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Editorial

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Contributing to the progress of descriptive taxonomy

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- *Zootaxa* published on average 288 issues in 23,330 pages at the frequency of 2–3 times per week during 2006–2008
- *Zootaxa* published more than one monograph (of 60 or more pages) each week during 2006–2008
- Zootaxa published over 100,000 pages for over 5,000 authors from more than 100 countries during 2001–2008
- *Zootaxa* contributed 14% of all new taxa of animals indexed in *Zoologica Record* in 2007
- *Zootaxa* contributed 4 of Top 10 New Species published in 2007
- *Zootaxa* was featured in *Essential Science Indicators* for its citation achievements in August 2008
- *Zootaxa* published a cybertaxonomy exemplar paper with 12,559 hits during the first month of its publication in 2008

One of the fundamental quests of biology is discovering how many species inhabit the Earth. Yet the vast majority of the world's animal species are waiting to be discovered, named and described—estimates of the total number vary from 5 to 30 million. Most biologists would agree that taxonomy is important and fundamental to credible biology, and descriptive taxonomy is the most important task of taxonomy (Wheeler 2007). Unfortunately, the reality is that descriptive taxonomy has been marginalized since the mid-1950s and has sustained serious losses in funding and academic positions in universities and museums around the world, especially since phylogenetic and molecular studies became popular in the last twenty years. During this period, there has also been an important historical trend in taxonomic publishing—many journal publishers/editors have been making increasing demands on authors to provide phylogenetic analysis, molecular systematics, and other modern types of information in taxonomic papers. In addition, there are long publication delays and/or increasing page charges for many journals that do publish descriptive taxonomic papers. *Zootaxa* was founded in 2001 to provide a much-needed outlet for descriptive taxonomic papers and monographs that are difficult to publish elsewhere, and as a result has received tremendous support from taxonomists worldwide, despite the fact that it is a grass-roots project without support from government and institutions (Zhang 2006a). *Zootaxa* satisfied the publishing need of many zoological taxonomists, and sustained a period of rapid growth during 2001 to 2006 (Zhang 2006b). During the last two years, it has continued to grow in size, and especially in its impact, and has become a major force in reviving descriptive taxonomy on a global scale. Here I summarize some encouraging data on the growth of *Zootaxa* and its impact. I also comment on its contribution to the progress of descriptive taxonomy.

Growth in size and frequency

The growth of *Zootaxa* has been extremely rapid during the first six years: from 302 pages of 20 papers in 2001 to 22,052 pages of 1,020 papers in 2006 (Fig 1A, B). Thereafter, the number of papers and pages continued to increase, but at a much slower rate: e.g. the rate of increase in papers was on average 126% per year during 2002 to 1006 but only 6.5% during 2007 and 1008. It should be noted that during 2002–2006, the greatest rate of increase in papers occurred during the second and third years (435% and 150%, respectively), due to the low base numbers of papers in the first and second years when the journal was just launched. The rate of increase in number of papers dropped to 49% and 44% respectively in the fourth and fifth year. The inclusion of *Zootaxa* in ISI's database *Science Citation Index Expanded* in 2004 seemed to have attracted a sudden increase in the submissions of papers in late 2004 and early 2005, which resulted in the rate of increase of papers in 2006 bouncing back to 78% (although still much lower than those of the second and third year).

The frequency of publication increased from 15 per year in 2001 to 103 per year in 2004 (Fig. 2). It remained at about two per week (based on 50 weeks per year) during 2004 to 2006, and then increased gradually to about three per week in 2008. It should be noted that when *Zootaxa* was started, each paper was separately issued and printed until the end of the fifth year. In May 2005, short papers of fewer than 60 pages were no longer published separately; instead, they were grouped to form issues of 60, 64, or 68 pages to save paper, printing and mailing costs. Since then, *Zootaxa* has been publishing 5–6 issues twice or three times, of 467 pages each week.

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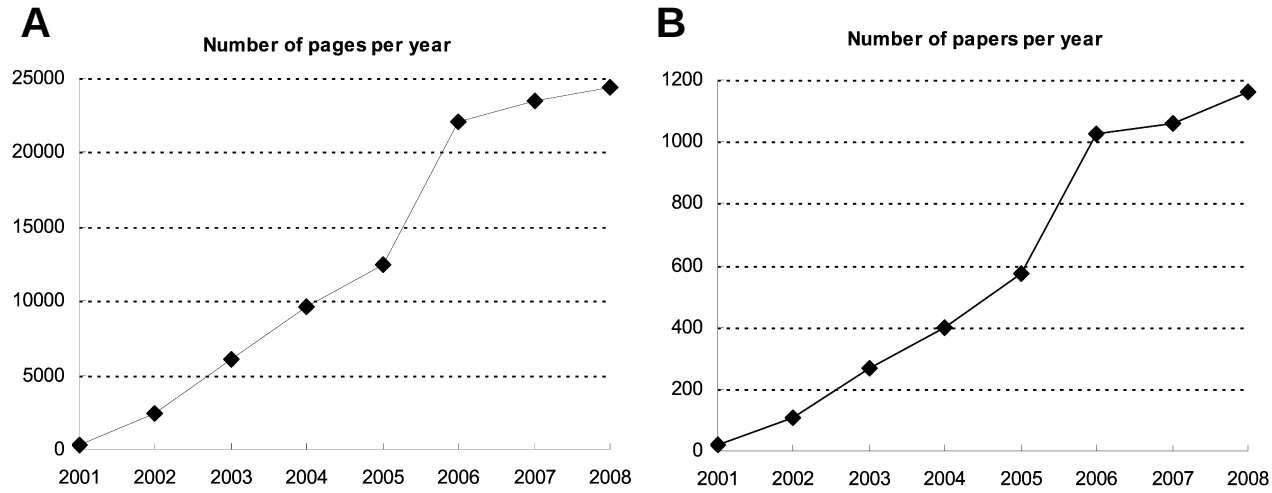

FIGURE 1. Growth of *Zootaxa* in size from 2001 to 2008: A) number of pages; B) number of papers (short notes fewer than 4 pages are not counted as papers).

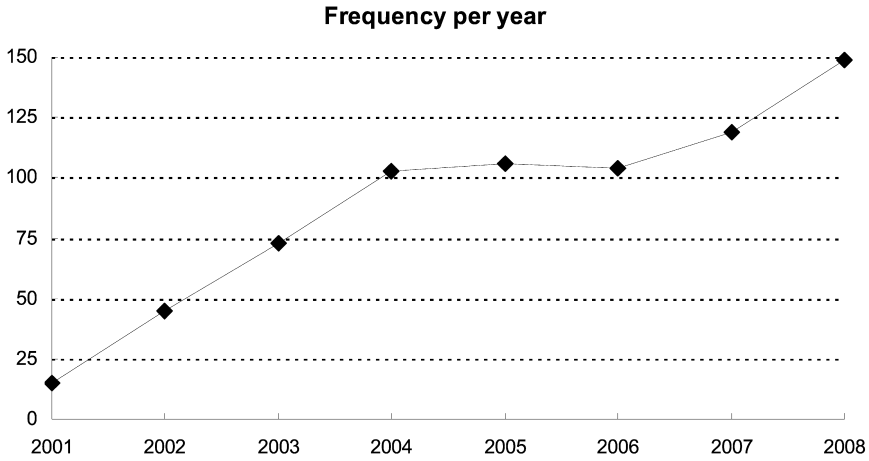

FIGURE 2. Frequency of publication (per year) of *Zootaxa* from 2001 to 2008.

Increasing contribution to descriptions of new taxa

The foremost task of descriptive taxonomy is the discovery and description of the other 90% of taxa yet unknown to science. The number of new taxa published in *Zootaxa* per year increased from 51 in 2001 (i.e. about 1 per week) to 2,547 in 2007 (i.e. about 51 per week) (see Fig. 3A). The total number of new animal taxa per year from all journals and books indexed in *Zoological Record* fluctuated between 17,548 and 19,495, with an average of 18,643 per year or about 373 per week[1] (Fig. 3A); overall, there was no obvious increase or decrease in the total number of new taxa per year, although the variation was greater during 2004–1007 than during 2001–1003. Because the number of new taxa in *Zootaxa* was increasing each year while the world total was more or less the same each year, *Zootaxa*'s contribution to the total new taxa described increased each year and by 2007 *Zootaxa* alone contributed 14% of all new taxa indexed in *Zoological Record* (Fig. 3B). It seems obvious that *Zootaxa* has filled an important gap in the decline of descriptive taxonomic papers published in many small journals during the last few years.

Another major benefit of *Zootaxa* is the concentration of a vast body of papers and new taxa in a single easy access journal that otherwise would be scattered in hundreds or even thousands of small journals/books, many of which may be expensive, difficult to access, and/or only available in large research libraries in developed countries. The new opportunity presented by *Zootaxa* is nothing short of revolutionary for the development of descriptive taxonomy at the beginning of the century of extinctions (Zhang 2006b).

1. It should be noted that a relatively small number of journals/books in 2007 might have been delayed in reaching *Zoological Record*'s office and new taxa therein have yet been indexed; also it should be noted that *Zoological Record* aims to be exhaustive but does not have a complete coverage of all publications.

FIGURE 3. Growth of *Zootaxa* in the number of new taxa published from 2001 to 2007: A) total number of new taxa published per year in *Zootaxa* versus total of new taxa of animals per year in all publications indexed in *Zoological Record*. B) *Zootaxa*'s new taxa per year as a proportion of the total new taxa per year in *Zoological Record*.

Developing impact as a mega-journal in taxonomy

Zootaxa became a mega-journal when the number of papers per reached 1,000 and the number of pages per year exceeded 20,000 (Zhang 2006b). In addition to its size, Zhang (2006b) emphasized two points: 1) it represented and involved the majority of scientists working in the discipline (over 2,700 in 2006) and 2) it published a significant number of the most important works in the subject area (58 monographs in 2006—over a monograph each week). It should be noted that Wilson (2004) estimated that there are about 6,000 taxonomists at work worldwide on all groups of organisms combined. *Zootaxa* continued to grow in the last two years: the number of authors exceeded 5,000 on 12 November 2008, while the total number of pages published in *Zootaxa* exceeded 100,000 on 5 December 2008. The number of monographs (with 60 or more pages) increased rapidly from 2001 to 2006 and then levelled off (Fig. 4). It should be noted that from 2007, the printed area of *Zootaxa*'s pages increased from 12 x 20 cm to 17 x 24 cm, which effectively makes a 100-page book in pre-2007 format to be about 80 pages in the 2007-format. Thus large monographic works in fact continued to increase in 2007 and 2008, although not as fast as during 2001–2006.

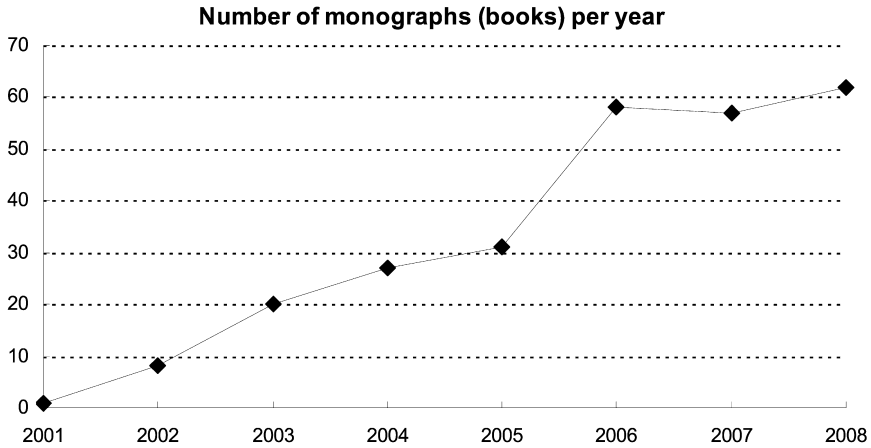

FIGURE 4. Number of monographs/books (60 or more pages) published in Zootaxa from 2001 to 2008.

Another important factor is the participation of a large number of editors who are volunteers; they are practicing taxonomists themselves as well as being editors ensuring the quality of papers in *Zootaxa*. This creates a community of people with shared values that is very important to the success of our science.

A commonly used measure of a paper's impact is the number of citations. Inclusion of *Zootaxa* in the *Science Citation Index Expanded* began in 2004 and the number of citations of *Zootaxa* papers rapidly increased from 2 in 2004 to 1,910 in 2008 (as of 16 Dec. 2008) (Fig. 5). In 2008, *Zootaxa* was named a Rising Star three times consecutively (May, July and September) by ScienceWatch.com based on its highest rate of increase in the number of citations among 392

journals in the ISI Animal & Plant Science Field (a large field with many high impact journals). In August 2008, *Zootaxa* was a Featured Journal from Essential Science Indicators (http://sciencewatch.com/inter/jou/2008/08aug-jou-Zoo/) for its citation achievements.

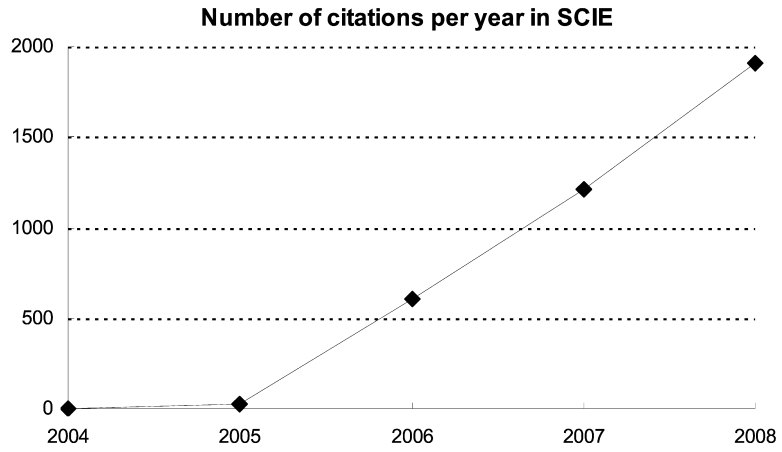

FIGURE 5. Number of citation of *Zootaxa* papers in ISI's *Science Citation Index Expanded* in size and frequency from 2004 to 2008.

Another measure of impact is the number of times the papers are accessed online by readers. Many papers in *Zootaxa* are very popular and far more so than papers in many more trendy comprehensive journals in Zoology. For example, Rich Pyle et al.'s (2008) cybertaxonomy exemplar paper describing 5 new species of fish—published on 1 Jan 2008 on the occasion of 250th anniversary of the officially recognized date of publication of *Systema Naturae* (Linnaeus, 1758)—was accessed 12,559 times during the first month of its publication. In comparison, the top paper in *Frontiers in Zoology* was accessed only a few hundred times each month (see http://www.frontiersinzoology.com/mostviewed).

Zootaxa has become the first choice for many authors to publish their important new species discoveries. Among the Top 10 New species published in 2007 (http://www.species.asu.edu/Top10), four are from *Zootaxa* (Doughty et al. 2007; Enghoff et al. 2007; Gershwin 2007; Meegaskumbura et al. 2007).

In multiple issues of *Zootaxa* published each week, we begin to see the transformation of the 250-year-old zoological taxonomy into a dynamic branch of zoology in this new era. For a relatively young journal of eight years, the future of *Zootaxa*, as well as taxonomy, is indeed very bright.

Acknowledgement

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