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THE ABNORMAL MORPHOLOGY OF THE ORIBATID MITE FROM THE GENUS PLATYNOTHRUS (ACARI, ORIBATIDA, CAMISIIDAE)

BY M. KOCHYŃSKA, Z. OLSZANOWSKI

(Accepted November 2007)

PLATYNOTHRUS BICARINATUS
JACOT 1938
ABNORMAL MORPHOLOGY
ANOMALIES

SUMMARY: Abnormalities in the morphological structures of Platynothrus bica­
rinatus Jacot, 1938 are presented and illustrated. A comparison with normally
developed specimen of this species is included. Abnormal adult differs from
other specimens by higher number of notogastral, anal, adanal setae and
variance of leg setation. One abnormal specimen was found in USA, New
Mexico, in a leaf and log litter of Pseudotsuga menziesii-Pinus ponderosa forest,
at 2390 m a. s. l.

INTRODUCTION

There were only a few reports about deformations in the morphological structures of moss mites. Mostly authors presented a shield and leg abnormalities or presence of extra setae in the ano-genital region (LUDWIG 1991, OLSZANOWSKI 2004). Moreover asymmetrical individuals were found as well (GRANDJEAN 1973, SENICZAK et al 1990). Nevertheless until now a moss mite with so large anomalies was not noticed.

The aim of this communication is to describe an abnormally developed specimen of Platynothrus bicarinatus Jacot, 1938 and to compare its morpho­
logy with “normal” representative of this species.

MATERIAL AND METHODS

The description presented is based on the material from the Field Museum of the Natural History (Chi­
cago, USA). The mite was preserved in 75% ethanol and cleared in lactic acid. It is stored in the collection

of Malgorzata KOCHYŃSKA (Department of Animal Taxonomy and Ecology, A. Mickiewicz University, Poznań, Poland).

Locality: USA, NM, Lincoln Co., Eagle Ck. at
Carlton Canyon (W. of Alto), 2390 m. Pseudotsuga
menziesii-Pinus ponderosa forest, 33°24' N, 105°44.3'
W. Leaf and log litter. A. NEWTON & M. THAYER
leg. 03. III. 1995.

MORPHOLOGY OF ABNORMAL ADULT
OF P. BICARINATUS Jacot, 1938
(FIGS. 1-3)

Body length: 790 μm; body width: 450 μm. Prodor­
sum. Rostrum rounded; two folds of thickened chitin run between bothridia and lamellar apophyses. Sur­
face with distinct oval or round pits. Setae ro smooth, slightly curved medially, set on small tubercles. Setae le long, distinctly reach beyond rostral margin, barbed and set on apophyses connected by band of thickened chitin. Setae in hardly and delicate barbed, long, distinctly reach beyond rostral margin.

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Figs. 1-3. Platynothrus bicarinatus Jacot, 1938. 1. — Abnormally developed specimen, dorsal view. 2. — ventral view. 3. — Dorsal view of left anterior part of notogaster. Additional setae are marked with an asterisk (*).
Character | "normal" specimen | "abnormal" specimen
--- | --- | ---
Number of notogastral setae | 15 | 19 (+ 2 vestigial alveolae)
Epimeral setation | 3-1-3-4 | 3-1-2-(1-2)
Number of genital setae | 11-12 | 13-15
Number of aggenital setae | 2 | 2
Number of anal setae | 2 | 3
Number of adanal setae | 2 | 3-4

Table 1. Comparison of selected morphological characters of "normal" and "abnormal" specimen of *Platynothrus bicusculatus* (after Oleszowski & Kity 2004 and present studies).

Sensillus long, broaded distally and covered with adherent spikes. One pair of short setae ex situated slightly under sensilli and outside.

Notogaster. Egg-shaped, dorsal part convex. Two elongated folds run along middle part of shield from base of setae c₂ to h₁. Surface with pits and dots. Notogaster with 19 pairs of setae. Extra 2 pairs of setae c₃ and d₃ are present at left side of plate. Two additional alveolae present posterior to the base of left seta c₂. All setae long. Setae c₁, p₁, p₂, h-series and additional setae are delicate and hardly barbed; other setae are smooth. Oval opening of opisthosomal gland gla between setae f₂ and h₁.

Ventral region. Epimeres separated medially by furrow. Epimeral setation: 3-1-2-(1-2). Number of genital setae: 12 and 14, aggenital setae: 2 pairs; anal setae: 2 pairs, adanal setae: 3 and 4 (one seta extra).

Legs. Tarsi monodactylous. Leg setation (including famulus) and solenidial formulæ:

I: 1-8-5-5-23 [1-1-3];
II: 1-8-6-5-23 [0-0-2];
III: 4-5-4-4-23 [1-1-0];
IV: 0-3-3-3-22 [1-1-0].

**DISCUSSION**

The origins of abnormalities in morphological structures or in the course of ontogenesis can be grouped in the following categories (Alekseev & Dubinin 1996, Seniczak et al. 1996, 2002, Ludwig 1991):

It can be
1. — a kind of "evolutionary reminiscence", when the genetic equipment characteristic of the ancestors can upon some developmental disturbance be manifested in descendants,
2. — a result of mutations taking place in meiosis or somatic mutations at early developmental stages,
3. — a result of mechanical damages at the stage of ontogenesis, e. g. related to the incorrect course of moulting,
4. — or an effect of high level of heavy metals pollution in the environment.

There are only few reports about abnormalities in Camisiidae family and moss mites generous. Grandjean, in his latest papers (1971, 1972, 1973), wrote about deformations of clones in the culture of *Platynothrus peltifer* (C. L. Koch, 1839). He noted many abnormalities in prodorsum, notogaster and aggenital regions, in the epimeres and legs setation. All these anomalies he divided into six groups:

1. — body and legs deformation
2. — organs’ displacement
3. — presence of additional, normal number of setae
4. — organs’ deformation (e. g. branched seta)
5. — organs’ reduction to vestige (an organ is much smaller than normally developed)
6. — disappearance without any vestige.

In 1990 Seniczak announced the variability of setae f₁ location in *Platynothrus capillatus* (Berlese). It can be located on the both or only on the one side of body or only one seta can be visible as well.

During our studies we noticed some small differences between specimens of one species (e. g. lack of one of notogastral setae or one pair of anal setae extra). However, in any studies there is no describe about such monstrosity as we found. This specimen differs from the normal specimen by possessing several setae extra (notogastral, leg, anal and adanal setae) and some of them are lost. It seems that the left side of mite’s body is more modified than the right side. Unlike vertitions, anomalies have no evolutionary significance (Grandjean 1971, Wauthy et al. 1991). So maybe it is only a mutation – a “mistake of partenogenetic reproduction” – or maybe Grandjean had right, that body sides of mites evolve independently?
TABLE 2. Comparison of the leg setation of "normal" and "abnormal" specimen of Platynothrus bicarinatus (after Olszanowski & Kuty 2004 and present studies; number of sensilli in parentheses).

<table>
<thead>
<tr>
<th>leg</th>
<th>segment</th>
<th>&quot;normal&quot; specimen</th>
<th>&quot;abnormal&quot; specimen</th>
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The comparison of selected morphological characters of normally developed and "abnormal" specimen of P. bicarinatus Jacot, 1938 is given in TABLES I and II.

ACKNOWLEDGMENTS

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