



## Papers published in *Zootaxa* concerning Neuropterida

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*I have grown to believe that a really intelligent man makes an indifferent painter;  
for painting requires a certain blindness, a partial refusal to be aware of all the options*  
The Draughtsman's Contract (Peter Greenaway, 1982)

### Abstract

#### Two Hundreds & Two Noughts

In the first twenty years of the publication of *Zootaxa*, more than two hundred papers have appeared in this journal that address the Neuropterida, which collectively includes the [Neuroptera+Raphidioptera]+Megaloptera sections (initially “Minor orders” section). A dozen submitted manuscripts were rejected before the review process, and another dozen submissions were rejected following the peer review process. Additional content and general submission history of these contributions is summarized here. These various contributions highlight the growing body of research on the Neuropterida and the importance of *Zootaxa* as a key journal for publishing and disseminating this research.

**Key words:** Neuropterida, numerosity, authorship, critical aspects

### Introduction

#### The Belly of a Minor Insect Order

Publications on Neuropterida, which includes the orders Neuroptera, Raphidioptera and Megaloptera, have long been limited to a relatively small number of scientists who focused on their taxonomy and basic ecology, with the exception of the well-funded field of agricultural biological control research (i.e., research mostly focused on green lacewings, Chrysopidae).

In the research areas of nature conservation and biodiversity, these insects have received relatively little attention, which is largely due to the difficulty of finding specialists able to correctly distinguish among the different species.

Also for this reason, it is not surprising that the Neuropterida initially were treated as part of the Minor Orders section of *Zootaxa*, and that it took more than four years from the publication of the first scientific article in this journal before the first paper dedicated specifically to Neuropterida appeared (Liu & Yang, 2005). In the meanwhile, a small number of articles published in *Zootaxa* during its first four years contained generic citations related to neuropterans.

Since 2005, the rising attention of scientists towards neuropterans in all sectors (ecology, ethology, morphology, biodiversity, physiology, taxonomy, systematics, etc.), and specifically in taxonomy, has resulted in an increased number of contributions to *Zootaxa*. During the past few years an average of almost twenty Neuropterida-related works have been published per year. This increase was both quantitative and qualitative, which consequently resulted in *Zootaxa* establishing two sections dedicated to these insects, one for Neuroptera and Raphidioptera, and a second for Megaloptera.

Over 190 papers addressing Neuroptera and Raphidioptera have been published in *Zootaxa* (29 of them are open access), but we do not list individually those papers here. However, one of us (AL) has been the subject editor of the section since 2015 and has been able to directly follow its quantitative and qualitative growth in various sectors related to fauna (Canbulat, 2007; Garland & Kevan, 2007; Hassan *et al.*, 2019), larval morphology (Satar *et al.*, 2007, Zhang *et al.*, 2013, Badano & Pantaleoni, 2014a, b; Tauber, 2014; Matsuno & Yoshitomi, 2016; Zheng & Liu, 2020; Tauber *et al.*, 2020), biology (Devetak *et al.*, 2010, 2013; Tauber *et al.*, 2012), the solution of nomenclatural problems (Tauber & Flint, 2010; Michel & Akoudjin, 2011; Mochizuki *et al.*, 2017; Tauber *et al.*, 2018, Pantaleoni & Loru, 2018; Duelli & Obrist, 2019, Duelli & Henry, 2020), and local family reviews (Zhang *et al.*, 2014a, b; 2015; Ardila-Camacho & Garcia, 2015; Carvalho Assmar & Falcão Salles, 2017; Bakkes *et al.*, 2017; Li *et al.*, 2018). Some faunal contributions have been both regional (Snyman *et al.*, 2018) and worldwide (Winterton *et al.*, 2019) in coverage. Some particularly noteworthy contributions concerned restricted taxonomic groups but with a plurality of approaches (Tauber *et al.*, 2011; Pires Machado & Oswald, 2020). *Zootaxa* was also a preferred journal for publishing various works related to fossil Neuroptera despite the presence of several other journals dedicated exclusively to fossil forms of insects. It is remarkable that about one fifth of all the contributions published in the Neuroptera + Raphidioptera and Megaloptera sections concerned the evolutionary histories and strategies of these insects. Also worthy of notice is an analysis of the evolution of termitophily among the Berothidae (Wedmann *et al.*, 2013), a revision of the fossil Mantispidae (Jepson, 2015), a morphological study of Paraberotherinae (Makarkin, 2015), and the phylogenetic significance of a species of Nevrothidae in fossil amber (Lu *et al.*, 2018).

Our knowledge of the systematics and evolution of the Megaloptera was significantly augmented during the past 20 years largely due to publications in *Zootaxa*, which provided an important platform for the research field of Megalopterology worldwide. The first paper of Megaloptera in *Zootaxa* was published by Xingyue Liu and Ding Yang in 2005, reporting the species of a fishfly genus *Neochondriodes* from Guangxi (southern China) with three of them new to science (Liu & Yang, 2005). From 2005 until 2020, there have been 48 papers on Megaloptera published in *Zootaxa* (three of them are open access). Most of these papers focus on the alpha taxonomy of extant Megaloptera, with description of one new genus and 49 new species. Additionally, many new distribution records and some taxonomic changes have been published in this journal. There are some noteworthy revisionary works, such as the revision of Megaloptera from Madagascar (Liu *et al.*, 2014), the revision of *Sialis* from the Oriental region (Liu & Yang, 2006), and the series of revisions of the species-rich corydalid genera *Protohermes* and *Neochondriodes* from Asia (Liu *et al.*, 2007a, b, 2009, 2010, 2013a, b, c). Contemporaneously, there were 68 new extant megalopteran species published in various other journals and books. The journals publishing the second largest number of new species of Megaloptera (17 species) are Systematic Entomology followed by Aquatic Insects (11 species). Biogeographically, the majority of the new megalopterans (44 species) published in *Zootaxa* were found from the Oriental region, while the few others were reported respectively from the Palaearctic (1 species), Afrotropical (1 species), and Neotropical (3 species) regions. A notable new finding published in *Zootaxa* concerns the new fishfly genus *Puri* Cardoso-Costa, Azevêdo & Ferreira-Jr, 2013 from Brazil, which is the only valid new megalopteran genus described since 2000 and represents the only record of the subfamily Chauliodinae east of the Andes from South America (Cardoso-Costa *et al.*, 2013).

Besides extant Megaloptera, there are three papers published in *Zootaxa* dealing with fossil megalopterans. One of those papers (Archibald & Makarkin, 2015) described a new genus of the family Corydasialidae, which is an extinct family originally placed in Megaloptera but currently assigned to the Neuroptera. A comprehensive review of the fossil Megaloptera was presented by Jepson & Heads (2016) in which two new genera of Corydalidae from the Lower Cretaceous of Brazil were described.

The taxonomy of megalopteran larvae, albeit being challenging, is another topic frequently tackled in recent years. *Zootaxa* has nine papers published describing the immature stages of Megaloptera. Among these papers, there are the first descriptions of the larvae representing four Asian endemic genera, i.e. *Acanthacorydalis* (Cao *et al.*, 2013), *Neoneuromus* (Cao *et al.*, 2016), *Anachauliodes* (Tu *et al.*, 2019), and *Indosialis* (Bowles & Contreras-Ramos, 2016). Besides, there are a few reports on the larvae of some species of *Chloroniella* (Martins & Contreras-Ramos, 2020), *Corydalus* (Azevêdo & Hamada, 2006, 2007), and *Ilyobius* (Archangelsky *et al.*, 2017).

Concerning the phylogeny of Megaloptera, one of the important contributions in *Zootaxa* refers to Contreras-Ramos (2011), in which the intergeneric phylogeny of Corydalinae and the interspecific phylogeny of *Corydalus* are reevaluated based on morphological data. There are also two papers describing the complete mitochondrial genomes of dobsonflies, with phylogenetic inference (Jiang *et al.*, 2015, 2016). DNA barcoding and species delimitation using

molecular techniques were applied in some taxonomic papers (Chang *et al.*, 2013; Yue *et al.*, 2015; Piraonapicha *et al.*, 2020). The remarkable sexual dimorphism in coloration of Corydalinae was first documented in this journal (Chang *et al.*, 2013).

## Material and methods

### The Author's Contract

To analyze the data relating to the presence of Neuropterida in *Zootaxa* we used the journal website and checked the results with the Lacewing Digital Library (Oswald, 2020). Neuropterida are specifically the subject of 222 publications, while they are cited generically in another twenty or so contributions.

Herein, we have used poetic license to slightly modify film titles by director Peter Greenaway for each section header of this note as a light-hearted means of providing data and reasoning on the value of the information content that has been published in *Zootaxa* on the taxonomy and other aspects of this group of insects.

## Results

### Drowning by Numbers

Although these data are not entirely complete, we know that a dozen manuscripts were rejected by us and earlier subject editors because they did not comply with the requirements of the “Information for the authors” section of the journal and another dozen were not accepted for publication after the peer review process; overall, therefore, 90% of what was submitted to the examination of the subject editors of the Neuroptera + Raphidioptera and Megaloptera sections was subsequently published. This high success rate is entirely due to the attention-to-detail in manuscript preparation and high quality of research conducted by the submitting authors, and strong and constructive reviews by the career field.

Curiously, a similar number of authors have submitted manuscripts addressing the Neuropterida during the past twenty years: to be exact, there were 199 authors. But, while the majority of these authors were responsible for one or a few published papers, there are ten authors who have submitted 10 or more articles to the journal (Table 1). Four of these top ten authors are from China, confirming the ever-increasing role of the Sinic school in neuropterological studies. More generally, we can see a shift of the center of taxonomic studies for Neuropterida from Europe to the Americas and East Asia. A further curious note is highlighted by the fact that this note is co-authored by two “extremes” of this participation: one of us (AL) has submitted this paper as a first contribution to *Zootaxa*, while the other (XL) has, by far, the highest number of publications on the Neuropterida appearing in *Zootaxa*. The third subject editor (DB) is also on the lower end with two publications in the journal.

**TABLE 1.** Ranking of the top ten authors in *Zootaxa* for Neuropterida.

Author name	Country	No. of contributions
LIU X. Y.	China	62
MAKARKIN V. N.	Russia	27
YANG D.	China	24
HAYASHI F.	Japan	19
ASPÖCK U.	Austria	17
ASPÖCK H.	Austria	14
REN D.	China	12
ARDILA CAMACHO A.	Colombia	11
TAUBER C. A.	U.S.A.	11
WANG X. L.	China	10

All currently existing families of Neuropterida have been included in papers submitted to *Zootaxa*, albeit in an unequal way. Corydalidae and Myrmeleontidae (if in the latter we include the Ascalaphidae based on a recent phylogenetic study of neuropterans, the ranking is reversed) are the first two families by number of specific studies (respectively 39 and 38 published papers). Especially noteworthy are the large number of studies (16) dedicated to the Osmylidae, a family that received very little attention until a few decades ago.

As expected, more than 70% of the papers published in *Zootaxa* refer to Neuroptera, a group that is much more taxonomically diverse compared to Raphidioptera and Megaloptera. The latter group, with comparatively much lower diversity, comprises almost a quarter of all the Neuropterida publications, thus again signalling the increasing contribution of Chinese scientists to this field.

Finally, as previously reported, it is noteworthy how one fifth of the papers on Neuropterida published in *Zootaxa* refer also or exclusively to fossil species. This is also not surprising, considering the high diversity of fossil forms for this group of holometabolous insects (Grimaldi & Engel, 2005).

## Discussion

### The Author, the Subject Editor, His Referee & Her Prudery

The high number of people who in recent years have coauthored contributions for the journal *Zootaxa*, the consistently high quality of these contributions, and the attention that these studies received from the rest of the community of researchers dealing with Neuropterida provide, on the whole, a positive scenario of this journal's influence over the progress of this field of study. This is particularly true of taxonomic advancements. The number of published citations of this research, as well as the impact factor of the journal, are testament as to the importance of this body of research.

It should be emphasized that, in the past, certain nomenclatural confusion slowed and made more complex a wider scope of research that took this group of insects into consideration (e.g., conservation and biodiversity studies).

This “positive feedback” of a growing body of high-quality research on the Neuropterida is essentially based on the proactive, careful and constructive collaboration between authors, editors and reviewers. This arrangement effectively serves as an unwritten contract to which a favourable interaction between these three elements is essential for a constant improvement of the quality of papers present in *Zootaxa* dealing with Neuropterida. The twenty-year stage of the journal's history is a good opportunity to reflect on the favourable and critical aspects of the situation.

Subject editors are occasionally forced to reject a limited number of contributions without peer review because they do not comply with the standards of the journal, and yet other submissions are rejected after the peer review process because sufficient issues are identified to make those papers unacceptable for publication in *Zootaxa*. Those latter rejected papers show how the relationship between authors and subject editors works to maintain high quality in the journal without sacrificing timely publication of acceptable papers. In this latter step of the process, the greatest risk of a paper being found unsuitable for publication is the inadequate attention to the linguistic properties of the research, although the research itself may be interesting and sound. That finding is why the editors strongly encourage pre-review of papers by someone with native English skills and experience.

A certain concern should be pointed out regarding the growing difficulty in finding willing reviewers of submitted manuscripts. We are perfectly aware (we too are often reviewers of papers sent to other scientific journals) of the time needed for a careful and useful revision that promote, where necessary, improvements to the paper itself, and that potential reviewers also may be asked to review manuscripts for other journals. It should also be noted that such laborious effort is often anonymous and goes without specific recognition or acknowledgement, but, in some instances, the reviewers identify themselves and their recommendations for improving a manuscript can be dutifully acknowledged by the authors. Nonetheless, it is with some concern that, as subject editors, we increasingly receive refusals from colleagues to our request to review submissions accepted for the review process—refusals often attributed to weak but unquestionable reasons. Although the standard is to have every submitted paper reviewed by at least two reviewers, we increasingly must settle for just one thorough review in order to avoid the work remaining unpublished or experiencing unjustified delays. The quality of the work for manuscripts submitted to *Zootaxa* remains strongly dependent on a sound and thorough peer review process. The future of high-quality papers related to Neuropterida published in *Zootaxa* strongly depends on a more positive and proactive response from all

the colleagues called to the task of reviewing the accepted submissions. Our expectation of the career field is that for every paper submitted for possible publication, contributing authors informally agree to serve as a reviewer of manuscripts submitted by others.

*Zootaxa* will certainly remain an active and important medium for reporting new findings on the systematics and evolution of Neuropterida as well as a stage for the researchers to exchange their ideas and results. Because species-level diversity of Neuropterida is becoming increasing better known from many parts of the world, the submission of taxonomic papers particularly for adults may start to decline. Conversely, with the advancement of molecular tools and techniques, we expect there may be more descriptive works of the immature stages of Neuropterida and life histories because those areas are presently limited using only morphological methods. Moreover, we welcome manuscripts on DNA barcoding and molecular phylogeny and related analyses. Finally, we are looking forward to seeing more manuscripts using integrative approaches (morphology, taxonomy, phylogeny, biogeography, palaeontology, and ecology) to investigate the evolutionary history of Neuropterida.

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