

Prologue

Biodiversity is deteriorating worldwide. According to the United Nations Environment Programme, biodiversity loss, alongside climate change and pollution, represents one of three major global crises. The 15th meeting of the Conference of the Parties to the Convention on Biological Diversity adopted the Kunming-Montreal Global Biodiversity Framework, which sets goals and targets for the next decade and 2050 to ensure that biodiversity loss is reversed. Understanding biodiversity is the first prerequisite for biodiversity research and conservation. The advancement of biodiversity informatics, biodiversity distribution data provides a robust support for biodiversity research and conservation. It notably facilitates the study of large-scale biodiversity patterns, conservation planning, biodiversity response to global change, and the prediction of invasive alien species dispersal. Creating a species checklist is the primary task in understanding biodiversity spatial-temporal patterns and a critical first step in the field of biodiversity informatics. It is essential for biodiversity conservation, research, management, monitoring and sustainable use. Additionally, the number of native and exotic species serves as a crucial statistical indicator of a country's biodiversity.

Asia is one of the richest continents in terms of biodiversity. With its myriad ecosystems and climatic zones, Asia stands as a global hotspot for plant diversity. The continent boasts an awe-inspiring array of flora, encompassing a wide spectrum of life forms, from the smallest mosses to the towering trees, and from delicate wildflowers to robust grasses. The variety of plant species in Asia reflects the continent's geographic expanse and the complex interplay of ecological, geological, and climatic factors.

However, plant cataloguing and the availability of occurrence data in Asia remain inadequate. In response to this, Mapping Asia Plants (MAP) was initiated at the Working Group Meeting of the Asia Biodiversity Conservation and Database Network (ABCDNet) in November 2015, organized by the Biodiversity Committee, Chinese Academy of Sciences (CAS). MAP aims to establish an online data platform for Asian botanical information, providing comprehensive foundational knowledge and an interdisciplinary data mining environment for the conservation and research of Asian plant diversity. The first step of MAP is to establish a database on the inventory and distribution of plant species in Asia and to develop an online platform for data management and mining. The plant species checklists and their distribution database are the cores of MAP at its current stage. The main sources include:

1. Floras, plant checklists and related publications;
2. Plant distribution maps;
3. Plant specimens, including photographs of plants with reliable identification;
4. Vegetation survey plots;
5. Plant investigation data;
6. Plant observation data, including data published by plant enthusiasts and parataxonomists;
7. Digitized online datasets.

Through cooperation with experts from many Asian countries and beyond, MAP overcame multiple language barriers, compiled research progress on plant diversity in Asia, integrated the floras and checklists, and established a database of Asian plant species. A series of plant species checklists have been completed and will be gradually released. According to our current research progress, there are 435 families, 6,838 genera and about 119,000 species (excluding subspecies) in Asia. Based on the plant species

checklists, a comprehensive data platform will be further developed to support research on plant ecology, evolutionary botany, plant geography, conservation biology and global change biology. It is also planned to create a data clearing and mining kit and an analysis platform for plant species distribution maps, plant diversity distribution maps, the revision of plant names and species distribution models.

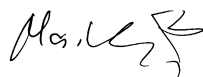
For a plant species checklist developed based on multiple sources, it is essential to perform taxonomic cleaning against a standard global plant checklist. Several global species checklists created by taxonomists are available for this purpose, such as Leipzig Catalogue of Vascular Plants, the World Checklist of Vascular Plants, World Flora Online (successor of The Plant List, TPL), World Plants and Catalogue of Life (CoL).

In this series of checklists, we present a meticulous compilation of plant species, organized taxonomically into families, genera, and species, with additional details on subspecies and varieties where applicable. The aim is to provide researchers, botanists, conservationists, and enthusiasts with a valuable resource for understanding and appreciating the remarkable flora of the Asian continent.

The MAP series presents the first-ever Asian catalogue for liverworts (Marchantiophyta), hornworts (Anthocerotophyta) and mosses (Bryophyta). It includes 2,777 species in 246 genera, representing 74 families from the two phyla of liverworts and hornworts. For mosses, the catalogue includes 4,039 species in 597 genera, representing 99 families. In the checklist of North Asia, there are 162 families, 1,151 genera, 6,459 species of vascular plants. Central Asia's checklist includes 139 families, 1,198 genera and 9,643 species of vascular plants. Related research has advanced in Southeast, South and West Asia, where plant biodiversity research is more complex, making it more challenging and time-consuming to complete the species checklist. To complete the MAP series, we conducted extensive data collection, and taxonomic literature review. Several review papers have been published for South Asia, West Asia, Central Asia, Northeast Asia and Russia respectively.

China, as one of the megadiversity countries in the world, plays an extremely important role in biodiversity conservation. China accounts for 21.5 % of Asia's land area and 35 % of Asia's plant species, and has published the world's largest flora. Meanwhile, China has established several platforms such as the BioONE (An Integrated Big BioData Infrastructure for CASEarth) and the National Specimen Information Infrastructure (NSII), which covers plant distribution data in China and many nearby countries. Based on these achievements, we have gained a comprehensive understanding of plant diversity in Asian countries, laying the foundation for biodiversity conservation and research at the regional level in Asia. Our work was supported by the Bureau of International Cooperation, CAS, the Alliance of International Science Organizations (ANSO) (ANSO-PA-2020-10), the Strategic Priority Research Program of CAS (No. XDA19050404) and the Southeast Asia Biodiversity Research Institute of CAS.

However, due to factors such as language barriers and the discovery and publication of new plant species or revisions of certain taxa, the MAP series may not be perfect publication at the moment. Suggestions and comments from all colleagues and experts are sincerely welcome to keep the checklists updated.



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