



HAL
open science

Checklist of ptyctimous mites (Acari, Oribatida) of New Zealand with descriptions of three new species

W. Niedbala, S.G. Ermilov

► To cite this version:

W. Niedbala, S.G. Ermilov. Checklist of ptyctimous mites (Acari, Oribatida) of New Zealand with descriptions of three new species. *Acarologia*, 2016, 56 (2), pp.203 - 211. 10.1051/acarologia/20162239 . hal-01547042

HAL Id: hal-01547042

<https://hal.science/hal-01547042>

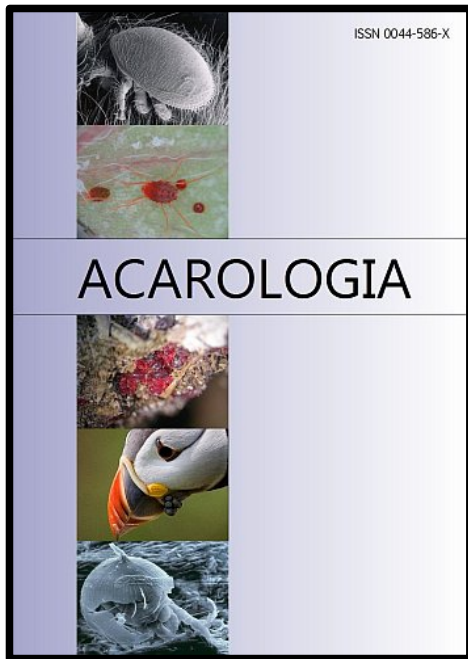
Submitted on 26 Jun 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License



ACAROLOGIA

A quarterly journal of acarology, since 1959
Publishing on all aspects of the Acari

All information:



<http://www1.montpellier.inra.fr/CBGP/acarologia/>
acarologia@supagro.inra.fr



**Acarologia is proudly non-profit,
with no page charges and free open access**

Please help us maintain this system by
encouraging your institutes to subscribe to the print version of the journal
and by sending us your high quality research on the Acari.

Subscriptions: Year 2017 (Volume 57): 380 €

<http://www1.montpellier.inra.fr/CBGP/acarologia/subscribe.php>

Previous volumes (2010-2015): 250 € / year (4 issues)

Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d'avenir » programme (Labex Agro: ANR-10-LABX-0001-01)



Acarologia is under **free license** and distributed under the terms of the Creative Commons-BY-NC-ND which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author and source are credited.

Checklist of ptyctimous mites (Acari, Oribatida) of New Zealand with descriptions of three new species

Wojciech NIEDBAŁA¹ and Sergey G. ERMILOV^{2*}

(Received 30 October 2015; accepted 22 January 2016; published online 19 May 2016)

¹ Department of Animal Taxonomy and Ecology, Faculty of Biology, Adam Mickiewicz University, Poznań, Poland; wojciech.niedbala@amu.edu.pl

² Tyumen State University, Tyumen, Russia; ermilovacari@yandex.ru (*Corresponding author)

ABSTRACT — An annotated checklist of ptyctimous mites of New Zealand is provided; it includes 74 species, 12 genera and four families. Two new species, *Austrophthiracarus parapulchellus* Niedbala **n. sp.** and *Notophthiracarus minorae* Niedbala **n. sp.**, are described from litter in *Pinus radiata* plantation of the North Island, and one new species, *Notophthiracarus otagoensis* Niedbala **n. sp.** is described from soil and debris under *Dracophyllum muscoides* cushions of the South Island.

KEYWORDS — mites; fauna; morphology; systematics; Australasian region

INTRODUCTION

This work is a part of a continuing study of the New Zealand oribatid mite fauna based on material collected by Dr. Maria A. Minor (Ermilov and Minor 2015 *a-d*, Ermilov *et al.* 2015), and includes data on ptyctimous mites. The goals of the paper are to present data on the taxonomic identification and specific localities of registered taxa, to provide checklist of known ptyctimous mites from New Zealand and to describe three new species: *Austrophthiracarus parapulchellus* Niedbala **n. sp.**, *Notophthiracarus minorae* Niedbala **n. sp.** and *N. otagoensis* Niedbala **n. sp.** Ptyctimous mites of New Zealand are little known (Niedbala 1993; 2000; 2006) even if more actively recently studied (e.g. Liu and Zhang 2013a, 1014a, 2015a); therefore this paper contributes to their faunistic and taxonomic knowledge.

MATERIALS AND METHODS

The mites were cleared in lactic acid and mounted to temporary cavity slides with glycerol for the duration of the study. Body measurements are presented in micrometers. Length of the body setae was measured in lateral aspect. Formulas for leg setation are given in parentheses according to the sequence trochanter-femur-genu-tibia-tarsus. Formulas for leg solenidia are given in square brackets according to the sequence genu-tibia-tarsus. The terminology follows Niedbala (2000). List of collecting sites in New Zealand:

NZ 1 – New Zealand, South Island, 45°3'41"S, 168°48'40"E, 1831 m a.s.l., Central Otago, The Remarkables, in the soil and debris under *Dracophyllum muscoides* cushion, 19.II.2014 (leg. M. Minor).

NZ 2 – New Zealand, North Island, Manawatu-Wananganui region, 39°45'37.218"S, 175°14'24.759"E, 288 m a.s.l., *Pinus radiata* plantation (pines 23 yrs

old), in litter, 29.I.2004 (leg. M. Minor).

NZ 3 – New Zealand, North Island, Manawatu-Wananganui region, 39°49'25.366 S, 175°00'01.502"E, 84 m a.s.l., *Pinus radiata* plantation (pines 15-18 yrs old), in litter, 31.I.2004, (leg. M. Minor).

NZ 4 – New Zealand, North Island, Manawatu-Wananganui region, 39°41'26.716 S, 175°01'56.045"E, 139 m a.s.l., *Pinus radiata* plantation (pines 20 yrs old), in litter, 31.I.2004 (leg. M. Minor).

RESULTS

Checklist of Ptyctimous mites of New Zealand

We herein registered eight species, seven genera and four families of ptyctimous mites collected by Dr. Maria A. Minor. These species are followed by "*" in the checklist of New Zealand ptyctimous mites presented. This fauna presently includes 74 species, 12 genera and four families.

Oribotritiidae

- *Indotritia (Zeaotritia) aotearoana* Ramsay, 1966
- *Oribotritia bilaminae* Liu and Zhang, 2013
- *Oribotritia brevis* Niedbała and Colloff, 1997
- *Oribotritia contortula* Niedbała, 1993*. Localities: NZ 3 (1 ex.), NZ 4 (4 ex.)
- *Oribotritia incognita* Niedbała, 2000
- *Oribotritia mangamuka* Liu and Zhang, 2013b
- *Oribotritia paraincognita* Niedbała, 2006
- *Oribotritia teretis* Niedbała, 1993
- *Sabacarus corneri* Ramsay and Sheals, 1969

Euphthiracaridae

- *Acrotritia vestita* (Berlese, 1913)*. Localities: NZ 2 (1 ex.), NZ 3 (1 ex.), NZ 4 (1 ex.)
- *Microtritia contraria* Niedbała, 1993
- *Microtritia fusa* Niedbała, 2000
- *Microtritia novazealandiensis* Niedbała, 2006. Localities: NZ 2 (8 ex.), NZ 3 (2 ex.)
- *Microtritia stria* Liu and Zhang, 2014a

Steganacaridae

- *Arphthiarius heterotrichus* Niedbała, 2000
- *Arphthiarius minimus* Liu and Zhang, 2015c
- *Atropacarus (Atropacarus) controversus* Niedbała, 2000
- *Atropacarus (Atropacarus) niedbalai* Liu and Zhang, 2013a

- *Austrophthiracarus aureus* Niedbała, 2000
- *Austrophthiracarus bah* Liu and Zhang, 2015a
- *Austrophthiracarus cronadun* Liu and Zhang, 2013d
- *Austrophthiracarus daimonios* Niedbała, 2000
- *Austrophthiracarus hiore* Liu and Zhang, 2014c
- *Austrophthiracarus karioi* Liu and Zhang, 2014d
- *Austrophthiracarus kirikiri* Liu and Zhang, 2015a
- *Austrophthiracarus matuku* Liu and Zhang, 2014d
- *Austrophthiracarus neotrichus* (Wallwork, 1966)
- *Austrophthiracarus notoporusus* Liu and Zhang, 2014d
- *Austrophthiracarus pulchellus* Niedbała, 1993
- *Austrophthiracarus tawhai* Liu and Zhang, 2013d
- *Austrophthiracarus parapulchellus* Niedbała **n. sp.*** Locality: NZ 2 (2 ex.)
- *Austrophthiracarus waitere* Liu and Zhang, 2015a
- *Hoplophthiracarus bisulcus* (Niedbała, 1993)*. Localities: NZ 2 (14 ex.), NZ 4 (3 ex.)
- *Hoplophthiracarus lividus* Niedbała, 2000
- *Plonaphacarus aitua* Liu and Zhang, 2015c
- *Plonaphacarus dikros* Niedbała, 2000
- *Plonaphacarus insolens* Niedbała, 2000

Phthiracaridae

- *Notophthiracarus aquilus* Niedbała, 2000
- *Notophthiracarus ater* Niedbała, 2000
- *Notophthiracarus atratus* Niedbała, 2000
- *Notophthiracarus australis* Ramsay, 1966
- *Notophthiracarus brachys* Niedbała, 2006
- *Notophthiracarus caliginosus* Niedbała, 1989
- *Notophthiracarus chatham* Liu et Zhang, 2015b
- *Notophthiracarus claviger* Niedbała, 1993
- *Notophthiracarus comatus* Niedbała, 2000
- *Notophthiracarus conspicuus* Niedbała, 1989
- *Notophthiracarus dugdalei* Liu and Zhang, 2013c
- *Notophthiracarus fecundus* Niedbała, 2000
- *Notophthiracarus incomparabilis* Niedbała, 2000
- *Notophthiracarus matatitipu* Liu and Zhang, 2013c
- *Notophthiracarus maurus* Niedbała, 2000
- *Notophthiracarus minorae* Niedbała **n. sp.*** Locality: NZ 2 (2 ex.)
- *Notophthiracarus motumuka* Liu and Zhang, 2014b
- *Notophthiracarus otagoensis* Niedbała **n. sp.*** Locality: NZ 1 (140 ex.)
- *Notophthiracarus paracapillatus* Niedbała, 2006
- *Notophthiracarus perlucundus* Niedbała, 2000

- *Notophthiracarus quietus* Niedbała, 1989
- *Notophthiracarus repostus* Niedbała, 1989
- *Notophthiracarus rimi* Liu and Zhang, 2014b
- *Notophthiracarus rotoitiensis* Niedbała, 2006
- *Notophthiracarus sensifus* Liu and Zhang, 2015b
- *Notophthiracarus sigifurcatus* Liu and Zhang, 2015b
- *Notophthiracarus tamaki* Liu and Zhang, 2014b
- *Notophthiracarus tripartitus* Niedbała, 1989
- *Notophthiracarus uncinulus* Niedbała, 2000
- *Notophthiracarus uncarinatus* Niedbała, 2000
- *Notophthiracarus whakau* Liu and Zhang, 2013c
- *Phthiracarus anonymus* Grandjean, 1933*. Locality: NZ 4 (8 ex.)
- *Phthiracarus banksi* Niedbała, 1987
- *Phthiracarus hikurangi* Liu and Zhang, 2013e
- *Phthiracarus inflatus* Niedbała, 1994
- *Phthiracarus longisensillus* Liu and Zhang, 2013e
- *Phthiracarus pellucidus* Ramsay, 1966

DESCRIPTIONS

Austrophthiracarus parapulchellus Niedbała n.sp. (Figure 1)

Measurement of holotype — Prodorsum: length 273, width 197, height 116. Setae of prodorsum: rostral 40, lamellar 13, sensilli 35. Notogaster: length 520, width 369, height 333. Setae of notogaster: c_1 88, $c_1/c_1-d_1=0.6$, c_3 45, h_1 and ps_1 91. Genitoaggenital plate 131×94 , anoanal plate 190×114 .

Integument — Colour light brown. Body surface densely punctated.

Prodorsum — With well discernible long sigillar fields. Lateral carinae and posterior furrows absent. Sensilli short, with narrow pedicel and globular, roughened head. Interlamellar and exobothridial setae vestigial, lamellar setae minute, rostral setae semierect, roughened.

Notogaster — With neotrichy of notogastral setae; 19 pairs of rigid, slightly recurved setae, covered with small spines in distal half. Setae c_3 about once shorter than other setae of row c . Additional setae, one in rows h and three in row ps . Setae c_1 and c_3 situated near anterior margin, setae c_2 far from margin. One of posterior setae of row ps (ps_3') situ-

ated above a row. Vestigial setae f_1 situated posterior of h_1 setae. Two pairs of lyrifissures ia and im present.

Ventral region — Setae h of mentum vestigial. Arrangement of genital setae: 9(4+5): 0. With neotrichy of adanal setae. Anoanal plate with 6 pairs of setae, 2 anal and 4 adanal. Two posterior adanal setae longer than anal setae, two anterior adanal setae shortest.

Chaetome of legs — Complete. Formulas of leg setation and solenidia: I (1-4-2-5-17) [2-1-3], II (1-3-2-3-12) [1-1-2], III (2-2-1-2-10) [1-1-0], IV (2-1-1-2-10) [0-1-0]. Setae d on femora I long, situated almost in the middle of article.

Material examined — Holotype and one paratype: New Zealand, North Island, Manawatu-Wananganui region, $39^\circ 45' 37.218''$ S, $175^\circ 14' 24.759''$ E, 288 m a.s.l., *Pinus radiata* plantation (pines ~ 23 yrs old), in litter, 29.I.2004 (leg. M. Minor).

Type deposition — The holotype (ethanol) is deposited in the New Zealand National Arthropod Collection, Auckland, New Zealand; paratype (ethanol) is deposited in the collection of the Department of Animal Taxonomy and Ecology, Adam Mickiewicz University, Poznań, Poland.

Etymology — The prefix *para* is Latin meaning "near" and refers to the similarity of new species with *Austrophthiracarus pulchellus* Niedbała, 1993.

Comparison — The new species is morphologically very similar to *Austrophthiracarus pulchellus* Niedbała, 1993 (see Niedbała 1993). It is distinguishable from the latter by setae c_3 shorter than other setae of row c (versus not shorter), presence of 19 pairs of notogastral setae (versus 18 pairs), vestigial setae of subcapitular mentum (versus well developed), presence of complete chaetome of femora I (versus absence of setae v'').

Notophthiracarus minorae Niedbała n. sp. (Figure 2)

Measurement of holotype — Prodorsum: length 363, width 247, height 141. Setae of prodorsum: rostral 106, lamellar 177, interlamellar 253, sensilli 50, exobothridial 51. Notogaster: length 717, width 505, height 515. Setae of notogaster: c_1 177, c_2 152, c_3 45,

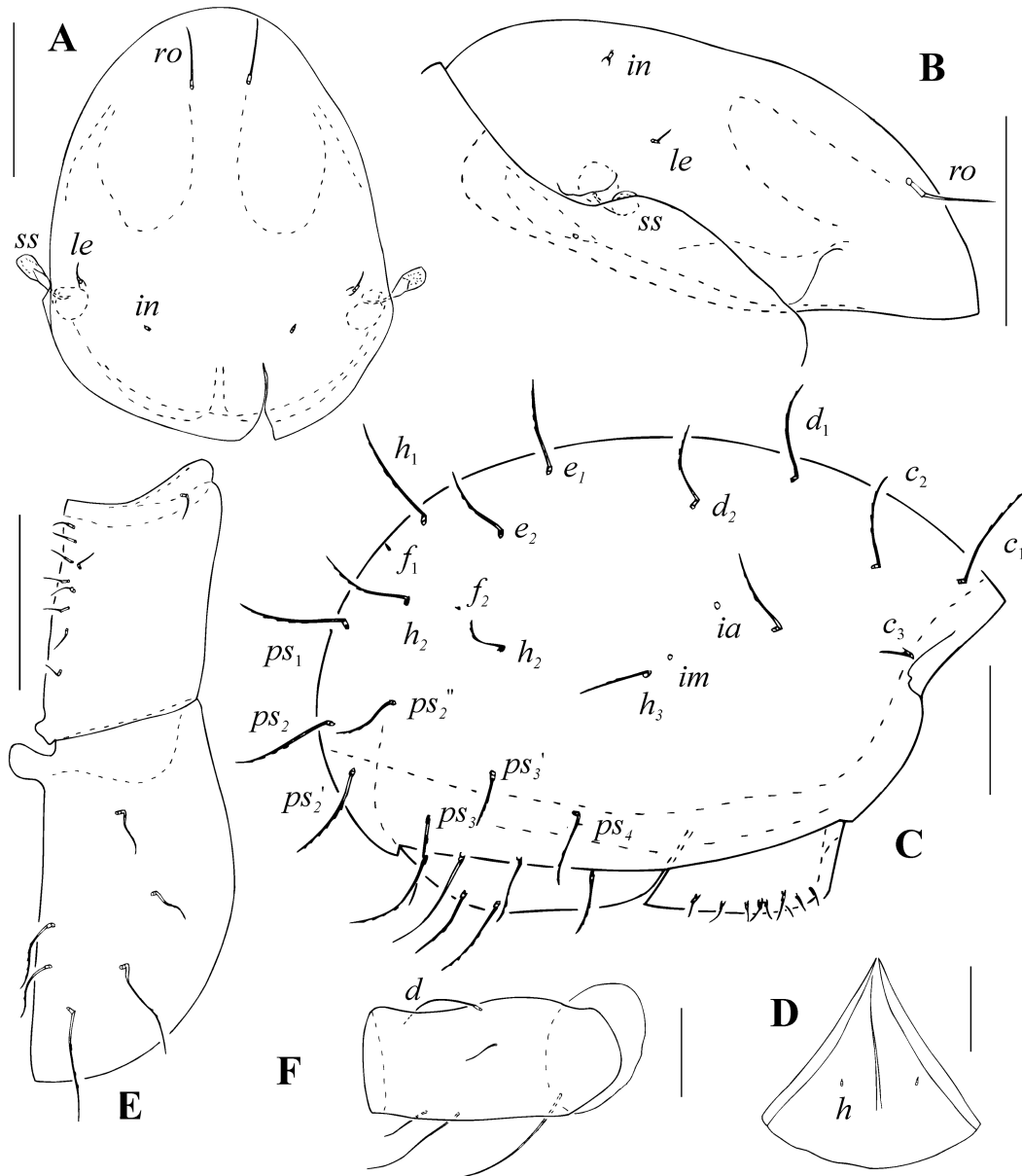


FIGURE 1: *Austrophthiracarus parapulchellus* Niedbała n. sp. (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left genitoaggenital and anoadanal plates; F – trochanter and femur of leg I. Scale bars (A-C, E) 100 μ m, scale bars (D, F) 50 μ m.

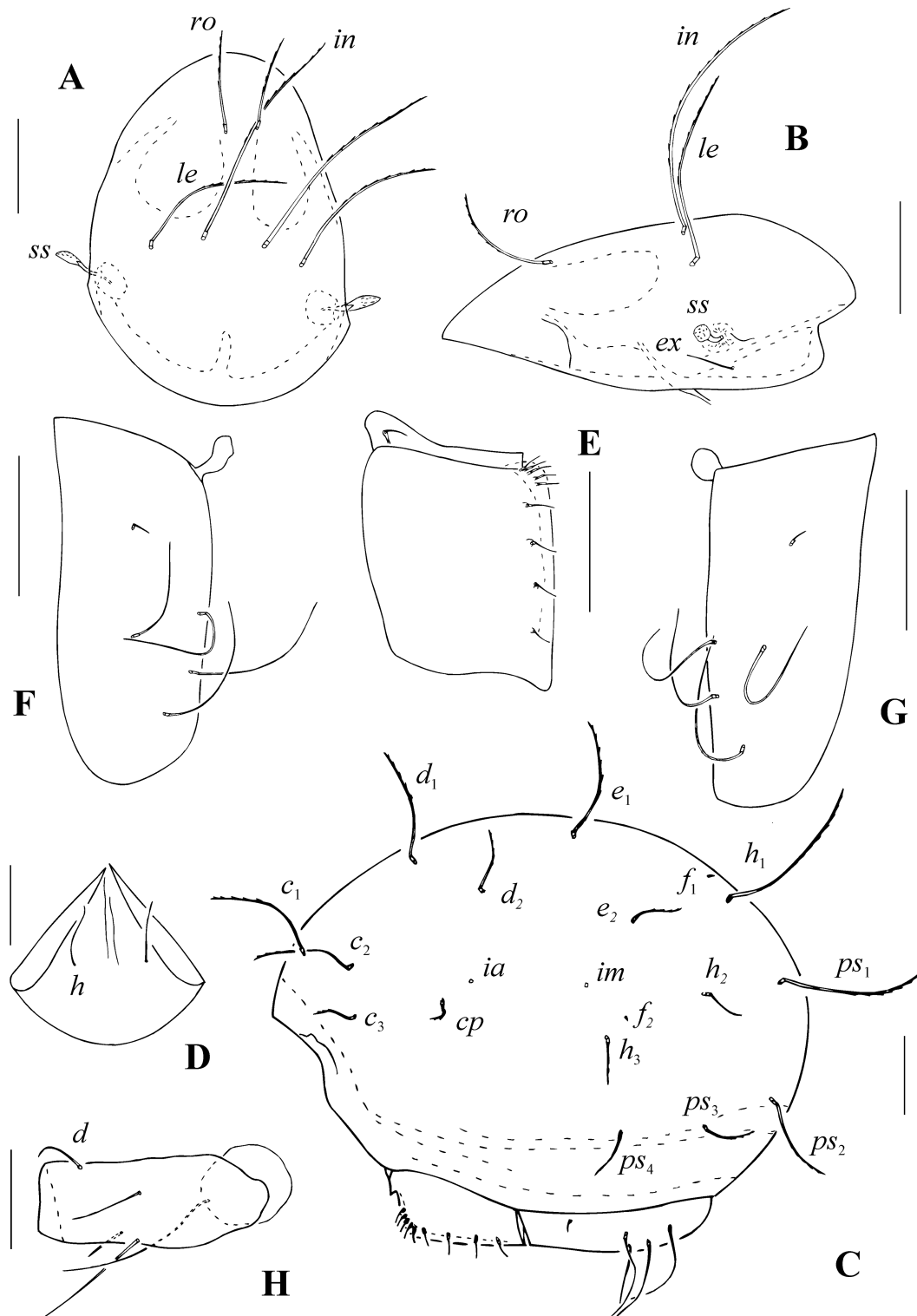


FIGURE 2: *Notophthiracarus minorae* Niedbala n. sp. (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – right genitoaggenital plate; F – right anoadanal plate; G – left anoadanal plate; H – trochanter and femur of leg I. Scale bar 100 μ m.

$c_1/c_1-d_1=0.9$, d_1 172, e_1 185, h_1 253, h_3 53, ps_1 215, ps_2 126, ps_3 71, ps_4 63. Genitoaggenital plate 172×146 , anoadanal plate 252×111 .

Measurements of paratype — Prodorsum: length 333, width 237, height 197. Notogaster: length 626, width 424, height 465.

Integument — Colour dark brown, almost black. Body surface punctated.

Prodorsum — With narrow sigillar fields well visible. Lateral carinae and posterior furrows absent. Sensilli short, with narrow pedicel and fusiform, rounded, roughened head. Interlamellar and lamellar setae very long, rigid, erect, bent backwards, tapering, covered with spines in distal half, similar to dorsal notogastral setae. Rostral setae similar in shape, but shorter, semierect; $in > le > ro > ex > ss$.

Notogaster — With 15 pairs of tapering setae, rigid covered with small spines in distal half, dorsal setae considerably longer (but c_1 slightly shorter than distance between c_1-d_1) than laterals. Setae c_1-c_3 remote from anterior margin, setae c_2 more than other. Vestigial setae f_1 situated anterior of setae h_1 . Lyrifissures ia and im present.

Ventral region — Setae h of mentum slightly shorter than distance between them ($h/h-h=0.8$). Genitoaggenital plates with 9 pairs of unusual long setae with formula: 4: 5. Anoadanal plates with 5 pairs of setae, long, filiform, smooth, except minute setae ad_3 .

Chaetome of legs — Complete. Formulas of leg setation and solenidia: I (1-4-2-5-17) [2-1-3], II (1-3-2-3-12) [1-1-2], III (2-2-1-2-10) [1-1-0], IV (2-1-1-2-10) [0-1-0]. Setae d on femora I long and remote from anterior margin.

Material examined — Holotype and one paratype: New Zealand, North Island, Manawatu-Wananganui region, $39^{\circ}45'37.218''S$, $175^{\circ}14'24.759''E$, 288 m a.s.l., *Pinus radiata* plantation (pines ~ 23 yrs old), in litter, 29.I.2004 (leg. M. Minor).

Type deposition — The holotype (ethanol) is deposited in the New Zealand National Arthropod Collection, Auckland, New Zealand; paratype (ethanol) is deposited in the collection of the De-

partment of Animal Taxonomy and Ecology, Adam Mickiewicz University, Poznań, Poland.

Etymology — The specific name is dedicated to the well-known soil zoologist and ecologist Dr. Maria A. Minor (Institute of Agriculture and Environment, Massey University, New Zealand).

Comparison — Three similar species are known from the Australasian Region, by the presence of long, similar in shape interlamellar and lamellar setae, very short, globular sensilli and setae ad_3 of anoadanal plates minute. The most similar is species *Notophthiracarus calugarae* Niedbała, 1987 from Victoria State of Australia (see Niedbała 1987) but it is distinguishable by the shape of rostral setae, very short, thick, rough, location of f_1 setae posterior of h_1 setae, setae h of mentum longer than distance between them, and incomplete chaetome of femora of legs I. Both other similar species originate from South Island of New Zealand. *Notophthiracarus ater* Niedbała, 2000 is distinguishable by the presence of vestigial exobothridial setae, vestigial setae f_1 situated posterior of h_1 setae, setae h of mentum longer than distance between them, and especially by longer ad_3 setae (almost half of length of anal setae). *Notophthiracarus fecundus* Niedbała, 2000 is distinguishable by the slightly shorter dorsal, notogastral setae, setae h of mentum longer than distance between them, and also by setae f_1 situated posterior of h_1 setae and especially by longer ad_3 setae (almost half the length of anal setae).

Notophthiracarus otagoensis Niedbała n. sp.
(Figure 3)

Measurement of holotype — Prodorsum: length 303, width 212, height 111. Setae of prodorsum: rostral 56, lamellar 28, interlamellar 177, sensilli 38, exobothridial 40. Notogaster: length 596, width 384, height 343. Setae of notogaster: c_1 152, $c_1/c_1-d_1=1.2$, d_1 and h_1 114, ps_1 104. Genitoaggenital plate 144×94 , anoadanal plate 253×104 . Length of ano-adanal setae: anal 76, ad_1 131, ad_2 111, ad_3 91.

Measurements of all paratypes — Prodorsum: length 252 – 325, height 101 – 121. Notogaster: length 465 – 687, height 303 – 454.

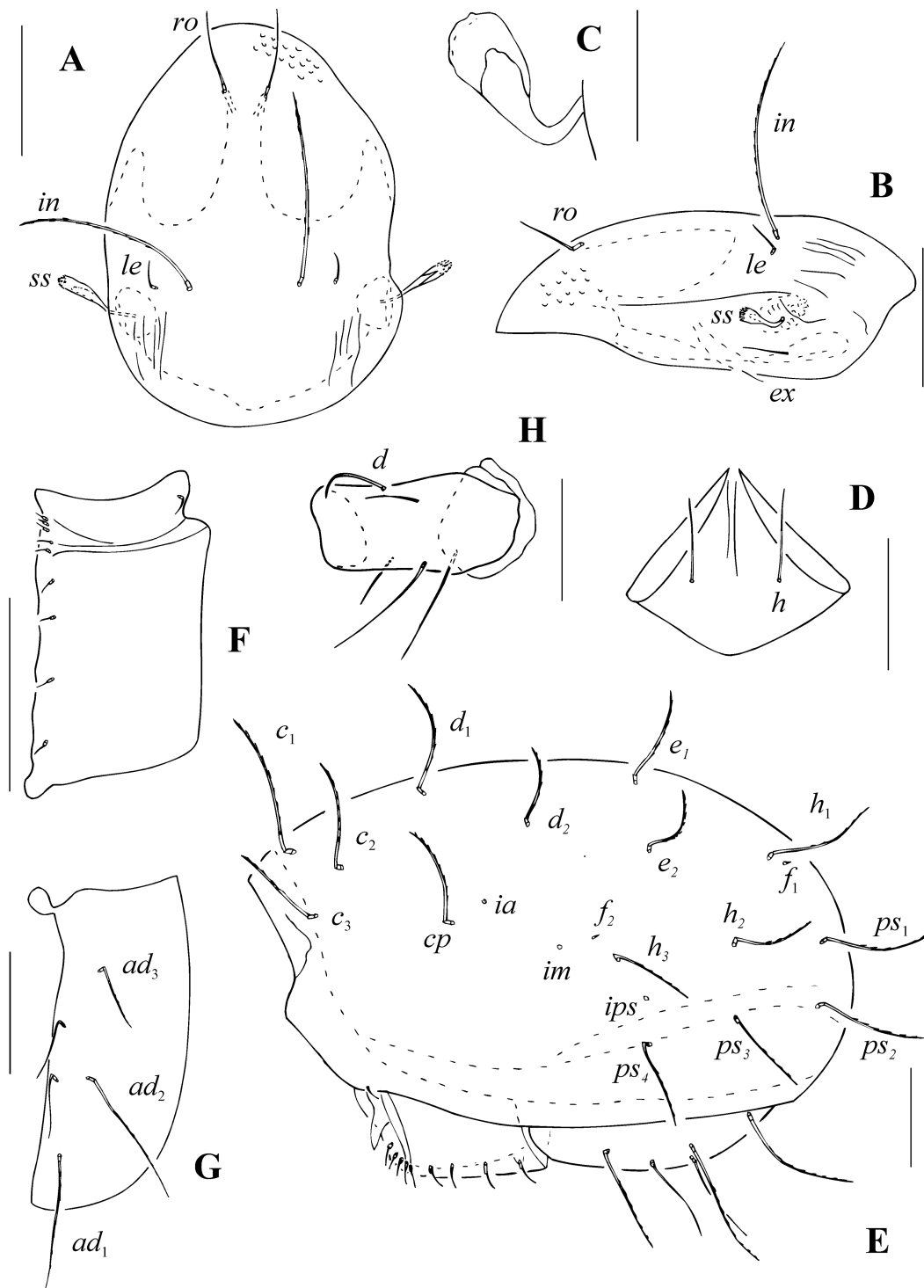


FIGURE 3: *Notophthiracarus otagoensis* Niedbała n. sp. (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – sensillus, lateral view; D – mentum of subcapitulum; E – opisthosoma, lateral view; F – left genitoaggenital plate; G – left anoanal plate; H – trochanter and femur of leg I. Scale bars (A, B, D-H) 100 μ m, scale bars (C) 25 μ m.

Integument — Colour brown. Microsculpture of integument punctuated, only anterior part of prodorsum slightly foveolate.

Prodorsum — With posterior furrows and sigillar fields feebly marked. Lateral carinae well marked. Sensilli short, more or less regular club-like with head covered with small spines. Interlamellar setae rigid, erect covered with small spines in whole length, similar to notogastral setae. Lamellar setae spiniform, smooth. Rostral setae longer, spiniform, rough. Exobothridial setae formed like a needle similar in length to sensilli; $in > ro > ex > ss > le$.

Notogaster — With 15 pairs of medium size, $c_1 > c_1-d_1$, but other setae shorter. Setae rigid covered with small spines in whole length. Setae c_3 situated close to anterior margin, setae c_1 slightly remote, setae c_2 far from anterior margin. Vestigial setae f_1 situated posteriorly of h_1 setae. Three pairs of lyrifissures (*ia*, *im* and *ips*) present.

Ventral region — Setae *h* of mentum longer than distance between them. Arrangement of genital setae 4: 5. Anoadanal plates with 5 pairs of flexible setae, adanal setae ciliated and longer than rough anal setae.

Chaetome of legs — Complete. Formulas of leg setation and solenidia: I (1-4-2-5-17) [2-1-3], II (1-3-2-3-12) [1-1-2], III (2-2-1-2-10) [1-1-0], IV (2-1-1-2-10) [0-1-0]. Setae *d* on femora I long, considerably remote from distal end of article.

Material examined — Holotype and 139 paratypes: New Zealand, South Island, 45°3'41"S, 168°48'40"E, 1831 m a.s.l., Central Otago, The Remarkables, in the soil and debris under *Dracophyllum muscoides* cushion, 19.II.2014 (leg. M. Minor).

Type deposition — The holotype (ethanol) and two paratypes are deposited in the New Zealand National Arthropod Collection, Auckland, New Zealand; 137 paratypes (ethanol) are deposited in the collection of the Department of Animal Taxonomy and Ecology, Adam Mickiewicz University, Poznań, Poland.

Etymology — The specific epithet refers to the Central Otago Region of South Island.

Comparison — The new species is characterized by the presence of long ad_3 setae of anoadanal plate, longer than anal setae. Some species from the Australasian region with these long setae have a long sensillus without a rounded head. The similar species are: *Notophthiracarus hammeni* Niedbala, 1987 from New South Wales (see Niedbala 1987), *N. abstemius* Niedbala and Colloff, 1997 (see Niedbala and Colloff 1997). *Notophthiracarus hammeni* has rigid and longer rostral setae, absence of lateral carinae of prodorsum and lyrifissures *ips* of notogaster. *Notophthiracarus abstemius* has adanal setae ad_3 slightly shorter than anal setae, setae *d* of femora I situated in proximal half of article, vestigial setae f_1 situated anterior of setae h_1 and lateral carinae of prodorsum and lyrifissures *ips* absent.

ACKNOWLEDGEMENTS


We are grateful to Dr. Maria A. Minor (Institute of Agriculture and Environment, Massey University, New Zealand) for collecting material, Colin Reece Cashmore, James Kitto, Roger Dickie NZ Ltd. for permission to sample on their land in the North Island, and the New Zealand Department of Conservation for sampling permit for Central Otago mountains, South Island (national authorization # 38116-GEO), and two anonymous reviewers for the valuable comments. The studies were supported by the Massey University Research Fund and by the Russian Science Foundation (project 14-14-01134 to Dr. A.A. Prokin).

REFERENCES

- Berlese A. 1913 — Acari nuovi. Manipulus 7-8 — Redia, 9: 77-111.
- Ermilov S.G., Minor M.A. 2015a — New Oppiidae (Acari, Oribatida) from New Zealand — Zootaxa, 4007(2): 181-194.
- Ermilov S.G., Minor M.A. 2015b — The genus *Scapheremaeus* (Acari, Oribatida, Cymbaeremaeidae) in the oribatid mite fauna of New Zealand, with description of two new species — ZooKeys, 508: 69-83.
- Ermilov S.G., Minor M.A. 2015c — The oribatid mite genus *Macrogena* (Acari, Oribatida, Ceratozetidae), with description of two new species from New Zealand — ZooKeys, 506: 13-26.

- Ermilov S.G., Minor M.A. 2015d — Two new species of *Neophysobates* (Acari, Oribatida, Tegoribatidae) from New Zealand — *Acarologia*, 55(3): 285-295.
- Ermilov S.G., Minor M.A., Behan-Pelletier V.M. 2015 — *Zealandozetes southensis* gen. nov., sp. nov. (Acari, Oribatida, Maudheimiidae) from alpine cushion plants in New Zealand — *Zootaxa*, 4027(1): 42-66.
- Grandjean F. 1933 — Structure de la région ventrale chez quelques Ptyctima (Oribates) — *Bulletin du Muséum*, 5(4): 309-315.
- Liu D., Zhang Z-Q. 2013a — *Atropacarus* (*Atropacarus*) *niedbalai* sp. nov., an extreme case of neotrichy in oribatid mites (Acari: Oribatida: Phthiracaridae) — *Internat. J. Acarol.*, 39(6): 507-512. doi:10.1080/01647954.2013.837960
- Liu D., Zhang Z-Q. 2013b — New Zealand species of *Oribotritia* (Acari: Oribatida: Oribotritiidae): descriptions of two new species and a key to eight species — *Syst. Appl. Acarol.*, 18(2): 153-162.
- Liu D., Zhang Z-Q. 2013c — The genus *Notophthiracarus* of New Zealand (Acari: Oribatida: Phthiracaridae): three new species and a key to 24 described species — *Zootaxa*, 3682(2): 392-400.
- Liu D., Zhang Z-Q. 2013(d) — Two new species of *Austrophthiracarus* (Acari: Oribatida: Phthiracaridae) from New Zealand — *Zootaxa*, 3682(2): 385-391.
- Liu D., Zhang Z-Q. 2013e — Two new species of the genus *Phrathicarus* from New Zealand (Acari: Oribatida: Phthiracaridae) — *Syst. Appl. Acarol.*, 18(3): 233-238. doi:10.11158/saa.18.3.5
- Liu D., Zhang Z-Q. 2014a — Redescription of *Austrotritia lebronnci* (Oribotritiidae) and descriptions of two new species of Euphthiracaridae (Acari, Oribatida) from Australian Region — *Internat. J. Acarol.*, 40(1): 43-51. doi:10.1080/01647954.2013.874497
- Liu D., Zhang Z-Q. 2014b — Three new species of the genus *Notophthiracarus* from New Zealand (Acari: Oribatida: Phthiracaridae) — *Syst. Appl. Acarol.*, 19(2): 189-196. doi:10.11158/saa.19.2.9
- Liu D., Zhang Z-Q. 2014c — Two new peculiar ptyctimous mites (Acari: Oribatida: Phthiracaridae) from the Australian region, with a key to 54 described species of *Notophthiracarus* Ramsay in Australia — *Austral Entomol.*, 53: 159-166. doi:10.1111/aen.12066
- Liu D., Zhang Z-Q. 2014d — Three new species of the genus *Austrophthiracarus* from New Zealand (Acari: Oribatida: Phthiracaridae) — *Zootaxa*, 3780(3): 585-593. doi:10.11646/zootaxa.3780.3.10
- Liu D., Zhang Z-Q. 2015a — New Zealand *Austrophthiracarus* (Acari: Oribatida: Phthiracaridae): three new species from North Island and offshore islands — *Syst. Appl. Acarol.*, 20(3): 263-272.
- Liu D., Zhang Z-Q. 2015b — Three new species of the genus *Notophthiracarus* (Acari: Oribatida: Phthiracaridae), with an updated key to its known species in New Zealand — *Internat. J. Acarol.*, 41(3): 232-240. doi:10.1080/01647954.2015.1017533
- Liu D., Zhang Z-Q. 2015c — Two new species of the family Phthiracaridae (Acari, Oribatida) from New Zealand, including keys to all species of *Plonaphacarus* and *Arphthacarus* of the Australian region — *Internat. J. Acarol.*, 41(7): 584-589. doi:10.1080/01647954.2015.1084045
- Niedbala W. 1987 — Phthiracaroida (Acari, Oribatida) nouveaux d'Australie — *Redia*, 70: 301-375.
- Niedbala W. 1989 — Phthiracaroida (Acari, Oribatida) nouveaux du royaume australien — *Ann. Zool.*, 43(2): 19-50.
- Niedbala W. 1993 — New species of Euptyctima (Acari, Oribatida) from New Zealand — *N. Z. J. Zool.*, 20: 137-159.
- Niedbala W. 1994 — Supplement to the classification of Phthiracaroida, with redescriptions and descriptions of some species (Acari, Oribatida, Euptyctima) — *Genus*, 5(1-2): 1-152.
- Niedbala W. 2000 — The ptyctimous mites fauna of the Oriental and Australian regions and their centres of origin (Acari: Oribatida) — *Genus*, supplement: 1-493.
- Niedbala W. 2006 — Supplement to the knowledge of ptyctimous mites (Acari: Oribatida) from Australian region — *Ann. Zool.*, 56(Supplement 1): 99-156.
- Niedbala W., Colloff M. 1997 — Euptyctime oribatid mites from Tasmanian rainforest (Acari: Oribatida) — *J. Nat. Hist.*, 31: 489-538. doi:10.1080/00222939700770261
- Ramsay G.W. 1966 — Three new box-mites (Acari: Oribatei: Phthiracaroida) from the Brothers, Cook Strait, New Zealand — *N. Z. J. Sci.*, 9(4): 901-912.
- Ramsay G.W., Sheals J.G. 1969 — Euphthiracaroid mites (Acari, Cryptostygmata) from North Borneo — *Bull. Br. Mus. Nat. Hist.*, 18(3): 93-115.
- Wallwork J.A. 1966 — More Oribatid mites (Acari: Cryptostygmata) from Campbell I — *Pacific Insects*, 8(4): 849-877.

COPYRIGHT

 Niedbala W. and Ermilov S.G. *Acarologia* is under free license. This open-access article is distributed under the terms of the Creative Commons-BY-NC-ND which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author and source are credited.