Structure and annual character of growth rings of *Pericopsis elata* trees

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Pericopsis elata (Leguminosae/Faboideae) is one of the indicator and pioneer species characterizing extensive anthropogenic perturbations in the African rainforest. Our study aims at understanding the structure and pattern of growth rings of this species and at verifying their annual character. Tree rings that are annual allow for drawing a time line of the life history of individual trees and to a certain extent of the forest community where they live in. Eventually, the human induced perturbation that is supposed to have been the trigger of many *Pericopsis* stands can be dated. The wood anatomical analysis of *Pericopsis elata* samples semi-deciduous rainforests from Cameroon and the Democratic Republic of Congo has shown that this species has growth rings that are anatomically distinct. They are delimited by marginal parenchyma, typical for many species from the Leguminosae family. This parenchyma band is two cells thick on the average and forms a fine continuous layer that is visible on the transverse section of a stem disc. Near to the ring borders there are flattened thick walled fibers and a widening of the rays. Three methodological approaches have been used to prove the annual nature of the growth rings of Pericopsis elata.

(i) In 2008 and 2010 seven stem discs have been taken from trees that have been planted in 1953 (Tw62209a, Tw62212a) and 1954 (Tw60900a, Tw60901, Tw62210a, Tw62221 and Tw62213). These trees were part of a plantation in the forest reserve of Yoko (DRC). Five trees planted in 1954 and cut in 2008 (Tw60900a, Tw60901, Tw62213) and in 2010 (Tw62210a, Tw62221a) showed respectively the mean age of 53.67±2.08 years and 54.5±0.71 years. The mean age of the two trees planted in 1953 is 58.5±2.12 years. The difference between the identified age and the expected age is probably due to a lack of precise information on the age of the planted saplings and the difficulties to read the rings around the pith.

(ii) Between 29th of March 2007 and 29th of June 2008 the cambial zone of five trees at Yangambi have been marked monthly with a surgical needle. The trees have been sampled on October 10th 2009 and May 19th 2010. This resulted in 69 wood blocks for microscopical observation. The wounds have been made visible after careful sounding of the wood above the level of the needle. The cambial wounding inflicted a dark colored oxidation of the xylem already in place around the needle point and a clear modification of the structure of the new wood tissue that is formed after the time of wounding. Microscopic observation of the wood formed after the wounding showed that three layers have been formed for the woods sampled on 10th October 2009 and four layers on the wood sampled at May 19th 2010 for those wounded between April and November 2007 and between two and three layers for the woods wounded between April and June 2008. We were able to observe a growth stop at the time the markings started (March 29th 2007) and during the period between end of December 2007 and end of March 2008.

(iii) Twelve individual growth rings from three stem discs (4 rings for each disc) from Biaro (Tw60927) and Lisala (Tw60923) in the DRC and Makalaya (Tw60886) in South-East Cameroon have been sampled and C14 dated in the Radiocarbon Laboratory of Poznan (Poland). The expected date of seven samples could be confirmed. Four rings appeared to be one year older than expected after examination of the wood structure and one ring appeared to be one year younger.

We were able to confirm the general annual character of the *Pericopsis elata* tree rings and observed a stop of cambial activity in the Yangambi region between end of December and March.