



Zootaxa 2954: 1–86 (2011)
www.mapress.com/zootaxa/

Copyright © 2011 · Magnolia Press

Monograph

ISSN 1175-5326 (print edition)

ZOOTAXA

ISSN 1175-5334 (online edition)

ZOOTAXA

2954

**Mites of the subgenus *Microtimyobia* (Acariformes:
Myobiidae: *Radfordia*) and their host-parasite relationships
with cricetid rodents (Cricetidae)**

ANDRE V. BOCHKOV^{1,2}

¹Zoological Institute, Russian Academy of Sciences, Universitetskaya embankment 1, 199034 St. Petersburg, Russia.
E-mail: andrevbochkov@gmail.com

²Museum of Zoology, University of Michigan, 1109 Geddes Ave., Ann Arbor, Michigan 48109 USA.

Magnolia Press
Auckland, New Zealand

Accepted by O. Seeman: 23 Feb. 2011; published: 8 Jul. 2011

Andre V. Bochkov

Mites of the subgenus *Microtimyobia* (Acariformes: Myobiidae: *Radfordia*) and their host-parasite relationships with cricetid rodents (Cricetidae)

(*Zootaxa* 2954)

86 pp.; 30 cm.

8 July 2011

ISBN 978-1-86977-737-1 (paperback)

ISBN 978-1-86977-738-8 (Online edition)

FIRST PUBLISHED IN 2011 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

<http://www.mapress.com/zootaxa/>

© 2011 Magnolia Press

All rights reserved.

No part of this publication may be reproduced, stored, transmitted or disseminated, in any form, or by any means, without prior written permission from the publisher, to whom all requests to reproduce copyright material should be directed in writing.

This authorization does not extend to any other kind of copying, by any means, in any form, and for any purpose other than private research use.

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Table of contents

Abstract	4
Introduction	4
Material and methods	5
Historical summary	5
Systematics	6
Family Myobiidae Megnin	6
Genus <i>Radfordia</i> Ewing	6
Subgenus <i>Microtimyobia</i> Fain and Lukoschus, 1976	6
Key to species of the subgenus <i>Microtimyobia</i> Fain and Lukoschus, 1976	7
Species group <i>lemnina</i>	9
1. <i>Radfordia (Microtimyobia) lemnina</i> (Koch, 1841)	9
2. <i>Radfordia (Microtimyobia) clethrionomys</i> Fain and Lukoschus, 1977	20
3. <i>Radfordia (Microtimyobia) rufocani</i> Bochkov, 1995	23
4. <i>Radfordia (Microtimyobia) alticolae</i> Bochkov, 1995	26
5. <i>Radfordia (Microtimyobia) eothernomys</i> Fain and Lukoschus, 1976	29
6. <i>Radfordia (Microtimyobia) golenishchevi</i> sp. nov.	30
7. <i>Radfordia (Microtimyobia) ladakensis</i> Fain and Lukoschus, 1976	34
Species group <i>hylandi</i>	35
8. <i>Radfordia (Microtimyobia) hylandi</i> Fain and Lukoschus, 1977	36
9. <i>Radfordia (Microtimyobia) pitymys</i> sp. nov.	38
10. <i>Radfordia (Microtimyobia) arvicolae</i> Fain and Lukoschus, 1977	40
11. <i>Radfordia (Microtimyobia) arctica</i> Fain and Lukoschus, 1977	42
12. <i>Radfordia (Microtimyobia) lemmus</i> Fain and Lukoschus, 1977	45
13. <i>Radfordia (Microtimyobia) synaptomysi</i> Bochkov and Mironov, 1998	46
14. <i>Radfordia (Microtimyobia) myopusi</i> Bochkov and Mironov, 1998	48
Species group <i>dinaromys</i>	49
15. <i>Radfordia (Microtimyobia) dinaromys</i> sp. nov.	49
Species group <i>zibethicalis</i>	51
16. <i>Radfordia (Microtimyobia) zibethicalis</i> (Radford, 1936)	52
Species group <i>arborimus</i>	54
17. <i>Radfordia (Microtimyobia) arborimus</i> Fain and Whitaker, 1975	54
Species group <i>triton</i>	58
18. <i>Radfordia (Microtimyobia) triton</i> Fain and Lukoschus, 1977	58
19. <i>Radfordia (Microtimyobia) abramovi</i> Bochkov and Mironov, 1998	64
20. <i>Radfordia (Microtimyobia) cricetuliphila</i> Bochkov, 1999	67
21. <i>Radfordia (Microtimyobia) cricetulus</i> Fain, 1973	69
Discussion	72
Acknowledgements	83
References	84

Abstract

Myobiid mites of the subgenus *Radfordia* (*Microtimyobia*) (Acariformes: Myobiidae) associated with hosts of the subfamilies Arvicolinae and Cricetinae (Cricetidae) are revised. Three new species are described from voles: *R. (M.) dinaromys* **sp. nov.** from *Dinaromys bogdanovi* from Montenegro, *R. (M.) golenishchevi* **sp. nov.** from *Eothenomys wardi* from China (Mekong River), and *R. (M.) pitymys* **sp. nov.** from *Microtus pinetorum* from USA (Virginia). *Radfordia (M.) lemnina micromys* Fain and Lukoschus, 1976 **syn. nov.**, *R. (M.) lemnina mikado* Uchikawa *et al.*, 1997 **syn. nov.**, *R. (M.) stekolnikovi* Bochkov and Mironov, 1998 **syn. nov.**, and *R. (M.) stenocrani* Bochkov and Mironov, 1998 **syn. nov.** are synonymized with *R. (M.) lemnina* (Koch, 1941); *R. (M.) rutila* Fain and Lukoschus, 1977 **syn. nov.** and *R. (M.) lemnina hata* Uchikawa *et al.*, 1997 **syn. nov.** are synonymized with *R. clethrionomys* Fain and Lukoschus, 1977; *R. (M.) lemnina japonica* Uchikawa *et al.*, 1997 **syn. nov.** is synonymized with *R. (M.) rufocani* Bochkov, 1995; *R. (M.) macdonaldi* Gill and Strandmann, 1977 **syn. nov.** is synonymized with *R. (M.) arctica* Fain and Lukoschus, 1977; *R. (M.) cricetus pakistanensis* Fain and Hyland, 1980 **syn. nov.** is synonymized with *R. (M.) cricetus* Fain, 1973. The female and male keys to all 21 currently recognized *Microtimyobia* spp. are provided. The host distribution of *Microtimyobia* spp. is analyzed. These mites serve as peculiar “markers” of particular host groupings and in many cases are useful tools to test some controversial hypotheses of cricetid phylogeny, including the intriguing problem of phylogenetic relationships of the Palearctic and Nearctic voles of the genus *Microtus*.

Key words: acari, ectoparasites, hamsters, host-parasite relationships, Myobiidae, *Radfordia (Microtimyobia)*, systematics, voles

Introduction

Myobiid mites (Acariformes: Myobiidae) are permanent highly specialized parasites of small marsupial and placental mammals belonging to 11 orders. This family is the sole representative of the superfamily Myobioidea, belonging to the acariform parvorder Eleutherengona (Mironov & Bochkov 2009) and presently includes over 580 species and subspecies in 53 genera (Bochkov 2009a). All myobiid species are mono- or oligoxenous ectoparasites feeding on living host tissues. These mites are characterized by the highly non-random distribution on their mammalian hosts and, therefore, are often considered as valuable tools for independent validation of host phylogenies (Dusbabek 1969; Uchikawa 1988; Fain 1994; Bochkov 2009a).

The latest phylogenetic system of the family Myobiidae was proposed by Bochkov (1997). In that system, this family was separated into four subfamilies; the fifth myobiid subfamily Australomyobiinae was recently added (Bochkov 2009a). Among myobiid subfamilies, mites of the subfamily Myobiinae are exclusively associated with rodents (Rodentia). Myobiids were recorded on representatives of 12 from 34 currently recognized extant rodent families, including Diatomyidae (Carleton & Musser 2005; Dawson *et al.* 2006). The most speciose rodent families are Muridae and Cricetidae. The latter family is especially widely represented in the Holarctic Region and South America. Three myobiid groups are associated with rodents of the family Cricetidae (Bochkov 2009a). Mites of the subgenus *Radfordia (Microtimyobia)* parasitize two subfamilies, the Old World hamsters Cricetinae and voles Arvicolinae. Two subfamilies of the New World hamsters, Sigmodontinae and Neotominae, bear mites of the subgenus *Radfordia (Hesperomyobia)*, which is closely allied to the subgenus *Microtimyobia*, and the *subuliger* species group (the group *incertae sedis* in the genus *Radfordia*), respectively. The other two cricetid subfamilies, Tylomyiinae and Lophiomyiinae, have never been examined for myobiids.

The phylogeny and systematics of the subfamilies Arvicolinae and Cricetinae, hosts of the myobiid subgenus *Microtimyobia*, were roughly developed recently but still remain very intricate (see for references Musser & Carleton 2005). The myobiid mites from these hosts are also insufficiently studied. In the meantime, host-parasite associations can be used as a valuable data source to test the host phylogenetic hypotheses (Klassen 1992), especially for such specialized and highly specific permanent parasites as myobiid mites.

In this paper, the subgenus *Microtimyobia* is revised based on large collection materials available for study and extensive examination of the numerous potential hosts for these mites. Three species are described as new for science; four species and five subspecies are synonymized. The keys to females and males of all 21 currently recognized *Microtimyobia* spp. are provided. The host distribution of *Microtimyobia* spp. is analyzed in detail.