IX. CONTRIBUTIONS TO THE OCCURRENCE OF CANARIUM DENTICULATUM (BURSERACEAE) IN THE PHILIPPINES

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SUMMARY

During vegetation studies on the foothills of Mt Pangasugan, Leyte, the species *Canarium denticulatum* Blume (*Burseraceae*) has been identified. So far, records of this species in the Philippines were restricted to the southernmost part of the country, to Basilan and Mindanao. This recent record shows that *C. denticulatum* extends north into the Visayas.

TAXONOMY

According to Leenhouts (1955) two subspecies of *Canarium denticulatum* Blume can be distinguished: subsp. *denticulatum* and subsp. *kostermansii* Leenhouts. Furthermore, *C. denticulatum* is related both to *C. odontophyllum* Miq. and probably to *C. karoense* H.J. Lam (Leenhouts l.c.: 272).

Distribution

Canarium denticulatum Blume occurs in the South Andamans, South Burma, Sumatra, Peninsular Malaysia, Java, Borneo, and the Philippines (Leenhouts, 1955). While subsp. *kostermansii* seems to be restricted to some areas in Borneo, subsp. *denticulatum* is widely spread and covers all the other areas mentioned above. From the related two species only *C. odontophyllum* occurs in the Philippines, but only in Palawan. *Canarium denticulatum* has been described in the Philippines so far only for Basilan, and – on Mindanao – for Agusan, Butuan, Davao, Lamao, Surigao, and Zamboanga (Merrill, 1923, as *C. laciniatum* Elmer). Recently the author identified four specimens in Leyte, c. 200 km north of Mindanao. These are found on the foothills of Mt Pangasugan, at the western part of Leyte, about 8 km north of Baybay near the Visayas State College of Agriculture (ViSCA).

Habitat

There are one sapling, a small female tree, a medium-sized and a big male tree, respectively. The sapling has been found at the river bottom of Kalbigaa at about 130 m altitude. The medium-sized male tree (c. 8 m high, $d_{1,3}$ 35 cm) grows at 50 m altitude on the riverbank of the same river. On the lower slope along Kalbigaa River at about 160 m altitude, the small female tree (c. 6 m high, $d_{1,3}$ 15 cm) has been found. Finally a big stout male tree of 85 cm $d_{1,3}$ and about 17 m height was identified on the riverbank of Lago Lago at 85 m altitude.

The parent material of the local soils are andesites, basalts, dacitics, and breccias. Soils studied at an elevation of 100 m altitude showed a basaltic parent material and were classified as Haplic Alisols (FAO-UNESCO classification of 1988) (Asio, 1996).

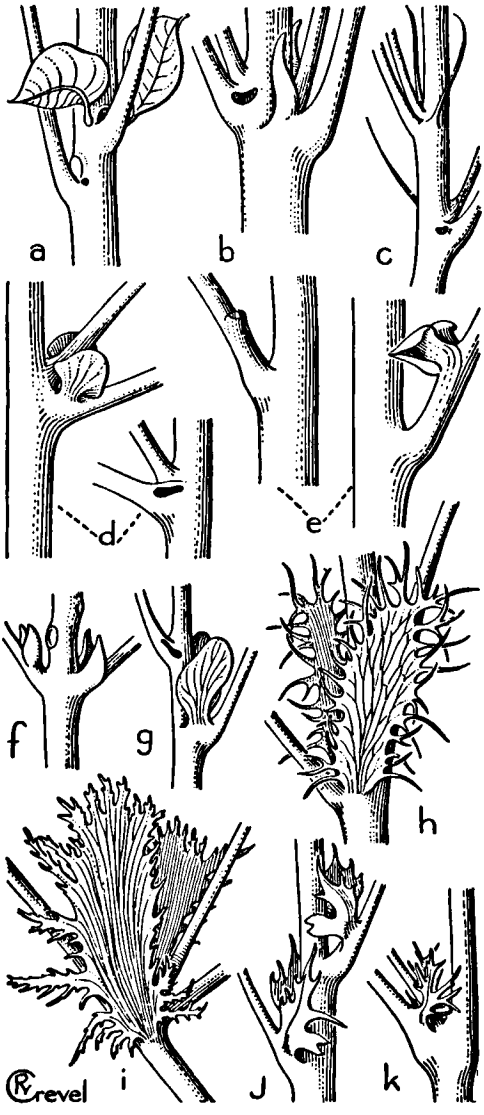

Figure 1. Different kinds of stipules (and their scars) in *Canarium*. a. Pseudostipules in *C. decumanum* Gaertn. – b, c. Lanceolate to subulate stipules in sect. *Pimela*: b. *C. dichotomum* (Blume) Miq., c. *C. acutifolium* (DC.) Merr. var. *acutifolium*. – d-k. Foliar stipules in sect. *Canarium*: d. *C. caudatum* King f. *caudatum*, e. *C. sylvestre* Gaertn. with auricle-shaped stipules, f. *C. ovatum* Engl., g. *C. vulgare* Leenh., h. *C. kaniense* Laut., i. *C. odontophyllum* Miq., j. *C. megalanthum* Merr., k. *C. denticulatum* Blume.

Average rainfall at ViSCA is about 2600 mm/a (ViSCA meteorological station). The climate is described as everwet without dry seasons. Nevertheless, dry periods occur from 3 to 4 months ir-regularly and this influences vegetation composition (Langenberger, in prep.).

Ecology

Flowers of the small male tree were observed only during a few days between February 8 and June 10, 1997; while only in June for the big tree at Lago Lago River (which the author did not know in February 1997). This indicates two short flowering periods.

Table 1. Variability of leaf characters.

Character	Leyte samples	Leenhouts, 1955
Leaf length	31–57 cm	30–45 cm
Stipules		
insertion from leaf base	4–11 mm	(0–)3–6 mm
height	6–25 mm	(5–)10–22.5(–40) mm
width	5–26 mm	7.5–15 mm
no. of branches > 1 mm length	6–22	no data
1st pair of leaflets		
insertion from leaf base	63–144 mm	
length of leaflets	52–185 mm	
length of petiolules	4–13 mm	
maximum width of leaflets	17–74 mm	
no. of secondary veins	11–16	
2nd pair of leaflets		no distinction between leaflets
insertion from leaf base	95–205 mm	no data
length of leaflets	120–272 mm	(50–)120–200 mm
length of petiolules	5–17 mm	no data
maximum width of leaflets	32–86 mm	20–150 mm
no. of secondary veins	16–21	(9–)11–17(–21)
3rd pair of leaflets		
insertion from leaf base	155–273 mm	
length of leaflets	118–275 mm	
length of petiolules	4–17 mm	
maximum width of leaflets	32–90 mm	
no. of secondary veins	17–21	
terminal leaflet		
insertion/length of rhachis	120–270 mm	
length of leaflet	122–316 mm	
length of petiolule	20–60 mm	
maximum width	33–87 mm	
no. of secondary veins	18–21	

These flowers were visited by bees. Fruits from the small female tree (c. 4 cm long) developed in the beginning of July, but these did not contain developed seeds at that time.

The big tree, which grows right on the riverbank, is obviously able to stand the difficult water regime of the area. The rivers often fall dry during dry periods and become torrent streams during typhoons, thus resulting not only in a wide amplitude of water levels, but big boulders transported during typhoons cause also severe damage to the roots and the stem base. However, this species seems to withstand such difficulties.

Habit

The big tree shows a rather stout habit with a thick conical stem and a broad, massive crown which lacks a dominant shoot. The bark is greyish-brown to ochre, lenticellate and comes off in small patchy flakes. The inner bark is pinkish-white and about 5–10 mm thick. The slash as well as broken branches exude a resinous smell. The colourless resin exudes slowly. The leaves are 2- or 3-jugate, the leaflets serrate in the upper two thirds of the lamina. The characteristic feature of the leaf is its persistent stipules which make field identification easy. Table 1 gives an impression of the variability in some characters. The measurements were taken from fresh leaves. A comparison with the data given by Leenhouts (1955) showed a close resemblance. It is remarkable that the first pair of leaflets is regularly smaller and shows fewer secondary veins than the other leaflets. The terminal leaflet is by far the biggest but does not show an increased number of secondary veins.

DISCUSSION

Canarium denticulatum as described by Leenhouts (1955) occurs in rain forests up to 700 m. At the locality of Leyte it could not be found higher than at 150 m altitude. It seems that this species prefers the vicinity of water under the local conditions. The study area irregularly experiences dry spells up to three months, resulting in relatively dry conditions along the ridges and the slopes. This could explain the absence of this species from those sites and support the assumption that it is dependent on a regular water supply. As the rivers on the foothills of Mt Pangasugan flow at higher altitudes (above c. 200 m) in canyons, a typical lower slope does not exist at these elevations, thus probably restricting the suitable sites to lower elevations.

It is very unlikely that *C. denticulatum* only occurs in the study area. Probably, it is scattered along the few still forested lower reaches of the rivers of Leyte and perhaps, due to the geological history, where Samar and Leyte were a connected land mass, of Samar, too. The complete destruction of the lowland forest below 100–200 m altitude for agriculture and settlements may have led to a strong restriction of the habitat of this species.

The species does not seem to have a special use to local communities. At least, people are not aware that this is an independent species. They generally name it 'Mili Pili', together with other *Canarium* species, although the stipules are a striking feature for delimitation. This shows once more that the use of local names has high risks and can only be helpful with a close botanical check-up. It shows, secondly, that people are not aware of the biodiversity of their own surroundings. Studies and plant inventories even in the vicinity of settlements may therefore result in new information.

Even if the timber may not be of high value, it should be stressed that this species could be useful in riverbank stabilization and thus in watershed management.

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