Supplementary Material 1. Initial test of divergence time estimation of Ochnaceae using fossil evidence for the clock calibration.

Two macrofossils were reported for Ochnaceae. The first is *Paleoochna tiffneyi* Ickert-Bond, Pigg and DeVore which is based on fruits from the Late Paleocene of North Dakota, USA, resembling those of modern Ochninae (Ickert-Bond et al., 2015). Furthermore, Danehy et al. (2007) described *Rhabdophyllites diapyros* from fossil leaves based on similarities in leaf venation and teeth, but assignment to extant genera is difficult. Therefore the first fossil seems to be the most appropriate for calibrating the molecular clock. Because this fruit type is synapomorphic for Ochninae (Amaral, 1991; Schneider et al., 2014), it must have evolved along the relatively short stem of this subtribe. Calibrating the stem of Ochninae is the most appropriate approach because this fossil cannot be unambiguously assigned to any of the extant genera of Ochninae and because calibrating younger nodes would further inflate the divergence times for the deeper nodes. To evaluate the suitability of this fossil calibration, we performed an initial test run with the dataset of Schneider et al. (2014; includes four plastid DNA regions plus one nrDNA region) but including 34 taxa only. The analysis was run using a log-normal distribution with an off-set of 55.0 Ma (minimum age of this fossil, incl. some uncertainty in age determination), a mean of 5.0 and a standard deviation of 1.25 to allow for a range of values that corresponds to a reasonable age distribution of the Ochninae stem. The site models were unlinked for the individual partitions und run with the substitution models as inferred with Modeltest v3.7 (Posada and Crandall, 1998). A birth-death model was chosen and the analysis run for 50 million generations, which was enough for achieving ESS values > 200 for all parameters. However, the estimated divergence times revealed highly unrealistic ages for the deep nodes of Ochnaceae (e.g., 449 Ma for the origin of the family). Therefore, we decided to choose secondary instead of the fossil calibrations for the divergence time analyses.

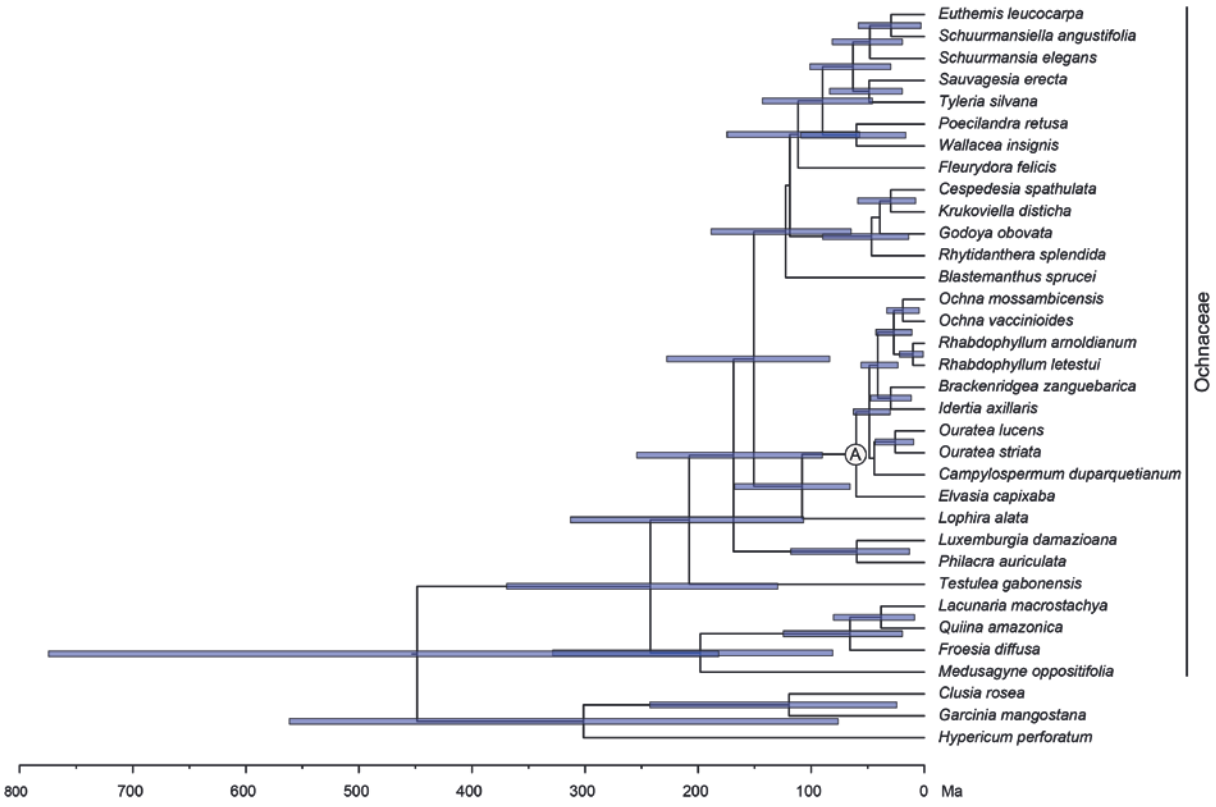

Figure S1. Maximum clade credibility tree obtained from BEAST analysis with divergence times of Ochnaceae based on the dataset of Schneider et al. (2014). The node bars are the 95% HPD ranges (mean heights). The stem of Ochninae was calibrated with *Paleoochna tiffneyi* (node A).

References

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