

Short Note

AN OVERVIEW ON THE CONSERVATION STATUS OF MERSAWA (*Anisoptera costata* Korth.) IN JAVA

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Anisoptera costata Korth., which has a commercial name of *mersawa* grows and proliferates naturally, often gregarious, in semi-evergreen dipterocarp forest and evergreen forest in areas with seasonal climate and rare but widespread in lowland everwet forest from sea level up to 700 m in continental S.E. Asia, Malay Peninsula, Borneo, Sumatra, and Java (Ashton, 1982). In Java, it has been recorded to occur only in Banten (Backer & Bakhuizen van den Brink, 1963) and in Leuweung Sancang Nature Reserve (LSNR) (Kalima, 2006).

A. costata belongs to Dipterocarpaceae. It is a large to very large tree reaching up to 50 - 65 m tall, with cylindrical branchless bole of up to 45 m in height 150 cm in diameter (Figure 1). Other characters commonly used to identify this species are the presence of few buttresses of up to 4 m high, spreading out up to 2.5 m, with greyish-brown fissured bark. The leaves are obovate to oblong, (6 - 18 cm x 5 - 10 cm), dull yellowish or greenish lepidote beneath, secondary veins 8 - 27 pairs, hardly or not depressed above. The venation is scalariform-reticulate and usually distinctly hairy on the undersurface. The petiole is about 2.5 - 4 cm long, with coarse stellate hairs (Figure 2) (Kalima, 2005). This species is highly variable and the variation on the whole is continuous, with geographically localized forms occurring in the less seasonal areas and the Javan species is one of the forms similar to that occurring in Sumatra (Ashton, 1982).

This hard timber is commonly used as light construction, handicraft, veneer, plywood and timber board for ships construction (Hoffman and Wong, 1994). The main concern of studying this particular species is mainly due to the limited information regarding its potentials and natural distribution in the wild. Without this information, it is difficult to argue that this species is under a serious threat. Therefore, there is a need to carry out a field survey to determine the population size in its natural habitat.

The forest area of LSNR is considered as the largest remaining lowland rain forest on Java. Currently, this area has been seriously threatened by the massive land utilization and uncontrolled human activities, such as illegal logging, shifting cultivation, forest conversion for settlements and plantation, forest encroachment and forest opening for agriculture (Balai Konservasi Sumber Daya Alam, 2007). Degraded forest in LSNR area covers about 1000 ha out of the total forest area of 2.157 ha (Hidayat, 2003).

LSNR, gazzeted as protected area in Sancang districts, Cibalong, by the Decree of the Minister of Agriculture in 1978 (SK Menteri Pertanian Nomor 370/Kpts/Um/6/1978 tanggal 9 Juni 1978), has been so far experiencing severe environmental destruction, that further causes habitat degradation, especially the *mersawa* habitat. This could eventually lead to the extinction of this particular plant species. This condition might become worse and

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Figure 1. The bole and bark of *A. costata*



Figure 2. Leaves of *A. costata*

seriously threaten the future of LSNR natural resources unless there are some actions to halt these ongoing degradation processes.

A field survey carried out in LSNR in 2005 revealed that, *mersawa* was recorded only from the eastern part of Sagara country side. It is growing in association with *Caesalpinia sappan*, *Macaranga subfalcata*, *Artocarpus rigidus*, *Alseodaphne umbelliflora*, *Eugenia* sp., and *Knema cinerea*. During the previous survey in the LSNR forest, Sidiyasa *et al.* (1986) recorded that *A. costata* was found in the western part of LSNR, near the Cikalomberan and Cipalawah villages at 30 - 40 m above sea level, where *Dipterocarpus hasseltii* was the most prevalent species in the study plot. The most recent study carried out by Kalima (2006) in Cipalawah village showed that *A. costata* was no longer present (Kalima, 2006). During the 2006 field survey, forest condition in the study area has changed greatly and the habitat of *A. costata* has been damaged significantly. Numerous felled trees and stumps in some places were noticed nearby the habitat of this species. There were also some evidences of the felling of *D. gracilis* and *D. hasseltii* with stem diameter of 58 cm and 76 cm, respectively, but *mersawa* remained undisturbed. In the future, however, there is no guarantee that *mersawa* will be able to survive under current serious threats.

Beside human disturbances, *mersawa* has a biological limitation for its regeneration due to its unique biological characters. For example, *mersawa* requires special attention to allow it to regenerate naturally as seedlings are difficult to survive in the wild. *Mersawa* seeds are recalcitrant, easy to rot and are often attacked by pest. This condition may influence the seedling population in its natural habitat and thus natural regeneration process may not work properly. During our observation we found only one tree within an area of 1.157 ha (six sample plots of 0.13 ha each) in LSNR and no seedling at all was encountered underneath. To date there is no information so far on the seed predation by animals.

Considering that we recorded only one individual of *mersawa* during our field observation, we, therefore, predict that this species is becoming endangered. We suggest that

counting the entire population in the field is deemed to be the proper way to determine the level of species rarity in the wild. Unless serious attempt to protect this species is carried out, within a short period of time *A. costata* will face a high risk of extinction. Actually, the conservation status of this species is subject to change based on the recent data and information that have been submitted to IUCN. However, the tentative status of *mersawa* in the wild could be used as a reference for the conservation status of the taxa.

Ashton (1998) has claimed that the distribution of *A. costata* in the Phillipine was very limited and there was only one individual collected during survey in some forest areas in the Phillippines. During the Conservation Expert Meeting in 2006, scientists have agreed to put the status of *A. costata* under EN A1cd+2cd criterias in IUCN Red List of Threatened Species. This mean that *A. costata* has been seriously threatened and at high risk to be extinct in the wild. Similar to the Phillipine siatuation, LSNR has now been facing great pressures from human activities, including tree cutting as well as forest conversion into agriculture and plantation areas. It is very obvious that this forest fragmentation will reduce the habitat of *mersawa* and most importantly is the loss of germplasm diversity. This genetic loss may increase the risk of species extinction. So far, attempt to develop *mersawa* conservation program has not been done yet because seeds or fruits are difficult to collect from their natural habitat. Thus, there is an urgent need to conserve this species, or otherwise, *mersawa* may soon be extinct from its natural habitat in Java island.

Nowadays, there is a strong indication that this species has become difficult to find in its habitat. Based on Government Regulation No. 5 Year 1990 concerning Conservation on Natural Resources and its Ecosystem, there is an immediate need to put *A. costata* under special protection action to prevent extinction attributed to illegal logging and other disturbances. The implementation of this regulation should be carried out in line with the environmental education program focusing on protecting *mersawa* as rare and endangered species and promoting regional development program for rare and endangered species conservation, such as the development of Baturaden Botanical Garden in Central Java.

A subsequent conservation effort should be implemented, such as planting *mersawa* within its natural habitat (*in-situ* conservation) and outside its natural habitat (*ex-situ* conservation) to ensure that this particular species is managed and utilized properly for its long-term existence. The development of *in-situ* conservation program can be carried out in LSNR while *ex-situ* conservation program can be developed in Baturaden Botanical Garden (Central Java), Bogor Botanical Garden (West Java), arboreta in climatically seasonal areas and some Research Forests Areas across Java islands (Departemen Kehutanan, 1984). Finally, we also suggest to carry out tree improvement program by means of species cross-breeding as this would be necessary in order to increase the diversity of *mersawa* in the wild. By developing these activities, we would expect that a detailed and comprehensive information could give a significant contribution to the development, utilization and conservation program of *mersawa*.

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