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NEW MITES OF THE FAMILY CROTONIIDAE
(ACARI : CRYPTOSTIGMATA)
FROM NORTHERN QUEENSLAND

BY Malcolm LUXTON

TAXONOMY
ORIBATIDA AUSTRALIA

ABSTRACT: Three new species of Crotonia (C. capistrata, C. ardala and C. borbora) are described from North Queensland rainforest. They differ from the previously described forms of the genus in possessing a full complement of c setae on the notogaster.

Crotonia is confined to the southern hemisphere from which 16 species have been adequately characterized. One contemporary species (C. jethurberea Lee, 1985) and one fossil species (C. ramosus (Womersley, 1957)) have been described from Australia. Ramsay and Luxton (1967) defined the genus, and the Queensland specimens fully accord with this. However, the species differ in one important respect, namely that all three of the c setae are present on the notogaster. In the previously described species (including those from Australia) setae c2 are always deficient. Furthermore, in one of the new species (C. capistrata) the d2 setae are represented at best by pores in the integument. It is not proposed to establish a new supraspecific taxon to accommodate these differences.

In common with other species of the genus, the morphological variability can be great. The leg setation in particular is extremely variable and this has been omitted from the descriptions since it has little apparent value systematically. Setal spacing and setal lengths are also variable, even sometimes on different sides of the same specimen (Table 1). The notogastral hypertrichy distinguishes this group of species from the 5 groups established by Luxton (1982).

<table>
<thead>
<tr>
<th>Species</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. capistrata</td>
<td>cl-c1 76 (60-110)</td>
<td>cl-c2 69 (50-90)</td>
</tr>
<tr>
<td>(n = 10)</td>
<td>c2-c3 111 (90-130)</td>
<td>c2-c3 96 (85-110)</td>
</tr>
<tr>
<td>C. ardala</td>
<td>cl-c1 105 (100-110)</td>
<td>c2-c3 80</td>
</tr>
<tr>
<td>(n = 2)</td>
<td>c2-c2 23 (20-25)</td>
<td>c2-c3 18 (15-20)</td>
</tr>
<tr>
<td>C. borbora</td>
<td>cl-c1 62 (50-80)</td>
<td>cl-c2 usually contiguous</td>
</tr>
<tr>
<td>(n = 6)</td>
<td>c2-c3 56 (50-60)</td>
<td></td>
</tr>
</tbody>
</table>

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All the specimens were collected from litter, moss, stick brushings and tree trunks in the Bellenden Ker Range of Northern Queensland. Like all *Crotonia* they were liberally coated with soil and debris, probably a device to limit water loss since individuals are frequently found on the above-ground parts of vegetation. The immersed sensillus is another feature which may be characteristic of species living in extremes of humidity. The generally long setae and apophyses are embedded in the detritus and serve to bind it together. The species are also probably viviparous (confirmed in *C. ardala*) and bear between 6 and 12 young per individual female. The contents of food bolus within the body suggest that they feed on fungal hyphae and particulate material.

*Crotonia capistrata* n. sp.

(Figs. 1, 2, 5 A, D)

**Material examined**

Bellenden Ker Range, North Queensland, Australia; October-November 1981 (i) Summit TV Station at 1560 m — 1 specimen in ferny vine on tree trunks; 43 specimens in pit traps and litter; 16 specimens from stick and moss brushings (ii) Cable Tower 3 at 1054 m — 25 specimens from litter; 1 specimen from moss on trees and rocks; 1 specimen from stick brushings (iii) 1 km South of Cable Tower 6 at 500 m — 7 specimens from litter (iv) Cableway Base Station at 100 m — 1 specimen.

**Description**

*Dimensions*: Mean length of female 1192 μm (range 1120-1200) (n = 10), mean width of females at widest point 735 μm (range 700-800) (n = 10); mean length of males 1006 μm (range 970-1050) (n = 10), mean width of males at widest point 557 μm (range 500-600) (n = 10).

*Prodorsum*: Generally finely punctate with some dimpling between lamellar and interlamellar apophyses. Rostral setae (ro) flame-shaped with a minutely notched edge, set on tubercles at the corners of the square rostrum and 35-40 μm long in both sexes. Lamellar setae (le) set on long apophyses (140-150 μm long in both sexes) arising from mounds on the prodorsum and reaching beyond the rostrum; lamellar setae curved back on themselves medially and both setae and apophyses covered in "woolly" cerotegument. Interlamellar apophyses shorter (30-40 μm long in both sexes); interlamellar setae (il) long and curved, extending beyond the rostrum. Sensilli round and completely immersed in bothridia. Bothridia characteristically connected with a dark line posteriorly which has a column of areolation projecting anteriorly from about its mid-point. Region of dorsosejugal suture with some coarse tuberculation.

*Notogaster*: Dorsal plate flat and demarcated from the lateral flanks with a plicature strip; folds, picked out with lines of tuberculation, run on the dorsum parallel with the plicature strip but stop short of the posterior apophyses region; the whole of the dorsum is finely punctate with a scattering of subintegumental maculae and, just anterior to the posterior apophyses, a few bright punctations in the integument. The c setae, or their insertions, are present in a transverse line just below the anterior edge of the notogaster. Setae c3 are long (average 255 μm) reaching forward at least to the posterior edge of trochanter I, smooth, finely pointed, and situated on a short apophysis (length of apophysis about 30 μm). Setae c1 and c2 usually represented by alveoli, the full complement of actual c setae not present on any specimen examined and those which are present are usually between 10 and 20 μm long. On two specimens examined one c1 alveolus was missing, and on another specimen the c1 and c2 alveoli on one side were contiguous. Setae d2 absent and largely represented by two bright punctations (not alveoli) in the integument. Setae cp located on the dorsal plate and 60-70 μm long; setae e2 similarly situated on the dorsal plate and 50-75 μm long; setae f2 usually curled medially, located on the plicature strip, and 50 μm long; pores gla on dorsal plate slightly anterior to setae f2. Pseudofissurace *ia* located immediately posterior
to setae e3 on the lateral integument. Posterior apophyses well developed; those of setae h1 extremely long, curved and slightly swollen towards their posterior end, lengths variable, the mean for females is 210 μm with a range of 150-270, for males 194 with a range of 160-210 (n = 10).

Venter: Epimeral region finely punctate; epimeral setae short with formula 3-1-4-2. Integument flanking anal region finely punctate and often with some coarse tuberculation posteriorly; pseudofissurae ih situated in this flanking plate opposite setae ps1. Genital, adanal and anal plates somewhat bowed outwards; genital and anal plates
finely punctate, adanal plates faintly punctate with some tuberculation; adanal plates fused with aggenital by a narrow isthmus; aggenital plates finely punctate and with numerous coarse tubercles. Genital setae number 9 pairs, aggenital setae 2 pairs, anal setae 3 pairs, and adanal setae 3 pairs (one arising from short apophyses on the posterior tips of the adanal plates). Most ventral setae spear- or scimitar-shaped or, in some orientations, peg-like; in one specimen the ps setae are trifid. Pseudofissurae ips in thinner integument between lateral and adanal plates; pseudofissurae iad oblique and situated in the thinner integument just anterior to the adanal plates.

Appendages: Tridactylous, claws with a dorsal fringe of fine serrations; all leg setae borne on tubercles or long apophyses, generally serrated and variable in number. Occasionally one or more claws missing. The length of legs I and IV are approximately equal to body length; legs II and III are about 3/4 the length of legs I and IV.

**Crotonia ardala** n. sp.  
(Figs. 3, 5 B)

**Material examined**

Bellenden Ker Range, North Queensland, Australia; October-November 1981 (i) Summit TV Station at 1 560 m — 3 specimens from moss on tree trunks; 1 specimen from moss on trees and rocks; 1 specimen from pit traps and litter.

**Description**

**Dimensions**: Mean length of female 993 μm (range 950-1 050) (n = 3), mean width of females at widest point 563 μm (range 500-610) (n = 3); mean length of males 890 μm (range 880-900) (n = 2), mean width of males at widest point 440 μm (range 430-450) (n = 2).

**Prodorsum**: Generally finely punctate with a dimple-like patterning in the lateral area between the lamellar and interlamellar apophyses. Rostrum truncate with stout setae (ro) 20 μm in length extending from tubercles at each corner. Lamellar apophyses relatively small (about 35 μm in length), situated far anteriorly and projecting slightly beyond the rostrum. Lamellar setae (le) directed medially; ends of setae undulating and whip-like. Interlamellar apophyses very small (about 20 μm in length), bases elongated and oblique, not meeting but touching bothridia. Interlamellar setae (il) long, projecting beyond rostrum, undulating and whip-like at their extremities. Sensilli round and completely immersed in bothridia; bothridial aperture covered in a membrane with a net-like pattern of dotted lines. Bothridia connected anteriorly by a line, with a column of aeration projecting anteriorly from its mid-point. Dorsosejugal region with some coarse tuberculation and a mass of vermiform lines.

**Notogaster**: Dorsal plate flat and demarcated from the lateral flanks by a plicature strip; shield mostly finely punctate with a scattering of subintegumental maculae; a few shining punctations where the plate merges into the posterior extension, with two more central punctations posterior to setae d2; a conspicuous strip, patterned with a reticum, occurs laterally on each side of the plate. Setae c1, c2, and c3 all present, all becoming correspondingly longer (30, 190, 260 μm respectively), and all projecting forwards; setae c3 on apophyses (each 40 μm long approximately). Length of d2 setae (where present) extremely variable, (mean 35 μm, range 15-55); distance between d2 setae also variable (mean for both sexes 103 μm, range 70-135); setae cp long (about 150 μm) and situated on plicature strip; setae e2 (95 μm long) and f2 (55 μm long) also on plicature strip; pores gla just posterior to setae f2 and on dorsal plate. Pseudofissurae ia not readily visible in dorsal view because they are on lateral folds of the integument. Posterior apophyses well developed; hl apophyses slightly the longer at 45 μm.

**Venter**: Epimeral region coarsely punctate; epimeral setae flattened, sometimes bifid, or peg-like; epimeral setal formula 3-1-4-2. Integument
3. — *Crotonia arda/a* n. sp., dorsal view (scale 100 μm). 4. — *Crotonia borbora* n. sp., dorsal view (scale 100 μm).
flanking anal region coarsely tuberculate; pseudofissurae ih situated in flanking plate slightly anterolaterally of setae ps1. Genital and anal plates finely punctate, adanal plates faintly punctate with some tuberculation; adanal plates fused with aggenital by a narrow isthmus; aggenital plates with oblique lines of tubercles. Genital setae number 9 (10) pairs, aggenital setae 2 pairs, anal setae 3 pairs, and adanal setae 3 pairs (one pair arising from short apophyses on the posterior tips of the adanal plates). Pseudofissurae ips in thinner integument between lateral and adanal plates; pseudofissurae iad oblique and situated in the thinner integument just anterior to the adanal plates. The ventral region of this species is very similar to that figured for C. capistrata (Fig. 2).

Appendages: Tridactylous, claws with a dorsal fringe of fine serrations; all leg setae borne on tubercles or long apophyses, generally serrated, and variable in number. The lengths of legs I and IV are approximately 2/3 the length of the body; legs II and III are less than half body length.

Crotonia borbora n. sp.
(Figs. 4, 5 C)

Material examined
Bellenden Ker Range, North Queensland, Australia; October-November 1981 (i) Summit TV Station at 1 560 m — 4 specimens in ferny vine on tree trunks; 5 specimens in pit traps and litter; 4 specimens from stick and moss brushings (ii) Cable Tower 3 at 1 054 m — 1 specimen* from litter (iii) 1 km south of Cable Tower 6 at 500 m — 1 specimen* from stick brushings (iv) Cableway Base Station at 100 m — 1 specimen (v) Russel River — 1 specimen* in moss.

Description

Dimensions: Mean length of females 1 290 μm (range 1 250-1 420) (n = 8), mean width of females at widest point 715 μm (range 650-770) (n = 8).

Prodorsum: Surface generally finely punctate with some dimpling laterally and medially between lamellar and interlamellar apophyses. Bothridia linked with a W-shaped arch of similar dimples. Some coarse tuberculation in dorsossejugal region. Rostral setae (ro) stout, spear-shaped, arising from tubercles at the corners of the rostrum, and 30-50 μm in length. Lamellar apophyses long (90-120 μm), situated on mounds and reaching beyond rostrum. Lamellar setae (le) long, and curved medially. Interlamellar apophyses small (20-30 μm), bases not extended and not reaching bothridia. Interlamellar setae (il) long, undulating and whip-like at their extremities, extending beyond rostrum. Sensilli round, completely immersed in bothridia, the opening of which is covered by a reticulated membrane.

Notogaster: Dorsal plate clearly demarcated from flanks by a plicature strip; shield mostly finely punctate with some lateral tuberculation, especially posterolaterally. Setae c1, c2, and c3 all present, extremely long (about 1/3 body length) and whip-like, directed posteriorly and tangled together; all approximately the same length, c2 the most robust at base; all on apophyses which are 15-20 μm in length, those for c1 and c2 usually being contiguous or fused. Setae d2 present, averaging 28 μm in length and between 50 and 100 μm apart; setae cp, e2 and f2 averaging 74, 57 and 65 μm in length respectively; pores gia just anterior to f2 on dorsal plate. Pseudofissurae ia on lateral fold of integument just posterolaterally to setae c3. Posterior extension well developed and single; h1 apophyses the longest at about 107 μm and with a characteristic condyle posterolaterally.

Venter: Epimeral region finely punctate; epimeral setae various in shape but mostly dagger-like and short; setae 4a are the longest; epimeral setal formula 3-1-4-2. Integument flanking anal region finely punctate, occasionally with some areolation medially and dorsally. Pseudofissurae ih situated in this flanking plate opposite setae ps1. Genital and anal plates finely punctate, adanal plate having in addition some lateral tuberculation; adanal plates fused with aggenital by a narrow isthmus; aggeni-
Fig. 5: Crotonia spp.
tal plates finely punctate with numerous small tubercles. Genital setae number 9 pairs, agenital setae 2 pairs, anal setae 3 pairs, adanal setae 3 pairs. Genital and anal setae short and dagger-like but adanal setae frequently long, curved or whip-like. Pseudofissurae ips on thinner integument between lateral and anal plates; pseudofissurae iad oblique and situated on the thinner integument just anterior to the adanal plates. The ventral region of this species is very similar to that figured for C. capistrata (Fig. 2).

**Appendages**: Tridactylous, claws with a dorsal fringe of fine serrations. Leg setae borne on tubercles, generally serrated and variable in number. Legs I and IV are approximately equal to body length; legs II and III are 2/3 to 3/4 the length of legs I and IV.

**Remarks**: In common with all species of Crotonia, the features of this species can be somewhat variable about the basic pattern. However, a particularly notable variation can be seen in those specimens indicated* above in which the dorsal plate is entirely covered with round areas (each with a dark centre spot) except for a narrow band on the perimeter of the plate. Since all other features are characteristic of C. borbora sensu stricto it is not intended to create a new taxon.

**Location of types**

The holotype and two paratypes of each species are deposited in the Queensland Museum, Fortitude Valley, Queensland, Australia; two further paratypes of each species are at the British Museum (Natural History), London.

**Keys to the Australian species of Crotonia**

1. — Setae c2 absent; genital setae number 7 or 8 pairs .................. C. jethurmerae Lee, 1985
   — Setae c2 present; genital setae number 9 or 10 pairs ......................... 2

2. — Posterior apophyses on a single, conspicuous, stem-like extension; setae cl, c2, and c3 extremely long and whip-like, the bases of cl and c2 usually contiguous ..................... C. borbora n. sp.
   — Posterior apophyses not arising from a single, conspicuous, stem-like extension; setae cl, c2, and c3 not all extremely long, bases of cl and c2 not contiguous ......................... 3

3. — Setae d2 absent; lamellar apophyses more than 100 μm in length ........... C. capistrata n. sp.
   — Setae d2 present; lamellar apophyses less than 50 μm in length ............ C. ardala n. sp.

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I am grateful to Valerie DAVIS of the Queensland Museum for giving me the opportunity to study these specimens. I should also like to thank the Liverpool Polytechnic technician, Barry WILLIAMS, for devising the sonic bath method for removal of detritus from the specimens, which saved many hours of tedium in preparing the animals for study.

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