

THE GENUS *NUNCIELLA* ROEWER (OPILIONES, LANIATORES)
WITH DESCRIPTION OF A NEW SPECIES FROM KANGAROO
ISLAND, SOUTH AUSTRALIA

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Synopsis

The genus *Nunciella* Roewer is redefined and the genus *Cinuna* Hickman is synonymized with it. A new species, *N. kangaroensis* n. sp., is described from Kangaroo Island, South Australia. A new key is given for the twelve species of *Nunciella*. The male genitalia of *N. aspera* (Pocock), *N. badia* (Hickman), *N. dentata* (Hickman), *N. tasmaniensis* Hickman and *N. tuberculata* Forster are described.

INTRODUCTION

The genus *Nunciella* Roewer is one of the largest groups of triaenonychid harvestmen in Australia. Five species have been described from eastern Australia south of Canberra, three from Tasmania, and two from the south-west of Western Australia. The new species from Kangaroo Island fills a gap in this distribution.

The genus is of considerable interest because of the complex structure of the male genitalia, and sexual dimorphism in the chelicerae, pedipalps and coxae of leg 1.

Family TRIAENONYCHIDAE Soerensen, 1886

Subfamily TRIAENONYCHINAE Pocock, 1903

Tribe TRIAENONYCHINI Pocock, 1903

Genus *Nunciella* Roewer, 1929

Nunciella Roewer, 1929: 96; Roewer, 1931: 162; Forster, 1952: 26; Hickman, 1958: 35.

Cinuna Hickman, 1958: 37, new syn.

Although early authors have regarded the number of segments in tarsus 1 as a reliable generic character, more recent work has shown that it must be used with caution in some genera (Goodnight and Goodnight, 1953). Forster (1954) allowed a variation of 2-4 tarsal segments in leg 1 for *Nuncia* and 5-7 for *Hendea* in his comprehensive revision of the New Zealand Laniatores. Recently, Forster (1965) described a cave species of *Hendea* with eight segments in tarsus 1, and remarked, "emphasis is placed on the tarsal formula for the separation of genera . . . and it is of considerable interest to find that it may be influenced so readily by adaptation to a different environment". Furthermore, Hickman (1958) has noted that variation (including asymmetry within an individual) is common in some Australian genera.

All the species of *Nunciella* described by Roewer possessed three tarsal segments in leg 1, a character he used in his description of the genus. Forster (1949), however, noted that the male of *N. tuberculata* possessed four segments in tarsus 1, whilst the female had three.

In his diagnosis of *Nunciella*, Hickman (1958) retained Roewer's diagnostic character of three segments in tarsus 1 while noting the situation in *N. tuberculata*. On the basis of the segment number in tarsus 1 and the position of the eyemound, Hickman erected the closely related genus *Cinuna* and placed in it *C. badia* (type species) and *C. dentata* from Tasmania. *Cinuna* possessed four segments

in both sexes and an eyemound removed from the anterior margin of the carapace. The latter character is not valid because in males of *N. aspera* and *N. tuberculata* the eyemound also rises from behind the anterior margin.

It is obvious that the dimorphic variation in tarsus 1 in *N. tuberculata* (and *N. kangarooensis*, n. sp.) causes problems in separating *Cinuna* from *Nunciella*. Because of the similarity in the genitalia of the two genera (Figs. 1-18) and the apparent absence of any clear-cut distinguishing characters, the limits of *Nunciella* must be extended to include species with four segments in tarsus 1. Thus *Cinuna* must be synonymized with *Nunciella* and the genus *Nunciella* redescribed.

Too little emphasis has been placed on the systematic importance of the male genitalia. Descriptions of genitalia have been given in only four of the 11 previously described *Nunciella* species. Kauri (1955) described those in *N. aspera* and *N. karriensis*, and Forster (1955) those in *N. montana* and *N. woolcocki*. Descriptions are given for species which have been examined by the author and whose genitalia had not been described previously. The penis of *N. aspera* is redescribed, as Kauri's drawing is partly inaccurate.

The genus *Nunciella* Roewer is now redefined as follows.

Anterior margin of carapace unarmed or with row of tubercles or granules above. Eyemound low, generally rounded, rising from or behind anterior margin, unarmed except for small granules in some species. Tergites without spines or large tubercles, but with rows of granules. Chelicera of male with proximal retrodorsal boss on first segment. Pedipalp femur in male with a large modified proximoventral bifid tooth which is laterally flattened and directed backwards. With pedipalp lowered this tooth abuts another modified bifid tooth on coxa of leg 1. Calcaneus of each metatarsus much shorter than astragalus and that of leg 1 in male without notch below. Tarsal formula 3-4, 8-15, 4, 4. Distitarsi 1 and 2 with two and mostly four segments respectively. Claw of both tarsus 3 and 4 three-pronged, middle prong larger than laterals. Apical portion of penis complex and usually compact. One superior and three inferior setae usual number on each ventral plate (*N. tasmaniensis* with two and five respectively).

Type species: *Nunciella aspera* (Pocock).

Nunciella is closely related to the Tasmanian genus *Nuncioides* Hickman and the New Zealand genus *Neonuncia* Roewer. The males of these genera possess a strong proximal boss on the first segment of the chelicera, a highly modified bifid tooth placed proximoventrally on the pedipalp femur, and a calcaneus of leg 1 without notch below. *Nunciella* differs from *Nuncioides* in having 3-4 segments rather than 5-6 in tarsus 1, and 4-5 compared with 6-8 in distitarsus 2. In *Neonuncia* the scute, including the anterior margin, is smooth, without tubercles or granules, and there are only two inferior setae on each ventral plate of the penis. The structure of the genitalia and other characters suggest *Nunciella* is also related to *Calliuncus* Roewer.

The 12 species in the genus *Nunciella* may be distinguished by the following key. Females are not known for all species, so the key is based on male characters with the possible exception of *N. parvula* Roewer, which Forster (1952) believes is a female, not a male as stated by Roewer (1931). *N. frontalis* Roewer is omitted as it is probably a synonym of *N. aspera* (Forster, 1952).

KEY TO SPECIES OF NUNCIELLA (MALES)

1. Tarsus of leg 1 with four segments (2)
 Tarsus of leg 1 with three segments (5)
2. Distal portion of first segment of chelicera unarmed *N. tuberculata* Forster
 Distal portion of chelicerai first segment with spine or prominent tubercle (3)
3. Pedipalp tibia with four strong retrolateral teeth *N. dentata* (Hickman), new comb.
 Pedipalp tibia with three strong retrolateral teeth (4)

4. Pedipalp femur with five mediodorsal teeth.....*N. kangarooensis*, n. sp.
Pedipalp femur with four mediodorsal teeth.....*N. badia* (Hickman), new comb.
5. Prolateral surface of pedipalp femur with two distal teeth.....(6)
Prolateral surface of pedipalp femur without two distal teeth.....(9)
6. Prolateral surface of pedipalp patella armed sub-distally with strong tooth.....(7)
Prolateral surface of pedipalp patella armed sub-distally with small tubercle.....(8)
7. Mediodorsal surface of pedipalp femur with four strong teeth.....*N. cheliplus* Roewer
Mediodorsal surface of pedipalp femur with four teeth, 1 and 3 very small, 2 and 4 strong....
.....*N. granulata* Roewer
8. Penis with a rounded distally oriented swelling ventral to the inferior setae.....
.....*N. karriensis* Kauri
Penis without a prominent swelling ventral to the inferior setae.....*N. aspera* (Pocock)
9. Femur of leg 3 with strong spine near proventral surface.....*N. woolcocki* Forster
Femur of leg 3 without such a spine.....(10)
10. Mediodorsal surface of pedipalp femur with five teeth.....*N. parvula* Roewer
Mediodorsal surface of pedipalp femur with three teeth in proximal half.....(11)
11. Ventral surface of pedipalp femur with strong tooth in distal half and the prolateral surface
unarmed.....*N. tasmaniensis* Hickman
Ventral surface of pedipalp femur with tubercle in distal half and spinous tubercle at two-
thirds on prolateral surface.....*N. montana* Forster

Of the species in *Nunciella*, *N. aspera* and *N. karriensis* are from Western Australia, *N. tasmaniensis*, *N. badia* and *N. dentata* are from Tasmania, *N. cheliplus* and *N. parvula* from Victoria, *N. montana* from New South Wales, *N. woolcocki* from the Australian Capital Territory, and *N. kangarooensis*, n. sp., from Kangaroo Island, South Australia. Roewer (1931) recorded *N. granulata* from New Zealand, but according to Forster (1954) it is probably an Australian species.

Nunciella aspera (Pocock)

Triaenonyx aspera Pocock, 1903 : 404 ; Loman, 1910 : 133.

Nuncia aspersa (Pocock) : Roewer, 1915 : 80 ; Roewer, 1923 : 592.

Nunciella aspera (Pocock) : Roewer, 1929 : 96 ; Forster, 1952 : 27-29 ; Kauri, 1955 : 3-4.

Nunciella frontalis Roewer, 1931 : 163.

Structure of Penis (Figs. 1-3): Penis complex and compact. Glans arising dorsally but curving ventrad, with terminal portion ventral (Fig. 2). Arising from glans, and flanking it on either side, two large curved plates. These plates present in all species, but relationship with glans not as evident in the eastern Australian forms. In these, the curved flanking plates meet dorsally and presumably obscure the line of fusion with the glans. The glans and flanking plates constitute the aedeagus.

Ventral plates fused and enlarged basally, but not with a pronounced distally-oriented swelling ventral to inferior setae. Plates tapering rapidly distal to inferior setae, separated by deep notch. Each ventral plate with one superior and three inferior setae.

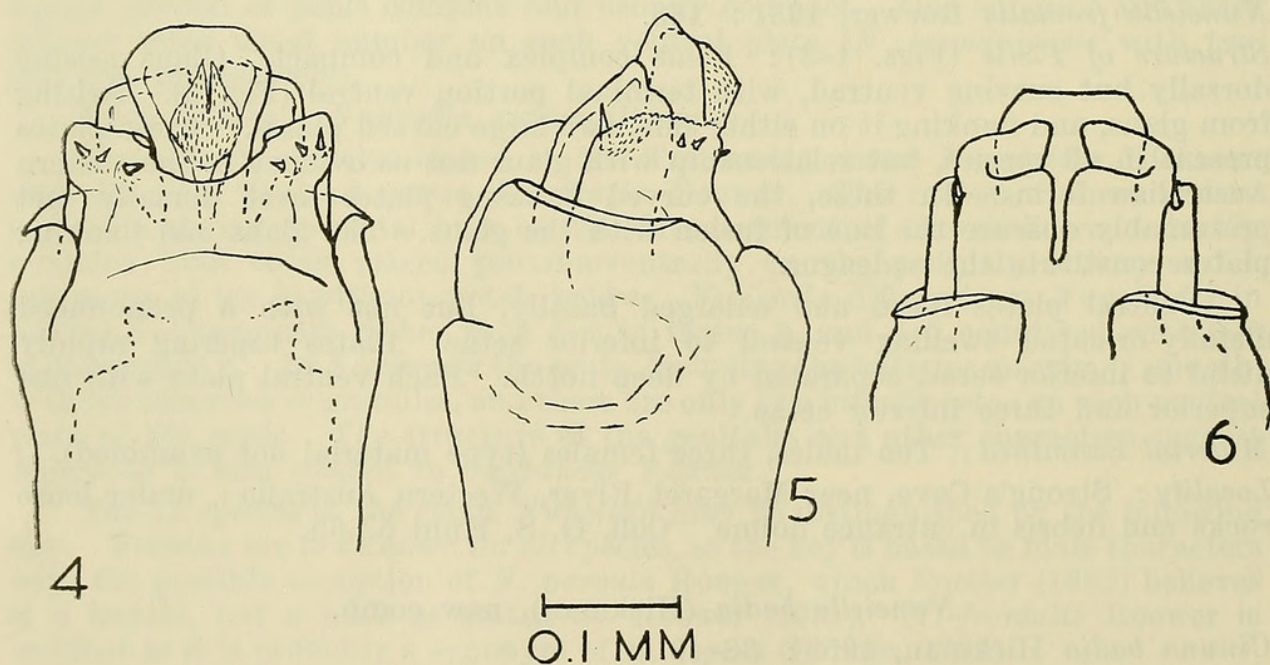
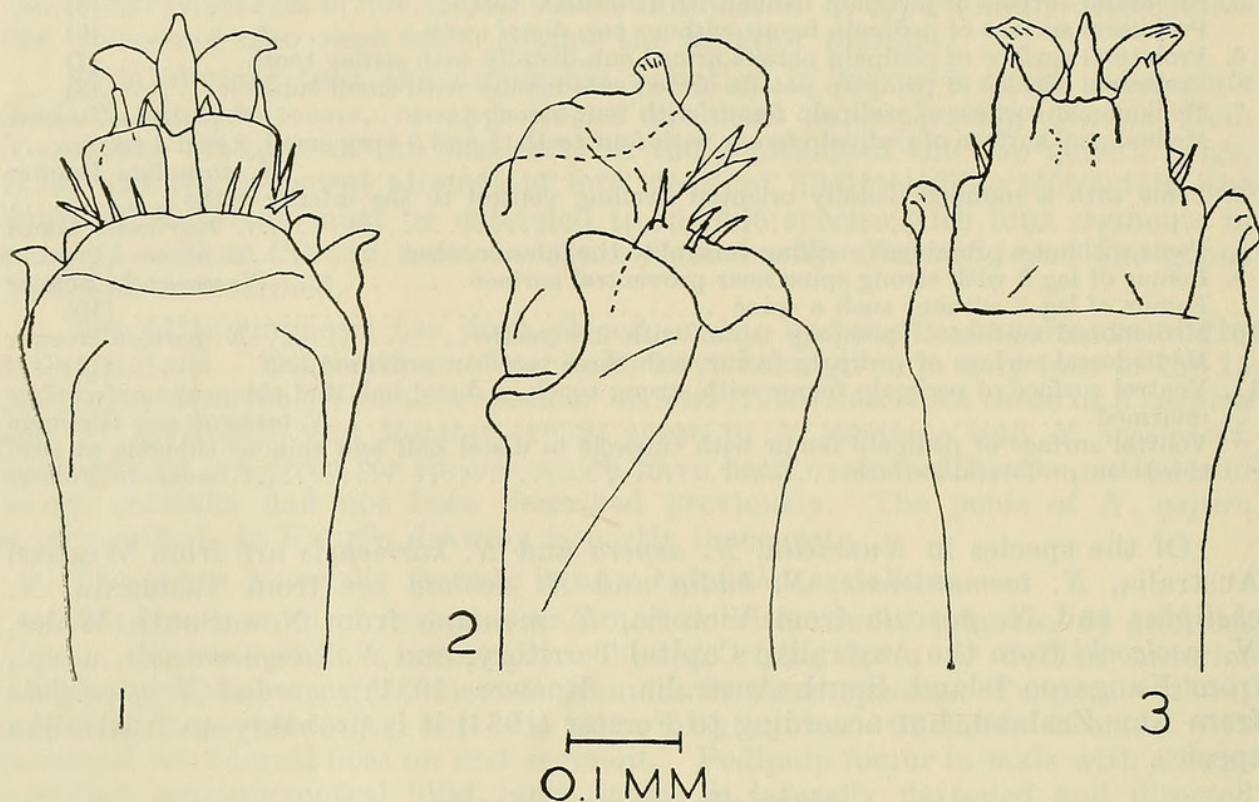
Material Examined : Ten males, three females (type material not examined).

Locality : Strong's Cave, near Margaret River, Western Australia : under loose rocks and debris in entrance doline. Coll. G. S. Hunt 5.i.65.

Nunciella badia (Hickman), new comb.

Cinuna badia Hickman, 1958 : 38-40.

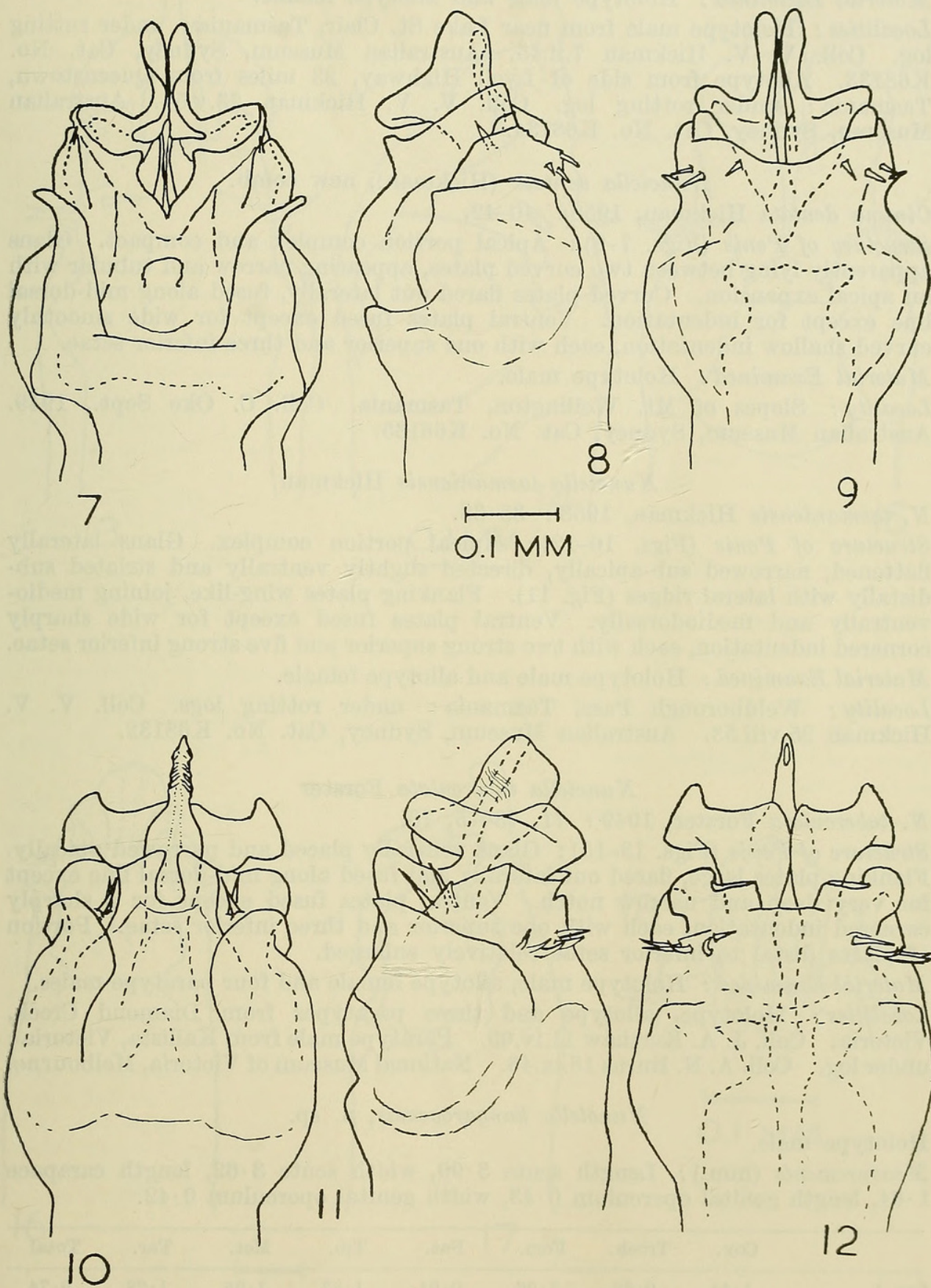
Structure of Penis (Figs. 4-6): Apical portion complex and compact. Glans rugose and swollen sub-apically (Fig. 4), protected dorsally by curved hood-like process. Two curved plates dorsal to hood, fused along mid-dorsal line except for narrow cleft. Each ventral plate with one superior and three minute inferior setae. Distal edge of plate serrated and distodorsal region rugose (Fig. 5). Plates fused except for shallow indentation.



Text-fig. 1

Figs. 1-3. *Nunciella aspera* (Pocock). 1, Apical portion of penis, ventral view ; 2, lateral view ; 3, dorsal view.

Figs. 4-6. *Nunciella badia* (Hickman), new comb. 4, Apical portion of penis, ventral view ; 5, lateral view ; 6, extreme apical portion, dorsal view.



Text-fig. 2

Figs. 7-9. *Nunciella dentata* (Hickman), new comb. 7, Apical portion of penis, dorsal view; 8, lateral view; 9, ventral view.

Figs. 10-12. *Nunciella tasmaniensis* Hickman. 10, Apical portion of penis, dorsal view; 11, lateral view; 12, ventral view.

Material Examined: Holotype male and allotype female.

Localities: Holotype male from near Lake St. Clair, Tasmania: under rotting log. Coll. V. V. Hickman 7.ii.45. Australian Museum, Sydney, Cat. No. K68133. Allotype from side of Lyell Highway, 23 miles from Queenstown, Tasmania: under rotting log. Coll. V. V. Hickman 23.v.54. Australian Museum, Sydney, Cat. No. K68134.

Nunciella dentata (Hickman), new comb.

Cinuna dentata Hickman, 1958: 40-42.

Structure of Penis (Figs. 7-9): Apical portion complex and compact. Glans apparently lying between two curved plates, appearing narrow and tubular with an apical expansion. Curved plates flared out laterally, fused along mid-dorsal line except for indentation. Ventral plates fused except for wide smoothly curved shallow indentation, each with one superior and three inferior setae.

Material Examined: Holotype male.

Locality: Slopes of Mt. Wellington, Tasmania. Coll. C. Oke Sept., 1949. Australian Museum, Sydney, Cat. No. K68135.

Nunciella tasmaniensis Hickman

N. tasmaniensis Hickman, 1958: 35-38.

Structure of Penis (Figs. 10-12): Apical portion complex. Glans laterally flattened, narrowed sub-apically, directed slightly ventrally and striated sub-distally with lateral ridges (Fig. 11). Flanking plates wing-like, joining medio-ventrally and mediodorsally. Ventral plates fused except for wide sharply cornered indentation, each with two strong superior and five strong inferior setae.

Material Examined: Holotype male and allotype female.

Locality: Weldborough Pass, Tasmania: under rotting logs. Coll. V. V. Hickman 25.viii.53. Australian Museum, Sydney, Cat. No. K68132.

Nunciella tuberculata Forster

N. tuberculata Forster, 1949: 71, 73-75, 78.

Structure of Penis (Figs. 13-15): Glans ventrally placed and narrowed apically. Flanking plates large, flared out laterally and fused along mid-dorsal line except for very deep and narrow notch. Ventral plates fused except for a sharply cornered indentation, each with one superior and three inferior setae. Portion of plates distal to inferior setae relatively enlarged.

Material Examined: Holotype male, allotype female and four paratype males.

Localities: Holotype, allotype and three paratypes from Diamond Creek, Victoria. Coll. J. A. Kershaw 11.iv.05. Paratype male from Kallista, Victoria: under log. Coll. A. N. Burns 18.ix.46. National Museum of Victoria, Melbourne.

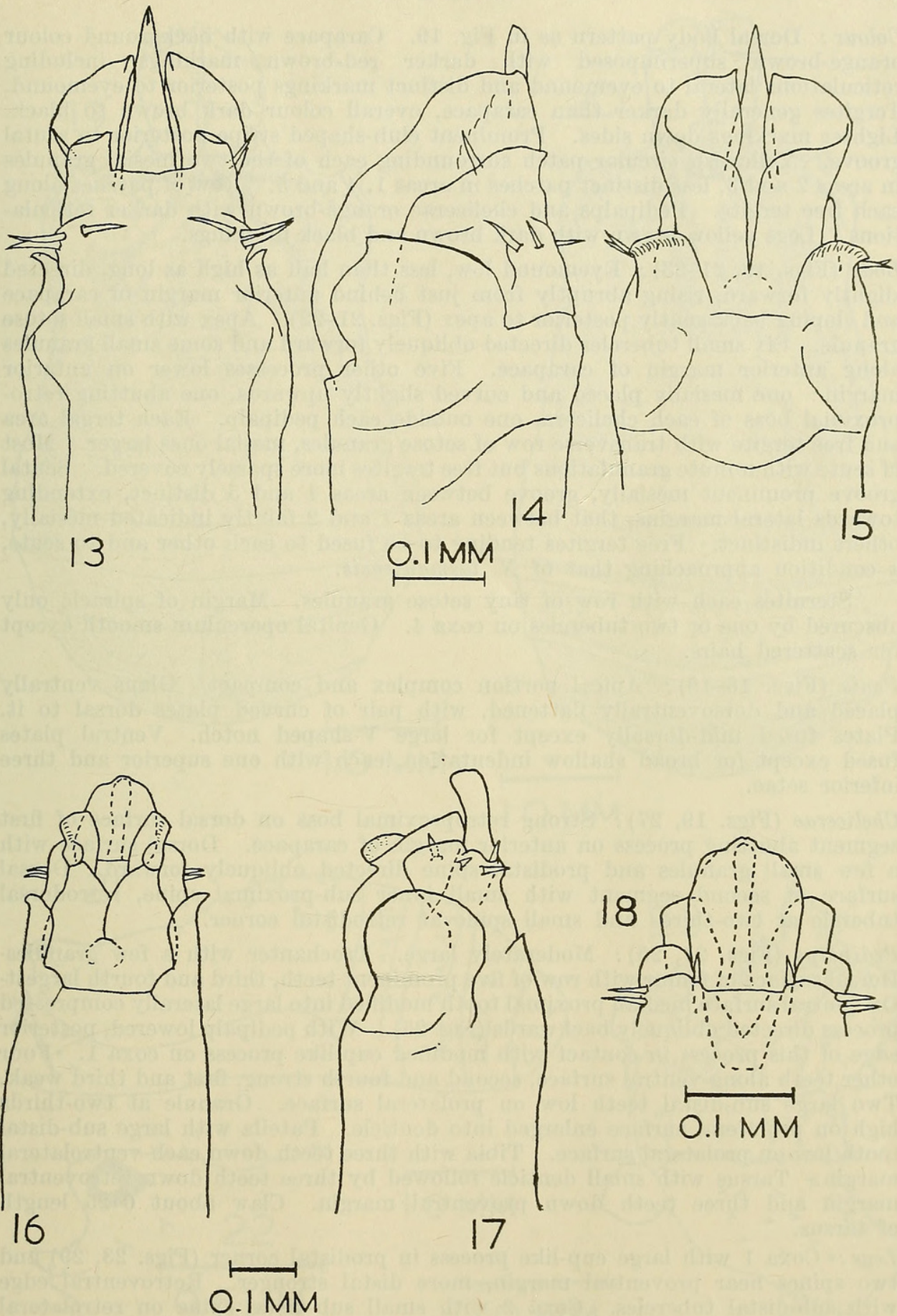
Nunciella kangarooensis, n. sp.

Holotype male.

Measurements (mm.): Length scute 3.90, width scute 3.62, length carapace 1.64, length genital operculum 0.43, width genital operculum 0.42.

	Cox.	Troch.	Fem.	Pat.	Tib.	Met.	Tar.	Total
Leg 1	1.44	0.68	1.96	0.91	1.52	1.95	1.28	9.74
Leg 2	1.99	0.74	2.74	1.15	2.31	2.77	2.70	14.40
Leg 3	1.49	0.78	2.02	0.85	1.54	2.13	1.35	10.16
Leg 4	1.96	0.94	2.77	1.18	2.16	3.34	1.60	13.95
Pedipalp	1.18	0.61	2.02	1.16	1.42	—	1.42	7.54

Chelicera: First segment 1.55, second segment 1.59, total 2.88.



Text-fig. 3

Figs. 13-15. *Nunciella tuberculata* Forster. 13, Apical portion of penis, ventral view ; 14, lateral view ; 15, dorsal view.

Figs. 16-18. *Nunciella kangarooensis*, n. sp. 16, Apical portion of penis, dorsal view ; 17, lateral view ; 18, extreme apical portion, ventral view.

Colour: Dorsal body pattern as in Fig. 19. Carapace with background colour orange-brown superimposed with darker red-brown markings, including reticulations lateral to eyemound and distinct markings posterior to eyemound. Tergites generally darker than carapace, overall colour dark brown to black. Lighter markings down sides. Prominent club-shaped stripe posterior to scutal groove. Yellowish circular patch surrounding each of the two mesial granules in areas 2 and 3, less distinct patches in areas 1, 4 and 5. Row of patches along each free tergite. Pedipalps and chelicerae orange-brown with darker reticulations. Legs yellow-brown with dark brown and black markings.

Body (Figs. 19, 21–23): Eyemound low, less than half as high as long, directed slightly forward, rising abruptly from just behind anterior margin of carapace and sloping back gently posterior to apex (Figs. 21–22). Apex with small setose granule. Six small tubercles directed obliquely forward and some small granules along anterior margin of carapace. Five other processes lower on anterior margin: one mesially placed and curved slightly upwards, one abutting retroproximal boss of each chelicera, one outside each pedipalp. Each tergal area and free tergite with transverse row of setose granules, mesial ones larger. Most of scute with minute granulations but free tergites more sparsely covered. Scutal groove prominent mesially, groove between areas 4 and 5 distinct, extending towards lateral margins, that between areas 1 and 2 faintly indicated mesially, others indistinct. Free tergites tending to be fused to each other and to scute, a condition approaching that of *N. tasmaniensis*.

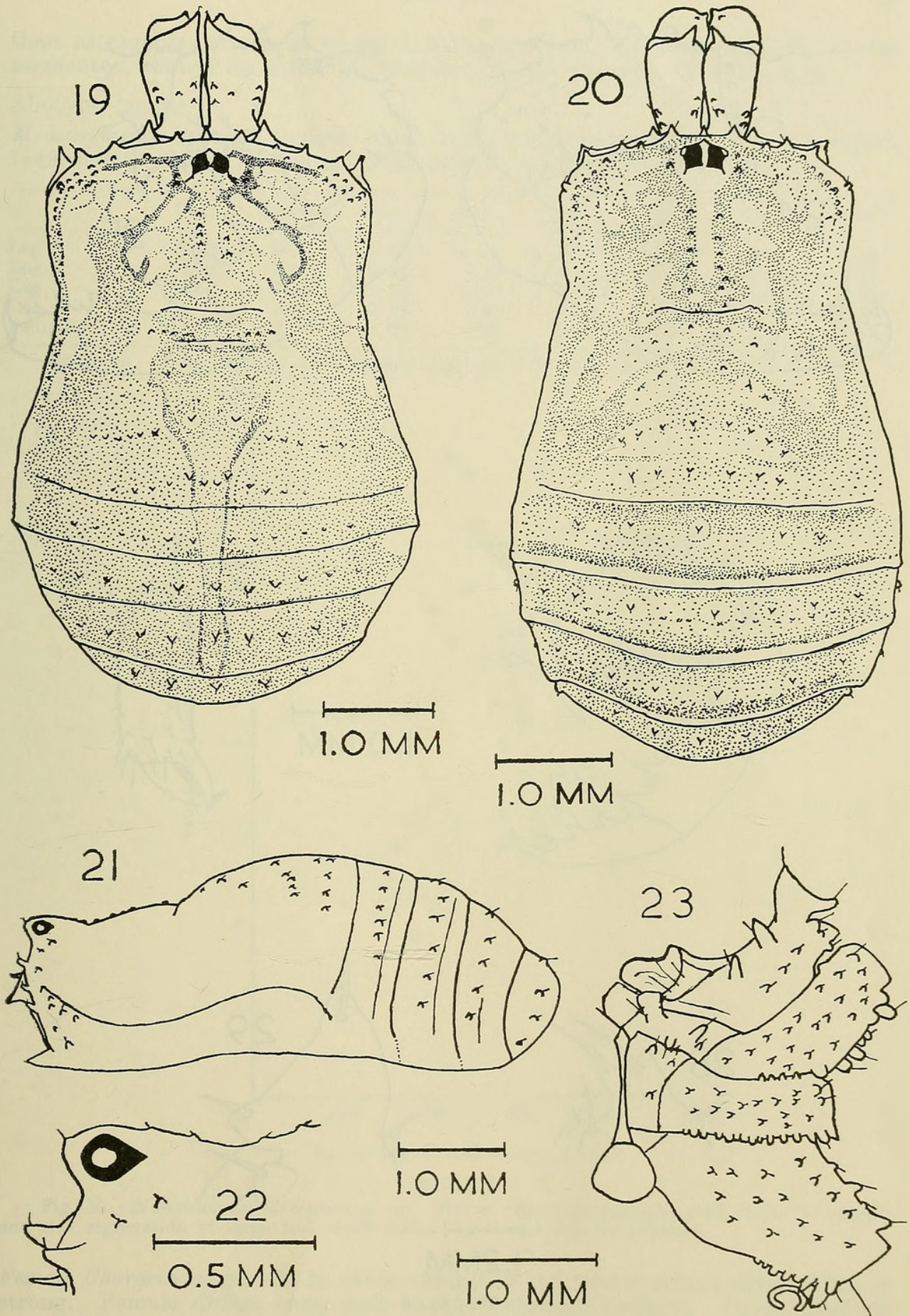
Sternites each with row of tiny setose granules. Margin of spiracle only obscured by one or two tubercles on coxa 4. Genital operculum smooth except for scattered hairs.

Penis (Figs. 16–18): Apical portion complex and compact. Glans ventrally placed and dorsoventrally flattened, with pair of curved plates dorsal to it. Plates fused mid-dorsally except for large V-shaped notch. Ventral plates fused except for broad shallow indentation, each with one superior and three inferior setae.

Chelicerae (Figs. 19, 27): Strong retroproximal boss on dorsal surface of first segment abutting process on anterior margin of carapace. Dorsal surface with a few small granules and prodistal spine directed obliquely forward. Dorsal surface of second segment with small inner sub-proximal spine, retrodorsal tubercle at two-thirds and small spine at retrodistal corner.

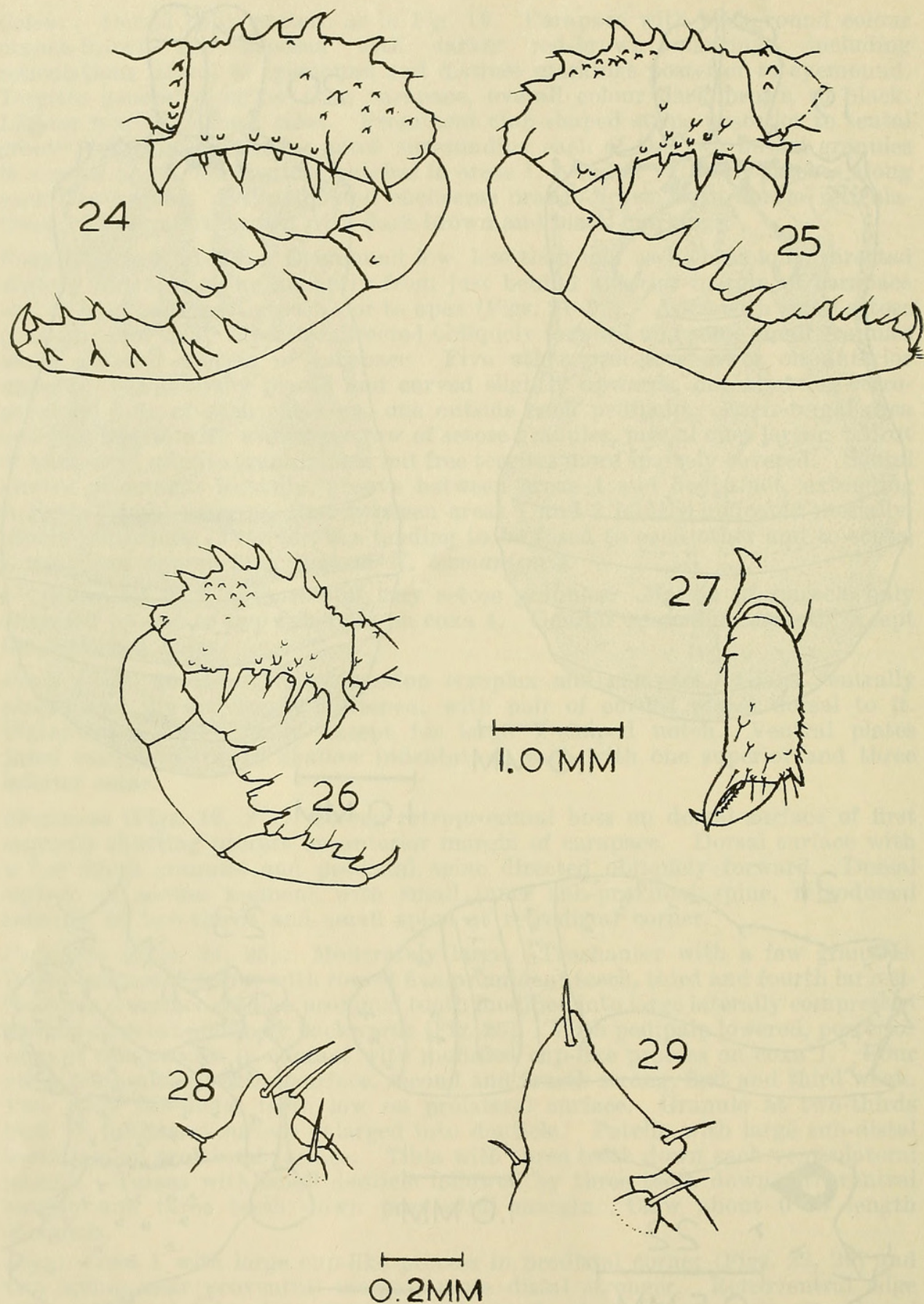
Pedipalps (Figs. 24, 25): Moderately large. Trochanter with a few granules. Dorsal surface of femur with row of five prominent teeth, third and fourth largest. On ventral surface median proximal tooth modified into large laterally compressed process directed obliquely backwards (Fig. 25). With pedipalp lowered, posterior edge of this process in contact with modified cup-like process on coxa 1. Four other teeth along ventral surface, second and fourth strong, first and third weak. Two large sub-distal teeth low on prolateral surface. Granule at two-thirds high on prolateral surface enlarged into denticle. Patella with large sub-distal tooth low on prolateral surface. Tibia with three teeth down each ventrolateral margin. Tarsus with small denticle followed by three teeth down retroventral margin and three teeth down proventral margin. Claw about 0.25 length of tarsus.

Legs: Coxa 1 with large cup-like process in prodistal corner (Figs. 23, 29) and two spines near proventral margin, more distal stronger. Retroventral edge with sub-distal tubercles. Coxa 2 with small sub-distal spine on retrolateral surface and small tubercles more proximally. Maxillary lobe with three setose tubercles. Coxa 4 with pro- and retrolateral tubercles. Trochanter of each leg with small tubercles or granules, femora with rows of small tubercles and/or granules, those on leg 1 ventral surface largest. Each calcaneus much shorter



Text-fig. 4

Figs. 19–23. *Nunciella kangarooensis*, n. sp. 19, Dorsum of male showing colour pattern, with first segment of chelicerae also shown; 20, dorsum of female showing colour pattern, with first segment of chelicerae also shown; 21, male body, lateral view; 22, eyemound of male, lateral view; 23, sterno-coxal region in male.



Text-fig. 5

Figs. 24-29. *Nunciella kangarooensis*, n. sp. 24, Male pedipalp, prolateral view; 25, retrolateral view; 26, female pedipalp, retrolateral view; 27, second segment of male chelicera, dorsal view; 28, process in prodistal corner of coxa 1 in female; 29, same process in male.

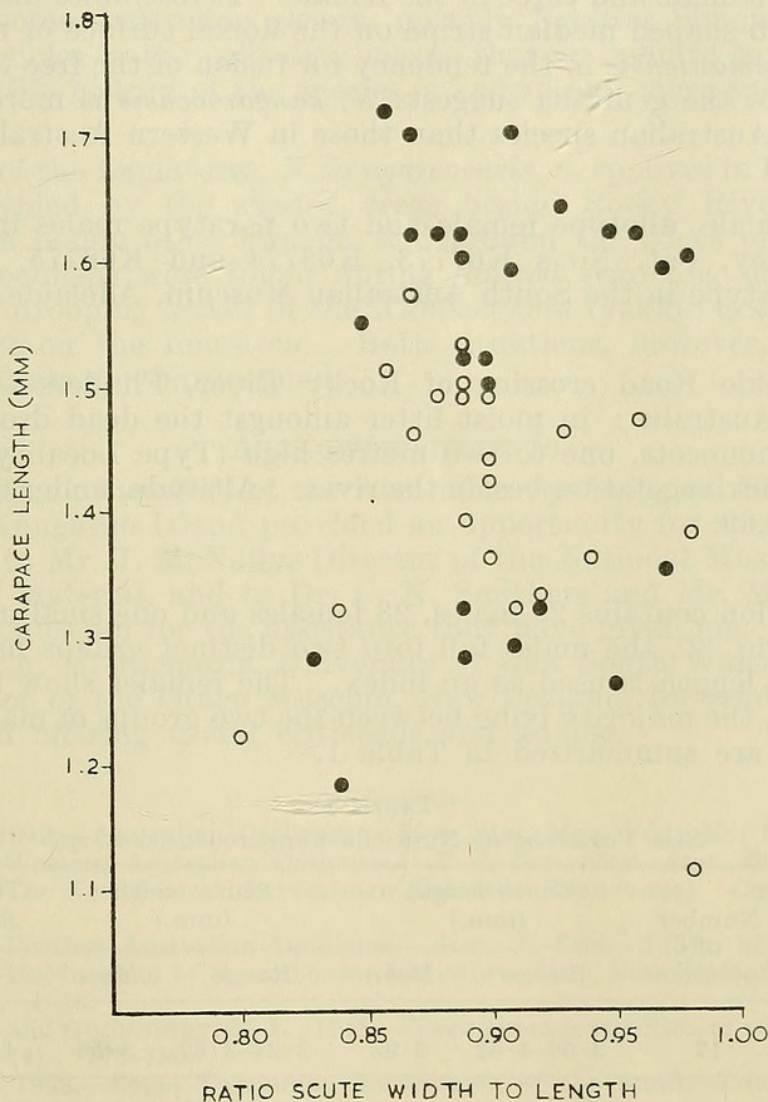
than astragalus, calcaneus of leg 1 without notch. Distitarsus of leg 1 two-segmented, that of leg 2 four-segmented. Tarsal formula : 4, 9-13, 4, 4.

Allotype female.

Measurements (mm.): Length scute 3.89, width scute 3.45, length carapace 1.49, length genital operculum 0.51, width genital operculum 0.47.

	Cox.	Troch.	Fem.	Pat.	Tib.	Met.	Tar.	Total
Leg 1	1.18	0.57	1.82	0.81	1.35	1.78	1.08	8.59
Leg 2	1.66	0.74	2.44	0.98	2.08	2.53	2.43	12.86
Leg 3	1.37	0.59	1.76	0.78	1.35	1.99	1.22	9.06
Leg 4	1.72	0.91	2.52	1.02	1.99	3.04	1.55	12.75
Pedipalp	1.01	0.54	1.62	0.88	1.15	—	1.08	6.28

Chelicera : First segment 1.04, second segment 1.66, total 2.70.



Text-fig. 6

Fig. 30. *Nunciella kangarooensis*, n. sp. Range of stoutness (ratio scute width to length) and size segregation of large and small males (dots) and females (circles).

Female Characteristics : As in other species in the genus, sexual dimorphism is strong. Female differs from male in the following respects. Dorsal pattern without median stripe, tergal areas more clearly defined, yellow patches around granules more prominent (Fig. 20). Retroproximal boss on dorsal surface of cheliceral first segment absent, but small tubercle occupies a near position ; corresponding process on anterior margin reduced. Spine in retrodistal corner

of second segment absent. Pedipalps (Fig. 26) smaller. Proximoventral tooth on femur not extremely modified, coxa 1 without extreme cup-like modification to bifid process in prodistal corner (Fig. 28). Body less stout than male, though not in all the population (Fig. 30). Female type of similar length to male, though females in general shorter (Fig. 30). Degree of fusion of free tergites less. As with *N. tuberculata*, tarsus 1 in the female with three segments. Tarsal formula : 3, 8-11, 4, 4.

REMARKS

The males can be separated from those of other species in the genus, except some individuals of *N. aspera* and *N. karriensis*, by the presence of five medio-dorsal teeth and two strong prolateral teeth on the pedipalp femur. A less granulate eyemound distinguishes them from the other two species.

N. kangarooensis, n. sp. is similar to *N. tuberculata* in having four segments in tarsus 1 of the male and three in the female. It resembles many other species in having a club-shaped median stripe on the dorsal surface of many males. It resembles *N. tasmaniensis* in the tendency for fusion of the free tergites in males. The structure of the genitalia suggests *N. kangarooensis* is more closely related to the eastern Australian species than those in Western Australia.

Types

Holotype male, allotype female and two paratype males in the Australian Museum, Sydney, Cat. No.'s K68773, K68774 and K68775. One male and one female paratype in the South Australian Museum, Adelaide.

Locality

Near Shackle Road crossing of Rocky River, Flinders Chase, Kangaroo Island, South Australia : in moist litter amongst the dead drooping blade-like leaves of tall monocots, one to two metres high (Type Locality). The habitat is shaded by thick vegetation beside the river. Altitude, under 60 metres. Coll. G. S. Hunt 7.i.69.

Variations

The collection contains 25 males, 23 females and one small nymph. As can be seen from Fig. 30, the males fall into two distinct groups based on size, for which carapace length is used as an index. The females show less tendency to fall into groups, the majority lying between the two groups of males in size. The size variations are summarized in Table 1.

TABLE 1
Size Variation in Nunciella kangarooensis, n. sp.

	Number of Specimens	Scute length (mm.)		Scute width (mm.)		Carapace length (mm.)	
		Range	Mean	Range	Mean	Range	Mean
Group of large males	17	3.69-4.42	3.93	3.24-3.82	3.56	1.50-1.72	1.67
Group of small males	8	2.86-3.21	3.03	2.40-3.11	2.73	1.18-1.35	1.29
Females ..	21	3.01-3.89	3.53	2.77-3.45	3.18	1.32-1.57	1.43

Two small females are not treated in the table as they do not fall into the main group. They have a scute length of 2.70 and 2.85 mm., scute width of 2.64 and 2.30 mm., and carapace length of 1.11 and 1.22 mm. The measurements of the nymph are 2.53, 2.09 and 1.04 mm. respectively.

Both males and females show roughly the same range in stoutness (ratio scute width to length, Fig. 30). Individuals vary in the tendency for fusion of

the free tergites, the group of small males and the females generally showing less tendency. Both sexes vary slightly in body pattern. The density of granules on the scute varies, and the strength of teeth and shape of eyemound is subject to minor variation. The number of segments in tarsus 1, 3 and 4 is constant for each sex, except one male with five, not four, in right tarsus 1. The number of segments in tarsus 2 is subject to asymmetry and wide variation. The mean in females is 9.6 compared with 10.5 in males. The mode, however, is 10 in both sexes. The number of segments in distitarsus 2 is four in both sexes, except for one male with five in the right distitarsus.

Male Dimorphism

The two distinct groups of males (Fig. 30) are of interest. Individuals in both groups seem to have secondary sexual characteristics developed to the same degree. The two groups may indicate male dimorphism which has been recorded by Forster (1954) in some New Zealand triaenonychids and which also occurs in some Australian genera, notably *Equitius* Simon. The presence of two small females in the collection means that no definite conclusions can be made until the life history of the species is known and more specimens studied.

Habitat

Like most of the Laniatores, *N. kangarooensis*, n. sp. lives in humid situations which are provided by the shaded areas beside Rocky River. The species probably occurs beside other streams and around the edges of lagoons on the island. No specimens were found during limited searching on higher ground under the dead drooping leaves of the *Xanthorrhoea* (yakka) grass-tree, or under rocks in dolines on the limestone. Both situations, however, are potentially favourable habitats for harvestmen.

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