

supraspecific taxa involved, the generic and subgeneric names *Ctenolepisma* and *Sceletolepisma* will be used here in the same sense that they were in Irish (1987).

All hosts of newly collected nidicoles were identified by the author. For ants, the generic keys in Hölldobler & Wilson (1990) were used, followed by the generic revisions of Bolton (1974, 1980, 1982, 1987) and Prins (1982). Where no recent generic revisions were available, Arnold (1915-24, 1926) was used. Because the latter is unfortunately outdated, species identifications proved impossible in the difficult genera *Crematogaster* and *Pheidole*. Collected hosts remain in the same containers with their lepismatid nidicoles, for future reference and re-identification by experts, if needed.

Under Direction 71 of the International Commission on Zoological Nomenclature (Hemming 1957), a feminine gender was attributed to the name *Lepisma* L. In accordance with majority established usage before and since, this also implies feminine gender for all derivative names, e.g. *Ctenolepisma*. Names of new and known species here have been treated accordingly.

SYSTEMATICS

Afrolepisma oudemansi (Escherich)

Lepisma oudemansi Escherich 1905: 53.

A. oudemansi was previously known from the types, collected at Bothaville, only. It is here recorded from several other places in the western OFS (fig. 2), while unpublished material on hand suggests that it is widespread in southern Africa. The species was adequately redescribed by Mendes (1988). Live individuals are uniform dark silvery grey.

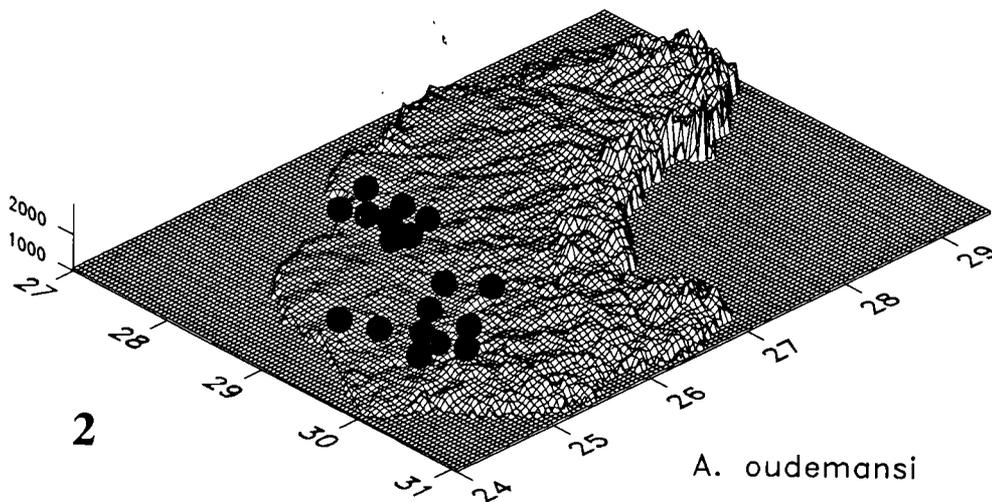


Figure 2: Distribution of *Afrolepisma oudemansi* in the study area.

It is usually myrmecophilous, and the preferred hosts are *Pheidole* species. In the material treated here, the following hosts were recorded:

<i>Pheidole</i> sp.	11 samples
Non-nidicolous, or, host not recorded	4
Unspecified ants	2
<i>Dorylus braunsi</i> Emery	1
<i>Hodotermes mossambicus</i> (Hagen)	1

Material examined: 23 (11 females, 12 males), all BMSA. Also 57 hosts.

Literature localities: 24. Bothaville (Escherich 1905; type locality; with unspecified ants).

New localities: 26. Smaldeel (with *Pheidole* sp.). 70. Groot Brittanje (*Pheidole* sp.). 71. 4 km E Wesselsbron (*Pheidole* sp.). 85. Kromrand (host not recorded). 93. Lemoenhoek (*Pheidole* sp.). 94. 3 km W Allanridge (*Pheidole* sp.). 108. Wanganella (*Pheidole* sp.). 109. Allendale (*Pheidole* sp.). 117. Kaalpan (*Pheidole* sp.). 146. Florisbad (non-nidicolous). 163. Paardenkraal (*Dorylus braunsi*). 166. Naval Hill (non-nidicolous). 174. Athene (*Pheidole* sp.). 187. Boesmansput (non-nidicolous). 197. Winkelhaak (*Pheidole* sp.). 199. Hartebeestplaat (*Pheidole* sp. and *Hodotermes mossambicus*). 212. Langberg (unspecified ants).

Afrolepisma sesotho (Wygodzinsky)

Lepisma sesotho Wygodzinsky 1955: 135.

A. sesotho was previously known from the types, collected in southern Lesotho, only. It occurs throughout the OFS (fig. 3), while unpublished material on hand suggests that it is widespread in southern Africa.

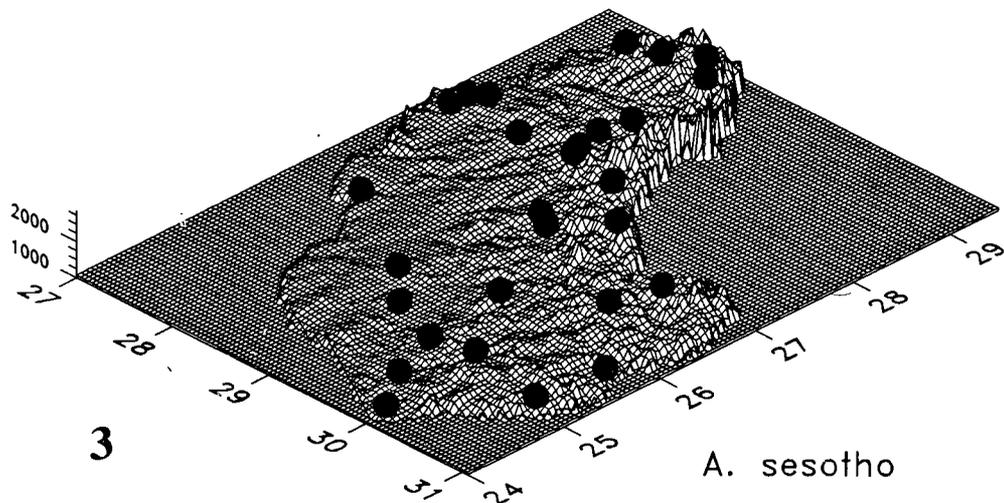


Figure 3: Distribution of *Afrolepisma sesotho* in the study area.

Intraspecific variation is low, so although the original description was based on a single male, it is sufficient to recognise the species. The very globose thorax of the type is not diagnostic for all members of the species. Though all specimens have unusually arcuate posterior margins to the metanotum, only the largest specimens have the thorax disproportionately globose. Smaller specimens are more slender. Males are more often globose than females, and at smaller sizes.

The female conforms to the male in all setational aspects. Fully mature females of *A. sesotho* have the inner processes of coxites IX as long as, or even slightly longer than, styli IX (similar to that described for *A. simulatrix*), but smaller females have the processes shorter. In juvenile specimens, urotergite X is proportionally very much shorter than in adults. Live individuals are uniform shiny honey brown in colour.

In general aspect, *A. sesotho* closely resembles *A. traegardhi*, differing mainly in the size of the infralateral urotergal macrosetal groups: these consist of only two macrosetae in *A. sesotho*, but of 2-4 in *A. traegardhi*. In those individuals of *A. traegardhi* where the infralateral group is reduced to only two macrosetae, only the relative robustness of the outer macroseta (which is as thick as the inner macroseta) reliably distinguishes it from *A. sesotho* (where the outer macroseta is always much more slender than the inner one). *A. sesotho* and *A. traegardhi* also frequent different hosts. These two species, along with the less well known *A. simulatrix* and *A. elegans*, are very similar and probably represent a monophyletic lineage.

A. sesotho is usually myrmecophilous. The following hosts were encountered in the present material:

<i>Messor decipiens</i> Santschi	22 samples
<i>Messor denticornis</i> Forel	3
<i>Trinervitermes trinervoides</i> (Sjöstedt)	2
<i>Camponotus maculatus</i> (F.)	1

The preferred hosts are *Messor* spp. The seed dumps of these ants often contain many *A. sesotho*, and most sampled nests yielded at least some specimens. The host shift from *M. decipiens* to *M. denticornis* in the southwestern OFS probably reflects replacement of the former by the latter, judging from the data on their respective distributions in Bolton (1982). The termite *T. trinervoides* is apparently a rarely utilised secondary host; although it is very common, these are the only records of *A. sesotho* with it. Significantly, the nests of *T. trinervoides* contain large amounts of dry vegetable matter, as do those of *Messor* spp. There is reason to doubt the host status of *Camponotus maculatus*, but it is listed until further collecting clarifies the issue. *A. sesotho* was also found in one house in Bloemfontein, but is not normally anthropophilic.

Material examined: 154 (53 females, 61 males, 40 unsexed); 153 BMSA, 1 SANC. Also 158 hosts.

Localities: 18. 2 km S Kragbron (with *Messor decipiens*). 19. Rietgat (*M. decipiens*). 23. Kwaggadrif (*M. decipiens*). 32. Saaiplaas (*M. decipiens*). 37. Erfdeel (*M. decipiens*). 48.

Goodlands (*M. decipiens*). 51. Kwaggapoort (*M. decipiens*). 86. Sterkfontein (*M. decipiens*). 99. Morgenson (*M. decipiens*). 101. Krugerswens (*M. decipiens*). 103. Alexpan N (*M. decipiens*). 111. Holfontein (*M. decipiens*). 123. Witwal (*M. decipiens*). 125. La France (*M. decipiens*). 132. Lushof (*M. decipiens*). 133. 2 km N Kransfontein (*M. decipiens*). 134. Mobile (*M. decipiens*). 150. Jakhalsfontein (*M. decipiens*). 165. Bloemfontein (in house). 165. Langenhovenpark, Bloemfontein (*Trinervitermes trinervoides*). 187. Boesmansput (*Camponotus maculatus*). 189. Mica Hill (*M. decipiens*). 195. Gansvlei (*M. decipiens*). 203. 18 mi. ex Luckhoff - Wanda (*Trinervitermes trinervoides*). 212. Langberg (*M. denticornis*). 226. Lessingkop (*M. decipiens*). 238. 2 km E Vanstadensrus (*M. decipiens*). 244. Tafelkop (*M. denticornis*). 253. Bethuliedam (*M. denticornis*).

Afrolepisma szeptyckii (Mendes)

Asterolepisma (Afrolepisma) szeptyckii Mendes 1981: 274

A. szeptyckii was previously known only from the holotype, collected near Phillipstown, just across the OFS border to the south-west. It is here recorded from a few places in the western OFS (fig. 4).

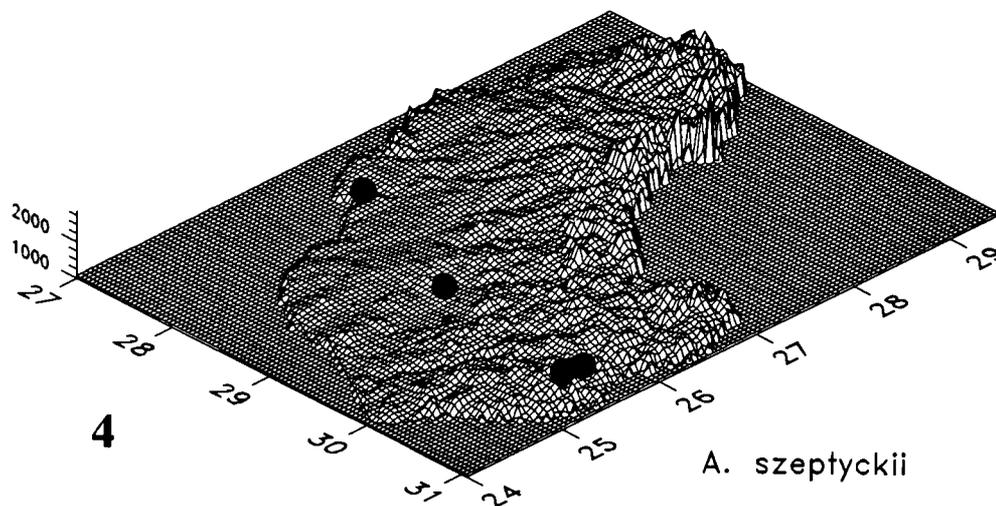


Figure 4: Distribution of *Afrolepisma szeptyckii* in the study area.

The few specimens listed below show some intraspecific variation. In particular, the relative lengths of the urotergal macrosetae, as described by Mendes (1981), are not valid for all individuals of the species. The holotype had the inner infralateral macroseta only one third as long as its adjacent accessory seta. Present material indicates that it is often

up to half or two thirds as long, however, it is always distinctly shorter than the adjacent seta. Similarly, the submedian macrosetae, while always much shorter than the lateral and sublateral setae, are usually not as extremely short as in the holotype. In small specimens, the short inner infralateral macroseta may be present on one or two anterior urotergites only, or it may be completely absent.

A. szeptyckii is normally myrmecophilous, the only recorded host so far is:

<i>Tetramorium sericeiventre</i> Emery	3 samples
Non-nidicolous	1

Material examined: 9 (7 females, 2 males), all BMSA. Also 8 hosts.

Localities: 23. Kwaggadrif (non-nidicolous). 143. Spioenkop (with *Tetramorium sericeiventre*). 250. Kuilfontein (*T. sericeiventre*). 251. Stinkhoutsfontein (*T. sericeiventre*).

Afrolepisma traegardhi (Silvestri)

Lepisma trægårdhi Silvestri 1913: 8.

A. traegardhi is widespread in southern Africa, but has not been recorded from the OFS before. It occurs throughout the province (fig. 5).

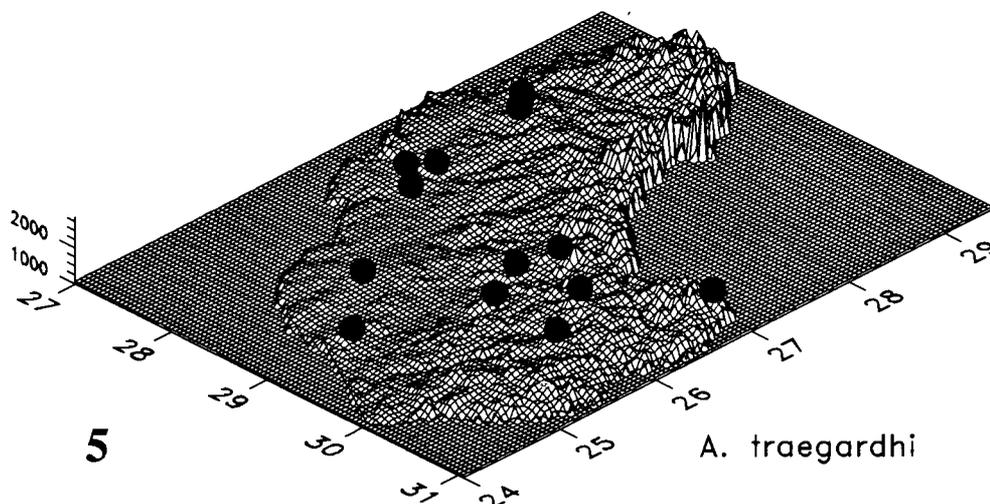


Figure 5: Distribution of *Afrolepisma traegardhi* in the study area.

Its similarity to *A. sesotho*, and the differences between them, was noted under the latter species. As with *A. sesotho*, juveniles have urotergite X proportionally much shorter than adults, though it is still emarginate and the basic setation remains recognisably the same.

A. traegardhi is usually myrmecophilous. In the northern and western OFS it occurs with *Camponotus maculatus*, but in the south and east with *Plectroctena mandibularis*. At one collecting site in the northern OFS it was found with both hosts.

<i>Plectroctena mandibularis</i> Smith	6 samples
<i>Camponotus maculatus</i> (F.)	6
<i>Camponotus angusticeps</i> Emery	1
Non-nidicolous	1

Material examined: 24 (8 females, 14 males, 1 unsexed), all BMSA. Also 43 hosts.

Localities: 31. Skurwepoort (with *Plectroctena mandibularis* and *Camponotus maculatus*). 36. Doorgaan (*P. mandibularis*). 41. Middelpoort (*C. maculatus*). 55. Palm (*C. maculatus*). 56. Mowbray (*C. maculatus*). 87. Katdoornbult (*C. maculatus*). 110. Warmhoek (*C. maculatus*). 147. Rietfontein (*C. angusticeps*). 165. Universitas, Bloemfontein (non-nidicolous). 180. Khumo Flat (*P. mandibularis*). 218. 2 km NE Kruidfontein (large ponerine ant, not collected, probably *P. mandibularis*). 223. 4 km W Dewetsdorp (*P. mandibularis*). 248. 30°17'S 27°19'E (*P. mandibularis*).

Ctenolepisma (Ctenolepisma) longicaudata Escherich

Ctenolepisma longicaudata Escherich 1905: 83.

Though described from the OFS, it is unlikely that southern Africa is the original home of this cosmopolitan anthropophile, as it does not occur in the wild here. All present records are anthropophilic. Because it would convey little biogeographical information, the distribution is not mapped.

Material examined: 15 (11 females, 4 males); 10 BMSA, 5 UOVS.

Literature localities: 24. Bothaville (Escherich 1905, type locality). 106. Swinburne (Irish 1987). 122. Winburg (Irish 1987). 135. Bethlehem (Irish 1990).

New localities: 10. Vredefort. 137. Avondrust. 138. Glen Reenen. 161. Glen. 165. Bloemfontein. 165. Langenhovenpark, Bloemfontein. 165. Pellissier, Bloemfontein. 165. U.O.V.S. Campus, Bloemfontein. 165. Westdene, Bloemfontein.

Ctenolepisma (Sceletolepisma) grandipalpis Escherich

Ctenolepisma grandipalpis Escherich 1905: 85.

C. grandipalpis is common throughout southern Africa, extending to East Africa. While common in the western OFS (fig. 6), it had only been recorded from the province once before.

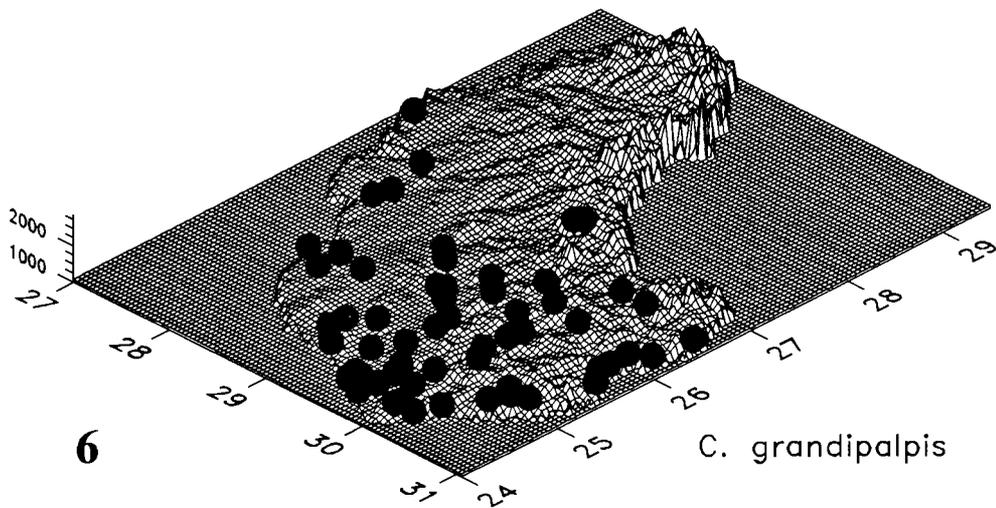


Figure 6: Distribution of *Ctenolepisma grandipalpis* in the study area.

Though *C. grandipalpis* is not an obligate nidicole, it is sometimes found in termite nests. At both Telpoort (locality 216) and Vaalkop (220) it was found in *Trinervitermes trinervoides* mounds. In the former case the mound also housed *Messor* sp. ants. *C. grandipalpis* probably utilises the abundant stores of dry vegetable matter usually present in *T. trinervoides* mounds. Wygodzinsky (1970) previously recorded *C. grandipalpis* from a derelict *T. trinervoides* mound.

Material examined: 219 (74 females, 99 males, 46 unsexed), all BMSA.

Literature localities: 25. 3 miles S Bothaville (Wygodzinsky 1970).

New localities: 16. Middelpunt. 27. Vals River. 54. Rustig. 64. Sandveld Nat. Res. 65. 2 km S. Hoopstad. 66. Renosterkop. 82. Kruis. 83. Bosmansrus. 88. Table Farm. 89. Dorspan. 110. Warmhoek. 115. Bakenskap. 142. Boesmansberg. 143. Spioenkop. 146. Florisbad. 152. Perdeberg. 154. Schoongezicht. 156. Jacobsdal Rietrivier. 157. Jacobsdal. 159. Ramdam. 160. Krugersdrifdam. 162. Glen Research Farm. 164. Aasvoëlkop. 165. Botanical Gardens, Bloemfontein. 166. Naval Hill. 167. Oliewenhuis-koppie. 171. Rusfontein. 176. 4 km E Kafferrivier. 183. Kluitjieskraal. 184. Mekoatleng-Nek. 185. Leeukop. 186. Doornkop. 194. Janee. 195. Gansvlei. 196. Kareeleegte. 198. Wolwekop. 201. Dutoitsbron. 204. Gannapan. 207. Bleskop. 209. Tevredenheid. 213. Vergenoeg. 214. 3 km NE Jagersfontein. 216. Telpoort. 217. Fouriespruitdam. 220. Vaalkop. 222. 2 km SE Suid-deel. 235. Zoetlief. 236. Kruitfontein. 239. Poortjie. 241. Boshofsrust. 242. Vetkop. 243. Lilliefontein. 244. Tafelkop. 245. Allermansdrift. 252. Elim. 253. Bethuliedam. 258. Erfeniskraal. 260. Lushof.

Ctenolepisma (Sceletelepisma) intercura Silvestri

Ctenolepisma intercura Silvestri 1922: 80.

C. intercura is confined to the drier western parts of southern Africa. It is recorded from the OFS for the first time, where it occurs marginally in the south-west (fig. 21).

Material examined: 14 (9 females, 5 males), all BMSA.

Localities: 210. Spitskop. 245. Allermansdrift.

Ctenolepisma intercura/prompta indet.

Without associated females, it is not possible to distinguish between the males of these two taxa.

Material examined: 46 (45 males, 1 unsexed), all BMSA.

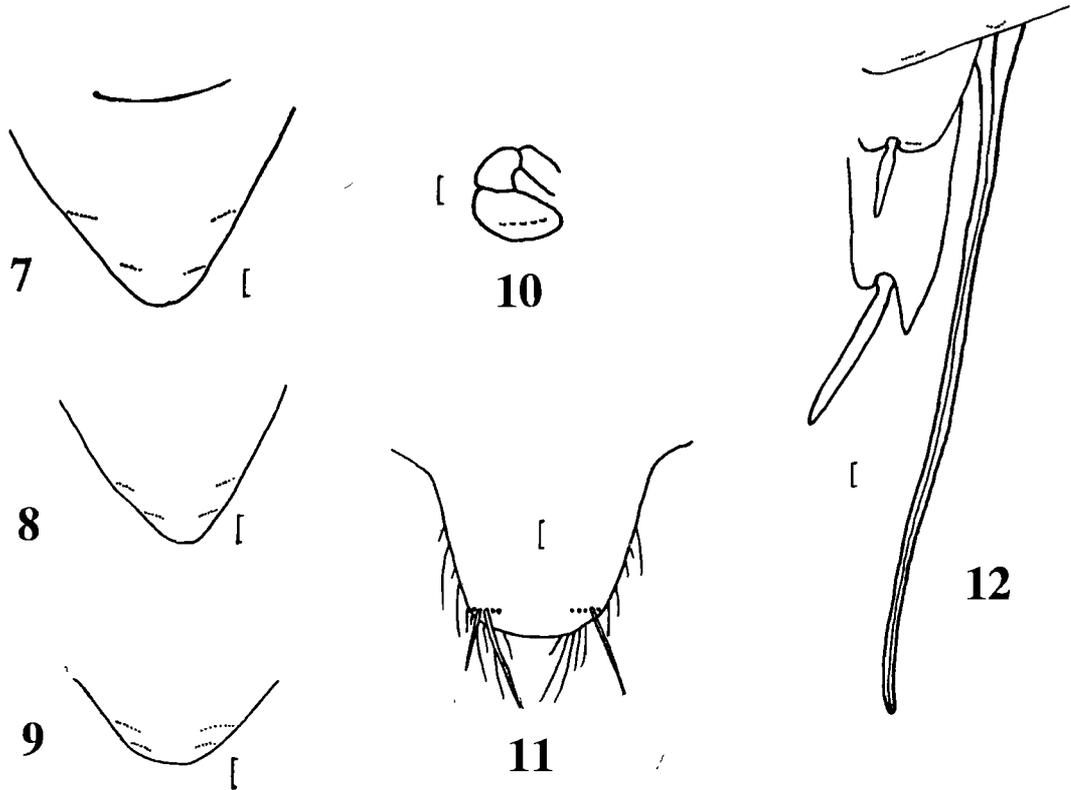
Ctenolepisma (Sceletelepisma) orangica sp. nov.**Description**

Male unknown. Body length of females examined 11 and 9 mm respectively. Antennae and caudal filaments not intact; estimated shorter than body length when intact. Body elongate. Ground colour of body yellowish white. Brownish hypodermal pigment present on the antennae, mouthparts, legs, ovipositor, anal area and caudal filaments. Scales dorsally uniform dark brown (yellowish brown in alcohol), ventrally transparent; densely multistriate. Macrosetae pale yellowish, plumose.

Setation of head as typical for subgenus: 1+1 subtriangular frontal setal tufts, 1+1 elongate supra-antennal tufts, 1+1 clypeal tufts, and 1+1 labral tufts, besides single circumocular macrosetae, and dense mandibular setal fields. Maxillary palp without special features. Distal segment of labial palp unilaterally dilated, about twice wider than long, with five sensory papillae arranged in a single row, and situated away from the apical edge (fig. 10).

Nape with a setal fringe. Pronotum with 7-8 + 7-8, and meso- and metanota each with 6-7 + 6-7 lateral bristlecombs of 2-4 macrosetae each. Each thoracic notum also with 1+1 posterolateral bristlecombs of 3-5 macrosetae each.

Urotergal setation: 2+2 / 3+3 / 3+3 / 3+3 / 3+3 / 3+3 / 3+3 / 2+2 / 0 / 1+1 bristlecombs. Lateral bristlecombs of 6-8, sublateral and submedian bristlecombs of 4-6 macrosetae each. Urotergite X trapezoidal, width to length ratio 0.68, posteriorly straight to slightly rounded, with 1+1 bristlecombs of 4-6 macrosetae each (fig. 11).



Figures 7-12: *Ctenolepisma orangica* sp. nov. Scale bar = 0.1 mm. 7. Prosternum. 8. Mesosternum. 9. Metasternum. 10. Distal labial palp. 11. Urotergite X. 12. Female ovipositor and coxites.

Thoracic sterna shaped as in figs. 7, 8, 9. Prosternum with 2+2 widely separated bristlecombs of 6-8 (proximal pair) or 5-6 (distal pair) macrosetae each (fig. 7). Mesosternum with 2+2 proximate bristlecombs of 6 macrosetae each (fig. 8). Metasternum with 2+2 proximate bristlecombs of 6-8 macrosetae each (fig. 9).

Legs lengthening strongly posteriad; tibia III about twice longer than tibia I. Tibial setation sparse; most spines distinctly shorter than the tibial diameter, only some posteroventral metatibial spines almost attaining lengths equal to the tibial diameter. Tarsi with three distinct segments each, of which the apical one is indistinctly subdivided into two; with two claws and an empodium.

Urosternal setation: 0 / 1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1 / - bristlecombs. Lateral bristlecombs of 10-11, median bristlecombs of 12-17 macrosetae each. Inner processes of coxites IX short, about one third as long as styli IX, with a marginal setal fringe (fig. 12). Two pairs of styli.

Ovipositor slender, reaching beyond the apices of styli IX by about 1.3 times their length, tips of gonapophyses rounded, unsclerotised (fig. 12).

Material examined.

Holotype, female: body length 11 mm, labelled: S. AFRICA; O.F.S., HARRISMITH DISTRICT, Mount Paul SE at: 28°22'S, 28°58'E, 1750m, 8.III.1993, J. Irish, under stones. In alcohol. (BMSA).

Paratype: 1 female, labelled: S. AFRICA, O.F.S., KROONSTAD DISTRICT, Theronsdrif, 1380m, 27°36'S, 27°05'E, 4.XI.1992, J. Irish, under stone. In alcohol. (BMSA).

Distribution and Habitat

Known from two localities in the northern OFS only (fig. 21). The type locality, Mt. Paul (107), is in pure grassland at relatively high altitude. Theronsdrif (57) is situated at lower altitude, in a river valley supporting a major savanna intrusion into the Grassland Biome. At both localities single females of *C. orangica* were collected under roadside stones, with many individuals of both sexes of *C. prompta*.

Discussion

The combination of urotergal and urosternal setation for *C. orangica* is at present unique in the genus. In the key to southern African *Ctenolepisma* spp. in Irish (1987) *C. orangica* will key out to couplet 39, *C. grandipalpis*, from which it differs in the setation of urotergite I. *C. orangica* also bears an overall resemblance to *C. prompta*, but may be distinguished from it by the setation of urotergite VII. The urotergal setation of *C. orangica* also resembles that of the next new species described below, but it differs in urosternal setation.

Etymology: The name is an arbitrary combination, derived from part of the geographical name 'Orange Free State'.

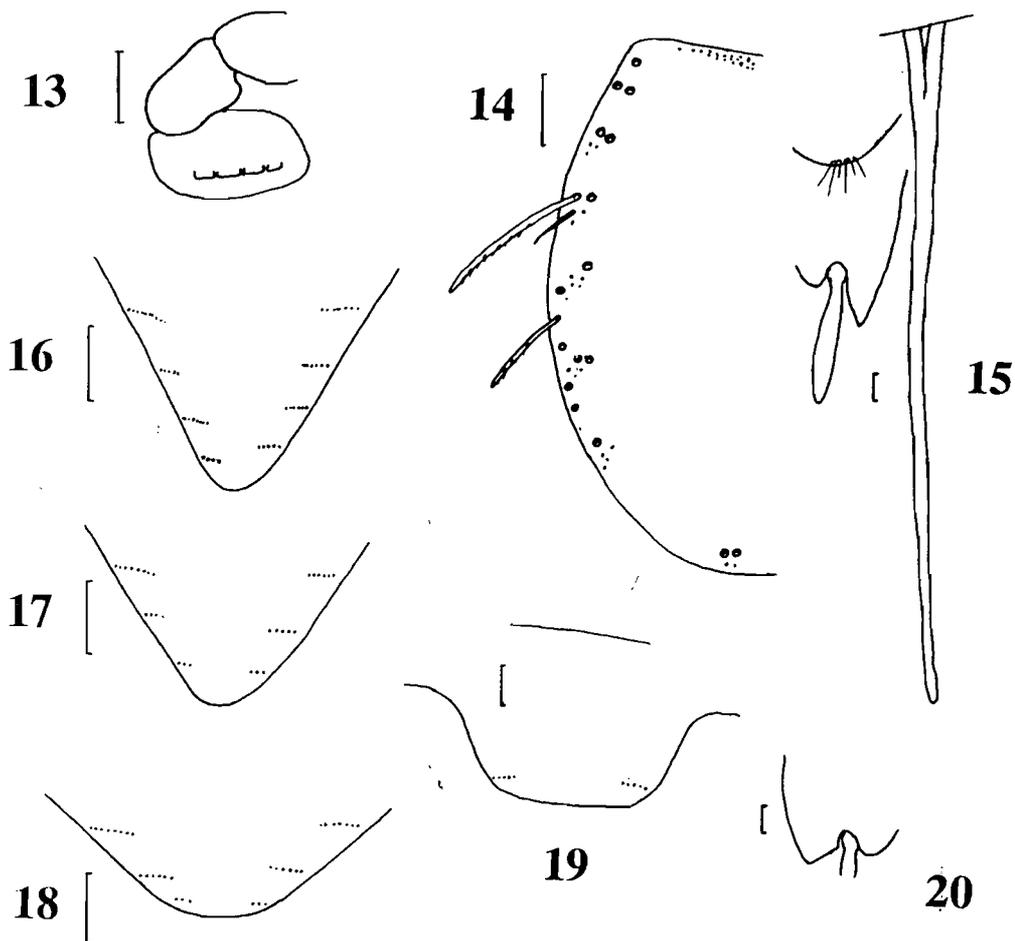
Ctenolepisma (Sceletolepisma) ovensis sp. nov.

Description

Body length of both sexes up to 8.25 mm. Antennae about 0.75 times body length; caudal filaments about equal to body length. Body elongate. Ground colour of body yellowish white. Faint brownish hypodermal pigment present; generally distributed, nowhere especially dense, most noticeable on the basal cerci. Scales dorsally uniform dark brown in alcohol, ventrally transparent; densely multistriate. Macrosetae pale yellowish, plumose.

Setation of head as typical for subgenus: 1+1 subtriangular frontal setal tufts, 1+1 elongate supra-antennal tufts, 1+1 clypeal tufts, and 1+1 labral tufts, besides single circumocular macrosetae, and dense mandibular setal fields. Maxillary palp without

special features. Distal segment of labial palp unilaterally dilated, about 1.75 - 2 times wider than long, with four sensory papillae arranged in a single row, and situated away from the apical edge (fig. 13).



Figures 13-20: *Ctenolepisma ovsensis* sp. nov. Scale bar = 0.1 mm. 13. Distal labial palp. 14. Pronotum, lateral. 15. Female genital area. 16. Prosternum. 17. Mesosternum. 18. Metasternum. 19. Urotergite X. 20. Male coxite IX.

Nape with a setal fringe. Pronotum with 5-7 + 5-7, and meso- and metanota each with 5-6 + 5-6 ill-defined lateral bristlecombs of 1-3 (usually 2) macrosetae each. Posteriad of each major lateral bristlecomb is a small triangular field of minor setae (fig 14). Each thoracic notum also with 1 + 1 posterolateral bristlecombs of 2-4 (usually 2) macrosetae each.

Urotergal setation: 2+2 / 3+3 / 3+3 / 3+3 / 3+3 / 3+3 / 3+3 / 2+2 / 0 / 1+1 bristlecombs. Lateral bristlecombs of 5-6, sublateral and submedian bristlecombs of 4 macrosetae each. Urotergite X trapezoidal, width to length ratio 0.59, posteriorly straight, with 1+1 bristlecombs of 5 macrosetae each (fig. 19).

Thoracic sterna shaped as in figs. 16, 17, 18. Prosternum with 4-5 + 4-5 bristlecombs of 4 (distally) to 10 (proximally) macrosetae each. Mesosternum with 3-4 + 3-4, and metasternum with 3+3 bristlecombs each; bristlecombs for both of 3 (distally) to 8 (proximally) macrosetae each. ✓

Legs lengthening moderately posteriad; tibia III about 1.25 times longer than tibia I. Tibial setation sparse; most spines distinctly shorter than tibial diameter, only some posteroventral metatibial spines attaining lengths equal to or slightly surpassing the tibial diameter. Tarsi with three distinct segments each, of which the apical one is indistinctly subdivided into two; with two claws and an empodium.

Urosternal setation: 1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1 / - bristlecombs. Lateral bristlecombs of 7 (anteriad) to 11-12 (posteriad), median bristlecombs of 12-15 macrosetae each. Inner processes of coxites IX short, about one third as long as the stylus in females, slightly shorter in males, with a marginal setal fringe (figs 15, 20). Both sexes with one pair of styli only.

Ovipositor slender, reaching beyond the apices of styli IX by about twice their length, tips of gonapophyses rounded, unsclerotised (fig. 15). Penis as normal for genus.

Material examined:

Holotype, female: body length 8 mm, labelled: S. AFRICA; O.F.S., BLOEMFONTEIN DIST., Vaalkop, 29°08'S, 26°21'E, 10.IX.1991, A. Wels. In alcohol. (BMSA)

Paratypes: 2 females, 4 males, labelled as holotype. In alcohol. (BMSA).

5 females, 9 males, labelled: S. AFRICA; O.F.S., BLOEMFONTEIN DIST., Diepfontein, 29°13'S, 26°35'E, 10.IX.1991, A. Wels. In alcohol. (BMSA)

Distribution and Habitat

Known from two proximate localities in the central southern OFS only (fig 21). The area consists of grassland, with low bush on hill slopes.

Discussion

The combination of urotergal and urosternal setation for *C. ovsensis* is at present unique in the genus. In the key to southern African *Ctenolepisma* spp. in Irish (1987) *C. ovsensis* will key out to an unnamed extralimital species in couplet 12. The latter is the central African *C. tenebrica* Silvestri, from which *C. ovsensis* differs in the setation of urotergite I. Etymology: The name is based on the abbreviation 'O.V.S.'

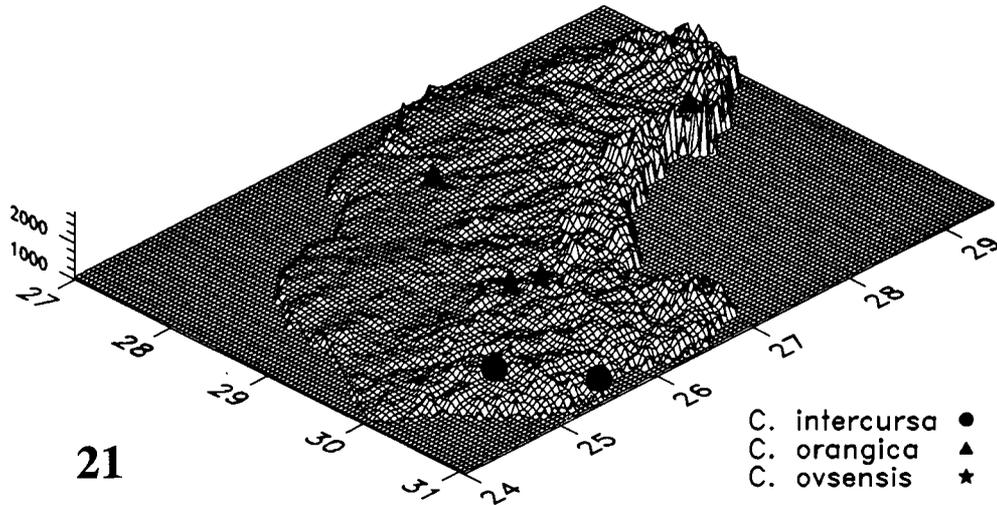


Figure 21: Distribution of *Ctenolepisma intercursa*, *C. orangica* and *C. ovsensis* in the study area.

Ctenolepisma (Sceletolepisma) suliptera sp. nov.

Ctenolepisma pluriseta auct., nec Silvestri 1908.

Irish (1987) found the typical habitat of *C. pluriseta* to be Kalahari dunes, or at least sandy substrates, therefore the records of it from as far afield as the Cape Peninsula and northern Tanzania (Wygodzinsky 1955, 1965) were somewhat anomalous. Examination of the single, immature, Cape Peninsula specimen did not reveal any firm characteristics by which it could be distinguished from *C. pluriseta*, and the matter was left at that. During the present study minor differences between OFS '*C. pluriseta*' and typical Kalahari *C. pluriseta* were noted. Eventually material from the edge of the Kalahari dunes (outside the OFS to the west) showed that these differences were constant and showed no overlap, and that the two forms were isolated by different habitat preferences.

Some material previously identified as *C. pluriseta* by myself and others will probably turn out to belong to *C. suliptera* instead. All will need to be rechecked, but provisionally it is assumed that most records from Namibia and Botswana are probably true *C. pluriseta*, as are those from dune areas of the northern Cape Province of South Africa. Records from elsewhere in southern Africa are more likely to refer to *C. suliptera*.

Description

Body length of both sexes up to 10 mm. Antennae and caudal filaments all about 0.5 times body length. Body elongate. Ground colour of body yellowish white. Faint brownish hypodermal pigment present; generally distributed, most noticeable on the mouthparts, legs, caudal filaments and genital area. Scales dorsally uniform dark brown in alcohol, ventrally transparent; densely multistriate. Macrosetae golden yellow, plumose.

Setation of head as typical for subgenus: 1+1 subtriangular frontal setal tufts, 1+1 elongate supra-antennal tufts, 1+1 clypeal tufts, and 1+1 labral tufts, besides single circumocular macrosetae, and dense mandibular setal fields. Maxillary palp without special features. Distal segment of labial palp unilaterally dilated, about 1.5 times wider than long (generally slightly wider in males than females), with five sensory papillae arranged in a single row (figs. 22, 23).

Nape with a setal fringe. Each thoracic notum with 6-8 + 6-8 lateral and 1+1 posterolateral bristlecombs, all of 2-3 macrosetae each.

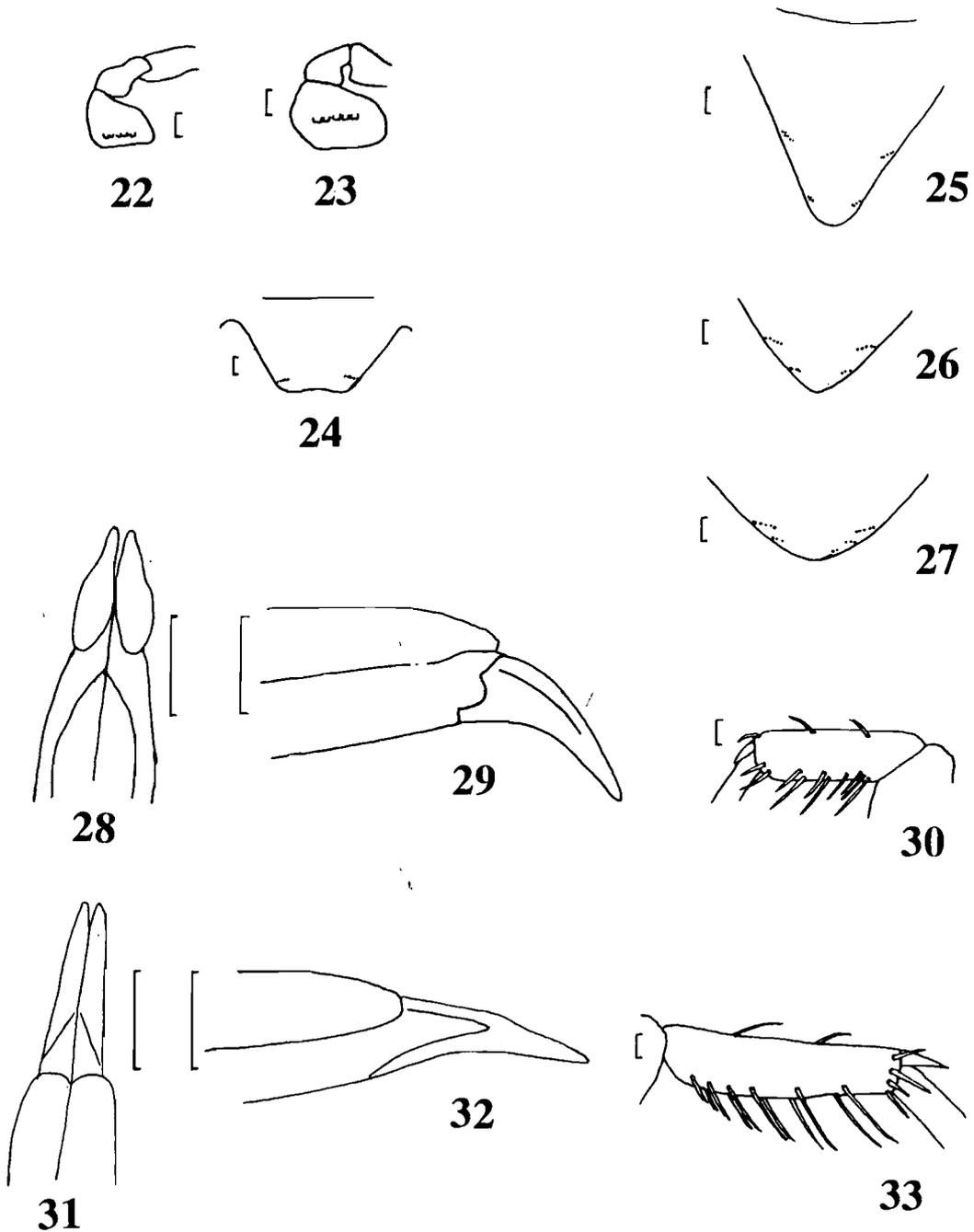
Urotergal setation: 1+1 / 3+3 / 3+3 / 3+3 / 3+3 / 3+3 / 3+3 / 2+2 / 0 / 1+1 bristlecombs. Lateral bristlecombs of 6-7, sublateral and submedian bristlecombs of 4-5 macrosetae each. Urotergite X trapezoidal, width to length ratio 0.53, posteriorly slightly emarginate, with 1+1 bristlecombs of 5 macrosetae each (fig. 24).

Thoracic sterna shaped as in figs. 25, 26, 27. Prosternum with 2-4 + 2-4 and mesosternum with 2-3 + 2-3 bristlecombs of 2 (distally) to 7 (proximally) macrosetae each. Metasternum with 2+2 bristlecombs of 5-7 macrosetae each.

Legs lengthening strongly posteriad; tibia III about twice longer than tibia I. Tibial setation moderately robust (fig. 30); each tibia with 1-2 dorsal, 2-3 anteroventral, 2-3 (or 4 on metatibia) posteroventral and 2-3 preapical inner macrosetae. Most metatibial macrosetae attaining or surpassing tibial diameter. Tarsi with three distinct segments each, of which the apical one is indistinctly subdivided into two; with two claws and an empodium.

Urosternal setation: 0 / 1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1+1 / 1+1 / - bristlecombs. Lateral bristlecombs of 8-11, median bristlecombs of 5 (posteriad) to 12 (anteriad) macrosetae each. Bristlecombs on inner processes of coxites VIII generally of only 3 macrosetae each, outer processes with a small setal cluster each. Inner processes of coxites IX about half to two thirds as long as the stylus in females, slightly shorter in males, with a marginal setal fringe. Both sexes with two pairs of styli.

Ovipositor short and stout, reaching to level with the apices of styli IX. Setae on shaft of ovipositor anteriorly directed. Posterior gonapophyses apically pointed and heavily sclerotised, curved dorsad at an angle of about 45° with the long axis of the ovipositor. Anterior gonapophyses apically pointed, hyaline or lightly sclerotised (figs. 28, 29). Penis as normal for genus.



Figures 22-30: *Ctenolepisma suliptera* sp. nov. Scale bar = 0.1 mm. 22. Distal labial palp, female. 23. Distal labial palp, male. 24. Urotergite X. 25. Prosternum. 26. Mesosternum. 27. Metasternum. 28. Apical ovipositor, ventral view. 29. Apical ovipositor, lateral view. 30. Metatibia.

Figures 31-33: *Ctenolepisma pluriseta* Silvestri. Scale bar = 0.1 mm. 31. Apical ovipositor, ventral view. 32. Apical ovipositor, lateral view. 33. Metatibia.

Material examined:

Holotype, female: body length 9.75 mm, labelled: S. AFRICA, O.F.S., BLOEMFONTEIN DIST., Naval Hill, SE2926Aa, 2.IX.1991, L. Lotz. In alcohol. (BMSA)

Paratypes, all in alcohol, all in BMSA:

2 females, 2 males: NMBH 24702, S. AFR., O.F.S., DEWETSDORP DIST., Voorspoed, 29°36'S, 26°51'E, 22.III.1991, A. Wels, under stones.

1 female, 2 males: NMBH 30115, S. AFRICA, O.F.S., ZASTRON DISTRICT at: 30°11'S, 27°12'E, 1650m, 8.VIII.1991, J. Irish, under stones.

1 female, 1 male: NMBH 30123: S. AFRICA, O.F.S., ZASTRON DISTRICT, Wildealsnek, 1600m, 30°23'S, 27°07'E, 8.VIII.1991, A. Wels, under stones.

3 females, 1 male: NMBH 30140, S. AFRICA, O.F.S., ROUXVILLE DISTRICT, Erfeniskraal, 1380m, 30°33'S, 26°26'E, 9.VIII.1991, under stones, J. Irish & A. Wels.

1 female, 2 males: NMBH 30148, S. AFRICA, O.F.S., SMITHFIELD DISTRICT, Zoetlief, 1300m, 30°25'S, 26°19'E, 12.VIII.1991, J. Irish, under stones.

1 female, 2 males: NMBH 30149, S. AFRICA, O.F.S., JACOBSDAL DISTRICT, Michville, 1160m, 29°14'S, 24°36'E, 7.VI.1991, A. Wels, under stones.

2 females, 1 male: NMBH 30150, S. AFRICA, O.F.S. FAURESMITH DISTRICT, Roodedam 50, 1360m, 29°48'S, 25°03'E, 13.VIII.1991, J. Irish, under stones.

2 females, 2 males, 1 unsexed: NMBH 30157, S. AFRICA, O.F.S., JACOBSDAL DISTRICT, Perdeberg, 1200, 28°58'S, 25°05'E, 7.VI.1991, J. Irish & A. Wels, under stones.

2 females, 1 male: NMBH 30163, S. AFRICA, O.F.S., FAURESMITH DISTRICT, Klein Hartebeesfontein 78, 29°53'S, 25°18'E, 1475m, 22.II.1991, J. Irish, under stones.

1 female, 3 males: NMBH 30166, S. AFRICA, O.F.S., BLOEMFONTEIN DIST., Wolwekop, 1350m, 29°27'S, 26°01'E, 15.II.1991, J. Irish, under stones.

3 females, 3 males: NMBH 30183, S. AFRICA, O.F.S., LADYBRAND DISTRICT, Kootmansrus, 1560m, 29°31'S, 27°09'E, 23.IX.1991, J. Irish, under stones.

2 females, 2 males: NMBH 30184, S. AFRICA, O.F.S., EXCELSIOR DISTRICT, Bovenlei, 1420m, 28°49'S, 26°54'E, 9.X.1992, J. Irish, under stones.

1 female, 7 males: NMBH 31619, S. AFRICA, O.F.S., FAURESMITH DISTRICT, Ramah, 1070m, 29°39'S, 24°22'E, 30.VIII.1993, J. Irish, under stones.

Additionally, 181 (90 females, 79 males, 12 unsexed), excluded from the type series, were examined from the following localities: 73. Bern-Elise. 79. Grootputs. 88. Table Farm. 93. Lemoenhoek. 141. Naudes Lust. 147. Rietfontein. 151. 3 km W Generaalsnek. 155. Leeuwpan. 166. Naval Hill. 170. Lindsvelei. 174. Athene. 181. Thaba Nchu Berg. 182. Vlakfontein. 185. Leeukop. 190. Spitskop. 192. Bethaven. 199. Hartebeestplaat. 205. 3 km SE Luckhoff. 207. Bleskop. 219. Dagbreek. 221. 10 km WNW Reddersburg. 223. 4 km W Dewetsdorp. 224. Devon Farm. 228. Matjesfontein. 229. Pienaarsfontein. 230. Noupoot. 231. Vaalspruit. 232. Hoogstede. 233. Erfhoek. 234. Van Wyksrus. 240. Kruidfontein. 246. Oranjekrag Lughawe. 255. 3 km N Rouxville. 256. Bekkerskraal. 257. Broederstroom. 259. Kromdraai.

Distribution and Habitat

Presently known from the southern half of the OFS only (fig. 34), but re-examination of material from outside the Kalahari, previously identified as *C. pluriseta*, is expected to indicate a wider distribution.

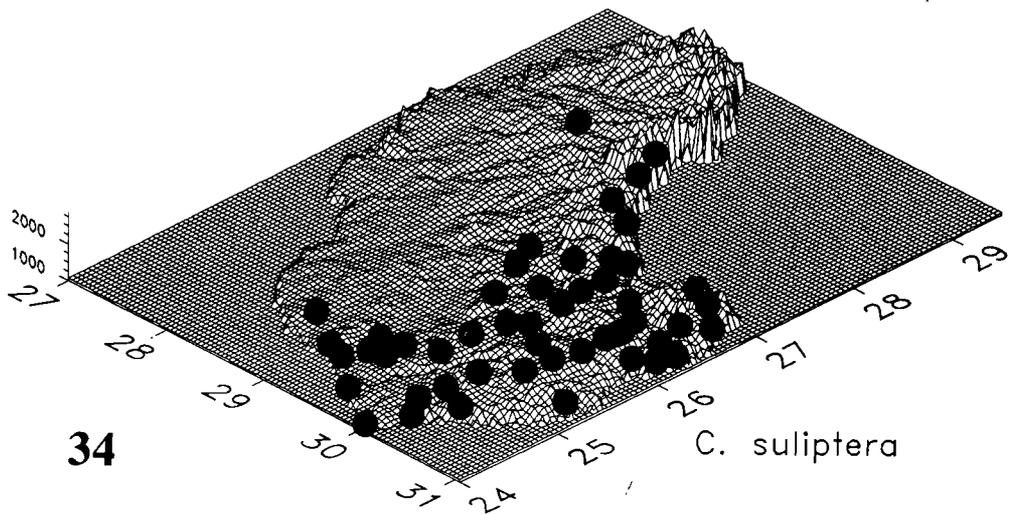


Figure 34: Distribution of *Ctenolepisma suliptera* in the study area.

Discussion

In the key to southern African *Ctenolepisma* spp. in Irish (1987) *C. suliptera* will key out to *C. pluriseta* Silvestri in couplet 38. *C. pluriseta* differs from *C. suliptera* in its more robust tibial setation (pro- and mesotibiae tend to have 3-4 anteroventral macrosetae, with up to 6 on the metatibia, while the 3-4 preapical inner macrosetae are especially distinct, fig. 33); different apical ovipositor (posterior gonapophyses apically more slender and less upcurved, anterior gonapophyses are apically rounded and unsclerotised, figs. 31, 32); smaller urosternal bristlecombs (especially the median bristlecombs tend to consist of only 3-5 macrosetae, even on the anterior urosternites); generally larger bristlecomb on the inner process of coxite VIII (consisting of 5 or more macrosetae); and different habitat preference (psammophilous, often on sand dunes).

Etymology: The name is a meaningless anagram of *pluriseta*.

Ctenolepisma (Sceletolepisma) plusiochaeta Silvestri

Ctenolepisma plusiochaeta Silvestri 1922: 83.

C. plusiochaeta was previously known from central and northern Namibia only (Irish 1987). Its finding in the western OFS (fig. 35) represents a major range extension. It is suspected that this is due to insufficient collecting in the intervening parts of southern Botswana and the Northern Cape Province, rather than representative of any true disjunction in distribution. In life they are dorsally uniformly shiny jet black, with the insertions of the bristlecombs on the abdomen visible as tiny white spots. Specimens with abraded scales progressively become dark brown.

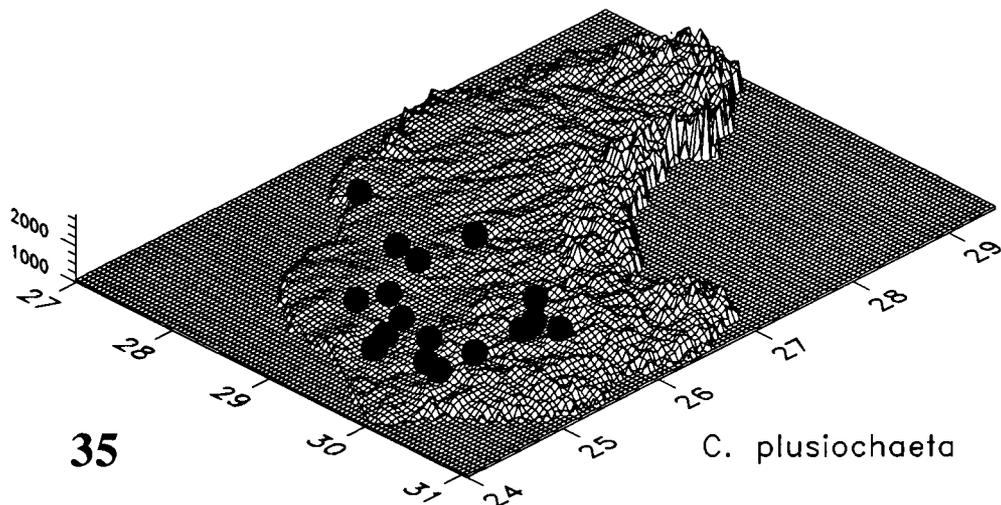


Figure 35: Distribution of *Ctenolepisma plusiochaeta* in the study area.

Ctenolepisma spp. normally have no setae on urotergite IX. In a sample of 12 specimens from near Kruidfontein (218), there were five individuals with 1+1, and a sixth with 1+0, bristlecombs on urotergite IX. In other respects these individuals resemble *C. plusiochaeta*, and the rest of the same sample and all other material listed below also conform to typical *C. plusiochaeta*.

Though it is not an obligate nidicole, *C. plusiochaeta* is occasionally found associated with ants. For a long time I believed that such findings represented lepismatids sheltering under the same stone as the ants' nest, but outside the nest, falling into the nest when the stone is overturned. A sample from Lemoenhoek (93) dispelled this, as here *C. plusiochaeta*, *A. oudemansi* and myrmecophilous Paussidae beetles were found in one *Pheidole* nest, under circumstances leaving no doubt that they were actually inhabitants of the nest. Since the only identified host, *Pheidole* sp., is a granivorous ant, *C. plusiochaeta* may simply be

opportunistically exploiting seed reserves in their nests. Host records are:

<i>Pheidole</i> sp.	2 samples
unspecified small ants, possibly also <i>Pheidole</i> sp.	1

Material examined: 55 (32 females, 23 males), all BMSA. Also 6 ants.

Localities: 23. Kwaggadrif. 80. Uitkyk 614. 81. Annaspan. 91. Langkuil. 93. Lemoenhoek. 108. Wanganella. 112. Wesselsrus. 116. 2 km W Theunissen. 152. Perdeberg. 173. Vaalbank. 187. Boesmansput. 197. Winkelhaak. 201. Dutoitsbron. 212. Langberg. 215. Bethany. 218. 2 km NE Kruidfontein. 221. 10 km WNW Reddersburg.

Ctenolepisma (Sceletolepisma) prompta Silvestri

Ctenolepisma prompta Silvestri 1922: 77.

C. prompta is widespread in northern and eastern southern Africa, extending to East Africa. Though found throughout the OFS (fig. 36), it had not been recorded from the province before. In the higher altitude grasslands of the northeastern OFS, *C. prompta* is the only non-nidicolous lepismatid that was encountered during this survey.

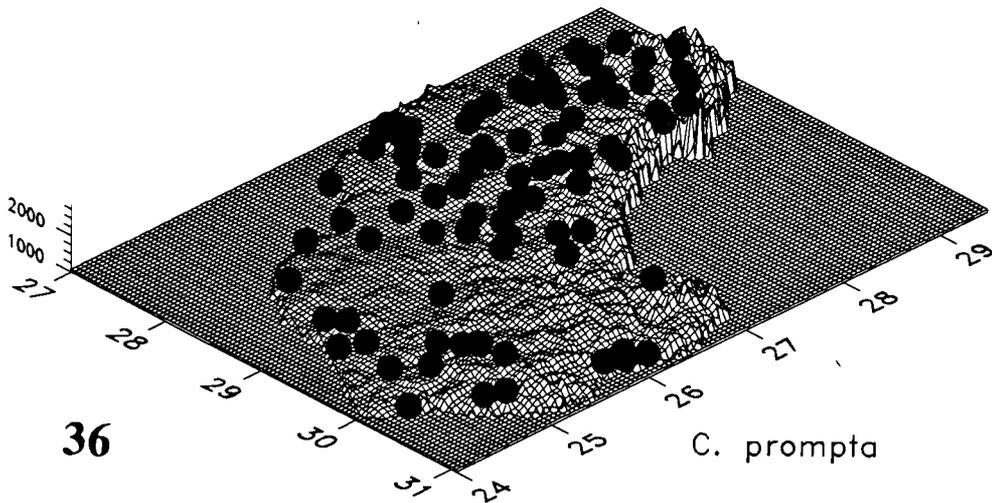


Figure 36: Distribution of *Ctenolepisma prompta* in the study area.

The scale pattern of live individuals has not been described before. The overall dorsal colour is uniform greyish. The thoracic nota have narrow yellowish lateral margins. On the urotergites, the bristlecombs are surrounded by small darker coloured patches, resulting in a faint brown and grey chequered pattern on the abdomen. The pattern described above is only visible on freshly moulted specimens. Abraded individuals are uniform brown or grey.

Material examined: 432 (197 females, 216 associated males, 19 unsexed), all BMSA.

Localities: 5. Rebokkop. 6. Vaalkop. 7. Mooihoek. 8. Edenvale. 9. 2 km N Vredefort. 11. Paardekraal. 12. Wittekopjes. 14. Vooruitsig. 20. Doornhoutrivier. 30. Houtkop. 33. Warwick. 34. Kalkfontein. 35. Slootkraal. 39. Scarborough. 41. Middelpoort. 42. Groenplaas. 43. Kleinkop. 44. Homestead. 45. Leeuspruit. 46. Pietersdeel. 47. Lebanon. 49. Jakkalskop. 50. Jacoba. 52. Mooigeleë. 53. Vastrap. 55. Palm. 56. Mowbray. 58. Rustig. 59. Albanie. 60. Meriba. 61. Dorothea. 62. Holfontein. 64. Sandveld Nat. Res. 68. Nooitgedacht. 69. Merwehof. 72. Susannaskop. 73. Bern-Elise. 74. Welkom. 75. Het-Hom. 82. Kruis. 87. Katdoornbult. 92. Uitkyk. 102. 95. Vaalkop. 96. Koppie Alleen. 97. Rietkuil. 98. Grootkop. 100. Leeukop. 102. Vleiplaas. 104. Mooihoek. 105. Aberfeldy. 107. Mount Paul SE. 113. Welgemoed. 114. Bosrand. 116. 2 km W Theunissen. 119. Rooipoort. 120. Morgenrood. 121. Sun Valley. 124. Kafferskraal. 127. Poortjie. 128. Wilgeboom. 129. Rooikoppie. 130. Eliza Noord. 136. Te Vrede. 137. Avondrust. 139. Kafferskop. 140. Breda. 145. Vaalbank. 148. Good Hope. 149. Nooitgedacht. 152. Perdeberg. 160. Krugersdrifdam. 179. Excelsior-Nek. 181. Thaba Nchu Berg. 188. Bethel. 195. Gansvlei. 199. Hartebeestplaat. 200. Rustpunt. 201. Dutoitsbron. 207. Bleskop. 213. Vergenoeg. 227. Plaatjieskraal. 235. Zoetlief. 237. Durand. 241. Boshofsrust. 243. Liliesfontein. 252. Elim. 254. Tussen-die-Riviere. 258. Erfeniskraal.

Xenolepisma globosa (Escherich)

Lepisma globosa Escherich 1905: 50.

X. globosa is widespread in southern Africa, but had not been recorded from the OFS before. It occurs throughout the province (fig. 37).

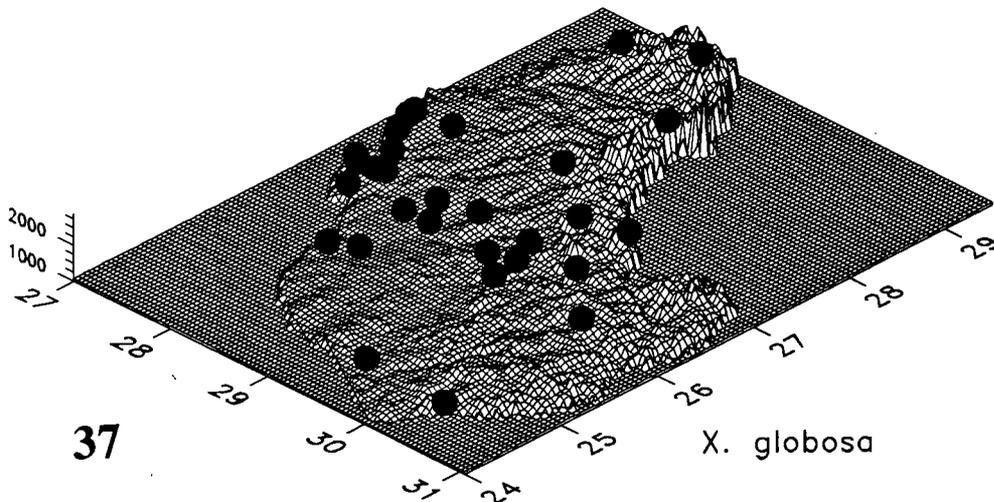


Figure 37: Distribution of *Xenolepisma globosa* in the study area.

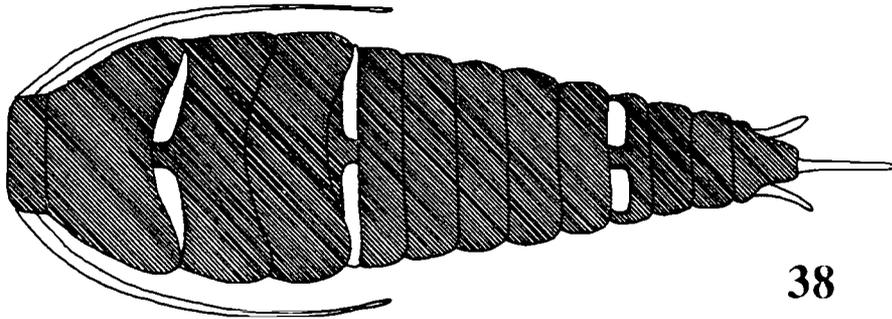


Figure 38: Scale colour pattern of *Xenolepisma globosa* (schematic).

The dorsal colour pattern of live animals is as follows (fig. 38): uniform dark honey brown to black, with three groups of white markings:

1. A medially interrupted transverse band along the anterior margin of the mesonotum.
2. A medially interrupted transverse band along the posterior margin of urotergite I.
3. A medially interrupted transverse band along the anterior margin of urotergite VII.

Both markings 2 and 3 above often appear uninterrupted due to scale loss, whether natural or incurred during capture. The white markings are areas where the scales are transparent, rendering the white body visible. Broadly similar colour patterns to that described here for *X. globosa* have also been reported for the myrmecophiles '*Lepisma*' *albomaculata* Uchida (Uchida 1943), *Hemilepisma nudata* Wygodzinsky (Wygodzinsky 1955), '*Lepisma*' sp. (Delamare Deboutteville 1951) and *Neoasterolepisma braunsi* Escherich (Irish 1990), as well as for an unspecified thysanuran (Zimmerman 1948).

Slight intraspecific variation occurs in the composition of the infralateral setal groups on urotergites I-IX. These usually consist of single macrosetae only. Occasional individuals (only four specimens in the present material) are found where each group consists of two macrosetae. These two macrosetae are inserted very close together, and the outer macroseta is more slender and about one third shorter than the inner. Individuals with double infralateral macrosetae do not differ otherwise from those with single macrosetae, and both may be found together. In both cases the macrosetae remain arranged in three groups, as is typical for *X. globosa*.

X. globosa is usually myrmecophilous, and is found with a wide variety of ants, and occasionally termites. The following hosts were recorded from the material studied here. Though *A. custodiens* is the most frequently recorded host, this is probably due to its ubiquitousness, rather than any preference for it by *X. globosa*. Considering the number of nests of *A. custodiens* unsuccessfully sampled, *X. globosa* is not more common with it than with any of its other hosts.

<i>Anoplolepis custodiens</i> (Smith)	14 samples
<i>Crematogaster</i> spp.	5
unspecified ants	3
<i>Monomorium albopilosum</i> Emery	2
Non-nidicolous	2
<i>Anoplolepis steingroeveri</i> (Forel)	1
<i>Myrmecaria nigra</i> Mayr	1
<i>Pheidole</i> sp.	1
<i>Tetramorium sericeiventre</i> Emery	1
In derelict mound of <i>Cubitermes</i> sp., associated with <i>Astalotermes brevior</i> (Holmgren)	1

Material examined: 52 (29 females, 22 males, 1 unsexed); 51 BMSA, 1 SANC. Also 139 hosts.

Localities: 1. Riversdale (with *Anoplolepis steingroeveri*). 2. Vaalbank (*Anoplolepis custodiens*). 3. Dudley (*A. custodiens*). 4. Vriendskap (*A. custodiens*). 8. Edenvale (*A. custodiens*). 13. Geluksfontein (*A. custodiens* and *Crematogaster* sp.). 15. 6 mi. ex Parys - Sasolburg (*Astalotermes brevior*). 16. Middelpunt (unspecified ants). 22. Broekmanskool (*A. custodiens*). 29. Kafferskop (*Pheidole* sp.). 47. Lebanon (*A. custodiens*). 63. Boomplaas (*Tetramorium sericeiventre*). 67. Vrede (*A. custodiens*). 94. 3 km W Allanridge (*A. custodiens*). 96. Koppie Alleen (non-nidicolous). 101. Krugerswens (*A. custodiens*). 117. Kaalpan (*A. custodiens*). 118. Bloemskraal (*A. custodiens*). 129. Rooikoppie (non-nidicolous). 137. Avondrust (*A. custodiens*). 144. Middelpunt (*Crematogaster* sp.). 147. Rietfontein (*Crematogaster* sp.). 153. De Kalk (*A. custodiens*). 162. Glen Research Farm (unspecified ants). 177. Bovenvlei (*Monomorium albopilosum*). 178. Korannaberg (*Myrmecaria nigra*). 191. Middelpunt (unspecified ants). 209. Tevredenheid (*Crematogaster* sp.). 211. 4 km W Gladstone (*M. albopilosum*). 222. 2 km SE Suid-deel (*Crematogaster* sp.).

DISCUSSION

Biogeography

Irish (in press) found the southern African biomes as proposed by Rutherford & Westfall (1986) to be a valid basis for biogeographical analysis of Lepismatidae, in that 63% of species had 80% or more of their known distribution records restricted to a single biome. Only 4% were widespread throughout five or more biomes, while the biome preference of the remaining 33% was thought to be masked by small samples or patchy sampling. Three biomes occur in the OFS: the northern and eastern Grassland Biome, the southern and western Nama-Karoo Biome, and the northwestern Savanna Biome (fig 39).

A parallel scheme of biogeographical subdivisions for southern Africa is the biotic zones that were first mapped in their presently accepted form by Meester (1965), following a long history of development (Rautenbach 1978). Though the biotic zones are at least