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Book Review

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Smut Fungi of the World

The American Phytopathological Society, St. Paul, Minnesota, USA, 2012, 1480 pp. b/w, 650 figs., 2800 microphotos, hardcover. – ISBN: 978-0-89054-398-6.

Smut fungi are obligate plant parasitic microfungi almost exclusively parasitising seed plants. A total of 1,688 species are known to date, but the estimated number of smut species worldwide is 4,500. Many smuts are rare with every fourth species only known from its type locality. Other species are very important as crop pests. All this makes them interesting for research. In the past decades, their ecology, taxonomy and phylogeny have been investigated quite intensively, resulting in many taxonomic changes on the species and higher levels.

Smut fungi are defined differently, depending on the author. According to Vánky, smut fungi are a polyphyletic group, including the "classical" basidiomycetous smut fungi possessing teliospores, i.e. Ustilaginomycetes and Entorrhizomycetes, partly Exobasidiomycetes, and the rust-related Microbotryomycetes. The book does not contain parts of the Exobasidiomycetes (*Exobasidiales*, *Ceraceosorales*, *Malasseziales*), and within the *Microstromatales* the families *Microstromataceae*, *Quambalariaceae* and *Volvocisporiaceae* are missing. A monographic overview of important genera such as *Exobasidium*, *Graphium* and *Microstroma* is thus still missing.

The monograph of smut fungi is the lifework of mycologist and trained physician Dr Kálmán Vánky (born 1930). He used to collect, take photographs and examine smut fungi using his microscope first at home in the Carpathians, later in Sweden and finally elsewhere in the world. The specimens form the basis for his Ustilaginales exsiccata (nos. 1–1300). In his home in Tübingen (Germany) he hosts the largest private smut fungus collection in the world (Herbarium Ustilaginales Vánky abbreviated HUV) with more than 21,500 specimens.

When George Zundel published his monograph of smut fungi in 1953, it took him only 440 pages. A comparison with Vánky's 1,480 pages indicates two things, the progress in smut systematics over the past 60 years and the rich space Vánky has provided to his very detailed descriptions and brilliant illustrations. As to the descriptions of all 1,688 smut species nearly all thinkable wishes are fulfilled, including type data, taxonomic references, synonyms, disease symptoms, macroscopical and microscopical characteristics, host ranges, distribution, and microphotographs of spores. Many species are provided with additional illustrations, particularly SEM photographs of spores and line drawings of disease symptoms. The technical quality of most photographs is excellent and it should be emphasised that many of them are taken of the type specimen. Unfortunately, information on anamorphic stages is often sparse.

The genera and species are listed in alphabetical order. Each genus starts with a description and dichotomous keys, often based on host plant taxonomy. Identification of the smut species therefore requires knowledge of the host. The annex contains a list of doubtful, excluded and invalidly published taxa and descriptions of new species. The book is completed with a long list of references, a host-smut index, and an index of fungus names.

The work is accurate and solid on every single page. Avoiding errors within a voluminous and detailed opus like this book is nearly impossible. I noticed only very few errors, such as the photograph of *Microbotryum silenes-acaulis* which is erroneously named *M. silenes-acaulidis*, and the missing of *Urocystis ranunculi-alpestris* in the index.

This book is relatively large-sized and heavy, nevertheless very useful in practice. The binding seems durable and robust, including a nicely illustrated front cover. The layout of two columns per page is satisfying, but I miss the actual species name on the top of every page. The non-acid, heavy,

glazed paper is very durable, but less absorptive, so the text may become somewhat smeared after finger pressure.

I predict that this book will be important for applied and basic smut fungus research for several decades. Therefore, this exceptional book is recommended to mycologists, botanists, plant pathologists and all other researchers dealing with smut fungi. The same counts for life science libraries of universities and other life science research facilities. Unfortunately, the price is exceptional as well. Therefore, low-budget mycologists working e.g. on the European smut flora might consider to rather buy a copy of Vánky's "European Smut Fungi" from 1994. Of course, this book is somewhat outdated, but still quite useful.

Kálmán Vánky's "Smut Fungi of the World" deserves to be spread around the world.

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