

A close-up photograph of a tree trunk covered in various lichens. The background is a dense carpet of green lichens, with prominent, bright red, leaf-like structures in the foreground and on the right side. The text is overlaid in white, bold, sans-serif font.

**Ecology and Diversity  
of  
Lichens  
in  
Bwindi Impenetrable N.P.**

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# *What are lichens?*

- ❖ Not plants but fungi!
- ❖ Epiphytes, not parasites!
- ❖ Symbiotic organisms living together with green algae and/ or cyanobacteria: The fungus provides a suitable environment for the algae or cyanobacteria and gets sugars and available nitrogen in return.
- ❖ Just beautiful...



# *How to identify lichens?*

- ❖ **Beard lichens** – string or strap shaped and branched, usually hanging down from trees or rocks
- ❖ **Shrub lichens** – often similar to beard lichens, but usually upright and not much longer than wide, also club-shaped or like tiny pins
- ❖ **Leafy lichens** – like small leaves and usually only weakly attached to the substrate (bark, rock, soil)
- ❖ **Crust lichens** – firmly attached with their whole surface and not to be removed without the substrate; never beard-like, shrubby or leafy



# *What makes them special?*

- ❖ Lichens can grow on a broad range of substrates.
- ❖ Lichens gain most water and nutrients from the atmosphere (rain, dust etc.).
- ❖ Lichens are poikilohydric – they can survive long periods of desiccation (this might not be true for many rainforest lichens!).
- ❖ Lichens can survive extreme temperatures and can be found on the hottest and coldest places on earth.



*Herpothallon rubrocruciatum*



*Heterodermia barbifera*



*Gyrotrema sinuosum*



*Gyalideopsis buckii*



# *Why study lichens?*

- ❖ Lichens are sensitive environmental and can be used for monitoring
  - air pollution.
  - climate change.
  - landscape (forest) change and history.
  - microclimatic conditions, etc.
- ❖ More than 20.000 species of lichens are described.
- ❖ Lichens constitute a highly diverse group in terrestrial ecosystems including rainforests.



# *Why study lichens?*

- ❖ In tropical forests lichens are important for
  - the input of nutrients, particularly nitrogen
  - water storage and buffering against desiccation
  - animals (nesting material, forage, camouflage, 'housing' etc.)
  
- ❖ Good knowledge of the species and their ecology is prerequisite for their use in forest conservation and landscape management.
  
- ❖ As ubiquitous and influential members of our environment they are worth knowing.



## *Lichens in Bwindi Impenetrable N.P.*

- ❖ The only known previous collections were made in the late 1970s for the MACROLICHENS OF EAST AFRICA (Swinscow & Krog 1985) .
- ❖ Only 8 species of lichens known from Bwindi in literature – Natural History Museum (London).
- ❖ No data on the ecology of lichens in Bwindi Impenetrable N.P. have been published and few such data are available for tropical lichens in general.





## *Our intention was to...*

- ❖ Perform a rapid biodiversity assessment (RBA) of lichens in Bwindi Impenetrable N.P.
- ❖ Collect first data on the ecology of lichens in Bwindi and evaluate their possible use as indicators for microclimatic conditions and forest history
- ❖ ... the first such study in Africa
- ❖ Develop a lichen herbarium at ITFC





## *What did we do so far?*

- ❖ Field work: 1 May to 6 June 2011
- ❖ Data collection took place along 14 valley to hill top transects Bwindi
- ❖ A total of 92 plots and 276 trees sampled
- ❖ For each tree, presence/ absence data were collected for all lichen species up to 2m tree heights.
- ❖ Small fragments of lichens were collected for later identification.
- ❖ 350 additional collections of lichens were made for the Rapid Biodiversity Assessment (various substrates)



## *First results - Ecological study*

- ❖ So far ...
- ❖ 59 tree species were included in the analysis, with only *Strombosia scheffleri*, *Leptonichia mildbraedii* and *Carapa grandiflora* being represented by more than 10 individuals, and 16 tree species sampled only once.
- ❖ Between 0 and 23 lichen species were found on single trees, averaging around 9. Difficulties with the identification!
- ❖ Field observations showed a clear differentiation in lichen species between forests at hill tops and valley bottoms.





## *First results - RBA*

- ❖ 240 species of lichens could be identified from the collected material, of which 99 could be named so far.
- ❖ With the exception of *Everniopsis trulla* and *Ramalina hoeneliana*, all identified species are new reports for Bwindi Impenetrable N.P.
- ❖ 33 species are new to Uganda, and *Coenogonium leprieurii* appears to be new to Africa.
- ❖ 4 species are new to science:

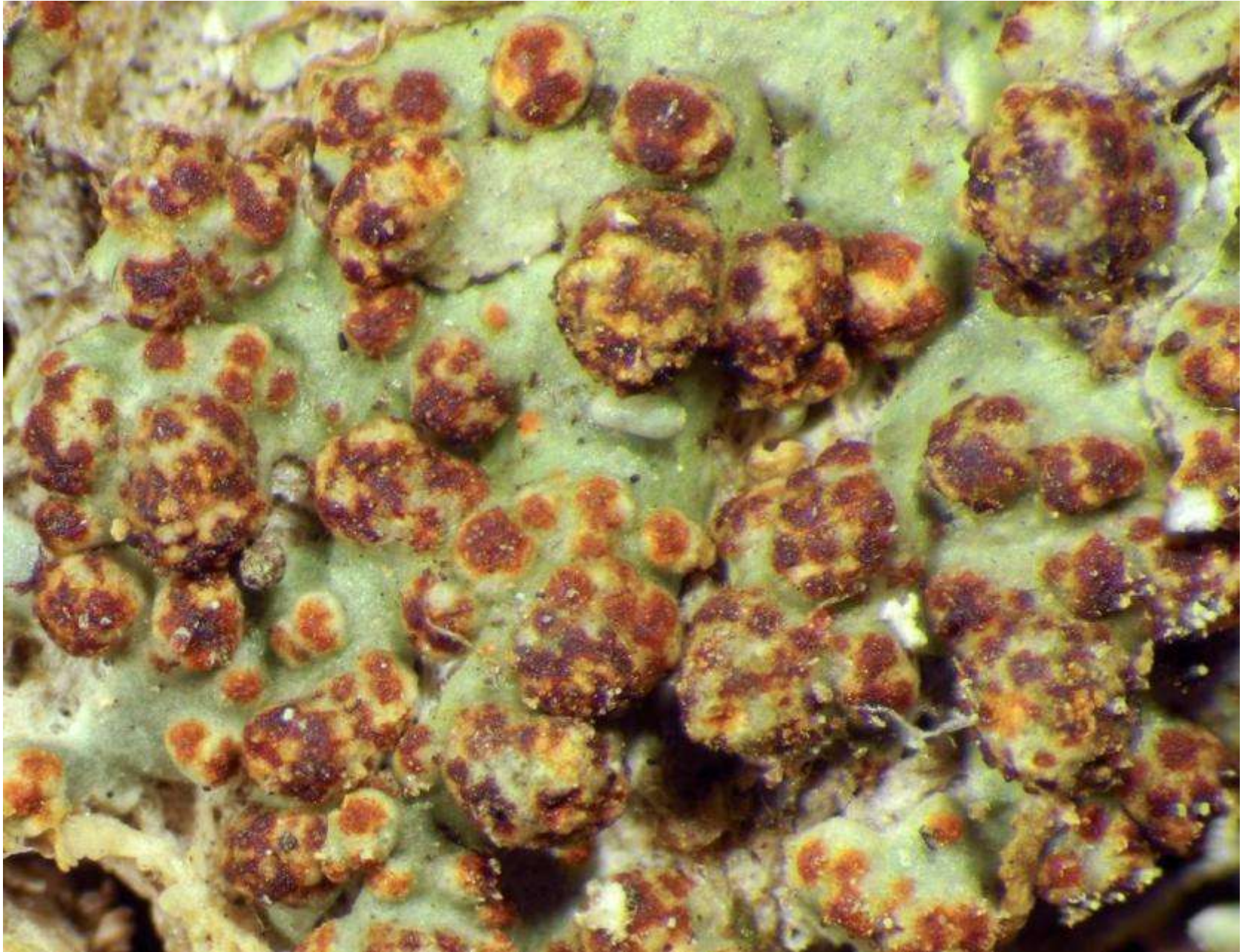


*Crypthonia coccifera* ad interim





*Arthonia physcidicola ad interim*





*Acanthotrema nuda ad interim*





*Chiodecton sorediiferum* ad interim



## *Outlook*

- ❖ Identification will continue but is slow due to lack of references (there are no texts on most African lichens)
- ❖ The preparation of the lichen specimens is almost finished and reference collections for ITFC are being prepared
- ❖ The ecological analyses will be finalised after the identifications are complete
- ❖ The new to science species will be described!





# *Thanks!*

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