A NEW GENUS AND TWO NEW SPECIES OF ARBOREAL
OPPIIDAE (Acari: Cryptostigmata) FROM NEW ZEALAND

By A. V. Spain

AGRICULTURAL ZOOLOGY DEPARTMENT, LINCOLN COLLEGE,
CANTERBURY, NEW ZEALAND

Abstract: A new genus is erected on the basis of 2 new species of Oppiidae, Tuparezetes christineae and Tuparezetes philodendrus. These mites were collected from the foliage of 2 different indigenous plant species in New Zealand. Both species appear to be well adapted for an arboreal existence in that they possess a deep wax layer on the notogaster and prodorsum. Some trophic and humidity relationships are considered briefly.

The specimens on which this work is based were collected from the foliage of living plants. Both species appear to be well adapted for an arboreal existence and are here described as new.

Superfamily OPPIOIDEA Balogh, 1961

Family OPPIIIDAE Grandjean, 1954

The relationships of the new species described below appear to place them closest to the family Oppiidae Grandjean, 1954. However, they are not members of the Oppiidae sensu stricto as they possess tridactylous instead of monodactylous tarsi and 6 genital setae instead of the maximum of 5 given by Grandjean (1954). The notogastral chaetotaxy of the new species is similar to that of the Oppiidae except that the setae te, ti, ms, r3 and r2 are, within this family, never developed to the same extent as in the species described below. The prodorsum of the new species is unique in its possession of large paired prodorsal spines and well developed setae l and il.

It is considered that the peculiarity of these species may warrant the erection of a new familial category when related species have been studied.

Genus Tuparezetes Spain, new genus

Cryptostigmata with long tactile solenidion (φ1) on a prominent projection. Tarsal claws with median thickest. Prodorsum with weakly developed ridges and a large pair of posteriorly directed spines inserted laterad of bases of setae l. Sensilli spheroidal, on a narrow stalk. Bothridia prominent. Setae l and il long, barbed all around. Exobothridial setae minute or absent. Notogaster and posterior part of prodorsum covered with a deep, white, wax layer. Notogastral setae te, ti, ms, r3 and r2 long, thick, barbed all around. Three notogastral fissures (im, ips and ih) present. Venter normal, with weakly developed coxisternal ridges, coxisternal setal formula
Fig. 1. *Tuparezetes christineae* n. sp.: a, dorsum; b, venter.

(3-2-0-2). Setae of genito-anal region and coxisternal rows a and b fine, smooth, tapering. Six pairs of genital setae. Setae *Ad₁* and *Ad₂* inserted posterior to anal aperture. Pedotecta I and II toothed.

Type species: *Tuparezetes christineae* n. sp.

The genus is named for the “host” plant of the type-species (*Olearia colensoi* Hook. f.) whose maori name is *tupare*.

*Tuparezetes christineae* Spain, new species

**Prodorsum**: Rostrum rounded, setae *ro* smooth to finely barbed at tips, inserted on slight prominences in a dorsolateral position; nearly 2× as long as mutual distance of their bases, curving broadly forward of rostrum by approximately 1/3 their length.

Prodorsal ridges present; indistinct and interrupted in parts, visible lateral to bases of setae *il*. Anteriorly interrupted for a short distance and reappearing as mesially curving ridges extending to bases of small, forward projecting cusps, these latter partially joined by a weak, medially interrupted ridge. A large pair of sharp, posteriorly directed spines on prodorsum (fig. 1a, 2a). In dorsal view, bases of spines inserted laterad of bases of setae *l*. Points of spines directed posteriorly over mesially curving portions of prodorsal ridges, from which they are quite separate. Posterior portions of bases of spines forming small, mesially directed projections. Tutorium apparently absent. Setae *l* thick, long, heavily barbed all around (fig. 2c); in-
serted lateral to mid-dorsal line opposite approximate middle of pedotectum I. Setae il similar to l; inserted between bothridia. Posterior portion of lamellar region bordered by a mesially interrupted ridge which may be incurring extensions of posterior parts of prodorsal ridges. Bothridia prominent, directed obliquely forward (fig. 2b). Sensilli large, spherical with a narrow stalk (fig. 2b). Exobothridial setae absent or minute. Pedotecta I and II well developed.

Notogaster: Oval in shape, convex, somewhat truncate anteriorly. In life this and prodorsum are covered with a deep, white to whitish-gray wax which may extend as high as half way up the major notogastral setae il and ms. Nine pairs of notogastral setae. Setae ta finely barbed, situated on front corners of notogaster; directed obliquely forward at approximately 45° to mid-dorsal axis of body. Setae te, ti, ms, r1 and r2 similar in structure to il and l, directed vertically upwards; inserted as shown in fig. 1a (only bases of these setae are shown to avoid obscuring the figure). Setae r1 barbed, smaller than r2 and r3; curving horizontally mesad. Setae P1 and P2 smaller but similar in structure and curvature to r1. Three pairs of notogastral fissures noted, (im, ips and ih) positioned as shown in figures 1a and 1b. A row of irregularly-shaped, more lightly pigmented areas extends around notogaster immediately above level of setae r1, P1 and P2.

Infracapitulum: Diarthral, labio/genal articulation complete. Setae h, m and a broadly curved, tapering, finely barbed. Pedipalps 5-segmented, chaetotaxy as in fig. 3a; setal formula (0-2-1-3-9).

Ventral region of podosoma: Coxisternal ridges not well developed. Ridges I, II and sejugal present; III and IV absent. A weakly chitinized sternal ridge present joining ridges I, II and sejugal. Coxisternal setae fine, smooth, similar in length to genital setae. Coxisternal setal formula (3-2-0-2). Apodemata I and II moderate in length; III, IV and sejugal short and heavily chitinized (fig. 1b).

Genito-anal region: (fig. 1b). Anal aperture widest posteriorly. Anal plates bear 2 small, smooth setae (fig. 2f). Adanal setae similar in structure to analis; Ad1 located immediately behind anal aperture and just lateral to mid-ventral line, Ad2 located lateral to Ad1, Ad3 lateral to and inserted approximately half-way along anal aperture. Anal fissure (iad) runs parallel to edge of anal aperture, lateral to its anterior 1/2. One pair of aggenital setae inserted postero-lateral of genital aperture. Genital aperture narrowest posteriorly. Genital plates bear 6, small, smooth setae arranged as in fig. 2e; the positions of the most anterior appear to be slightly variable.

Legs: Long; order of increasing size is II, I, III, IV. All tarsi tridactylous; claws finely barbed dorsally under high (1750X) magnification, the median somewhat longer and 2× as thick as laterals (fig. 2d). The chaetotaxy of the 1st genu, tibia and tarsus shown in fig. 3b. Long tactile solenidion (φv) inserted on a conspicuous projection. The "touffe du premier tarse" of
Grandjean (1935) is raised on a small prominence and contains the famulus, 2 solenidia and seta \( tf \). Chaetotaxy of other legs not studied.

**Size**: Mean body length of 20 specimens from all localities was 407 \( \mu \), range 371 \( \mu \) to 451 \( \mu \). The mean body width of these specimens, at the widest part of the notogaster, was 214 \( \mu \), range 190 \( \mu \) to 232 \( \mu \).

The holotype is 425 \( \mu \) long, 220 \( \mu \) wide and 210 \( \mu \) deep.

The lengths, in microns, of the legs of 12 specimens from all localities are as follows:

<table>
<thead>
<tr>
<th>Leg</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>362</td>
<td>315 to 405</td>
</tr>
<tr>
<td>II</td>
<td>332</td>
<td>303 to 357</td>
</tr>
<tr>
<td>III</td>
<td>374</td>
<td>339 to 423</td>
</tr>
<tr>
<td>IV</td>
<td>459</td>
<td>435 to 514</td>
</tr>
</tbody>
</table>

The lengths, in microns, of the major dorsal setae of 12 specimens from all localities are as follows:

<table>
<thead>
<tr>
<th>Seta</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ro</td>
<td>103</td>
<td>92-116</td>
</tr>
<tr>
<td>il</td>
<td>132</td>
<td>122-158</td>
</tr>
<tr>
<td>te</td>
<td>127</td>
<td>103-146</td>
</tr>
<tr>
<td>ms</td>
<td>122</td>
<td>97-140</td>
</tr>
</tbody>
</table>

Holotype \( \Phi \), Mt Wharite, 29.X.1966, taken from foliage of *Olearia colensoi* Hook. f. at 1025 m, A. V. Spain.

Other records: Rangiwahia Ski Club Hut Area, Ruahine Ranges, 4.IV.1964, A. V. Spain. Blue Range, Tararua, Ranges, 23.II.1965, A. V. Spain. (Only damaged specimens were available from these localities.)

Ecology: The only host plant so far known for *Tuparezetes christineae* is *Olearia colensoi* Hook. f. This is a composite shrub that grows up to 3 meters high and forms dense stands in the subalpine areas of New Zealand. It is found below 38°S (Allan 1961) normally where the mean annual rainfall exceeds approximately 250 cm. *T. christineae* is undoubtedly a fungivore as masses of fungal hyphae and spores were noted in squash preparations of food boluses. One such preparation was sent to the Commonwealth Mycological Institute and the following identifications of the fungi present were made:

Conidia of *Clasterosporium* sp. or *Sporidesmium* sp.

Conidia of *Cladosporium* sp.

Groups of setae which may belong to *Colletotrichum* sp. Other fungi known from *Olearia colensoi* are *Uredo tupare* Cunningham, 1924. (Cunningham, 1931) and another tentatively identified as *Asterina* sp. (Holloway, *et al.* 1963). It may well be that either or both of these latter are also utilized by *Tuparezetes christineae*. During the course of this study the large orange uredospores of *Uredo tupare* were observed to be present on both the upper and lower leaf surfaces of the host plant and thus readily available for consumption by *T. christineae*. It is not known, however, whether they are utilized as they may be too large for the relatively small mouth parts of *christineae*.

*T. christineae* is normally found on the lower leaf surfaces of the host plant, on and amongst the deep, diffuse tomentum. This presumably provides it with a favorable level of humidity and mechanical protection. It appears to be adapted to an arboreal existence in that it possesses long legs and well developed claws, with which it can cling most tenaciously to the leaves. It also possesses, in life, a white waxy substance that covers the posterior part of the prodorsum and notogaster to some depth and this probably aids in water conservation. *Tuparezetes christineae* probably spends at least some of its nymphal stadia on the foliage as oppioid nymphs were noted to be present on the foliage. This mite is the only member of the Oppioidea present in this habitat thus it is considered that these nymphs are probably those of *T. christineae*. These facts, together with the absence of *christineae* from litter samples collected underneath stands of the host plant, suggest that this mite is truly arboreal in its habits.

*Tuparezetes philodendrus* Spain, new species

Prodorsum: Rostrum rounded, setae ro smooth to finely barbed at the tips; inserted on slight prominences in a dorsolateral position. Slightly longer than mutual distance of bases, curving broadly forward of the rostrum by nearly 1/2 their length.

Prodorsal ridges indistinct; represented by small ridges contiguous with and anterolateral of setae ii. A conspicuous pair of spines inserted immediately laterad of bases of setae i; spines conical, sharply pointed, directed obliquely rearward at approximately 45° to longitudinal axis of body, bases round. Tutorium apparently absent.

Setae i thick, long, barbed all round; inserted on slight prominences just laterad of mid-dorsal
Fig. 4. *Tuparezetes philodendrus* n. sp.: a, dorsum; b, venter.

line opposite anterior part of Pedotectum I. Setae *il* similar to *l*; inserted mesad of bothridia on large rounded prominences which have small areas of chitinisation anterolaterally. Setae *ex* minute; inserted immediately laterad of bothridia, obscured by latter when viewed in dorsal aspect. Bothridia prominent, directed obliquely forward. Sensilli prominent, spheroidal with a narrow stalk. Pedotecta I and II well developed, toothed.

**Notogaster:** Convex, generally oval in dorsal aspect but broader posteriorly and somewhat truncate both anteriorly and posteriorly. In life notogaster and posterior part of prodorsum covered with a deep, white, diffuse, wax layer.

Nine pairs of notogastral setae present, inserted as shown in fig. 4a (only setal bases are shown to avoid obscuring the figure). Setae *ta* moderately short, finely barbed unilaterally. Setae *te*, *ti*, *ms*, *r₁* and *r₂* similar in structure to setae *l* and *il*, directed vertically upward. Setae *r₁*, *P₁* and *P₂* small, barbed all round, curving broadly rearward and meso-ventrad, inserted at approximately equal distances from each other.

Three pairs of notogastral fissures noted (*im*, *ips* and *ih*) positioned as in fig. 4a and 4b. In cleared specimens a line of irregularly-shaped lighter areas extends laterally around sides of notogaster between levels of setae *te* to *r₂* and setae *r₁* to *P₂* extending from opposite setae *P₁* to opposite setae *ti*.

**Infracapitulum:** Diarthral, labio/genal articulation complete. Setae *h*, *m*, *a* fine, smooth, tapering. Pedipalps 5-segmented, setal formula (0-2-1-3-9) chaetotaxy as for *Tuparezetes christineae*.

**Ventral region of podosoma:** Coxisternal ridges not well developed; ridges I, II and sejugal present, III and IV absent. A weakly chitinized sternal ridge present and joins coxisternal ridges. Coxisternal setae fine, smooth, tapering except for 1c which is finely barbed. Coxisternal setal formula (3-2-0-2). Apodemata I moderate in length, II and sejugal longer, III and IV short.
**Genito-anal region:** Anal aperture widest posterior. Anal plates (fig. 5a) bear 2 small smooth setae. Adanal setae small, smooth, tapering; \( Ad_1 \) located immediately behind anal aperture and lateral of mid ventral line, \( Ad_2 \) located anterolaterad of \( Ad_1 \) near edge of anal aperture, \( Ad_3 \) inserted immediately laterad of anal aperture approximately half way down its length. Anal fissure (\( iad \)) runs parallel to edge of anal aperture opposite its anterior half. Preanal organ small, truncate anteriorly, confined to anterior end of anal aperture. One pair of small, smooth, tapering aggenital setae inserted posterolaterad of genital aperture. Genital aperture broadest anteriorly. Genital plates bear 6 pairs of fine, smooth, tapering setae (fig. 5b).

**Ovipositor:** As in fig. 5c.

**Legs:** Legs long; order of increasing size is I, II, III, IV. All tarsi tridactylous, claws finely barbed dorsally, median somewhat thicker and slightly shorter than laterals. The long tactile solenidion (\( vO \)) is inserted on a conspicuous projection. Chaetotaxy not otherwise studied.

**Size:** Mean body length of 14 specimens was 430 \( \mu \), range 371 \( \mu \) to 451 \( \mu \). Mean body width, at widest part of notogaster, was 254 \( \mu \), range 235–275 \( \mu \).

The leg lengths, in microns, of 12 specimens are as follows:

<table>
<thead>
<tr>
<th>Leg</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leg I</td>
<td>354</td>
<td>283–417</td>
</tr>
<tr>
<td>Leg II</td>
<td>356</td>
<td>295–413</td>
</tr>
<tr>
<td>Leg III</td>
<td>399</td>
<td>364–478</td>
</tr>
<tr>
<td>Leg IV</td>
<td>458</td>
<td>364–538</td>
</tr>
</tbody>
</table>

The lengths, in microns, of the major dorsal setae of 12 specimens are as follows:

<table>
<thead>
<tr>
<th>Seta</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ro )</td>
<td>91</td>
<td>73-107</td>
</tr>
<tr>
<td>( il )</td>
<td>197</td>
<td>190-206</td>
</tr>
<tr>
<td>( ti )</td>
<td>219</td>
<td>190-246</td>
</tr>
<tr>
<td>( ts )</td>
<td>193</td>
<td>174-206</td>
</tr>
</tbody>
</table>


**Ecology:** Little is known of the ecology of this species. It is similar to *Tuparezetes christineae* in its possession of a deep wax layer and long legs and appears to be well adapted for an arboreal existence. It may well have been feeding on the “sooty mould”
that grows profusely on *Nothofagus solandri* as a consequence of its infestation with *Eriococcus fagicorticis* Maskell which produces copious honey dew. The trophic relationships of this species on *Olearia lacunosa* are unknown.

**Differences between *Tuparezetes christineae* and *T. philodendrus***: A comparison of the sizes of the 2 species of *Tuparezetes* described above shows that, although they are of fairly similar length, *philodendrus* is considerably broader than *christineae*. A further difference between the 2 species is that *philodendrus* is somewhat truncate posteriorly while *christineae* is not.

*Tuparezetes philodendrus* has longer setae *l*, *il*, *te*, *ii*, *ms*, *r*₃ and *r*₂ than *christineae* although setae *r*₁, *P₁* and *P₃* are finer in the latter species.

Another feature distinguishing the 2 species is the length of the median tarsal claw. That of *christineae* is longer, and that of *philodendrus* shorter, than the 2 laterals.

The most obvious difference between the 2 species is in the form of the prodorsal spines and associated structures. From a lateral aspect it can be seen that the prodorsal spines of *christineae* are longer than those of *philodendrus* and extend posteriorly almost as far as the bases of setae *il*. They are also curved and more closely appressed to the prodorsum. In comparison, the prodorsal spines of *philodendrus* are short, conical and directed obliquely rearward. From a dorsal aspect, the bases of the prodorsal spines of *christineae* can be seen to be produced mesad and are somewhat elongate while those of *philodendrus* are round.

Beneath the free, rearwardly directed part of the spine a transverse ridge can be seen in *christineae*. This structure is absent in *philodendrus*.

**Acknowledgments**: I should like to acknowledge the help of the following persons: Dr R. A. Harrison of Lincoln College, New Zealand, for his supervision of this work part of which was carried out as part of the requirement for a M. Agr. Sc. degree. Dr M. Luxton of the Soil Bureau, D.S.I.R., Taita, New Zealand, for considerable help and guidance during the preparation of this paper. Dr G. W. Ramsay of Entomology Division, D. S. I. R., Nelson, New Zealand, for making specimens available for study. Dr P. Wardle of Botany Division, D. S. I. R., Lincoln, New Zealand, Mr P. Lewis of Napier, New Zealand, and Mr J. C. McIlroy of Lincoln College, New Zealand, for collecting leaf samples from which specimens were taken. Dr G. C. Ainsworth, Director of the Commonwealth Mycological Institute, Kew, England for arranging identification of the fungi present in the food boluses of *Tuparezetes christineae*. My wife, Christine, for whom the type species of the genus is named, for help with preparation of the diagrams.

**REFERENCES**


