










Rescuing the rare monotypic *Aetoxylon sympetalum* from remnant forests in Kapuas Hulu, West Kalimantan

Aetoxylon sympetalum (Steenis & Domke) Airy Shaw (Thymelaeaceae) is a monotypic tree species endemic to West Borneo. It can reach a height of c. 30 m and grows mainly in inundated soils such as heath forests. The tree produces aromatic resin that smells similar to that of agarwood and that is extracted and mixed with resin from agarwood-producing trees of the genus *Aquilaria*. The market demand for *A. sympetalum* has increased as the demand for agarwood has risen. The species was formerly harvested in Indonesia but is now protected under the Minister of Environment and Forestry Decree 106/2018 because of its rarity, continuing decline and endemism. Nationally, *A. sympetalum* has been categorized as Critically Endangered.

A research team from the Indonesian Plant Red List Authority, in collaboration with the National Agency for Research and Innovation, Natural Resources Conservation Agency West Kalimantan Province, and Tumbuhan Asli Nusantara Foundation, surveyed for *A. sympetalum* during July–August 2023 in Mentebah District of the Kapuas Hulu Regency of West Kalimantan Province. We collected data on the number of mature and immature individuals, area of occupancy, extent of occurrence and threats, and seedlings and twigs were collected for propagation in a nursery in West Java. The information obtained will be used to reassess the species' conservation status and to estimate its standing stock. We found only nine mature and seven immature trees. Efforts to find other trees and propagation experiments are ongoing. We anticipate that the propagated cuttings will serve as planting stock for ex situ conservation.

During our surveys we informed local communities and village officials about the protected status of *A. sympetalum*. We also explained how the existence of *A. sympetalum* within a forest can be used as the legal basis for applying for land status as a customary forest.

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YULITA KUSUMADEWI^{1,2}  (yulita.kds@gmail.com), R.M. WIWIED WIDODO³ , KUSUMA RAHMAWATI^{1,2} , BAYU A. PRATAMA^{1,2} , GUSTAMAN SYAH³ , IGNASIUS SURIYANTO⁴ , AGUSTI RANDI⁴ , SIMON PETRUS⁵  and HENTI H. RACHMAT^{1,2} 

¹Indonesian Plant Red List Authority, Bogor, Indonesia.

²National Agency for Research and Innovation-Indonesia, Bogor, Indonesia. ³Natural Resources Conservation Agency,

West Kalimantan Province, Pontianak, Indonesia.

⁴Tumbuhan Asli Nusantara Foundation, Palu, Indonesia.

⁵Arboretum Sylva Fahutan UNTAN, Pontianak, Indonesia

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Endemic crabs from ancient Sulawesi lakes under double threat

The ancient lakes of the Indonesian island Sulawesi stand out for their rich species diversity and high levels of endemism, especially of fish, snails, shrimps and crabs. The invertebrates in particular face serious threats, one of which is invasive fish, specifically the flowerhorn, an artificial hybrid of various Neotropical cichlids. This fish has been spreading rapidly in the Malili lake system in South Sulawesi since 2010, when the first occurrence was recorded in Lake Matano, the uppermost lake of the system, probably the result of a release by a local aquarist or pet store owner. Many local endemic shrimp and snail species are categorized as Critically Endangered on the IUCN Red List, and all five crab species in the Malili lakes are categorized as Endangered.

During monitoring in Lake Matano in September 2022 and May 2023, we witnessed flowerhorns attacking crabs. In the first case, it was an adult *Parathelphusa pantherina*, which was deprived of several limbs in a few minutes and finally pulled out from under a rock and killed. In the second case, an adult *Syntripsa matannensis* was attacked and lost several limbs. The fact that we have witnessed this behaviour on several occasions indicates it is a common occurrence. Each time, multiple cichlids attacked together.

Crustaceans are not the main prey of flowerhorns; research suggests they primarily eat snails. In Lake Matano, seven species of *Sulawesidrobia* and six of *Tylomelania* are endemic. Nearly all are Critically Endangered. The smallest species of the genus *Sulawesidrobia* may already be extinct. They disappeared as the flowerhorns spread, and so did the smaller species of *Tylomelania* and the juveniles of the larger species (Haase et al., 2023, *European Journal of Taxonomy*, 864, 77–103).

This predation of snails also has an impact on the crabs. Two species of *Syntripsa* are molluscivorous: *S. matannensis*, endemic to Lake Matano, and *S. flavichela*, which also inhabits two neighbouring lakes. Flowerhorns are thus also competing for food with the endemic crabs, which are now threatened both by the depletion of their mollusc prey and by predation.

Our observations of interactions between flowerhorns and crabs underscore the urgency of the situation. Invasive cichlids exert great pressure on this lake ecosystem, and flowerhorns have already made their way into neighbouring lakes that have a similarly unique invertebrate diversity.