

MORPHOTYPES OF NEW WORLD *RHYTIDELASMA* GAUD
(ACARINA, PTEROLICHIDAE), WITH (RE)DESCRIPTIONS
OF FIVE NAMED AND ONE NEW SPECIES¹

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FEATHER
MITES
ASSOCIATED
WITH
PARROTS
GENUS
REVISED
NEW
TAXA
NEARCTIC
REGION

ACARIENS
PLUMICOLES
ASSOCIÉS
AUX PERROQUETS
RÉVISION
DE GENRE
NOUVEAU
TAXON
RÉGION
NÉARCTIQUE

ABSTRACT : Six males morphotypes of the feather mite genus *Rhytidelasma* Gaud (Pterolichoidea, Pterolichidae) are known from New World parrots. The five described and one new species each represent a different morphotype, namely, *R. dilatata* (Trouessart) [= *Pterolichus (Pseudalloptes) tritiventris dilatatus*], n. comb., n. stat., from *Ara nobilis* (L.) ; *R. tritiventris* (Trouessart) and *R. ulocerca* (Trouessart) from *Ara chloroptera* Gray ; *R. tenuis* (Trouessart) [= *Pterolichus (Pseudalloptes) tenuis*] n. comb., from *Pionus menstruus* (L.) ; *R. forficiventris* (Trouessart) from *Pionites leucogaster* (Kühl) ; and *R. mesomexicana*, n. sp. from *Aratinga holochlora* (Sclater). Each species is (re)described ; the morphology of immatures and host-parasite associations are discussed. Another new combination : *Rhytidelasma lambda* (Trouessart) (= *Pseudalloptes lambda*).

RÉSUMÉ : Six morphotypes mâles d'Acariens plumicoles du genre *Rhytidelasma* Gaud (Pterolichoidea, Pterolichidae) sont connus chez les perroquets du Nouveau Monde. Cinq espèces déjà décrites et une espèce nouvelle représentent chacune un morphotype différent, à savoir, *R. dilatata* (Trouessart) [= *Pterolichus (Pseudalloptes) tritiventris dilatatus*] n. comb., n. stat., parasite d'*Ara nobilis* (L.) ; *R. tritiventris* (Trouessart) et *R. ulocerca* (Trouessart) parasites d'*Ara chloroptera* Gray ; *R. tenuis* (Trouessart) [= *Pterolichus (Pseudalloptes) tenuis*] n. comb., parasite de *Pionus menstruus* (L.) ; *R. forficiventris* (Trouessart) parasite de *Pionites leucogaster* (Kühl) ; et *R. mesomexicana* n. sp., parasite d'*Aratinga holochlora* (Sclater). Chaque espèce est (re)décrite ; la morphologie des immatures et les associations hôtes-parasites sont discutées. Autre combinaison nouvelle : *Rhytidelasma lambda* (Trouessart) (= *Pseudalloptes lambda*).

Species of *Rhytidelasma* Gaud (Pterolichidae) are commensal of the world parrot fauna. During the late 1800s, TROUESSART, either as sole author or in collaboration with P. MÉGNIN or J. FAVETTE,

described over 100 feather mite species associated with parrots. Among these many taxa, 13 are, or will be, reassigned to *Rhytidelasma*. GAUD (1966, 1980) has added four additional species from

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Africa, and ATYEO and PÉREZ (1987a, b) will be describing three species from Mexican and Central American Conures (*Aratinga* Spix).

In collections from the world parrot faunas amassed by field collecting and by examination of avian study skins, we know that some host species support three (and possibly four) species of *Rhytidelasma*. Nomenclatural problems have arisen when the total complement of species from a host has not been described, when descriptions of described taxa are vague, and when type series are lost.

To facilitate planned work on New World *Rhytidelasma*, we will redescribe the named species, describe a new species, discuss host associations, and present a general overview of morphology. Additionally, all named species of *Rhytidelasma* and their psittacine hosts will be listed for the first time.

In the descriptive section, signatures for idiosomal setae follow ATYEO and GAUD (1966) and measurements are in micrometres. Existing types of previously described species are in the TROUESSART Collection in Paris; most materials used in the resdescriptions have been collected from museum study skins primarily at the American Museum of Natural History (AMNH) and Field Museum of Natural History (FMNH). Accession numbers in the descriptive sections refer to AMNH, FMNH, BMNH [British Museum (Natural History)], UGA (University of Georgia), UNAM (Universidad Nacional Autónoma de México), and TMP (field numbers of the authors).

PTEROLICHOIDEA, PTEROLICHIDAE, PTEROLICHINAE

Rhytidelasma Gaud

Rhytidelasma GAUD, 1966 : 126; GAUD, 1980 : 32.

Species-type : *Pseudalloptinus grammophyllus* Gaud and Mouchet 1959 (by original designation).

Most pterolichid taxa associated with New World parrots are related to the pterolichid genera *Protoli-*

chus Trouessart or *Aralichus* Gaud. The males of these taxa have the adanal discs heavily sclerotized with the corollae dentate and the subhumeral setae setiform. *Rhytidelasma* males are characterized in part by adanal discs weakly sclerotized and edentate, and subhumeral setae short and dagger-shaped. *Rhytidelasma* males have the opisthosomata in a variety of configurations. Six types are encountered in the New World fauna ; five of these are represented by the five species to be redescribed, the sixth by a new species.

The six morphotypes have two basic idiosomal configurations, a laterally expanded opisthosoma with a broad, thin terminal membrane (Figs. 2, 7), and forms with terminal lamellae (leaflike idiosomal extensions). Subgroups of the second type include a laterally expanded terminus bearing ridged (Fig. 15) or unridged lamellae (Fig. 13), and a narrow terminus with ridged lamellae (Fig. 12).

In addition to opisthosomal configurations, other characters to describe these include : condition of the prodorsal and scapular shields, shape of epimerites I, positions of setae *d* 3 and *d* 4, development of apophyses on tibiae and tarsi IV, presence or absence of setae *kT* IV, shape of adanal discs, and length of genital organ.

The aedeagus is short, thick, and recurved. When extended, the aedeagal tip covers the female spermpore which is on a small protuberance. There is a correlation between the length of the aedeagus and the spermpore position. If the aedeagus is relatively short, the spermpore is terminal ; if the aedeagus is longer, the spermpore is subterminal.

In microslide preparations, the longer aedeagus tends to be seen in lateral aspect, a shorter aedeagus in a normal position. Importantly, legs IV in life have solenidia φ on the apicodorsal surfaces of tibiae IV and the apophyses of the tibiae and tarsi directed toward the meson ; however, on microslides these legs tend to rotate 45° and the solenidia and apophyses appear to be differently oriented.

Specimen storage and/or preparation tends to distort some structures of males, especially the opisthosoma, genital organ and legs IV. As males dehydrate (i.e., on museum study skins), the lateral edges of the opisthosoma tend to bend toward the

venter; when slide mounted, unless considerable pressure is exerted on the microcover slip, the lateral margins do not return to life-like positions and the opisthosoma appears to be parallel-sided rather than laterally expanded. When measuring or comparing specimens with illustrations, differences between opisthosomata may be simple abberations due to specimen preparation.

Species differences among females are expressed as positioning of setae *d 3* and *d 4* (compare Figs. 5, 8, 10), the sclerotization of the setae bearing area, position of the sperm pore, and the lengths of legs IV relative to the end of the idiosoma. We have not determined if the conditions depicted in the illustrations represent species or group differences.

The immature stadia of *Rhytidelasma* are exceptional in the lengthening of the idiosoma between the prodorsal shield and setae *d 2*, *l 2*, shortening of the hysterosomata posterior to the named setae, and the positioning of cupules *ia* (Fig. 3). Also, the complement of idiosomal setae and cupules may be incomplete. In larvae, only cupule *im* has been observed; in nymphs and adults, cupules *ia* and *im* are evident. Cupules *ip* and *ih* are either absent or positioned so that they can not be observed. Either idiosomal setae *l 4* or *pae* (external postanals) are absent; the positioning of the existing pair, lateral to *l 5* in the nymphs and females, would indicate that *pae* are the missing pair.

In all stadia, the dorsal tegument posterior to the prodorsal shield is often ornamented with broad, usually transverse, ridges; this is especially apparent in immature stadia. The "striae" in our illustrations represent the inter-ridge demarcations (Fig. 3).

KEY TO MALES OF NAMED SPECIES OF NEW WORLD
Rhytidelasma

1. Idiosoma without terminal lobes 2
- Idiosoma with leaflike terminal lobes 3
2. Prodorsal shield with anterolateral projections; terminal cleft shallow, extending to level of setae *d 4*
- dilatata*
- Prodorsal shield without anterolateral projections; terminal cleft deep, extending anterior to setae *d 4*.
tritiventris

3. Bases of terminal lobes (lamellae) widely separated, tips of lobes directed toward meson; setae *d 4*, *d 5* approximate..... 4
- Bases of terminal lobes approximate, separated by small terminal cleft; internal lobe margins parallel; setae *d 4* distant from *d 5* 5
4. Terminal lobes with transverse, dorsal ridges; epimerites I V-shaped *mesomexicana*, n. sp.
Terminal lobes without dorsal ornamentation; epimerites I Y-shaped *forficiventris*
5. Epimerites I Y-shaped, prodorsal and scapular shields fused, opisthosoma expanded laterally ... *ulocerca*
Epimerites V-shaped, prodorsal and scapular shields not fused, opisthosoma narrowed behind legs IV ..
tenuis

Rhytidelasma dilatata (Trouessart),

n. comb., n. stat.

(Figs. 1-5)

Pterolichus (Pseudalloptes) tritiventris dilatatus TROUES-SART 1899a : 311; TROUESSART 1899b : 13; CANESTRINI and KRAMER 1899 : 62.

Pseudalloptes tritiventris dilatatus, FAVETTE and TROUES-SART 1904 : 125; RADFORD 1958 : 136.

Protolichus tritiventris dilatatus, DUBININ 1956 : 304.

Males of *R. dilatata* and *R. tritiventris* (Trouessart) lack terminal lobes, have epimerites I Y-shaped, and the dorsal and lateral shields of the propodosoma fused. *R. dilatata* has projections from the anterolateral margin of the prodorsal shield, setae *d 3* far anterior to setae *l 3* and at the same level as cupules *im*, cupules *ia* on the humeral shields, and the only apophyses on tarsi IV are tarsal claws. In contrast, the males of *R. tritiventris* lack projections on the anterior margin of the prodorsal shield, setae of the third row are near the same level, cupules *ia* are on the hysterosomal shield, and legs IV, in addition to the tarsal claws, have apophyses on the tibiae and tarsi.

MALE. Length, including gnathosoma, 386; width, 181. *Prodorsum*: Shield with anterolateral projections, 7 in length (Fig. 2); without ornamentation; setae *sci* as near to meson as to *sce*; *sce* : *sce*, 82; *sci* : *sci*, 51; cupules *ia* on humeral shields. *Hysterosoma*: Shield with weak ridges in region posterior to setae *l 3*; setae *d 2*, *l 2* in shallow

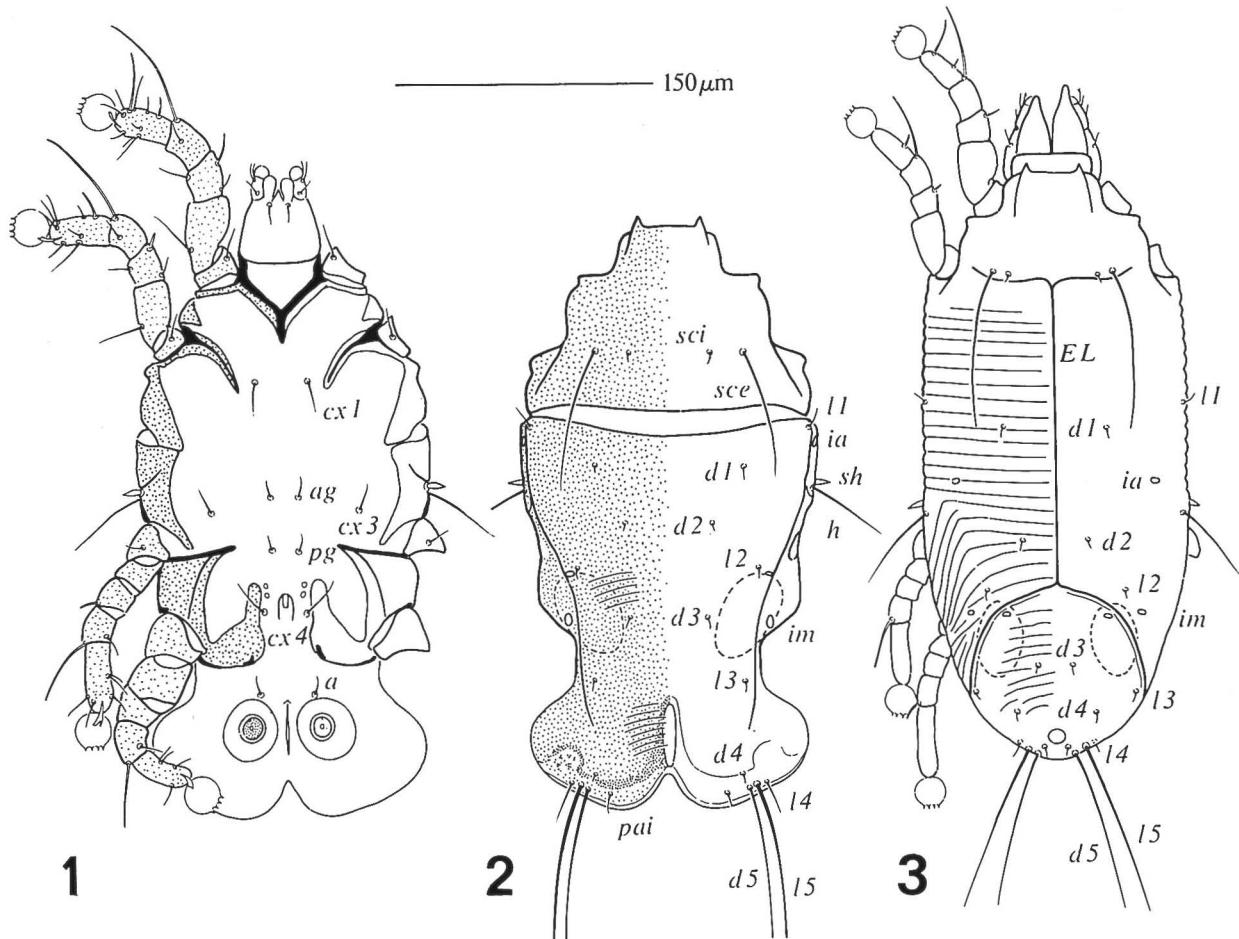
trapezoidal arrangement; levels of setae $d\ 3$, $l\ 3$ distant; $d\ 1 : d\ 1$, 92; $d\ 2 : d\ 2$, 37; $d\ 3 : d\ 3$, 24; terminus expanded laterally, 157 in width; supranal concavity pronounced; posterolateral semicircular areas weakly sclerotized; terminal membrane regular; setae *pai* distant from setae *d\ 5*. *Venter*: Epimerites I Y-shaped with sclerotizations between arms, adanal discs circular. *Legs*: Tarsal claw on each tarsus IV; tibiae IV with setae *kT*.

FEMALE. Length, including gnathosoma, 524; width, 216. Proterosoma similar to male; *sce* : *sce*, 88; *sci* : *sci*, 57; setae *l\ 2*, cupules *im*, opisthonotal gland opening, approximate, almost equidistant; level of setae *d\ 3* far posterior to *l\ 3*; *d\ 3*, *d\ 4*

inserted at same level on narrow area of weakly sclerotized conjunctiva; spermpore terminal; pretarsi IV not extending to end of idiosoma.

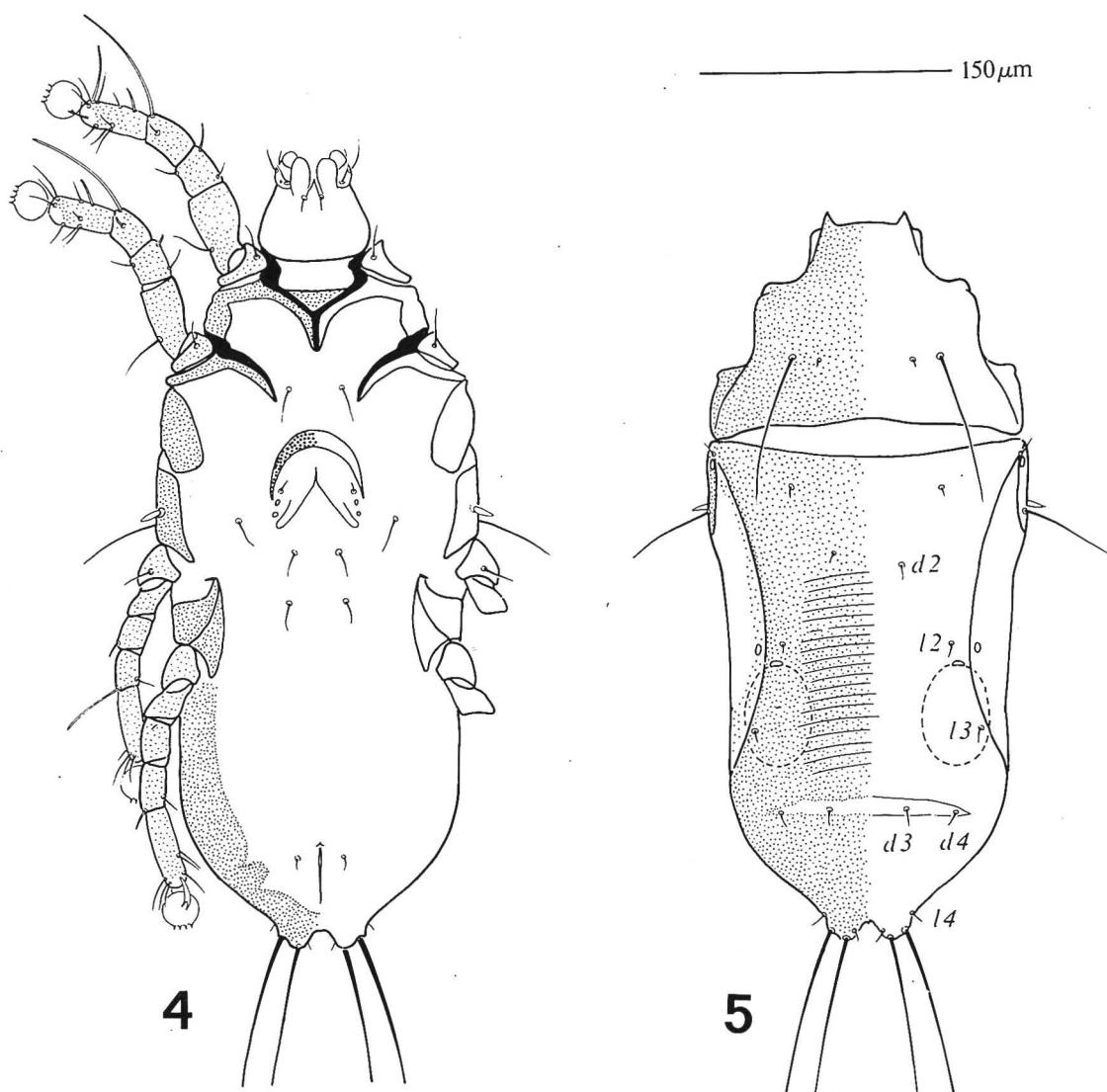
Type data. From *Ara n. nobilis* (L.) (= *Ara Hahnii*), Guyana; 9 ♂♂, 6 ♀♀ co-types, mounted on slide no. 37 E 16 in the Trouessart Collection.

Additional material. From *A. n. nobilis*: 2 ♂♂, 1 ♀, 2 NN, Grova, East Demerara, Guyana, 1902, J. RODWAY (FMNH 43833, UGA 11571); 6 ♂♂, 2 ♀♀, Buxton, East Demerara, Guyana, June 3, 1937, E. R. BLAKE (FMNH 108119, UGA 11575-6); 7 ♂♂, 3 ♀♀, Lagôa Juparaña, Espírito Santo, Brazil, November 23, 1929, E. KAEMPFER (AMNH 317267, UGA 10363); 1 ♀, Mt. Roraima, Bolívar, Venezuela, December 13, 1927, T. D. CARTER



FIGS. 1-3 : *Rhytidelasma dilatata* (Trouessart).

1. — Male, venter; 2. — Male, dorsal idiosoma; 3. — Tritonymph. Abbreviations : *EL*, ecdysial line; cupules *ia*, *im*. Setae : *a*, anals; *ag*, anterior genitalia; *cx\ 1-4*, coxals; *d\ 1-5*, *l\ 1-5*, dorsal and lateral hysterosomals; *h*, humerals; *pai*, internal postanals; *pg*, posterior genitalia; *sce*, *sci*, external and internal scapulars; *sh* subhumerals.



FIGS. 4-5 : *Rhytidelasma dilatata* (Trouessart), female.

4. — Ventral aspect ; 5. — Dorsal idiosoma. Setae : d 2-4, l 2-4, dorsal and lateral hysterosomals.

(AMNH 236519, UGA 10359) ; 3 ♂♂, Mt. Auyán-tepui, Bolívar, Venezuela, February 24, 1938, W. H. PHELPS (AMNH 324143, UGA 10362).

Remarks. The type slide is in poor condition, but as the species is readily identifiable, the specimens were not remounted ; consequently, a lectotype will not be designated. The redescription and drawings are based on the collection from Brazil.

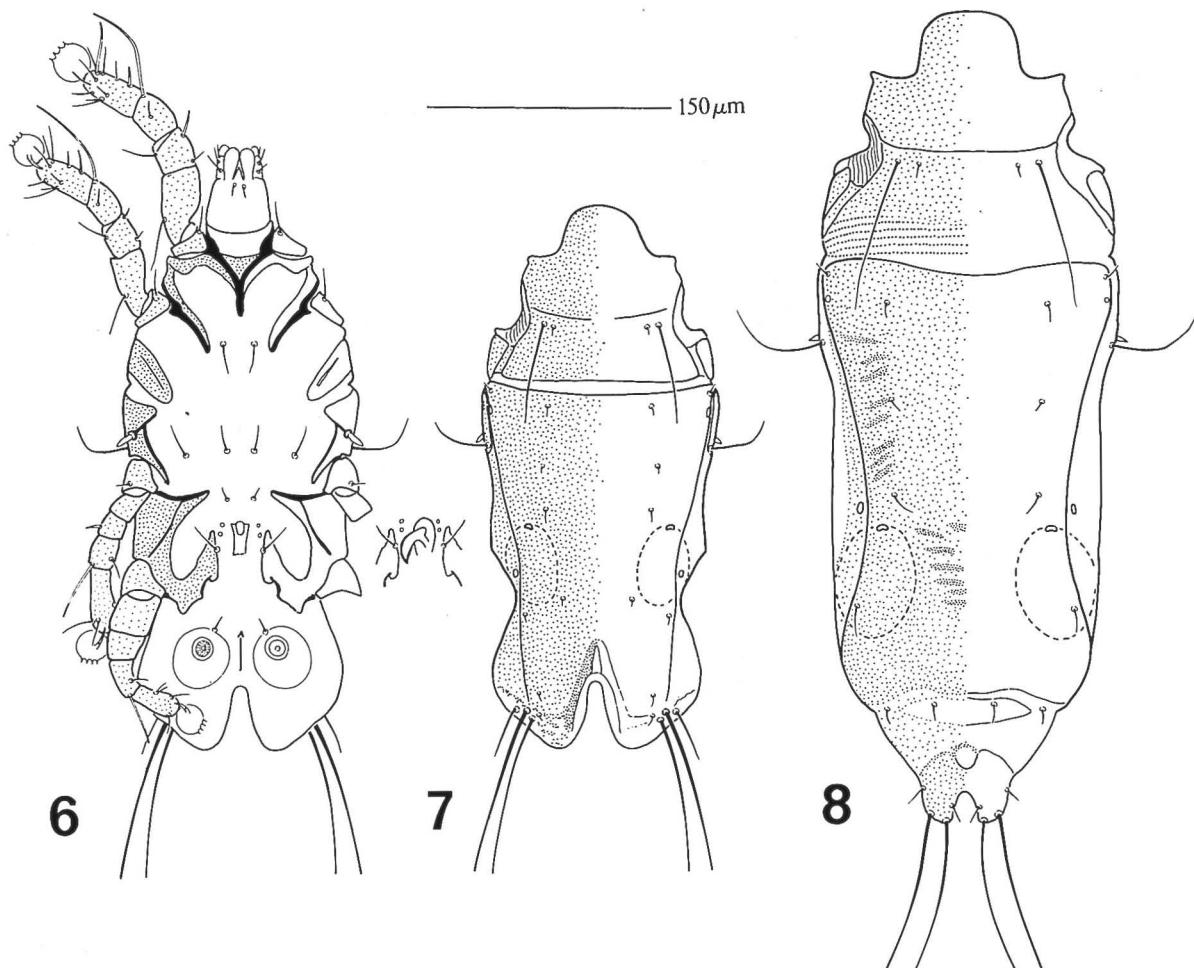
Rhytidelasma tritiventris (Trouessart)
(Figs. 6-8)

Pterolichus (Pseudalloptes) tritiventris TROUESSART, 1884 : 575 ; TROUESSART, 1885 : fig. 3a ; TROUESSART and MÉGNIN, 1885 : 68, fig. 16a ; CANESTRINI and KRAMER, 1899 : 62.

Pseudalloptes tritiventris, FAVETTE and TROUESSART, 1904 : 125.

Protolichus tritiventris, DUBININ, 1956 : 304.

Rhytidelasma tritiventris, PÉREZ and ATYEO, 1984 : 567 ; ATYEO, 1985 : 54.



FIGS. 6-8 : *Rhytidelasma tritiventris* (Trouessart).

6. — Male, venter ; 7. — Male, dorsal idiosoma ; 8. — Female, dorsal idiosoma. Insert : Genital organ in lateral aspect.

Although superficially similar to *R. dilatata*, this species has numerous apophyses on tarsi IV, a character state shared with some of the following morphotypes. Other species within the *tritiventris* complex may have the terminal membranes extended even more than those illustrated in Fig. 7 thereby forming leaflike lobes, but in these instances the bases of the lobes are very wide and the dorsal surfaces lack transverse ridges.

MALE (co-type). Length, including gnathosoma, 370; width, 146. **Prodorsum** : Shield without anterolateral projections ; with conspicuous transverse line anterior to scapular setae ; setae *sci* approximate to *sce* ; *sce* : *sce*, 75 ; *sci* : *sci*, 60. **Hysterosoma** :

Shield without transverse ridges ; cupules *ia* on shield ; setae *d* 2, *l* 2 in quadrate arrangement ; levels of setae *d* 3, *l* 3 at approximately same level ; setae *d* 1 : *d* 1, 65 ; *d* 2 : *d* 2, 75 ; *d* 3 : *d* 3, 39 ; terminus expanded laterally, 125 in width ; supranal concavity not pronounced ; terminal membrane extended between setae *d* 5 and cleft ; setae *pai* approximate to setae *d* 5. **Venter** : Epimerites I Y-shaped with sclerotizations between arms, adanal discs circular. **Legs** : Apophyses on tibiae, tarsi IV ; tibiae IV with setae *kT*.

FEMALE. Length, including gnathosoma, 540 ; width, 193. **Proterosoma** similar to male ; *sce* : *sce*, 84 ; *sci* : *sci*, 65 ; setae *l* 2, cupules *im*, opisthonotal

gland openings, approximate, almost equidistant, distances greater than in *dilatata*; level of setae *d 3* far posterior to *d 4*; *d 3, l 3* at same level, widely separated, inserted at anterior margin of weakly sclerotized conjunctiva; spermpore subterminal; pretarsi IV not extending to end of idiosoma.

Type data: From *Ara chloroptera* Gray (= *Ara canga*): 3 ♂♂, 2 ♀♀ co-types, 2 TNN, *Amerique chaude*. Type series in the TROUESSART Collection, slide #37 D 12. An unnumbered slide in the TROUESSART Collection from *A. canga* has 1 ♂ and 1 ♀, but lacks other data.

Additional material. From *A. chloroptera*: 2 ♂♂, 1 ♀, Río Suno, above Avila, Napo, Ecuador, April 14, 1923, OLALLA & SONS (AMNH 178953, UGA 10340); 18 ♂♂, 14 ♀♀, Orose, Tachira, Venezuela, March 7, 1908, N. DEARBORN (FMNH 34368, UGA 11384; FMNH 34366, UGA 11387); 2 ♂♂, 2 ♀♀, Puerto Valdivia, Antioquia, Colombia, December 19, 1914, MILLER & BOYLE (AMNH 133009, UGA 10338); 2 ♂♂, 3 ♀♀, Guyana, no other data, TROUESSART Collection, Slide #37 B 11 [labelled *Pseudalloptes tritolobus* (sic), with types of *R. ulocerca*].

Remarks. TROUESSART (1884) listed two hosts for this mite species, *Ara chloroptera* (= *A. canga*) and *Pyrrhura cruentata* (Wied) (= *Conurus cruentatus*); the mites from the latter host represent a new species more closely related to *R. dilatata* than to *R. tritiventris*. TROUESSART also mentioned a variety occurring on the two named host species that was paler, more elongated, and thinner than the nominate species and in which the males had the anterior epimerites null or poorly developed. There are in fact three *Rhytidelasma* species associated with *A. chloroptera*, namely *R. tritiventris*, *R. ulocerca* (see below), and a new species near *R. mesomexicana*, n. sp., in which the males have terminal leaves in the shape of tennis racquets. All are rather broad, and all have prominent epimerites; the only species that we have encountered that would resemble TROUESSART's brief discussion of a variety would be *R. tenuis* which occurs on *Pionus menstruus* (see below).

The microhabitats of the three *Ara chloroptera* species are unknown. However, we can extrapolate from information about three similar (new) species

known from *Aratinga holochlora*. The species similar to *tritiventris* probably occurs on the inner primaries and secondaries, the one related to *ulocerca* is probably restricted to the tail, and the species similar to *mesomexicana* with racquet-shaped terminal lamellae probably occurs on the outer primaries, at least when populations are low.

Rhytidelasma ulocerca (Trouessart),
(Figs. 9, 10)

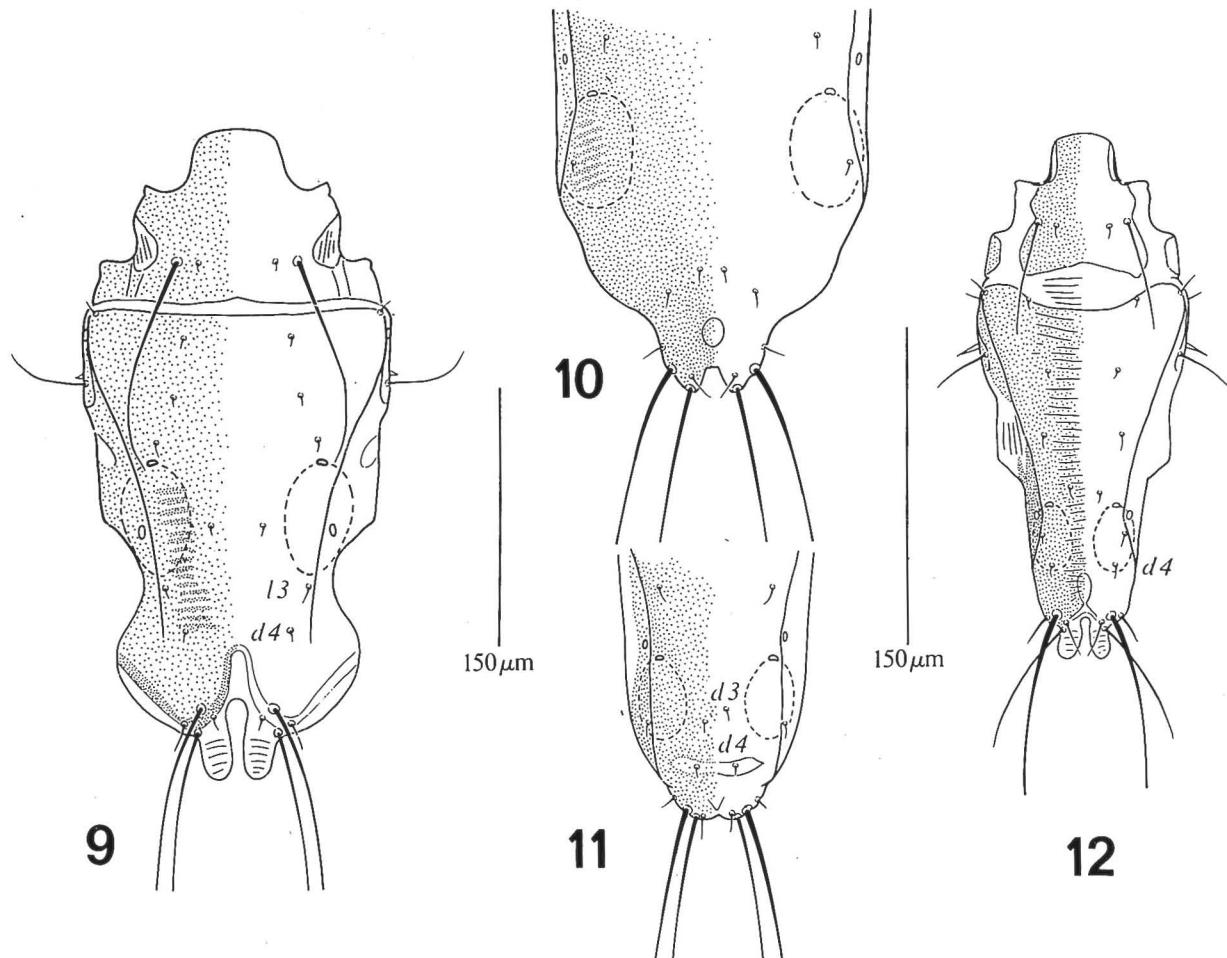
Pterolichus (Pseudalloptes) tritiventris ulocereus TROUESSART 1899a : 311; TROUESSART 1899b : 12 (*ulocercus*, emendation); CANESTRINI and KRAMER 1899 : 62 (*ulocerea*) (sic).

Pseudalloptes tritiventris ulocercus, FAVETTE and TROUESSART, 1904 : 125; RADFORD, 1958 : 126.

Protolichus tritiventris ulocercus, DUBININ, 1956 : 304. *Rhytidelasma ulocerca*, PÉREZ and ATYEO, 1984 : 567.

Two male morphotypes have small terminal lobes separated by a small cleft; each lobe is ornamented with transverse ridges on the dorsal surface (Fig. 9) (which appear as striae in microslide preparations). These morphotypes are represented by *R. ulocerca* and *R. tenuis*, two species that are not closely related. *R. ulocerca* has the propodosomal shields partially fused and the idiosoma is heavily sclerotized; and in the males, cupules *im* are distant from the opisthonotal gland, and setae *d 4* are distant from the cluster of terminal setae.

MALE (lectotype). Length, including gnathosoma, 432; width, 193. *Prodorsum*: Shield without anterolateral projections; without ornamentation; setae *sci* nearer to *sce* than to meson; *sce* : *sce*, 74; *sci* : *sci*, 49; *Hysterosoma*: Shield with weak ridges on lateral margins between opisthonotal gland and setae *d 4*; cupules *ia* on humeral shields; setae *d 2, l 2* in shallow trapezoidal arrangement; levels of setae *d 3, l 3* distant; setae *d 4* lateral to supranal concavity apex; *d 1* : *d 1*, 69; *d 2* : *d 2*, 73; *d 3* : *d 3*, 34; terminus expanded laterally, 147 in width; supranal concavity pronounced; posterior membrane lateral to setae *d 4* with straight anterior demarcation; setae *pai* approximate to setae *d 5*. *Venter*: Epimerites I V-shaped without sclerotizations between arms, adanal discs circular. *Legs*: Apophyses on tibiae IV; tibiae IV with setae *kT*.



Figs. 9-10 : *Rhytidelasma ulocerca* (Trouessart).

9. — Male, dorsal idiosoma ; 10. — Female, dorsal opisthosoma.

Figs. 11-12 : *Rhytidelasma tenuis* (Trouessart).

11. — Female, dorsal opisthosoma ; 12. — Male, dorsal idiosoma. Setae : d3-4, 13, dorsal and lateral hysterosomals.

FEMALE. Length, including gnathosoma, 540; width, 200. Proterosoma similar to male; *sce* : *sce*, 80; *sci* : *sci*, 53. Setae *l* 2, cupules *im*, opisthonal gland openings, distant, almost equidistant; level of setae *d* 3 anterior to *d* 4, inserted on evenly sclerotized tegument; spermpore terminal; pretarsi IV not extending to end of idiosoma.

Type data. From *Ara chloroptera* Gray : ♂ lectotype, 2 ♂♂, 2 ♀♀ paralectotypes, Guyane. The type series is in the TROUESSART Collection, slide no. 37 B 11 before remounting.

Additional material. From *A. chloroptera* : 2 ♀♀, Río Suno, above Avila, Napo, Ecuador, April 14, 1923, OLALLA & Sons (AMNH 178953, UGA 10340); 2 ♂♂, 4 ♀♀, Orope, Tachira, Venezuela, March 7, 1908, N. DEARBORN (FMNH 34368, UGA 11384; FMNH 34366, UGA 11387); 2 ♂♂, Chapada, Mato Grosso, Brazil, October 19, 1883, H. H. SMITH (AMNH 34525, UGA 10342).

Remarks. The lectotype series (TROUESSART slide 37 B 11) was labelled “*Pseudalloptes tritilobus* & Var. *ulocercus*” by TROUESSART; *tritilobus* is

obviously a *lapsus* for *tritiventris*. *R. ulocerca* was described 14 years after *tritiventris*, and as this is the only known slide identified as *ulocerca*, we elect these specimens as the type series.

The positions of setae *d 3* and *d 4* in females are variable. In some specimens these setae are separated by greater distances than illustrated, however, the lateral shifts are the same distance for each seta.

The third species from *Ara chloroptera*, the undescribed species with racquet-shaped terminal lobes, mentioned previously, occurred with *ulocerca* and *tritiventris* in the Río Suno collection, and with *ulocerca* in the Chapada collection.

Rhytidelasma tenuis (Trouessart), n. comb.

(Figs. 11, 12)

Pterolichus (Pseudallopites) tenuis TROUESSART, 1884 : 574; TROUESSART, 1885 : 67; CANESTRINI and KRAMER, 1899 : 60.

Pseudallopites tenuis, FAVETTE and TROUESSART, 1904 : 125; RADFORD, 1958 : 137.

Protolichus tenuis, DUBININ, 1956 : 304.

Rhytidelasma tenuis and related undescribed species are the smallest of the *Rhytidelasma* morphotypes, e.g., males about 225-250 μm and females about 300-350 μm in length. Additionally, these species are weakly sclerotized, the dorsal and lateral shields of the propodosomata are not fused, the anterior epimerites are basically V-shaped with the arms of the V free or weakly connected, and setae *kT* on tibiae IV are absent.

MALE. Length, including gnathosoma, 239; width, 100. *Prodorsum* : Shields independent, prodosomal shield without anterolateral projections; without ornamentation; setae *sci* about equidistant between *sce* and meson; *sce* : *sce*, 45; *sci* : *sci*, 24. *Hysterosoma* : Shield with weak ridges on entire surface; cupules *ia* not visible; setae *d 2*, *l 2* in large quadrangular arrangement; levels of setae *d 3*, *l 3* distant; setae *d 4* lateral to supranal concavity apex; *d 1* : *d 1*, 51; *d 2* : *d 2*, 35; *d 3* : *d 3*, 12; terminus not expanded laterally, 51 in width immediately posterior to legs IV; supranal concavity pronounced; posterior membrane absent; setae *pai*

long, approximate to setae *d 5*. *Venter* : Epimerites I V-shaped without sclerotizations between arms, adanal discs oval. *Legs* : Apophyses on tibiae, tarsi IV; tibiae IV without setae *kT*.

FEMALE. Length, including gnathosoma, 324; width, 131. Proterosoma similar to male; *sce* : *sce*, 55; *sci* : *sci*, 35; setae *l 2* distant from cupules *im*, opisthonotal gland openings; level of setae *d 3* far anterior of *d 4*; only *d 4* inserted on unsclerotized tegument; spermpore not visible; legs IV extending beyond terminus by 2/3 lengths of tarsi.

Type data : From *Pionus menstruus* (L.) (= *Amazona menstrua*) from "l'Amerique tropicale (Equateur)". The type is not in the TROUESSART Collection.

Study material : From *Pionus menstruus* : 4 ♂♂, 1 ♀, Río Mechenque, Cauca, Colombia, June 30, 1958, K. von SNEIDERN (FMNH 255500, UGA 11995-6); 3 ♂♂, 2 ♀♀, Río Frío, Cauca, Colombia, November 27, 1911, A. A. ALLEN and L. E. MILLER (AMNH 111467, UGA 10984); 1 ♂, 3 ♀♀, Kartabu Point, Guyana, November 1, 1922, coll. unknown (AMNH 805034, UGA 10893).

Remarks. The types of this species are not in the TROUESSART Collection. We have slides from *Pionus menstruus*, but is it the same species observed by TROUESSART? In the description (1884), he states that the male hysterosoma is narrowed to the posterior, beginning at daggerlike setae *sh*; this agrees with our specimens. However, he states that the body is elongated and strongly bilobed, without transparent terminal discs [probably terminal membranes]; this does not agree with our specimens as there are two leaflike terminal expansions. Finally, TROUESSART states that the males have four setae on the posterior margins of the lobes, of which the internal pair is very long; on our specimens, the external pair are very long, but there is a tendency in slide preparations for the two setae on each side to cross-over each other — therefore internal and external is a matter of interpretation.

Regardless of the discrepancies, we believe that our determination is correct. We have collections from six species of *Pionus*; from each, there is only one species of *Rhytidelasma*, a member of the *R. tenuis* complex.

Rhytidelasma forficiventris (Trouessart),
(Figs. 13, 14)

Pterolichus (Pseudallopites) forficiventris TROUESSART 1884 : 576 ; TROUESSART 1885 : fig. 3b ; TROUESSART AND MÉGNIN 1885 : 69, fig. 16b ; CANESTRINI and KRAMER 1899 : 62.

Pseudallopites forficiventris, FAVETTE and TROUESSART 1904 : 125 ; RADFORD 1958 : 137.

Protolichus forficiventris, DUBININ 1956 : 304.

Rhytidelasma forficiventris, GAUD 1980 : 32.

Two species have males with deep terminal clefts and terminal lobes widely separated at the bases, with the lobe apices directed medially, *R. forficiventris* and *R. mesomexicana*, n. sp. The dorsal surfaces of the lobes in the two species are differently formed, unornamented in *forficiventris* and with dorsal ridges in *mesomexicana* (Fig. 15). It is probable that *R. forficiventris* is related to *R. ulocerca* as taxa of the latter complex may have the terminal membranes more developed than depicted in Fig. 9 ; all lack dorsal ridges.

MALE. Length, including gnathosoma, 386 ; width, 154. *Prodorsum* : Shield without anterolateral projections ; with ornamentation around external scapular setae ; setae *sci* nearer to *sce* than to meson ; *sce* : *sce*, 66 ; *sci* : *sci*, 41. *Hysterosoma* : Shield without transverse ridges ; cupules *ia* on humeral shields ; setae *d 2*, *l 2* in trapezoidal arrangement ; opisthonotal gland nearer to setae *l 2* than cupules *im* ; setae *d 3*, *l 3* distant ; setae *d 4* approximate to setae *l 5* ; *d 1* : *d 1*, 78 ; *d 2* : *d 2*, 55 ; *d 3* : *d 3*, 39 ; terminus expanded laterally, 131 in width ; supranal concavity not pronounced ; posterior lobes without dorsal ornamentation ; posterior membranes lateral to setae *d 4*, small ; setae *pai* approximate to setae *d 5*. *Venter* : Epimerites I Y-shaped without sclerotizations between arms, adanal discs circular. *Legs* : Apophyses on tibiae, tarsi IV ; tibiae IV with setae *kT*.

FEMALE. Length, including gnathosoma, 470 ; width, 173. *Proterosoma* similar to male ; *sce* : *sce*, 76 ; *sci* : *sci*, 45. Setae *l 2*, cupules *im*, opisthonotal

gland openings approximate, with gland between mentioned structures ; level of setae *d 3* posterior to *d 4*, inserted on coarsely sclerotized tegument ; spermpore subterminal : pretarsi IV extending to level of supralan concavity.

Type data : From *Pionites leucogaster* (Kühl) (= *Caica leucogastra*) : Guyana, Brazil, 4 ♂♂, 3 ♀♀ co-types on slide no. 34 E 15 in the TROUESSART Collection.

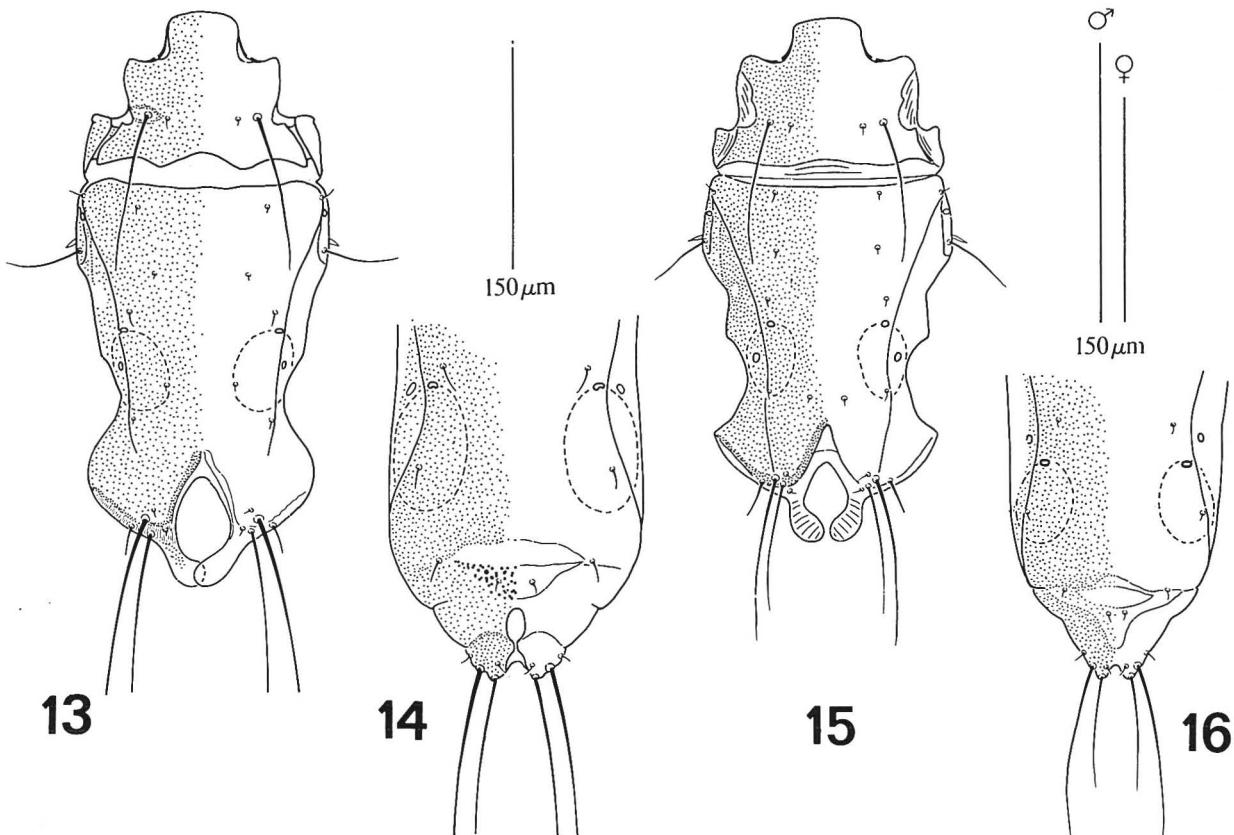
Additional material. From *Pionites l. leucogaster* : 16 ♂♂, 9 ♀♀, Ilha de Taiuna, near Cametá, Pará, Brazil, November 4, 1931, A. M. OLALLA (AMNH 430345, UGA 10882) ; 1 ♂, 1 ♀, Igarapé Açu, Pará, Brazil, April 1904, A. ROBERT (AMNH 475684, UGA 10883) ; 2 ♂♂, 1 ♀, Penarides, Pará, Brazil, July 24, 1879, J. B. STURE (AMNH 475687, UGA 10881). From *P. l. xanthomeria* (Sclater) : 3 ♂♂, 2 ♀♀, Loreto, Peru, October 28, 1926, OLALLA & Sons (AMNH 230957, UGA 10886). From *P. l. xanthurus* Todd : 2 ♂♂, 1 ♀, Tefé, Amazonas, Brazil, April 1906, W. HOFFMANNS (AMNH 475689, UGA 10887).

Remarks. Study specimens of females display considerable variation in the amount of sclerotization posterior to setae *d 4*. The two extremes are specimens with distinct, heavy punctations as in Fig. 14, and specimens with apparently unsclerotized tegument between setae *d 4* and two small shields lateral to the terminal cleft. Intermediate conditions are represented in this new species and related species in the *forficiventris* complex.

The redescriptions are based on specimens from Ilha de Taiuna collection.

Rhytidelasma mesomexicana, new species
(Figs. 15, 16)

The new species represents the sixth morphotype and sixth species complex of New World *Rhytidelasma*. The relationships among the complexes have not been determined because the Old World taxa have not been studied in detail. It is possible that the *mesomexicana* complex will be more closely related to Indo-Australian taxa than to New World *Rhytidelasma*.



FIGS. 13-14 : *Rhytidelasma forficiventris* (Trouessart).

13. — Male, dorsal idiosoma ; 14. — Female, dorsal opisthosoma. Left scale.

FIGS. 15-16 : *Rhytidelasma mesomexicana* n. sp.

15. — Male, dorsal idiosoma ; 16. — Female, dorsal opisthosoma. Right scale.

MALE (holotype). Length, including gnathosoma, 347; width, 154. *Prodorsum* : Shield without anterolateral projections; without ornamentation; setae *sci* nearer to *sce* than to meson; *sce* : *sce*, 61; *sci* : *sci*, 41. *Hysterosoma* : Shield without transverse ridges; cupules *ia* on humeral shields; setae *d* 2, *l* 2 in quadrate arrangement; opisthonotal gland nearer to setae *l* 2 than cupules *im*; setae *d* 3, *l* 3 at about same levels; setae *d* 4 approximate to setae *l* 5; *d* 1 : *d* 1, 71; *d* 2 : *d* 2, 65; *d* 3 : *d* 3, 20; terminus expanded laterally, 110 in width; supralan concavity not pronounced; posterior lobes with dorsal ridges; posterior membranes lateral to setae *d* 4, narrow; setae *pai* approximate to setae *d* 5. *Venter* : Epimerites I V-shaped without sclerotizations bet-

ween arms, adanal discs circular. *Legs* : Apophyses on tibiae, tarsi IV; tibiae IV with setae *kT*.

FEMALE. Length, including gnathosoma, 493; width, 193. *Proterosoma* similar to male; *sce* : *sce*, 76; *sci* : *sci*, 52; setae *l* 2, cupules *im*, opisthonotal gland openings distant, approximately equidistant; level of setae *d* 3 posterior to *d* 4, inserted on weakly sclerotized tegument; spermpore subterminal : pretarsi IV extending to level of terminal setae.

Type data : From *Aratinga h. holochlora* (Sclater). ♂ holotype, 27 ♂♂, 29 ♀♀ paratypes, Ciudad Mante, Tamaulipas, Mexico, April 8, 1986, L. MENCHACA (TMP 67); 4 ♂♂, 5 ♀♀ paratypes, same data as holotype except collected October 17, 1985,

A. MENCHACA (TMP 69); 9 ♂♂, 7 ♀♀ paratypes, same data as holotype except collected November 5, 1986, L. MENCHACA (TMP 74). The holotype and paratypes are deposited US National Museum of Natural History, other paratypes in the American Museum of Natural History, Field Museum, Leningrad Academy of Science, TROUESSART Collection, and the institutions of the authors.

Additional material. From type host subspecies : 8 ♂♂, 11 ♀♀, states of Tamaulipas, Chiapas, Mexico. From *A. h. rubritorquis* (Slater) : 1 ♂, 1 ♀, Honduras.

Etymology. The specific epithet denotes the distribution of the host, basically through the middle of Mexico as opposed to the coastal distributions of the related *Aratinga* species.

HOST-PARASITE ASSOCIATIONS

WOLTERS (1975) arranged the world parrot fauna in a number of families with many subfamilies. All New World parrots are assigned to the Psittacidae, subfamily Psittacinae (Table 1). FACCINI and ATYEAO (1986) have shown that there is a general congruence between genera within host subfamilies and genera or species groups of *Aralichus* and some related taxa. In their analysis, only the *Aralichus attenuatus* (Favette and Trouessart) complex are associated with the Amazoninae [except *Touit* (Gray) and *Deroptyus* Wagler], furthermore, the *attenuatus* complex is restricted to these birds.

In the current study, the *Rhytidelasma* species group associated with *Deroptyus* is shared with taxa of the Aratinginae, and *Rhytidelasma* has not been collected from *Touit*. Of the remaining amazonine genera, *Pionopsitta* Bonaparte, *Gyropsitta* Bonaparte and *Haplopsittaca* Ridgway have *Rhytidelasma* associates shared with genera of the Aratinginae, while *Graydidascalus* Bonaparte, *Pionus* Wagler and *Amazona* Lesson share a species group with *Forpus* Boie. The general congruence of the *Aralichus attenuatus* complex with the Amazoninae is not demonstrated with *Rhytidelasma* as the species groups associated with the Amazoninae are shared with genera of other higher group parrot taxa.

Again, to facilitate future work, the described

TABLE 1. Host-parasite associations of *Rhytidelasma* species with New World parrots (as arranged by Wolters 1975). Columns 1—6 refer to male morphotypes of *Rhytidelasma* as represented by named species. Column 1 - *dilatata*, 2 - *tritiventris*, 3 - *ulocerca*, 4 - *mesomexicana*, n. sp., 5 - *forficiventris*, 6 - *tenuis*. The host species column has two numbers separated by a (/); the first is the number of host species with *Rhytidelasma* in our collections, the second number is the number of species within the named avian genus.

Host Taxa	spp	1	2	3	4	5	6
ARATINGINAE							
<i>Anodorhynchus</i>	1/3	—	—	?	+	—	—
<i>Cyanopsittaca</i>	0/1						
<i>Ara</i>	10/15	+	+	+	+	—	—
<i>Aratinga</i>	15/19	+	+	+	+	—	—
<i>Nandyus</i>	1/1	—	—	+	+	—	—
<i>Leptosittaca</i>	1/1	—	—	+*	—	—	—
<i>Ognorhynchus</i>	1/1	—	—	?	—	—	—
<i>Rhynchopsitta</i>	0/1						
<i>Conuropsis</i>	1/1	—	—	?	+	—	—
<i>Cyanoliseus</i>	0/1						
<i>Pyrrhura</i>	11/18	+	—	—	—	—	—
<i>Enicognathus</i>	0/2						
<i>Myiopsitta</i>	0/1						
FORPINAE							
<i>Bolborhynchus</i>	0/5						
<i>Forpus</i>	4/7	—	—	—	—	—	+
BROTODERYGINAE							
<i>Brotogeris</i>	0/7						
<i>Nannopsittaca</i>	0/1						
PIONITINAE							
<i>Pionites</i>	1/2	—	—	—	?	—	—
AMAZONINAE							
<i>Touit</i>	0/7						
<i>Pionopsitta</i>	3/6	—	—	+	—	+	—
<i>Gyropsitta</i>	1/1	—	—	+	—	—	—
<i>Haplopsittaca</i>	2/2	—	—	+	—	—	—
<i>Graydidascalus</i>	1/1	—	—	—	—	—	+
<i>Pionus</i>	6/8	—	—	—	—	—	+
<i>Amazona</i>	15/27	—	—	—	—	—	+
<i>Deroptyus</i>	1/1	+	—	—	—	—	—
TRICLARIINAE							
<i>Triclaria</i>	0/1						

* Represents a possible intermediate morphotype between *tritiventris* and *ulocerca*.

Rhytidelasma species, other than the New World taxa (re)described in this publication, are listed according to the geographical distributions of their hosts. Previous reassessments were by GAUD (1966, 1980), ATYEAO (1985), and PÉREZ and ATYEAO (1984).

AFRICA

R. allochaeta Gaud 1980 from *Agapornis swinderniana* (Kühl).

R. euryicerca Gaud from 4 *Poicephalus* spp.

- R. grammophylla* (Gaud and Mouchet) from *Psittacus erithacus* L.
R. lambda (Trouessart) (= *Pseudallopites lambda*) n. comb., from *Coracopsis vasa comorensis* (Peters) (= *C. comorensis*).
R. zebra Gaud from 3 species of *Agapornis*.

INDO-AUSTRALIA

- R. cultriventris* (Trouessart) from *Glossopsitta concinna* (Shaw).
R. delibativentris (Trouessart) from *Lorius domicelus* (L.).
R. discifera (Trouessart) from *Lorius domicellus* (L.).
R. emarginiventris (Trouessart) from *Vini peruviana* (Müller) (= *Coryphilus taitianus*).
R. lobigera (Trouessart) from *Lorius domicellus* (L.).
R. securiventris (Trouessart) from *Vini peruviana*.
R. spathuligera (Trouessart) from *Calyptorhynchus magnificus macrorhynchus* Gould.
R. stenura Gaud from *Geoffroyus heteroclitus hyacinthinus* Mayr.

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