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Diversity and Distribution of *Ficus* on the Campus of Universitas Lambung Mangkurat, Banjarmasin, Indonesia

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Abstract

Campus of Universitas Lambung Mangkurat (ULM) Banjarmasin covering an area of 50.78 ha stands on wetland and is a *Ficus* habitat. However, what species of this genus grow and develop on this campus have never been documented. This research aimed to inventory species from the genus *Ficus*, map their distribution and analyze their diversity. Species data was collected through exploration. Species were identified qualitatively or quantitatively based on the morphological characters of stems, leaves, syconium, and roots. The distribution of each species was mapped, the number of individuals counted, and diversity analyzed. Seven species were found, namely *F. benjamina*, *F. kurzii*, *F. microcarpa*, *F. elastica*, *F. natalensis* subsp. *leprieurii*, *F. racemosa*, and *F. trichocarpa*. The number of individuals varied from 1 to 53 and they were evenly distributed on campus. The overall density of *Ficus* was 2.09 individuals/ha and the diversity index was 1.31. Data on morphological characters can be developed as teaching materials, while density and diversity indices become basic data for monitoring the development of *Ficus* on campus.

Keywords: *Ficus;* density; distribution; diversity; morphology

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INTRODUCTION

The Campus of Universitas Lambung Mangkurat (ULM) Banjarmasin, which has an area of 50,78 ha, stands on a wetland in the form of a swamp (Riefani et al., 2020). Along with development, the land has changed into dry land due to backfilling. The backfilling was deliberate because it aimed to transform the swamp land into an area suitable for academic and lecture activities. Despite this, traces of swamp land are still visible. First, areas that are empty land or buildings that have not yet been built are covered with swamp vegetation which, together with the various animal species that visit them, creates a swamp ecosystem. Second, flooding of roads, courtyards, or various other campus infrastructure occurs periodically due to flooding which is influenced by sea tides.

Many species of plants that make up swamp vegetation or form swamp ecosystems can still be found growing and developing on campus today. These plants include grasses (*Cyperus*), ferns (*Acrostichum, Lygodium, Stenochlaena*), herbs (*Eichhornia, Ipomoea, Ludwigia*), and woody plants (*Cerbera, Ficus, Sonneratia, Melaleuca*). On the other hand, many plant species are starting to become difficult to find due to land changes. These species include swamp jelutung (*Dyera costulata*), jingah (*Gluta renghas*), nipah (*Nypa fruticans*), pulantan (*Alstonia*), and rumbia (*Metroxylon sago*).

Ficus is one of the plants on this campus which is currently being used as a research theme. This theme was floated because of three interesting things. First, *Ficus* is generally known as a pioneer plant (Lee et al., 2013; Wahyuningtyas et al., 2022). It can live in karst ecosystems (Nasrudin & Parikesit, 2020; Yelastri et al., 2023; Widiyanti & Kusmana, 2014) , scrub forests (Onrizal et al., 2005; Soendjoto et al., 2023a), and even in wetland environments such as riparian areas (Atmoko & Mukhlisi, 2021; Pothasin et al. 2014; Sumarni & Oktavianus, 2022) and coastal areas (Ara et al., 2023; Kumala et al., 2021; Trad et al., 2013).

Second, *Ficus* has an important role ecologically. It functions to maintain biodiversity (Kurniawan et al., 2022) and plays a role in ecological restoration (Hendrayana et al., 2019). However, the names of *Ficus* species that grow and develop in the ULM environment have never been recorded, let alone published. Data collection on Ficus carried out by several universities in their area of responsibility inspired this research. The University of North Sumatra, North Sumatra Province (Susilowati et al., 2021) recorded eight species of *Ficus* in its area, Syah Kuala University, Aceh Province (Jauharlina et al., 2022) 13 species, and Jahangirnagar University, Bangladesh (Mahanta et al., 2014) only two species.

Third, *Ficus* is a unique plant. The fruit can be found without being preceded by the physical appearance of the flower or flowering. This is different from the general condition that occurs in most plants. The plants referred to here have fruit that forms or appears after the flowers appear, starting from buds, blooming, wilting, until finally falling or rotting. This uniqueness is certainly interesting and should trigger ULM to make and develop *Ficus* as a teaching material in study programs at ULM or schools around campus. Hasanah et al. (2022) and Juanda et al. (2020) have used *Ficus* and various things related to it as teaching materials in schools.

The research aimed to inventory various plant species from the genus *Ficus* that grow and develop on the ULM Banjarmasin Campus based on the morphological characteristics of their plant organs, distribution maps, and analysis of species diversity. In turn, this research provides a comprehensive description of the morphology of species from the genus *Ficus*. Courses that require a detailed explanation of morphology, both in lecture sessions and practical sessions, include plant morphology, phanerogamae, and plant ecology.

METHOD

The research was carried out at the ULM Banjarmasin Campus, a campus other than the ULM Banjarbaru Campus. This campus is administratively located in North Banjarmasin District, Banjarmasin City, South Kalimantan Province and geographically located at 3°17'40" – 3°17'55" South Latitude and 114°34'45" –114°35'10" East Longitude (Figure 1). This campus was chosen because it is located in a wetland, to be precise, a freshwater swamp area that is influenced by sea tides. The campus which includes the Biology Education Study Program is significantly different from the campus in Banjarbaru which is located on dry land. On the other hand, the wetland environment has been designated as ULM's superior field.

Data about *Ficus* species was obtained through exploration. Species are identified through the morphology of plant organs, which are stems, leaves, syconium and roots. The results are described qualitatively or quantitatively, especially in relation to leaf size and syconium. Leaves were documented with a camera. These plant organs are objects that are always available in each species and are easy to observe and compare. References used to identify plant organ shapes are Tjitrosoepomo (2020) and Ellis et al. (2009). References for comparison include Mulyani et al. (2021), Nair et al. (2021), Peniwidiyanti (2017), Peniwidiyanti et al. (2022), and Wijaya & Defiani (2021).

Apart from species, data that was also collected was the number of individuals of each species. The number of individuals was then analyzed to obtain density (which is individual/ha) and the *Ficus* diversity index. The diversity index used is the Shannon-Wiener index (H') whose formula is as follows.

$$H' = -\Sigma \left(\frac{ni}{N}\right) \ln \left(\frac{ni}{N}\right)$$

In this case, ni = number of individuals of species i, N = number of individuals of all species, and ln = natural logarithm).

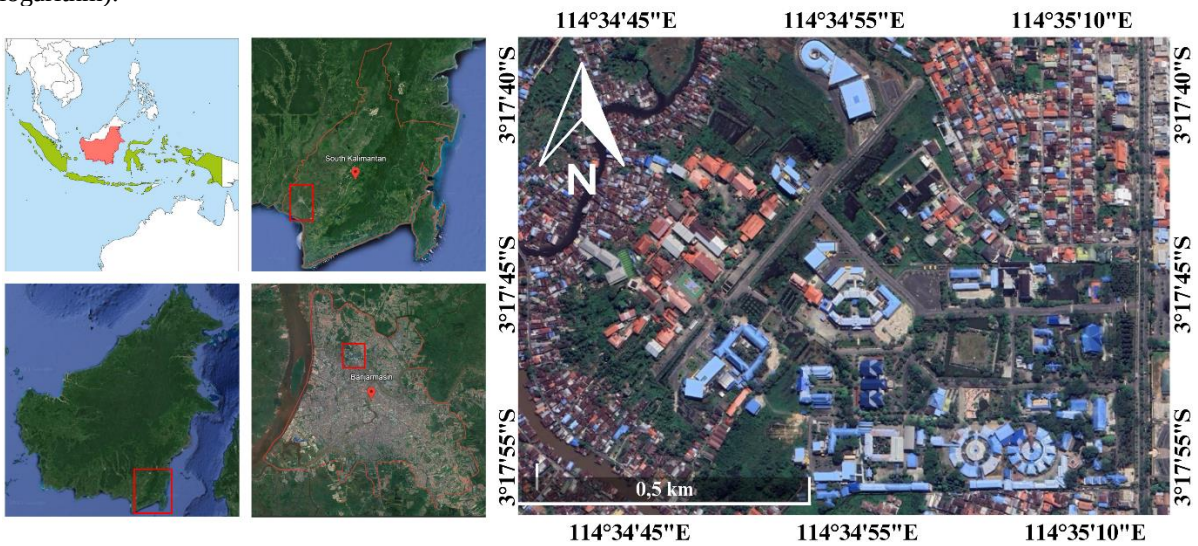

Figure 1. Map of research location (Campus of ULM Banjarmasin)

The density and diversity index is basic data used as a benchmark to analyze the presence of *Ficus* on campus. *Ficus* is a learning object for Biology Education Study Program students. On the other hand, it is very likely that *Ficus* will decrease or even disappear due to changes in habitat. Valid information states that in the next few years the Faculty of Dentistry will be built in this campus area. This construction uses land that grows *Ficus*.

RESULTS AND DISCUSSION

Density, Diversity, and Distribution of *Ficus*

Seven species of *Ficus* are found on the ULM Banjarmasin Campus (Table 1). Three of the seven species are commonly traded as ornamental plants. The first species is *F. microcarpa* var. Green Islands is known by the trade name dollar banyan or the natural one is known as panggang. The next two species are *F. natalensis* and *F. elastica*. Based on where they are kept, *F. microcarpa* and *F. natalensis* are kept in pots, while *F. elastica* is kept in the yard of one of the buildings on campus. The next four species which in this study were not included as ornamental plants were *F. benjamina, F. kurzii, F. racemosa*, and *F. trichocarpa*. They grow naturally, both in the yard and in open swampy areas.

The number of individuals found of each species varies; at least one and at most 53 (Table 1). The distribution is even, growing spread out in all locations or not clustered in certain locations (Figure 2).

Table 1. Density and diversity of *Ficus* on campus of ULM Banjarmasin

Subgenus	Species nama	Local name	Number of individuals	Density (ind./ha)	H'
Urostigma	*F. benjamina* L.	Beringin, kariwaya	19	0,37	0,31
	F. kurzii King	Beringin walik	25	0,49	0,34
	F. microcarpa L. f.	Panggang	53	1,04	0,35
	F. elastica "Burgundy" Nois.	Karet kebo	1	0,02	0,04
	F. natalensis subsp. *lepreurii* Miq	Beringin kupu-kupu	3	0,06	0,10
Sycomorus	*F. racemosa* Roxb	Loa	4	0,08	0,12
Synoecia	*F. trichocarpa* Miq	Reket	1	0,02	0,04
Number of *Ficus* individuals			106	2,09	-
Diversity index (H') of *Ficus*			-	-	1,31

Note: The Campus Area of ULM Banjarmasin = 50,78 ha

They are classified in three different subgenera, namely *Urostigma*, *Sycomorus*, and *Synoecia*. The differences in the subgenus lie in the vegetative parts and external completeness of the syconium (Yelastri et al., 2023).

Five species are classified as subgenus *Urostigma.* All species in this subgenus are hemi-epiphytic in habit. They start their life phase in the tree canopy (Yelastri et al., 2023). This subgenus has aerial roots that develop from the top (tree crown) to the bottom (soil surface) to obtain food nutrients. Aerial roots that enlarge at the same time as the trunk of the host tree also enlarges, hampering the transport of nutrients to the host tree. The strangling *Ficus* roots cause the host tree trunk to die (Figure 3). Because of this condition, *Ficus* subgenus *Urostigma* is called *Ficus* strangler. Pollination in this subgenus is easier because the male and female flowers are on the same fruit (Yelastri et al., 2023).

Figure 2. Distribution of Ficus on the ULM Banjarmasin Campus: (a) *F. benjamina*, (b) *F. kurzii*, (c) *F. microcarpa*, (d) *F. elastica* "Burgundy", (e) *F. natalensis* subsp. leprieurii, (f) *F. racemosa*, dan (g) *F. trichocarpa*.

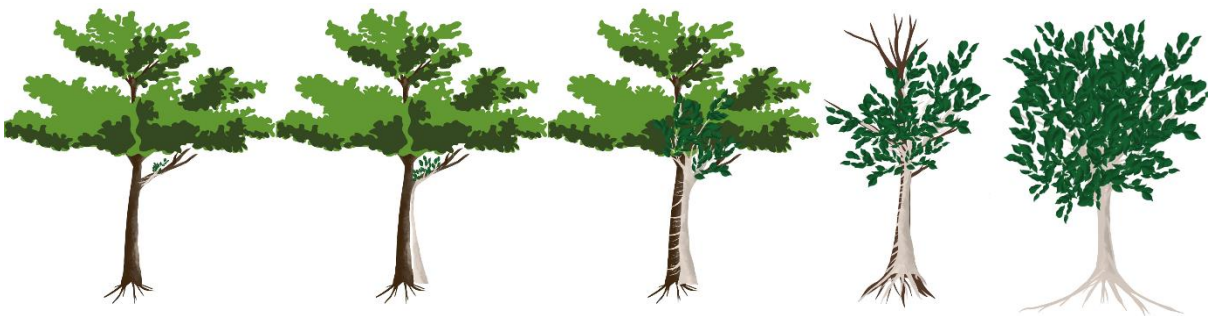

Figure 3. The development of hemi-epiphytic *Ficus* begins from seeds that frugivores land in the tree canopy. The roots then lead down to reach the ground. During its development, the roots twine around the host tree (the trunk is dark brown) until finally the *Ficus* grows into an independent tree.

The next species is classified in the subgenus *Sycomorus*. The habitus of subgenus is a tree and this subgenus has a tap root. The final species is included in the subgenus *Synoecia*. This subgenus is liana and can climb the stems of other plants. According to Berg & Corner (2005), this subgenus is characterized by the presence of two types of leaves. The climbing sterile stems have short aerial roots and *bathyphyll* leaves. Meanwhile, the branches are fertile, without roots, and grow *acrophyll* leaves. These leaves produce syconium when the *Ficus* climber reaches the canopy of the host tree.

Ficus is a versatile plant genus that has a positive impact on the physical, the biological and also the socio-cultural environments. This plant species is used as an environmental bioindicator (Peniwidiyanti et al., 2022), soil and water conservation (Aji et al., 2022; MacKay et al., 2018) and air pollution mitigation (Suad et al., 2017). *F. benjamina* is used by one of the coal mining companies in Indonesia operating in South Kalimantan to revegetate and replant its reclamation areas (Soendjoto et al., 2023b). Several *Ficus* species are known and used by many ethnic or community groups for medicine and food (Astuti & Mufrodi, 2019; Dewi et al., 2023; Khatun et al., 2016; Shi et al., 2018). The fruit (syconium to be precise) is an important food source for various wild animals, such as the Pink-necked Green Pigeon (*Treron vernans*), Long-tailed Monkeys (*Macaca fascicularis*) (Mulyani et al., 2021) as well as other frugivorous birds such as the Sooty-headed Bulbul (*Pycnonotus aurigaster*) and the Yellow-vented Bulbul (*P. goiavier*) (Febriyanto et al., 2020; Riefani & Soendjoto, 2021) which then helps spread its seeds to other areas.

Therefore, cutting down or eliminating the presence of *Ficus* (in the case that occurred about 3 weeks ago it was *F. racemosa*) by the ULM Cleanliness and Gardening Subdivision for the reason of maintaining the aesthetics (cleanliness and beauty) of the campus environment was a wrong action. The staff or anyone else should work professionally and wisely. Any plants cut down in areas that are targeted for cleanliness must be reported in writing.

Morphological Characteristics

Ficus benjamina

F. benjamina (the scientific name for beringin, the Indonesian name or kariwaya, the local name in the South Kalimantan region) has a hemi-epiphytic habit. The stem (lignosus) is woody and forms trees (arbores) with a height of 4.5–12.1 m and a diameter of 5.25–16.24 cm. The stem is light brown and grooved (sulcatus). The growth direction of the stem is perpendicular (erectus). The cross-section of the stem is round (teres). The branches are sympodial and the growth direction tends upwards (patens). The elongation of the stem, branches or twigs of *F. benjamina* is of the tip bud type (gemma terminalis) which is also a leaf bud (gemma foliifera).

The leaf type is single (folium simplex) and the phyllotaxis is 3/8 (Figure 4). The nodes look thin. The young leaves are light green and the old ones are dark green. The surface of the leaves, both top and bottom, is smooth (laevis) and has thin cystoliths. The laminas are ovalis or ellipticus with a length of 2.4–12.03 cm and a width of 1.4–7.65 cm. The base folli is blunt (obtusus), the apex folli is tapered (acuminatus), and the margo folli is flat (integer). The intervenium is thin; it is as thin as paper (papyraceus) and tears easily. The petiole has a round cross-section and is 7.75 –17.04 mm long. The leaf veins (venatio) are pinnate (penninervis). The primary vein does not appear on the upper surface of the leaf but appears very clearly on the lower surface of the leaf. The secondary veins (nervus lateralis) stop before reaching the leaf margin. The supporting leaves (stipules) are of the convolunted type with a length of 5–18.79 mm. The young stipules are light green while the old ones are dark green.

Syconium is located on twig segments with an amount of 1–2 syconium per location. Syconium has no eduncle but has two bracts which are brownish in color and a length of 0.87-1.73 mm. Syconium has a length of 7.53-13.02 mm, a width of 6.35-15.34 mm, and an ostiole diameter of 0.52-1.52 mm. If the syconium is cut open, stamens 1.06-1.89 mm long and pistils 1.35-2.41 mm long will be visible. The stigma as part of the pistil is white with a length of

0.17-0.22 mm and an ovary 0.42-1.19 mm. The thickness of the mesocarp is 0.41-1.54 mm. According to Debbarma et al. (2020), syconium usually grows or appears in January-March.

The root system (radix) of *F. benjamina* is radix primaria. Roots are light brown. At the ULM Banjarmasin Campus, the aerial roots of this species are attached to substrates in the form of rocks or other trees, such as Angsana (*Pterocarpus indicus*), Ketapang (*Terminalia catappa*), and Trembesi (*Samanea saman*) (Figure 5). Strangler figs such as *F. benjamina* are primary hemi-epiphytes whose aerial roots develop until they touch the ground (Peniwidiyanti, 2017).

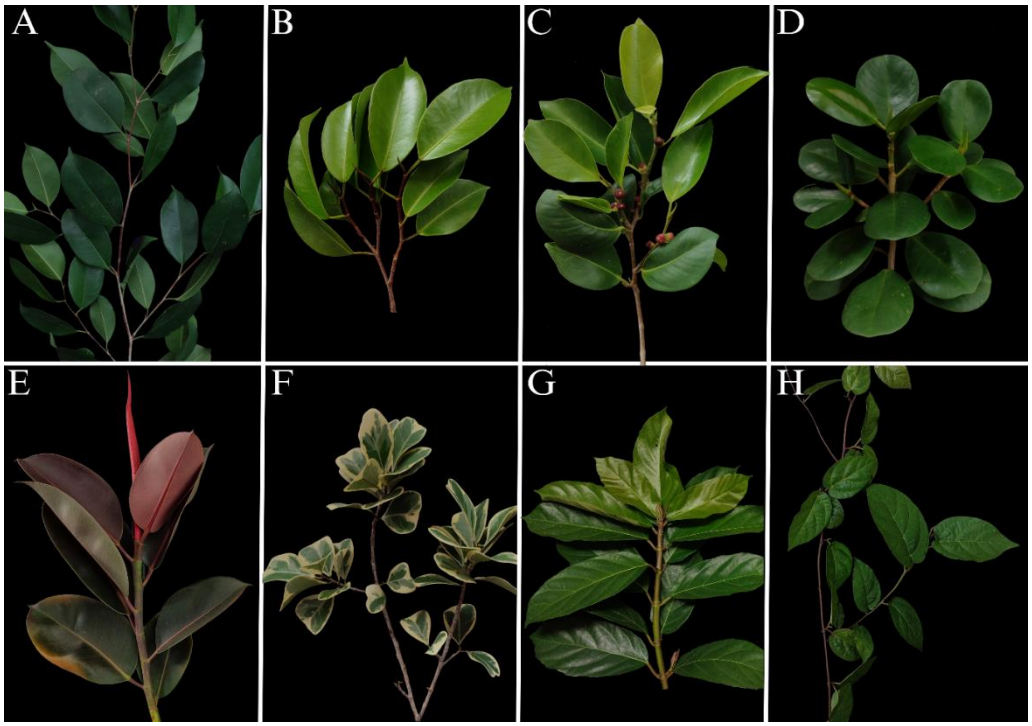

Figure 4. *Ficus* found on the ULM Banjarmasin Campus based on leaf morphology: A. *F. benjamina* L; B. *F. kurzii* King; C.*F. microcarpa* L.f.; D. *F. microcarpa* L.f. var. Green Islands; E. *F. elastica* "Burgundy" Nois.; F. *F. natalensis* subsp. *lepreurii* Miq.; G. *F. racemosa* Roxb; and H. *F. trichocarpa* Miq

Figure 5. The strangler roots of *F. benjamina* gradually strangle the stems of the trembesi (*Samanea saman*)

Ficus kurzii

F. kurzii, whose local name is beringin walik, has a tree habit. The stem is woody, blackish brown, and forms a tree with a height of 15.1–36.6 m and a diameter of 32.16–93.31 cm. The surface of the stem is grooved with lenticels that are clearly visible and evenly distributed. The branching is sympodial type. The direction of growth of the stem is perpendicular, while the branches lean upwards. The cross-section of the stem is round. Elongation of stems, branches or twigs including the gemma terminalis type which is also a leaf bud (gemma foliifera).

The leaf type of *F. kurzii* is single and the phyllotaxis is 3/8. The surface of the leaves is smooth, shiny (nitidus), and has thin cystoliths. The upper surface is dark green and the lower surface is light green. Leaf is a length 6.01–12.13 cm and a width 1.92–5.38 cm. The petioles are round in cross section and 5.88–19.84 mm long. The nodes are thin. The leaves are oblong. The base folii is blunt, the apex folii is tapered, the margo folii is flat, and the intervenium is thin and soft. The venatio are pinnate. The primary vein appears on both the top and the bottom of the leaf. The secondary veins do not reach the margo folii. The stipules are convolunted type with a length of 0.5–1.26 cm. The young stipules are light green and slightly dark, while the old ones are dark green, slightly purplish.

Syconium has no eduncle and also bract, but has a lump that surrounds the top of the syconium. The young syconium is light green with yellowish white spots, the ripe syconium is red with yellowish spots, and the old one (which has withered) is dark brown. Syconium is located near the stipules and the number is 1–2 syconium per location. The syconium is a length of 0.98–1.3 cm, a width 1.09–1.3 cm, and an ostiole diameter of 2–2.3 mm. The stamens are 1.2–1.9 mm long, pistils 2.16–3.24 mm, and ovaries 1.08–1.45 mm. The thickness of the mesocarp is 0.83–1.23 mm. The ripe mesocarp is yellowish.

The root system of *F. kurzii* is the radix primaria. The roots are brown and slightly white. Aerial roots are dark brown with a slightly yellowish tint at the tips.

The difference between *F. kurzii* and *F. benjamina* lies in the primary veins of the leaves, although both have leaves with tertiary venation parallel to the lateral veins. The primary veins on the upper surface of *F. kurzii* leaves are clear and raised, while on *F. benjamina* those are faint.

Ficus microcarpa

F. microcarpa has a strangler tree habitus. The stems are woody and grow upright. The branches are sympodial and the growth tends upwards. This species has developed into a tree 3.6–11.9 m tall and 15.21–36.62 cm in diameter. The cross-section of the stem is round. Stems are light brown. The surface is grooved. Elongated stems, branches or twigs are marked by the appearance of buds at the ends of the plant organs. This tip bud is actually also a leaf bud. The surface of young stems is yellowish and covered with fine hairs (trichomes) which are 0.23–0.31 mm long. Lenticels are not clearly visible.

The leaf type of this *Ficus* is single and the phyllotaxis is 3/8. The surface of the leaves is scaber without cystolith. The upper surface of the leaves is dark green and the lower surface is light green. The leaves are oblong in shape with a length of 2.4–11.70 cm and a width of 1.4–6.42 cm. The base folii is blunt, the apex is tapered, and the margo is flat. The intervenium is thin and soft. The leaf veins are arranged pinnately. The primary vein does not appear on the upper surface of the leaf but arise and are very clear on the lower one. The secondary veins do not reach the edge of the leaf.The petioles are 2.98–18.6 mm long and round in cross-section. The nodes are clearly visible.

The type of stipulation is convoluted with a length of 0.5–1.5 cm. Young stipules are light green, while old stipules are dark green with a purplish and slightly reddish hue. Circular lines are clearly visible on the trunk, branches, or twigs, if the stipule falls off. The distance between two circular lines that are located sequentially makes the trunk, branch or twig appear to have segments.

The syconium is small, 4.67–7.52 mm long, 4.39–10.38 mm wide, and 1–1.7 mm in ostiole diameter. The syconium are located near stipules and there are 1–2 in each location. Syconium has cystoliths on its surface which are clearly visible in young syconium. Syconium does not have an eduncle, but there are three bracts, each 1.03–2.76 mm long. If the syconium is removed from its location, the scar will produce a lot of milky white sap. Young syconiums are light green with reddish spots on the underside, while mature syconiums tend to be purplish red or reddish brown. If the syconium is cut open, there are stamens 0.93–1 mm long, pistils 0.97–1.56 mm long, and ovaries 0.46–0.59 mm long. The mesocarp is pale yellow and 0.33–0.68 mm thick.

The root system of *F. microcarpa* is taproot. The roots are grayish brown. Apart from the main root, there are aerial roots (radix aereus) which are small in diameter, emerge from the stem, and are light brown in color. These roots can grow bigger and are able to support the parent tree. These also function to bind the substrate and also for respiration.

The difference between *F. microcarpa* and *F. kurzii* lies in the size of the syconium, leaves and aerial roots. *F. microcarpa* has a smaller syconium and larger leaves than *F. kurzii*. The aerial roots are also less dense.

Ficus elastica

Habitus *F. elastica* or karet kebo (the "Burgundy" variant often found on campus) is a tree. The stem is woody and begins to develop into a tree with a height of 2.1 m and a diameter of 4.62–5.57 cm. The cross-section of the stem is round, the color of the bark is light brown, and the lenticels are clear. The direction of stem growth is perpendicular. The branches are sympodial and the direction of growth tends to be upwards. The elongation of stems, branches or twigs is called gemma terminalis which is actually also a leaf bud (gemma foliifera). The root system is taproot and the roots are grayish brown.

The leaf type is single and the phyllotaxis is 3/8. The nodes are clearly visible. The leaves are oval (ovatus) with a length of 2.4–6.1 cm and a width of 1.4–2.7 cm. Young and old leaves are reddish green. The upper and lower surfaces of the leaves are smooth (laevis) and have thin cystoliths. The base folli is blunt, the apex is rounded (rotundatus), and the margin is flat. The intervenium is thick. The cross section of the petiole is semicircular. The vein arrangement of the leaves is pinnate. The primary veins on the upper surface of the leaf are visible but more obvious on the lower surface. The secondary veins stop before the leaf edge. The stipule is of the convolunted type and is 5–21.5 cm long. The young stipules are pink, but the old ones are dark red.

Syconium *F. elastica* growing on campus has not yet appeared or has not been obtained. According to Wu et al. (2003), syconium of this species grows in the leaf axils on leafless branches. It grows in pairs, yellowish green in color, with an egg-shaped ellipsoid shape. The bract of the syconium is hood-like, the caducus, with a conspicuous scar. Male and female flowers are in one syconium. The male flowers (stamens) are scattered among the other flowers. The female flowers (pistils) are sessile and have enlarged stigmas. Achenes are ovoid.

Ficus natalensis

Habitus of beringin kupu-kupu atau *F. natalensis* (which is on the ULM Banjarmasin Campus is subsp. *lepreurii*) is a shrub. The stem is woody with a height of 1–1.2 m and a diameter of 0.64–1.03 cm. The cross-section of the stem is round. The stem is light brown with a grooved stem surface. The direction of growth of the stem is perpendicular. The branching of the stem is of the sympodial type and the direction of growth tends upwards. The type of stem, branch or twig extension is the gemma terminalis which is actually also a leaf shoot (gemma foliifera). The root system is taproot. The roots are brown, slightly white and without aerial roots.

The leaves are single type with the phyllotaxis 3/8. The nodes look thin. The leaves are different from other *Ficus* leaves. The leaves of this species form an inverted heart (variegata)

with a dark green color in the middle and bright yellow on the part towards the edge of the leaf. The color pattern on the lower surface of the leaves is the same but not as bright as the pattern on the upper surface of the leaves. Petioles are 2.45–7.66 mm long and semicircular in cross-section. The leaves are peg-shaped (cuneatus) with a leaf length of 2–6.1 cm and a width of 1.4–3.9 cm. The surface of the leaves is smooth and without cystoliths. The base folii is tapered, the apex is truncated, and the margo is flat. The intervenium is thin and soft. The leaf veins are pinnate. The primary veins on the upper side are not clearly visible and only reach the middle of the leaf, while on the lower side they are clear, prominent and reddish brown in color. The secondary veins stop before reaching the leaf edge. This species has stipules of a convoluted type that are 0.5–1 cm long. The young stipules are light green, while the old ones are reddish green and quite dark.

Syconium is located on twig segments and has short stalks with a length of 2.91–5.25 mm. No bracts are found on syconium. Young syconiums are bright green and have a reddish-brown coating. Syconiums are green and turn yellowish when ripe. The length of the syconium is 4.66–5.33 mm, width 4.45–5.94 mm, and ostiole diameter 0.43 mm. The pistil is 0.72–1.3 mm long and the stamens 0.53–0.7 mm long. The mesocarp is light green and 0.47–1.1 mm thick.

Ficus racemosa

F. racemosa or loa is a plant whose habit is a tree. The stem is woody. The plants found were tree-shaped with a height of 1.9–3.2 m and a trunk diameter of 1.59–4.14 cm. The cross-section of the stem is round. The stem is dark brown and the lenticels are scattered over the surface of the stem. Young stems are brownish yellow and covered with fine hairs 0.07–0.41 mm long. The surface of the stem is curved and the growth direction of the stem is perpendicular. The branching is sympodial and its growth direction of branch is upwards. The elongation of stems, branches or twigs is indicated by the presence of buds at the ends (gemma terminalis) which are actually leaf buds (gemma foliifera). The root type is a tap root with a grayish brown color.

The leaf type of *F. racemosa* is single and its phyllotaxis is 3/8. The leaves are oval with a length of 2.4–17.42 cm and a width of 1.4–8.05 cm. The nodes are thin. Young leaves are light green while old ones are dark green. The top and bottom surfaces are rough and have thin cystoliths. The base folii is blunt, the apex is tapered, the margo is individually incised (divisus) or serrated and wavy (repandus). The intervenium is stiff. Cystoliths are clearly visible all over the leaf surface. The petiole is 8.27–37.76 mm long and resembles a sickle in cross-section. The leaf veins are pinnate. Primary vein is clearly visible on the upper surface of the leaf and very clearly on the lower one. Secondary veins do not reach the edge of the leaf. The stipules are convoluted and 0.5–1.65 cm long. Young stipules are reddish green, while old ones are reddish brown.

Syconium attaches to the surface of the stem near the branches. The number was 5–64 syconium per site. The color is pale green when young and turns yellowish to dark red when ripe. The length of the syconium is 2.84–11.23 mm, width 6.75–9.03 mm, and ostiole diameter 1.24–1.85 mm. The entire surface of the syconium is covered with white spots. Syconium has eduncles that are 3.42–5.96 mm long. When syconium is picked, milky white sap comes out of the wound. There are light green bracts on top of the syconium. Inside the syconium there are stamens 0.53–0.64 mm long, pistils 1.04–1.52 mm long and also ovaries 0.49–0.67 mm long. The male and female flowers leading to the eduncle are pink and those leading to the ovaries are darker. The stigma is clearly visible, white, and measures 0.23–0.34 mm. The mesocarp is pale yellow and 0.80–1.88 mm thick.

Ficus trichocarpa

Habitus *F. trichocarpa* is a liana or climbing plant. The stem with additional small roots on this climbing Ficus is attached to the surface of a tree trunk or rock surface. The stem is

woody. The growth height of this plant reaches 3.4 meters. The cross-section of the stem is round with a diameter of 9.5–9.55 mm, brown in color. Young stems are light green.The surface of the stem is rough and grooved. Lenticels are clearly visible. The growth direction of the stem bends to the left (sinistrorsum volubilis). The branching is sympodial and its growth direction tends to be upwards. The type of elongation of stems, branches and twigs is gemma terminalis which is actually also a leaf bud. Young stems have fine hairs 0.35–0.91 mm long. The roots are taproot type and are grayish brown in color.

The leaves are single type and the phyllotaxis is 3/8. Nodes are not visible. The upper and lower surfaces of the leaves contain thin, downy cystoliths. The leaves or young shoots are red. The leaves are heart-shaped (cordatus) with a length of 2.4–13.85 cm and a width of 1.4–7.68 cm. The petiole is 4.55–22.44 mm long and almost round or sickle-shaped in cross-section. The base folii is blunt, the apex is tapered, and the margo is incised (divisus) with a wavy type (repandus) and has fine hairs. The intervenium is as thin as paper (papyraceus) and tears easily. The leaf veins are pinnate. The primary vein is clearly visible on the upper surface of the leaf and very clearly on the lower one. The secondary veins bend upwards before the leaf margins. Stipules are convoluted type and 2–7.8 mm long. Young stipules are light whitish green while old ones are light brownish green.

Syconium *F. trichocarpa* was not obtained. The only individual found on the ULM Banjarmasin Campus was attached to or climbing the trunk of a red palm tree (*Cyrtostachys renda*: Arecaceae). This individual appears to be focused on growing bathyphylls leaves and has not yet grown acrophylls leaves. This last type of leaf indicates the presence of syconium.

CONCLUSION

Three of the seven types of *Ficus* that grow and develop on the ULM Banjarmasin Campus were planted as ornamental plants and the rest grow spontaneously. In this study, the distribution of *Ficus* was even, the density was 2.09 individuals/ha, and the diversity index was 1.31. The large number of *Ficus* species should be a trigger for lecturers or teachers to immediately develop teaching materials about this unique plant. Apart from that, the presence of *Ficus* should encourage all ULM staff not only to maintain biodiversity around campus (even developing it as a source of seeds), but to make this plant an icon of the wetland environment. Revegetation (replanting) needs to be done immediately if the *Ficus* falls. Storm winds easily topple *Ficus*, especially *F. benjamina* and *F. microcarpa*. This is because the roots spread across the surface, rather than sinking into the soil.

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