

ACARI FROM OPERATION DRAKE IN NEW GUINEA

1. PTERYGOSOMATIDAE¹

BY R. DOMROW *

PTERYGOSOMATIDAE
GECKOBIA
LIZARDS
AUSTRALIA
NEW GUINEA

ABSTRACT : The Australian gecko *Phyllurus platurus* (White) (Gekkonidae) is confirmed as the host of *Geckobia clelandi* Hirst. *G. manzanelli* sp. nov. is described from *P. cornutus* (Ogilby) in Australia. The ranges of *G. bataviensis* Vitzthum and *G. keegani* Lawrence are extended from Pakistan, Nepal, Indonesia and the Philippines (*Hemidactylus* spp., Gekkonidae) to New Guinea (*H. frenatus* Duméril & Bibron). *G. bataviensis* Vitzthum, 1926 (Jan.) = *G. gleadoviana* Hirst, 1926 (Feb.) = *G. nepalii* Hiregaudar, Joshee & Soman, 1959 = *G. cosymboti* Cuy, 1973 syn. nov.

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RÉSUMÉ : *Phyllurus platurus* (White) (Gekkonidae), Gecko Australien, est confirmé comme hôte de *Geckobia clelandi* Hirst. *G. manzanelli* sp. nov. sur *P. cornutus* (Ogilby) en Australie est décrite. Les distributions de *G. bataviensis* Vitzthum et de *G. keegani* Lawrence, Pakistan, Népal, Indonésie et Philippines (*Hemidactylus* spp., Gekkonidae), sont étendues à la Nouvelle-Guinée (*H. frenatus* Duméril & Bibron). *G. bataviensis* Vitzthum, janv. 1926 = *G. gleadoviana* Hirst, févr. 1926 = *G. nepalii* Hiregaudar, Joshee et Soman, 1959 = *G. cosymboti* Cuy, 1973, syn. nov.

Operation Drake, under the patronage of H.R.H. the Prince of Wales, was a two-year circumnavigation of the globe by the brigantine "Eye of the Wind" to commemorate Sir Francis Drake's voyage 400 years ago. Her crew took in a team of scientists and relays of youngsters from many countries, all involved in a varied programme of research, including a project "Blood-sucking insects associated with animal reservoirs of disease", during the Morobe Province phase of which I collected ectoparasites for a month (Anon., 1980).

The study area was centred some 50 miles (80 km) south of Lae (Anon., 1967); it took in Lasanga Island and two coastal villages, Kui (also spelt Kuwi) and Buso, some 5 miles to the south and west, respectively. Base-camp was at Buso (Fig. 1). About 40 live-traps were set nightly, baited with local fruits and vegetables smeared with a mixture of peanut butter and oatmeal. Initial trapping in mangrove and pandanus swamps was unproductive; so too (and this surprised me) was rainforest on the rocky mountainside. The only habitat in which rats were trap-

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1. See Steyskal (1971).

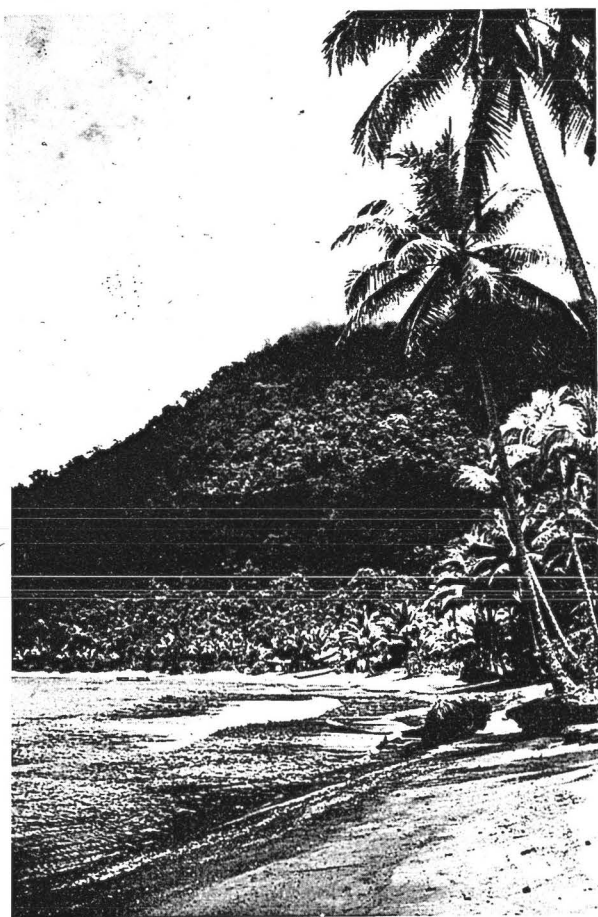


FIG. 1 : Buso camp looking south.

ped comprised a low, narrow strip of brush and grassland immediately behind the sandy foreshore. Here 12 rats (Muridae) were taken : water rat (*Hydromys*) 1, bush rats (*Rattus*) 4, scaly-tailed rats (*Melomys*) 7. Two marsupials were examined, a bandicoot (Peramelidae) trapped in sago swamp and a cuscus (*Phalanger*, Phalangeridae) taken by hand from a pandanus tree. This represents an overall trapping rate of some 1.5 %, a rather low value perhaps reflecting predation by

feral dogs and cats, intensive slash-and-burn cultivation &c.²

Declaration of a state of emergency due to an outbreak of tribal "pay-back" killings ruled out the use of fire-arms, and the only four birds examined were taken by Messrs IAN REDMOND (Molescroft — who also visited Lake Trist, 16 miles WSW of Buso, and Western Province) and PETER DRISCOLL (Brisbane). Several bats netted by Mr BEN GASKELL (London) were examined, together with many reptiles collected by hand by Mr REDMOND. Occasional insects, millipedes &c. were also searched for ectoparasites.

Since an occasional lot is too small to be published alone, some will be grouped together or supplemented by other New Guinea and Australian material, including a small collection from Irian Jaya by Dr P. BLUM (Freiburg, *per* Dr R. TRAUB, Baltimore).

I thank the field leader at Buso, Capt. Anthony EVANS (Coldstream Guards), for many courtesies ; four Young Explorers : Miss Joppa JOHNS (Siassi = Umboi) and Messrs Boniface BOLOTI (Milne Bay), Holden LUFA (Solomon Islands) and Florian MINGEN (Sepik River), as well as Master John DEI (Kui Primary School), for much help in the bush ; the R.A.A.F. (Amberley) and Mr Harry PELGEN (Lae) for transport ; Maj. Gen. T.F. CAPE (Canberra), Messrs F. C. RODGER and Anthony MITCHELL (U. K.), and the Council of my Institute for the chance to take part in the adventure ; and my colleagues for their help in placing this useful collection on record.

The Pterygosomatidae, restricted to lizards, comprise eight genera (DAVIDSON, 1958 ; JACK, 1961 ; PRASAD, 1975), of which *Geckobia* Mégnin is the largest. JACK (1964) provided a useful supplement to earlier descriptions and keys (*e.g.* those of HIRST, 1926 ; LAWRENCE, 1951), *viz* a detailed account of the leg setation of a range of taxa. Hosts are given after WORRELL (1963) and INGRAM & COVACEVICH (1981).

2. Measurements and a skull each of *Rattus* and *Melomys* were lodged with the Division of Wildlife Research, CSIRO, Canberra, but no identification has yet been received.

GENUS *GECKOBIA* MÉGNIN

Geckobia : MÉGNIN, 1878 : 188 (type-species *G. latasti* Mégnin) ; JACK, 1964 : 1 ; GIROT, 1969 : 63 — curiously, this author proposed the emendation *latastei* (given formally as *latastei*) under 31A of the Code, but this is a recommendation, not a mandatory article ; in any case, MÉGNIN's name consistently *does* end in *-i*, and is the correct original spelling (Art. 32).

Geckobia clelandi Hirst (Figs 6-7)

G. clelandi : HIRST, 1917 : 138 ; 1926 : 175 ; JACK, 1964 : 8.

■ **Material** : Nine ♀♀ and one ♂ from broad-tailed rock gecko, *Phyllurus platurus* (White) (Lacertilia : Gekkonidae) (given on label as *Gymnodactylus platurus*), Oxford Falls, near Sydney, New South Wales, Australia, 1922, I. M. MACKERRAS (K. M. JACK det.). In Queensland Institute of Medical Research, Brisbane (QIMR).

■ **Female** : Dorsal shield with 4 + 6 setae in all specimens (anterior row of four arranged 1 + 3 once).

■ **Male** : Palpal femur with short, stiff seta ; genu with nude seta.

Idiosoma (Fig. 6) subcircular from above, about 230 µm long, 250 µm wide. Dorsal shield about 190 µm wide, length not measurable ; with setal pattern partially obscured by genitoanal papilla (all setae in this region are shown as superficial, but some may, in fact, lie beneath the papilla). Dorsal body setae less numerous than in ♀, only weakly clavate. Papilla dorsoterminal, with at least two pairs of finer setae ; aedeagus slender.

Ventral body setae (Fig. 7) similar to dorsals posterolaterally, but almost filiform anteromedially.

Coxal setal formula 2.2.2.2/1, nude except for internal seta on II-III. Leg setation, as far as can be seen, as specified by JACK (1964) ; dorsal seta on femora strong, but only weakly clavate.

■ **Notes** : The vertical position of the male genitoanal papilla of *Geckobia* in life is well shown in GIROT's Fig. 6A (1969) of *G. loricata* Berlese. In mounted specimens, the papilla may fall either forwards (as in my Fig. 6 of *G. clelandi*) or backwards (as in Fig. 10 of *G. manzanelli* sp. nov.). This series will confirm the original record.

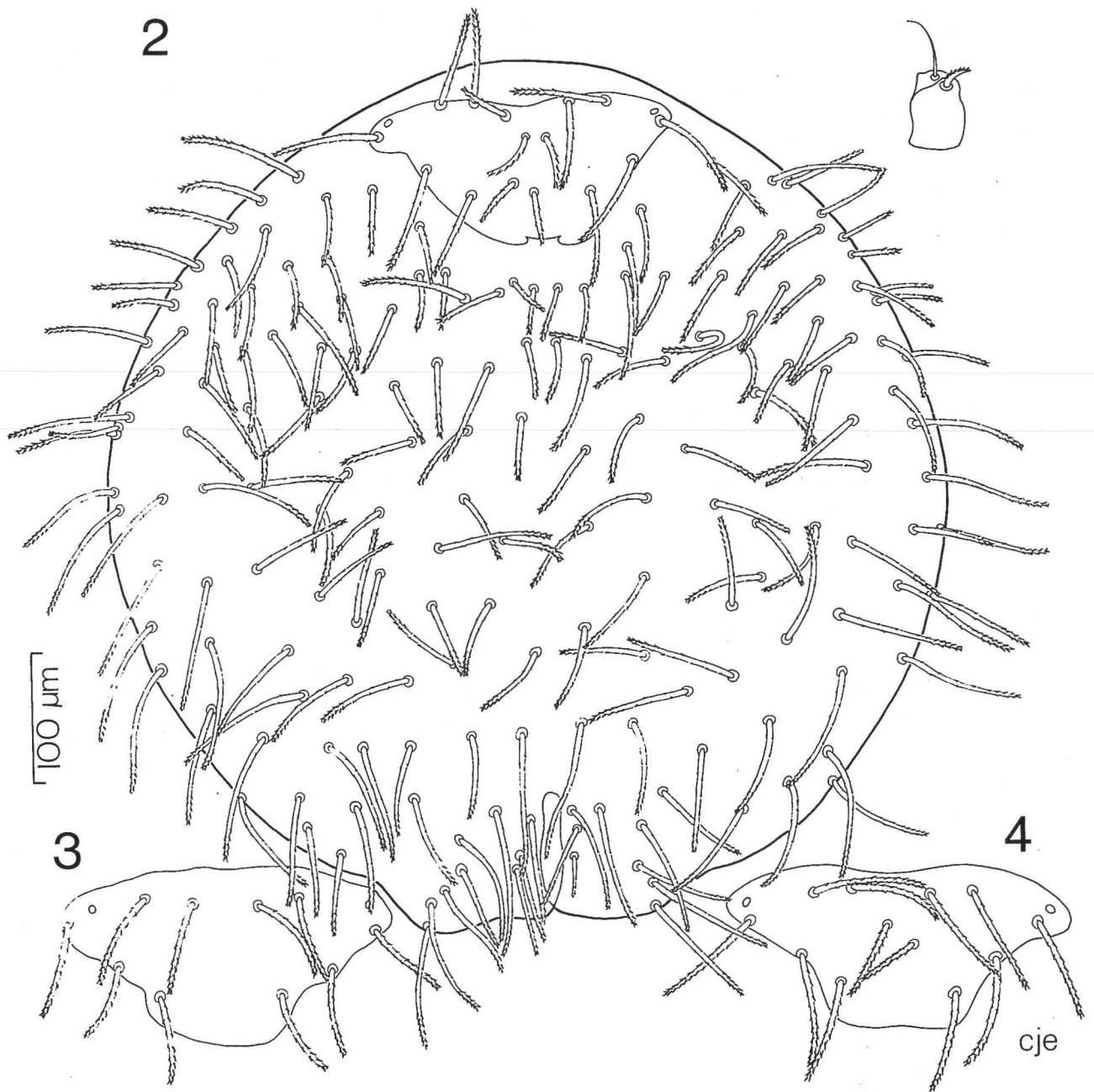
Geckobia manzanelli sp. nov. (Figs 2-5, 8-12)

■ **Types** : Holotype ♀, allotype ♂, 34 paratype ♀♀ and one paratype ♂, red mites attached singly and in small groups, with their bodies fully exposed (cf. *G. loricata*), on dorsum and flanks of leaf-tailed gecko, *Phyllurus cornutus* (Ogilby), Girraween, near Stanthorpe, S. E. Queensland, Australia, 1-IV-1981, R. MANZANELL. Holotype and allotype in Queensland Museum, Brisbane ; paratypes in British Museum (Natural History), London (BMNH), and QIMR.

■ **Female** : Basis capituli partially hidden under fold of cuticle ; with a pair of nude setae. Chelicerae and peritremes normal. Palpal femur with short, stiff seta ; genu with nude seta.

Idiosoma subspherical, about 650-670 µm long, 640-660 µm wide in engorged, gravid specimens illustrated ; as small as 440-550 µm in diameter when neither gravid, nor shrivelled. Dorsal shield 90-130 µm long, 220-265 µm wide, somewhat variable in outline, but at least twice as wide anteriorly as posteriorly ; normally with 10 setae submarginally and two discally as in Fig. 4 (rarely nine submarginals ; discals more variable, at times three, rarely none, one, four or five as in Figs 2-3) ; with two convex eyelets in usual position. Dorsal body setae unexpanded, barbulate, evenly spread and evenly increasing in length towards termen (*i.e.* not of two distinct size-groups). Analia dorsoterminal, with setae somewhat irregular in length.

Ventral body setae (Fig. 5) similar to dorsals,



FIGS 2-4 : *Geckobia manzanelli*, ♀.

2. — Holotype idiosoma dorsal, with variant dorsal shield and inset showing palpal femur-genu ; 3-4. — Paratype variant and normal dorsal shields.

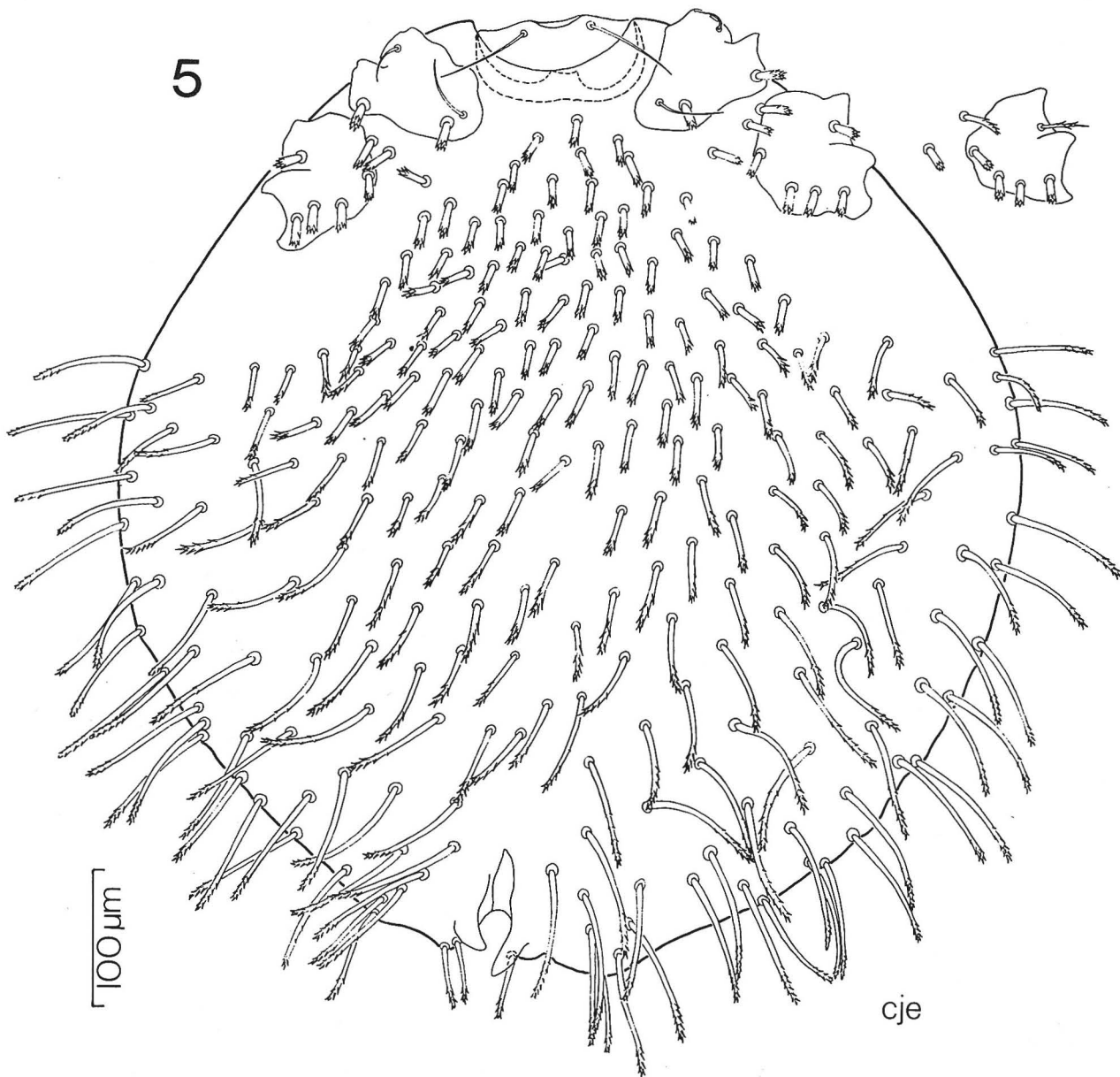
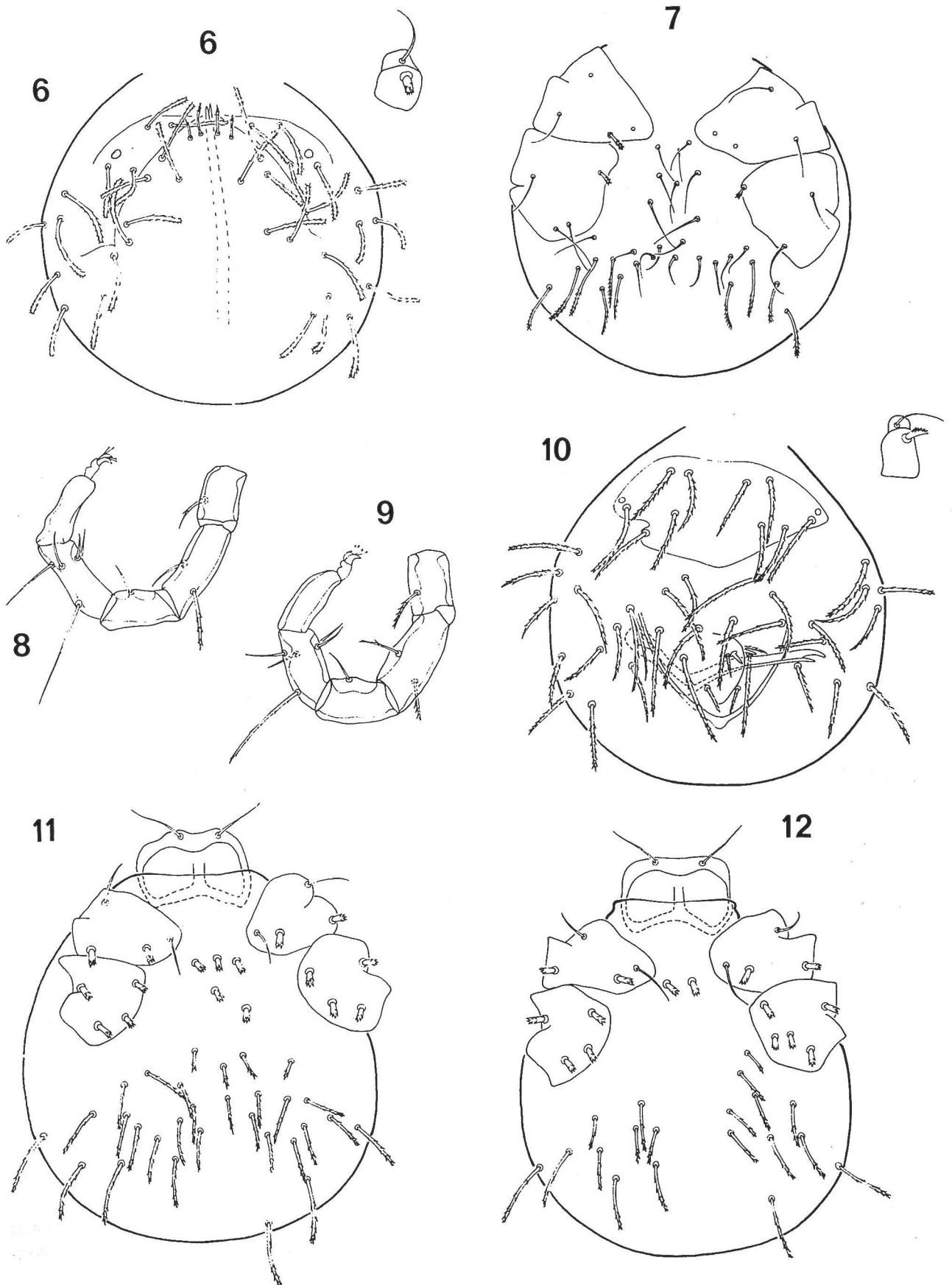


FIG 5 : *Geckobia manzanelli*, paratype ♀ (on same slide as holotype). Idiosoma ventral, with inset showing teratological external seta on coxa III.

but anteromedians short and stiff, with two (range one to three) setae on each side between coxal plates. Genitalia ventroterminal, with pair of conical processes each bearing one or two shorter setae.

Legs normally developed, IV not incrassate. Coxal plates with normal setation (LAWRENCE,

1936), but IV somewhat variable (normally 3/3, often 3/2, at times 2/2). Trochanters-tibiae with same setation as in group I of JACK (1964), but seta *d* on tibia I not so basad as in his Fig. 1 of *G. bouleengeri* Hirst; no setae, especially on trochanters-femora, thickened (Figs 8-9). Tarsi with same setation as in group A of JACK. Am-



FIGS 6-12 : *Geckobia* spp.

6-7. — *G. clelandi*, ♂ idiosoma dorsal and ventral, with inset showing palpal femur-genu ; 8-9. — *G. manzanelli*, ♂ and ♀ trochanter-tarsus IV anterodorsal and posteroventral, with tarsal setae omitted ; 10. — *G. manzanelli*, paratype ♂ idiosoma dorsal, with aedeagus inserted from allotype ; 11-12. — *G. manzanelli*, allotype and paratype ♂ idiosoma ventral.

bulacra normal, convexity of each claw bearing two tenent processes.

■ *Male* : Capitulum as in ♀.

Idiosoma (Fig. 10) about 250-285 μm long, 250-275 μm wide ; U-shaped "line" behind genitalia present in both ♂♂, probably a fold in cuticle. Dorsal shield 70-80 μm long, 155-165 μm wide, as in ♀ in Fig. 3. Dorsal body setae much fewer than in ♀, paired discally. Genitoanal papilla dorsal, with two pairs of short setae and a pair of rods around its base ; aedeagus slender, distally cleft (unless lower portion is a support in which aedeagus moves).

Ventral body setae (Figs 11-12) much fewer than in ♀, similar to dorsals, but anteromedians short and stiff (five in allotype, two in paratype), with none between coxal plates.

Legs with same setation, and as large as in ♀, despite great disparity in size of bodies.

■ *Notes* : *G. manzanelli* falls in group I of JACK (1964), but one or more of the following characters — presence or absence of dorsal shield, and its shape and setation ; dorsal body setae in two distinct size-groups ; ventral body setae scalelike ; leg IV incrassate ; some setae on basal leg segments thickened — quickly exclude all its members from comparison, except *G. clelandi*. Species not examined by JACK or described later (e.g. those of ABDUSSALAM, 1941 ; DE LA CRUZ, 1973 ; CUY, 1979 ; FLOCH & ABONNENC, 1944, 1945 ; FLOCH & FAURAN, 1955 ; HIREGAUDAR, JOSHEE & SOMAN, 1959 ; KAWASHIMA, 1962 ; KAWASHIMA & KAMO, 1960) can likewise be excluded.

G. clelandi, interestingly enough, is also an Australian species, and parasitises the same host-genus (*Phyllurus* Schinz) as *G. manzanelli*, but the two are at once separable :

1. — Dorsal shield widest in posterior half, without discal setae. Dorsal (and to lesser extent ventral) body setae clubbed. Host *P. platurus* *clelandi* Hirst
- Dorsal shield widest in anterior half, normally with a pair of discal setae. Body

setae parallel-sided. Host *P. cornutus*....
manzanelli sp. nov.

Geckobia bataviensis Vitzthum (Figs 13-17)

G. bataviensis : VITZTHUM, 1926 : 122 (January).

G. gleadoviana : HIRST, 1926 : 185 (February) ; JACK, 1964 : 8. Syn. nov.

G. nepalii : HIREGAUDAR, JOSHEE & SOMAN, 1959 : 66. Syn. nov.

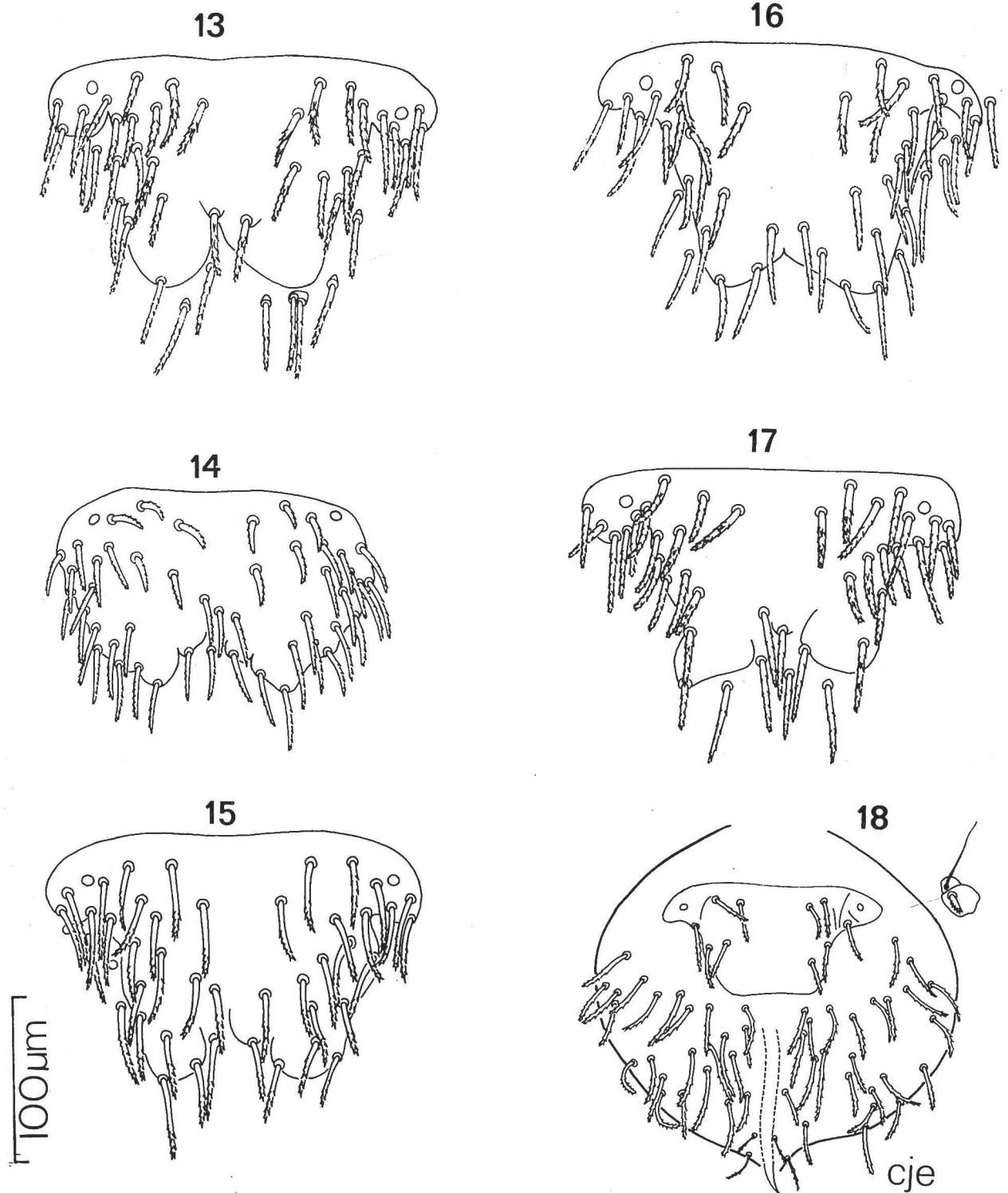
G. cosymboti : CUY, 1979 : 156. Syn. nov.

■ *Material* : Several ♀♀ from under toe-nails of house gecko, *Hemidactylus frenatus* Duméril & Bibron (Gekkonidae), Kui, Morobe Province, Papua New Guinea, 27-IX-1979, I.R. ; many ♀♀, same parasitope and host, Lake Murray, Western Province, P.N.G., 29-XI-1979, I.R. (each series red in life ; the first, except for two mites under one nail, comprised one mite *per* nail). Also seven ♀♀, *H. frenatus*, Port Moresby, P.N.G. (K. M. JACK *det.*). Four ♀♀ from Lake Murray in BMNH ; remainder in QIMR.

■ *Notes* : The two slides of *G. bataviensis* in the Zoologische Staatssammlung, München (ZSM), are each labelled "TYPUS". One contains one adult female (here designated lectotype), and the other one eight-legged immature (here designated paralectotype). The slides were kindly loaned me by Drs H. FECHTER and E. POPP, ZSM. VITZTHUM's Fig. 76 is accurate, except that it (as does my Fig. 13) presents a mirror-image of the mite as mounted, and the eyes are borne on extensions of the dorsal shield. In the nymph, the eyes are on unisetose shieldlets free of the dorsal shield, which carries 13 (6/7) setae.

The one slide of *G. gleadoviana* in BMNH contains one female, that on which HIRST's Fig. 9 is based. This may be regarded as the holotype, and was kindly loaned me by Miss A. S. BAKER and Mr K. H. HYATT, BMNH. In addition to HIRST's labels, it carries JACK's notation (dated 1963) " = *Geckobia bataviensis* Vitzthum 1926 ". The mount is too thick to examine at $\times 500$, but the posterior margin of the dorsal shield (my Fig. 14) seems not to be so eroded as originally figured.

The one slide of *G. nepalii* in the Zoological Survey of India, Calcutta, contains two paratype



FIGS 13-18 : *Geckobia* spp.

13. — *G. bataviensis*, lectotype ♀ dorsal shield ; 14. — *G. gleadoviana*, holotype ♀ dorsal shield ; 15. — *G. nepalii*, paratype ♀ dorsal shield ; 16. — *G. cosymboti*, paratype ♀ dorsal shield ; 17. — *G. bataviensis*, New Guinea ♀ dorsal shield ; 18. — *G. keegani*, ♂ idiosoma dorsal.

females of that species (Fig. 15), plus one paratype female of *G. himalayensis* H., J. & S.; these were kindly loaned me by Dr A. K. SANYAL of that survey.

Two slides containing a total of two paratype females (Fig. 16) and one paratype nymph of *G. cosymboti* were kindly loaned me by Drs L. S. CUY and L. S. RAROS, University of the Philippines at Los Baños College of Forestry, Laguna. The nymph shows its eyes on unisetose shieldlets free of the dorsal shield, which carries 11 (5/6) setae.

G. bataviensis is here newly recorded from New Guinea (Fig. 17), and may be later shown also to occur in Australia, since the host (*H. frenatus*) ranges as far as there.

Geckobia keegani Lawrence (Fig. 18)

G. keegani : LAWRENCE, 1953 : 10 ; JACK, 1964 : 8 ; CUY, 1979 : 158.

■ *Material* : Three ♀♀ and two ♂♂ from *Hemidactylus frenatus*, Port Moresby, P.N.G. (♀♀ K. M. JACK det.). In QIMR.

■ *Male* : Palpal femur with short, stiff seta ; genu with nude seta.

Idiosoma (Fig. 18) subcircular from above, about 200 µm long, 190-220 µm wide. Dorsal shield 60-65 µm long, 130-135 µm wide, shaped much as in ♀, but with eye shieldlets more broadly attached and posterior margin not incised ; with 4 + 6 setae in both specimens. Dorsal body setae less numerous than in ♀, subequal. Genitoanal papilla dorsoterminal, with at least two pairs of finer setae ; aedeagus slender, not especially clear.

Ventral body setae similar to dorsals, but shorter anteriorly.

Coxal setal formula 2.2.2.1, those on I nude, on II-IV short, stiff. Legs shrivelled, but trochanters-tibiae apparently with setation specified by JACK (1964) ; tarsi not clear.

■ *Notes* : The only previous records of this species are from *H. frenatus* in the Philippines. I associate the males with these females rather than

with those of *G. gleadowiana* with the same collection data because their leg setation is the same : trochanters 1.1.1.0, not 1.1.1.1 ; femora 2.1.1.1, not 3.2.2.2.

G. keegani may also extend to Australia (see notes on *G. bataviensis* above).

ACKNOWLEDGEMENTS

In addition to those curators who kindly facilitated this study, I thank Mrs C. J. ELLWOOD for her drawings, Mr D. A. SMITH for Fig. 1, and Miss R. McDOWELL for typing the ms.

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CORRIGENDA

Haemolaelaps omnitectus (Vitzthum)

Hypoaspis (*Haemolaelaps*) *omnitectus* : VITZTHUM,
1928, Zool. Anz., 75 : 181 (sic). *Haemolaelaps*
palaniae : DOMROW, 1981, Acarologia, 22 : 115,
syn. nov.

Types. — Of *H. omnitectus* : Holotype in Zoo-
logische Staatssammlung, München, examined by
courtesy of Dr H. FECHTER, labelled "V249
Haemolaelaps omnitectus Vitzth. 1928 ♀ TY-
PUS" and "Wai Lima/Java auf *Chrysocolaptes*
validus (Temm.) 6.12.1921 leg : SIEBERS det :
VITZTHUM 15.3.1924". Of *H. palaniae* :
Holotype ♀ (No. 3973) in U.S. National Museum,
Washington, on *C. lucidus* (Scopoli) (Piciformes :
Picidae), Selangor, 6.IV.1962, H. E. MCCLURE.

Notes. — VITZTHUM's well preserved type
allows the following additions to his description :
Deutosternum with six rows of two to five denti-
cles. Podonotal half of dorsal shield with setae
*j*₃ and *r*₅, i.e. holotrichous (22 pairs) ; opisthono-
tal half with elongate *Z*₅ now lacking (but inser-
tions distinct), *J*₄ doubled, i.e. hypertrichous (18
pairs, my type actually 16.18 rather than 17.17 as
published). Sternal shield with anterior margin
weakly demarcated, bearing setae *st*₁. Setation of
appendages as in *H. palaniae*.

Hattena clemmys Domrow

Hattena clemmys Domrow, 1981, Orient. Insects,
14 : 415.

Page 417, line 11, for III read II ; line 35,
delete dorsal shield, retracted genital.

Paru en décembre 1983.