

Supplementary Information

Structural and compositional analysis of palm leaf manuscripts using synchrotron X-ray methods: a statistical analysis

Laura Gallardo, Mark Busch, Giovanni Ciotti, Patrick Huber

S1. Sample parameters in BM02 and P62

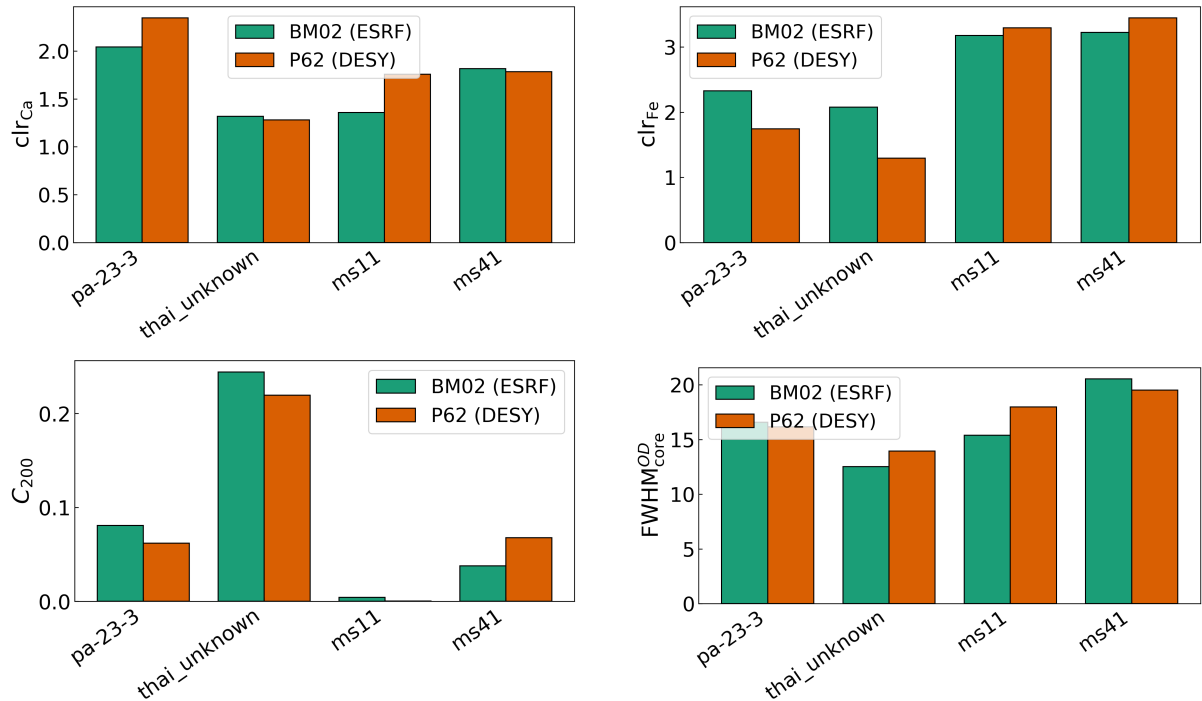


Figure 1: **Selected features as calculated from measurements at different beam lines.** In order: Centered log-ratios of calcium clr_{Ca} , and iron clr_{Fe} , crystallinity index of cellulose [200] crystallographic plane C_{200} , and full width at half-maximum of the core component in the orthogonal direction (OD) of the leaf (short side). Measurements were performed on the same samples but scan region may vary. Selected samples were chosen to represent different groups: pa-23-3 is unprocessed, *Corypha*, Thai; thai_unknown is Thai writing support; ms11 is an Indian manuscript fragment, *Borassus*; and ms41 is an Indian manuscript fragment, *Corypha*. Plots show similar values for both measurements, where differences are attributed to the evaluation of the different scan regions selected.

S2. Sample parameters upon sample rotation

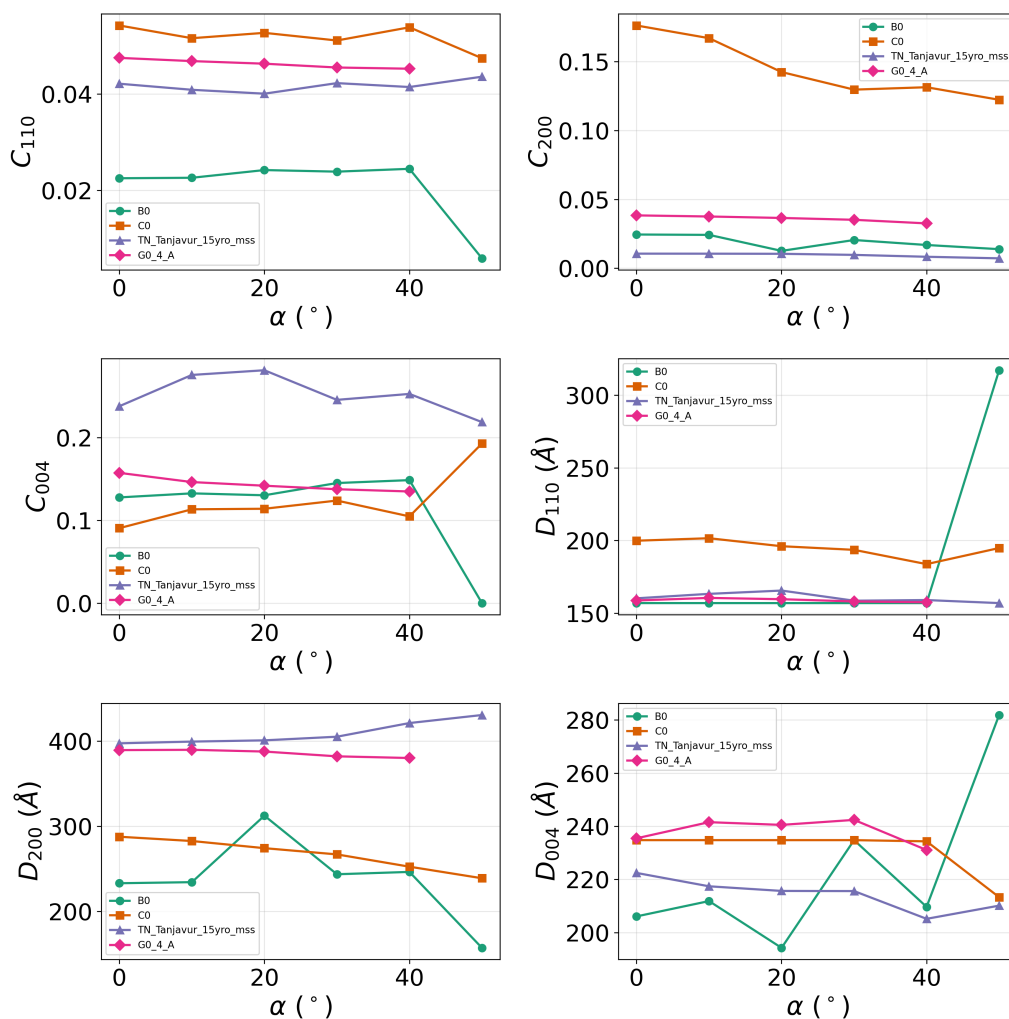


Figure 2: **Crystallinity (C) and crystal sizes (D) dependence on sample-beam rotation α , for different cellulose crystallographic planes $[hkl]$.** Rotation measurements were performed on four different samples: B0 and C0 are unprocessed *Borassus* and *Corypha* leaves, TN_Tanjavur_15yro_mss is a manuscript fragment from Tanjavur (Tamil Nadu, India), genus *Corypha*, and G0_4_A is a reference writing support sample from Bali, Indonesia, genus *Borassus*. The plots show that features tend to be constant, but deviations are more likely as sample rotation increases, especially over 40° . Exception is sample B0, which shows deviations already at 30° , this could be due to natural bending of the samples, which are sometimes difficult to adjust flat on the sample holder. For the statistics, we keep the measurements performed with α as close to 0° as possible.