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book review

Definitive guide to China's woody plants

Atlas of woody plants in China: distribution and climate, by Fang Jingyun, Wang Zhiheng, Tang Zhiyao

2011, Springer / Higher Education Press, 2000 pp. ISBN: 978-3-642-15016-6

Price: £449.50 / \$670.00 / €499.00 (Hardcover); <http://www.springer.com/>

The sheer magnitude of the accomplishment represented by these two mammoth volumes is difficult to convey. Some descriptive information might begin to give an impression: it weighs nearly 3 kg, with over 2,000 pages and 11,427 figures. It covers the distribution of 11,405 taxa of woody plants across the entire land area of the world's third-largest country, one with more plant species than North America and Europe combined. Impressed yet? Three editors recognise 22 other contributors and 21 reviewers of focal areas. Though the plan was long in gestation, the work formally began in 2003, with no specific financial support, which fortunately came later through the National Natural Science Foundation of China, and the database was eventually completed in 2008.

The taxa are divided into 170 families and 1,175 genera, including 1,355 subspecies, based primarily on the Flora of China. There are 3,165 trees (defined as > 4 m in height), the remainder being largely woody shrubs (6,735) and vines (1,035). Cultivated plants are excluded, although this information is available elsewhere (e.g. the Vegetation Atlas of China). Pleasingly, 470 bamboo species are also incorporated, which is helpful given their importance to the dynamics of oriental forests. The most speciose genus is *Rhododendron*, its 624 species reflecting their Himalayan origins. Meanwhile, the idea of 331 *Salix* species is intimidating to those of us who still struggle with their more modest diversity in Europe. Surprisingly, only two extant endemic woody plant families occur in China: Eucommiaceae and Ginkgoaceae. Families are arranged according to the Flora of China – making this an ideal companion tome – with alphabetical order within. The family names are clearly marked at the tops of pages with thumbnails that are mostly clear examples of representative specimens. The index seems com-

prehensive and random checks suggest it to be accurate.

Data-gathering used all available sources, including floras, checklists, monographs, published articles, distribution records based on herbarium specimens, and consultation of local experts. Some judgement was applied in assessing county-level presence; while some taxa remain sporadic in their distribution, widespread species with gaps in their distribution had these filled in if it seemed that false absences were the most likely cause. Administrative units naturally vary in size and the intensity of sampling that has taken place within them, but this work represents the best possible collation of present knowledge.

What information does it contain? In the main section, six species are covered per page. Each has a distribution map which is necessarily restricted in size (5.7 x 8.2 cm). The latitudinal extent, from the southern shore of tropical Hainan, over 4,000 km northwards to the boreal border of the Amur river (*Hēilóng Jiāng* to the Chinese), is covered in under 6 cm (the islands of the South China sea are placed in an inset map). Moving from the western border at the foot of Gora Kumdandy, across the Taklimakan desert, through the Tian Shan range then on to the eastern tip by Khabarovsk, a trip of nearly 5,000 km, is accomplished in 7 cm. This degree of contraction is a necessary cost to fitting so much into the books, and the quality of printing is suitably high, though it means that the fine resolution of the underlying data is not readily accessible from reading the maps.

For each species, the atlas gives the mean and range of 13 environmental variables based on county-level averages drawn from the WorldClim website (<http://www.worldclim.org>). These include measures of temperature (mean annual, mean of the coldest and warmest months, annual biotemperature [the sum of monthly mean tem-

peratures for all those with a mean between 0–30°C], warmth and cold indices [the sum of monthly mean temperatures above and below 5°C respectively] and potential evapotranspiration), water availability (annual precipitation, precipitation in the warmest and coolest quarters of the year) and combined measures (moisture index, actual evapotranspiration, vegetative net primary productivity).

A publication of this scope carries with it a price-tag to match; at €499 it is likely that only those with a direct interest, or a particularly generous budget, will be able to afford it. Those who do will no doubt be rewarded with data that could simply not be obtained elsewhere. Perhaps this is its ultimate selling point – exclusivity. Most biogeographers would dream of access to this volume and quality of data.

It is therefore difficult, even churlish, to be critical of a publication of this scale. And yet... perhaps it is a mark of how much the landscape of science has changed that this set of volumes, which would have inspired awe when their first outline was drafted, now seems slightly dated in approach. The European publishers have no plans to make a digital or online edition available. This seems to be an enormous oversight, not simply because of the expense of the printed issues, but mainly because a searchable database from which information could be extracted would be a far more intuitive means of presentation. Of course, the dedicated researcher could trawl through each species and transcribe the information themselves, but this would test the devotion of even the most committed graduate student, while the rest of us simply don't have the time. A database exists and is described by the authors, with ac-

companying images, though it would seem to have been compiled in Chinese. The authors' website provides further details but at the time of writing it is not accessible online.

If you can afford these books then they will certainly reward you with more information than a lifetime in science could handle, though sadly not in a form that makes them readily accessible to the synthetic analyses that a biogeographer might hope to perform. I can only implore the authors and publishers to explore alternative means of publication as therein lies the potential for this work to receive the acclaim it deserves, as a landmark accomplishment that will transform our understanding of the biogeography of the Asian mainland. There is astonishing potential for visualising gradients in vegetation composition, predicting the impacts of climate change, testing for the signals of past glaciations... there is so much that could, and should, come from this work. It deserves to be used, to be cited, to be celebrated. Until the data are presented in a form that makes it possible for an international audience to extract and appreciate them, I fear these mighty tomes may gather dust, and their authors will have to wait for the plaudits which they richly deserve from a grateful worldwide community of researchers.

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