A new species of *Crotonia* from New Zealand  
(Acari: Oribatida: Crotoniidae)

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**Abstract.** The morphology of immature and adult stages of the new oribatid mite *Crotonia longisetosa* sp. n. from New Zealand is described. The new species is compared with the morphologically similar species *C. unguifera* Michael, 1908, *C. obtecta* (Pickard-Cambridge, 1875) and *C. flagellata* (Balogh et Csiszár, 1963). Unlike these species, *C. longisetosa* n. sp. possesses longer lateral notogastral setae and has smaller body dimensions. Immature stages of the new species are compared with juvenile stages of *C. pulcher* (Beck, 1962). The adult of *C. longisetosa* sp. n. possesses features of the “unguifera” group of *Crotonia*.

Key words: acarology, taxonomy, moss mites, *Crotonia longisetosa* n. sp., morphology, juvenile stages, “unguifera” group, New Zealand.

**Introduction**

The present paper is part of a study on the ontogeny of crotoniid species. Almost 50 species of the genera *Crotonia* and *Holonothrus* have been described so far. However, immature stages had been described for only 13 of them, often only a single stage for each species. Olszanowski (1997, 2000) started studies on immature stages with precise descriptions and drawings. All instars of *Crotonia pulcher* (Beck, 1962) were described and illustrated by Kutý (2005). The analysis of morphology and development of all stages will be useful in phylogenetic analyses, which are planned in the future.

In the Australian region the genus *Crotonia* is represented by 18 species. Most of them are endemic to New Zealand (Subias 2004). The first two species: *C. cophinaria* and *C. unguifera* were described by Michael (1908). Ramsay and Luxton (1967) redescribed *C. obtecta* (Pickard-Cambridge, 1875), which is the type species for the genus. In 1966 Hammer recorded two new species, *C. brachyrostrum* and *C. caudalis,*
and Wallwork described *C. brevicornuta* from Campbell Island. The last five species from New Zealand, *C. reticulata*, *C. cervicorna*, *C. cupulata*, *C. longibulbula* and *C. tuberculata*, were described by Luxton (1982). Three year later he synthesised the information on the ten species currently known from New Zealand.

This ample representation in the Australia/New Zealand region, a fossil of *Crotonia* species from the Caenozoic of Victoria and presence of two related genera: *Australonothrus* and *Holonothrus* prove that *Crotonia* has a Gondwanan origin (Hammer and Wallwork 1979).

**MATERIAL AND METHODS**

The description of *Crotonia longisetosa* sp. n. presented is based on material borrowed from Prof. Wojciech Niedbała (Department of Animal Taxonomy and Ecology, A. Mickiewicz University, Poznań, Poland) and the late Prof. J. Balogh (Eötvös Loránd University, Budapest, Hungary). All specimens of the new species are from 2 samples from New Zealand, and 4 specimens were found: 1 larva, 1 deutonymph and 2 adults.

The mites were preserved in 70% ethanol and cleared in lactic acid. The layer of debris covering specimens was removed with a small hook. During cleaning process legs of mites were damaged. Body measurements were measured in dorsal view from the tip of the rostrum to the end of notogastral plate, excluding posterior apophyses.

The holotype and paratype are stored in the collection of Department of Animal Taxonomy and Ecology, A. Mickiewicz University, Poznań, Poland.

The morphological terminology used in the descriptions follows that developed by F. Grandjean (see Trávé and Vachon (1975) for references).

List of localities.


*Crotonia longisetosa* n. sp.

**Diagnosis**

*Crotonia longisetosa* sp. n. can be distinguished from other species of the genus by very long setae *c*₃ and *c*₅, lack of setae *c*₄, relatively short setae *in*, long centro-lateral notogastral setae and *f*₁ and *h* similar to *d*₂.

**Description**

Larva (Figs. 1-2): Body length: 510 μm, body width: 310 μm; colour: whitish. Whole body thickly covered with dirt. Rostrum rounded. Two folds of thickened chitinous ridges running between bothridia in direction of lamellar apophyses. Surface with small knobs; small folds occurring posteriorly. Rostral setae (*ro*) straight, half as
long as the distance between their tubercles. Lamellar setae \((le, \text{length: } 80 \, \mu \text{m})\) barbed and curved, longer than the distance between tops of their apophyses, set on large apophyses. Setiform interlamellar setae \((in)\) as long as \(ro\), originating in alveolae. Small sensilli completely contained within bothridium. Notogastral surface with knobs and folds. Ten pairs of notogastral setae (setae \(c_\text{1}, d, \text{and } e_1 \text{absent, seta } f_1 \text{ present}). Setae \(c_1\)

1, 2. Crotonia longisetosa n. sp., larva: 1 – dorsal view, 2 – ventral view; scale bar: 100 \(\mu \text{m}\)
half as short as ro, smooth, originating in alveolae; setae $c_3$ (length: 200 μm) and the longest setae $d_3$ (length: 245 μm) barbed, set on apophyses. Setae $d_1$ (length: 28 μm) smooth, set on tubercles. Setae $e_2$ similar to $c_3$. Setae $f_2$ (length: 160 μm) and $f_1$ (length: 110 μm) barbed, set on apophyses. Setae $h_1$, 2/3 length of $le$, on apophyses; setae $h_2$, 2/3 length of $d_1$ and $h_3$ as long as ro, both originating in alveolae. Apophyses of setae $c_3$ and $d_1$ and apophyses of $e_2$ and $f_2$ nearby each other; apophyses of setae $f_1$ nearby $h_1$. Oval

3, 4. *Crotonia longisetosa* n. sp., deutonymph: 1 – dorsal view, 2 – ventral view; scale bar: 200 μm
openings of opisthosomal glands (*gla*) situated above seta $f_2$. Three pairs of epimeres separated. Epimera porose, with formula: 2-2-2 (one seta extra on II epimers). Lack of genital plates, anal and adanal setae. All legs monodactylous (setation not studied).

5-8. *Crotonia longisetosa* n. sp., adult, holotype: 5 – dorsal view (tritonymphal seta $f_2$ matched with a dashed line), 6 – ventral view, 7 – posterior notogastral setae, 8 – setae p of paratype; scale bar: 200 μm
Deutonymph (Figs. 3-4): Body length: 1100 μm, body width: 410 μm (specimen has collapsed during examination); colour: light brown. Whole body thickly covered with dirt and debris, particularly on the posterior part (hardly visible setae and apophyses). Prodorsum shape and surface similar to that of larva. Setae le (length: 120 μm) barbed, set on large apophyses. Setae in one and half longer than the distance between their bases. Sensilli well developed, completely contained within bothridium. Notogastral surface with folds and knobs, laterally running longitudinal ridges. Thirteen pairs of notogastral setae. Setae c₁ (length: 270 μm) smooth, on tubercles. Setae d₂ (length: 135 μm) smooth, on small apophyses. Setae c₃ (length: 290 μm), d₃ (length: 250 μm), e₂ (length: 270 μm) and f₂ (length: 340 μm) barbed, on apophyses. Setae f₁ similar to d₃. Setae h₂ 2/3 length of f₂, barbed, set on the biggest apophyses. Setae h₃ similar to h₂. Setae h₁ not visible. Setae p₁, almost as long as d₂, smooth, on apophyses; p₂ and p₃ half as long as p₁, on tubercles. Apophyses of setae c₁ and d₁ and apophyses of e₂ and f₂ nearby each other; apophyses of setae f₁ and h nearby, forming cluster. Oval openings of opisthosomal glands (gla) situated above seta f₂. Four pairs of epimeres separated. Epimera porose, with formula: 3-2-3-2. Four pairs of genital setae, 1 pair of aggenital setae, three pairs of adanal setae. Anal setae lacking. All legs monodactylous (setation not studied).

Adult (Figs. 5-8) (all measurements of female, holotype): Body length: 1220 μm, body width: 670 μm; colour: amber brown. Whole body thickly covered with dirt and debris, in posterior part with fragments of tritonymphal exuvium as well (setae hardly visible). Rostrum rounded. Two folds of thickened chitinous ridges running between bothridia in direction of lamellar apophyses. Surface smooth; rare small knobs occurring posteriorly. Setae le (length: 130 μm) barbed, set on large apophyses. Setae in (length: 300 μm) smooth, on small apophyses. Notogastral plate covered with knobs, demarcated laterally by longitudinal, plicate ridges. Thirteen pairs of notogastral setae. The longest setae c₁ (length: 420 μm) smooth, on apophyses. Setae d₂ (length: 85 μm) smooth, in alveolae. Setae c₃ (length: 355 μm), d₃ (length: 140 μm), e₂ (length: 110 μm) and f₂ (length: 100 μm) very delicately barbed, on tubercles. Setae f₁ and h as long or shorter than d₂, very delicately barbed, set on apophyses (the biggest apophyses of h₂). Setae p₁ (length: 50 μm) smooth, on small apophyses. Setae p₂ half as long as p₁, in alveolae; visible only apophyses of p₂. Apophyses of setae c₁ and d₁ and apophyses of e₂ and f₂ nearby each other; apophyses of setae f₁ and h forming cluster. Oval openings of opisthosomal glands (gla) situated above seta f₂. Epimera porose, with formula: 3(4)-2-3-3. Genital plate with 8 pairs of long setae; 2 pairs of aggenital setae. Three pairs of short anal and 3 pairs of adanal setae. All legs tridactylous (setation not studied).

REMARKS

The adult of the new species possesses all features of the “unguifera” group of Crotonia (Wallwork 1978):

1. posterior setae inserted on short, bulbous apophyses, paired (dorsal and ventral pair) and joined basally to the small, common stem of the ventral pair;
2. notogastral plate narrow, elongated and demarcated from lateral field by a plicate strip;
3. lamellar apophyses approximately as long as their mutual distance;
4. straight setae ro;
5. setae c₂ lacking;
6. long setae c₁ and c₃ set on apophyses;
7. three pairs of anal setae.

_Crotonia longisetosa_ sp. n. is similar to the New Zealand species _C. unguifera_ Michael, 1908 and _C. obtecta_ (Pickard-Cambridge, 1875) and the Argentinian species _C. flagellata_ (Balogh et Csiszar, 1963). These species have a caudal apophyseal cluster, 2 pairs of setae c and long setae c₁. However, unlike these known species, _C. longisetosa_ sp. n. possesses longer setae c₁, d₂, e₂ and f₂. Moreover, the new species is different from _C. unguifera_ by longer prodorsal setae (_C. unguifera_ possesses setae le slightly shorter than distance between tips of their apophyses and setae in reach only to tips of le apophyses). In addition it has smaller body dimensions (_C. unguifera_ body length: 1391 μm, body width: 706,2 μm; after Wallwork 1978).

Unfortunately, juvenile stages are not described for any of these three known species. However, the studied instars may be compared with described earlier juvenile stages of _C. pulcher_ (Beck, 1962). The comparison of selected characters is given in Table 1.

This new species was found in material from two localities: Croydon Bush, near Gore, South Island and Rotorua, North Island. These two localities are over 1200 km apart and characterised by very different habitat (Rotorua – a botanic garden; Croydon

Table 1. The comparison of selected characters of _Crotonia longisetosa_ sp. n. and _C. pulcher_ (Beck, 1962) immatures (after Kuty 2005 and present studies).

<table>
<thead>
<tr>
<th>Stage</th>
<th>Characters</th>
<th>Crotonia longisetosa sp. n.</th>
<th>C. pulcher (Beck, 1962)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larva</td>
<td>Body length</td>
<td>510 μm</td>
<td>395 μm</td>
</tr>
<tr>
<td></td>
<td>Body width</td>
<td>310 μm</td>
<td>150 μm</td>
</tr>
<tr>
<td></td>
<td>Number of notogastral setae</td>
<td>10 pairs</td>
<td>10 pairs</td>
</tr>
<tr>
<td></td>
<td>Epimeral setation</td>
<td>2-2-2</td>
<td>2-1-2</td>
</tr>
<tr>
<td></td>
<td>Openings of opisthosomal glands location</td>
<td>above to seta f₂</td>
<td>close to seta f₂</td>
</tr>
<tr>
<td>Deutonymph</td>
<td>Body length</td>
<td>1100 μm</td>
<td>585 μm</td>
</tr>
<tr>
<td></td>
<td>Body width</td>
<td>410 μm</td>
<td>315 μm</td>
</tr>
<tr>
<td></td>
<td>Number of notogastral setae</td>
<td>13 pairs</td>
<td>13 pairs</td>
</tr>
<tr>
<td></td>
<td>Genital setae</td>
<td>4 pairs</td>
<td>4-6 pairs</td>
</tr>
<tr>
<td></td>
<td>Epimeral setation</td>
<td>3-2-3-2</td>
<td>3-1-1-3</td>
</tr>
<tr>
<td></td>
<td>Openings of opisthosomal glands location</td>
<td>above to seta f₂</td>
<td>close to seta f₂</td>
</tr>
</tbody>
</table>
Bush – a dense rainforest). The author supposes that South Island locality is native and new species was introduced to the North Island, probably during transporting plants with soil.

REFERENCES


