

# Myxomycetes: Biology, Systematics, Biogeography, and Ecology (Book review)

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The publication of the second edition of “Myxomycetes: Biology, Systematics, Biogeography, and Ecology”, edited by Carlos Rojas and Steve Stephenson, is a welcome event for anyone interested in slime molds (See Figure 1). This is the only contemporary monograph that combines all aspects of myxomycetology, including morphology, biology, taxonomy, ecology, biogeography, physiology, and biochemistry as well as field, laboratory, and molecular methods used for studying myxomycetes. The application of myxomycetes in education, art, and technology is also not neglected.

A previous effort to compile a comprehensive overview of myxomycetes was made in the monumental monographs “The Myxomycetes” by G. W. Martin and C. J. Alexopoulos (1969) and “Biology of Myxomycetes” by W. D. Gray and C. Alexopoulos (1968). After more than 50 years of progress in studying myxomycetes, which has yielded a large body of new information, no comparable work can be generated by just a few individuals, even those with the broadest possible expertise. For that reason, the fourteen chapters that make up “Myxomycetes: Biology, Systematics, Biogeography, and Ecology” were written by different authors who represent many of the world's leading experts in the relevant fields, including such legendary names as Bruce Ing, Uno Eliasson, Steve Stephenson, and Harold Keller. Interestingly, the authors of different chapters sometimes present different views on the same subject, so that the attentive reader may find enthralling discussions in the pages of the monograph.

The first edition of this book was published relatively recently (in 2017) and gained well-deserved popularity. However, additional studies of myxomycetes carried out during the past five years have provided a considerable amount of new data, the lack of which made the this first edition somewhat incomplete. For example, during the period of 2018–2021, the results of important investigations in the phylogeny of myxomycetes were published, and a number of new taxa were described or re-established, including the genera *Licaechalium*, *Siphoptychium* and *Thecotubifera* (Leontyev et al. 2019a). Moreover, the first phylogenetic classification of myxomycetes was proposed, including two new subclasses, two new orders, and one new family (Leontyev et al. 2019b). The separation of the order Echinosteliopsidales was confirmed by molecular data (Shchepin et al. 2019). The publication of a new classification for the Eukaryotes (Adl et al. 2019) clarified the systematic position of myxomycetes in the Tree of Life. These

and other changes required modifications and revisions in the information contained in the first edition of “Myxomycetes: Biology, Systematics, Biogeography, and Ecology.” The new edition of this book includes two entirely new chapters, the first entitled “The metagenomic approach in myxomycete research” and the second “Integrated biology of *Physarum polycephalum*: cell biology, biophysics, and behavior of plasmodial networks.” All of the other chapters have been updated with new information that has become available since the first edition was published.

The science surrounding myxomycetes today faces fundamental challenges, including the study of species delimitation, the evolutionary history of particular taxa, understanding global patterns of distribution, and various aspects of the biology and behavior of these organisms. Undoubtedly, budding researchers of this interesting group will find this new edition of “Myxomycetes: Biology, Systematics, Biogeography, and Ecology” to be an inspiring source of ideas for further exciting research.

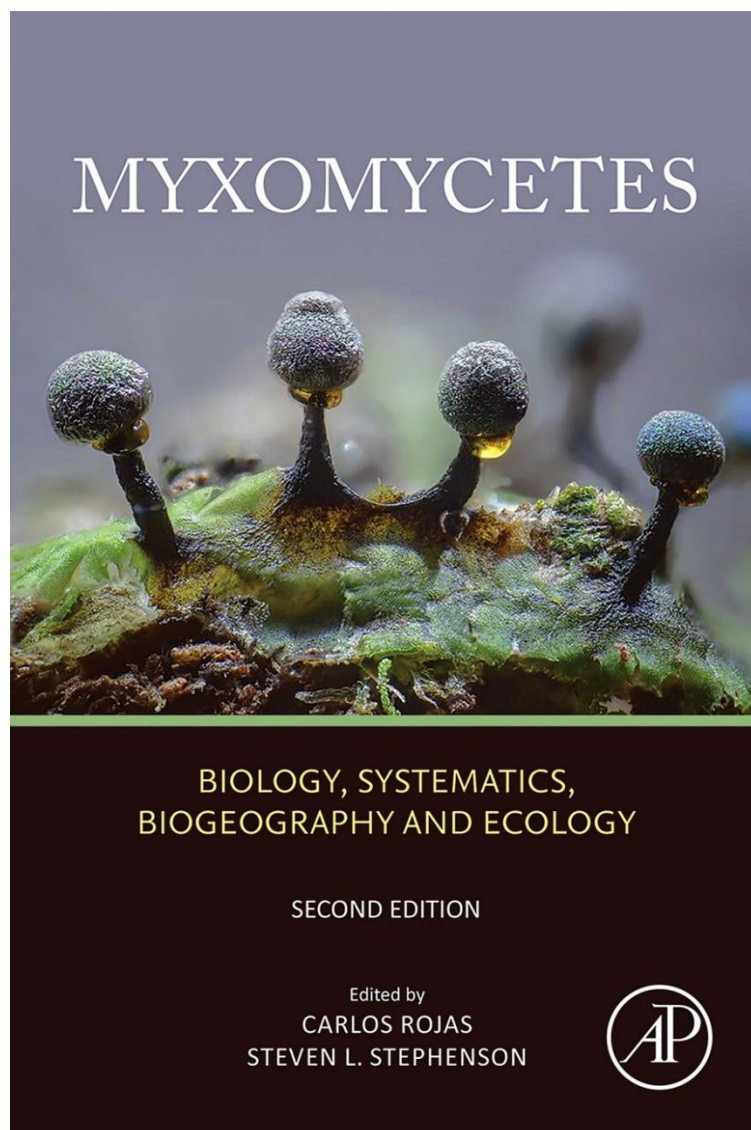


Figure 1. Front cover of the second edition of “Myxomycetes: Biology, Systematics, Biogeography, and Ecology” published in 2021.

## References

- Adl SM, Bass D, Lane CE, Lukeš J, Schoch CL, Smirnov A, Agatha S, Berney C, Brown MW, Burki F, Cárdenas P, Čepička I, Chistyakova L, del Campo J, Dunthorn M, Edvardsen B, Eglit Y, Guillou L, Hampl V, Heiss AA, Hoppenrath M, James TY, Karnkowska A, Karpov S, Kim E, Kolisko M, Kudryavtsev A, Lahr DJ, Lara E, Le Gall L, Lynn DH, Mann DG, Massana R, Mitchell EA, Morrow C, Park JS, Pawlowski JW, Powell MJ, Richter DJ, Rueckert S, Shadwick L, Shimano S, Spiegel FW, Torruella G, Youssef N, Zlatogursky V, Zhang Q. 2019. Revisions to the Classification, Nomenclature, and Diversity of Eukaryotes. *J Eukaryot Microbiol.* 66: 4-119.
- Gray WD, Alexopoulos CJ. 1968. *The Biology of Myxomycetes*. The Ronald Press Company, New York.
- Leontyev DV, Schnittler M, Stephenson SL, Novozhilov YK. 2019a. Systematic revision of the *Tubifera casparyi* – *T. dictyoderma* complex: Resurrection of the genus *Siphoptychium* and introduction of the new genus *Thecotubifera*. *Mycologia* 111(6): 981-997.
- Leontyev DV, Schnittler M, Stephenson SL, Novozhilov YK, Shchepin OV. 2019b. Towards a phylogenetic classification of Myxomycetes. *Phytotaxa* 399(3): 209-238.
- Martin GW, Alexopoulos CJ. 1969. *The Myxomycetes*. University of Iowa Press, Iowa City.
- Shchepin O.N., Schnittler M., Dagamac N.H.A., Leontyev D.V., Novozhilov Y.N. 2019. Unexplored diversity of microscopic myxomycetes: evidence from environmental DNA. *Plant Ecol Evol.* 152 (3): 499-506.