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ACARI SPINTURNICIDAE FROM AUSTRALIA AND NEW GUINEA

BY

Robert Domrow

Little is known of the Spinturnicidae of Australia. The first recorded species of Spinturnix (antipodiana = novaehollandiae) has been incertae sedis since its brief, posthumous description (Hirst, 1931), and Womersley, in his long career, never published on the family. Domrow (1962, 1967) recorded three species: S. psi, Meristaspis mindanaoensis, and Paraperiglischrus rhinolophinus. Finally, Prasad (1969 b) described S. queenslandica (= S. novaehollandiae).

Spinturnicidae (Ancystropus kanheri) were first recorded from New Guinea by Delfinado & Baker (1963), although they had long been known from the Moluccas and the Solomons (see Rudnick’s 1960 monograph). Baker & Delfinado (1964) added two species of Spinturnix (paracuminata and veruta = psi), four of Meristaspis (lateralis, dusbaboki = macroglossi, mindanaoensis, and jordani), one of Ancystropus (rudnicki = taprobanus), and one of Paraperiglischrus (hipposideros). Finally, Prasad (1969 b, c) first published S. wilsoni, and then confirmed all of Baker & Delfinado’s records except S. paracuminata and P. hipposideros (M. hardyi = M. mindanaoensis).

In this paper, additional material (including several new host-records) is detailed for all four species of Spinturnix listed above. Two new species of Spinturnix are described from Australia. The genus Eyndhovenia is recorded from Australia for the first time. Additional material (including several new host-records) is detailed for all six species of Meristaspis and Ancystropus listed above. Two species of these genera are added to the fauna: M. calcarata from Australia and New Guinea, and A. zeleborii from New Guinea. The host-relationship of P. rhinolophinus in Australia is confirmed, and only with P. hipposideros has it been impossible to add to existing knowledge. Two generic, and ten specific, names are newly synonymised.

In summary, eight species of four genera are now known from Australia, and twelve species of four genera from New Guinea. As S. psi, M. calcarata, and M. mindanaoensis are known from both areas, the total fauna comprises seventeen species of five genera.

The documentation given below includes only synonymies and references published since Rudnick (1960) and then only if they refer to the south-west Pacific. Radovsky (1969) also makes interesting comments on the family. Further, while the text includes all known species of Eyndhovenia, Meristaspis, and Ancystropus, it takes in only the species of Spinturnix and Paraperiglischrus recorded from Australia and New Guinea.

The initials of the collectors (except mine) are those of J. H. Calaby, K. Davey, Barbara Dew, G. M. Dunnet, P. D. Dwyer, D. Fitzsimon, R. H. Green, E. Guindy, B. Hall, E. Hamil-
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Comparative morphology

Males of Spinturnix, Meristaspis, and Ancystropus are generally similar, but females show increasing modification, particularly to the anterior half of the body. The three taxa have therefore been variously combined (RUDNICK, 1960), and a closer study of this modification, as well as of the idiosomal setation, seemed necessary. Leg I is unmodified in Spinturnix, but becomes more incrassate and armed in the other two genera. Thus simple claws and a diaphanous pulvillus occur in Spinturnix, but Meristaspis and Ancystropus have strong (sometimes angulate) claws, while the pulvillus is reduced in the former and absent in the latter. (Similar modification to ambulacrum I occurs in species of the rhinonyssine genus Tinaminyssus Strandinmann & Wharton infesting doves and pigeons, see DOMROW, 1969).

Correspondingly, all species of Spinturnix are mobile on the wings of their hosts, but I have removed, from the arm-pits of Malayan bats, specimens of Ancystropus (now lost) which were attached somewhat like ticks, their legs I and mouthparts (capitulum) being tightly embedded in the skin. Therefore, to judge from the frequency of specimens with snapped-off legs I, A. kanheri also burrows into the skin, probably to the level of the distinct transverse cuticular ridge behind coxae II (which is, in fact, the posterior margin of a band of heavily sclerotized cuticle behind the sternal shield). The dorsal shield also terminates at this level (Fig. 51).

A character correlated with these habits is the nature of the two lateroterminal setae (presumably homologues of al 1 and pl 1 on tarsi II-IV 3) flanking the pulvillus. In Spinturnix, they are tapering, sinuous, and tend to diverge. In Meristaspis, they are stiff and spatulate, with

3. I use EVANS' (1963) original formula, which maintains the integrity of the basal whorl of six setae on the larval telotarsus, rather than his unpublished modification (LEE, 1970).

Since submitting the ms of this paper, I have seen EVANS' (1969) extended formula designed to accommodate additional setae found on tarsus IV in the Sejina (Monogynaspida) and Antennophorina (Trigynaspida). One point requires comment: the specialization he mentions in T. aprosmicti (Domrow) — setae pl 4 (old notation) lacking on tarsus IV — is, in fact, simple intraspecific variation. His statement could well be true of the short series of paratypes in the B.M. (N.H.) (host Aprosmictus erythrophorus, S. E. Queensland), but those in the Q.I.M.R. show me (av 3 ) either present or absent, while specimens from the same host from far N. Queensland, A. scapularis, Platycerus adscitus, Barnardius barnardi, Psephotus varius, and Ps. haematotus show this seta almost invariably present (in one specimen from A. scapularis, it is present on one leg and absent on the other). Likewise, seta pl 3 (pl 4 ) is usually absent is specimens from Aprosmictus, variable in those from Barnardius, and usually present in those from Platycerus and Psephotus. These additional collections are listed by DOMROW (1969).
their tip drawn out into a filament that may be extensive (jordani) or obsolescent (calcarata). In Ancystropus, they are adpressed, in the form of stiff stylets or ventrally-directed hooks.

The leg setation of spinturnicid mites was largely ignored until Rudnick (1960) attempted realistic illustration and some taxonomic use of this feature. However, the first detailed account was that of Evans (1968) for Spinturnix myoti Kolenati, whose patterns are repeated in S. novaehollandiae (including all Hirst's specimens) and S. wilsoni (see Prasad, 1969b, who inadvertently omits seta mv on tarsus II and al₂ on tarsus III of the former, and seta al₄ on tarsus IV of the latter). I now confirm these three species have identical patterns, but both S. paracuninata and S. opesici n. sp. differ in showing femur I unidentifiable ventrally (2-4/2-2, not 2-4/3-2). All four forms of the two species associated with Miniopterus Bonaparte (S. psi and S. loricata n. sp.) also show femur I unidentifiable, but differ sharply from their congeners in showing femur IV unidentifiable as well (1-3/1-0, not 1-3/2-0).

Oudemans (1903) had early noted that Spinturnix contained uryalis only with difficulty, and Rudnick (1960), noting this species recalled both Spinturnix and Meristaspis, erected the monotypic Eynhovenia for it. Its leg setation also proves diagnostic in that femora III-IV have a third seta ventrally (1-3/3-0). Minor differences also occur on the tibiae (III 1-3/2-0, but not II and IV), but Costa (1968) noted greater setational stability in Hemipterus Evans on legs I-II than on III-IV, and on the basal leg segments and tarsi than on the genua and tibiae. Otherwise, the patterns of Eynhovenia resemble those of S. myoti.

All species of Meristaspis show the same pattern as S. myoti, except that tibiae III-IV are unidentifiable (1-3/1-1, not 1-3/2-1 — but whether pv or pl is the missing seta is hard to say).

Ancystropus laprobanus shows a pattern generally similar to that of S. myoti, although eight segments are unidentifiable. Trochanter IV lacks the posteriormost of the usual five setae. Femur IV is 1-3/1-0. Genu and tibia I are 1-4/2-1 (the two al on the latter having coalesced to a stout rod). Genua III-IV are 1-4/1-1 (pv lacking). Tibiae III-IV are 1-3/2-0 (pl lacking).

This relatively full complement of leg setae suggests A. laprobanus is the only mobile member of the genus, and it is noted above that legs I are probably used by the other species for attachment. Nonetheless, although they are incrassate and armed, they retain in at least three species (aethiopicus, convycteris, and zeleborii) the setational pattern of S. myoti. Indeed, I believe the same pattern is detectable even in A. leleupi and A. khaneri, although refraction makes exact focussing more than usually difficult in these species. The following segments also have the same general setation as S. myoti, with the occasional unidentifications shown: trochanters II-IV; femora II-IV (IV 1-3/1-0 in aethiopicus, leleupi, and khaneri); genu II; tibia II (1-2/2-1 in khaneri, i.e. only 1 pl); tarsi II-III.

The major deficiencies noted by Rudnick (1960) on the terminal segments of legs III-IV in species of Ancystropus other than laprobanus are probably correlated with the reduction of sensory function in sessile forms. Thus the basal pair of dorsal setae are missing on genua and tibiae III-IV, resulting in the formulae 1-2/2-1 and 1-1/2-0, respectively, since tibiae III-IV further lack seta pl. Even tarsus IV is unidentifiable (ad₄ absent).

The small size and state of preservation of my specimens of Paraperiglischnus rhinophilophinum do not allow complete formulation of the leg setation. Particularly difficult to see are the minute ventral setae, but the numbers in brackets below, if not certain, are at least minimal: trochanters ?; femur I 2-4/2-2, II 1-4/2-2, III 1-3/1-0, IV 1-3/0-0; genu I 2-5/2-1, II 1-4/-1, III 1-4/0-1, IV 2-4/0-1; tibia I 2-5/2-1, II 1-3/2-1, III 1-3/2-0, IV 2-3/2-1; tarsus II ?, III-IV 18. The other four genera above never have as many as five setae dorsally on genu and tibia I.

Figs. 6-7 and 11-12 show that the tarsal I setation of S. wilsoni and S. loricata is exactly comparable with that of S. myoti. However, the pattern is very crowded, and, although other
genera are basically similar (with possibly some reduction in smaller forms), this character has not been explored.

The tritosternum is weak or absent in *Spinturnix*, but always forms a discrete, heavily sclerotized plaque between coxae I in *Meristaspis* and *Ancystropus*.

A less clear-cut distinction is provided by the number of setae flanking the dorsal shield in front of the peritremes (proteronotals). These typically number five (or four) pairs in *Spinturnix*, and four pairs in both *Meristaspis* and *Ancystropus*. A tendency to say only three pairs are present in *Ancystropus* must be resisted, since the first pair (verticals), though reduced at best and normally represented by the merest remnant, has been detected in all species except *taprobanius* and *leleupi*. The second and third pairs become approximated in *Ancystropus*, and coalesce in *A. leleupi* and *A. kanheri*.

The hysteronotal and ventral setation may also conveniently be discussed here. Species of *Meristaspis* and *Ancystropus* (with two exceptions noted below) uniformly show a pattern of nine pairs, a degree of reduction never reached by Australian species of *Spinturnix* (but see Allred's 1969 description of *S. nudata* (emend.) Allred from Pakistan). They are correctly figured by Rudnick (1960) for *M. lateralis*, and comprise one pair of poststigmals, one pair of postscutals (present in all species, but often much reduced), three pairs of dorsocaudals (or caudals in *Ancystropus*), and four pairs of ventrals. In *M. calcarata*, the terminal pair of dorsocaudals is lost due to the development ventrally of the posterolateral cuticular depressions peculiar to this species. In all species of *Ancystropus* (except *A. taprobanius*) one pair of ventrals is lost, possibly due to the tendency to physogastry noted below.

The distinct transverse « suture » in the cuticle immediately behind the dorsal shield in three species of *Meristaspis* (lateralis, macroglossi, and mindanaensis) is also present in *Ancystropus*, at least in those species I have been able to examine in a non-pregnant state (*taprobanius, eonycteris*, and *zeleborii*).

One further aspect deserves comment. As other sessile parasitic mites (e.g. Bakerocoptes Fain, see Lavopierre, Rajamanickam, and Ward, 1967) tend to physogastry during pregnancy, it is not surprising to see this phenomenon in spinturnicid genera. Females of *Spinturnix* often have the opisthosoma largely filled by a well-developed protonymph, with its anterior end directed towards the posterior of the mother. Breech birth is thus apparently normal. Also, at least in specimens of *S. novaehollandiae* from Chalinolobus gouldii, as many as six additional non-embryonated ova of decreasing size may occur in the more central portion of the idiosoma. Some species of *Ancystropus* (zeleborii and eonycteris) become heavily pregnant, but in *A. kanheri* the physogastry is extreme, and although the genital aperture is normally placed in non-pregnant females (Baker & Delfinado, 1964), it migrates with increasing distension to a subterminal position, while the anus moves onto the dorsum. The hysterosoma may contain as many as eleven ova, in which embryonation may extend to the second (Fig. 51). In another specimen, the second embryo has developed to a protonymph.

In summary, these characters are not to be treated independantly, but as facets of one tendency, viz a change from tactile to prehensile function. Zumpt's (1951) very broad concept of *Spinturnix* therefore had good morphological justification. However, host-specificity is also an important character, and, as it is correlated with morphological criteria, I take a more narrow view.

*Spinturnix* is restricted to insectivorous bats (Microchiroptera, Vespertilionoidea), while *Meristaspis* and *Ancystropus* are confined to frugivorous bats (Megachiroptera, Pteropodidae). Both Eyndhovenia, whose mosaic-like nature was noted by Rudnick (1960), and the peculiar *Paraperiglischrus*, are widespread on the Rhinolophoidea (Microchiroptera). It is unlikely that
genera parasitizing bats restricted to the New World (Machado-Allison, 1965 a, b; Furman, 1966; Duszabek, 1968 *) will occur in the Australian region, and the five Old World genera just listed may be naturally keyed as follows #:

**Key to Genera of Spinturnicidae from Australia and New Guinea**
(based principally on females).

1. Dorsal shield entire. Peritremes elongated, extending forward at least to level of anterior margin of coxae III. Tritosternum frequently present. Genu and tibia I with four setae dorsally.
   - Various hosts ........................................................................................................... 2
   - Dorsal shield divided. Peritremes abbreviated, restricted to area above posterior half of coxae III. Tritosternum absent. Genu and tibia I with five setae dorsally. Rhinolophoid hosts.............. *Paraperiglischrus*

2. Postanal seta present. Body cuticle with at least fifteen pairs of setae. Microchiropteran hosts. 3
   - Postanal seta absent. Body cuticle with at most thirteen pairs of setae. Megachiropteran hosts. 4

3. Peritremes extending onto venter. Tritosternum weak and amorphous, or absent. Femora III-IV with two or one seta ventrally. Vespertilionid hosts......................... *Spinturnix*
   - Peritremes confined to dorsal. Tritosternum large and quadrate. Femora III-IV with three setae ventrally. Rhinolophid hosts............................................... *Eyndhovenia*

4. Setae A1 and A2 on tarsus I spatulate, with drawn-out tips. Pulvillus I present. Genua and tibiae III-IV with four and three setae dorsally, respectively.................... *Meristaspis*
   - Setae A1 and A2 on tarsus I stylet- or hook-like. Pulvillus I absent. Genua and tibiae III-IV with two and one seta dorsally, respectively (except in *Taprobantes)*........... *Ancystrops*

**Genus Spinturnix** von Heyden.


The recognition of other bizarre forms of this genus below removes the necessity of distinguishing *P. globosa* (emend.) Rudnick generically. Its adults are *Spinturnix*-like at moulting, and both taxa parasitize vespertilionid bats.

This, the type-genus, derives from *spinturnix*, an unsightly bird; *Meristaspis* derives from *meristus* (*γεροντος*), divided + *aspis* (*αμιξ*), a shield. Both genera therefore remain feminine under Article 30 (a) (i) of the Code (Stoll & al., 1964), and masculine adjectival names traditionally used with them require amendment under Art. 30. *Ancystrops* derives from *ancistrum* (*ἀγναστρον*) a fish-hook + *pis* (*πις*), a foot, and similarly remains masculine. *Onocoscelus* derives from *oncus* (*ὀκτενα*), a barb + *scelos* (*σκλης*), a leg. However, although *σκλης* is neuter, *Onocoscelus* is masculine under Art. 30 (a) (i), (3), being parallel to the example given (*στήθος*, the chest, is neuter, but genera in -*stethus* are masculine). *Eyndhovenia* is feminine (Art. 30 (a) (ii)). *Paraperiglischrus* derives from the adjective *glischrus* (*γλυκορός*), greedy, and is to be treated as a noun under Art. 11 (f). It is masculine.

Cases such as *Spinturnix* are clear-cut, but with genera such as *Onocoscelus* taxonomists may care to read the Code (B, n. 6) — not only can a change to the ending of a Greek work during latinization set off a chain-reaction involving gender, declension, and even stem, but they are

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4. This recalls the situation in S.E. Asia, where American, Chinese, and Russian workers are independently naming the same species over an even broader taxonomic range.

5. In view of this current expansion of knowledge, the genera are not assigned to subfamilies (Benoit, 1957).
unnecessary. I will therefore state in future the derivation and gender of generic names I publish as new (Code, E16), and indicate whether new specific names are nouns (and therefore immutable), or adjectives subject to Art. 30. An alarming proportion of modern specific names cannot be assigned with certainty to either category (Art. II (g) (i)), and creates immediate difficulty on transfer to a genus of different gender. These are best treated as nouns unless the contrary is explicitly stated.

Another procedure, impossible both grammatically and under the Code, is also being attempted: the change of endings of specific names that are nouns in the belief that they must be treated as adjectives are under Art. 30, e.g. gallinarum is already feminine and correct (-arum merely indicates case, not gender), and cannot be made into gallinara when assigned to a feminine genus (e.g. Neoschoengastia Ewing).

The demands for scholarship made by the Code are minimal. The pity is, however, that the same taxonomists who admit confusion also choose to compound it by publishing names inexpertly coined without the advice of a classicist. In addition to the appendices of the Code, I find Woods (1944), Jaeger (1959), and Stearn (1966) most helpful (not to say entertaining).

Key to females of Spinturnix from Australia and New Guinea.

   Setae on femur IV arranged 1-3/1-1. Peritrematal shield sometimes present. Seta md on tarsi II-IV sometimes foliate. Associated with Miniopterus. .................................................. 5
2. Setae on femur I arranged 2-4/3-2. .......................................................... 3
   Setae on femur I arranged 2-4/2-2. .......................................................... 4
3. Hysteronotal setae extending forward in circumscutal band to well in front of peritremes, and obliterating fourth pair of proteronotals. Spinturnix wilsoni
   Four pairs of proteronotal setae present. Hysteronotal setae confined to area behind stigmata. ....... wilsoni
   No trace of tritosternum. Palpal femur with five setae. ............................................ paracuminata
   Dorsal shield normal in shape and texture. Hysteronotal setae numerous. Sternal shield subcircular. ..... novahollandiae
   Dorsal shield variously modified. Hysteronotal setae in three small, discrete groups of 3+4+3. Sternal shield elongate.......................................................... loricata

Spinturnix wilsoni Prasad.
   (Figs. 2-9).


Notes: I had already figured this characteristic species (Figs. 2-5) as new before seeing Prasad's paper, and therefore restrict the present text to supplementary comment.

6. S. paracuminata is the only species on this side of the key to be recorded from Miniopterus; but, to judge from the volume of mixed collection data accompanying both Spinturnicidae and Rhinonyssinae from this source, either host-identifications are not final, or undue contamination occurs in the field. None of the carefully documented material of this species listed below is from Miniopterus.
Basis capituli (Fig. 9) short, with two capitular setae. Hypostome with three pairs of setae (H.23 rudimentary); epistome subcircular, with dense margin. Palpi slender; setal formula 1.5.6.9 (trochanter-tibia; see description of S. eptesici below). Tarsal claw simple.

Setation of tarsus I identical to that detailed by EVANS (1968) for S. myoti. This segment also shows two strong, reniform apodemes internally (Figs. 6–7). Femur IV with two setae ventrally (Fig. 8).

PRASAD rightly uses the lack of the fourth pair of proteronotal setae to diagnose his species; nevertheless, it does not belong with those species which normally have only four pairs of these setae. The male shows five pairs, and the lack of the fourth pair in the female is due simply to the forward incursion of the circumscutal members of the hysteronal series.

_Spinturnix novaehollandiae_ Hirst.
(Figs. 1, 16).


_Chalinolobus dwyeri_, New South Wales, Jenolan, 3.IX.1967, B. D. (2 ♀♂).


_Nycticeius greyi_, New South Wales, Seven Hills, 11.XI.1962, B. D. (1 ♂, 3♂♂, 3 nymphs).

_Miniopterus schreibersii_, New South Wales, Colong Caves, 12.I.1966, K. D. (1 ♂, 2 ♂♂, 1 nymph, probably stragglers).

_Eptesicus pumilus_, Victoria, Darlimurla, 18.II.1967, E. H. S. (BS 1533) (2 ♀♂, 1 ♂, possibly stragglers).

_Nyctophilus geoffroyi_, Tasmania, Colebrook, 18.II.1963, R. H. G. (1 nymph, possibly a straggler).

Unidentified host, South Australia, Lucindale, F. S. (2 ♀♂, 1 ♂ — the original series of _S. novaehollandiae_, one female being labelled « type », and the capitus of the male being dissected off and mounted separately). Mr. HAMILTON-SMITH (in litt., 30.IX.1970) mentions « There is
no question that Lucindale has been and is a most likely locality for *Chalinolobus gouldii*... Lucindale is very close to Naracoorte » (the type-locality for *S. loricata*, v. infra).

Unidentified host, QUEENSLAND (labelled NEW SOUTH WALES, but the former has been a separate political entity since 1859 — Hirst left England for Australia in the '20s), CAIRNS, A.M.L. (not A.H.L. as published). (1 ♂ — the original series of *S. antipodiana*, the specimen being

![Image of Spinturnix novaehollandiae](image-url)

**Fig. 1**: *Spinturnix novaehollandiae*. Sternogenital shield ♂. Left and centre, four specimens from *C. gouldii* (Kooweerup and Seven Hills, respectively); right, Hirst's specimen (above) and type of *S. antipodiana* (below).

labelled « type », but lacking the capitulum. The slide also bears an unpublished specific name, *viz* the Latin equivalent of Queensland (*terra reginae*, but combined and in the genitive).

**Notes**: The two species of Hirst cited above were published over a footnote reading « Publication... has been delayed in the hope that... the text-figures might have been found among the effects of the late Mr. Stanley Hirst ». They were not (nor has enquiry to the British Museum (Natural History) and several likely Australian laboratories, including the South Australian Museum, turned them up), and later authors, unaware that the specimens still exist in London
and unable to add to the brief original descriptions, left the two taxa as *species inquirendae*.

The only concrete characters given by Hirst to differentiate them were that the sternogenital shield in *antipodiana* was coarser than in *novaehollandiae*, and that the arrangement and size of setae on the terminal palpal segments differed. Fig. 1, representing the sternogenital shield of two pairs of males from *C. gouldii* from Kooweerup and Seven Hills, and of Hirst’s two males, indicates the small, heavily sclerotized « tiles » between the reticulations tend to coalesce to a coarser pattern in some specimens. All Australian species of *Spinoturnix* have the setae on the palpal genu, tibia, and tarsus identically arranged, and Hirst’s alleged difference in size could have resulted from some distortion such as foreshortening. See Fig. 16.

I therefore consider his two species synonymous. *S. novaehollandiae* lacks page precedence, but, as it is based on both sexes and the male capitulum still exists, I take advantage, as first reviser, of Art. 24 (a) of the Code (Stoll & al., 1964) to choose this name as the senior synonym. It further clearly represents the same taxon as that later described by Prasad.

*S. novaehollandiae* shows four pairs of proteronotal setae, a condition seen in only two other species : *S. plecolina* (emend.) (Koch) from Europe, and *S. nudata* from Pakistan (Allred, 1969). The former is distinguished by showing seta *md* on the tarsi (particularly II-IV) lanceolate (Cooreman, 1960). Three paratypes of the latter confirm that 1+0+1 hysterontals are normally present in both sexes, but, although males of *S. novaehollandiae* reach this extreme, females never even approach it. Further, the male of Hirst’s species shows the sternogenital shield distinctly longer than in Allred’s (ratio L/B 1.6 against 1.1).

Prasad naturally saw little individual variation in his short series, but, in fact, the idiosomal setation varies in the extreme 7. Females from the common host (*C. gouldii*) normally show a continuous band of 55-70 (65) *hysterontal setae*, but occasional specimens show as few as 30-40. In one, only 24 setae are present, being arranged in three groups (two poststigmal and one caudal) of 1+18+5. The proteronotal setae typically number four pairs, but the first pair is normally absent in specimens with less than 40 hysterontals. The ventral setae number 25-35 (35), exclusive of the sternals &c. In males, the hysterontals vary continuously from 1+0+1 to a continuous band of 29 (5+3+8), the first pair of proteronots again being sometimes absent when only few hysterontals are present. The ventrals usually number 12-20 (20), but occasionally as few as 5 are seen.

Specimens from *C. morio* and *Myotis* vary almost to the same degree. The short series from *C. picatus*, *C. dwyeri*, and *Pipistrellus* have setal counts in the upper range. Specimens from *N. greyi* have setal counts in the lower range (hysterontals 5+15+6 in the female, 2+0+2, 1+2+1, and 1+0+1 in the males), and all lack the first pair of proteronots. The four females from *N. rueppelli* show 5-6)+(16—20)+(5-6) hysterontals, and lack all but the fourth pair of proteronots.

The normally weak tritosternum may, in occasional specimens, fairly be said to be absent. (An analysis of variation in this respect in other species might also prove instructive.)

The rediscovery of Hirst’s types makes the point academic, but I would comment on the situation had they not been recovered, because, in spite of the Code and its glossary (Stoll & al., 1964), enquiry prompted three different opinions on the status of these names:

7. Similarly, Furman (1966), with abundant material, was able to confirm Rudnick’s (1960) suggestion that *S. americana* (emend.) (Banks) and *S. carloshoffmanni* Hoffmann were conspecific.
8. The figures in brackets in this paragraph refer to Hirst’s specimens of *novaehollandiae*, which further show four pairs of proteronots (divided between two slides in the case of the dissected male). The type of *antipodiana*, showing 15 ventrals and only 2+4+2 hysterontals (one of the caudals is very strong), lacks the first pair of proteronots.
1. *Nomina nuda* — names that, if published after 1930, fail to satisfy the conditions of Art. 13 (a) (i.e. names unaccompanied by a statement that purports to give characters differentiating the taxa...). This is irrelevant to Hirst, both of whose names are available because they were followed by brief descriptions. *Nomina nuda* have no nomenclatural standing.

2. *Nomina dubia* — names not certainly applicable to any known taxon. I now construe this rigidly as referring to doubtful names that are known, in fact, to be unsupported by original type-material (e.g. any of the briefly described species whose types were lost in the Hungarian uprising). Two radical solutions are available: (i) choose as neotype either the type (or at least an authoritatively determined specimen) of a published species, or a specimen of a «new» species, reasonably likely to be conspecific (Art. 75); or (ii) apply for suppression under the plenary powers of the Commission if resurrection threatens nomenclatural stability (Art. 79).

3. *Species inquirendae* — doubtfully identified species needing further investigation. This is the definition I originally applied to Hirst’s species, because the types possibly still existed. Their subsequent rediscovery allowed an estimation of the species’ validity.

*Spinturnix paracuminata* (emend.) Baker & Delfinado.

(Figs. 17-19).


*Pipistrellus angulatus*, New Ireland, Poronbus, x.1965, B. McM. (♀♀, 2 ♂♂, 1 nymph).


*Notes:* The hysteronotal setae in all females are arranged in three groups as called for by Baker & Delfinado: 2-5 behind each stigma, and 6-11 caudally. Figs. 17-18 show the female capitulum and tritosternal variation. The dorsum of the male is detailed in Fig. 19.

*Spinturnix eptesici* n. sp.

(Figs. 20, 22-27).


The type series (holotype ♀, allotype ♂, and 12 pairs of paratypes, all from Mt. Iron Pot) is in the School of Public Health and Tropical Medicine, Sydney.

*Notes:* The diagnosis of this species is fully discussed in the keys and notes on comparative morphology above. A further point is that the four glands opening onto the cuticle surrounding the dorsal shield in the other species open on the shield itself in *S. eptesici* (the one exception...
is in males of *S. paracuminata*, where the anterior pair opens on the shield, and the posterior on its margin.

In Rudnick's (1960) key to world species, *S. eptesici* comes near *S. lawrencei* Zumpt, but an examination of 3 ♀♀ (including holotype) and 3 ♂♂ (including paratype) from the type-host (*Myotis tricolor* Temminck, *South Africa*, Pietermaritzburg and Rooiberg) confirms Zumpt's Figs. 1-2 (femur I 2-4/3-2; palpi slender in both sexes; sternal setae on shield in female). None of these statements is true of *S. eptesici*; nor is the fact that the dorsal glands open onto the cuticle.

Benoit (1959 b) described two species from *Eptesicus* Rafinesque in Africa: *S. aelleni* (holotype ♂ and one paratype ♂ examined, Gabon) and *S. faini* (holotype ♀ examined, Congo). They show five pairs of proteronotal setae, the sternal setae free of the shield, and a palpal setal formula commencing 1.4.6 as in the new species, but differ distinctly in showing femur I 2-4/3-2, almost 40 pairs of hysteronotal setae, and dorsal glands opening free of the shield.

The specific name is the genus (*i.e.* noun) *Eptesicus* in the genitive case.

**Female**: Idiosoma 1,080-1,200 long * when pregnant, 940-1,010 when not. Dorsal shield 640-680 long, 480-510 wide; with eight pairs of minute setae and four pairs of pores in usual arrangement. Four small glands also open onto shield. Five pairs of proteronotal setae; 18-24 pairs of hysteronotal setae. Peritremes typical, terminating ventrally in minute shieldlet bearing aperture of small gland (Fig. 22). Dorsal cuticle scaled as in *S. paracuminata*.

Sternal shield (Fig. 23) drop-shaped, reticulate with four pores; six sternal setae always well removed from margin. Two metasternal setae present. Genital complex (operculated shield, two setae, and two apodemes) typical. Anal shield 3-setose. Ventral cuticle minutely mammillate as in *S. paracuminata*; with 14-20 setae (midanterior pair smaller than remainder).

Leg setation (Figs. 24-25) as detailed for *S. myoti* by Evans (1968), but femur I unideficient ventrally (2-4/2-2). Seta *md* on tarsi II-IV not foliate. Only coxa II complete dorsally.

Basis capituli short, with two capitular setae. Hypostome with three pairs of setae (H*2* rudimentary); epistome subcircular, with dense margin. Palpi stout; setal formula for trochanter-tibia as in other species, but femur unideficient dorsally (1.4.6.9.). Tarsal claw simple. Chelicerae typical. No sign of tritosternum even in well prepared specimens. See Fig. 27.

**Male**: Idiosoma 770-810 long. Dorsal shield 550-590 long, 440-470 wide. Ten to eleven pairs of hysteronotal setae (Fig. 20).

Sternogenital shield variable in shape, finely (but strongly) reticulate, with six sternal setae set submarginally. Metasternal and genital setae set well clear of shield. Ventral cuticle with six setae (anterior pair smallest). See Fig. 26.

Spermatodactyl probably relatively shorter than in *S. myoti* (see Evans, 1968).

Otherwise as in female.

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9. All measurements are in micra (\(\mu\)), and each division on the scales = 100 \(\mu\).

10. All species show tibia 9 (including two dorsodistal rods), agreeing with Evans' (1968) text and figures — his formulae, apparently in error, give 10 for the protonymph and 11 for the deutonymph and adult. On the tarsus, all species show five longer setae (two baseventrals and two curved subterminal rods set around a filamentous seta); the number of minute setae is uncertain, but at least two are present terminally.
Spinturnix ψi (Kolenati).
(Figs. 21, 28-33 (typical phenon); 34-38 (second phenon)).


M. schreibersii or M. australis, New South Wales, Willi Willi, 10.i.1961, P.D.D. (1 ♀).


Rhinolophus megaphyllus, New South Wales, Bungonia, The Drum, 7.il.1964, B.D. (1 ♂, a straggler).

Notes: The very small opisthosoma of the sole original female of S. verutus shows only that the specimen was freshly moulted and not pregnant, and the two characters alleged to be diagnostic are, in fact, also found in S. ψi (see Rudnick, 1960). As the characteristic radial pattern in the circumscutal cuticle also develops with age, the above synonymy should have been made by Baker & Delfinado on receipt of extensive collections of both nominal taxa with similar data. Prasad is correct.

The bent-winged bat, M. schreibersii, ranges from France to Japan in the Palaearctic, into Africa and Indonesia, and finally to New Guinea and Australia. Here it occurs from northern West Australia, around the northern and eastern coasts, and into south-eastern South Australia, being limited by the 20° isohyet and the 50° F. annual range of temperature variation. It is absent from coastal south-western Australia, Tasmania, and (naturally) inland Australia (Hamilton-Smith, 1966). In New South Wales, Dwyer (1963) found it common in natural caves and mine-shafts, in habitats ranging from subtropical rain-forest to open savannah, and from near sea-level to almost 5,000'. It is capable, therefore, of exploiting a wide range of climatic conditions.

11. Dwyer (1968, personal communication) records the other Australian species (M. australis) as very intimately connected, in its eastern Australian range, with M. schreibersii.
Detailed studies of individual populations of *M. schreibersii* in New South Wales by Dwyer (1966) have shown that each is (i) identifiable by its dependence on a single nursery colony at a specific cave, to which virtually all females return annually; and (ii) spatially delineated by major physiographic features, in particular drainage systems formed by major divides. Movement between ranges is much less frequent than movement within a particular range.

Of greater interest is the situation in western Victoria (Warnambool) and south-east South Australia (Naracoorte) (Dwyer, 1969). The latter bat population differs biologically from the former in breeding one month earlier, in movement patterns, and in at least one parasite 12, and movements from either population to intermediate caves in far western Victoria are infrequent (only one bat was noted to make the complete passage). It is therefore broadly true that the Naracoorte population is isolated at the extreme end of the Australian range.

This is largely 13 in accord with the known distribution of typical *S. psi*, which has been widely recorded from *Miniopterus* in Eurasia and Madagascar (Rudnick, 1960), while Baker & Delfinado (1964) and Domrow (1962) have recorded it from New Guinea and north Queensland, respectively. The present records extend its southward range from central and southern Queensland, through coastal New South Wales, and into eastern Victoria. It has not been recorded from western Victoria or south-east South Australia at the limit of the range of its host.

However, three other forms of *Spinoturix* also occur on *Miniopterus* in Australia. One has been collected twice (in company with typical *S. psi* on both occasions): New South Wales, *M. schreibersii* and *M. australis*, Willi Willi, 10.I.1961, P.D.D. (21 ♀♀, 15 ♂♂, 3 nymphs, sample only); *M. schreibersii*, Bungonia, The Drum, 13.II.1965, B.D. (2 ♀♀, 4 ♂♂). The former locality is the nursery cave for the Macleay basin in the north-east, the latter for the Shoalhaven basin in the south-east, and Dwyer (1966) has recorded several exchanges of bats between these two areas. Both collection dates coincide with the nursing period, when the caves are abnormally warm from the large numbers of bats present, but it is not known if this form occurs only at this season.

It is larger than typical *S. psi* (Figs. 21, 28-31), but the setation of the idiosoma (Fig. 34), capitulum, and legs is identically arranged, though correspondingly stronger (illustrations drawn to same scale for ease of comparison). The texture of the dorsal marginal cuticle is simpler, but reflects that figured by Baker & Delfinado (1964). The legs are relatively longer and more slender, particularly the tarsi, and seta nd on tarsi II-IV is unmodified, i.e. not foliate (Figs. 36-37). These statements apply to both sexes; in the male, the peritrematal shield is less extensive (Fig. 35).

In addition to this general resemblance, males of the two forms show similar sensory setae on the palpal tibia (outer dorsodistal rod twice as strong as inner, Fig. 32), and a spermatodactyl subequal in length to the cheliceral digits (Figs. 33, 38). Thus, although both forms of females have been seen pregnant, sexual isolation cannot be excluded, and these two sympatric forms, differing slightly in morphology, are considered phena of the same population (Mayr, 1969). Both are therefore identifiable as *S. psi* 14.

The other two forms have been collected only at Naracoorte, which is also a nursery site subject to high temperatures. Superficially, they appear to differ markedly one from the other,

12. Mr. Hamilton-Smith tells me (in litt., 14.ix.1970) that a nectaribiid fly is confined to the Naracoorte population.

13. On mainland Africa, *M. schreibersii* is known to carry only the closely related *S. semilunaris* de Meillon & Lavoipierre (see Rudnick, 1960).

but the setational pattern on the idiosoma of both sexes (different both dorsally and ventrally from that of the two phena of S. psi noted above), the posterior division of the dorsal shield, and the elongation of the sternal shield in the female, all indicate a close relationship.

Males of both forms are again similar, but differ from those of S. psi in showing subequal rods on the palpal tibia and a spermatodactyl considerably stronger than the cheliceral digits (Figs. 15, 50). Therefore, although both forms of females have been seen pregnant, sexual isolation cannot be excluded, and these two morphologically different but sympatric forms are again considered phena of the same population. They may be separated by the following couplet:

Setae on dorsal shield minute as usual. Proteronotum not swollen, even in fed, pregnant specimens. Coxae not provided with articulatory sclerites; Setae on dorsal shield uniquely long. Proteronotum of female strongly humped. Coxae II-IV of female provided with articulatory sclerites.

Finally, because the two pairs of phena show correlated morphological differences in both sexes, differ in male sexual characters, and parasitize geographically isolated populations of bats, the pair of phena from Naracoorte is described as belonging to a new species distinct from, but related to, the pair of phena comprising S. psi.

**Spinturnix loricata** n. sp.  
(Figs. 10-15, 39-42 (typical phenon); 43-50 (second phenon))


The type series (holotype ♀, allotype ♂, and five pairs of paratypes, all with the latter date) is in South Australian Museum, Adelaide.

I have since seen 1 ♀ and 3 ♂ of the typical phenon, *M. schreibersii*, Allansford, 13 miles east of Warnambool, Vic., IX.1961, J. Edge (see Notes above).

Notes: The diagnosis of this species is fully discussed in the keys and notes on comparative morphology above.

The specific name is the adjective *loricat-*us, -*a, -*um, clad in mail, and refers to the modified dorsal shield.

Female: Idiosoma 88.0 long when non-gravid or pregnant (one specimen, undistorted by mounting, shows the opisthosoma unexpanded behind coxae IV, and bears in the intercoxal area an embryonic protonymph reversed with respect to the mother). Dorsal shield 550-605 long, 375-395 wide; emarginate anterolaterally and flared posteriorly; lightly sclerotized except for dense oblique band on either side of transverse posteromedian striations. Usual pores and eight pairs of minute setae on shield. Dorsal cuticle variously ornamented (except for band in front of shield); with openings of four glands, five pairs of proteronotal setae, and ten hysteronotal setae arranged 3+4+3. Peritremes terminating ventrally near subtriangular, irregularly divided shield with distinct pore at inner angle. See Fig. 39.

15. Interestingly enough, the same correlation between short-leggedness and foliation of seta md occurs here as well as in S. psi. However, it is unknown whether the long-legged phena occur in response to high temperatures, or whether they are a dispersal phase timed to coincide with the nursing and weaning of juvenile hosts.
Sternal shield elongate, expanded posteriorly; surface weakly reticulate, with six sternal setae and four pores. Metasternal setae present. Genital complex as detailed for _S. eptesici_ above. Distinct linear and scale-like markings on ventral cuticle, which bears ten setae arranged 2.4.4 (anterior pair smallest), and ill-defined, 3-setose anal shield. See Fig. 40.

Legs stout in both sexes, with setation detailed above in keys and notes on comparative morphology (Figs. II-I4).

Basis capituli normal (Fig. 10). Palpi slender, with setae arranged 1.5.6.9 (trochanter-tibia); tarsus with five longer, and some very short, setae. Palpal claw simple. Chelicerae normal. Tritosternum tripartite centrally, with weaker lateral extensions.

*Male*: Idiosoma 660-690 long. Dorsal shield normally shaped, 470-480 long, 350-360 wide. Dorsal cuticle spinulose. Peritrematal shield more discrete than in female. See Fig. 41.

Sterogenital shield elongate, with small posterior extension; surface uniformly reticulate, with four pores; ten sternal, metasternal, and genital setae submarginal. Ventral cuticle with weak texture reflecting that on shield. See Fig. 42.

Spermatodactyl stiff and strongly curved, twice as long as cheliceral digits (Fig. 15). Tritosternum simple, transverse.

Otherwise as in female.

The notes on comparative morphology above strongly suggest that the true host of the second phenon of this species now described from the same locality is also _Miniopterus schreibersii_, and Mr. Hamilton-Smith (*in litt.*, 14.9.1970) confirms that this is the only bat found in this cave, or any other for 500 miles. The material is dated 14.1.1964, E.H.-S. (BS 0481) (4 ♀♀, 16 ♂♂). I have since seen specimens from _M. schreibersii_ from this locality, 4.1.1967, E.H.-S. (BS 1552) (1 ♀, 8 ♂♂).

*Female*: Idiosoma 1,330-1,560 long when pregnant, 1,230 when not; strongly humped anteriorly, with cuticle thin and characteristically striate (one specimen, examined while still in clearing fluid, showed an embryonic protonymph occupying this cavity, and reversed with respect to the mother). Remainder of cuticle, both dorsally and ventrally, and in both sexes, not distinctly textured. Dorsal shield recalling that of typical phenon, 900-980 long, 640-680 wide when pregnant, 790×460 when not; with eight pairs of setae elongate as in no other species. Peritrematal shield discrete. See Fig. 43.

Setae on venter (Fig. 44) relatively longer than in typical phenon.

Coxae I very weak internally, but with large posteroexternal spur. Coxae II-IV provided with articulatory sclerites, the middle pair of which bears the metasternal setae. Legs long and slender.

Capitulum (Fig. 47) broadly based, somewhat inset under anterior hump. Tritosternum simple.

Otherwise as in typical phenon.

*Male*: Idiosoma 900-1,030 long. Dorsal shield 780-860 long, 450-470 wide; with four of eight pairs of setae elongate. See Fig. 45.

Ten sternal, metasternal, and genital setae relatively longer than in typical phenon. See Fig. 46. Legs as in female, but coxae unmodified (Figs. 48-49).

Capitulum as in typical phenon (Fig. 50).

Otherwise as in female.
Genus *Eyndhovenia* Rudnick.

*Eyndhovenia euryalis* (Canestrini).


**Material examined:** *Rhinolophus megaphyllus*, New South Wales, Wombeyan, Junction Cave, 5.II.1966, B.D. (23 ♀♀, 16 ♂♂, 4 nymphs).

**Notes:** My material is slightly smaller than the typical subspecies — 10 females average: dorsal shield 305 (290-312) long, 237 (220-245) wide; stigma plus peritreme 112 (108-116) long; fifth proteronotal seta 58 (54-62) long; sternal shield 106 (103-110) long, 94 (89-98) wide. The sternal cuticle in both sexes resembles more that of the typical subspecies. All 16 males show a reduced hysterontal setation (two near each stigma and two very near the posterior margin of the shield).

I prefer not to name each population of such a widespread parasite.

A new host- and locality-record.

Genus *Meristaspis* Kolenati.

**Key to females of *Meristaspis* (including extralimital species).**

1. Dorsal shield and coxa I lacking distinct transverse linear markings. Setae $a_1$ and $p_1$ on tarsus I spatulate, with median notch carrying minute extension.......................................................... 2

   Dorsal shield and coxa I with distinct transverse linear markings. Setae $a_1$ and $p_1$ on tarsus I flattened, with slenderly drawn-out tips.................................................. *jordani*

2. Hypostome with one pair of weak hooks. Posterior margin of coxa I with process....... 3

   Hypostome with two pairs of strong hooks. Posterior margin of coxa I without process.... 5

3. Distinct transverse » suture « present behind dorsal shield. Process on posterior margin of coxa I small, not projecting beyond anterior margin of coxa II.......................... *lateralis*

   No » suture « behind dorsal shield. Process on posterior margin of coxa I large, projecting beyond anterior margin of coxa II............................................................. 4

4. With three pairs of dorsocaudal setae. Distal anteroventral seta on tibia I and basal anteroventral seta on tarsus I rod-like. Posteroventral seta on trochanter I simple ...... *kenyaensis* 16

   With two pairs of dorsocaudal setae. Distal anteroventral seta on tibia I and basal anteroventral seta on tarsus I spine-like. Posteroventral seta on trochanter I blade-like ...... *calcarata*

5. Sternal, metasternal, and genital setae weak, each pair falling short of insertions of subsequent pair. *macroglossi*

   Sternal, metasternal, and genital setae strong, each pair reaching or exceeding insertions of subsequent pair................................................................. *mindanaoensis*

16. I have seen two pairs of this species (Kenya), one labelled « type » and one « paratype » by RADFORD. As RUDNICK (1960) speaks of a female holotype and a male allotype, I designate RADFORD'S « type female » as lectotype.
Meristaspis calcarata (emend.) (Hirst).


*Pteropus poliocephalus* (3 ♀♀, 1 nymph).


*Notes:* This species has not previously been recorded from Australia or New Guinea, and all host-records are new. The specimens from *P. poliocephalus* carry no data, but the host is restricted to south-eastern Australia.

Meristaspis lateralis (Kolenati).


*Notes:* A new host-record for this widespread parasite of pteropodids.

Meristaspis macroglossi (Hirst).


Also Hirst’s type female (*Molucca* Is. — the only specimen ever identified as this species), and a female from Tabalia (*Solomon* Is.) labelled *M. dusbabeki* by Prasad.

*Notes:* Hirst’s type is overcleared, and somewhat torn around the posterior portion of the dorsal shield. The tritosternum is more narrowly transverse than figured. The sternal shield as figured shows only the outer edge of a narrow, pale band around the less regular, and more heavily sclerotized, central area. All three of Baker & Delfinado’s diagnostic criteria therefore fail; Prasad has also corrected some of their description.

This is a new host-record.

Meristaspis mindanaensis Delfinado & Baker.


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N. robinsoni, QUEENSLAND, Innisfail, 10.IX.1963, H.I.McD. (5 ♀, 2 ♂).  
Also 4 ♀, 4 ♂, and 1 nymph of M. mindanaoensis (PHILIPPINE Is.), comprising two pairs of paratypes and specimens labelled by PRASAD.

Notes: These specimens, particularly some from N. albiventer and P. raptor, show ventral setae intermediate in strength between those figured for the two nominal taxa above.
All material from New Guinea represents new host-records.

Meristaspis jordani (Radford).


Also 2 ♀ and 2 ♂ identified as A. jordani (CELEBES) by RADFORD. These bear only his labels, one pair being « type », the other « paratype », specimens. As RUDNICK (1960) speaks of a female holotype and a male allotype, I designate RADFORD’s « type » female as lectotype.
Also two specimens identified as A. lavellanus (SOLOMON Is.) by RADFORD, and labelled « holotype ♀ » and « allotype ♀ ».

Notes: Confusion has arisen about both original taxa. RUDNICK (1960) believed coxa I of jordani lacked a process on the posterior margin, but the backwardly-directed semiloop in RADFORD’s figure at the outer end of the distinct transverse line across this segment is, in fact, this process. It projects freely, as illustrated by RADFORD for lavellanus.
Recent workers have possibly been further misled by RADFORD’s description of lavellanus, since he omitted the pair of short ventral setae immediately behind the genital shield (V1, not metasternals), and depicted two pairs of dorsal setae (postscutals and first dorsocaudals) as ventral (second and fourth pairs of those illustrated). In fact, both taxa show the standard nine pairs of hysterosomal setae illustrated by RADFORD for jordani, and detailed above.
The one female of lavellanus I have seen is much flattened, but the lateral spurs on the distal segments of leg I alleged by PRASAD to distinguish his subspecies j. philippinensis (latterly curiously referred to as a species, and separated from the typical subspecies by four other good species) are present, though not illustrated, on jordani.
Further, the original series of jordani is somewhat heavier with respect to the spur on coxa IV and seta V1 than figured by PRASAD for j. jordani. Indeed, in these two respects, his figures of j. jordani more resemble the allotype of lavellanus.
PRASAD’s last criterion (the outline of the posterior margin of the sternal shield) is also clearly invalid, and, in view of the above comments, I regard all three nominal taxa as representing populations of a single species.
This is a new host-record.
Genus Ancystropus Kolenati.


The heavy hook on coxa and tarsus I of A. kanheri does not override its otherwise striking similarity to its congeners (except taprobanius), and Oncoscelus, monotypic for this species, is therefore not accepted. See notes on comparative morphology above.

Key to females of Ancystropus.
(including extralimital species)

1. Leg I unarmed, with long sinuous setae on posterior edge. Distal anteroventral seta on tibia I and basal anteroventral seta on tarsus I conspicuous and rod-like. Genua and tibiae III-IV with four and three setae dorsally, respectively. Opisthosoma with four pairs of ventral setae (♀ physogastric when pregnant).................................
   Leg I armed with various hooks and spurs, with short stiff setae on posterior edge. Distal anteroventral seta on tibia I and basal anteroventral seta on tarsus I inconspicuous, even if latter is knob-like. Genua and tibiae III-IV with two and one seta dorsally, respectively. Opisthosoma with three pairs of ventral setae (♀ physogastric when pregnant).................................
   2. Proteronotal setae 2 and 3 discrete.................................................................................. 3
      Proteronotal setae 2 and 3 coalesced.............................................................................. 5
   3. Sternal shield only slightly wider than long. Basal anteroventral seta on tarsus I unmodified..............
   Sternal shield distinctly wider than long. Basal anteroventral seta on tarsus I small, knob-like. 4
   4. Omitting lateral crotchets, major armature of leg I confined to characteristically angled anteroventral spur on femur and genu. .................................................................
      Omitting lateral crotchets, major anteroventral armature of leg I augmented by posteroventral hook
      on all four terminal segments..........................................................................................
      5. Coxa and tarsus I without strong posterior hook............................................................
      Coxa and tarsus I with strong posterior hook...................................................................
   17. I have seen the type female of this species (Zanzibar).
18. A. eonycteris Delfinado & Baker (1963) and A. nahtae Prasad (1969 a), although described from a single freshly moulted, and a single heavily gravid, specimen, respectively (both of which I have seen, and both from Eonycteris Dobson, Philippine Is.), are obvious synonyms. The latter shows leg I armed exactly as in DELFINADO & BAKER’s careful figures, but both authors omit the mid-posterior boss on coxae II-III, and show short dorsal setae on leg I — these are frequently broken off short. PRASAD says only one (fourth) pair of proteronotal setae are present, but the type, had he turned it over, would clearly have shown pairs 2 and 3 as well, the former being characteristically small and convenient to the latter (pair 1 is rudimentary as usual). DELFINADO & BAKER did not see the posterior third of the tritosternum in their pale, newly moulted specimen, and omitted the first (most dorsal) pair of dorsocaudals (PRASAD, 1969 c, uses these setae in his key, but all species have the same number, and their disposition depends solely on the degree of swelling of the opisthosoma). I was unable detect setae V 1 on the opisthosoma of A. naktate. The characteristic markings on the scutum of these physogastric species develop with age.
19. The holotype ♂, bearing three ova, was examined (Katanga). The original description is accurate, except that the anterior half of the dorsal shield and a midposterior boss on coxae II-III are omitted. The triangular posterior portion of coxa I (BENOIT’s Fig. 4) is an apodeme, and femur-genu I bear a blunt ventral process directed towards the posterointernal angle. The basal anteroventral seta on tarsus I is small and knob-like.
Ancystropus taprobanius (Turk).


Material examined: Rousettus stresemanni, New Guinea, Imbia, 20.XI.1962, K.K. (5 ♀). Also 2 ♀♀ of M. taprobanius (Ceylon), both bearing Turk's "syntype" labels, and of which one is now designated lectotype.
Also 5 ♀♀, 1 ♂, and 1 nymph of A. rudnicki (Philippine Is.), identified by Prasad.

Notes: Had Hiregaudar and Bal compared their species, not with A. zeleborii, but with the strikingly similar A. taprobanius, they may have made the above identification. All attempts to borrow their specimens have been in vain.
Both Turk (1950) and Rudnick (1960) overlooked the two setae just behind the dorsal shield of females of A. taprobanius, but they are indeed present. Baker & Delfinado's criterion therefore fails.
This species is widespread, but the above is a new host-record.

Ancystropus zeleborii Kolenati.

A. zeleborii, Prasad, 1969, Acarologia II : 674.


Also 5 ♀♀ of A. palawanensis (Philippine Is.), including two paratypes and two specimens labelled by Prasad.

Notes: This widespread species has not previously been recorded from Malaya or New Guinea, or from these hosts.

Ancystropus kanheri Hiregaudar & Bal.
(Fig. 51).


Notes: A new host-record for this widespread species.
Genus *Paraperiglischrus* Rudnick.

*Paraperiglischrus rhinolophinus* (Koch).


*Paraperiglischrus hipposideros* Baker & Delfinado.


*Notes*: No key is offered for these two species, since the latter was described from excessively cleared material. If its opisthosoma expands with age and pregnancy as in other species, the peculiar posteroventral striation may be only temporary.

Skeleton classification of the hosts mentioned:

Based on Ride (1970), Laurie & Hill (1954), and Medway (1965). Some labels give synonyms of the three species marked * (Miniopterus medius Thomas & Wragthorn, Nycticeius orion (Troughton), and Nyctimene papuanus Anderson).

**Microchiroptera**

**Vespertilionidae**

*Nyctophilus geoffroyi* Leach

*Miniopterus schreibersii* (Kuhl) *

*Miniopterus australis* Tomes

*Epiesicus punilus* (Gray)

*Chalinolobus gouldii* (Gray)

*Chalinolobus morio* (Gray)

*Chalinolobus picatus* (Gould)

*Chalinolobus dayeri* Ryan

*Pipistrellus tasmaniensis* (Gould)

*Pipistrellus angulatus* (Peters)

*Pipistrellus papuanus* (Peters & Doria)

*Myotis adversus* (Horsfield)

*Nycticeius rueppelli* Peters

*Nycticeius greyi* (Gould) *

**Rhinolophidae**

*Rhinolophus megaphyllus* Gray

**Molossidae**

*Tadarida beccarii* (Peters)

**Megachiroptera**

**Pteropodidae**

*Pteropus scapulatus* Peters

*Pteropus poliocephalus* Temminck

*Dobsonia moluccensis* (Quoy & Gaimard)

*Nyctimene robinsoni* Thomas

*Nyctimene albiventer* (Gray) *

*Nyctimene allo* (Thomas)

*Paranyctimene raptor* Tate

*Macroglossus lagochilus* Matschie

*Rousettus stenomanni* Stein

*Penthetor lucasi* (Dobson)
SUMMARY.

Additional material, including many new host-records, is detailed for all 10 species of Spinturnix, Meristaspis and Ancystopus known from Australia and New Guinea. Two new species (S. eptesici from Eptesicus pumilus and S. loricata from Miniopterus schreibersii) are described from Australia. Rhinolophid bats are confirmed as the normal hosts for Eyndhovenia and Paraperiglischns, the former being recorded from Australia for the first time. Natural keys to genera and species are offered, based on extended notes on comparative morphology. Two genera (Paraspinturnix and Oncoscelus) and ten specific names (ahi, antipodianus, dusbabeki, hardyi, indicus, lavellanus, nakatae, philippinensis, queenslandicus, and rudnicki) are newly synonymized.

RéSUMÉ.

Nous présentons des matériaux complémentaires dont de nombreux hôtes nouveaux, se rapportant aux genres Spinturnix, Meristaspis et Ancystopus, en Australie et Nouvelle Guinée. Nous décrivons deux espèces nouvelles d'Australie (S. eptesici sur Eptesicus pumilus et S. loricata sur Miniopterus schreibersii). Nous confirmons que les Rhinolophoïdes sont bien les hôtes normaux d'Eyndhovenia et de Paraperiglischns; le premier de ces genres est signalé pour la première fois en Australie. Nous proposons des clés naturelles des genres et des espèces, basées sur des notes étendues à la morphologie comparée. Deux genres (Paraspinturnix et Oncoscelus) et dix noms d'espèces (ahi, antipodianus, dusbabeki, hardyi, indicus, lavellanus, nakatae, philippinensis, queenslandicus et rudnicki) sont l'objet de synonymies nouvelles.

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ALLRED (D. M.), 1960. — New mesostigmatid mites from Pakistan with keys to genera and species. — J. med. Ent. 6 : 219-244.


Laurie (Eleanor M. O.) & Hill (J. E.), 1954. — List of land mammals of New Guinea, Celebes and adjacent islands 1758-1952. — British Museum (Natural History), London 175 p.


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*Corrigenda & addenda.*

*Proc. Linn. Soc. N.S.W.* 31 : 144 (line 6 from bottom, for 199 read 119) ; 86 : 60 (line 28, for *Isosodon macrourus* read *Perameles nasuta*) ; 61 (line 25, for *I. macrourus* read *P. nasuta*) ; 71 (line 22, for Victoria read South Australia) ; 71 (line 36, for the same host read *P. nasuta*) ; 71 (lines 42-43, delete 4 999, *A. flavipes*, Tuggolo State Forest, New South Wales, 21 iii 1960, J. Bromell) ; 76 (line 9, for III & IV read II & III) ; 80 (line 2 from bottom, for *quadratus* read *harrisoni*) ; 82 (lines 7-8, for short-nosed bandicoot, *Isosodon macrourus* (Gould) read long-nosed bandicoot, *Perameles nasuta* Geoffroy) ; 88 : 199 and 211 (line 13 and last line, for *banicorensis* read *vanikorensis*) ; 216 (line 7, delete pairs of and pairs) ; 219 (last line, delete (two rats)) ; 217 (line 2, delete pairs of) ; 93 : 326 (line 40, insert from penguins) ; 346 (fig. 190, delete line to left of sternal setae — it is the edge of the trimmed drawing) ; 361 (figs. 165-170, for *gliciphilae* read *monarchae*, and for *Myzomela pectoralis* read *Monarcha trivirgata*) ; 415 (line 48, delete brackets around Gould) ; 423 (line 17, insert comma after described) ; 423 (third last paragraph, add *Podargus papuensis* Quoy & Gaimard (kindly identified by Mr. H. J. de S. Disney), and for 148 read 149).

*Bull. natn. Mus. Singapore* 34 : 131 (line 16 et passim, the use of sp. in *Rattus sp. tiomanicus* and R. sp. *jalorensis* was an editorial device to indicate uncertainty as to the status of the form in question. The matter was resolved by Medway & Lim, *Bull.* 34 : 33) ; 133 (line 21, for *atheruri* Hoogstraal et al. read *fraguli* Oudemans) ; 134 (table 3, column 5, for 1/N* read 1/N*); 135 (line 11, for 1962b read 1963) ; 137 (line 9 from bottom, insert *Tupaia glis*, after from) ; 138 (table 4, column 2, insert / after exam), ; 139 (line 24, for Pankor read Pangkor) ; 139 (amend last two lines of discussion to read on the mainland, where all stages have been found in the nests of *Rattus sp. jalorensis* in oil palm) ; 140 (line 13, for 1962b read 1963) ; 140 (line 14, for 78 read 87).


Figs. 2-5: *Spinturnix wilsoni.*
2-3. — Dorsal and ventral views of idiosoma ♀. 4-5. — Same ♂
(four hysteronotal setae deleted on left).
Figs. 6-9: *Spinturnix wilsoni*.
9. — Capitulum ♂ (dorsal view on right, ventral on left).

Figs. 10-15: *Spinturnix loricata* (typical phenon).
10. — Capitulum ♀ (dorsal view on right, ventral on left). 11-12. — Dorsal and ventral views of tarsus I ♂.

*Acarologia*, t. XIII, fasc. 4, 1972.
Fig. 16: *Spinturnix novahollandiae*. Capitulum ♀ (dorsal view on right, ventral on left) (C. gouldii, Sydney).

Figs. 17-19: *Spinturnix paracuminata*.
17. — Capitulum ♀ (dorsal view on right, ventral on left).
18. — Tritosternum ♀ (six variations).
19. — Dorsal view of idiosoma ♂.

Fig. 20: *Spinturnix eptesici*. Dorsal view of idiosoma ♂.

Fig. 21: *Spinturnix psi* (typical phenon). Capitulum ♀ (dorsal view on left, ventral on right).
Figs. 22-26: *Spinturnix oatesi*.
22-23. — Dorsal and ventral views of idiosoma ♂.
Fig. 27: *Spinturnix eptesici*. Capitulum ♀ (dorsal view on right, ventral on left).

Figs. 28-33: *Spinturnix psi* (typical phenon).
32. — Dorsal view of palpal tibia ♂. 33. — Lateral view of chelicera ♂.
Figs. 34-38: *Spinturnix psi* (second phenon).

34. — Ventral view of idiosoma ♀. 35. — Same ♂. 36-37. — Dorsal and ventral views of leg IV ♂
38. — Lateral view of chelicera ♂ (somewhat flattened).
Figs. 39-42: *Spinturnix loricata* (typical phenon).
39-40. — Dorsal and ventral views of idiosoma ♀. 41-42. — Same ♂.
Figs. 43-47: *Spinturnix loricata* (second phonon).
43-44. — Dorsal and ventral views of idiosoma ♂. 43-46. — Same ♂.
47. — Capitulum ♀ (dorsal view on right, ventral on left).
Figs. 48-50: *Spinturnix loricata* (second phenon).

48-49. — Dorsal and ventral views of leg IV ♂. 50. — Lateral view of chelicera ♂.

Fig. 51: *Ancyrostopus kanheri*. Ventral view of idiosoma ♀ (pregnant).


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**CORRIGENDA**

*Volume 13 — Fascicule 4, page 356 :*

- ligne 29, au lieu de γ, lire : μ
- ligne 32 (premier u) au lieu de μ, lire : π

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Le Directeur Gérant : Max VACHON.


--- CORRIGENDA ---

Volume 13 — Fascicula 4. page 356 :

— ligne 29, au lieu de γ, lire : μ
— ligne 32 (premier u) au lieu de μ, lire : π