Morphological characteristics and habitat conditions of suweg (Amorphophallus paeoniifolius) around Mount Ciremai National Park, West Java, Indonesia

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Abstract. Mutaqin AZ, Kurniadie D, Iskandar J, Nurzaman M, Husodo T. 2021. Morphological characteristics and habitat conditions of suweg (Amorphophallus paeoniifolius) around Mount Ciremai National Park, West Java, Indonesia. Biodiversitas 22: 2591-2600. Indonesia is a country that has abundant biodiversity, especially the diversity of plant species. One of the plant species that widely distributed across Indonesia is Amorphophallus paeoniifolius (Dennst.) Nicolson, or locally known as suweg. This study aims to identify morphological characteristics of A. paeoniifolius and its habitat conditions around Mount Ciremai National Park, West Java Province, Indonesia. Several stages of the exploratory survey were randomly carried out followed by purposive intensive observations. The method used to collect and analyze data is qualitative methods combined with simple measurements of quantitative technique. The results showed that suweg in the studied areas had distinctive morphological characteristics, which are different from the rest of the species from Amorphophallus genus. The plant is found in 4 types of land, namely home gardens, gardens, rice fields, and pond edges, whether with open or closed canopy conditions. The density of suweg in the study area is generally low. The climatic and edaphic conditions of suweg habitat in several study areas showed that there are a lot of similarities of conditions with other references. There are also 156 species of plants found that grow around suweg, both in the category of cultivated and wild plants. This study enriches the existing knowledge on the botanical and ecological information of A. paeoniifolius in the context of geographical area (i.e., Ciremai National Park, West Java, Indonesia).

Keywords: Amorphophallus paeoniifolius, botany, Ciremai, suweg

INTRODUCTION

Indonesia is among the countries with the richest biodiversity in the world. Therefore, it is called a mega-biodiversity country in the sense that it has a high diversity of species with a lot of genetic uniqueness, a high level of endemism, and a large variety of ecosystems (Sutoyo 2010). In terms of plant diversity, Indonesia is estimated to have around 30,000-40,000 species of vascular plant, or equivalent to 15.5% of the total number of vascular plant species globally. There are also about 80,000 species of fungi, 595 species of lichen, 949 species of Hepaticae, 1,510 species of Musci, and 2,197 species of ferns (Indonesian Institute of Sciences, 2014).

One of the endemic plant species in Indonesia is Amorphophallus paeoniifolius (Dennst.) Nicolson, which is locally known as suweg (Mutaqin et al. 2020a). The plant belongs to the Araceae family along with other genera, such as Alocasia, Colocasia, and Xanthosoma (Diazgranados et al. 2020). Yuzammi et al. (2017) state that the plant species is widely distributed across Indonesia, in addition to other species of the genus Amorphophallus, such as Amorphophallus muelleri Blume, Amorphophallus variabilis Blume, Amorphophallus pranii Hook. f., Amorphophallus gigas Teijsm. & Binn. Likewise, Supriati (2016) informs that several species of Amorphophallus are found in Indonesia, including Amorphophallus variabilis Blume, Amorphophallus campanulatus (Roxb.) Blume, and Amorphophallus oncophyllus Prain ex Hook. f.

Plants live and grow in certain areas which are generally known as habitat. Knox et al. (2010) explain that habitat is the environment of an organism; the place where it is usually found. Hickman et al. (2012) state that habitat is the place where an organism normally lives or where individuals of a population live, while Bambord and Calver (2014) explain that habitat is the environment of a species, and particularly those features that determine where the species occurs. Based on their habitat, there are plant groups that grow in aquatic or terrestrial, low or highland, tropical or sub-tropical, and being cultivated or wildy grow.

Habitat conditions can trigger certain adaptation and speciation. For example, there are plant groups called halophyte, xerophytic, hydrophytic, hygrophytic, and mesophytic plant. Halophyte is a terrestrial plant adapted morphologically and/or physiologically to grow in salt-rich soils and salt-laden air. Xerophyte is a plant that can grow in very dry conditions and can withstand any kind of period. Heterophyte is a plant that grows in a wide range of
Apart from climatic variables, edaphic factors can also affect plants. Zuquim et al. (2020) state that soil conditions can affect plant habitats. For example, organic carbon, which is one of the main soil parameters, can affect vegetation establishment (Fonge et al. 2011). Other factors, such as soil pH, also affect plant occurrence and distributions, especially in the case of Amorphophallus (Hafsah et al. 2018).

*Amorphophallus paeoniifolius* is a species of plant that has its uniqueness or characteristics that may differ from other species in the genus of *Amorphophallus*. The phenomenon of uniqueness may also appear as a response to certain conditions, such as environmental conditions, which are expressed in several characters. Thus, this study aims to identify morphological characteristics of *A. paeoniifolius* and its habitat conditions in several areas around Mount Ciremai National Park, West Java Province, Indonesia. We expected the results of this study can bring a wider horizon of knowledge regarding the morphological characteristic of *A. paeoniifolius*, especially around Mount Ciremai National Park, West Java, Indonesia.

**MATERIALS AND METHODS**

**Study period and area**

This research was conducted in January-November 2020 in 11 villages around Mount Ciremai National Park, which is geographically located in the Cimanuk Watershed Region and administratively located at Cikijing Sub-District, Majalengka District, West Java Province, Indonesia. The villages studied were Bagjasari, Cidulang, Cikijing, Cilancang, Cipulus, Cisoka, Jagasari, Kancana, Sindangpanji, Sukamukti, and Sunalari (Figure 1).
Procedures
In general, the method used for this research is qualitative methods with simple quantitative techniques for data explanation purposes (Creswell, 2014). This research was conducted in two stages, which are preliminary survey and intensive observation. The preliminary survey aims to ensure the existence of suweg in the studied area and was done in a random and exploratory manner throughout the Cikijing Sub-District, Majalengka District.

The intensive observation was carried out to collect detailed information in a selected area that is purposively selected based on a preliminary survey. There are 3 types of data collected in intensive observation which are morphological and morphometric data of the suweg (leaf blades, petioles, flowers, and tubers) (Permatasari et al. 2014), abiotic factors around the suweg (such as soil pH and soil moisture, altitude, air temperature, air pressure, air humidity) and biotic factors as well as the population of the suweg and plants that grow around the suweg (Indriyani et al. 2011; Hidayat 2019).

Data analysis
The morphological characteristics (morphometric) of the suweg then descriptively analyzed and compared to reference from related literature. Meanwhile, ecological aspects of the suweg population are analyzed based on its density or the number of suweg individuals per unit area. Furthermore, the biotic and abiotic data that exist around the suweg, were also descriptively analyzed and compared to study literature.

RESULTS AND DISCUSSION

Results
Botanical characteristics
The results of the research showed that there are 5 morphological characteristics of suweg that visually analyzed in this research which are leaf blade, petiole, tuber, flower, and root. The morphological characteristics of suweg found around Mount Ciremai National Park are presented in Table 1 and showed in Figure 2.

Land type, condition, and population of suweg
Other results of the research showed that suweg were found in 11 villages around Mount Ciremai National Park which are Bagjasari, Cidulang, Cikijing, Cilancang, Cipulus, Cisoka, Jagasari, Kancana, Sindangpanji, Sukamukti, and Sunalari villages. The land type, land conditions, and suweg population are presented in Table 2 and showed in Figure 3.

Table 1. Morphological characteristics of suweg in villages around Mount Ciremai National Park

| Part     | Description                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Leaf-blade | The leaf blade is found on the leaflets (petiololes); young leaf blades on growth periods are green, but when they are old, they are yellow, then wilt along with the petiole; hairless; gloomy (laevis) surface; pinnate leaf bones (penninervis); flat-leaf edge (integer); thin soft flesh (intervenum); tapered leaf tips (acuminatus); the widest part is in the middle; ellipticus/ovalis; length reaches 31 cm; width 9 cm wide; the number of leaf blade reaches 816. |
| Petiole   | Green petiole with white spots; round; the surface is slightly rough; gummy or slimy that is clear and itchy; height up to 204 cm; width of the canopy reaches 294 cm; diameter of the tip of the petiole reaches 11 cm; petiololes is 3. |
| Tuber     | The outer skin of the tuber is dark brown-black in color; reddish-white or yellowish-white flesh; take root and sprout; gummy or slimy that is clear and itchy; flat round, grooved in the middle as a place where the petiole appears or grows; odorless. |
| Flower    | Spathas are maroon or purple in color; threaded spadix; smell of carcass; bloom period of about 1 week |
| Root      | Roots emerge from the tubers in large numbers; round shape; short size. |

Figure 2. The morphological characteristics of suweg organs: A. Leaf blade; B. Petiole; C. Flower; D. Tuber
Table 2. Land type, land condition and suweg population in villages around Mount Ciremai National Park, West Java, Indonesia

| Village     | Land type | Altitude (m asl) | Land extent (m²) | Amount of land | Suweg population | Suweg density (per m²) | Canopy cover |
|-------------|-----------|-----------------|------------------|----------------|------------------|------------------------|--------------|
| Bagjasari   | Garden    | 658-661         | 270              | 2              | 38               | 0.141                  | Shaded       |
| Cidulang    | Garden    | 676-687         | 336              | 2              | 50               | 0.137                  | Shaded       |
| Cikijing    | Garden    | 641-666         | 258              | 10             | 77               | 0.299                  | Shaded & opened |
| Cilancang   | Garden    | 819-860         | 476              | 14             | 92               | 0.193                  | Shaded & opened |
| Cipulus     | Garden    | 905-955         | 495              | 6              | 49               | 0.099                  | Shaded & opened |
| Cisoka      | Garden    | 598-658         | 247              | 19             | 318              | 1.288                  | Shaded & opened |
| Jagasari    | Garden    | 681-825         | 270              | 22             | 261              | 0.967                  | Shaded & opened |
| Kancana     | Garden    | 878             | 135              | 1             | 21               | 0.154                  | Shaded       |
| Sindangpanji | Garden  | 649-778         | 194              | 7             | 140              | 0.722                  | Shaded & opened |
| Sukamukti   | Garden    | 648             | 552              | 1              | 6                | 0.011                  | Shaded       |
| Sunalari    | Garden    | 779             | 171              | 1             | 4                | 0.023                  | Opened       |

Figure 3. Land type of the occurrence of suweg: A. Home gardens; B. Gardens; C. Pond edge; D. Rice fields

Climatic and edaphic factors of suweg habitat

This research collects climatic and edaphic factors of suweg habitat. The data collected consist of air temperature, air pressure, air humidity, soil pH, and soil moisture. The climatic and edaphic factors of suweg habitat can be found in Table 3.

Based on the data that have been collected, there are several information that obtained regarding the climatic and edaphic factors that collected in suweg habitat, which are the minimum temperature of suweg habitat is 19.2°C and 42.3°C maximum, air pressure between 937.8 hPa to 940.2 hPa, air humidity from 35% to 95%, soil pH varies between 6.2 to 7 and soil moisture from 25% to 90%.

Vegetation around suweg habitat

Based on the results of the research, suweg found in 11 villages around Mount Ciremai National Park and there are about 156 plant species that grow near suweg. The data regarding plant species found around suweg presented in Table 4. Based on Table 4, there are about 156 plant species that grow near suweg and 36 plant species that are always found living near suweg in every village where suweg grows. They are Acalypha australis Linn., Ageratum conyzoides L., Amaranthus spinosus L., Axonopus compressus (Sw.) P. Beauv., Bidens pilosa L., Blumea balsamifera (L.) DC., Chloris barbata (L.) Nash, Chrysopogon aciculatus (Retz.) Trin., Commelina bengalensis L., Crassocephalum crepidioides (Benth.) S. Moore, Cyandillium cinereum (L.) H. Rob., Cy nodon dactylon L., Cyperus kyllingia Endll., Cyperus rotundus L., Digitaria ciliaris (Retz.) Koeler, Echinochloa colona (L.) Link., Elephantopus scaber L., Eleusine indica (L.) Gaena, Eragrostis unioloides (Retz.) Nees ex Steud., Eupatorium odoratum L., Euphorbia hirta L., Hedychium coronarium (L.) Lamk., Hyptis capitata Jacq., Imperata cylindrica (L.) P. Beauv., Isotoma longiflora Pres. L., Mimosa pudica, Peperomia pellucida (L.) Kunth, Phyllanthus niruri L., Pluchea indica L., Portulaca oleracea L., Sida rhombifolia L., Sonchus arvensis L., Sporobolus bertianus (Trin.) Hitchc. & Chase, Stachyarthra indica (L.) Vahl, Themeda argens (L.) Hack, and Urena lobata L. The plant species living near suweg vary from understorey to trees.
### Table 3. The climatic and edaphic factors of *suneg* habit in villages around The Mount Ciremai National Park

| Village       | Air temperature (°C) | Air pressure (hPa) | Air humidity (%) | Soil pH | Soil moisture (%) |
|---------------|----------------------|--------------------|------------------|---------|-------------------|
| Bagjasari     | 19.5-31.5            | 938.7-932.8        | 39-95            | 6.8     | 50-90             |
| Cidulang      | 19.6-41.7            | 937.9-940.1        | 36-95            | 6.8     | 25-90             |
| Cikijing      | 19.7-42.3            | 937.8-940.0        | 35-95            | 6.6-7   | 25-90             |
| Cilancang     | 19.5-34.8            | 936.6-932.5        | 44-95            | 6.4-7   | 25-90             |
| Cipulus       | 19.2-34.6            | 938.1-932.1        | 45-95            | 6.2-7   | 60-90             |
| Cisoka        | 19.6-41.7            | 937.9-939.7        | 36-95            | 6.4-7   | 25-90             |
| Jagasari      | 19.5-32.1            | 938.7-931.7        | 40-95            | 6.6-7   | 50-90             |
| Kancana       | 19.5-34.7            | 938.2-932.2        | 45-95            | 6.6     | 60-90             |
| Sindangpanji  | 19.6-41.8            | 937.9-940.2        | 36-95            | 6.4-7   | 25-90             |
| Sukamuki      | 19.6-42.2            | 937.9-940.0        | 35-95            | 6.2     | 25-90             |
| Sunalari      | 19.5-34.9            | 938.7-932.8        | 40-95            | 7       | 50-90             |

### Table 4. Plant species in the habitat of *suneg* in villages around Mount Ciremai National Park

| Scientific name | Local name           | Village |
|-----------------|----------------------|---------|
| Acalypha australis Linn. | Jukut kokosan | Bgi     |
| Ageratum conyzoides L. | Babadotan | Cdl     |
| Albizia chinensis (Os) | Albasiah | Ckj     |
| Albizia procera (Roxb) Bth. | Kilih | Ckc     |
| Allium fistulosum L. | Bawang daun | Cpl     |
| Alocasia macrophylla (L.) Schott, orth. | Sente | Csk     |
| Alocasia plumbea Van Houtte. | Taleus hias | Cpl     |
| Alpinia galang L. | Laja | Cpl     |
| Amaranthus spinosus L. | Senggang cucuk | Csk     |
| Annona muricata L. | Kapol | Cpl     |
| Annona muricata L. | Danas | Cpl     |
| Anthocrophiola (Ten.) Steenis | Jati ambon | Cpl     |
| Antherium crystallinum Linden & Andre | Kuping gajah | Cpl     |
| Apium graveolens L. | Saleri | Cpl     |
| Arachis hypogea L. | Sunu | Cpl     |
| Archidendron pauciflorum (Benth) I.C. Nielsen | Jengkol | Cpl     |
| Arenga pinnata Merr | Kawung | Cpl     |
| Artocarpus altillis (Parkinson) Fosberg | Sukun+ | Cpl     |
| Artocarpus heterophyllus Lmk. | Nangka+ | Cpl     |
| Asperagus cochinchenensis (Lour.) Merr | Awi tali+ | Cpl     |
| Averrhoa carambola | Buah bentang | Cpl     |
| Axonopus compressus (Sw.) P. Beauv. | Jukut paht | Cpl     |
| Bambusa vulgaris Schrd. Ex J.C. | Awi ampel | Cpl     |
| Bidens pilosa L. | Harega+ | Cpl     |
| Blumea balsamifera (L.) DC. | Sembung+ | Cpl     |
| Brassica juncea L. | Sesi+ | Cpl     |
| Bridelia monoica Merr. | Kanyere+ | Cpl     |
| Calodium bicolor (Aiton) Vent. | Taleus hideung | Cpl     |
| Cana edulis Ker | Ganyol+ | Cpl     |
| Capsicum annum L. | Cabe+ | Cpl     |
| Capsicum frutescens L. | Cengek+ | Cpl     |
| Carica papaya L. | Gedang+ | Cpl     |
| Chloris barbata (L.) Nash | Kembang goyang+ | Cpl     |
| Chrysogonum acicularis (Retz.) Trin | Jukut jarum+ | Cpl     |
| Citrus amylcarpa (Hassk.) Osche | Jeruk lemo+ | Cpl     |
| Citrus aurantifolia Swingle | Jeruk mips+ | Cpl     |
| Citrus maximia (Burm. F.) Merr. | Jeruk bal+ | Cpl     |
| Citrus sinensis (L.) Osbeck | Jeruk+ | Cpl     |
| Cnidoscolus chayamansa McVaugh | Chaya | Cpl     |
| Cocos nucifera L. | Kalapa+ | Cpl     |
| Codiaeum variegatum (L.) A. Juss. | Puring | Cpl     |
| Coffea arabica L. | Kopi+ | Cpl     |
**Persea americana** P. Mill. | Alpuket | + | + | + | + | + | + | +  
**Phragmites karka** (Retz.) Trin ex Steud. | Bayongbong | + | + | + | + | + | + | + | +  
**Phyllanthus embica** | Mareme | +  
**Phyllanthus niruri** L. | Memeniran | + | + | + | + | + | + | + | +  
**Physalis angulata** L. | Cecendet | +  
**Piper betle** L. | Seureuh | + | +  
**Piper nigrum** L. | Sahang | +  
**Pisum sativum** L. | Kacang kapri | + | + | +  
**Plectranthus scutellarioides** R.Br. | Jawer kotok | +  
**Pluchea indica** L. | Baruntas | + | + | + | + | + | + | + | +  
**Polyscias scutellaria** (Burm.f.) Fosberg | Manangkakon | +  
**Portulaca oleracea** L. | Gelang | + | + | + | + | + | + | + | +  
**Psidium guajava** L. | Jambu batu | + | + | + | + | + | + | + | +  
**Psopocarpus tetragonolobus** (L.) DC | Jait | + | +  
**Rosa gallica** L. | Eros | + | +  
**Saccharum officinarum** L. | Tiwu | +  
**Salacia edulis** Reinw | Salah | + | +  
**Sauropsis albicus** Wight. | Katuk | + | +  
**Sechium edule** (Jack.) Sw. | Lejet | + | + | +  
**Sida rhombifolia** L. | Sadagori | + | + | + | + | + | + | + | +  
**Solanum lycopersicum** L. | Tomat | + | + | + | + | + | + | + | +  
**Solanum melongena** L. | Terong | + | + | + | + | + | + | + | +  
**Solanum nigrum** L. | Leunca | + | + | + | + | + | + | + | +  
**Solanum torvum** Sw. | Takokak | + | + | + | + | + | + | + | +  
**Sonchus arvensis** L. | Rayana | + | + | + | + | + | + | + | +  
**Spinacea oleracea** L. | Bayem | + | +  
**Spondias dulcis** Parkinson | Kadongdong | +  
**Sporobolus berterianus** ((Trin.)Hitchc. & Chase | Nyenerean | + | + | + | + | + | + | + | +  
**Stachyarthra indica** (L.) Vahl | Jarong | + | + | + | + | + | + | + | +  
**Strobilanthes crispus** Blume | Pecah beling | +  
**Swietenia mahagoni** (L.) Jacq | Mahoni | + | + | + | + | + | + | + | +  
**Syzygium aquaeum** (Burm. f.) Alston | Jambu air | + | + | +  
**Syzygium aromaticum** (L) Merr and Perry | Cengkeh | + | + | + | + | + | + | + | +  
**Syzygium polyanthum** (Wight.) Walp. | Salam | + | + | +  
**Tectona grandis** Li.| Jati | + | + | + | +  
**Themeda argens** (L.) Hack | Mererakan | + | + | + | + | + | + | + | +  
**Theobroma cacao** L. | Coklat | +  
**Toona sureni** (Blume) Merr. | Suren | + | + | + | + | + | +  
**Urena lobata** L. | Pungpurutan | + | + | + | + | + | + | + | +  
**Vigna cylindrica** (L.) Skeels | Kacang panjang | + | + | +  
**Xanthosoma sagittifolium** (L.) Schott. | Taleus Padang | + | + | + | + | + | + | + | +  
**Zea mays** L. | Jagong | + | + | + | +  
**Zingiber cassumunar** Roxb. | Panglay | + | + | + | + | + | +  
**Zingiber officinale** Rosc. | Jahe | + | + | + | + | + | +  
**Zinnia violacea** Cav. | Kembang kertas | +  

**Note:** Bgi: Bagiasari; Cdl: Cidulang; Ckj: Cikijing; CLe: Cilancang; Cpl: Cipulus; Csk: Cisoka; Jgi: Jagasari; Kcn: Kancana; Spi: Sindangpanji; Sm: Sukamak; Sli: Sunalari

**Discussion**

Regarding the morphological characteristics of suweg (*Amorphophallus paonifolius*), the results of this study (Table 1) are in line with several other studies. Generally, Sedayu et al. (2010) mention that morphological characters, such as sessile/non-sessile stigma, pollen opening mechanism, the shape of the main segments of the lamina, growth cycle, and berry color, supported some clades of *Amorphophallus* which reflect the biogeographical distribution. Sitanggang et al. (2017) state that in general, Angiosperms, including *Amorphophallus*, have pinnate leaves. In particular, Yuzami (2018) informs that *A. paonifolius* is a terrestrial herb; tuber depressed globose, dark brown with root-scars prominent, c. 30 cm in silence; petiole c. 2 m long, surface somewhat corrugate to strongly echinate-verrucate, pale to dark green or blackish green with large and small pale blotches and numerous tiny dark dots; leaf blade c. 3 meters in silence, highly dissected; inflorescence with short peduncle; spathe campanulate limb spreading strongly undulate.

Hettescheid and Mangelsdorff (2006) explain that this plant has a peduncle much shorter than spathe, rounded or conical appendix; petiole rough; tuber with distinctly raised, annulate root scars. Kurniawan et al. (2011) inform that the plant has characteristics of tuber diameter of 25 cm and up to 30 cm, dark brown, rough with several nodes, and producing seasonal rhizomatous buds. Petiole height can reach 100-200 cm, diameter reaches 5-10 cm; strongly verrucose-echinate until shallowly corrugate surface, dark green to brownish green (wild species), slightly verrucose
to smooth surface, pale green to green (cultivated species); with whitish green spots either in wild or cultivated species. Lamina or blade 100-150 in diameter, deeply dissected, rachises winged; leaflets ovate to lanceolate, 3-35 cm x 2-12 cm. Peduncle 3-15 cm in height and elongating when fruiting until 75 cm, peduncle surface is similar with petiole both in wild and cultivated species; peduncle turns brownish green-when the fruit is ripening. The inflorescence is the biggest among two other Amorphophallus. Spathe 10-30 cm x 15-50 cm, limb spreading and strongly undulate, pale green to brown with pale green-whitish green spot outside, glossy dark brown to dark red-purple inside. Spadix is longer than spathe, 10-25 cm long. Inflorescence produces very unpleasing odors like carcass smell. Cylindric infrared; berry cylindrical, less than 2 cm, bright red. Jintan et al. (2015) inform that this plant has petioles, vagina, and lamina so that it can be called complete leafy. The leaves of this plant are compound, the leaf bones are pinnate with sharing edges, and the leaflets are 6-8. The leaf blade has an elliptical shape with a pointed tip, smooth surface, and is light green to dark green. Length of petiole can reach 75-100 cm, 3.3-10 cm in diameter, light green to dark and white spots, the surface is mottled, and divided into three secondary stems. The height of the petiole reaches 2 meters in an upright direction. Brownish-yellow tubers. Permatasari et al. (2014) inform that this plant has petiole that is light yellowish-green, dark green, and brownish-green in color. The diversity of the color of the petiole is thought to be due to the presence of various pigment combinations such as levels of chlorophyll, ß-carotene, and anthocyanin compounds. Sulistiyo et al. (2015) inform that this plant has special characteristics, which is not having a bulbil. The petiole has a slightly rough texture and a round patch shape. The tubers have bud eyes, a slightly smooth texture, yellow in the color of the surface, pink or white in the color of flesh, and are not itchy.

This study found that suweg occurred in several types of land use, such as home gardens, gardens, and rice fields (Table 2). This is in line with what Mutaqin et al. (2020a) that based on ethnobotanical studies, the community generally states that suweg can grow on non-cultivated lands, such as forests, also on land that is categorized as cultivated lands, such as home gardens, gardens, rice field edges, and pond edges. Also, Mandal et al. (2016) inform that the plant is grown on cultivated land by residents in several Asian countries, such as Indonesia and India. Likewise, Kumar et al. (2015) inform that this species of Amorphophallus has been traditionally cultivated by residents on lands in several rural areas in India.

Table 2 also informs that suweg is more common in home gardens than in gardens or rice fields. This may be related to community behavior or culture, where there is a public interest in planting certain species of plants and more often home gardens because the access to the land is closer than other types of land. Several scientific studies can be used as a comparison or basis for rationalizing this phenomenon. Iskandar and Iskandar (2011) state that every member who owns the home garden can generally participate actively in managing the family's home garden. Iskandar and Iskandar (2016) inform that the home garden as one of the traditional agroforestry systems has an important social, economic and cultural function for the community. Beyene et al. (2018) state that the home garden agroforestry system can provide economic benefits and ecological services to households.

In terms of population or density of suweg in various lands (Table 2), the percentage is categorized as low. This is possible because this plant is not the primary crop being cultivated by the local community, unlike chili, cayenne pepper, shallots, or other species of cultivated plants. This phenomenon may be compared or rationalized with the results of several scientific studies. Mutaqin et al. (2020b) state that suweg is a plant that is not cultivated intensively by the community because it has no economic value. Prihatini et al. (2018a) reveal that along with the development of the market economy, the home garden changes in function, which leads to a commercial function. The same thing is expressed by Mohri et al. (2013) that recent socio-economic changes are converting subsistence-oriented home gardens into commercial ones in Indonesia, Sri Lanka, and Vietnam. Jintan et al. (2015) state that the population of suweg is related to the level of shade of habitat and the lack of community activity that can affect the existence of the suweg. In addition, Prihatini et al. (2018b) state that plant groups in the form of herbaceous, shrubs, and vines are plants that are widely planted in the home garden system. More generally, Xu et al. (2019) inform that human activities have shaped large-scale distributions of many plant species, driving both range contractions and expansions.

The results of observations of environmental parameters of suweg are in line with several research results. In general, Angiosperms, including A. paeonifolius, are found in areas with an altitude of up to 1,000 m asl (Sitanggang et al. 2017). In particular, A. paeonifolius is distributed inland with an elevation of up to 800 meters with area conditions that are shaded or exposed to full sunlight (Hetterscheid and Itenbach 1996; Yuzammi et al. 2017). Mutaqin et al. (2020c) state that suweg lives in shaded or open areas in home gardens, gardens, and rice fields. Jintan et al. (2015) inform that suweg can be found at an altitude of 70 m asl. Heriyansyah et al. (2017) inform that this type of Amorphophallus is distributed in areas with an altitude of 50-846 m asl. Mulyati et al. (2017) report that this plant is found in areas with an altitude of 200, 400, and 600 m asl. Hidayat (2019) found suweg in areas with an altitude of 64-134 m asl and canopy cover between 40-100%. Trimanto and Hapsari (2016) found suweg in mountainous forest areas that have an altitude between 8-572 m asl.

Related to other environmental factors as listed in Table 3, this is in line with Jintan et al. (2015) that suweg grows at a temperature of 27.1-27.6°C, rainfall of 23.6-108.4 mm, air humidity of 76-78%, the light intensity of 44-57%, and soil pH of 6-7.5. Hidayat (2019) found suweg in areas with temperatures of 33.4-33.9 °C, air humidity of 58.5-65.8%, sunlight intensity of 80-226.9 lux, and soil pH between 5.8-6.5. Permatasari et al. (2014) state that the growing environment of this plant has a light intensity of 7500-
37700 lux, air temperature of 23-33 °C, air humidity of 59-100%, soil pH of 7-7.4, clay soil, sandy clay, loose, and soil moisture of 10-80%. Heriyansyah et al. (2017) inform that suweg was found in areas with temperatures of 26-31°C. Meanwhile, Mulayati et al. (2017) found this plant in locations with soil pH of 7, the light intensity of 1180-1820 lux, air temperature of 30-33 ° C, and air humidity of 18-22%.

Table 4 informs that there are many species of plants around suweg, including those that being cultivated or grow naturally. This is in line with Mutaqin et al. (2020a) that suweg grows in areas with varied ranges, both open and closed areas of several types of vegetation. Jintan et al. (2015) inform that the plants that grow around suweg vary in species and strata of the crown. Hidayat (2019) informs that the plants that grow around suweg apart from teak also contain several other wild plants with herbaceous habitats, lianas, shrubs, epiphytes, and trees, especially from the Fabaceae, Compositae, and Zingiberaceae families.

In conclusion, this research gives and enriches information regarding suweg (Amorphophallus paeoniifolius) morphological and habitat conditions near Mount Ciremai National Park, West Java, Indonesia. Based on analysis, suweg can be found in 11 villages around Mount Ciremai National Park which are Baggiasari, Cidulang, Cikijing, Cilancang, Cipulus, Cisoka, Jagasari, Kancana, Sindangpanji, Sukamuti, and Sunalari villages. The morphological aspect of A. paeoniifolius found around Mount Ciremai has a lot of similarities with A. paeoniifolius from other areas obtained from the literature study. Suweg that found around Mount Ciremai National Park, West Java, Indonesia is usually found in four types of land which are home gardens, gardens, rice fields, and pond edges. There are also about 36 plant species that are always found living near suweg in every area.

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