



Phylogeny and systematics of the tribe Gluemeae (Sapotaceae)

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INTRODUCTION

Generic delimitation in Sapotaceae has for long been problematic because homoplasy is frequent in the family. The purpose of this study is to test the monophyly of the subtribe Gluemeae, a group of 13 continental African rainforest species presently grouped in 4 genera (*Gluema*, *Inhambanella*, *Lecomtedoxa* and *Neolemonniera*). Except *Inhambanella*, they all share a rare character in the family: a dehiscent fruit (Figure 1). We aim to elucidate the Gluemeae phylogeny, to infer its position in the family and to derive a sound generic delimitations using morpho-anatomical characters and sequence data.



Figure 1. Dehiscent fruit of the species *Lecomtedoxa klaineana*

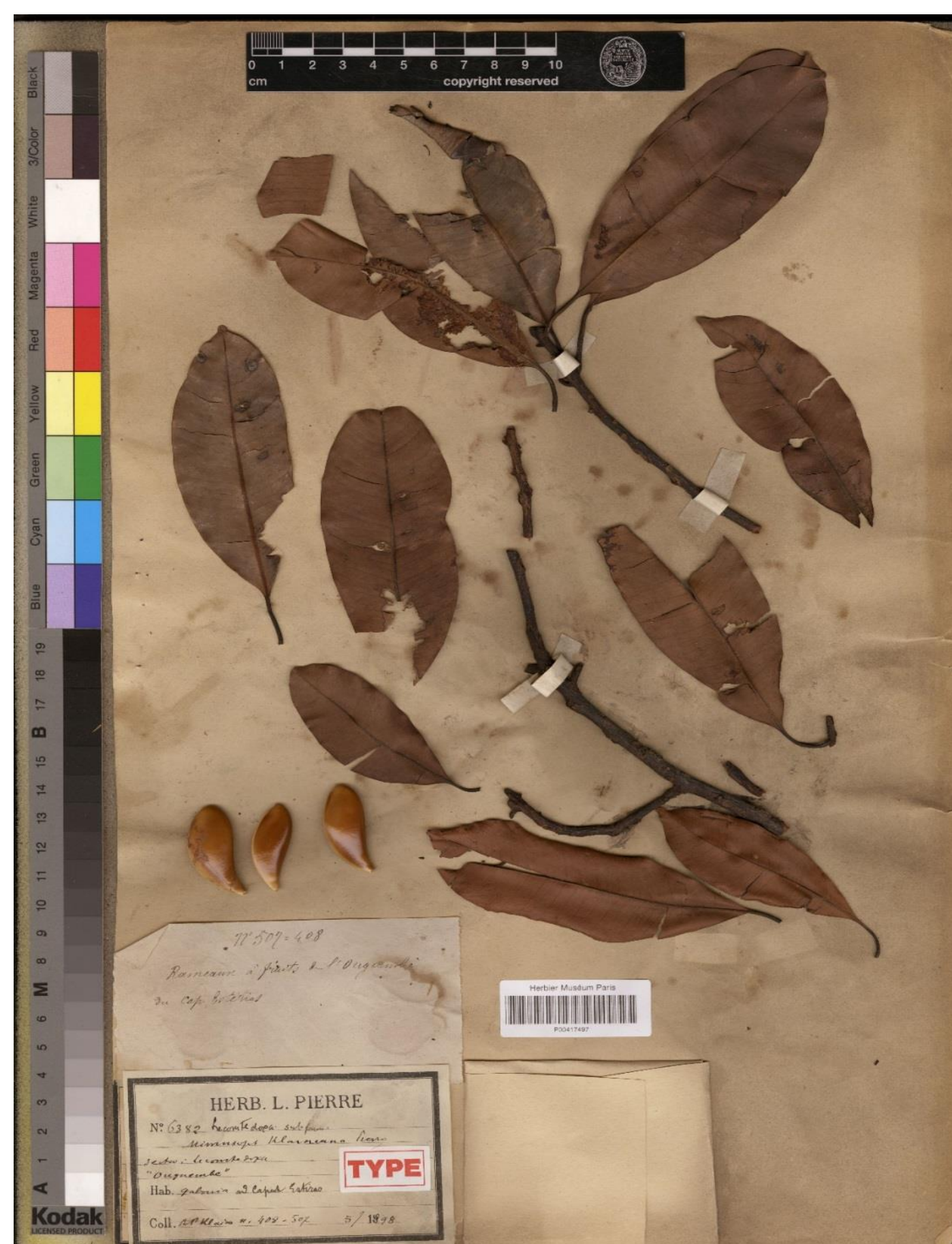


Figure 2. Herbarium specimen of *Lecomtedoxa klaineana*

MATERIAL & METHODS

A herbarium database was compiled and a total of 216 specimens were analyzed, of which 68 could be sampled for molecular analyses. Because of a lack of recent specimens for most of these rare species, low concentrations and low qualities of DNA were often observed. For morphological analyses, data were absent for some of the rarest species, something that could hinder the comparison with molecular data. A list of relevant traits has been established and measurements have been taken from specimen images from online herbarium databases (Figure 2). The results should be explored to allow a complete characterization of the subtribe, and support phylogenetic results.

RESULTS

Due to very degraded DNA a comprehensive sequence alignment could only be obtained for the nuclear ribosomal ITS marker (37 individuals from 13 species). DNA from the chloroplast region was much more difficult to amplify than nuclear one. Some of our samples were added to a parallel project, also focused on the Sapotaceae family, in which NGS (Next-Generation Sequencing) techniques are used, in order to obtain an analysis of large areas of interest and to add the results to the study. It will then be possible to compare the phylogenies using the two techniques.

DISCUSSION

Inhambanella is retrieved separate from the rest of Gluemeae (Figure 3). This is correlated with the fruiting character: these species are indeed the only ones in the group whose fruit is not dehiscent. This genus should then be excluded from Gluemeae. This leaves us with *Gluema*, *Lecomtedoxa* and *Neolemonniera*. Based on the preliminary molecular results, the group is retrieved monophyletic, although with weak support. A few rearrangements must be done for some species, but the three genera seems to make sense.

Although ITS provides an interesting insight for a Gluemeae suprageneric classification and gives significant results at the species level, further genes will be used to test the validity of these encouraging preliminary results which also have to be compared to the morphological data.

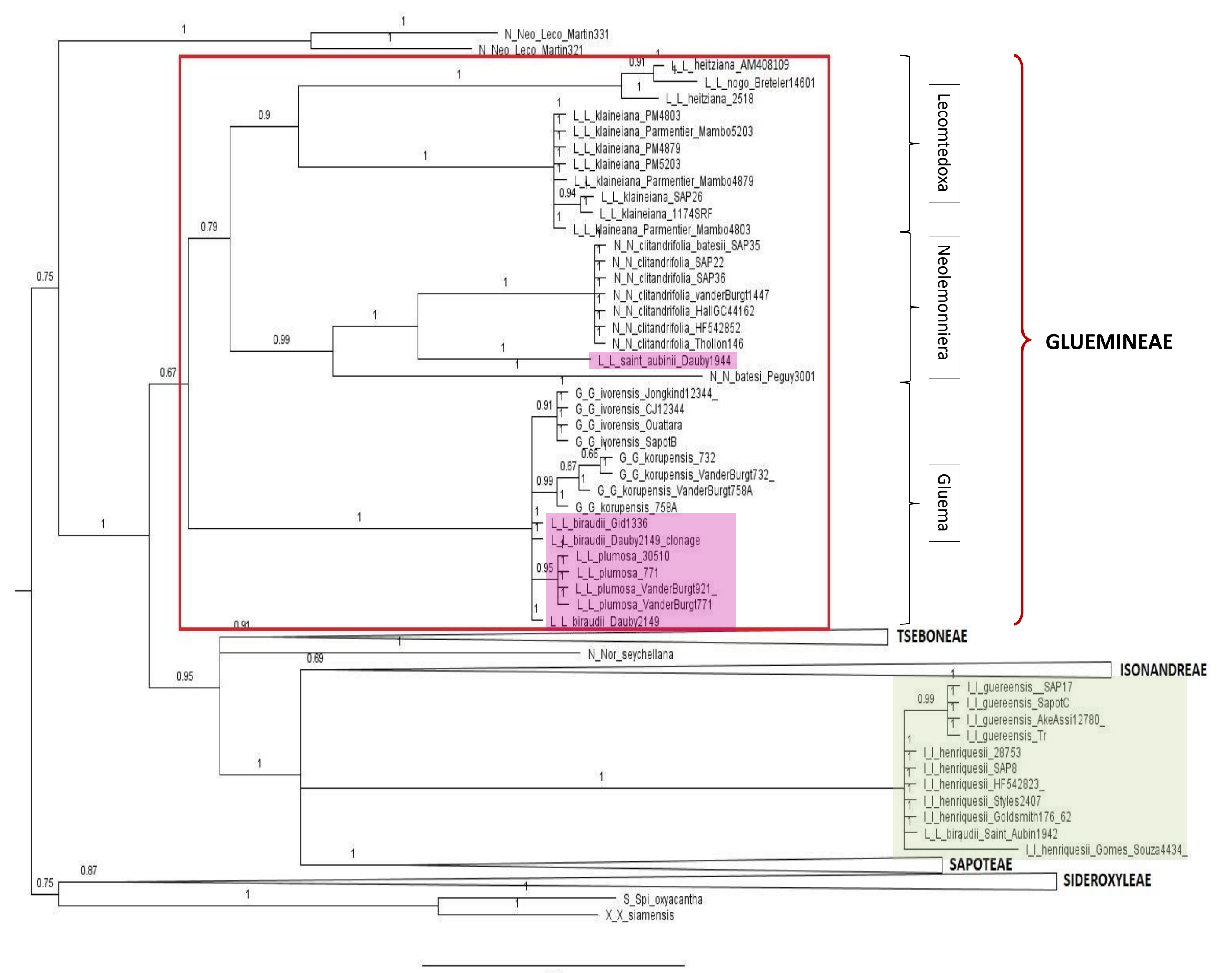


Figure 3: Phylogram of subfamily Sapotoideae based on ITS, highlighting the tribe Gluemeae. [L: *Lecomtedoxa*; N: *Neolemonniera*; G: *Gluema*; I: *Inhambanella*].

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