

## Biodiversity Record: Rediscovery of *Engelhardia serrata* in Singapore

Ali Ibrahim, Rie Chong, Soh Sun Yi, Muhammad Khairuldin Aziz, Primeman Tan Yew Loong, Jolyn Tan Si Ying & Chong Kwek Yan\*

National Parks Board, Singapore Botanic Gardens, Singapore 259569;

Email: [chong\\_kwek\\_yan@nparks.gov.sg](mailto:chong_kwek_yan@nparks.gov.sg) (\*corresponding author)

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**Subject:** *Engelhardia serrata* (Angiosperms: Fagales: Juglandaceae).

**Subject identified by:** Ali Ibrahim and Paul Leong.

**Location and date:** Singapore Island, Central Catchment Nature Reserve, Long-Term Forest Ecological Monitoring plot W48, near the edge of Upper Peirce Reservoir; 17 August 2022 and 30 September 2022.

**Habitat:** Secondary forest with small remnants of primary forest nearby.

**Observers:** Ali Ibrahim, Rie Chong, Soh Sun Yi, Muhammad Khairuldin Aziz, Primeman Tan Yew Loong and Jolyn Tan Si Ying.

**Observation:** A fruit with a 3-lobed wing (Fig. 1) was spotted in the leaf litter by Ali Ibrahim while conducting a survey of the undergrowth in plot W48 on 17 August 2022. The fruiting tree was determined to be a large tree in the extended (i.e., 40 × 40 m) area of the plot. The tree was leaning at the upper reaches to one side. Its trunk had fluted buttresses at the base (Fig. 2); the diameter measured above the buttresses at 3 m height was 45.7 cm. The inner bark was reddish-brown (Fig. 3). The search produced a few possibly conspecific seedlings but no other tree nearby.

In a second visit on 30 September 2022, tree climbers Primeman Tan Yew Loong and Jolyn Tan Si Ying climbed the tree to collect specimens for vouchering and molecular analysis. The leaves are compound and paripinnate with five to six pairs of leaflets arranged oppositely to sub-oppositely along the rachis, reducing gradually in size towards the base (Fig. 4). The leaflet blade margin is serrated and the base is asymmetric. The underside of the leaflet blade is densely covered in yellow round scales. The upper side of the leaflet blade also has these scales but in lower densities. The height of the tree was estimated to be 33 m.

The collected material was deposited in the Singapore Herbarium, Singapore Botanic Gardens (SING).

**Remarks:** The characters of the fruit and tree match the descriptions of *Engelhardia serrata* Blume given by Jacobs (1960) and Ng (1972). Until the present find, *Engelhardia serrata* was presumed extinct in Singapore (Lindsay et al., 2022). This, therefore, marks the rediscovery after about one century of not only the species, but also the walnut family Juglandaceae of which *Engelhardia serrata* is the only local representative.

The last properly dated specimens of *Engelhardia serrata* to be deposited in the Herbarium of the Singapore Botanic Gardens were collected in the 19<sup>th</sup> century. In 1889, J.S. Goodenough made two collections of this species, from Changi Reserve (J. S. Goodenough 1609, barcode SING 0011207, 11 Mar 1889) and Kranji (J. S. Goodenough 2833, barcode SING 0011208, 7 Oct 1889). In 1894, H.N. Ridley collected this species from Seletar (H. N. Ridley s.n., barcode number SING 0011211) and the Singapore Botanic Gardens. Curiously, the two collections from the latter had the same collection number (H. N. Ridley 5905) but were indicated to be from different parts of the Gardens (Gardens' Jungle, barcode number SING 0011210; and Garden Rockery, barcode number SING 0011209).

There is one specimen which collection details were not written on the label, but seems likely to be collected in the 1920s (barcode number SING 0011206; Fig. 5).



Fig. 1. Fruit of *Engelhardia serrata* with three-lobed wing. Length of middle lobe about 4 cm. (Photograph by: Ali Ibrahim).  
Fig. 2. Fluted buttresses at the base of the trunk. (Photograph by: Soh Sun Yi).



Fig. 3. Lichen-covered bark showing reddish-brown inner bark. (Photograph by: Ali Ibrahim).

Plot W48 was re-established over the location of plot 1 of Cluster 48 surveyed in 1992 (see Wong et al., 1994). However, this *Engelhardia serrata* tree was not recorded in an earlier survey and may have been outside of the original circular plot of radius 12.6 m.

Even though fruiting and possible seedlings of this dioecious species (Jacobs, 1960; Ng, 1972) suggest that there should be other individuals within pollinating distance, we only encountered one mature individual in our search. Thus, we propose that *Engelhardia serrata* should be regarded as nationally Critically Endangered.

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Fig. 4. Leafy branch of the tree collected by tree climbers. (Photograph by: Chan Pin Jia).

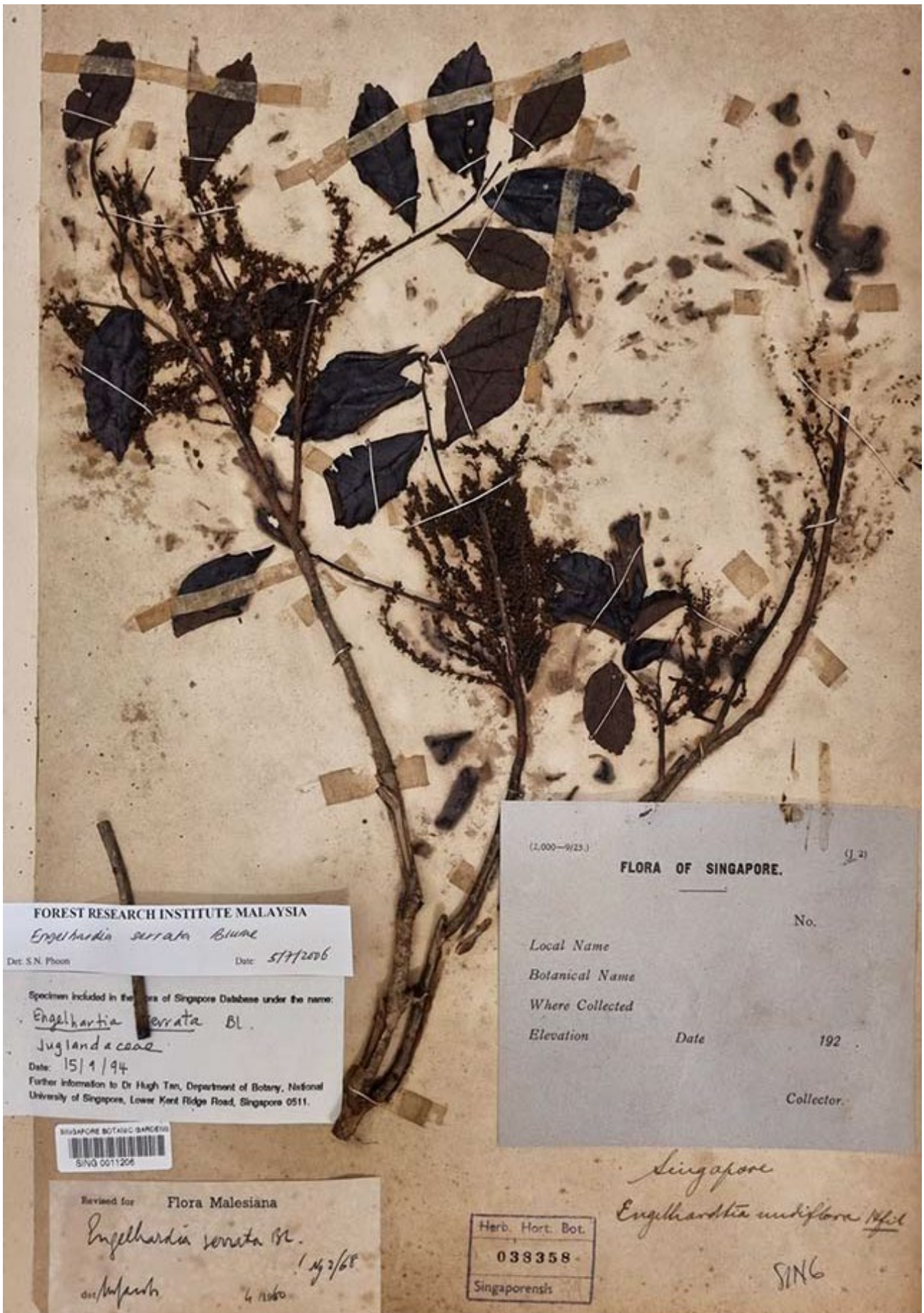


Fig. 5. The likely last collection of *Engelhardtia serrata* before the current sighting, unfortunately with no collection details on the label other than the pre-filled decade suggesting that it was collected in the 1920s. (Photograph by: Chong Kwek Yan).