

# Ecological Distribution of *Ficus* Spp in Kuningan District, West Java, Indonesia

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**Abstract.** *Ficus* spp is a group of plants which has high diversity and generally found in lowland ecosystems. Information about ecological distribution of *Ficus* spp in Kuningan District was carried out through literature studies, field observations and herbarium materials. The materials and methods used in this study were the locations where of *Ficus* spp and herbarium grew. The purpose of this study was to determine the ecological distribution of *Ficus* spp. in Kuningan District. The results showed that *Ficus* spp found consisted of 24 species scattered in lowland forest ecosystems in the north, south, west and east of Kuningan District. The highest number of species found was in the eastern part of Kuningan District with 19 species, while the smallest number was in the western part of Kuningan District. namely 5 species. The name of *Ficus* spp found in all locations were *Ficus ampelas* Burm.f., *Ficus fistulosa* Reinw.ex Blume, and *Ficus variegata* Blume. Tree habitus is the one that dominates the distribution of *Ficus* spp, which is as much as 79,17% of the total species found, while the place where it grows is found at an altitude of 500 m asl - 1,300 m asl. It can be conclude that *Ficus* spp. can grow in the lowlands, especially areas that are disturbed and the distribution of the genus is very wide.

**Keywords:** Ecological Distribution; *Ficus* spp; Distributio *Ficus* spp

## 1 Introduction

Kuningan is a district located in the east of West Java Province in a geographical position E 108° 23" – 108° 47" and S 6° 45" – 7° 13" [1]. The specific characteristic possessed by Kuningan District in terms of land cover and use include natural forest, plantation forest, and agricultural land [2]. The potential and function of the forests that are spread out in each area of Kuningan District vary, including those that have conservation function and production function. On the eastern slopes of Mount Ciremai National Park, there are 43 plant species belonging to 34 genera and 9 families, one of which is moraceae [3].

*Ficus* spp. is a plant from the family moraceae which is widely distributed in the tropics and subtropics [4]. Because this plant can live in extreme conditions and is a source of food for the animals, *Ficus* spp. plays an important role in ecology [5]. Judging from its habitus, *Ficus* spp. is a woody plant with a life form of tree, shrubs, small tree, stranglers, creepers, lianas (spreading) or as wild roots (hemi-epiphytes, epiphytes, creeping roots) [6]. Almost all parts of *Ficus* spp. can be utilized, ranging from food sources, and traditional medicines, to simple tools and ship frames with light loads [7]. Currently, the use of *Ficus* spp for medicinal

plants [8], especially in the field of pharmacology, began to be developed because of the high content of polyphenols and flavonoids, which are strong antioxidants [9].

In a previous study in Gunung Tilu, Kuningan District, West Java, 11 species were found on the western slope [10] and 12 species in total, spread from 600 m asl to 1.000 m asl [11]. Furthermore, this type is also recorded; there are 10 types of *Ficus* scattered on the eastern slopes of Mount Ciremai which is part of the Mount Ciremai National Park [12]. In several places in Kuningan District, it is not yet known about the type and distribution and identification of *Ficus* spp. in Kuningan District, and it is felt that it is important that further research be carried out.

## 2 Methodology

The methods used in this research are field observation and literature study. Field observations were carried out in the Bukit Barisan area (south) and Karangsari Research Station Mount Ciremai National Park (west) in Kuningan District because information about the distribution of *Ficus* spp. at that location had not been carried out. Meanwhile, for the Seda area of Mount Ciremai National Park (north) and Gunung Tilu (east) of Kuningan District, information about the distribution of *Ficus* spp. is available, so only a literature study is needed.

In the western and southern regions, data was collected using a purposive sampling method, namely by placing plots at each height. The variables observed were the type and number of species [13], while the distribution of *Ficus* spp. was mapped from coordinates on *Ficus* spp. found using the Global Positioning System (GPS) through field observations. Vegetation analysis was used to determine the dominance of *Ficus* spp. while the data analysis of the distribution map of *Ficus* spp. was obtained by processing with the Arc Gis 10.2 device. Processing is done to get a map of land cover, elevation, slope, and distance [9].

## 3 Result and Discussion

Based on the results of field observations and literature studies of vegetation conditions in the Seda area of Mount Ciremai National Park (north), the area is dominated by *Pinus merkusii*, *Cinnamomum sintoc*, *Gnetum gnemon*, *Schima wallichii*, *Sterculia oblongata*, *Artocarpus* sp., *Dillenia excelsa*, and *Zyzygium polyanthum*. [14]. At this location, 10 species were found, namely *Ficus ampelas* Burm.f., *Ficus benjamina*, *Ficus calophylla*, *Ficus fistulosa* Reinw.ex Blume, *Ficus hipsida*, *Ficus padana*, *Ficus retusa*, *Ficus ribes*, *Ficus septica*, and *Ficus variegata* Blume. The height of the place to grow starts at 700 m asl. to 900 m asl. and goes up. The dominant species at this location is *Ficus hipsida* L.f. Many are found along the inspection road, which is an open and dry area. This is similar to the results of research [15] that this tree species mostly grows in open areas, river banks, and secondary forests.

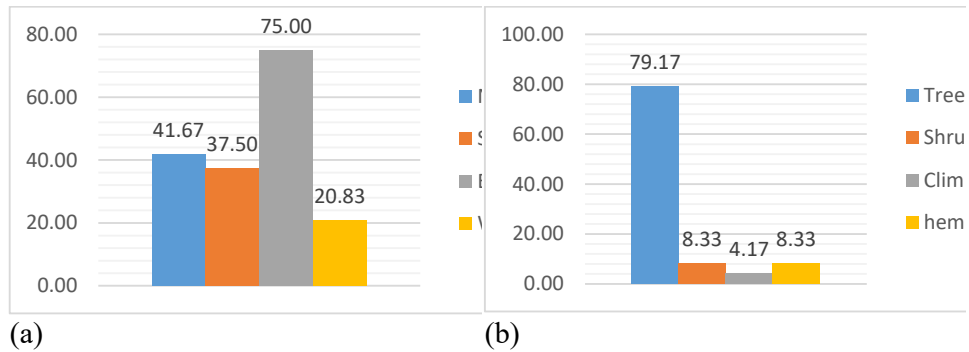
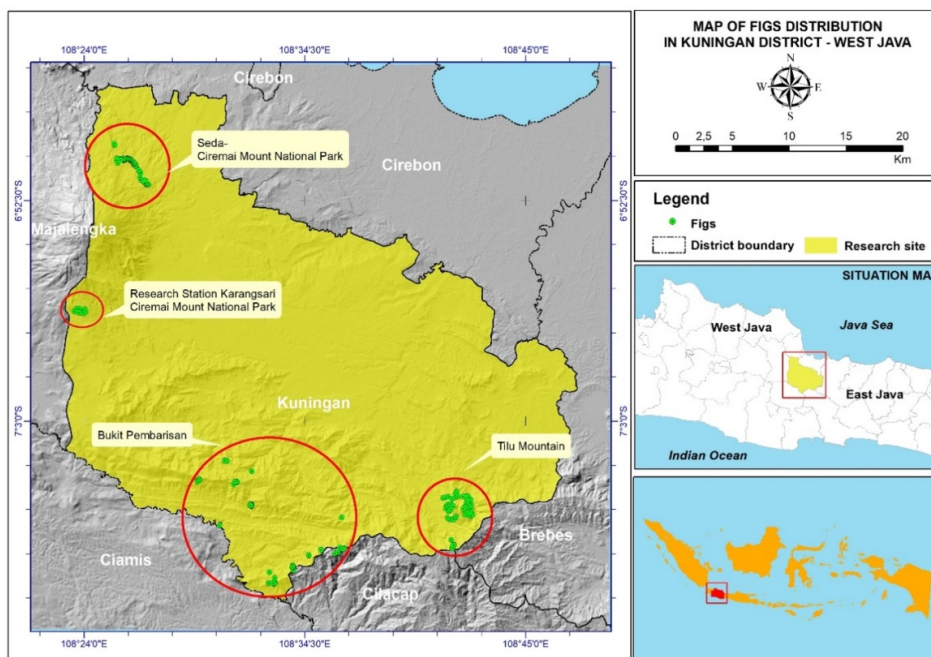


Figure 1. (a) Number of Types Ficus spp (b) Habitus of Ficus spp

The Bukit Barisan area (south) is dominated by *Vlebrunea rubescens*, *Castanopsis argentea*, *Melaleuca* sp, and *Eurea javanica*, which are included in secondary vegetation, with a steep and very steep topography [13] and a number of *Ficus* spp. 9 species were recorded, including *Ficus ampelas* Burm.f., *Ficus benjamina*, *Ficus elastica* Roxb. ex Hornem, *Ficus fistulosa* Reinw.ex Blume, *Ficus glaberrima* Blume, *Ficus hipsida*, *Ficus kurzii* King, *Ficus montana*, and *Ficus variegata* Blume. The dominant species in this area is *Ficus fistulosa* Reinw ex Blume, which is found from an altitude of 500 m asl. to 1,300 m asl. in a cool area to the edge of an open forest.

In the Karangsari Research Station area of Mount Ciremai National Park (west), vegetation is dominated by plantations and shrubs with the types of *Pinus merkusii*, *Persea americana*, *Toona sureni*, and *Artocarpus heterophyllus* [16], which found five species, namely *Ficus ampelas* Burm.f, *Ficus fistulosa* Reinw.ex Blume, *Ficus ribes* Reinw.ex Blume, *Ficus septica* Burm.f, and *Ficus variegata* Blume. The height of the place to grow starts at 1,075 m asl .to 1,300 m asl. The species that are commonly found are the same as locations in the south, namely *Ficus septica*. Based on observations, this species is spread under stands of *Pinus merkusii*, shrubs to open areas.

Gunung Tilu area (east) with lowland forest vegetation with vegetation types *Celtis tetrandra*, *Bischofia javanica*, *Sterculia campanulata*, *Neonauclea calycina* [11] found 19 species including *Ficus ampelas* Burm.f, *Ficus benjamina* L., *Ficus botryocarpa* Miq, *Ficus calophylla* Blume , *Ficus copiosa* Steud, *Ficus drupacea* Thunb, *Ficus elastica* Roxb. ex Hornem, *Ficus fistulosa* Reinw.ex Blume, *Ficus glandulifera* (Wal. Ex. Miq.) King, *Ficus globosa* Blume, *Ficus kurzii* King, *Ficus ribes* Reinw.ex Blume, *Ficus septica* Burm.f, *Ficus subulata* Blume, *Ficus sinuata* Thunb , *Ficus sundaica* Blume, *Ficus tinctoria* Forst. F, *Ficus variegata* Blume, and *Ficus virens* Aiton. The most common individuals found are *Ficus sundaica* Blume, ranging from an altitude of 500 m asl. to an altitude of 900 m asl.



**Figure 2.** Map of Distribution of Figs in Kuningan District

*Ficus* spp. were found to have different habits which is a form of plant adaptation to environmental conditions in different places so that they can grow in that area. However, the identity of *Ficus* is determined through the characteristics of leaves, fruit, and stipules, thus allowing one type of *Ficus* to have several types of habits [17]. The habitus of *Ficus* spp. in Kuningan District are trees, shrubs, climbers, lianas, hemi epiphytes based on the identification results as follows:

1. *Ficus ampelas* Burm.f.  
Habitus tree, 15 - 25 meters high, with a diameter up to 30 cm, white gummy, Single leaf, alternate, protruding, tapering base and tip, jagged edges, upper surface dark green, lower surface light green. Orange fruit diameter: 1 cm. The leaves are sometimes used to grind utensils..
2. *Ficus benjamina* L.  
Habitus tree, height between 20 and 25 meters, taproot. The stem is blackish brown, erect, round, with a rough surface. There are hanging roots on the stem. Single leaf, located opposite each other, oval shape, pointed flat edge. Leaf pinnate. A Single flower emerges from a leaf axil, with a round, smooth crown. Buni fruit, round, green, and red when ripe. Hard round seeds are white.
3. *Ficus botryocarpa* Miq  
Habitus tree height range from 6-14 meters, with a woody trunk, monopodial branching, and round, brown appearance. Alternate leaves, pinnate spine. Leaf shape: oblong, elongated, tapered tip, dark green color and paler at the bottom.
4. *Ficus calophylla* Blume.

- Habitus tree, up to 30 meters high. Single leaf, alternate. Broad leaf shape at the tip (obovate), pinnate leaf veins. Small fruit 1 cm in diameter, brownish yellow.
5. *Ficus copiosa* Steud.  
Habitus tree, more than 10 meters high, 90 cm in diameter, slender trunk, Decussate leaves, gathered at the end of the stem, oval oval leaf blade, serrated edge. Round fruit, 1-2 cm in diameter, greenish brown color
  6. *Ficus drupacea* Thunb  
Trees up to 40 meters high, 90 cm in diameter, brown to yellow. Elliptical to egg-shaped leaves, blunt tip, slightly pointed. The fruit appears in the leaf axils, oval-shaped and red.
  7. *Ficus elastica* Roxb. ex Hornem  
Trees up to 20 meters high, cylindrical in shape, dark brown in color. Single leaves are arranged alternately, oval at the base and tapered at the tip, The edges of the leaves are flat. The fruit is ovoid and 1-2 cm in size, with a greenish yellow color.
  8. *Ficus fistulosa* Reinw.ex Blume  
Habitus tree, up to 20 meters high, 20 - 25 cm in diameter. stem with white sap. Twigs are often empty. Stipules are about 10 mm long, glabrous. alternative Leaves, simple, penni-to triple-veined, glabrous. Fruit measuring 10 mm in diameter, yellow-brown, round, fleshy figs are placed in bundles with twigs and stems.
  9. *Ficus glaberrima* Blume  
Habitus tree up to 25 meters high, up to 40 cm in diameter, blackish trunk. Single leaf, spiral, lanceolate, base blunt to rounded, flat leaf edge, dark green surface color, pale green underside. Fruit rounded up to 1.2 cm in diameter.
  10. *Ficus glandulifera* (Wal. Ex. Miq.) King  
Habitus trees grow up to 30 meters high, their twigs and leaf stalks covered with brown hair. The leaves are elliptical to egg-shaped. Fruits are round, up to 1.2 cm in diameter, and dark purple in color.
  11. *Ficus globosa* Blume  
Climber habitus, hemi-epiphyte. The leaves are spirally arranged, long-stemmed, oval, and glossy green. The fruit is slightly round, green with white spots, and covered with fine brown hairs, appearing in pairs in the axils of the leaves.
  12. *Ficus hispida* L.f  
Habitus tree up to 10 meters tall, 20 cm diameter, white gummy stem, single leaf, opposite rounded to lanceolate, base rounded to blunt, pointed tip to tapered, serrated edge. Fruit rounded yellow, hairy on the outside, and up to 2 cm in diameter.
  13. *Ficus kurzii* King  
Habitus trees, up to a height of 30 meters, have coarse leaves arranged in a spiral, elliptical to oval. Paired fruits appear in the axils of the leaves, 1-2 cm in diameter, dark red, purple, or black.
  14. *Ficus Montana*  
Shrubs with a habit of reaching less than 50 cm tall; leaf shape varies; rough surface, jagged leaf edges. The small fruit is green when young and red when ripe.
  15. *Ficus padana* Burm.f.  
Habitus shrubs up to 15 meters high, wide canopy and branching. Diameter 30 cm. Single leaf spread, egg-shaped, upper surface green, lower surface covered with white fine wool hair. Fruit appears in leaf axils, flattened round, 4-5 cm in diameter. Black red.
  16. *Ficus retusa* L

- Shrub or tree with a height of up to 5 meters high. Smooth stems are gray. The leaves are ovate in shape and spirally arranged. Berries appear at the ends of the branches.
17. *Ficus ribes* Reinw.ex Blume  
Small trees up to 10 meters in height, up to 15 cm in diameter. Single leaf, spiral, lanceolate, base unequal, pointed tip, flat edge. The upper surface is dark green, while the lower surface is yellowish green. Fruit that has been rounded up to 1 cm in diameter.
  18. *Ficus septica* Burm.f.  
Habitus trees or shrubs, up to 10 meters high, and up to 20 cm in diameter. Pushing rounded base, pointed tip, flat edge, dark green top surface, light green bottom surface, alternating single leaf. Flat rounded fruit, 2 cm in diameter, green.
  19. *Ficus subulata* Blume  
Shrubs to trees with a height of up to 15 meters high. Climbers are often epiphytic. The leaves are tapered at the tip, and dark green; the underside is light green.
  20. *Ficus sinuata* Thunb  
A hemi-ephipit can be a large tree up to 30 cm in height, and 60 cm in diameter. Single leaf alternate, oval, tapered base, leaf tip tail, jagged edges. smooth green top surface, and a rough pale green bottom surface. Fruit with a diameter of up to 1.5 cm.
  21. *Ficus sundaica* Blume  
Habitus tree heights reach up to 30 meters, and their diameters up to 60 cm. Black stem. Single leaf, alternate, round to protruding, flat edge, dark green upper surface, light green lower surface. Fruits are rounded or oblong elongated, up to 1.5 cm in diameter.
  22. *Ficus tinctoria* Forst. f.  
Habitus strangler trees, up to 15 meters high. Stems are whitish gray, with green leaves, smooth texture, and symmetrical. Small brown fruit, 1 cm in diameter.
  23. *Ficus variegata* Blume  
Habitus a large tree, up to 30 meters high, up to 70 cm in diameter. Single leaf, spiral, ovate, rounded base, pointed tip, serrated edge, green top surface, light green bottom surface. Fruit rounded, yellowish green or red when ripe, 3-5 cm in diameter.
  24. *Ficus virens* Aiton  
Habitus tree, up to 15 meters high, 30 cm in diameter. Single leaf, spiral, lanceolate, blunt base, blunt tip to rounded, flat edge, upper surface green, lower surface yellowish green. Fruit, that is and ranges in color from cream to pink.

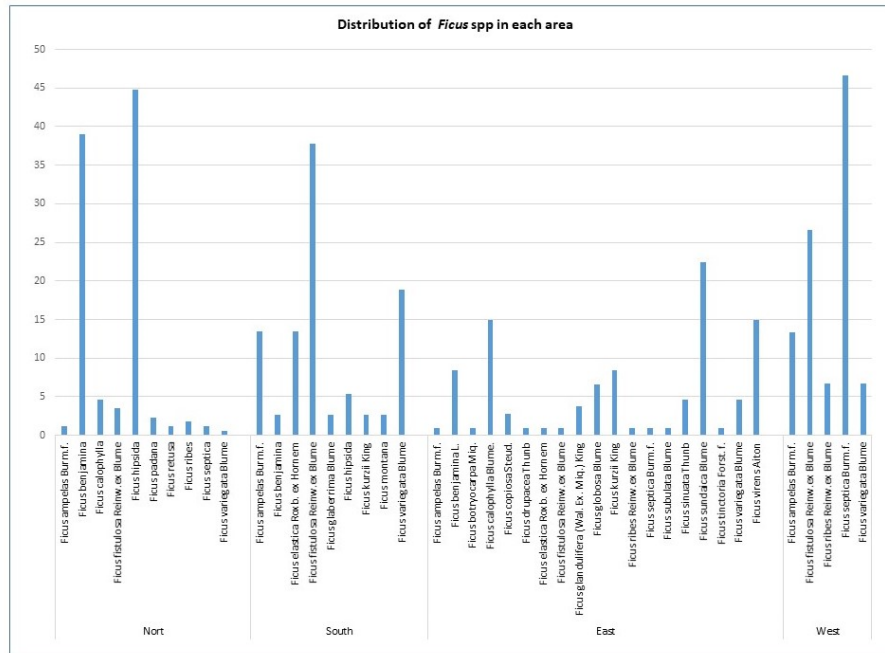


Figure 3. Distribution of *Ficus* species in Kuningan District

## 4 Conclusion

*Ficus* spp found consisted of 24 species spread in lowland forest ecosystems in the north, south, west and east of Kuningan Regency. The highest number is in Gunung Tilu or the eastern part of Kuningan as many as 19 species, while the smallest number is found in the Karangsari Research Station or the western part of Kuningan namely 5 species. The names of *Ficus* spp. found in all locations were *Ficus ampelae* Burm.f., *Ficus fistulosa* Reinw.ex Blume, and *Ficus variegata* Blume. Habitus of trees dominates the distribution of *Ficus* spp, which is 79.17% of the total species, while the place of growth is at an altitude of 500 m asl - 1,300 m above sea level.

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