809, 5810); Rietpoel, near Caledon (Smithers & Thorne), 1F (SAM B9275); Signal Hill, Cape Town, June 1900 (Mrs W.F. Purcell), 1F (SAM X8477); 12 miles S. of Swellendam, 3 Dec. 1937 (Barnard & Thorn), 1F (SAM B9210); Steinkopf, Namaqualand, Mar. 1935 (Lawrence, Hesse & Thorne), 1F (SAM B8859); Tows River, Cape Province, 3320S/2022E, Aug. 1903 (R.M. Lightfoot), 1F (SAM X13164); Tradouw Pass, 2000-4000ft, Swellendam, Nov. 1924 (K.H. Barnard), 1F (SAM B6897); Tulbach, 18 Jan. 1939 (Tudhope), 1F (SAM B9676); Verlorenvlei near Aurora, CP., 21 Mar. 1938 (Plague gang), 1F (SAM B9281); Vissers Hoek, CP., 13 Jan. 1939 (Smithers & Thorne), 1F (SAM B9635); Vredenburg, Malmesbury Distr., CP., (Van Zyl), 1F (SAM B7548); Vredendal, Sept. 1938 (Barnard & Thorne), 1F (SAM B9378); 3 miles W. of Vredendal, 1938 (Barnard & Thorne), 1F (SAM B9380); Walvis Bay, May 1908 (J. Drury), 3F (SAM B2301); Wynberg, Cape Province, May 1916 (C.W. Mally), 1F (SAM B2466).

**Distribution:** Republic of South Africa, southwest and northwest Cape Province; and coastal areas of Namibia, south of Swakopmund (Map 4). The distribution of this species and that of its closest related species, *L. cinctus*, is separate except in the Cape Peninsula where *L. cinctus* seem to occur in exceptional cases, as only two specimens were found west of 23° E. All the other specimens of *L. cinctus* were collected east of 24° E, while all the specimens of *L. indistinctus* were collected west of 23° E.

*Latrodectus karroensis* stat. nov. Smithers  
(Figures 9a-b & 10a-c)

*Latrodectus indistinctus karroensis* Smithers, 1944: 298, M & F syntypes from high lying parts of the Karroo, S. Africa, in the collection of the SAM (studied); Levi 1959: 28 (as *L. mactans*).

**Diagnosis:** Both the males and females were described by Smithers (1944) as a subspecies of *L. indistinctus*. It is here proposed that it should be raised to species level. This is supported by the consistence of the distinguishing character, the T-shaped abdominal marking of the males and females, as well as the distinct way in which it constructs its retreat. It is proposed that the following specimens should be considered as the new lectotype and paralectotype specimens: SAM X11801, Hanover district, Cape Province, 1F lectotype and 1M and 3 immature paralectotypes; collected by S.C. Cronwright Schreiner, January 1902.

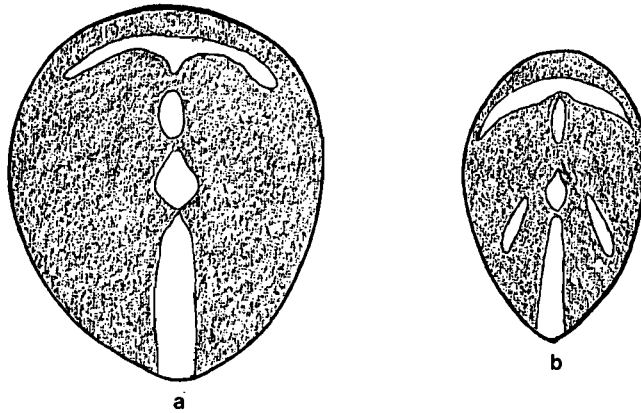


Figure 9(a-b): *Latrodectus karroensis* Smithers abdominal patterns: a. Female; b. Male.

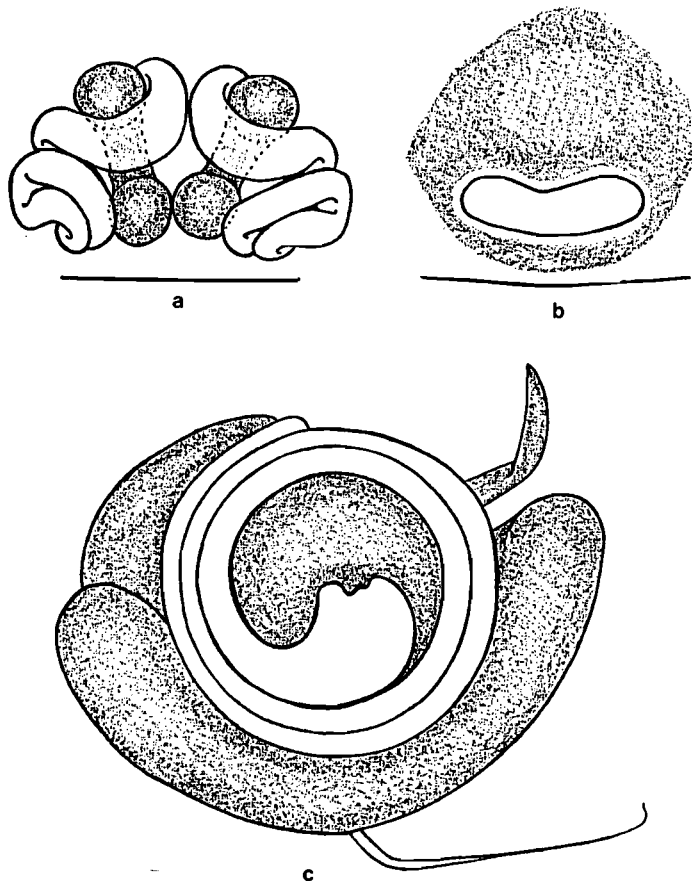


Figure 10(a-c): *Latrodectus karroensis* Smithers: a. Female internal genitalia; b. Female external genitalia; c. Male palp showing embolus.

**Description:**

**Colour pattern:** Females: The distinct red T-shaped markings on the dorsum of the abdomen (Figure 9a) is the most distinguishing character in the females and consists of a median longitudinal band which extends laterally in the anterodorsal region of the abdomen. Ventrally the abdomen has an indistinct light yellow mark between the spinnerets and the epigastric furrow. Males: The males can be distinguished from the other species in this species-group by the T-shaped red pattern on the abdomen (Figure 9b), which consists of a median longitudinal band extending laterally in the anterodorsal region. This T-shaped marking is combined with two lateral red marks, one on each side of the longitudinal band and medially to the dorsolateral part of the abdomen.

**Abdominal setae:** The dorsal abdominal setae consists of two types of setae, namely medium-long thick setae and short thick setae (Figure 5). This setation is the same for most of the species in this species-group, except for *L. pallidus* which has only sparse short setae and *L. tredecimguttatus* in which the short setae are bifurcated.

**Female genitalia:** In Smithers (1944) no mention is made of the internal structure of the female genitalia. As seen in Figure 10a the internal genitalia consists of two dumbbell shaped seminal receptacles with the posterior ends touching or almost touching and the anterior ends separated by parts of the spermathecae ducts. The spermathecae ducts have three loops as seen from the dorsal side. The three loops in the spermathecae ducts are the main character to distinguish *L. karrooensis* from *L. renivulvatus*, as *L. renivulvatus* has four loops instead of three. Externally the epigynum is oval wider than long and the copulatory opening is a wide oval with the anterior and posterior sides smoothly curved (Figure 10b).

**Male palps:** As in most of the other species of this species group, the embolus has three loops (Figure 10c). In *L. renivulvatus* the embolus has four loops (Figure 12c).

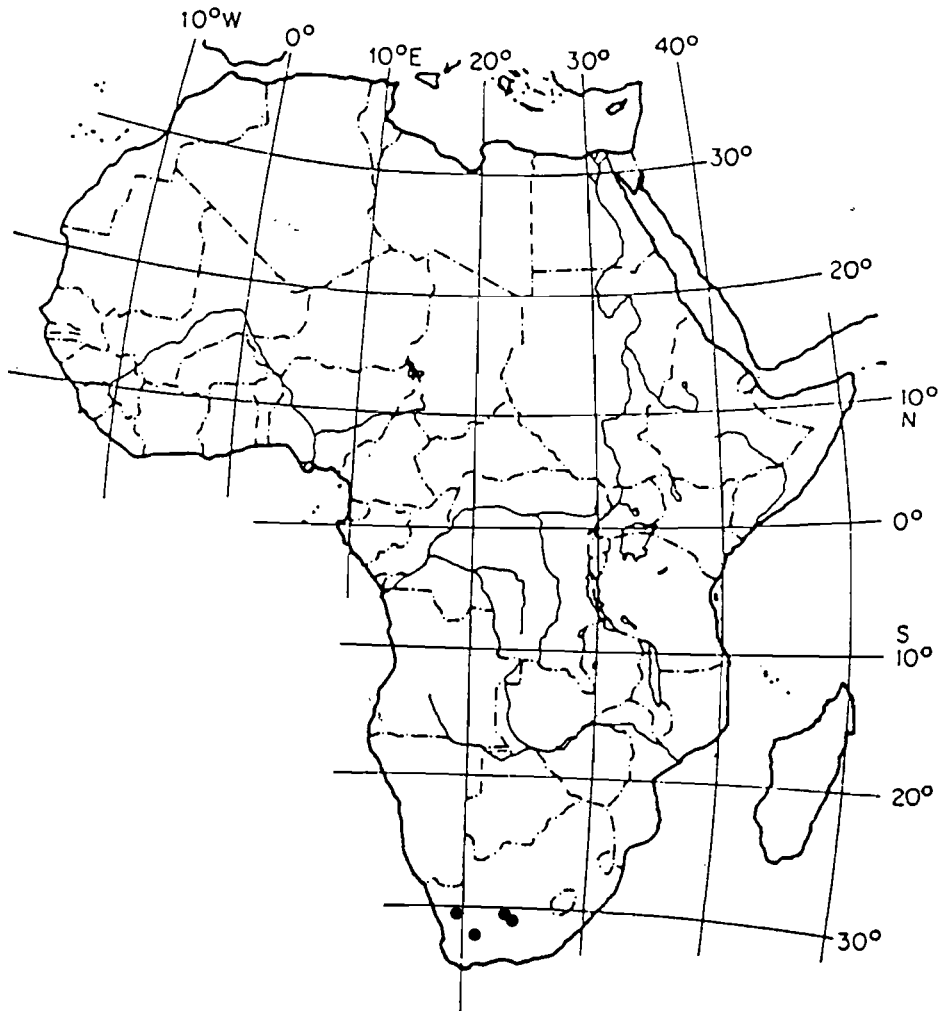
**Habit:** The main distinguishing features of the web is the inverted cup-shaped retreat which incorporates pebbles in the construction of the dome and the way it is suspended in mid-air, and this is also a distinct character of this species. In other ways it has the same basic structure of loose interconnected threads leading to the tightly woven retreat. A more detailed description of the web is given by Smithers (1944) and by Cronwright Schreiner (1902).

**Medical importance:** The venom of this species has so far not been studied, but it is probably close to that of *L. indistinctus* and medical treatment with the antiserum is advised.

**Measurements:** (n = 9) F: TL = 11,09 (9,50 - 12,45); CW = 3,88 (3,50 - 4,60); T1 = 5,28 (4,80 - 6,20); and (n = 3) M: TL = 4,35 (3,90 - 4,85); CW = 1,70 (1,65 - 1,75); T1 = 3,75 (3,55 - 3,95).

**Material examined RSA: CAPE PROVINCE:** Blaauwkranz, 23 miles S. of Calvinia, Jan. 1903 (G. French), 1F (SAM X13239); De Aar, 1909, 1F (SAM X14673); Hanover, E. Karroo, CP., 1-7 Feb. 1902 (S.C. Schreiner), 2M & 1F (SAM X10058); Jan. 1902 (S.C. Schreiner), 1M & 1F, new lectotypes (SAM X11801, 2 vials); Dec. 1901- Jan. 1902 (S.C. Schreiner), 1F (SAM X11814); Mar.- June 1902 (S.C. Schreiner), 1F (SAM X11867); 13 Feb. 1934 (S.C. Schreiner), 1F (SAM B234); Laingsburg, Mar. 1937 (Boonstra & Thorn),





Map 5: Distribution of the *Latrodectus karooensis* Smithers specimens that were examined.

1F (SAM B9101); Stuurmans Kuilen, 24 miles from Hanover on De Aar Rd., Jan. 1902 (S.C. Schreiner), 1F (SAM X11896). So far no other specimens of this species could be found.

**Distribution:** Republic of South Africa, Karroo region (Map 5).

*Latrodectus pallidus* O. P.-Cambridge  
(Figures 11a-e)

*Latrodectus pallidus* O. P.-Cambridge, 1872: 287 (as *Lathrodectus*) 2F and 1 immature syntypes from Jerico, Israel, in the collection of the UMO (B624, t.3) (studied); F. P.-Cambridge, 1902: 253; Keegan, 1955: 149; Levi 1959: 38; Levy & Amitai 1983: 47.

*Latrodectus pallidus immaculatus* Caporiacco, 1933: 323, F holotypes from near Gialo, Libya (not found), synonym ?.

This species have been included here only because of the subspecies *L. p. immaculatus* described by Caporiacco (1933). As these type specimens could as yet not be traced, it is uncertain wether this is a synonym of *L. pallidus* or *L. geometricus*, as Levi (1959) seem to suggest.

**Diagnosis:** Distinguished from the other species in the species-group by the dorsal abdominal colour of both sexes and the dorsal abdominal setae of the females.

**Description:**

**Colour pattern:** The main distinguishing characters are the cream coloured abdomen with dark spots dorsally (Figure 11a) and the cream-white hourglass mark ventrally between the spinnerets and the epigastric furrow.

**Abdominal setae:** The females have short, sparse dorsal abdominal setae (Figures 11e).

**Female genitalia:** The epigynum externally resemble that of the *geometricus* species-group with the copulatory opening anteriorly with a lobed border and the posterior border smoothly curved. The epigynum is oval, wider than long. (Figure 11c). The internal genitalia are the same as most of the species in this species-group with three loops in the spermathecal ducts (Figure 11b).

**Male palps:** As in most of the other species of this species group, the embolus has three loops (Figure 11d). In *L. renivulvatus* the embolus has four loops (Figure 12c).

**Habit:** According to Szlep (1965) "This species is found only in the desert which has some vegetation. ... the retreat situated up to 60 cm above ground level ... between twigs of the shrubs. ... it has, in addition to the retreat, a special catching web." For a detailed description see Szlep (1965).

**Medical importance:** Most of the studies on the venom of *L. pallidus* have so far been done in Russia. The study closest to Africa was that of Shulov & Weissman (1959) in Israel, in which it is stated to be less poisonous than the other two species occurring in Israel.

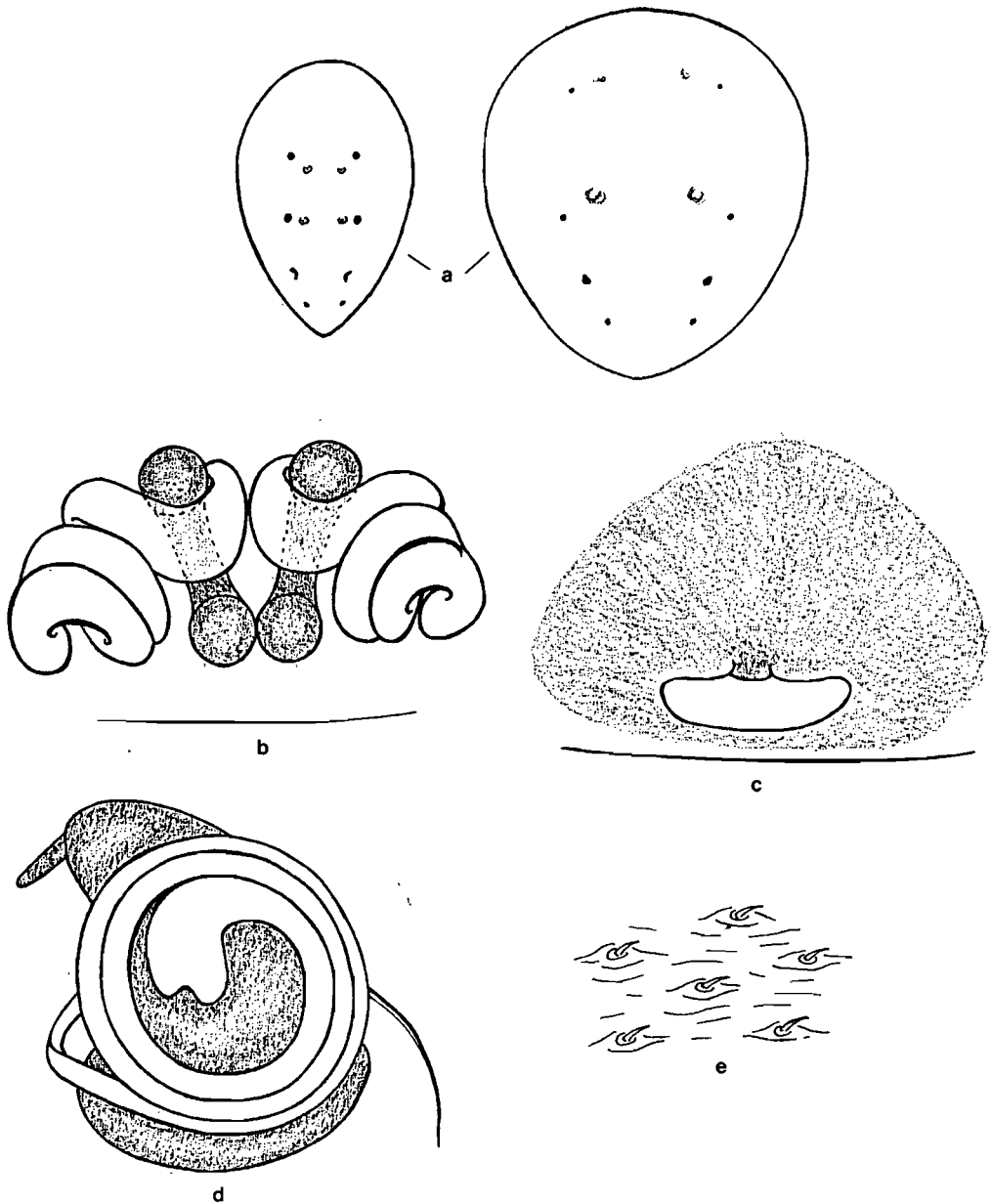
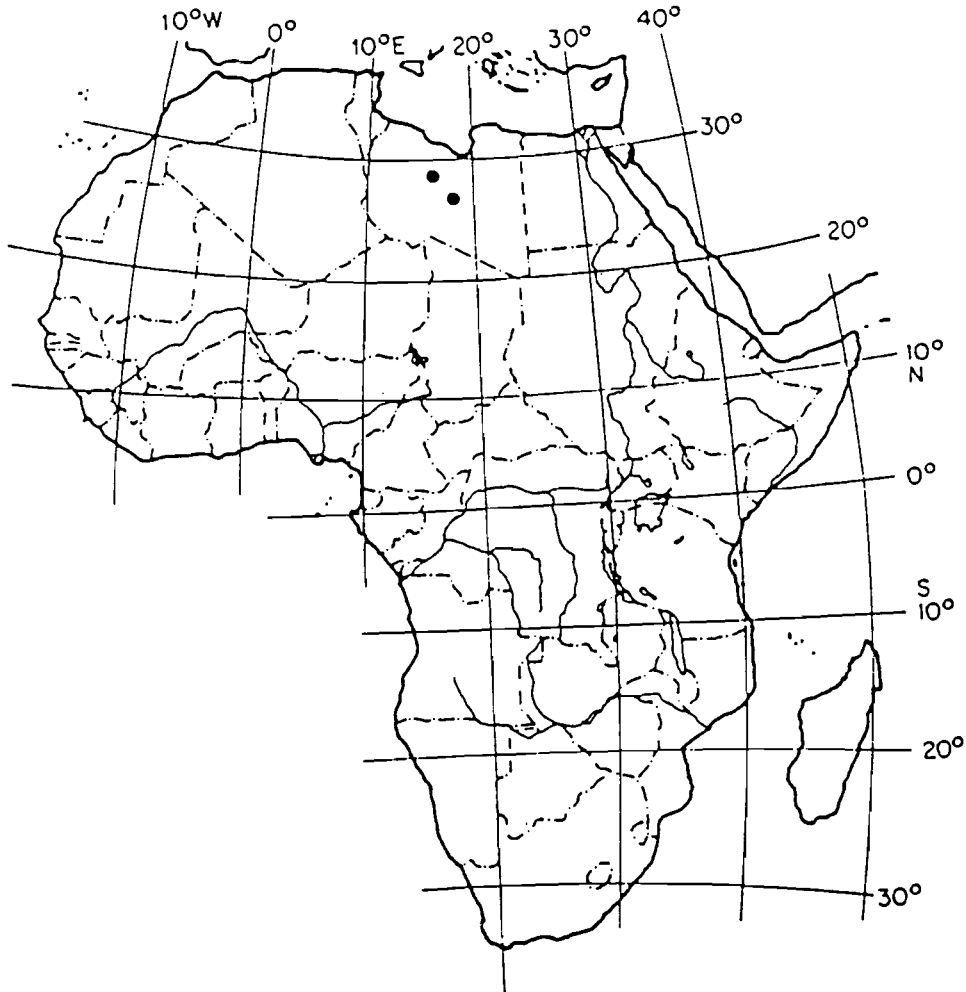


Figure 11(a-e): *Latrodectus pallidus* O. P.-Cambridge: a. Male & female abdominal patterns; b. Female internal genitalia; c. Female external genitalia; d. Male palp showing embolus; e. Female dorsal abdominal setae.



Map 6: Distribution of *Latrodectus pallidus* O. P.-Cambridge in Africa, as depicted by Levi (1959).

**Measurements:** (n = 3) F: TL = 11,22 (9,00 - 12,45); CW = 3,87 (3,35 - 4,15); T1 = 4,35 (4,10 - 4,60). Measurements for the males were calculated from measurements given by Levy & Amitai (1983), (n = 5) M: TL = ca. 4,50 (3,50 - 5,50); CW = ca. 1,50 (1,10 - 1,90); T1 = ca. 4,00 (ca. 2,78 - ca. 5,41).

**Material examined:** ISRAEL: Jerico, Israel, 2F (UMO B624, t.3); PALESTINE: Palestine (Shulov), 1M & 3F (SAM B9370).

**Distribution:** See Map 6 for the distribution of this species in Africa (Libya) as it is depicted by Levi (1959).

*Latrodectus renivulvatus* Dahl  
(Figures 12 & 13)

*Latrodectus renivulvatus* Dahl, 1902: 45, F holotype from D.S.W. Africa [Namibia], in the collection of the ZMB (29260) (studied); Simon, 1910: 191; Levi 1959: 27 (as *L. mactans*).  
*Latrodectus insertus* Lawrence, 1927: 30, 2F & 1 immature F syntype specimens from Namutoni and Ongandjera, Namibia, in the collection of the SAM (B5883, B6236) (studied); Levi 1959: 27 (as *L. mactans*). (new synonym)

The female holotype specimen (ZMB 29260) of *L. renivulvatus* was examined and compared with *L. insertus* type specimens from the SAM (B5883, B6236). It was found to be the same species as *L. renivulvatus*. It is therefore proposed here that *L. insertus* is a junior synonym of *L. renivulvatus*. Only the female of this species have so far been described and the males are here described for the first time.

**Diagnosis:** This species can be distinguished from the other species in this species-group by the number of loops in the female spermathecal ducts and the male embolus as well as in the dorsal abdominal pattern of the males.

**Description:**

**Colour pattern:** Females: The abdominal colouration cannot be used as a distinguishing character as it differs from specimen to specimen, ranging from almost totally dark-brown to black, to dark-brown to black with transverse and longitudinal orange-red bands (Figures 13a-b). Males: One of the distinguishing characters of the males are the dorsal abdominal pattern, of a dark background with three transverse orange-red bands and three posterior longitudinal short bands (Figure 13c).

**Abdominal setae:** The dorsal abdominal setae consists of two types of setae, namely medium-long thick setae and short thick setae (Figure 5). This setation is the same for most of the species in this species-group, except for *L. pallidus* which has only sparse short setae and *L. tredecimguttatus* in which the short setae are bifurcated.

**Female genitalia:** In *L. renivulvatus* the internal female genitalia is very distinct in that this is the only species of this species-group where the spermathecal ducts have four instead of three loops (Figure 12a). Externally the epigynum is oval wider than long and the

copulatory opening is a wide oval with the anterior and posterior sides smoothly curved (Figure 12b).

**Males palps:** Apart from the colour pattern the male palps are also a distinguishing character that can be used to separate this species from the rest of this species-group. Corresponding with the four loops in the female spermathecal ducts the male embolus has four loops (Figure 12c). All the other species in this species-group has three loops in their embolus.

**Habit:** No specific study has so far been done on the web and web sites of this species, but in general they are the same as that of *L. indistinctus*. The web is always close to the ground and seldom higher than half a meter. From the web a tunnel lead to a blind refuge. The refuge can be in a tuft of grass, in a low shrub, in an empty burrow or under a loose stone. In a few cases this species were found close to or in houses in the Pretoria-Johannesburg area, once in Welkom, the Orange Free State, and once in Windhoek, Namibia.

**Medical importance:** The venom of this species has so far not been studied, but it is probably close to that of *L. indistinctus* and medical treatment with the antivenin is advised.

**Measurements:** (n = 10) F: TL = 10,37 (9,30 - 11,60); CW = 4,02 (3,35 - 4,45); T1 = 4,68 (4,30 - 5,30); and (n = 10) M: TL = 3,19 (2,55 - 4,00); CW = 1,16 (1,00 - 1,30); T1 = 2,52 (2,10 - 2,90).

**Material examined:** BOTSWANA: Maun, Government Camp, 1959S/2325E, 5 June 1976 (A. Russell-Smith), 1M (NMBA 6337); ETHIOPIA: Addis Ababa, Rift Valley Escarpment, Sheno on Debre Berhan Rd., IUCA Compound, 2 Mar. 1986 (A. Russell-Smith), 3F (NMBA 6339); Rift Valley Escarpment, 58km E. Addis Ababa, 2600m, 1 Jan. 1983 (A. Russell-Smith), 1M (NMBA 6338); KENYA: Hgong Hills, Nairobi, Aug. 1961 (R. Springer), 1F (NM 9830); LESOTHO: Mamathes, Basutoland, Oct. 1957 (J. Guillamod), 1F (NM 8000); NAMIBIA: Elephants Rest, Etosha Nat. Park, 1858S/1451E, 6 Aug. 1987 (E. Griffin), 1M (SMWN 41269); W. Caprivi, 1722Dc, 5 Apr. 1990 (E. Marais), 1M (SMWN 41836); Gobabeb, NE. of River, Aug. 1968, 1F (AM); Gobabis, SWA, July 1936, 2F (SAM C1352); Katima Mulilo, E. Caprivi, 11 Oct. 1984 (C.H.G. Schlettwein), 1F (SMWN 39899); Klein Windhoek, 2217Ca, 1 Jan. 1990 (A. Marais), 1F (SMWN 41760); Between Mahonga and the corner, 1820Bb, 8 Feb. 1984 (E. Griffin), 1M (SMWN 41601); Namotoni, South West Africa, Mar. 1923 (R.F. Lawrence), 1F (imm.) (SAM B5883, *L. incertus* type); Ongandjera, South West Africa, Mar. 1923 (R.F. Lawrence), 2F (SAM B6236, *L. incertus* type); SAW [Namibia], 1F (ZMB 29260, *renivulvatus* holotype); Swakopmund Area, SWA., 2214Da, Sept. 1978 (E. Erb), 1F (TM 11378); Windhoek, Paulinenhof 72, 2217Cb, 22 Nov. 1972 (P.G. Olivier), 1F (SMWN 35763); RSA: CAPE PROVINCE: Bak Hills, Gordonias, 1926 (K.H. Barnard), 1F (SAM B7629); Brandvlei, Bushmanland, 4 Aug. 1976 (J.N. van Niekerk), 1F (SAM C1271); Colesberg, Dec. 1900 (C.L. Leipold), 1F (SAM X8765); Aug. 1910 (S.H. Skaife), 1F (SAM B9341); Cookhouse, E. Cape, Mar. 1954 (Museum Exp.), 1F (SAM C1319); Hanover, E. Karoo, CP., Sept. 1901 (S.C. Schreiner), 1F (SAM X9496); Karoo Nat. Park, 10km N. of Beaufort West, 3218S/2233E, 22-24 Oct. 1985 (C. Griswold, J. Dayer & T.M. Griswold),

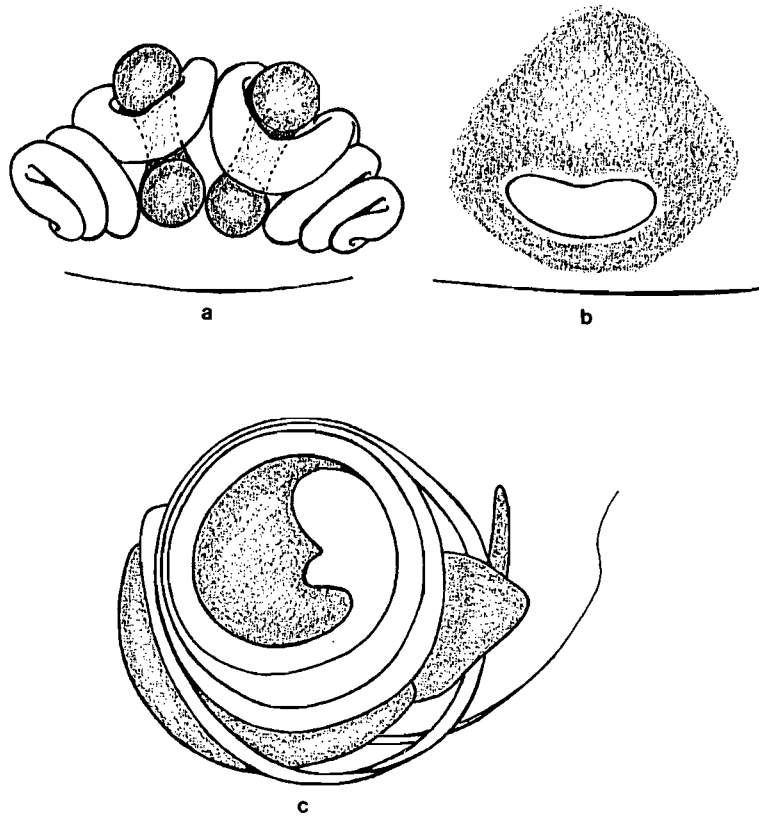


Figure 12(a-c): *Latrodectus renivulvatus* Dahl: a. Female internal genitalia; b. Female external genitalia; c. Male palp showing embolus.

2F (NM); Napier, Dec. 1907 (Lounsbury), 1F (SAM B1965); Patentie [Patensie] (Barnard, Hesse & Thorne), 1F (SAM B9481); Postmasburg, Commissie 649, 2801S/2244E, 30 Aug. 1981 (Museum Staff), 1F (NMBA 2177); Prince Albert Division, 3F (SAM C1232); Walvisbaai, 10km S. Swakopmund, 2247S/1432E, 13 July 1987 (L.N. Lotz), 1F (NMBA 2956); Near Williston, Mar. 1939 (R. Smithers), 1F (SAM B9738); RSA: NATAL: Bulwer, Feb. 1947 (W.G. Rumo), 1F (NM 5202); RSA: O.F.S.: Bethlehem, Golden Gate Nat. Park, Avondrus, 2828S/2841E, 11 Jan. 1992 (L.N. Lotz), 1F (NMBA 6078); Bloemfontein, 2908S/2610E, 24 Nov. 1984 (J. Watson), 1F (NMBA 5545); 3 Jan. 1992 (de Wet), 1F (NMBA 5865); Boshof, Krugersdriftdam, 2842S/2555E, 24 Sept. 1985 (Museum Staff), 1F (NMBA 1019); 24 Jan. 1992 (L. Grobler), 1F (NMBA 6079); Kroonstad, Mar. 1899 (W. Watermeyer), 1F (SAM X5809); Lusitof, Kroonstad Distr., 2729S/2739E, 21 Sept. 1967 (N. de L. Genis), 1F (MRAC 155.186); Oranjeville, 22 Mar. 1980, 1M (NCA 81/342); Rouxville, Brakgrond, 3022S/2610E, 9 Aug. 1991 (J. Irish), 1F (NMBA 6022); Smithfield,

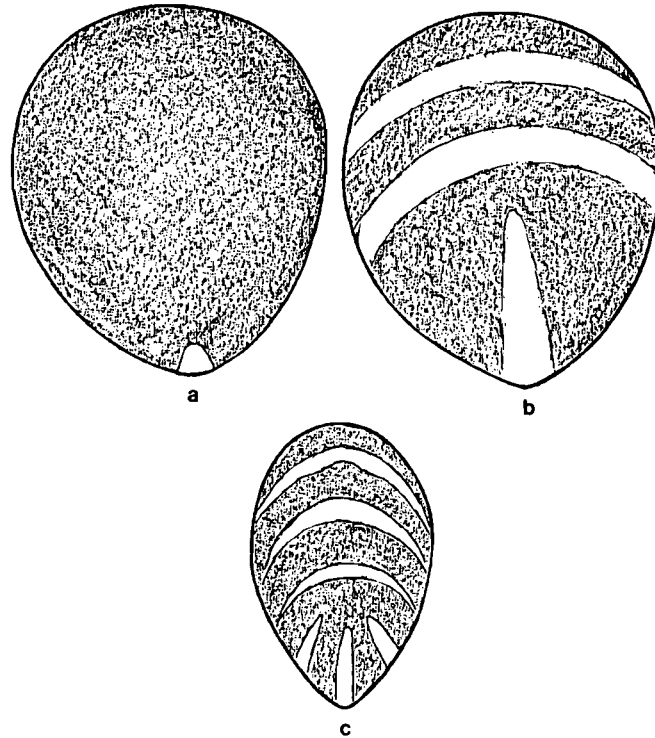
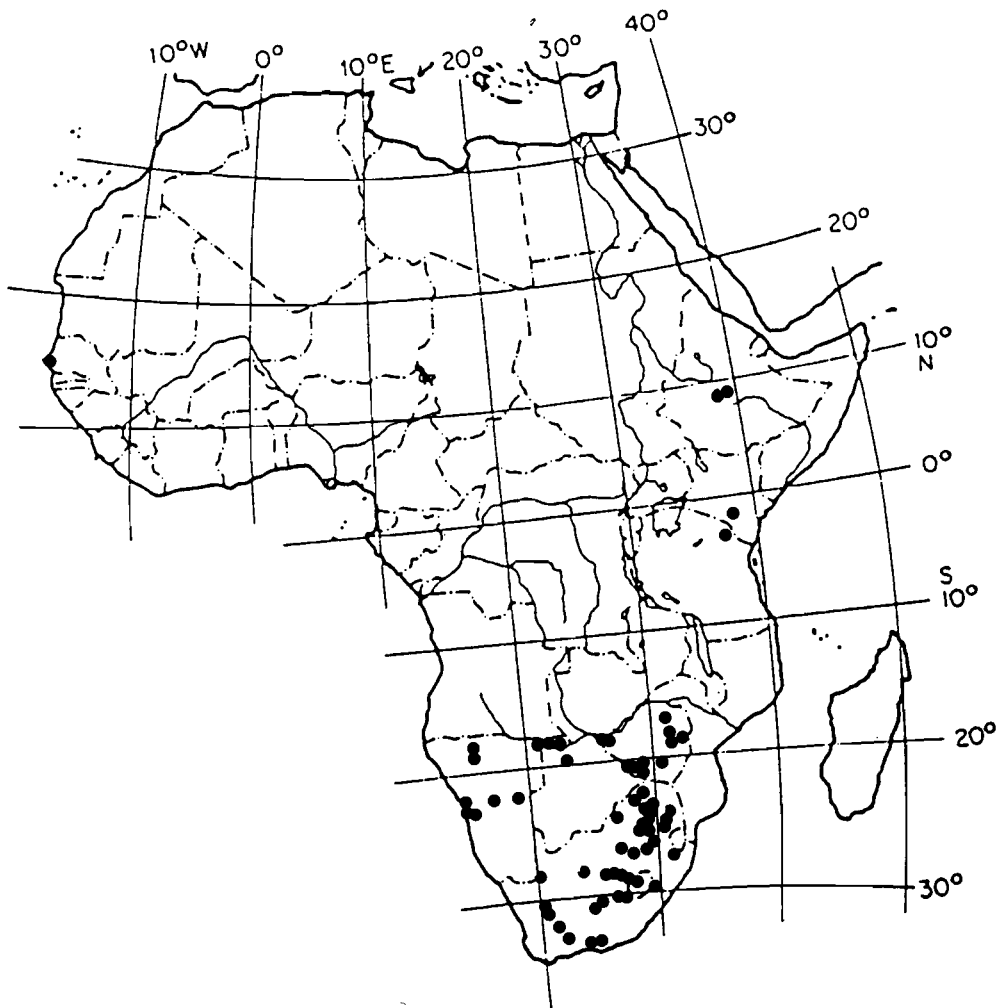


Figure 13(a-c): *Latrodectus renivulvatus* Dahl abdominal patterns: a. & b. Female; c. Male.

O.R.C., 1 Sept. 1912 (Dr. Kannemeyer), 1F (SAM B147); Vrede, Vrede Distr., 2725S/2909E, 21 Jan. 1982 (C. van der Westhuizen), 1F (TM 12465); Vrededorf (British Museum), 1F (SAM B9232); RSA: TRANSVAAL: Amsterdam, Zoutpansberg, 2317S/2924E, 7 Aug. 1969 (A. Schoeman), 2F (MRAC 155.192); Brooklyn, Pretoria, 5 Dec. 1974, 1F (NCA 76/1106); Constantia Park, Pretoria, 5 Oct. 1987, 1F (NCA 87/847); Junction of the Crocodile & Marico Rivers, NW. Transvaal, 1 Jan. 1918 (R.W.E. Tucker), 1F (SAM B3755); Dendron, Aug. 1970, 1F (NCA 76/1732); Doringkloof, Verwoerdburg, 2 Jan. 1983 (NCA 82/759); Elarduspark, 15 Feb. 1984 (Hanekom, NCA), 1F (84/446); Grisswold, Johannesburg, 1966, 1F (AM); Guerney Farm, 15km NW. Klaserie, E. Tvl., 19-31 Dec. 1985 (S. & J. Peck), 1M (AMNH 85-295); Halfway House, Jan. 1987, 1F (NCA 88/89); Hartebeestpoortdam, Brits Distr., 2545S/2750E, 5 June 1967 (M. Johannsmeyer), 1F (MRAC 155.183); Hendrina Power St., 30 km SE. Middelburg, Tvl., 2629Ba, 26 Jan.



1973 (K. Van Meygaarden), 1F (TM 10734); Irene, Tvl., 2 Jan. 1958, 1F (NCA 76/400); Johannesburg, Klipfontein Nat. Res., 2617S/2758E, 22 Feb. 1992 (A. Leroy), 3F (NMBA 6043, 6080, 6239); Kempton Park, 9 Oct. 1974, 2F (NCA 76/1712); Kempton Park, 8 June 1980, 1F (NCA 81/571); Lydenburg, 2530Ab, 1897 (P.A. Krantz), 1F (TM 13303); Lydenburg, 17 km on Oshoek Rd., 9 Oct. 1987, 1M (NCA 87/917); Maasstroom, "Al-te-Ver", 17 Aug. 1976, 1M (NCA 76/1329); 26 Aug. 1976, 1M & 1F (NCA 76/1499); Magoebaskloof 15 Sept. 1965, 1F (AM); Monument Park, Pretoria, 2547S/2814E, 24 Feb. 1982 (H. Roux), 1F (TM 12466); Murrayfield, Pretoria, 6 Apr. 1978, 1F (NCA 78/386); Onderstepoort, 1F (NCA 88/242); Pietersburg, Oct. 1961 (A. Spies), 1F (NM 9828); Pretoria, 19 Oct. 1967 (J.A. Slater), 1F (AMNH); 25 Jan. 1983, 1F (NCA 83/199); 15 Jan. 1985, 2F (NCA 85/59); Nov. 1988, 1F (NCA 88/809); Pretoria, Rooihuiskraal, 2551S/2810E, 24 Feb. 83 (V. Strydom), 1F (NMBA 9); Randfontein, 11 Mar. 1975, 1F (NCA 76/421); Rietondale, 2 June 1986, 1F (NCA 86/96); 14 June 1986 (A. van den Berg), 1M (NCA 89/464); 18 Aug. 1986, 1M (NCA 89/458); 25 Aug. 1986, 1M & 1F (NCA 86/264); 2 Sept. 1986, 2M & 7F (NCA 86/283, 89/457, 89/461); 13 Jan. 1987, 1M (NCA 87/59); 7 Apr. 1987, 2M (NCA 87/529, 87/572); Rietveldam, Pretoria Distr., 14 Aug. 1972 (G. Newlands), 1F (TM 10601); Roodeplaat, 10 Aug. 1976, 1F (NCA 76/1534); 27 Sept. 1976, 1F (NCA 76/1594); Near Roodeplaat, 7 Oct. 1975, 1F (NCA 76/1581); Roodeplaat, Wonderboom, 5 June 1918 (G.P.F. van Dam), 1F (TM 12945); Rust-de-Winter, 13 Jan. 1981, 1M (NCA 83/43); Sinoville, Pretoria, 1989, 1M (NCA 90/421); Soutpan, 50 km N. Pretoria, 26 Aug. 1968 (G. Newlands), 1F (TM 10558); Smitsdrift, Pietersburg (B. Möller), 9F (AM, 2 vials); (M. Möller), 4F (AM); Villieria, Pretoria, 14 Oct. 1974, 1F (NCA 76/1110); 5 km from Warmbad, 17 Feb. 1977, 1M (NCA 77/429); Waterberg, Nr. Vaalwater, Klipfontein, Tvl., 2408S/2818E, 3 Dec. 1979 (C.A. Car), 1F (NMZ 1021); 6 Dec. 1979 (C.A. Car & Falcon College), 1F (NMZ 1381); Waverley, Pretoria, Jan. 1987, 1F (NCA 87/88); Wierda Park, Pretoria, Jan. 1972 (J. Church), 1F (TM 10595); Wildebeeshoek, Plot 739, Pretoria Distr., 2528Ca, Dec. 1975 (A.L. Rabie), 1F (TM 11142); SENEGAL: Dakar Peninsula, Jan.- Apr. 1945 (E.H. Newcomb), 1M (AMNH); TANGANYIKA: Longido, 1 Feb. 1916 (A. Loveridge), 1F (MCZ); ZIMBABWE: Bulawayo, 2010S/2835E, Jan. 1977 (G. Border), 1F (NMZ 133); 29 Dec. 1964, 1F (NMZ 548); Nov. 1960, 1F (NMZ 1046); 12 Apr. 1948 (P.K. Pringle), 1F (NMZ 1209); 24 May 1973 (D. McDougall), 1F (NMZ 1275); Sept. 1963, 1F (NMZ 1286); 27 Dec. 1942, 1F (NMZ 1302); 3 Dec. 1973, 1F (NMZ 1442); Bulawayo, 2010S/2835E, 7 Jan. 1982, 1F (NMZ 1579); 27 Mar. 1982 (L. Williams), 1F (NMZ 1587); Apr. 1983 (G. Barnard), 2F (NMZ 1746); 28 Nov. 1990 (R. Sithole), 1F (NMZ 8658); Bulawayo, Bradfield 2028Ba, 1 Jan. 1988 (N. Sparg), 1F (NMZ 6193); Bulawayo, Hillside Dams, 2010S/2835E, 2 Nov. 1978 (C.A. Car), 1F (NMZ 54); Bulawayo, Hyde Park, 2010S/2835E, 31 Mar. 1948, 1F (NMZ 1301); Bulawayo, Pise de Terre, 2010S/2835E, 10 Apr. 1948 (Holloway), 1F (NMZ 1339); Bulawayo, Riverside, 2010S/2835E, 25 Apr. 1948, 1F (NMZ 1514); Bulawayo, Saucertown, 2028Ba, 12 June 1986 (M. Erasmus), 1F (NMZ 4695); Bulawayo, Upper Matsheum Shlope, 2010S/2835E, 24 May 1973 (D.G. Broadley), 1F (NMZ 1745); Bulawayo, S. Rhodesia, 1-3 May 1917 (R.W.E. Tucker), 1M (SAM B3307); (R.F. Lawrence), 1F (SAM B9102); Chisuma Area, 1825Bb, 28-31 July 1990 (F. Nyathi), 1M (NMZ 8288); Delaware Ranch, Matetsi, 1815S/2555E, 26 Nov. 1973 (F.C. de Moor), 1F (NMZ 897); Essexvale, 2018S/2857E, 22 Dec. 1981 (J. Roff), 1M (NMZ 1580); Nov.



Map 7: Distribution of the *Latrodectus renivulvatus* Dahl specimens that were examined.

1981 (J. Roff), 2F (NMZ 1581); Inyanga, E. Highlands, 1820S/3245E, Aug. 1975 (Sergt. May), 1F (NMZ 1406); Marondera, 1831Ba, Aug. 1984 (J. Seegers), 1F (TM 14685); Matopo Hills, 30 km S. of Bulawayo, 5 Mar. 1969, 1F (MCZ); Matopos Res. St., Nr. Mhlonyane dam, 2028Bc, 24 Nov. 1986 (F. Nyathi), 1F (NMZ 5377); Metasa Communal Land, 1831Da, 24 Feb. 1984 (C.T. Masango), 1F (NMZ 3418); Mushandike Sanctuary, 2030Ba, June 1988 (N. Monks), 1F (NMZ 7335); Plumtree, 2027S/2752E, 17 June 1948, 1F (NMZ 1283); 21 Mar. 1948, 1F (NMZ 1407); Reigate Farm, Bulawayo Area, 2005S/2830E, 2 Mar. 1978 (L. Henneberg), 1F (NMZ 1258); Salisbury [Harare], Avondale West, 1750S/3105E, 27 Dec. 1972 (Mrs. Smallpiece), 1F (NMZ 1504); Salisbury [Harare], Forestry Comis. Nursery, 1750S/3105E, 3 Dec. 1957 (H.D.B.), 1F (NMZ 1473); Salisbury [Harare], Mabelreign, 1750S/3102E, 14 Nov. 1973 (F. Pert), 1F (NMZ 1278); Salisbury [Harare], Parktown, 1750S/3102E, 10 Oct. 1972 (J.L. Sievl), 1F (NMZ 557); Salisbury [Harare], The Koppie, 1750S/3102E, 4 Jan. 1974 (R. Murray), 1F (NMZ 1035); Salisbury [Harare], Waterfalls, 1750S/3102E, 1 Dec. 1978 (H.A. Taylor), 1F (NMZ 1211); Salisbury [Harare], Rhodesia, 1 Aug. 1969 (I.R. Mackay), 1F (MCZ); 23 Aug. 1970 (I.R. Mackay), 1F (MCZ); 28 Aug. 1970 (died Nov. 1970) (I.R. Mackay), 1F (MCZ); 4 Apr. 1971 (I.R. Mackay), 1F (MCZ); Apr. 1917 (R.W.E. Tucker), 1M (SAM B3240); Salisbury [Harare], Rhodesia, Atlanitica Ecology Res. St., 9 Dec. 1969 (I.R. Mackay), 1F (MCZ); Salisbury [Harare], Rhodesia, Haig Park, 4 July 1970 (I.R. Mackay), 1F (MCZ).

**Distribution:** Botswana, Ethiopia, Kenya, Lesotho, Namibia, Republic of South Africa, Senegal, Tanganyika and Zimbabwe (Map 7).

*Latrodectus tredecimguttatus* (Rossi)  
(Figures 14, 15 & 16a-c)

*Aranea 13-guttata* Rossi, 1790: 136, F holotype from Tuscany, Italy (not examined); *Latrodectus tredecimguttatus* (Rossi) Walckenaer, 1805: 81; F. P.-Cambridge 1902: 247; Vellard, 1936; Shulov, 1940: 309; Roewer, 1942:425; Shulov, 1948: 211; Gaud & Delaselle, 1949: 233; Keegan, 1955: 142; Bonnet, 1957: 2378; Shulov & Weissman, 1959: 515; Levi 1959: 24, (as *L. mactans*); Szlep, 1965: 75 (web); Levi, 1966: 427, (as *L. mactans tredecimguttatus*); Levy & Amitai 1983: 46, (as *L. tredecimguttatus*).

*Meta schuchii* C. L. Koch, 1836: 10, F type from Greece; *Latrodectus schuchii* C. L. Koch, 1837: 7 (not examined) (synonym ?)

Up to the publication of this paper the holotype specimen could not be located and specimens of this species studied were identified with the key in Levy & Amitai (1983). A specimen marked as *L. schuchi*, from the MNHN collection (AR 1103) from 'Fuerta Ventura Tencrippe (All)' was examined and found to be the same species as *L. tredecimguttatus*. It is therefore possible that in future studies it will be found that *L. schuchii* is a synonym of *L. tredecimguttatus*.

**Diagnosis:** The main distinguishing characters is the dorsal abdominal spination of the females and the dorsal abdominal colour pattern of the males.

**Description:**

**Colour pattern:** Female: Abdomen with background colour either dark brown or black. Dorsal pattern, if present, consist of a central red band broken up into three or more spots and three or more elongated oval lateral spots. Some specimens lack the dorsal pattern and are completely brown or black (Figures 15a-b). Ventrally there are white lines next to the spinnerets and the epigastric furrow in some specimens (Figure 15c). Male: The male dorsal abdominal pattern are basically the same as for the female and consist of a dark background with disconnected orange-red markings consisting of a transverse mark anterior, three pares of lateral marks and four medial marks (Figure 15d). Unlike the female this character is constant and is the distinguishing character for the males of this species.

**Abdominal setae:** In Figure 14 it can be seen that the dorsal abdominal setation of the females consist of two types of setae, of which the smaller setae are forked setae, with a small extension on one side. This is the distinguishing character for the females of this species as none of the other species of this species-group has such setae.

**Female genitalia:** Further characters are the internal female genitalia with four loops in the connecting ducts of which the fourth loop is situated between loop two and loop three (Figure 16a). The external genitalia are the same as most of the species of this species-group, oval wider than long with both sides of the copulatory opening smoothly curved (Figure 16b).

**Male palps:** The embolus with has three loops as can be seen in Figure 16c.

**Habit:** According to Szlep (1965) these spiders "... are found in holes under stones and their presence is revealed by their catching-webs..." and is situated "... at ground level.". As in the other species the web consist of the catching web and a retreat. For a full description of the web see Szlep (1965).

**Medical importance:** No comparable studies have so far been done to compare this species venom with that of the other species from Africa, but according to Maretic (1987) it is the most poisonous European species.

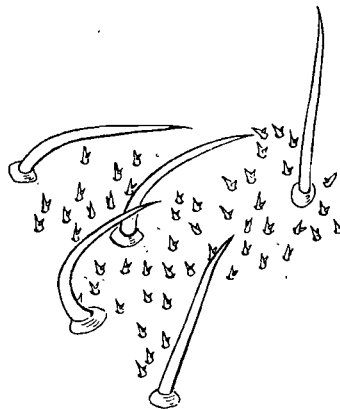


Figure 14: *Latrodectus tredecimguttatus* (Rossi) female dorsal abdominal setae.

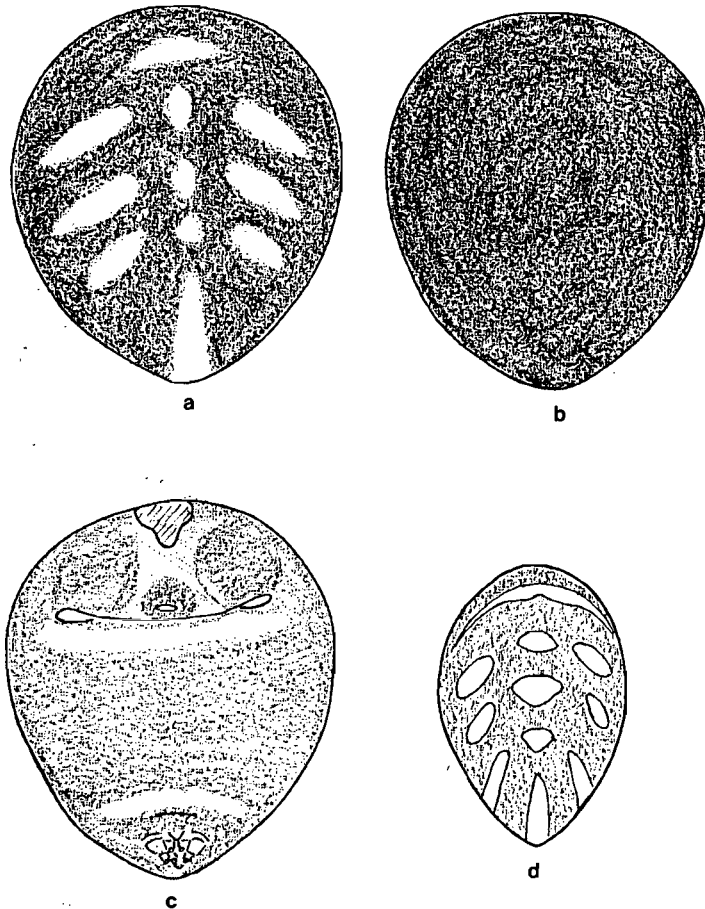


Figure 15(a-d): *Latrodectus tredecimguttatus* (Fossi) abdominal patterns: a. & b. Female, dorsal; c. Female, ventral; d. Male, dorsal.

**Measurements:** (n = 4) F: TL = 11,88 (11,00 - 13,05); CW = 4,05 (3,60 - 4,60); T1 = 4,68 (4,55 - 4,85); and (n = 4) M: TL = 4,24 (4,10 - 4,40); CW = 1,60 (1,45 - 1,75); T1 = 3,35 (3,00 - 3,60).

**Material examined:** ETHIOPIA: Addis Ababa, Dec. 1965 (J.L. Cloudsley-Thompson), 2M (MRAC 130.682); LIBYA: Garian, Tripolitania, 2200-2400ft., 28 Sept.- 2 Oct. 1948 (B. Malkin), 4F (AMNH); Sabrata, Nr. Tripoli [Tarabulus], 2 July 1979 (Goodnight & Barbash), 1M (AMNH); MOROCCO: Agadir, 31 May 1974 (B. Malkin), 1M (AMNH); PALESTINE: Palestine (Shulov), 2M & 2F (SAM B9371, 2 vials).

**Distribution:** The distribution of the specimens examined is Ethiopia, Libya and Morocco in Africa (Map 8). The species also occur in the Mediterranean countries of Europe, the Middle East and Central Asia.

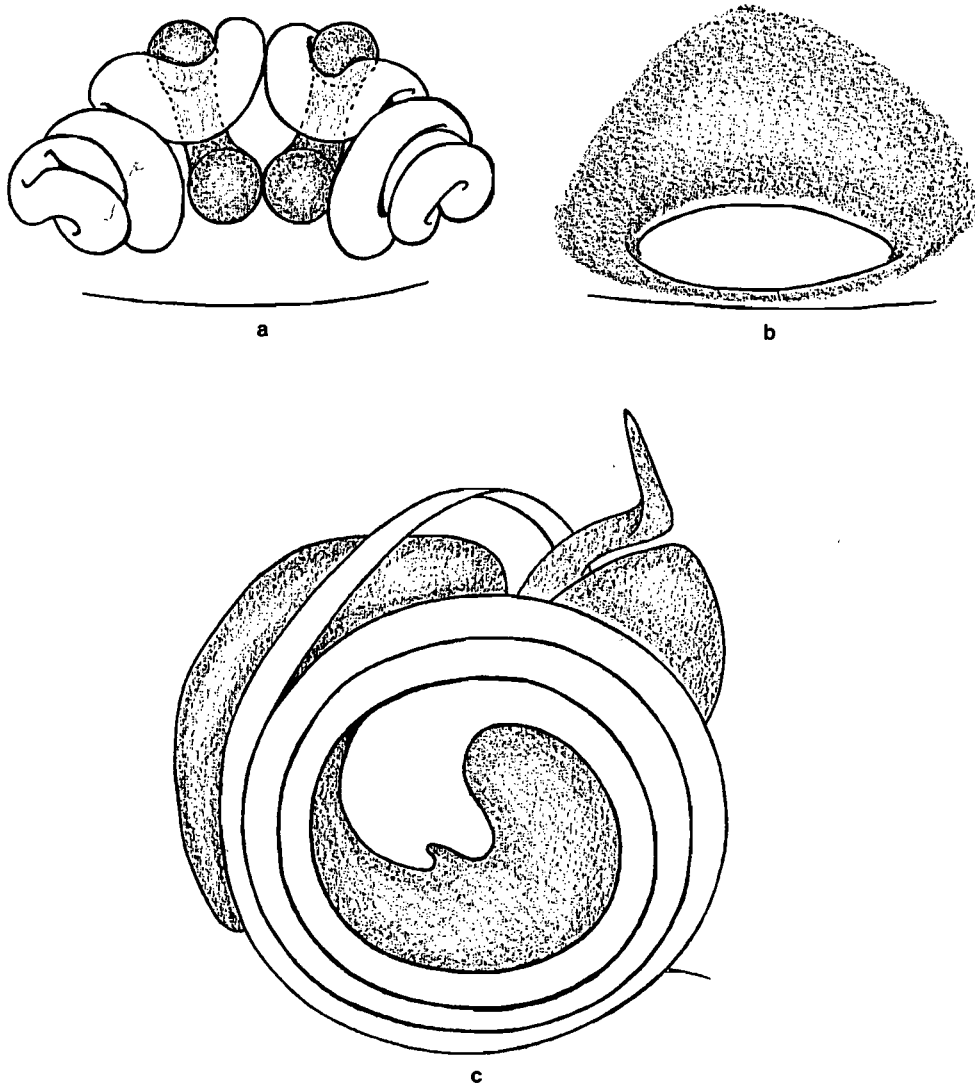
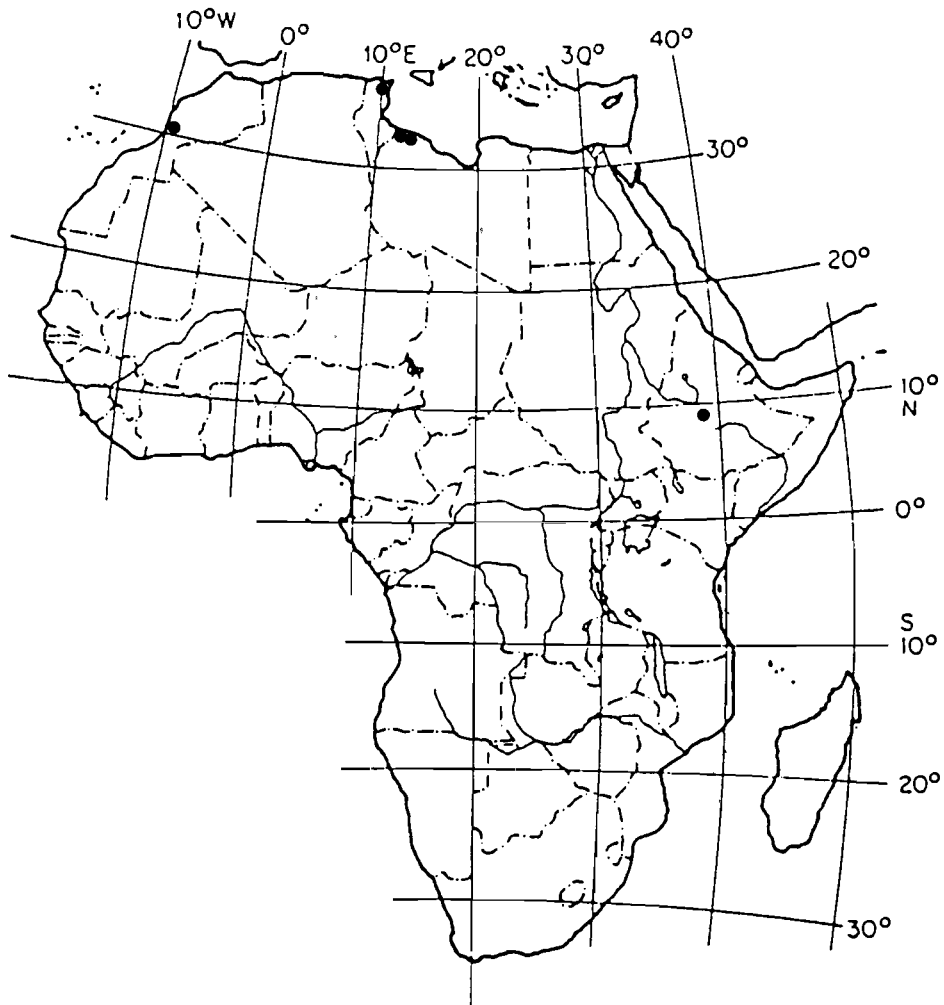


Figure 16(a-c): *Latrodectus tredecimguttatus* (Rossi): a. Female internal genitalia; b. Female external genitalia; c. Male palp showing embolus.



Map 8: Distribution of the *Latrodectus tredecimugttatus* (Rossi) specimens that were examined.

## OPSOMMING

Die genus *Latrodectus* in Afrika is hersien en beskrywende inligting vir mannetjies en wyfies is verskaf. Daar word 8 spesies in Afrika herken en hulle is *L. geometricus*, *L. rhodesiensis*, *L. cinctus*, *L. indistinctus*, *L. karooensis*, *L. pallidus*, *L. renivulvatus* en *L. tredecimguttatus*. Die spesies is verdeel in twee spesie-groepe gebaseer op die rangskikking van die seminale stoorbuis. Twee nuwe sinonieme is uitgewys, naamlik *L. stuhlmanni* = *L. cinctus* en *L. insertus* = *L. renivulvatus*. *Latrodectus karooensis* is verhef van subspesie na spesie vlak. Die mannetjies van *L. cinctus* en *L. renivulvatus* is vir die eerste keer beskryf. 'n Sleutel tot die herkende spesies in Afrika is verskaf.

## REFERENCES

- ABALOS, J.W. 1980. Las arañas del género *Latrodectus* en la Argentina. *Obra Centen. Mus. La Plata* 6: 29-51.
- ABALOS, J.W. & BÁEZ, E.C. 1967. The spider genus *Latrodectus* in Santiago del Estero, Argentina. In: *Animal Toxins* Oxford, Pergamon Press :59-74.
- BLACKWALL, J. 1865. Descriptions of recently discovered species and characters of a new genus, of Araneida from the East of Central Africa. *Ann. Mag. Nat. Hist.* (3)16: 336-352.
- BONNET, P. 1957. *Bibliographia Araneorum*. Toulouse, Les Frères Douladoure 2(3)(F-M): 1927-3026.
- BRIGNOLI, P.M. 1984. Ragni di Grecia 12. Nuovi dati su varie famiglie (Araneae). *Rev. Suisse Zool.* 91: 281-321.
- Broadley, D.G. & Minshull, J.I. 1986. A gazetteer of African countries, their constituent parts, and their synonyms. *Arnoldia Zimbabwe* 9: 333-342.
- CAPORIACCO, L. DI 1933. Araneidi. In: *Spedizione scientifica all'oasi di Cufra (Marzo-Luglio 1931)*. *Ann. Mus. civ. stor. nat. Genova* 56: 311-340.
- CAPORIACCO, L. DI 1949. Aracnidi della colonia del Kenya raccolti da Toschi e Meneghetti Negli Anni 1944-1946. *Commentat. pontif. Acad. Sci.* 13: 309-492.
- CRONWRIGHT SCHREINER, S.C. 1902. Some Arachnids at Hanover, Cape Colony. *Popul. Sci. Monthly* 62: 145-162
- DAHL, F. 1902. Abgebrochene Kopulationsorgane. *Sitzber. Gesell. naturf. Fr. (Berlin)* 1902: 36-45.
- DE MEILLON, B. & GEAR, J. 1947. A note on three noxious arthropods occurring on the Witwatersrand. *S. Afr. med. J.* 21: 407-411.
- DESPORTES, C. 1937. *Latrodectus schulchi* - Araigné venimeuse du Maroc. *Arch. Inst. Pasteur Maroc* 1: 651-665.
- DIPPENAAR-SCHOEMAN, A.S. & NEULANDS, G. 1980. Knopiespinnekoppe van Suid-Afrika. *Boerdery in S.A., pamflet* 146: 1-4.
- FINLAYSON, M.H. 1936. Knoppie-Spider Bite. *S. Afr. Med. J.* 10: 43-49.
- FINLAYSON, M.H. 1937. Specific Antivenine in the Treatment of Knoppie-Spider Bite. *S. Afr. Med. J.* 11: 163-173.
- FINLAYSON, M.H. 1937b. Observations upon Venomous Spiders (*Latrodectus* sp.) of South Africa. *Proc. Zool. Soc. Lond.* 107: 60-63.