



Lothar Krienitz
**LESSER FLAMINGOS:
DESCENDANTS OF PHOENIX.**
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The well-illustrated book *Lesser Flamingos - Descendants of Phoenix* describes in many ways the habitats of the Lesser Flamingo and other animals, mostly birds in tropical soda lakes. The focus in East Africa is on Kenya (e.g. lakes Bogoria, Nakuru, Oloidien), followed by Uganda, Tanzania (Lake Natron), Ethiopia, and the wetlands in southern Africa (Botswana, Namibia and South Africa), but also in India.

The author Lothar Krienitz describes the breathtaking beauty of the natural spectacle of the mass occurrence of the Lesser Flamingo (*Phoeniconaias minor*), the so-called Pink Diamonds: "Approaching a soda lake in the East African Rift Valley, all of our senses are touched. Our eyes cannot get enough of the billowing sea of pink birds. Our ears receive the busy sounds of the birds during joint food intake. Our skin feels the merciless heat that flickers over the lake. We taste the salt in the dust, which is stirred up by the movement of the air. Our nose absorbs the corrosive scent of soda, decomposing food algae and feces of the birds" (quote from the book, loc. cit. p. 76). It quickly becomes clear that this natural spectacle is by no means self-evident and that the flocks of birds have to migrate between the lakes in search of food and rest for breeding. This requires, however, alternative, adequate habitats that need to be protected in the long term. For ornithologists, especially in the tropics, the fascination of such a natural spectacle may already be a wealth of experience - yet for those readers, the book may be an enrichment, as it is written from the perspective of a freshwater ecologist.

How do you get close to the Lesser Flamingo? By looking at their food – i.e. studying the microphytes from the bird habitats macroscopically and microscopically. The author is fascinated on several occasions - by the monumental natural spaces, the diversity and beauty of the bird life and the striking algal flora. His observations at a watering hole are meant to illustrate his "conflict of interest". A beautiful Violet-hooded Turaco, "has settled on the mud. Close to him, dirty blue cyanobacteria and green *Chlorella* grow on the wet surface. Should I concentrate on birds or algae? Despite the fascinating charisma of the bird, I have remained true to the algae, but I have been able to combine the pleasant with the useful by embarking on the food relationship of the Lesser Flamingo with the microphytes." (loc. cit. p. 193). So, the book is actually written from the experience of an internationally respected phycologist. An environmentally interested reader may benefit from the author's perspective. Lothar Krienitz describes the many facets of limnology of soda pans, from the physics and chemistry of different types of these extreme environments to the ecology of fascinating living forms of algae and cyanobacteria and other water biota. The reader learns that a delicate diversity of different phytoplankton and flamingo food taxa can hide behind the green, blue-green or other pigment spectra, and, that closely related species compete with each other and quickly redistribute in the optimal habitats. In this context, modern satellite observations on the habitats of the flamingos are mentioned as being helpful, but cannot replace in-situ measures totally. Profound interpretation of ecological surveys still calls for taking field samples by gearing up in rubber boots and walking to the hot and often inhospitable muddy soda lakes.

The "take-home message" of the book is that these unique habitats of soda lakes are vulnerable structures of nature, few microorganisms can live in these niches, and, after long adaptation, these microscopic extreme habitat colonizers are precisely what is needed as the main food source of the Lesser Flamingo, the flagship species of these environments. The author thus provides a broadened-up perspective on the ecology of the soda lakes and their microscopic world of algae, also delights us with his photographs.

The book not only shows individual snapshots of the life and the areas of incidence of the Lesser Flamingo, but also reports coherently over a period of 15 years (2001 - 2015). Hence, the reader can also grasp the book as a contemporary history of habitats and changing living conditions of the Lesser Flamingo for more than a decade. The author also provides personal insights of travelling to the many remote sites of soda lakes. Reading the book, it is easy to follow the author's own observations, descriptions, results and interpretations, in addition to selected references to many other sources of previous observations, facts and figures. Thus,

the reader can easily find more details. The book shows how many ecological, but also human-social or cultural themes intersect the world of the Lesser Flamingo, and it takes a position to preserve this unique bird on behalf of many animals through the protection of its habitat. It draws attention to the fate of habitats of the Lesser Flamingo and other endangered wetland ecosystems. Although the book is primarily aimed at describing the habitats in Africa and India, the author provides textual anchors to episodes in his homeland and elsewhere in the world, and thus promotes thinking globally.

The book convinces with its clear, concise chapter design; its approx. 280 impressive photos, which are usually grouped thematically in graphic panels, complemented by tables, graphics and index, and its lively writing style. About 60% of the photos show natural scenic views of birds and bird habitats. Another large number of stunning photos (24%) illustrate algae and blue greens macroscopically building mats on lake shores or plankton in lake water, or are visualised as tiny organisms under higher magnification by light microscopy or scanning electronic microscopy, which all together may guide the reader in recognizing at least specific key microphytes at first glance.

Conclusion: The reader is offered a current, authentic ecological inventory of the flamingo habitats. The book is a stimulating treasure trove of topics for all limnologists and bird lovers particularly interested in the tropics and to whom trusting the power of interdisciplinary collaboration: together we should be able to secure the future of this emblematic bird, the likeness of the firebird Phoenix.

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