

A NEW SPECIES OF WIDOW SPIDER
(GENUS *LATRODECTUS*)
FROM SOUTHERN AFRICA
(ARANEAE: THERIDIIDAE).

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INTRODUCTION. Despite numerous names there are apparently only a few species of widow spiders (Levi 1959). The members of the genus *Latrodectus* are of considerable interest since their venom has a fraction specific to vertebrates, as well as a group of proteins specific to insects, their normal prey. Several new species have recently been discerned as a result of studying the habits of sympatric black widows (Levi 1966, McCrone & Levi 1964). Minor but consistent differences in the genitalia were found later. Also, Abalos (1962,) found four sympatric species of black widows in Argentina, with different habits and egg-sacs.

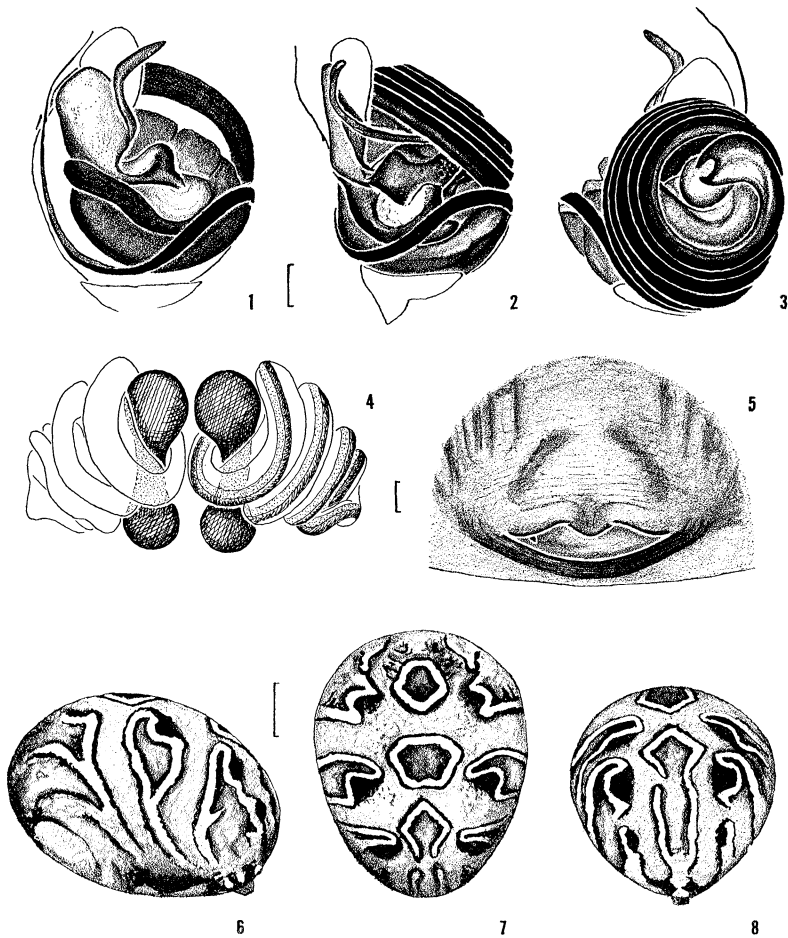
In this paper a new species is described from Rhodesia; the first sibling species of the cosmopolitan Brown widow (*L. geometricus*). This new species was first separated by the distinctive, smooth egg-sacs (Fig. 9). The two species seem to occur together. The genitalia are distinct, in contrast to the sympatric *L. revivensis*, *L. pallidus* and *L. mactans tredecimguttatus* in Israel (Levi 1966).

I have not been able to match this new species to any of the previous descriptions from Africa, most of which are based on color variations of *L. geometricus*.

EGG-SACS The different egg-sacs (Fig. 9) first made me aware of the possibility of another species confused with *L. geometricus*. The egg-sacs of *L. rhodesiensis* are smooth, spherical and dirty white in color (pure white when first constructed). They are larger than the yellow, tufted cocoons of *geometricus*, with an external diameter of 10-18 mm (5-9 mm in egg-sacs of *geometricus* from Rhodesia). These smooth cocoons consist of an inner, pear-shaped, thin-walled sac — approximately half the diameter of the complete structure — surrounded by a layer of fluffy threads.

HEMOLYMPH In a search for other distinguishing characters I examined the hemolymph of the two species using electrophoresis, since McCrone (1967) separated sibling species of *L. mactans* by this

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Figures 1-8. *Latrodectus rhodesiensis*, n.sp. Figs. 1-3, left male palpus. 1. mesal view; 2. ventral view; 3. lateral view. Figs. 4, 5, epigynum. 4. dorsal view, cleared; 5. ventral view. Figs. 6-8, female abdomen. 6. lateral view; 7. dorsal view; 8. posterior view.

Scales: Figs. 1-5, 0.1 mm; Figs. 7-9, 1 mm.

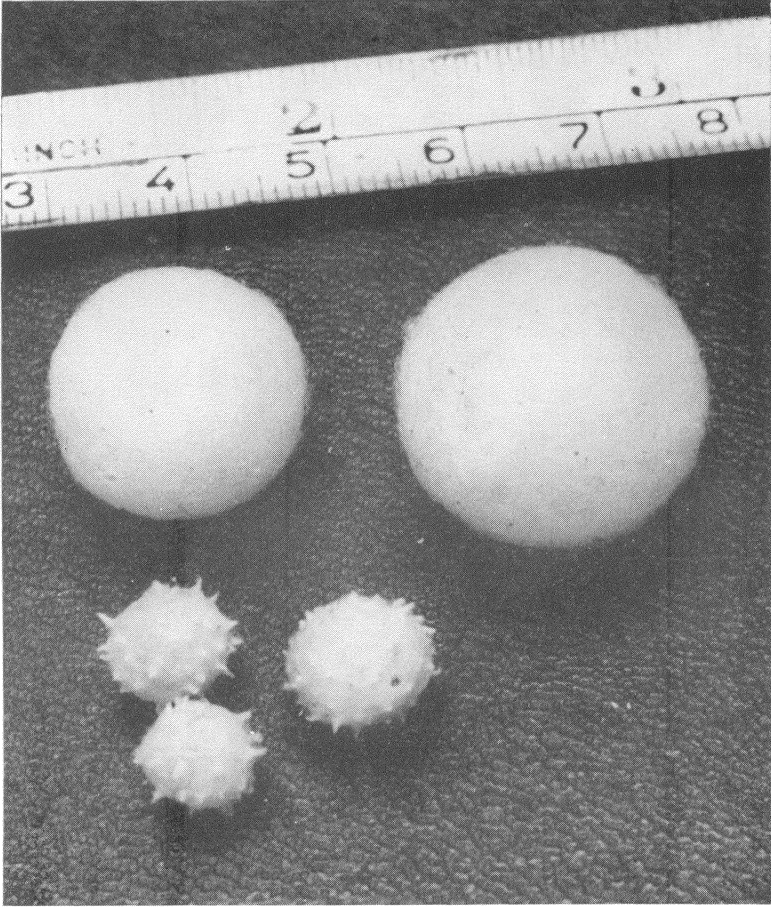


Figure 9. Egg-sacs of *L. rhodesiensis* (smooth) and *L. geometricus* (spiked). Lower scale in centimeters.

method. The runs were made on Schleicher cellulose acetate strips in a Shandon Electric cell, with a Vokam SAE 2761 power pack. Borate buffer (pH 8.48) was used and 150 V constant voltage at 3 ma applied for several hours. The results to date indicate that there are differences, for example in the lowered mobility of the last band in *geometricus* (Fig. 10), but the method is too crude to permit accurate separation.

A difference in the color of the extracted hemolymph was also noted: that from *geometricus* was pale pink and from *rhodesiensis* the hemolymph was colorless.

NATURAL HISTORY The two species are found in the same habitat, often living within a meter of each other. No consistent differences have been noticed in the position of the retreat or in the web structure. A qualitative examination of the prey remains of both species has failed to show food preferences.

Differences have been seen in the breeding biology. The mean number of eggs per cocoon (in captivity) is different: 133.59 ± 39.78 (29 cocoons) for *geometricus*; and 166.38 ± 70.31 (86 cocoons) for *rhodesiensis*. The diameter of the eggs is 0.91-0.92 mm in *geometricus* and 0.92-0.96 mm in *rhodesiensis*. The color of the egg is different: those of *rhodesiensis* are pale yellowish flesh; while eggs of *geometricus* are dark pink. Kaston (1970), however, has noted eggs of different colors in the same cocoons of black widows. The cocoons of both species are parasitized by the larvae of *Mantispa tenella* (Neuroptera: Mantispidae). No consistent differences were discerned in preliminary observations of the postembryological development. Two series of young of each species were reared to the sixth instar (adult males and immature females) and showed no differences in pattern.

***Latrodectus rhodesiensis* sp.n.**

Figures 1-9

TYPES Male holotype, female paratype from Salisbury (Rhodesia), deposited in the Natal Museum, Pietermaritzburg (South Africa). Paratypes deposited in the British Museum (Natural History) and the Museum of Comparative Zoology.

DESCRIPTION. Similar in appearance to *L. geometricus*. Females apparently have similar measurements. The male measures: 2.5 mm total length. Carapace 1.2 mm long and 1.0 mm wide. First femur, 2.3 mm; patella and tibia, 2.6 mm; metatarsus, 2.6 mm; tarsus 1.0 mm. Second patella and tibia, 1.4 mm; third, 0.9 mm; fourth, 1.7 mm.

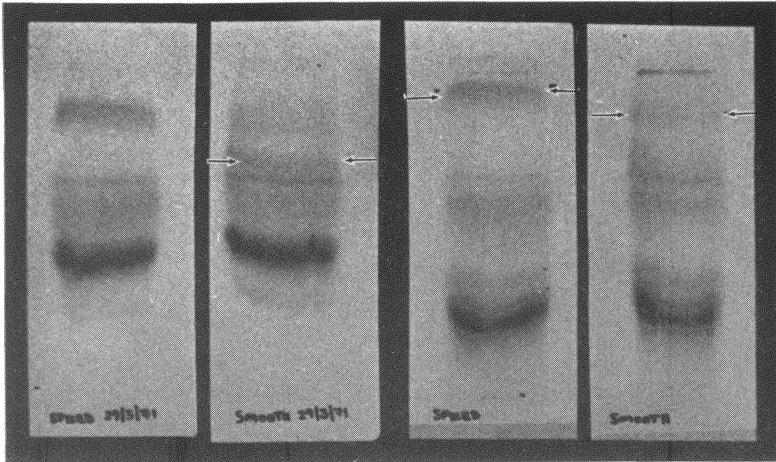


Figure 10. Electrophoresis plates of *L. geometricus* (1st and 3rd plates from left) and *L. rhodesiensis* (2nd and 4th plates). 1st and 2nd; 3rd and 4th plates run together. Differences noted by arrows.

DIAGNOSIS The males are distinguished from *L. geometricus* by the additional coil of the embolus and by the lack of a spur on the conductor (Figs. 1-3). The epigynum is much like that of *geometricus*. The spermathecae are more heavily sclerotised than in *geometricus* and the coils of the ducts extend antero-laterally beyond the spermathecae (Fig. 4). The inner line of the pattern of the female abdomen seems more distinct (Figs. 7, 8).

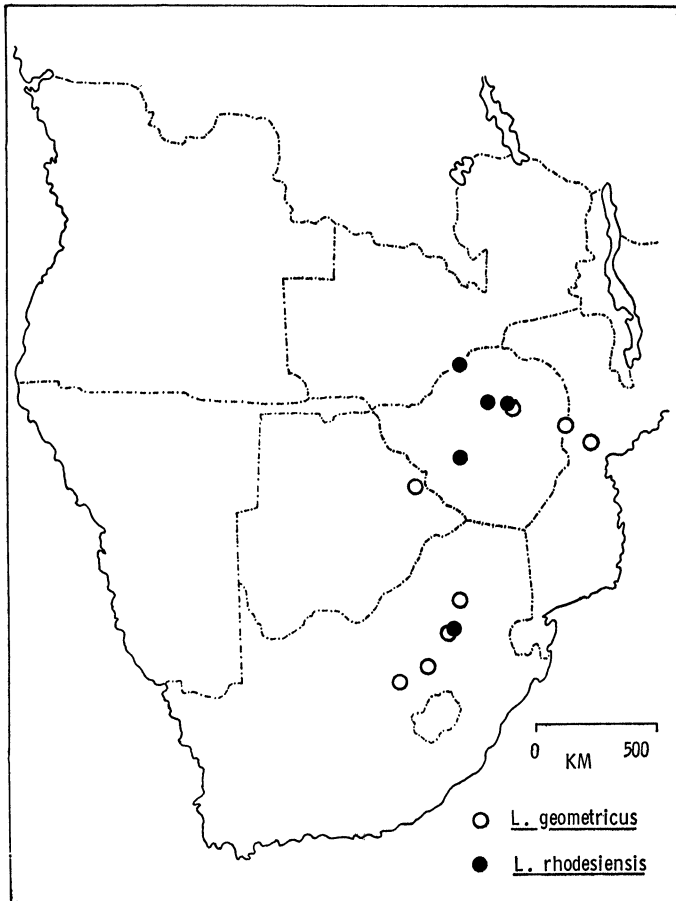
RECORDS Rhodesia: I have collected specimens of *L. rhodesiensis* in Salisbury. Smooth cocoons have been found in Kariba (G. Begg), Darwendale (IRM) and Bulawayo (IRM). I have collected *L. geometricus* in Salisbury and Umtali.

South Africa: J. Ledger (pers. comm.) collected a single female *L. rhodesiensis* in Walkerville (30 Km south of Johannesburg). G. Newlands has sent me specimens of *L. geometricus* from Pretoria (Transvaal), and Kroonstad and Boshof (Orange Free State).

Mozambique: D. Broadley collected a single female *L. geometricus* with egg-sacs 35 Km south of Inchobe, on the new road to NE Mozambique.

Botswana: There is a single female *L. geometricus* in the MCZ collection from Tonota (D. Carmichael).

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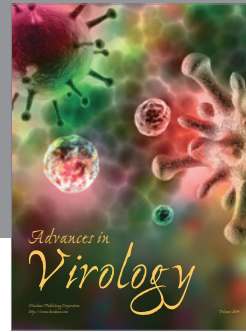
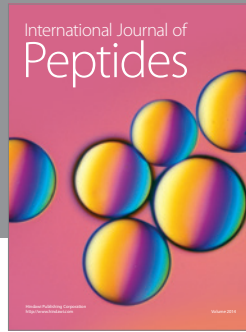


Map 1. Southern African records of *L. rhodesiensis* and *L. geometricus*.

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REFERENCES

- ABALOS, J. W.
1962. The egg-sac in the identification of species of *Latrodectus* (Black widow spiders). *Psyche* 69 268-270.
- KASTON, B. J.
1970. Comparative biology of American black widow spiders. *Trans. San Diego Soc. Nat. Hist.* 16(3) 33-82.
- LEVI, H. W.
1959. The spider genus *Latrodectus*. *Trans. Amer. Microsc. Soc.* 128(1) 7-43.
1966. The three species of *Latrodectus* found in Israel. *J. Zool. London* 150(4) 427-432.
- MCCRONE, J. D.
1967. Biochemical differentiation of the sibling black widow spiders, *Latrodectus mactans* and *L. variolus*. *Psyche* 74(3) 212-217.
- MCCRONE, J. D. AND LEVI, H. W.
1964. North American widow spiders of the *Latrodectus curacaviensis* group (Araneae: Theridiidae). *Psyche* 71(1) 12-27.



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