



A review of the oribatid mite family Nothridae in Australia, with new species of *Novonothrus* and *Trichonothrus* from rain forest and their Gondwanan biogeographical affinities (Acari: Oribatida)

MATTHEW J. COLLOFF

CSIRO Ecosystem Sciences, GPO Box 1700, Canberra, ACT 2601, Australia. E-mail: Matt.Colloff@csiro.au

Table of contents

Abstract	1
Introduction	2
Materials and methods	2
Definitions of genera and descriptions of species	3
<i>Nothrus</i> C.L. Koch, 1835	3
<i>Nothrus anauniensis</i> Canestrini & Fanzago, 1876	3
<i>Novonothrus</i> Balogh, 1972	4
<i>Novonothrus barringtonensis</i> sp. nov.	5
<i>Novonothrus coronospinosus</i> sp. nov.	8
<i>Novonothrus glabriseta</i> sp. nov.	12
<i>Novonothrus nothofagii</i> sp. nov.	18
<i>Novonothrus silvanus</i> sp. nov.	20
<i>Novonothrus flagellatus</i> Hammer, 1966	25
Key to species of <i>Novonothrus</i> (adults)	30
<i>Trichonothrus</i> Mahunka, 1986	31
<i>Trichonothrus hallidayi</i> sp. nov.	31
<i>Trichonothrus austroafricanus</i> Mahunka, 1986	36
Discussion	38
Acknowledgements	42
References	42

Abstract

The Nothridae of Australia hitherto consisted of the semi-cosmopolitan *Nothrus anauniensis*, *Novonothrus flagellatus* and an un-named *Novonothrus* species. This paper contains additional records of *N. anauniensis* and descriptions of five new species of *Novonothrus*, including immatures (*N. barringtonensis* **sp. nov.**, *N. coronospinosus* **sp. nov.**, *N. glabriseta* **sp. nov.**, *N. nothofagii* **sp. nov.** and *N. silvanus* **sp. nov.**), a genus known from Australia, New Zealand and Chile. A key to *Novonothrus* is provided and the genus redefined. A second species of *Trichonothrus* (*T. hallidayi* **sp. nov.**), is described, representing a new generic record for Australia: *Trichonothrus* was previously known only from South Africa. Supplementary descriptions are given for *Novonothrus flagellatus* Hammer, 1966 and *Trichonothrus austroafricanus* Mahunka, 1986. The Australian record of the former species is based on a misidentification of the species described herein as *N. glabriseta* **sp. nov.** and *N. flagellatus* appears to be confined to New Zealand. Three species groups are proposed for *Novonothrus*: Barringtonensis (*N. barringtonensis*, *N. nothofagii* and *N. silvanus*) from central New South Wales and Victoria; Puyehue (*N. glabriseta* from Tasmania, *N. puyehue*, *N. covarrubiasi* and *N. kethleyi* from Valdivian temperate rain forest in Chile) and Flagellatus (*N. coronospinosus* from northern New South Wales and *N. flagellatus* from native forest, including *Nothofagus*, in New Zealand). *Novonothrus* and *Trichonothrus* show a relict Gondwanan distribution and are associated with indigenous wet forests. In Australia, members of these genera have been recorded mostly from cool tem-

perate *Nothofagus* rain forest. The relatively high diversity of sexual species of Nothrina in Australian temperate rain forests is contrasted with high diversity of thelytokous parthenogenetic species in temperate Northern Hemisphere localities and is discussed in relation to differences in palaeoclimate and environmental history.

Key words: taxonomy, morphology, systematics, biogeography, Gondwanan distribution, moss mite, species group, *Nothofagus* forest

Introduction

Our knowledge of the oribatid fauna of Australia is fragmentary. Hammer and Wallwork (1979) remarked that high endemism of the New Zealand fauna indicated it was comparatively isolated, “although it must be stressed that the oribatid fauna of Australia is virtually unknown and there may be, as yet, undetected relationships here.” Over thirty years on, well over half the genera listed by Hammer and Wallwork (1979) considered endemic to New Zealand have been recorded from Australia, mainly due to a marked increase in research on the Australian oribatid fauna since the 1980s. Nevertheless, there are still large gaps in taxonomic coverage (Colloff & Halliday, 1998). One of these is the Nothridae Berlese, 1885, with only one named species of *Nothrus*, the semi-cosmopolitan species *N. anauniensis* Canestrini & Fanzago, 1876, as well as *Novonothrus flagellatus* Hammer 1966 recorded from Tasmania (Palmer & Norton, 1991) and an un-named *Novonothrus* species from Lamington National Park, Queensland recorded by Hunt (1994). Unidentified Nothridae were recorded by Heatwole *et al.* (1981) from a coral cay on the Great Barrier Reef.

Novonothrus was proposed by Hammer 1966 to contain two new species, *N. flagellatus* and *N. pupuensis* (named after Pu Pu Springs, Nelson, New Zealand, not *papuensis*, a name implying an association with Papua New Guinea, as mis-spelled by several authors, e.g. Mahunka, 1978; Casanueva & Norton, 1997). Casanueva & Norton (1997), added *N. covarrubiasi* and *N. puyehue* from Osorno Province, Chile. *Novonothrus kethleyi*, also from Chile, was described by Casanueva & Norton (1998).

Hammer's (1966) description of *Novonothrus* is considered invalid because no type species was designated. For this reason Mahunka (1978) combined *Novonothrus pupuensis* Hammer 1966 with *Nothrus*. But Casanueva & Norton (1997) pointed out that the name *Novonothrus* was made available by Balogh (1972) through a diagnosis in a key and a table and the designation of *N. flagellatus* Hammer, 1966 as the type species. They agreed with Mahunka's (1978) combination of *Nothrus pupuensis*. However, Balogh & Balogh (1992) point out that they consider it unfair that Hammer lose authorship of the genera she described between 1961 and 1973 because she did not designate type species, and that ‘an application is in the process of being submitted to ICZN to recognise the original author of these genera. In the hope that the petition will be acknowledged, Hammer is considered as author in this work.’ No record of any such application appears in the *Bulletin of Zoological Nomenclature*. Colloff & Halliday (1998) followed Balogh & Balogh (1992) in recognizing Hammer's authorship. Herein, I follow Casanueva & Norton (1997) in the attribution of *Novonothrus* Balogh, 1972 as technically correct.

Mahunka (1986) established the monotypic genus *Trichonothrus* for *T. austroafricanus* from the Western Cape, South Africa, based on a comparison with *Novonothrus*, and characterised as lacking a rostral notch, with greater neotrichy of the epimeres and three claws rather than one. Palmer & Norton (1991) recorded this species from South Africa and confirmed it and *Novonothrus* as sexual.

The purpose of the present paper is to describe new species of *Novonothrus* and *Trichonothrus* from rain forest and wet sclerophyllous forest in south-eastern Australia, to re-define these genera in the light of descriptions of new species since the genera were first proposed, and to provide supplementary descriptions of *Novonothrus flagellatus* Hammer, 1966 and *Trichthonius austroafricanus* Mahunka, 1986.

Material and methods

Some of the species descriptions in this paper are based in part on material taken from the collection of bulk Berlese funnel extractions of invertebrates from soil, moss or leaf litter, accumulated since 1967, housed in the Australian National Insect Collection, CSIRO Ecosystem Sciences, Canberra. All specimens were placed in a cavity slide and macerated in lactic acid (70% aqueous) in 50% glycerol or, for heavily-sclerotised specimens, in 30% aqueous