

## Analyses d'ouvrages / Book reviews

STOYKO S. & KOPACH V. 2012. — *Centenary of Establishment of the Primeval Forest Reserves in the Ukrainian Carpathians*. Bilingual Ukrainian/English. “MAB” UNESCO Programme, second edition. Printer TzOV “Prostir-M”, L'viv, 61 p., 40 figs.

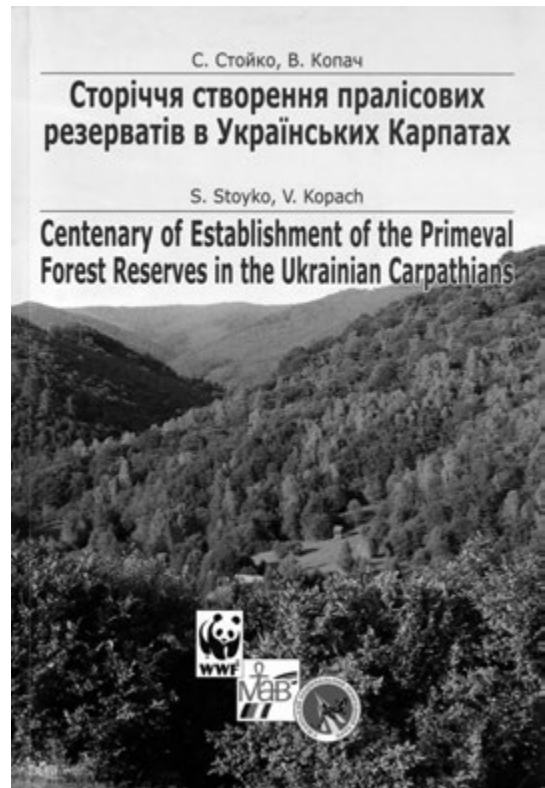
ISBN: 978-966-397-163-2.

Format: 24.3 × 16.6 cm. No price.

Pdf available at: [http://awsassets.panda.org/downloads/pralisy\\_indd\\_\\_1\\_\\_1.pdf](http://awsassets.panda.org/downloads/pralisy_indd__1__1.pdf)

This booklet is a bright introduction to the study of temperate primeval forest ecosystems, exemplified by Ukrainian Carpathians. After a detailed historical report about the sudden awareness of their meaning and the actions taken for avoiding or at least delaying their degradation, the authors provide a sound analysis of vegetation belts on different slopes, with an emphasis on the vertical forest architecture (including grass and moss layers), relationships with fauna, age pyramid of dendroflora and state of health. Then the Uzhanskyi National Nature Parc (39 159 ha, 220-1250 m a.s.l.), related to the Tysa-Danube basin and established in 1999, is entirely described by defining carefully all the distinctive plant associations in tight link to climatic and soil parameters. Several relict phytocoenoses are pinpointed, illustrating the complex postglacial history, as well as the genetical diversity of the region, which will be undoubtedly a significant resource in a next future.

The most striking feature is that these primeval ecosystems were highly threatened since only 150 years ago, especially with the penetrating rail network, which promoted logging and intensive farming. However they are of an uppermost interest for improving forestry practices as they exhibit the natural succession processes. By their structural and phytocoenotic alterations, they express moreover any climatic change, thus allowing a long-term monitoring of global warming. It is needless to remind they are also the convenient frames for monographic studies, such as recent ones published about the oak and beech forests (Stoyko 2009; Parpan *et al.* 2013).



The fervour and courage of the foresters and botanists, not only Ukrainian, but also Hungarian, Slovakian, Czech and Polish, should be highly admired, considering the dreadful events suffered by this whole region, particularly during the World War II. They contributed, sometimes even by their death, to the establishment of the first in Europe trilateral biosphere great reserve (East Carpathians, c. 208 090 ha).

This work is very accessible to a wide range of people, due to its simple and concise style, informative pictures, clear tables, diagrams and maps. It should be of interest for anyone wishing to understand quickly and exactly the numerous stakes (ecological, economical, educational, aesthetical, and so on) of preserving natural landscapes.

The fine editorial work is to be commended as illustrating the long academic history of Lviv.

Thierry Deroin

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STOJKO S. M. 2009. — *Oak forests of the Ukrainian Carpathians: Ecological Peculiarities, Restoration, Conservation*. Printer TzOV "Prostir-M", Lviv, 219 p. ISBN: 978-966-7563-19-6 (in Ukrainian).

WANG X. 2010. — *The Dawn Angiosperms. Uncovering the Origin of Flowering Plants*. Lecture Notes in Earth Sciences 121. Springer, Berlin, Heidelberg, 236 p., 101 figs, 4 tables.

ISSN: 0930-0317;

978-3-642-01160-3;

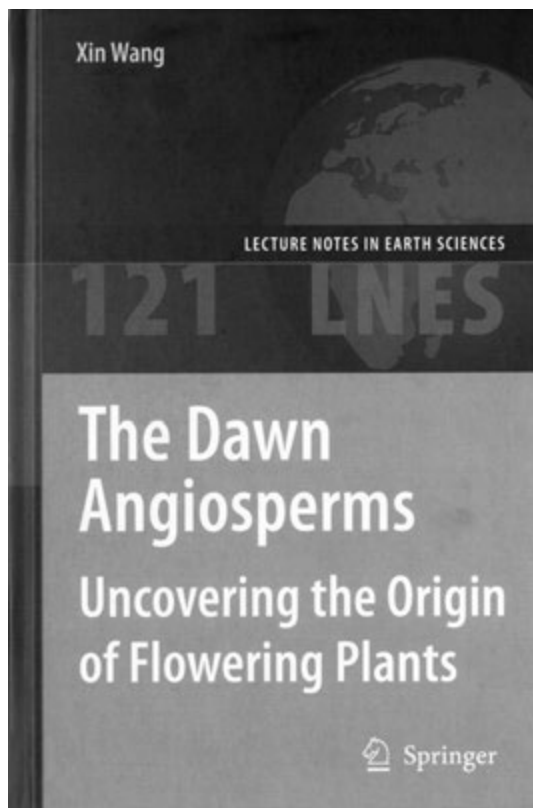
e-ISBN: 978-3-642-01161-0;

<http://dx.doi.org/10.1007/978-3-642-01161-0>.

Format: 24 × 16 cm. Price: 77.12 €.

As remarked and repeatedly reminded by Bruce Cornet in his stimulating website (2014), the "abominable mystery" of the angiosperms birth results mainly from our bad knowledge of the Mesozoic floras. In this context, publishing a synthetic and enriched study about recent discoveries of angiosperm-like fossils from the Jurassic and early Cretaceous (125-199 Ma) – even in an area almost surrounded to North-East China – appeared as very opportune.

The book is rather logically divided in three parts: the three first chapters (p. 1-27) set out the main available data on the problem; the chapters 4-7 (p. 29-161) are a detailed description and interpretation of 7 puzzling genera: *Chaoyangia*, *Archaeofructus*, *Simocarpus*, *Callianthus*, *Schmeissneria*, *Xingxueanthus*, *Solaranthus* and a brief discussion about two incompletely known taxa from the JiuLongshan Formation (Inner Mongolia, >164 Ma); the chapters 8-9 (p. 163-194) deal with the possible consequences for our understanding of the floral mor-



phology of extant angiosperms and especially of the right nature of carpel. The final chapter (p. 195-212) gathers all data used for cladistic analysis, datation and ecological reconstruction. An extensive bibliography is also provided.

Without any doubt, the best part is the central one, which is a splendid statement of the most up-to-date paleobotanical methods applied to hard specimens, often deceiving at a first glance, revealing then significant and rather unexpected features, e.g., the discovery of a hermaphroditic flower-like structure in *Callianthus* from Barremian strata (c. 125 Ma). The usual arrangement (tepals/stamens/gynoecium) may be already recognized, ovules were however not preserved. Carpel-like organs were surprisingly embedded in a fleshy cupule, which possibly intervened during pollination or/and fruit set (perhaps as the stylopodium in Apiales). The apices of anther were crowned by bristles, while perianth was similar to a magnoliaceous one. Female flower-like reproductive organs were described in the genera *Schmeissneria* and

*Xingxueanthus*, in which perianth is reduced to three tepals or even one bract. The gynoecium exhibited a seemingly classical architecture, with a hollow ovary containing few ovules, a very short stylar region and a stigma. In the both genera placentation was axile, ovules being inserted at the base of a transverse septum in *Schmeissneria* (so with two locules) or along a central column in *Xingxueanthus* (like in many extant caryophyllaceous genera, where an early fading of the septa happens during the ontogeny). Unfortunately, vasculature is too poorly preserved in these fossil prints: right ovular connections as well as vascular network in the ovary wall cannot be detailed enough for ascertaining any homology with a carpel, although the functional equivalence is wholly demonstrated.

It is thus astonishing that, after a careful introduction, the author left any caution by claiming these female structures were built by true carpels (e.g., in *Chaoyangia* p. 47, 56 and 64). More advisable appears a previous and strong remark of Meyen (1973: 227), which should be given here in full: "Thus, referring to fossil material does not in and of itself guarantee against mistakes and contradictions. Moreover, the mistakes made by means of interpretation of paleobotanical data may be even more dangerous, since in this case a statement, being in reality speculative, appears to be based on direct facts. The cause of these mistakes may be in: 1) the incompleteness of the fossil record; 2) the imperfection of our knowledge of already known plants; 3) the incorrect (biased) interpretation of fossil remains, disregarding the possible isomorphism of forms and structures in various taxa; and 4) inadequate attention to the accurate dating of fossil records."

It should be added that fossilization occurred only in peculiar ecological conditions (so only highly specialized taxa became fossilized), and that immediate ancestors of angiosperms were indeed not angiosperms. Besides none of the described Mesozoic genera may be brought nearer of any extant angiosperm order, even if vegetative morphology (badly or not known) is taken in account. Thus *Callianthus*, *Schmeissneria* and *Xingxueanthus* were outstanding genera, whose reproductive structures were functionally comparable to those of angiosperms, but their status of ancestors is in no way proven, they might express parallel evolutive trends as well. It is anyway puzzling *Schmeissneria* leaves reminded those of Ginkgoales (p. 94), while

the hermaphroditic *Solaranthus* "flower" (p. 149) was somewhat convergent with a peltate sporangiophore of *Equisetum*. In fact characters now linked to sharply distinct phyla of vascular plants were – or appeared to be – combined in some Mesozoic taxa (a comparable situation was yet recognized elsewhere, e.g., in fossil Mammals).

From a theoretical viewpoint, the occurrence of an axile placentation in female fossil structures suggests that angiospermous carpel might be evolved from an ontogenetical fusion of a branched ovuliferous axis with a sterile phyllome, a process closely recalling the "Carpel polymorphism" of Edith Saunders, a theory – not even cited here (e.g., in p. 177) – which might so regain some interest. However extant carpels grow as morphogenetical units, no dissociation between axial and axillary organs may be seen inside, neither in the usual, nor in teratological cases.

Considering this fact, the chapter 8 "Making of the Flower" seems much debatable, as it is meaningless – even in the scope of the author – to distinguish between carpel and placenta, because morphologically carpel = placenta + phyllome. In another hand, the carpel was always well and passionately discussed since its definition by Dunal in 1817, a fine contribution covering a large part of its history was published by Claudia Brückner in 1991. It is wholly wrong (see also p. 64) that a "traditional orthodoxy" is forced in phytomorphology, in which "the conduplicate carpel of *Magnolia* is taken as the archetypal carpel". No reference is provided as a support, and probably few might be brought considering the high specialization of the gynoecium in this genus, with few ovules supplied by the median carpel bundle, while their stipes are fused in a so-called stretched receptacle (Derooin 1999). What is currently named "carpel" in *Magnolia* is only the upper prominent and ovuliferous part of it. It is so a pity that *Magnolia* carpel was hastily reinterpreted in a recent paper (Liu, *et al.* 2014) in the framework of the "Unifying Theory for Flower Formation" (p. 181), which appears to be mainly based on few and incompletely known fossils. These puzzling specimens should indeed take place in a discussion on the origin of angiospermy, but they are not liable to revolutionize deeply the phytomorphological research, because even striking func-

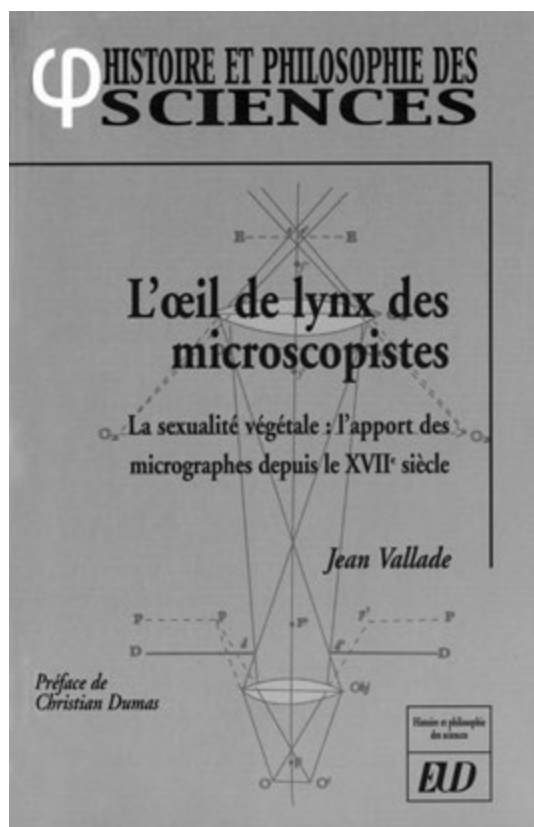
tional convergences do not mean true homologies without other firm proof.

In conclusion, this book is an interesting report, written in an unaffected style, well illustrated and setting out some challenging ideas, yielding new working hypotheses if read critically. Peculiarly, it strongly suggests the ovules were not bore by the ancestral carpel, but only sheltered by it. Such an assumption should be thoroughly examined in the future, considering that developmental genetics is somewhat different for carpel and ovules (p. 174), and that even in few extant gynoecia occurrence of additional ovules seemingly unrelated to usual carpels was yet recorded (Dupuy & Guédès 1975), or suggested (Deroin 2014).

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VALLADE J. 2008. — *L'Œil de lynx des microscopistes. La sexualité végétale : l'apport des micrographes depuis le XVII<sup>e</sup> siècle*. Préface de Christian Dumas. Collection « Histoire et philosophie des sciences ». Éditions universitaires de Dijon, 337 p., 35 figs.

ISBN : 978-2-915552-99-7.

Format : 23 × 15 cm. Prix : 20 €.

Cet ouvrage est remarquable par trois aspects : son thème, rarement abordé sur un plan historique jusqu'ici, et de façon beaucoup trop brève pour être exacte (Guyénot 1941); son traitement très pédagogique, avec un bon emploi des parallèles, retours en arrière et répétitions; enfin par les perspectives offertes au lecteur grâce à sa structuration en outil de recherche et de réflexion. Le sous-titre même ne désigne que le thème central du livre, mais le contexte historique est bien introduit (p. 21-32) et les développements actuels sont décrits en détail (p. 276-290).

Loin des simplifications habituelles, Jean Vallade nous rappelle que la priorité du chercheur est d'établir des faits – même peu étendus – et de les comprendre le mieux possible (on pense ici à Jean Rostand, 1967), non d'édifier une théorie du Tout : les généralisations – du reste toujours partielles – sont certes souvent l'œuvre de quelques individus (par ex. Wilhelm Hofmeister pour l'alternance des générations, ou Léon Guignard et Sergius Nawaschin pour la double-fécondation), mais elles sont préparées par un long travail effectué par une foule de découvreurs, auxquels l'Auteur rend pleinement justice (par ex. Pringsheim, de Bary, Suminski). Ces pionniers ont travaillé constamment à la limite des possibilités techniques (instruments, préparation des spécimens), méthodologiques (concepts) et même terminologiques (a-t-on les bons termes pour désigner des faits nouveaux ?). L'histoire de la recherche est faite de prémonitions, de découvertes, mais également de régressions et d'erreurs, dont le rôle positif ne peut être sous-estimé : obligeant à se concentrer sur certains objets celles-ci apportent de nouvelles informations et conduisent à choisir des matériels (biologiques et techniques) plus appropriés.

Le texte, d'un style agréable, accorde une large place aux citations originales et insiste sur des caractéristiques majeures de la recherche botanique du XIX<sup>e</sup> siècle, à savoir l'impact des traductions intégrales des travaux en allemand, effectuées par les chercheurs eux-mêmes (notamment Brongniart et Van Tieghem) et publiées rapidement dans les grandes revues françaises (comme les *Annales de Sciences Naturelles*), ainsi que l'importance du dessin scientifique illustrant les observations et leur interprétation. Enfin, beaucoup de cytologistes examinent en même temps du matériel animal (par ex. Strasburger, p. 133), ce qui élargit encore le champ des comparaisons. Les grandes avancées techniques (microscopes d'Amici vers 1830, sections sériées à

la paraffine à partir de 1880) sont, en ce domaine, décisives pour comprendre les processus de la fécondation et la nature des tissus préparant et accompagnant l'embryon. À cet égard, les pages sur l'albumen (p. 159-164 et 287-290) témoignent d'une réflexion théorique très approfondie et, disons-le, exceptionnelle.

La haute qualité de ce travail transparait tout autant dans la précision des légendes des figures, l'abondance des notes infrapaginales, et même dans l'importance de ses annexes (p. 291-333) : 386 références bibliographiques – dont 68 travaux généraux ou d'histoire des sciences –, six pages de repères chronologiques (1440-1909), un glossaire de 210 entrées définies le plus souvent en deux-trois lignes, un index des auteurs et enfin une table des matières très détaillée. Autant d'instruments qui se révéleront utiles non seulement à l'historien et au chercheur, mais sans doute plus encore aux étudiants de biologie, car ils permettent une initiation concrète à la démarche scientifique, autour d'un thème bien défini.

Nous ne pouvons guère conclure de meilleure façon, qu'en reprenant les mots du Professeur Dumas dans sa préface (p. 12) : « (...) cet excellent ouvrage fera date dans l'histoire des sciences, dans celle du végétal en particulier ».

Thierry Deroin

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