

Importance of taxonomic research for biodiversity of Korea

Wee-Haeng Hur¹, Chan-Ho Park^{1,*}, Gi-Sik Min², Chang-Woo Hyun¹, Eun Hee Bae¹, Jeong Hyun Lee¹, Eun-Hee Jung¹, Jung-Sun Yoo¹ and Suh, Min Hwan¹

¹National Institute of Biological Resources (NIBR), Incheon 22755, Republic of Korea

²Department of Biological Sciences, Inha University, Incheon 22201, Republic of Korea

*Correspondent: ddony@korea.kr

In 2012, the NIBR started publishing the Journal of Species Research (JSR) as an international specialized journal of biological taxonomy focusing on taxonomic research. JSR Volume 5 Number 3, to be published in October 2016, has been planned as a 'Special Edition on New and Unrecorded Species of Invertebrates in Korea', and so it consists of the reports of 149 new and unrecorded invertebrate species (including protozoa) discovered in Korea. In future, the JSR should further accelerate the use of such methods to generate valid data for new species and effectively support the compilation of 'National List of Species of Korea'. In this way, it will contribute significantly to enrich for biodiversity in Korea.

Keywords: Invertebrates, Journal of Species Research (JSR), biodiversity, Special Edition, taxonomic research

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DOI:10.12651/JSR.2016.5.3.261

It is estimated that there are approximately 8.7 million (± 130 million SE) species in the world (Mora *et al.*, 2011), but this is only an estimate, and the actual number of species discovered as of 2015 was 1.65 million (National Diversity Center, 2016), which represents only about 19% of this estimate. The discovery and recording of biological species is an important process and outcome of taxonomic research, which has progressed persistently worldwide since the establishment of taxonomic systems. Recently, focus on the economic value of biological species has led to each country using taxonomic studies, such as reports of new and unrecorded species, as evidence to claim sovereignty over indigenous species. This trend is making taxonomic research even more important.

When a new biological species that has never been recorded worldwide is discovered, it becomes a candidate new species. If a species is distributed in other countries, but is newly discovered in a country where it has not been recorded previously, it becomes a candidate unrecorded species for that country. It is only by valid publication in an academic journal or other published material that such a candidate species can receive official recognition as a new or unrecorded species. Following official recognition, the species is added to the official list of species for that country. These academic records

and valid data of species are the most certain form of evidence for claiming national sovereignty in international relations.

Approximately 100,000 indigenous species are estimated to inhabit the Korean Peninsula (Lim *et al.*, 2008), but the number of species recorded was only 28,462 as of 1996 (The Korean National Council for Conservation of Nature, 1996), and only 29,916 as of 2005 (Ministry of Environment, 2005). Hence, in an effort to find undiscovered species living in the Korean Peninsula, the Korean Ministry of Environment launched the 'Discovery of Korean Indigenous Species' in 2006. The National Institute of Biological Resources (here after NIBR) was established in 2007, and has taken the lead on this project in addition to 'The Compilation of National List of Species of Korea'.

Through these projects, a large number of new and unrecorded species have been discovered and added to 'National List of Indigenous Species of the Korea', increasing the total number of species to 45,295 as of 2015 (Table 1). This number represents a considerable increase in the number of indigenous species in the Korean Peninsula in 2015 compared to 1996 and 2005 (Fig. 1).

NIBR's 'Discovery of Korean Indigenous Species' and 'Compilation of National List of Species of Korea' proj-

Table 1. The number of species in the National List of Species of Korea, and the number of candidate new and unrecorded species discovered through the 'Plan for Discovery of Korean Indigenous Species', by taxa.

Taxa	Number of species in 'National List of Species of Korea' (NIBR, 2015)	Results of 'Discovery of Korean Indigenous Species' from 2006 to 2015 (NIBR, 2016)
Prokaryotes	1,369	2,994
Fungi-Lichens	4,686	803
Algae	5,725	1,531
Plants	5,349	221
Insects	16,447	2,237
Invertebrates (including protozoa)	9,758	2,775
Vertebrates	1,961	98
Total	45,295	10,659

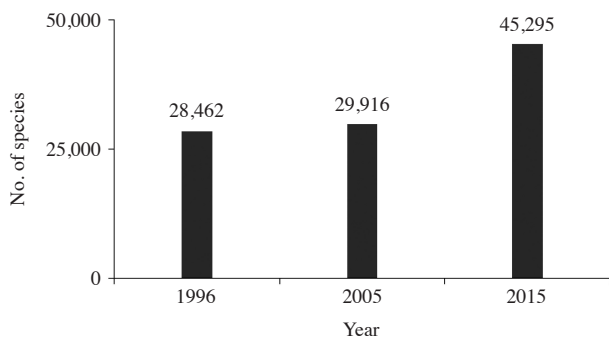


Fig. 1. The number of species reported in Korea as of 1996, 2005, and 2015.

ects made a significant contribution to this increase in the number of species. From 2006 to 2015, the 'Discovery of Korean Indigenous Species' led to the discovery of 10,659 candidate new and unrecorded species (Table 1). Of these candidate species, those that were published in academic journals and officially recognized as new or unrecorded species were added to 'National List of Species of Korea'. Even now, a considerable number of candidate species discovered by this project is in the progress for academic publication in order to be recognized as official species.

In 2012, NIBR started publishing the Journal of Species Research (here after JSR) as an international specialized journal of biological taxonomy focusing on taxonomic research. Thus far, a total of 12 issues, including 2 issues each of volumes 1-5 and 2 special issues, have been published. During that time, the journal has played a major role as a site of publication for taxonomic research results and has enabled official recognition of candidate new and unrecorded species.

Table 2. The number of new and unrecorded species published in JSR.

Taxa	Vol. 1 No. 1 ~ Vol. 4 No. 2	Vol. 5 No. 1 ~ No.2	Vol. 5 No. 3 (Special Edition)	Total
Prokaryote	148	236	—	384
Plants	12	3	—	15
Invertebrates (including protozoa)	70	31	149	250
Total	230	270	149	649

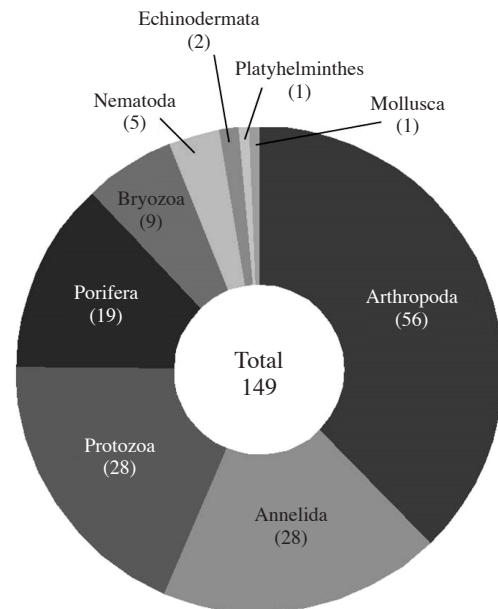


Fig. 2. Taxa composition of new and unrecorded invertebrate (including protozoa) species in JSR Volume 5 Number 3 (parenthesis indicates number of species).

With the publishing of Volume 5 Number 2 of JSR, a total of 500 new or unrecorded species, including 384 prokaryotes, 101 invertebrates, and 15 plants species have been officially added 'National List of Species of Korea' (Table 2). JSR Volume 5 Number 3, to be published in October 2016, has been planned as a 'Special Edition on New and Unrecorded Species of Invertebrates in Korea', and so it consists of the reports of 149 new and unrecorded invertebrate species (including protozoa) discovered in Korea.

The 149 new or unrecorded invertebrate species included in JSR Volume 5 Number 3 broadly consist of 56 species of Arthropoda, 28 species of Protozoa, 28 species of Annelida, 19 species of Porifera, and so on (Fig. 2). Together with the 270 new and unrecorded species included in Volume 5 Numbers 1 and 2, these species will be officially added to the 'National List of Species

of Korea' in 2017. Given that there are more new and unrecorded species that have been reported in other journals, the number of species on the 2017 'National List of Species of Korea' can be expected to increase by at least 419 from that in 2016 (Table 2).

Following the special edition on invertebrates for Volume 5 Number 3, the JSR plans to continue pursuing the publication of further special editions or issues on other taxonomic groups, such as plants and insects. This should contribute significantly to enrich for biodiversity in Korea, by accelerating the generation of valid data for new species and effectively supporting the compilation of the "National List of Species of Korea."

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Submitted: September 30, 2016

Revised: October 12, 2016

Accepted: October 13, 2016