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NEW RECORDS AND DESCRIPTIONS OF RALLINYSSUS FROM PACIFIC BIRDS (Acarina: Mesostigmata)¹

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Abstract: The genus *Rallinyssoides* Fain, 1960 is synonymized with *Rallinyssus* Strandtmann, 1948. Three new species are described: *Rallinyssus amaurnornis* from Taiwan, and *R. cycchramus* and *R. rallus* from New Guinea. Additional new records, a key to the species and a summary of hosts and localities are presented.

This paper, based on material collected by Bishop Museum staff members and field associates, reports the first record of Rhinonyssidae from Taiwan and increases the number known from New Guinea to 16 species. The holotypes and paratypes are deposited in the Acarology collection of Bishop Museum. Other paratypes, insofar as available, have been deposited in the collections of Dr R. W. Strandtmann and the United States National Museum. Measurements given first are the mean, followed by the maximum and minimum in parentheses. The formula used for the leg chaetotaxy follows Evans (1963) and is: anterolaterals $\frac{\text{dorsals}}{\text{ventrals}}$ posterolaterals. Variation is shown in parenthesis. Peters (1934) has been used as the authority for scientific names of hosts; Delacour (1947) and Iredale (1956) as authority for common names of new hosts. Unfortunately not all hosts were identified at the time this paper went to press and these will have to be listed in later papers.

Acknowledgment is extended to Dr R. W. Strandtmann for taxonomic suggestions and to Miss Helen Tong for the excellent illustrations.

Genus *Rallinyssus* Strandtmann

Rallinyssus Strandtmann, 1948, J. Parasit. 34 (6): 512 (Type species: *Rallinyssus caudistigmus* Strandtmann, 1948; orig. desig.).

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Rallinyssoides Fain, 1960, Bull. Ann. Soc. Roy. Ent. Belg. **96** (11-12): 295 (Type species: *Rallinyssus congolensis* Fain, 1956; orig. desig.). **New Synonymy.**

Members of this genus have the peritreme located dorsally and on the posterior part of the idiosoma. In the adults the dorsal plates range from a well developed podosomal and opisthosomal plate as in *R. amaurornis* n. sp. to only areas of muscle attachment as in *R. verheyeni*. The gnathosoma lacks a deutosternal groove; a tritosternum and metasternal setae are absent. A sternal and genital plate is present in the female. The anal plate is large; in some species it has a large circular membrane and in others this membrane is absent. There are well developed chelicerae with 2 strong chelae which are 20-30 % of the total length.

Fain (1960) proposed the genus *Rallinyssoides* for mites with characters of the genus *Rallinyssus* except that the anal plate was of normal shape (*i.e.* without the surrounding large circular membrane). I cannot agree with him that this one character justifies division of the species into two genera and I can find no other characters for separating them.

As known at present *Rallinyssus* with 10 species is confined to the avian family Rallidae of the order Gruiformes. There are 47 genera and 128 species extant in this family (Peters 1934). Of this number, 9 genera (19 %) and 12 species (9 %) have had *Rallinyssus* reported from them. It would appear there are many more species to be discovered.

***Rallinyssus amaurornis* Wilson, n. sp. Fig. 1.**

Diagnosis: A large mite with a well defined podosomal and opisthosomal plate, sternal plate quadrangular or hexagonal-shaped and without setae, anal plate with 2 paranal setae and lacking large circular membrane.

♀. Measurements, except tarsi and chelicera, the mean of 8 specimens. Body: length of idiosoma 722 μ (750-670), width 481 μ (500-460). Dorsum: all setae short and tapering, with 2 plates, both well defined, podosomal 313 μ (325-290) long, 375 μ (385-360) wide, triangular, lateral margins convex, posterior margin bisinuate, 5 pairs of lateral submarginal setae, anterior most pair sometimes arranged vertically rather than horizontally, posteriormost pair more median than others, 1 pair of posterior submarginal setae, 1 pair of anteromedian setae and pores, opisthosomal 86 μ (100-60) long, 213 μ (220-205) wide, lateral and posterior margins rounded, anterior margin concave, 1 pair of setae posterior to podosomal plate and anterolateral to opisthosomal plate, 1 pair anterior to opisthosomal plate but sometimes 1 or both bordering or on edge of plate (1 specimen had a 3rd seta present), 4 pairs posterior to opisthosomal plate in 3 rows, 2 pairs immediately posterior to plate, 1 pair about midway between plate and peritremes, 1 pair posteromedian to peritremes, peritreme short, 32 μ (37-30) long, 20 μ (21-18) wide (in area of stigma). Venter: sternal plate 92 μ (108-80) long, 201 μ (220-190) wide, approximately quadrangular or hexagonal-shaped with irregular margins, lateral areas frequently with a break in the surface, 1st and 2nd pair of sternal setae opposite anterior and lateral margin of plate respectively, 3rd pair some distance posterior to plate, anteromedian margin extends beyond level of 1st pair of setae, 1 pair of pores near anterolateral margin of plate, often in slight concavity of plate, sometimes on plate itself, 1 pair of pores posteromedian to 2nd pair of sternal setae, genital plate broadly rounded behind, 74 μ (83-63) wide, weakly rayed anterior margin appears to extend to level of 3rd pair of sternal se-

tae, genital setae and 1 pair of small pores opposite posterolateral margin of plate (1 specimen has only 1 genital seta lying posteromedian to genital plate), anal plate ventral, $101\ \mu$ (108-88) long, $87\ \mu$ (93-80) wide, anterior margin arched and poorly defined, sides

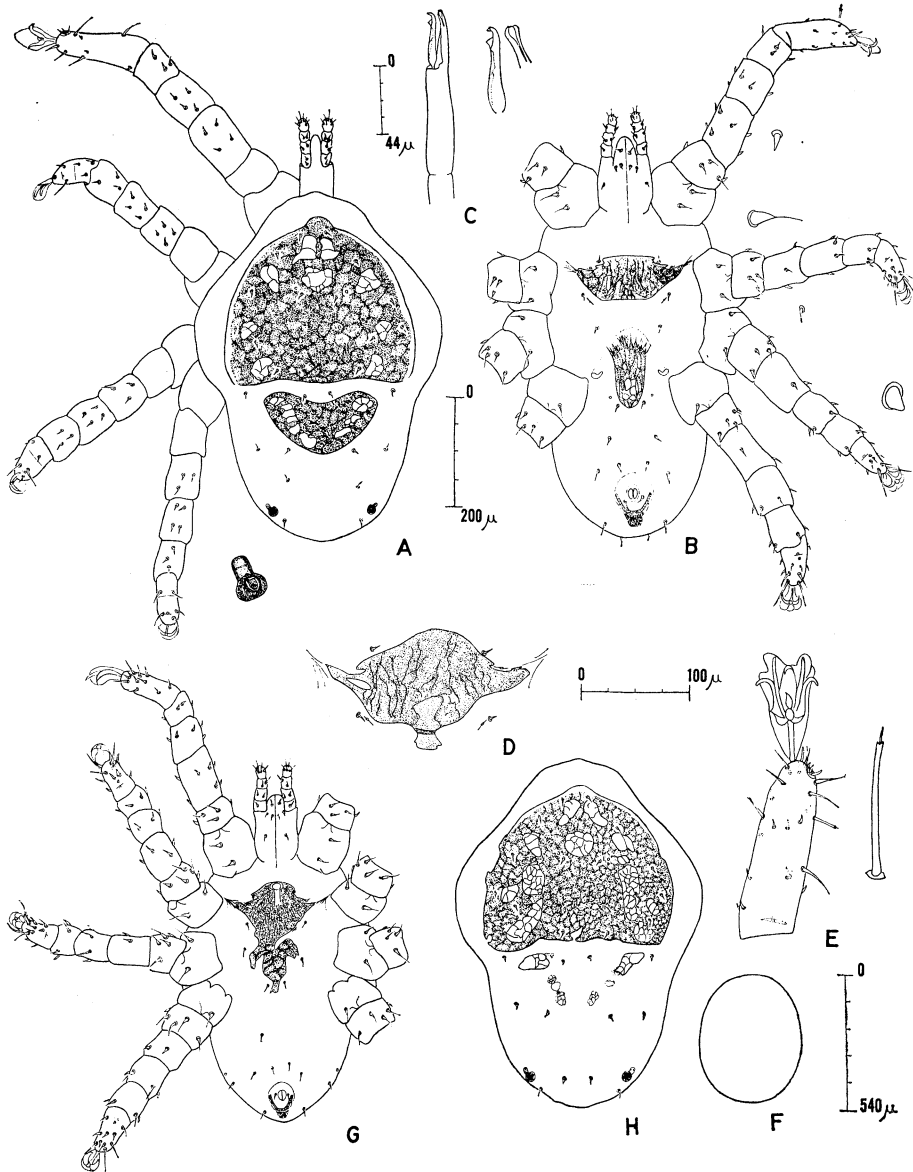


Fig. 1. *Rallinyssus amaurornis* Wilson, n. sp. A, ♀ dorsal view with enlarged drawing of peritreme; B, ♀ ventral view with enlarged drawings of 1st sternal seta and leg setae; C, ♀ chelicera with enlarged drawing of tip; D, ♀ sternal plate showing variation; E, ♀ tarsus I with enlarged drawing of furcate seta; F, egg; G, ♂ ventral view; H, ♂ dorsal view.

thickened laterally to about level of anterior margin of anal pore and posteriorly in front of cribrum, paranal setae opposite midlateral or posterolateral margins of anal pore, post-anal seta and base absent, cribrum present, 5 pairs of opisthosomal setae in 4 horizontal rows, 1 pair about midway between genital and anal plate, 2 pairs in front of anal plate, 1 pair posterolateral to anal plate, 1 pair posterior to anal plate and on posterolateral body margin. Gnathosoma: 1 pair of gnathosomal setae and 3 pairs of hypostomal setae all about same size, palp trochanter with 1 ventral seta, palp femur and genu each with 2 dorsal and 2 ventral setae, palp tibia with about 9 setae, 8 simple, 1 trifurcate, 2 terminal ones distinctly longer than others, chelicera (2 specimens) 123 μ long, movable digit 37 μ long, broadest at base, with apical and 2 subapical teeth, fixed digit narrower with tip expanded and fluted. Legs: (7 specimens) length of tarsus I, 178 μ (193-163), II-III, 102 μ (108-93; 110-88) and IV, 114 μ (120-105), ventral setae on coxae and trochanters I-IV inflated and usually with whip-like tip, remaining setae on trochanters and all setae on other segments spine-like, chaetotaxy as given in Table 1, apex of tarsus I with several long slender setae and a tight cluster of short blunt setae, 1 long seta on dorsal and antero- and posterolateral surface with furcate tip, a small spine-like seta ventrally in front of spaltorganen, apex of tarsi II-IV extended midventrally into small spine, tarsal claws well developed, those on tarsus I slightly longer than on tarsi II-IV.

Table 1. Leg chaetotaxy of *Rallinyssus amaurornis* n. sp.

Leg Segment	I	II	III	IV
Coxa	$0\frac{0}{2}0$	$0\frac{0}{2}0$	$0\frac{0}{2}0$	$0\frac{0}{1}0$
Trochanter	$1\frac{0}{3}1$	$1\frac{0}{4}1$	$1\frac{0}{4}0$	$1\frac{0}{4}0$
Femur	$2\frac{4}{3(2)}2$	$1(0)\frac{4}{1}1$	$1\frac{3}{1}0$	$1\frac{3}{1}0$
Genu	$2\frac{4}{2}1$	$1\frac{4}{2(1)}1$	$1\frac{4}{2}1$	$1\frac{4}{2}1$
Tibia	$1\frac{3}{2}1$	$1\frac{3}{2}1$	$1\frac{3}{2}1$	$1\frac{3}{2}1$
Tarsus	21	$3\frac{5}{5}3$	$3\frac{5}{5}3$	$3\frac{5}{5}3$

♂. Two specimens available, 1 apparently teneral and with diagnostic features difficult to distinguish. Body: smaller than ♀, length of idiosoma 525 μ , width 390 μ . Dorsum: podosomal plate similar to ♀, 255 μ long, 310 μ wide, opisthosomal represented by areas of muscle insertion and plate remnants. Venter: similar to ♀, sternal and genital plates joined to form sterno-genital plate, each distinguished by surface pattern, extremely irregular, enclosing genital pore anteriorly, extending to midpoint of coxa IV posteriorly, 1st pair of sternal setae lying in concavity of anterolateral margin of plate, 2nd pair opposite lateral margin of plate, 3rd pair and genital setae lateral to genital portion of plate, 1 pair of pores on anterolateral margin of sternal portion of plate, 1 pair posteromedian to 2nd pair of sternal setae and very close to lateral margin of sternal portion of plate, anal plate 88 μ long, 78 μ wide. Gnathosoma: similar to ♀, chelicera not clearly seen. Legs: length of tarsus I, 105 μ , II, 68 μ , III, 70 μ and IV, 75 μ , chaetotaxy as in ♀.

Larva: One partially visible in egg. Leg setae appear less numerous and stouter, tarsal claws well developed, chelae simple.

Egg: Measurements the mean of 7 specimens. Elliptical, surface smooth, length 505 μ (550-461), width 408 μ (470-381).

Holotype ♀ (BISHOP 6111), Taiwan, Nantou Hsien, Puli, *Amaurornis phoenicurus chinensis* (TMT 195), 17.XII.1963, T. C. Maa.

Paratypes: 2 ♂♂, 7 ♀♀, same data as holotype.

The specimens showed minor variations in the location or absence of setae and shape of the various plates. The large, well developed opisthosomal plate so evident in the ♀, was not observable in the ♂; however, the latter had areas of muscle attachment and remnants of plates which corresponded in position to the opisthosomal plate of the ♀.

R. amaurornis is easily distinguished from all other species of *Rallinyssus* by the presence of the large, well developed opisthosomal plate in the ♀. The 2 ♂♂ available lacked this plate but had several areas of muscle attachment and remnants of plates in this position. In addition the ♂ may be distinguished from the other species for which the ♂ has been described (*caudistigmus*, *gallinulae*, *strandtmanni*) by the shape and number of setae on the podosomal plate. This plate is wider than long with 14 setae in *R. amaurornis* but longer than wide with 9 or less setae in the other species. Also *R. caudistigmus* and *R. gallinulae* have the anal pore surrounded by a large circular membrane while *R. amaurornis* does not.

Prof. T. C. Maa collected 24 *Amaurornis p. chinensis* on Taiwan; 3 were infested with nasal mites but only 1 with *R. amaurornis*.

Rallinyssus cychramus Wilson, n. sp. Figs. 2 & 3.

Diagnosis: A large mite with a weakly sclerotized podosomal plate and 13 poorly defined platelets, genital plate bullet-shaped, anal plate with 2 paranal setae and lacking large circular membrane, setae of legs III-IV distinctly stouter than those of legs I-II.

♀. Measurements, except stigma, the mean of 6 specimens. Body: length of idiosoma 992 μ (1115-860), width 618 μ (665-565). Dorsum: all setae short, tapering and blunt tipped, with 1 weakly sclerotized plate and 13 poorly defined platelets, podosomal 92 μ (105-83) long, 199 μ (238-175) wide, arched anteriorly, bisinuate to straight posteriorly, 1 pair of anterior or anterolateral submarginal setae (1 specimen has 1 seta anterior, 1 in center of plate and 1 from lateral body area on posterolateral portion of plate), with weak scale-like pattern, 13 platelets behind podosomal in 6 rows of 3, 2, 2, 2, 2, 2, posterior most pair more weakly sclerotized than others, faint indication of scale-like pattern between 1st 2 rows of platelets, 12 (13) pairs of body setae, 6 (7) pairs lying lateral to podosomal plate and platelets, 4 pairs between platelets, 2 pairs posterior to last row of platelets, stigma large, 10 μ in diameter (1 specimen), peritreme posterodorsal, short, 34 μ (38-33) long, 18 μ (20-18) wide (in area of stigma). Venter: all setae except anal as on dorsum, sternal plate 121 μ (133-113) long, 155 μ (163-148) wide, roughly hexagonal-shaped, margins extremely irregular (1 specimen with break in anterolateral surface), 1st pair of sternal setae located in slight depression of anterolateral margin of plate, 2nd pair opposite posterolateral margin of plate, 3rd pair posterior to plate, no pores visible, genital plate 196 μ (213-168) long, 85 μ (103-75) wide, weakly rayed anterior margin may extend almost to level of 3rd pair of sternal setae, posterior portion wedge-shaped with

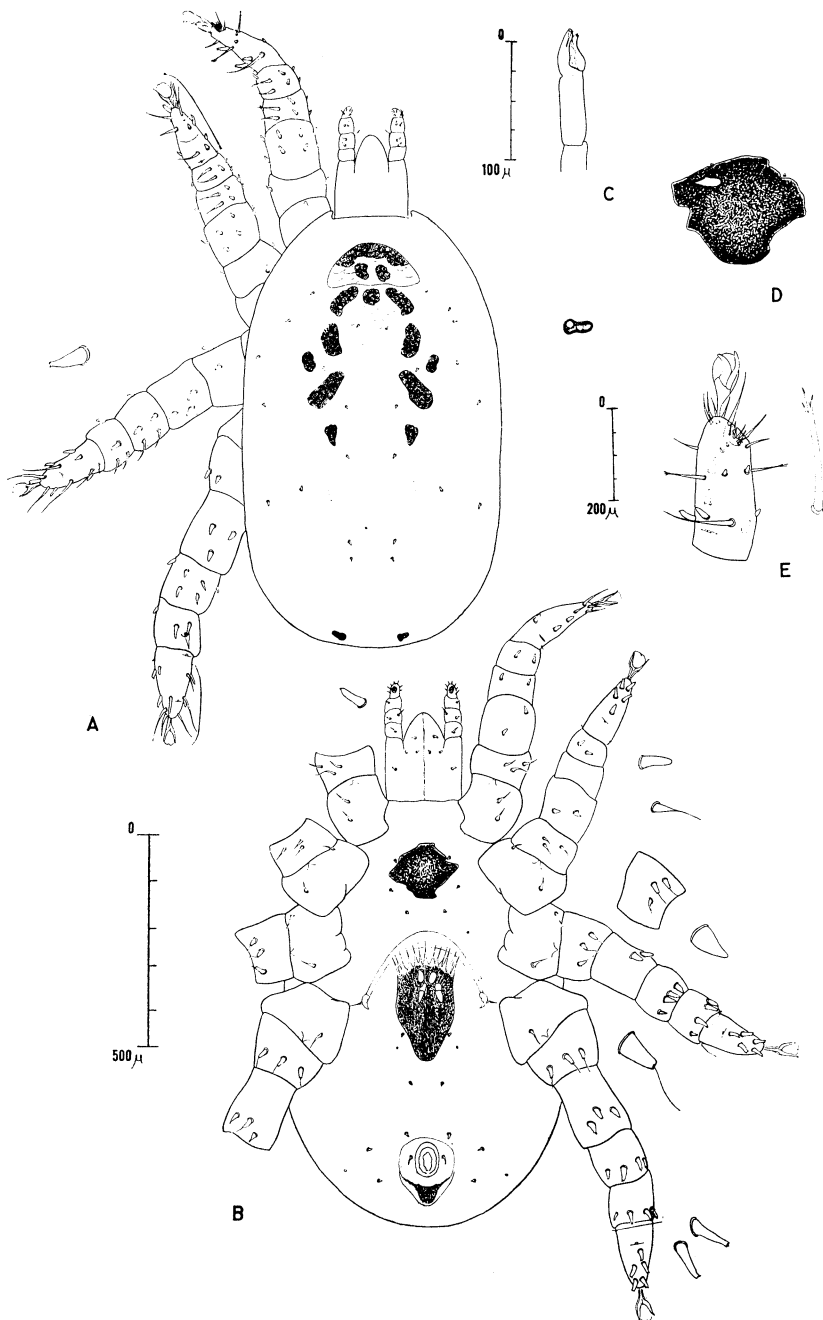


Fig. 2. *Rallinyssus cychramus* Wilson, n. sp. A, ♀ dorsal view with enlarged drawing of leg seta and peritreme; B, ♀ ventral view with enlarged drawings of trochanter III showing variation, palpal seta and leg setae; C, ♀ chelicera; D, ♀ sternal plate showing variation; E, ♀ tarsus I with enlarged drawing of furcate seta.

bluntly rounded tip, genital setae very near posterolateral margin of plate, 1 pair of minute pores posterior to genital setae, anal plate ventral, $139\ \mu$ (158-128) long, $117\ \mu$ (133-103) wide, anterior margin arched, sides slightly thickened posterolaterally, anal pore large, $65\ \mu$ (68-60) long, $53\ \mu$ (58-48) wide, located in anteromedian portion of plate, postanal seta and base absent, paranal setae pointed, opposite center of anal pore, cribrum present, 4 pairs of opisthosomal setae in 4 rows, 1 pair behind genital plate, 1 pair in front of anal plate, 2 pairs lateral to anal plate (1 specimen with additional odd seta in front of anal plate), 1 pair of pores near posterolateral body margin. Gnathosoma: 1 pair of gnathosomal setae and 3 pairs of hypostomal setae, all about same size, shape as in body setae, size slightly smaller, palp trochanter with 1 ventral seta, femur with 1 ventral seta, 1 lateral seta and 2 dorsal setae, genu with 1 lateral seta and 2 dorsal setae, tibia with about 7 ventral setae surrounding tarsus, 1 bifurcate, 2 at apex longer than others and 4 dorsal setae, chelicera $138\ \mu$ (145-130) long, chela $37\ \mu$ (41-36) long, movable digit broadest at base and with apical notch, fixed digit narrower, with fluted tip on inside surface. Legs: length of tarsus I, $144\ \mu$ (153-130), II, $134\ \mu$ (138-128), III, $143\ \mu$ (150-133) and IV, $158\ \mu$ (163-153), ventral setae on coxae I-IV and trochanters I-II simple, with slightly expanded bases, ventral setae on trochanter III both simple (1) and flagellate (2) (2 specimens have all ventral setae on trochanter III flagellate), ventral setae on trochanter IV stout, flagellate, the flagellum on all setae originating from concavity in apex of basal portion of seta and as long or slightly longer than base, remaining setae stout and blunt with small apical spine, spine-like or long and tapering, chaetotaxy as given in Table 2, apex of tarsus I with several long slender setae, short spine-like setae and tight cluster of short blunt tipped and spine-like setae, 1 long seta on antero- and posterolateral surface with furcate tip, setae of legs III-IV noticeably stouter than those of legs I-II, tarsal claws well developed, all of equal size.

Table 2. Leg chaetotaxy of *Rallinyssus cycchramus* n. sp.

Leg Segment	I	II	III	IV
Coxa	$0\frac{0}{2}0$	$0\frac{0}{2}0$	$0\frac{0}{2}0$	$0\frac{0}{1}0$
Trochanter	$1\frac{0}{3}1$	$1\frac{1}{3}1$	$1\frac{1}{3}0$	$1\frac{1}{3}0$
Femur	$2\frac{4}{2}2$	$1\frac{4}{2}1$	$0\frac{3}{2}0$	$0\frac{3}{3}0$
Genu	$2\frac{4}{2}1$	$2\frac{4}{0}1$	$1\frac{4(3)}{4}0$	$1\frac{4}{4}1$
Tibia	$2\frac{4}{2}1$	$2\frac{3}{2}1$	$1\frac{3}{4}0$	$1\frac{3}{4}0$
Tarsus	21	$3\frac{5(6)}{5}3$	$3\frac{5}{5}3$	$3\frac{5}{5}3$

♂. Measurements the mean of 2 specimens. Body: smaller than ♀, length of idiosoma $725\ \mu$, width $475\ \mu$. Dorsum: similar to ♀, podosomal plate $68\ \mu$ long, $179\ \mu$ wide, peritreme $29\ \mu$ long, $16\ \mu$ wide (in area of stigma). Venter: similar to ♀, sternal plate irregular in shape, $163\ \mu$ long, $125\ \mu$ wide, enclosing genital pore anteriorly, extending posteriorly to midway between 2nd and 3rd pair of sternal setae or about level of 3rd pair of sternal setae, sternal setae bordering plate (1 specimen has 1st pair on plate), geni-

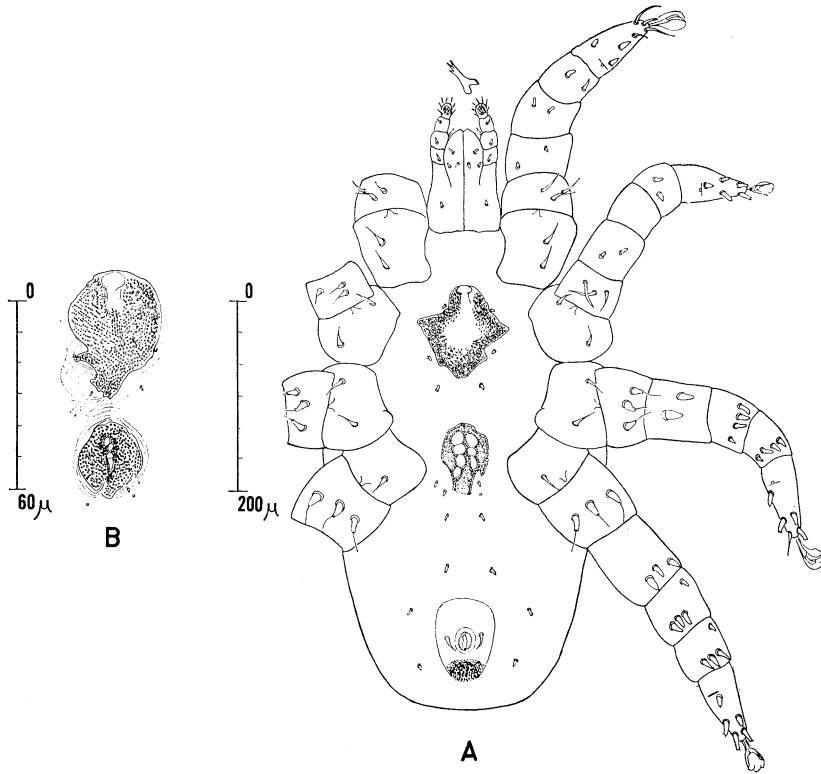


Fig. 3. *Rallinyssus cychramus* Wilson, n. sp. A, ♂ ventral view with enlarged drawing of furcate seta on palp tibia; B, ♂ sterno-genital area showing variation.

tal plate of irregular shape, 96 μ long, 78 μ wide, genital setae and pair of pores opposite posterolateral margin (1 specimen has a seta in place of a pore and the other specimen 1 seta on the plate), anal plate 119 μ long, 93 μ wide. Gnathosoma: similar to ♀, chelicera not fully visible, fixed digit appears similar to ♀. Legs: length of tarsus I, 113 μ , II, 106 μ , III, 114 μ and IV, 131 μ , chaetotaxy as in ♀.

Holotype ♀ (BISHOP 6112), NE New Guinea, Western Highlands, Tambul, 2300 m, Crake (Rallidae) (BBM-NG 7986), 2.VI.1963, H. Clissold.

Paratypes: 2♂♂, 4♀♀, NE New Guinea, Morobe Dist., Wau, 1100 m, Little Crake (Rallidae) (BBM-NG 21033), 7.I.1963, H. Clissold; 1♀, same data as holotype.

The only variation among the 8 specimens was in the general shape of the plates and the number and type of setae.

R. cychramus is separated from all other species of *Rallinyssus* by the shape of the podosomal plate, its scale-like pattern, the 13 small platelets lying posterior to it and the shape and arrangement of the leg setae. The new species is most closely related to *R. limnocoracis* Fain which also has a podosomal plate with a scale-like pattern, several smaller posterior platelets and similar shaped leg setae. In the case of *R. limnocoracis* the podosomal plate is longer and has a posteromedian projection; there are also fewer platelets and ventral

leg setae.

Rallinyssus rallus Wilson, n. sp. Figs. 4 & 5.

Diagnosis: A large mite with a well developed podosomal plate, longer than wide and with 3 pairs of setae on anterior half. First pair of setae posterior to plate stouter than others on idiosoma and closer together than median pair on plate.

♀. Measurements, the mean of 6 specimens. Body: length of idiosoma 887 μ (1020-752), width 536 μ (564-517). Dorsum: all setae short and pointed, podosomal plate 351 μ (357-343) long, 294 μ (310-277) wide, margins irregular, with median posterior convexity, flanked by a pair of lateral and posterior platelets, 1 pair of anterior and anterolateral submarginal setae, 1 pair of median setae and pores, 11 pairs of body setae, 4 pairs opposite lateral margins of podosomal plate, 1 larger pair immediately behind podosomal plate, 12 μ (14-9) long, 3 pairs between posterior platelets and peritremes, 1 pair behind peritremes (sometimes median to them), 2 pairs on posterior body margin, peritreme posterodorsal, short, 36 μ (39-32) long, 19 μ (21-18) wide (in area of stigma). Venter: all setae except anal as on dorsum, sternal plate 103 μ (132-80) long, central portion 125 μ (157-103) wide, including lateral extensions 178 μ (202-165) wide, roughly hexagonal-shaped, with lateral margins extenuated (several specimens have a break or breaks in surface), 1st pair of sternal setae on anterior margin of plate, off plate or in nonsclerotized breaks of plate, 2nd-3rd pair posterior to plate, genital plate 180 μ (189-173) long, 47 μ (55-39) wide (at midpoint), weakly rayed anterior margin extends from midway to level of 3rd pair of sternal setae, posterior margin rounded, 1 pair of genital setae opposite lateral margin, anal plate ventral with large, circular membrane, 142 μ (145-138) long 165 μ (173-150) wide, with 1 postanal, 2 paranals and 8 (9) setae surrounding anal pore, cribrum present, no other opisthosomal setae. Gnathosoma: 1 pair of long tapering gnathosomal setae, 3 pairs of slightly shorter hypostomal setae, palp trochanter with 1 ventral seta, femur with 1 ventral seta, 1 lateral seta and 2 dorsal setae, genu with 2 lateral setae and 2 dorsal setae, tibia with about 10 simple setae, 1 furcate seta, 2 terminal setae longer than others, chelicera 214 μ (219-207) long, chela 45 μ (48-37) long, movable digit with apical and subapical tooth, fixed digit with fluted tip which extends partially down inside surface. Legs: length of tarsus I, 165 μ (174-155), II, 106 μ (118-99), III, 107 μ (113-103) and IV, 114 μ (118-108), ventral setae on coxae and trochanters I-IV long and tapering with slightly inflated bases, those on coxa and trochanter I slightly smaller than others, setae on remaining segments stout and spine-like or long and simple, chaetotaxy as given in Table 3, apex of tarsus I with several long slender setae and tight cluster of short spine-like setae, 1 long seta on dorsal and antero- and posterolateral surface with furcate tip, apex of tarsi II-IV extended midventrally into small spine, tarsal claws well developed, all of equal size.

♂. Measurements the mean of 2 specimens. Body: smaller than ♀, length of idiosoma 620 μ , width 421 μ . Dorsum: similar to ♀, podosomal plate 280 μ long, 259 μ wide, peritreme 36 μ long, 17 μ wide (in area of stigma). Venter: similar to ♀, sternal plate 110 μ long, central portion 92 μ wide, including lateral extensions 138 μ wide, enclosing genital pore anteriorly, bluntly pointed or attenuated posteriorly, extending to, or slightly beyond posterior margin of coxa II, 1st pair of sternal setae on anterior margin or submargin of plate, 2nd pair lateral to plate, 3rd pair behind plate, genital plate represented by narrow

band of nonstriated cuticle, difficult to distinguish, 1 pair of genital setae, anal plate 125μ long, 128μ wide. Gnathosoma: similar to ♀, chelicera 143μ long, chela not clearly seen,

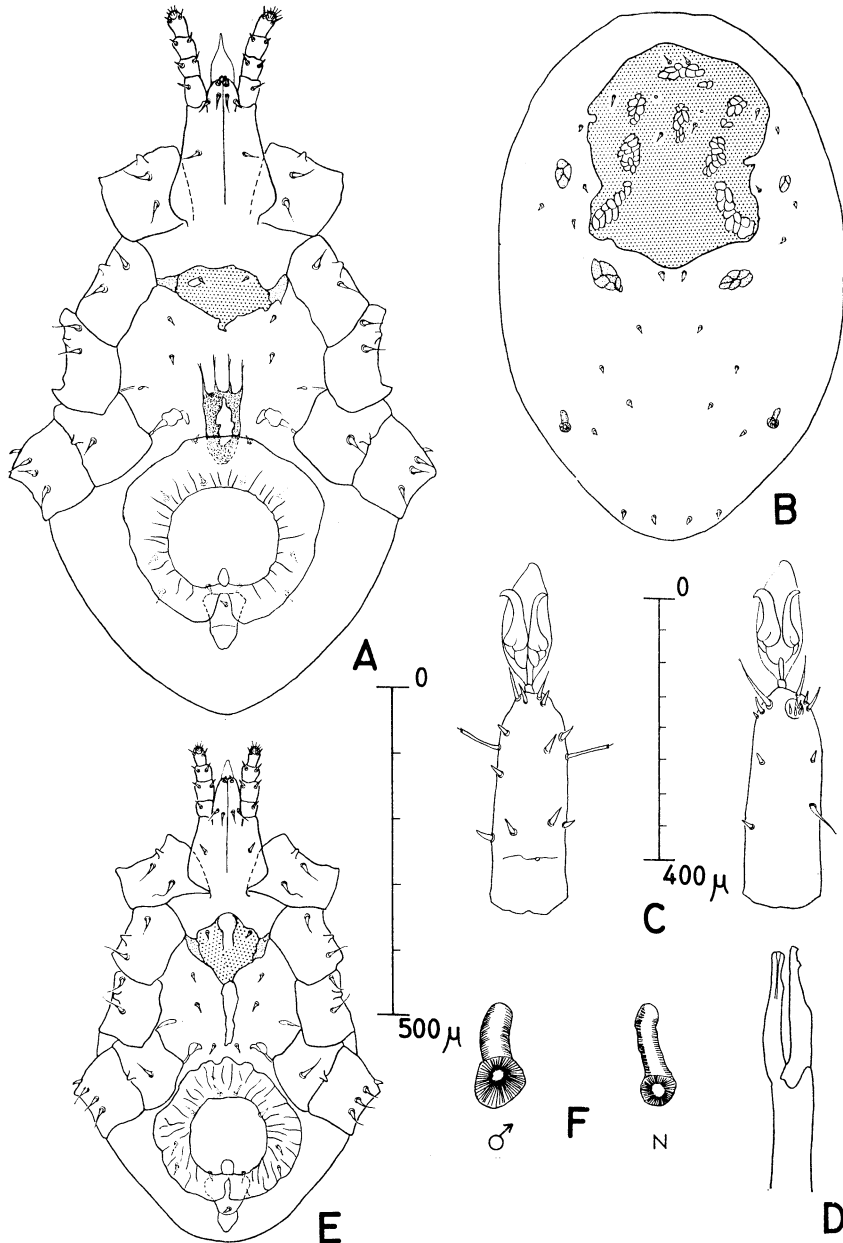


Fig. 4. *Rallinyssus rallus* Wilson, n. sp. A, ♀ ventral view; B, ♀ dorsal view; C, ♀ tarsus I, dorsal and ventral view; D, ♀ chelicera; E, ♂ ventral view; F, ♂ and nymph peritreme.

Table 3. Leg chaetotaxy of *Rallinyssus rallus* n. sp.

Leg Segment	I	II	III	IV
Coxa	0 $\frac{0}{2}$ 0	0 $\frac{0}{2}$ 0	0 $\frac{0}{2}$ 0	0 $\frac{0}{1}$ 0
Trochanter	1 $\frac{0}{3}$ 1	1 $\frac{1}{3}$ 1	1 $\frac{1}{3}$ 0	1 $\frac{1}{3}$ 0
Femur	2 $\frac{4}{2}$ 2	1 $\frac{4(3)}{1}$ 1	1 $\frac{3}{1}$ 0	0 $\frac{4}{2}$ 0
Genu	1 $\frac{4}{2}$ 1	1 $\frac{4}{2}$ 1	1 $\frac{4}{2}$ 1	1 $\frac{4}{2}$ 1
Tibia	1 $\frac{4}{2}$ 1	1 $\frac{3}{2}$ 1	1 $\frac{3}{2}$ 1	1 $\frac{3}{2}$ 1
Tarsus	25	3 $\frac{5}{5}$ 3	3 $\frac{5}{5}$ 3	3 $\frac{5}{5}$ 3

tip of fixed digit similar to ♀. Legs: length of tarsus I, 128 μ, II, 92 μ, III, 91 μ and IV, 96 μ, chaetotaxy and claws as in ♀.

Deutonymph: 1 specimen containing a ♂ is available. Body: length of idiosoma 517 μ, width 404 μ. Dorsum: indistinct, a few short setae can be seen but no podosomal plate is visible, peritreme as in adult, 34 μ long, 12 μ wide (in area of stigma). Venter: indistinct, impossible to tell whether anal plate belongs to deutonymph or ♂, only 1 visible while other features such as peritremes, legs and palps of both ♂ and deutonymph are distinctly visible. Gnathosoma: similar to adult, including furcate seta on palp tibia, chelicera 124 μ long, chela short, stout, 16 μ long fixed digit with terminal notch or fluted tip. Legs: length of tarsus I, 106 μ, II, 81 μ, III, 90 μ and IV, 87 μ, setae on segments difficult to distinguish from those of ♂ but appear similar to adult including 3 furcate setae on tarsus I, tarsal claws as in adult.

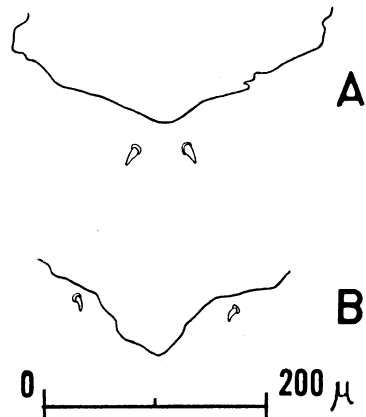


Fig. 5. ♀ posterior margin of podosomal plate. A, *Rallinyssus rallus* Wilson, n. sp.; B, *Rallinyssus caudistigmus* Strandtmann.

Holotype ♀ (BISHOP 6113), NE New Guinea, Morobe Distr., Wau, 1100 m, *Rallus pectoralis* (BBM-NG 28977) 20.VIII.1963, P. Shanahan.

Paratypes: 2♀♀, NE New Guinea, Morobe Distr., Bulolo, 700 m, *Rallus pectoralis* (S 163), 15. I. 1962, G. Monteith; 1♀, NE New Guinea, Morobe Distr., Wau, 1100 m, *Rallus pectoralis* (HC 156), 14.V.1962, H. Clissold; 2♂♂, 5♀♀, 1N, with same data as holotype.

Other Specimens: 1♂, 1♀, NE New Guinea, Morobe Distr., Wau, 1100 m, *Rallus pectoralis* (HC 156), 14.V.1962, H. Clissold.

R. rallus is closely related to *R. caudistigmus* Strandtmann from which it may be distinguished by its smaller size in all features, more slender chelicera and pair of stout setae immediately posterior to the podosomal plate. *R. rallus* has 3 pairs of setae on the anterior half of the podosomal plate, the pair of median setae are farther apart than the

1st pair of setae posterior to the plate and the sternal setae in the ♀ are 10 μ (12-9) in length. In *R. caudistigmus* there are only 2 pairs of setae on the anterior half of the podosomal plate, the pair of median setae are closer together than the 1st pair of setae posterior to the plate and the sternal setae in the ♀ are 25 μ in length. The pair of stout setae posterior to the podosomal plate are suggestive of *R. gallinulae* except that they are about 30 μ long in ♀♀ of this species and average 12 μ long in ♀♀ of *R. rallus*. This character and shape of the podosomal plate readily distinguish the new species from *R. gallinulae*.

Rallinyssus gallinulae Fain Fig. 6.

Specimens: 8♂♂, 19♀♀, 1 N, 1 L, 2 ?? (3♂♂, 12♀♀ in alcohol; 1L, 2 ?? lost), NW New Guinea, Enarotali, 1740 m, *Porphyrio poliocephalus melanopterus* (BBM-NG 21402), 19. VII. 1962, N. Wilson; 1♀, 1 N, NE New Guinea, Morobe Distr., Mt Missim, Coot (BBM-NG 21040), 8.I.1963, H. Clissold.

The following descriptive notes, based on New Guinea specimens, may be added to those given by Fain (1960) in his original description.

♀. Measurements, except as indicated, the mean of 7 specimens. Body: length of idiosoma (4 specimens) 930 μ , width 628 μ . Dorsum: podosomal plate 414 μ (437-381) long, 436 μ (484-385) wide, margins more irregular than shown by Fain and usually extended laterally to join circular platelets, 1 or both lateral platelets sometimes missing or not contiguous with podosomal plate, chaetotaxy and pores as illustrated by Fain except anteriormost seta on podosomal plate usually paired, large pair of setae posterior to podosomal plate 24 μ (25-23) long and smaller than on 1 paratype on which it measured 30 μ . Venter: sternal plate 99 μ (113-89) long, with heavily sclerotized central portion and weakly sclerotized lateral extensions, central portion 176 μ (207-150) wide, including lateral extensions 268 μ (310-212) wide, lateral extensions may be apodemes rather than part of plate, the clearer the specimen the more difficult to see the lateral extensions, other plates and chaetotaxy as described by Fain except 1st pair of sternal setae may lie in nonsclerotized openings of plate, genital setae usually paired, 2 specimens have 3 genital setae, 11 anal setae, 1 postanal, 2 paranals and 8 surrounding anal pore, 1 specimen with 12 anal setae, anal pore 150 μ (156-138) long, 186 μ (193-170) wide. Gnathosoma: similar to Fain's description except that only 1 furcate seta can be seen on palp tibia, chelicera (6 specimens) 171 μ (189-152) long, chela (6 specimens) 35 μ (39-32) long. Legs: length of tarsus I, 217 μ (240-202), II (3 specimens), 146 μ , III (4 specimens), 148 μ and IV (5 specimens), 152 μ (183-136), chaetotaxy as illustrated by Fain, 1 long seta on dorsal and antero- and posterolateral surface of tarsus I with furcate tip.

♂. Measurements from 1 specimen. Body: length of idiosoma 730 μ , width 550 μ . Dorsum: podosomal plate 292 μ long, 331 μ wide, large pair of setae posterior to plate 12 μ long, other characters as in ♀. Venter: sternogenital plate 214 μ long, 106 μ wide, extremely irregular, widest in sternal region, 2 parts distinguished by surface pattern, genital portion very faint, enclosing genital pore anteriorly, extending almost to level of genital setae posteriorly, 1st pair of sternal setae on plate, 2nd-3rd pair and genital setae lateral to plate, 1 pair of pores posterior to genital setae, anal pore 131 μ long, 152 μ wide, remaining chaetotaxy as in ♀. Gnathosoma: as in ♀. Legs: length of tarsus I, 152 μ , II, 101 μ ,

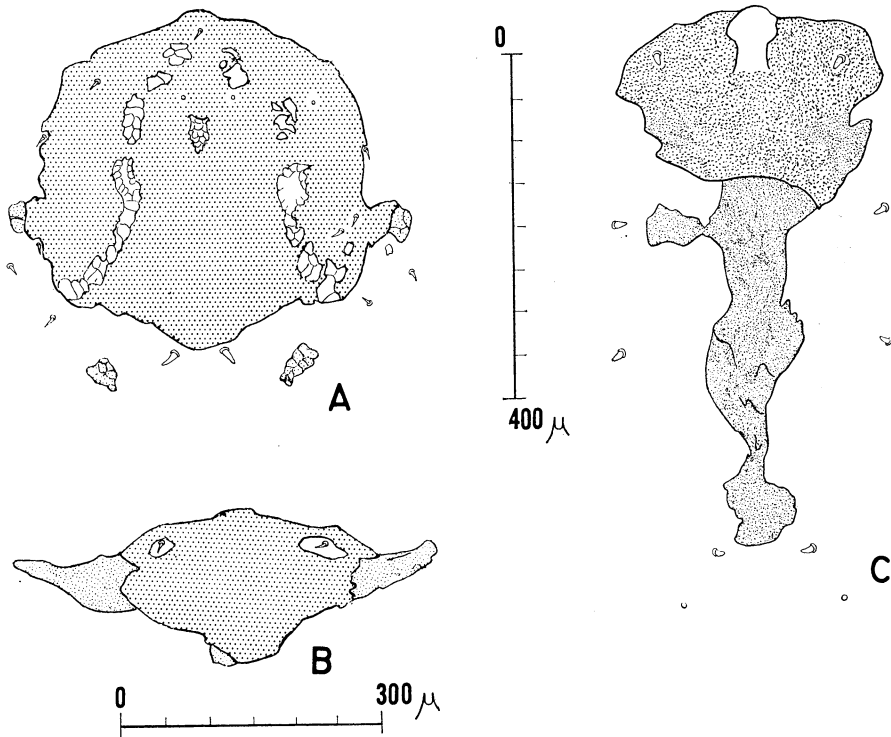


Fig. 6. *Rallinyssus gallinulae* Fain. A, ♀ podosomal plate; B, ♀ sternal plate; C, ♂ sterno-genital plate.

III, 99 μ and IV, 113 μ , chaetotaxy as in ♀.

Nymph: Measurements from 1 specimen. Body: length of idiosoma 846 μ , width 611 μ . Dorsum: no plates or setae observable, however, idiosoma poorly cleared and they may be obscured. Venter: no sterno-genital plate, 3 pairs of sternal setae, 1 pair of genital setae, anal plate and setae as in adult. Gnathosoma: similar to adult including furcate seta on palp tibia, chelicera 106 μ long, chela short, stout, 18 μ long. Legs: length of tarsus I, 188 μ , II-III, 122 μ and IV, 132 μ , chaetotaxy as in adult including 3 furcate setae on tarsus I.

Larva: Two ♀♀ each contained a single larva, 1 was extruded when adult was mounted. A larva flushed from the nares of a bird was lost. In curled position 1 specimen was 508 μ long, 395 μ wide, there are no visible dorsal or ventral plates, the chelicera are stout and tip of chelae appears furcate. There is 1 pair of gnathosomal setae and 2 pairs of hypostomal setae visible. All legs have well developed claws, there are several long slender setae and short stout setae on tarsi I-III, the remaining segments have a few short stout setae.

The specimens from New Guinea agree very closely with Fain's (1960) description which was based on specimens collected from a European moorhen in the zoo at Anvers. Our specimens are slightly larger in most measurements, otherwise there are few differences.

Fain (1960) does not mention or illustrate the lateral extensions of the sternal plate of the female or the lateral and posterior extensions of the sterno-genital plate of the male. I have found these extensions to be weakly sclerotized and on well cleared specimens they can be seen only with difficulty or not at all. I have examined two paratype females and both show traces of the lateral extensions. In uncleared specimens preserved in alcohol the lateral extensions of the sternal plate in the female are readily seen while the lateral and posterior extensions of the sterno-genital plate in the male are not.

One of 3 birds examined at Enarotali was infested with 31 mites. These were obtained by using Yunker's technique (Wilson 1964).

A key to the species of *Rallinyssus* from the Rallidae follows. Specimens of *R. caudistigmus*, *R. congolensis*, *R. gallinulae* and *R. trappi* have been seen.

KEY TO THE SPECIES OF RALLINYSSUS FROM GRUIFORMES: RALLIDAE

1. Anal pore surrounded by a large circular membrane 2
 Anal pore not surrounded by a large circular membrane 5
2. Podosomal plate fragmentary, represented only by areas of muscle attachment
 **verheyeni** Fain, 1963
 Podosomal plate well developed 3
3. Podosomal plate about as long as wide, 1st pair of setae posterior to plate distinctly larger than others on idiosoma **gallinulae** Fain, 1960
 Podosomal plate distinctly longer than wide, 1st pair of setae posterior to plate may be only slightly larger than others on idiosoma 4
4. Two pairs of setae on anterior half of podosomal plate; pair of setae posterior to plate separated by convexity of plate..... **caudistigmus** Strandtmann, 1948
 Three pairs of setae on anterior half of podosomal plate; pair of setae posterior to plate not separated by convexity of plate..... **rallus** Wilson, n. sp.
5. With 3 anal setae **congolensis** Fain, 1956
 With 2 anal setae..... 6
6. Podosomal and opisthosomal plates well developed, the former much larger than the latter..... **amaurornis** Wilson, n. sp.
 Podosomal plate well developed, opisthosomal plate fragmentary..... 7
7. Setae of legs III-IV noticeably stouter than those of legs I-II; all or most of ventral setae on trochanters III-IV flagellate..... 8
 Setae of legs III-IV not noticeably stouter than those of legs I-II; ventral setae on trochanters III-IV simple 9
8. Podosomal plate longer than wide, with posteromedian projection; 8 small posterior platelets **limnocoracis** Fain, 1956
 Podosomal plate wider than long, without posteromedian projection; 13 small posterior platelets..... **cychramus** Wilson, n. sp.
9. Podosomal plate with relatively smooth margins and 1 pair of long simple setae; adanal setae behind anal pore..... **strandtmanni** Gretillat, 1961
 Podosomal plate with very irregular margins and 1 pair of minute spine-like setae; adanal setae opposite anal pore..... **trappi** (Amaral) 1962

HOST AND LOCALITY LIST OF RALLINYSSUS SPECIES
FROM GRUIFORMES : RALLIDAE

Species Host	Locality
1. <i>amaurornis</i> n. sp. <i>Amaurornis phoenicurus chinensis</i>	Taiwan
2. <i>caudistigmus</i> Strandtmann <i>Fulica americana</i> <i>Fulica cristata</i> <i>Rallus elegans</i>	United States South Africa United States
3. <i>congolensis</i> Fain <i>Limnecorax flavirostra</i>	Rwanda
4. <i>cychramus</i> n. sp. Crake Little Crake	New Guinea New Guinea
5. <i>gallinulae</i> Fain <i>Gallinula chloropus chloropus</i> <i>Hypotaenidia philippenis</i> <i>Porphyrio poliocephalus melanopterus</i> Coot	Belgium Australia New Guinea New Guinea
6. <i>limnecoracis</i> Fain <i>Limnecorax flavirostra</i> <i>Porzana fusca fusca</i>	Rwanda Malaya
7. <i>rallus</i> n. sp. <i>Rallus pectoralis</i>	New Guinea
8. <i>strandtmanni</i> Gretillat <i>Gallinula chloropus</i>	France
9. <i>trappi</i> (Amaral) <i>Ortygonax nigricans</i>	Brazil
10. <i>verheyeni</i> Fain <i>Rallus aquaticus aquaticus</i>	Belgium

SCIENTIFIC AND COMMON NAMES OF NEW HOSTS REFERRED TO IN PAPER²

Scientific name	Common name
Gruiformes	
Rallidae	
<i>Amaurornis phoenicurus chinensis</i>	White-breasted swamphen
<i>Porphyrio poliocephalus melanopterus</i>	Purple gallinule
<i>Rallus pectoralis</i>	Slate-breasted rail

2. This does not include those common names listed in the collection records. These were names applied by collectors in the field and were not meant to imply a specific scientific name.

APPENDIX

Additional host identifications have become available for several of the records listed in my paper (Wilson 1964) dealing mainly with New Guinea Rhinonyssidae. These are as follows:

BBM-NG 27661, 28785, 29694, 29813, 29874, 29876—*Aviceda subcristata* (Crested hawk). This becomes the type host for *Mesonyssus epileus* and the only known host at present.

BBM-NG 27660—*Ptilinopus coronulatus* (Little coronated fruit dove). A new host for *Mesonyssus ptilinopi*.

BBM-NG 29273—*Ptilinopus superbus* (Superb fruit dove). This becomes the type host for *Mesonyssus ptilinopi*.

In addition the following corrections should be noted:

Page 358, 3rd paragraph, 6th line should read genera instead of species.

Page 370, 2nd paragraph, 17th line should read sternal instead of genital.

Page 373, Fig. 6, K should read larva instead of nymph.

Page 380, couplet 6 should have 7 instead of 6 as a choice; couplet 7 should have 8 instead of 7 as a choice.

Page 381 under specimens of *Ptilonyssus hirsti*, 4th line insert Hawaii, before Hawaii Co.

Page 383 under specimens of *Rhinonyssus rhinolethrum*, 1st line should read 1 L instead of 1 ♀; 2nd line should read 21331 instead of 21311 and 5♀♀ instead of 4♀♀, 1 L.

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POLYMORPHISM IN THE SOUTHERN GREEN STINK BUG

By Junichi Yukawa¹ and Keizi Kiritani²

Abstract: A probable mechanism in the formation of geographical variation of *Nezara viridula* is suggested. The original home of this species is also suggested in view of the distribution of genetic color variations in the world.

The southern green stink bug, *Nezara viridula* Linné, is widely distributed throughout the world and infests various kinds of cultivated plants sometimes causing serious damage. Since Linné's (1758) description of *viridula* as a new species from West Indies several adult forms of this species have been named. Kiritani & Yukawa (1963) observed some additional types among Japanese specimens (Table 1).

In SE Asia the population of *N. viridula* consists of several types, but in other areas,

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