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LICHEN COMMUNITIES IN THE MONTANE ECOSYSTEMS OF MT. KILIMANJARO, TANZANIA

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Mt. Kilimanjaro, the highest mountain of Africa, is situated near the equator in tropical eastern Africa. The climatic gradient of the slopes give rise to an abundance of natural vegetation types which, especially in the lower elevations, have often been converted into agriculture or used e.g. for selective logging. As a result, the slopes of Mt. Kilimanjaro support several prominent natural and human-modified ecosystems. On the southern slope these range from natural savanna and maize fields, through lower montane forests, traditional agroforestry systems (home gardens), commercial coffee farms, and grasslands, montane natural and logged *Ocotea* forests, upper montane undisturbed and burnt *Podocarpus* forests, subalpine *Erica* forest and more open vegetation, and finally to alpine *Helichrysum* heaths in ~4500 m alt. Each of the ecosystem types had five established study plots, sampled now also for macrolichen diversity. The most diverse lichen communities were found from the upper montane and montane forest zones, with Parmeliaceae as the clearly most prominent lichen family, followed by Lobariaceae, Physciaceae, and Collemataceae in *Podocarpus* and *Ocotea* forests, and Cladoniaceae within the *Erica* zone. Also, the alpine heaths harbor a considerable lichen diversity of mostly saxicolous and terricolous species of Parmeliaceae and Stereocaulaceae. The lower montane forests as well as the more sheltered agricultural habitats, like the home gardens, still support a high lichen diversity with various species of especially Collemataceae, Parmeliaceae, Physciaceae, and Ramalinaceae. In natural savanna and in some of the more open agricultural habitats especially species of Caliciaceae are common. Funding: UK (German Research Foundation, DFG, 408295270).

Lichen communities in the montane ecosystems of Mt. Kilimanjaro, Tanzania

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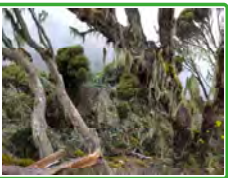
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Mt. Kilimanjaro, the highest mountain of Africa, is situated near the equator in tropical eastern Africa; it is also part of the Eastern Afrotropical biodiversity hotspot. The climatic gradients of the slopes give rise to an abundance of natural vegetation types which, especially in the lower elevations, have often been converted into agriculture or used e.g. for selective logging. As a result, the slopes of Mt. Kilimanjaro support several prominent natural and human-modified ecosystems, many harboring also abundant and diverse lichen communities.



Subalpine zone (3500–4000 m alt.) with *Erica trimera* forest and fire disturbed *Erica* shrubbery.

Usnea, *Hypotrachyna*, *Stereocaulon*, *Ramalina*, *Hypogymnia*, *Cladonia*, *Peltigera*, *Parmotrema*, *Heterodermia*, *Sticta*, *Xanthoparmelia*, *Platismatia*, *Imshaugia*



Alpine *Helichrysum* zone (4000–4500 m alt.)

Xanthoparmelia, *Usnea*, *Stereocaulon*, *Cladonia*, *Peltigera*, *Hypotrachyna*, *Bryoria*, *Rhizoplaca*, *Umbilicaria*, *Physcia*

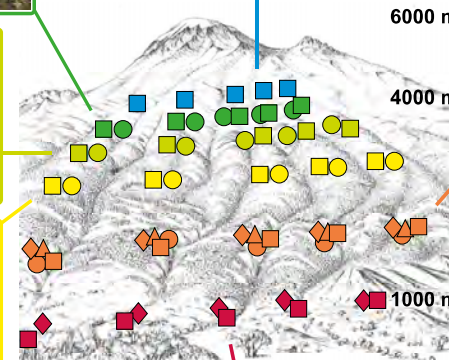
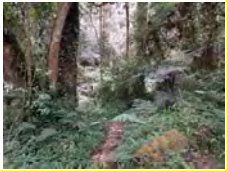
Upper montane zone (2800–3100 m alt.) with *Podocarpus* forest and burned *Podocarpus* forest colonized by *Erica excelsa*.

Parmotrema, *Hypotrachyna*, *Usnea*, *Heterodermia*, *Sticta*, *Leptogium*, *Lobaria*, *Cladonia*, *Ramalina*, *Sphaerophorus*, *Peltigera*, *Nephroma*, *Anzia*



Montane *Ocotea* forest zone (2100–2800 m alt.) and selectively logged *Ocotea* forest.

Usnea, *Parmotrema*, *Leptogium*, *Hypotrachyna*, *Heterodermia*, *Sticta*, *Lobaria*, *Ramalina*, *Nephroma*, *Teloschistes*, *Gabura*



Lower-montane forest zone (1100–2000 m alt.) is largely occupied by homegardens, commercial coffee plantations, and grasslands.

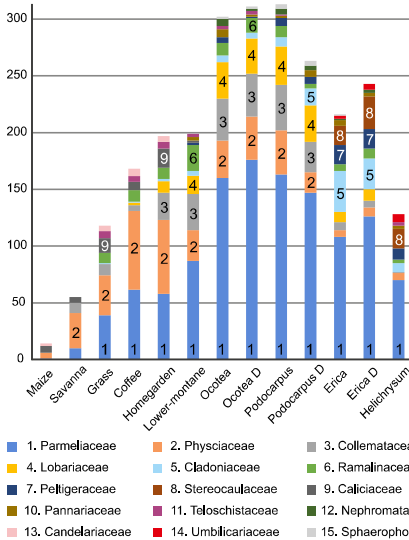
Forest: *Leptogium*, *Parmotrema*, *Sticta*, *Heterodermia*, *Usnea*, *Hypotrachyna*, *Ramalina*, *Lobaria*

Homegardens, Coffee plantations, Grasslands: *Physcia*, *Parmotrema*, *Heterodermia*, *Candelaria*, *Punctelia*, *Ramalina*, *Hyperphyscia*, *Teloschistes*

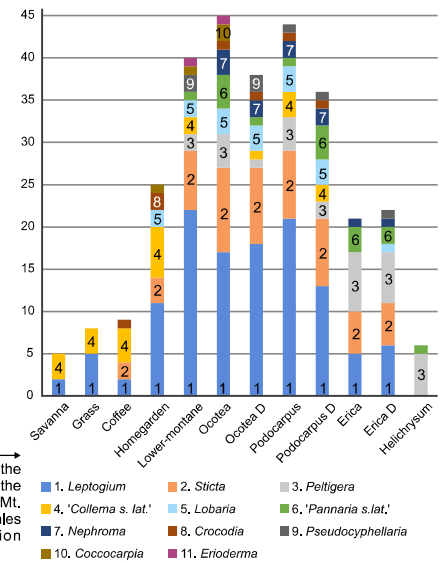


Savanna zone (800–1100 m alt.) has mostly been converted into agriculture, like maize fields.

On savanna: *Pyxine*, *Physcia*, *Dirinaria*, *Collema*, *Leptogium*; on maize fields very few lichens exist (*Pyxine*, *Hyperphyscia*).



Material and Methods. The 65 sample plots are situated on the southern and southeastern slope of Mt. Kilimanjaro, along five transects with five replicate plots in each of the 13 ecosystem types. On each plot, macrolichen diversity was sampled on a 5 x 20 m central plot as well as along two 50 m transects running parallel on the opposite sides of the central plot. Based on an initial morphological inspection, at least one specimen of each species from each plot was included in the sampling for DNA. The material consists of several thousand lichen specimens representing over twenty fungal families.



References

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