

**Genome size, molecular phylogeny, and evolutionary history of the tribe
Aquilarieae (Thymelaeaceae), the natural source of agarwood**

ABSTRACT

The tribe Aquilarieae of the family Thymelaeaceae consists of two genera, *Aquilaria* and *Gyrinops*, with a total of 30 species, distributed from northeast India, through southeast Asia and the south of China, to Papua New Guinea. They are an important botanical resource for fragrant agarwood, a prized product derived from injured or infected stems of these species. The aim of this study was to estimate the genome size of selected *Aquilaria* species and comprehend the evolutionary history of Aquilarieae speciation through molecular phylogeny. Five non-coding chloroplast DNA regions and a nuclear region were sequenced from 12 *Aquilaria* and three *Gyrinops* species. Phylogenetic trees constructed using combined chloroplast DNA sequences revealed relationships of the studied 15 members in Aquilarieae, while nuclear ribosomal DNA internal transcribed spacer (ITS) sequences showed a paraphyletic relationship between *Aquilaria* species from Indochina and Malesian. We exposed, for the first time, the estimated divergence time for Aquilarieae speciation, which was speculated to happen during the Miocene Epoch. The ancestral split and biogeographic pattern of studied species were discussed. Results showed no large variation in the 2C-values for the five *Aquilaria* species (1.35–2.23 pg). Further investigation into the genome size may provide additional information regarding ancestral traits and its evolution history.

Keyword: *Aquilaria*; *Gyrinops*; Flow cytometry; Chloroplast genes; ITS gene

