

Book review

KÁLMÁN G. VÁNKY: EUROPEAN SMUT FUNGI.

– 570 p., 1003 figs., Gustav Fischer Verlag, Stuttgart, 1994. – 398 DM (the book is in the library of the Society).

Smut fungi (Ustilaginales) are important plant parasites. This book comprises, for the first time, the knowledge about 500 known smut fungi from Europe. For these species and for further 70, detailed descriptions are given. 82 doubtful or excluded taxa are also presented. The descriptions are completed by 220 drawings of diseased plants and by more than 770 microphotographs of the spores seen in LM, SEM or TEM. Keys to genera and species, a host plant / smut fungus index, make an easy identification of these plant pathogens possible.

In 1985 has been published by K. Vánky a valuable monograph of smut fungi of the Carpathian basin: Carpathian Ustilaginales (see review by Urban in *Čes. Mykol.* 40: 59-60, 1986). Vánky's interest in smut fungi was aroused beginning the fifties on phytopathological lectures given by academician Tr. Săvulescu in Bucharest (Romania), since the time Vánky is engaged in collection and study of smuts and in edition and distribution of smut fungus exsiccata which has now reached 950 numbers. In the fifties he worked in the present day Institutul de Biologie "Tr. Săvulescu" in Bucharest. In 1970 he left for Sweden where he worked first as a physician in a small town Gagnef. Later on, supported by scholarships of some Swedish institutions, he ended the above mentioned doctoral dissertation and since 1986 he is working at the Institute of Biology I, University of Tübingen.

A short preface is written by Professor H. Scholtz, Botanical Museum Berlin-Dahlem, the co-author of a voluminous work on German smuts (1988). In the preface is stressed that fungal taxonomy and especially of smut fungi in Europe has not yet come to its end. In the introduction Vánky writes: "... there are numerous undescribed species and unsolved problems regarding smut fungus classification, ... biology, ... host-parasite relationship, phylogeny. ... At the same time, increasing population and expansion of cities, industries, traffic ways and cultivated areas are rapidly destroying the natural floras all over the world. Smut fungi as yet undescribed are destroyed with their hosts. Heavy application of agricultural fungicides, combined with pollution from cities and industry, are also reducing or eradicating populations of the smuts (and other groups of fungi) and, because they are part of the unique ecosystem of the world, it is high time to take measure to preserve them for the future (Vánky et Harada 1989/1990: 445)."

Five pages of thickly printed literature quotations embrace as sources for inventory of European smuts as well as extra-European smut floras and papers dealing with general or special problems. All quotation are to be found in the chapter "Literature cited" which presents ca 60 pages printed in two columns.

The chapter "Materials and methods" begin with a short note concerning the applied species concept to the smut fungi. It is a fairly broad morphological concept defining species as groups of organisms recognizable by consistently distinct morphology. In many cases host specificity must be considered in definitions, due to the simple morphology of the parasite. More details elucidating the author's species concept to the smut fungi are dealt on p. 17 and 153. Vánky writes: "I am conservative regarding modifications based on (often one-sided) knowledge of ultrastructure (septal pore, haustoria, spindle pole bodies), biochemistry (enzymes, sugar pattern of the cell walls, extracellular amyloid components), ribosomal ribonucleic acid sequence (5 S r RNA) data and others known for relatively few taxa. E.g. under *Microbotryum* I am treating anther smuts of Caryophyllaceae only (see also comments in the introductory part of the chapter *Microbotryum*)." On p. 153, after repeating the new characterization of the genus *Microbotryum* proposed by Deml et Prillinger (in Prillinger et al. 1991: 9), Vánky writes: "This is a completely new interpretation and characterization of this genus, a characterization which certainly will lead to the recombinations of perhaps one hundred or more *Ustilago* species into *Microbotryum*. ... In my opinion it is too early to change the systematic of the Ustilaginales radically on the basis of the knowledge of some biochemical parameters analyzed for only relatively few species, even if we know that other characters (e.g. ultrastructure of the septal pore; partly unpublished) are supporting such tendencies. One of the weaknesses of this kind genus-delimitation is the fact that too many characters are used. The absence of one or several of these characters will, on the other hand, automatically exclude many, closely related species, ... on the other hand, will bring together

a heterogenous assemblage of species regarding other characters. Application of biochemical methods used by yeasts specialists in delimitation of smut genera is another inconvenience. These methods ... are difficult to repeat for checking previously published data." According to me, Vánky is right in evaluating with care all biochemical, molecular and ultrastructural characters by delimitation not only of genera but also smut species.

The genera are arranged alphabetically and the species appear alphabetically under each genus. The species (and genera) are numbered. For species (and genera) that would be expected to occur in Europe, but have not yet been found there, the numbers are given in parentheses. The names of species and genera for which no description is given in this book, appear in square brackets in the keys.

Following are noted abbreviations of the generic names of Ustilaginales, countries and territories, the collections of exsiccata and for consulted herbaria. Separated are listed consulted private herbaria and herbaria not mentioned in the Index herbariorum.

A short chapter deals partly on nomenclature which has been followed according to the latest issue of the International Code of Botanical Nomenclature (Berlin 1987), partly on species concept in smut fungi, delimitation of species and classification of the Ustilaginales.

The key of the European smut genera is constructed first of all according to morphologic characters but indices on host families are also exploited. All other specific keys are based on host taxonomy.

The valid name of every smut species is followed by synonymy and quoting the type specimen. In many cases lectotypes or neotypes had to be selected.

Some genera as e.g. *Nannfeldtiomyces*, *Neovossia*, *Orphanomyces* etc. are very poor what about species or it is noted that the species are known from sporadic findings only. In such cases it would be useful to bring the quotations in full.

The genus *Ustilago* contains most species (over 400) and Vánky anticipates that it will be split into several smaller, more uniform (but it is not sure that simultaneously more natural) genera when sufficient additional characters are examined (e.g. ontogenical, ultrastructural etc.).

The economically relevant species are named by correct scientific names what is important for plant pathologists. It is remarkable that the name *Ustilago hordei* (Pers.) Lagerh. is uncorrect and should be replaced by the valid name *U. jensenii* Rostr. Vánky prefers to retain the well known binomial *U. hordei* which he proposed for conservation. Very useful is the review of the differences between *U. tritici* and *U. nuda* (after J. Nielsen in litt.). For economically relevant smut diseases short control measures are also given.

In the chapter dealing with doubtful and excluded taxa it is interesting that Nagler et al. (1989), based on germination and ultrastructure studies, showed that the genus *Schroeteria* (six species on *Veronica* sp. div.) is an ascomycete.

Vánky's excellent book will prove an invaluable reference source and standard work for all mycologists of various aspects of study but also for plant pathologists and botanists who are engaged in problems of the preservation of our environment and organismal biodiversity as vascular plants as smut fungi.

Zdeněk Urban