**Are the high altitude treelines of North Ethiopia sensitive to climate change?**

M. Jacob1, M. De Ridder2, A. Frankl1, T. Asfaha1,3, J. Nyssen1 and H. Beeckman2

*1 Department of Geography, Ghent University, Belgium*

*2 Royal Museum for Central Africa, Laboratory for Wood Biology and Xylarium, Belgium*

*3 Department of Land Resource and Environmental Protection, Mekelle University, Ethiopia*

**Corresponding author:** miro.jacob@ugent.be

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The important ecosystem services of the high altitude tropical afro-alpine *Erica arborea* L. forests are under increasing environmental and human pressure. The *Erica* treeline ecotone in the North Ethiopian highlands forms a temperature-responsive vegetation boundary and is thus potentially affected by climate change. A better understanding of tree ring formation of *Erica* species in the tropical highlands is needed to disentangle this complex relation between tree growth and climate. Therefore, ten *Erica arborea* trees in Lib Amba Mt. (12°04’N, 39°22’E, 3993 m a.s.l.) part of the Abune Yosef Mt. range of the North Ethiopian highlands were cambial marked in 2012. Microphotographs of these cambial marks indicated the formation of annual growth rings with higher vessel density in the earlywood and flattened fibres in the latewood. In continuum measurements of vessel size and density on microphotographs, indicated the formation of early Inter-annual Density Fluctuations (IADFs) related with early rainfall in March-May (Nagelkerke R²: 0.86). Moreover, tree ring width is also significantly related with early rainfall (p<0.05, R²: 0.35). A tree ring chronology from stem discs and increment cores is proven difficult, due to the formation of these IADFs. Approximate tree ages could be derived and were used for a site index of tree age and height versus elevation, indicating a recent increase of the treeline elevation. However, this uplift of the *Erica* treeline cannot directly be linked to climate change, due to strong disturbances by human and livestock browsing.