

## *Myrmica* ants (Hymenoptera: Formicidae) of the Old World

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Alexander G. Radchenko and Graham W. Elmes, 2010. *FAUNA MUNDI Volume 3: Myrmica ants (Hymenoptera: Formicidae) of the Old World*. Natura Optima Dux Foundation, Wilcza 64., 00-679 Warszawa, Poland. 789 pages, 333 figs, 163 maps, hardcover, 165 × 235 mm. 150 euro. ISSN 2081-4615, ISBN 978-83-930773-1-1

This “little” book is in a lot of ways much better than I hoped for when I ordered it. It is also not as boring as I, and probably also a few others, might have thought. Someone who orders this book to find descriptions of all the species: well, he will be disappointed. This is not to say you will not find any descriptions in it; you can find in this book the descriptions of: *M. arisana* (first description of queen and male), *M. bactriana* stat. rev. (redescription of worker and male), *M. bakurianica* (redescription of worker, queen and male), *M. kozakorum* n. sp. (description of worker, queen and male), *M. lobulicornis* (first description of queen and male), *M. pleiorhytida* (first description of queen), *M. pulchella* stat. rev. stat. nov. (first description of queen), *M. schoedli* (first description of male), *M. turcica* (first description of male) and *M. wesmaeli* (first description of male).

Beside the already indicated stat. rev., stat. nov. and n. sp., two nomenclatural changes are given: *M. ruzskyana* nom. nov. (for *M. exigua* Ruzsky, 1915) and *M. slovaca* (priority over *M. curvithorax*). And last but not least, 20 new synonyms are indicated (one each for *M. bactriana*, *M. deplanata*, *M. rubra*, *M. scabrinodis*, *M. schencki* and *M. transsibirica*, two each for *M. kurokii* and *M. sulcinodis*, three each for *M. ruginodis* and *M. specioides* and four for *M. kozlovi*).

But what makes this book so marvelous? The book contains, besides an abstract and a preface, five chapters, each with interesting and good scientific content. It starts with a preface that recalls the beginning of the research on “red ants” (old common name for ants of the genus *Myrmica*) and the origin of the collaboration of the authors, Radchenko and Elmes. In it, two names are worth remembering: J. Ray and W. Gould (p. 8). Both were important in the 18th Century as pioneers in the systematic and natural history of ants (including *Myrmica*!).

Chapter 1 describes a “General background and biology of *Myrmica*”. It gives the scope and the layout of the work, the general biology of the genus, a brief but thorough history of the taxonomy of the Old World species, a review and critique of morphometrics and, last but not least in the chapter, small biographies of all the authors who were important in describing species of Old World *Myrmica*'s.

The chapter starts with N. A. Weber and his first and the only prior attempt at a worldwide review of the genus. Here I find one of the rare acknowledgements of Jean Bondroit (I. H. H. Yarrow was another important myrmecologist who recognized Bondroit's work!) “who had a far better record in naming “good species” of *Myrmica* compared to his contemporaries...” Radchenko and Elmes originally started a world revision of *Myrmica* but later omitted the Nearctic species for a number of reasons (pp. 13 – 14). The most important reason is that in the New World there is so much confusion about which names are connected with which species. This part they end with: “In our opinion, the time is ready for a complete revision of North American *Myrmica*

that should start with no pre-conceptions and a fresh examination of the collections to erect a new taxonomy based on the modern concept of species variation in the genus *Myrmica*. Only then, should the types be examined and the existing names fitted to the modern taxonomy.” They also hope that their book “might stimulate a New World revision.”

After an overview of the book comes the review of *Myrmica*-biology/ecology/physiology. It's a nice but quick review that, sadly, is a little bit too quick and jumpy in two paragraphs (p.17 on population dynamics and p. 19 on the frequency distribution of queens).

The part on taxonomic history is divided into a pre-1950 and a post-1950 account. On page 31 the authors indicate a few times that still more species await discovery in the Old World and that even now, after their revision, some problems still exist in the taxonomy of certain species. The review of morphometrics also discusses the critiques about this method.

Last, this chapter ends with the biographies of the most important *Myrmica*-taxonomists. While most get from ¼ to ½ page, Bondroit has a biography of more than 1 page. This befits their approval of Bondroit as a taxonomist as indicated throughout the book: “...we consider that his appreciation of the genus *Myrmica* was far superior to that of many of his better known contemporaries.” My impression is that Bondroit's biggest problem, later used against him, was that he did not read the descriptions of species published in reviews from other regions than France or Belgium or that he did not understand about which species they really talked. So, except for his four really good species, most of the other names he used or described were known under other names. I also agree with R. and E. that Bondroit should be appreciated more by modern taxonomists.

Chapter 2 describes the taxonomic position and definition of *Myrmica* (description of worker, queen and male) and how it is divided into species groups. Only one little omission in this chapter: although they say in the text that *Nothomyrmica* was synonymised with *Myrmica*, in the synonymic list they forget to include *Nothomyrmica*.

Chapter 3 is the bulk of the book (602 pages!). In it all the species are reviewed. First the 142 extant species, then the five fossil ones and the nine names that are *incertae sedis*. Each extant species has a full synonymic list, list of type localities and type specimens, material examined, distribution, etymology of the species name and all the synonyms, notes (why names are synonymized, what problems still exist in the species – morphological gradients, cryptic species, eco-types... –, problems with types, eventually descriptions – see the start of this review – and so on) and ecology. Also, all the known and described castes are depicted, drawn as much as possible from type material.

One of the biggest surprises – for me – about the ecology stands on page 103: while there are a few species known to live in very salty environments, workers of *M. bergi*, when their nest is flooded by a salty lake nearby, are known to “actively swim, sometimes for several tens of meters.” This is described in a Russian publication of 1998. The only other known actively swimming ant is *Polyrhachis sokolova* from northern Australia.

Other nice ecological points are: (1) that colonies of *M. pulchella* were found in internodal cavities of bamboo (p. 222-223) and (2) on page 233 they describe why *M. rubra* is such a successful invader.

The most difficult species in the whole book is *M. tulinae*. The workers are almost identical to *M. sabuleti*-workers and the males are almost identical to *M. scabrinodis*-males. *M. tulinae* belongs to the *scabrinodis*-complex of the *scabrinodis*-group (the *sabuleti*-complex also belongs in this group!). This makes the separation of these species very difficult in regions like Middle Europe. All three species are found there and most collections of these ants are workers (series) or lone males... So, we are obliged to collect nest-series INCLUDING males to separate these species in the future!

Sadly, there are a series of errors, omissions and mistakes in the chapter (most of them are luckily minor ones!):

- Page 107 – 108: Eidmann 1941 and 1942 should all be 1941.

- Page 108: Although the male is known for *M. cagnianti* it is not depicted.
- Page 115: (see notes to *M. rugulosa*) should be on page 114 at the end of the notes for *M. constricta*.
- Page 118–119: The authors did not indicate why *M. plana* is synonymized under *M. deplanata*. Also, in the synonymic list, *M. plana* is indicated as described as a subspecies of *M. lobicornis* but on page 270 Radchenko and Elmes say it was described as a subspecies of *M. schencki*.
- Page 143: The queen of *M. gigantea* is known but not depicted.
- Page 146: The etymology of *caucasica* is easy but not given.
- Page 158: The queen of *M. juglandeti* is known but not depicted.
- Page 176: Etymology of *M. ruzskyi* is not given (but of course it is obvious!).
- Page 193: First description of the queen of *M. lobulicornis* but on page 191 it is indicated that the queen of *M. alpine* (a synonym of *M. lobulicornis*) was described by Stärcke in 1927.
- Page 239: Types were studied for *M. silvestrii* but they are not indicated in the list of material examined on page 237.
- Page 259: In the synonymic list, under *M. rolandi*, stands “see notes below and...” but in the notes I cannot find anything about *M. rolandi*.
- Page 313 under *M. turcica*: In the notes is indicated “... *M. kozakorum* (see Notes to that species).” But there you cannot find any comparison with *M. turcica*. Look instead under *M. georgica* where the story is told (as indicated in the second line of p. 313)!
- Page 382: Queen syntype? No syntype queen indicated on page 113 under *M. constricta*.
- Page 458: A paratype queen is depicted for *M. kirghisorum* but the original description is of worker and male (page 167) and no queen.
- Page 489 depicts a paratype male of *M. luteola* but the male was described four years after the description of worker and queen (p. 197).
- Page 497: Only the head of the male of *M. myrmecoxena* is depicted. The authors indicate in the description of the species that they did not see any males and the figure of the head is after Kutter (1977).
- Page 591: *M. specioides*, a paralectotype male is depicted but on page 284 the male is excluded

of the type-series and on page 288 males are included as paralectotypes. So, are they included in the types-series or not?

If you look at this list you may say “So many errors!” But no, if you consider that for the review of extant species 574 pages are needed, I found very few errors (17 to be exact). Of these only the reason *M. plana* is synonymized, the list of examined material of *M. silvestrii* and the notes for *M. rolandi* really matter (and are what I would also like to know!).

After reading the book I looked up one of the *M. plana* problems I noticed. It is originally described as *Myrmica lobicornis* var. *plana* by Karavaiev in 1927 but in 1929 Karavaiev placed it under *M. schencki* as *M. schencki* var. *plana*. Later, in 1934, Karavaiev synonymized it under *M. deplanata* (in the same year Arnoldi made *plana* a “natio” of *M. deplanata*). So, who can follow all this?

This review of extant species, together with the fossil species and the names *incertae sedis*, are the core of the book and, yes, they are very well reviewed!

The chapter ends with lists of the *nomina nuda*, unavailable names and the transferred/excluded species. In the last list Radchenko and Elmes did forget to mention for five species which castes were described (*M. nylanderi*, *M. rugiceps*, *M. semipolita*, *M. sordidula* and *M. striatula*).

Chapter 4 describes the zoogeography and evolution of the genus. This is a chapter everybody needs to read! If you consider *Myrmica* to be a genus of the plains, forget it: *Myrmica* is originally a genus of mountainous regions! The boreal fauna is the derived group. Also, a lot of endemic species await discovery in the Central Asian Mountains (some are already being described), South and Southeast Asia, the Tibetan Mountains and the Mediterranean region. For the rest of this chapter: it is so good you have to read it yourselves, I am not going to reproduce it here!

Chapter 5 gives good keys to the species but separate for certain regions. Maybe not the best method for the Old World as a whole but easier for the regions! For the most part they are keys for workers only but for the Western part of the Old World you also need the males to separate a few species.

For the references that end the book, very nice! Only the citations of Weir, J. S. need to be corrected ('58a and '59a are the same and '58c and '59c are also the same!).

My final and personal judgment: Very, very good. If *Nothomyrmica*, *M. plana*, *M. silvestrii*, *M. rolandi* and Weir, J. S. were corrected/included the book would be near-perfect. For all working in the Old World, it is surely a book you should have (not withstanding the price!) or have read.

P.S.1: Both authors of the book have seen a draft of this review and appreciated the comments in it.

P.S.2: Since the publication of this book B. Seifert reviewed the *M. salina* species complex in 2011, H. Bharti, Y. P. Sharma and I. Gul described nine species from the Himalayas in 2011 and 2012, and A. Radchenko and Z. Yusupov described one species from the Caucasus in 2012.

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