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Morphological Structure and Anatomy of Bamboo Ampel (*Bambusa Vulgaris*) in Imogiri

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Abstract : This research aims to find out the morphological structure of bamboo ampel (*Bambusa vulgaris*) and the anatomy of bamboo ampel rods (*Bambusa vulgaris*). This research through two stages, the first stage is exploration and the second stage is the observation conducted in the integrated laboratory of UIN Sunan Kalijaga Yogyakarta. This study produced data in the form of morphological structures namely, the part of the stem that is smooth green shiny, bamboo shoots are fresh green, reeds with triangular tips and bald bases and covered with brown to blackish fur, and the surface of the upper leaves is smooth and shiny, and the lower leaves are fluffy. For its anatomical structure, ampel bamboo has anatomical parts such as the epidermis, cortex, transporting beams (protoxilem, metaxilem, and xilem), as well as fibers. This ampel bamboo transporter file is included in the type III transport file. For bamboo stem components this bamboo ampel is lignin 28.01%, cellulose 44.79%, starch 21.35%, water 6.81%, ash 2.47%, and silica 0.47%.

Keywords : Morphological Structure Bamboo Ampel, Anatomical Structure of Bamboo Ampel, Bamboo Stem Components

Abbreviations : This research aims to find out the morphological and anatomical structure of bamboo ampel (Bambusa vulgaris) obtained in the form of anatomical structure consisting of epidermis, transport file (phloem and xilem), fiber, and cortex. As for morphological structures obtained data from stems, leaves, bamboo shoots, and bamboo reeds. For bamboo stem components this bamboo ampel is lignin 28.01%, cellulose 44.79%, starch 21.35%, water 6.81%, ash 2.47%, and silica 0.47%.

Running title : Morphological Structure and Anatomy of Bamboo

INTRODUCTION

Bamboo belongs to the family Graminae/Poaceae which is also referred to as Hiant Grass (giant grass), enumerate and consists of a number of stems (reeds) that grow gradually, from bamboo shoots, young stems, and have matured at the age of 4-5 years. Bamboo rods are cylindrical, book-shaped, hollow, hard-walled, in each book there are eye buds or branches. Bamboo roots consist of book-booked anduas rhizomes. In books overgrown by fibers and shoots that can grow into stems. And approximately 1000 bamboo species in 80 genera, about 200 species are found in Southeast Asia, while in Indonesia there are about 60 species. Indonesian bamboo plants are found in lowland to mountainous places with an altitude of about 300 meters above sea level (Yuyun,2010). Approximately 263 types of bamboo are found in southeast Asia ranging from Myanmar, Indo-China to Papua New Guinea (S. Dransfield and Widjaja, 1995 in Abrori .R., 2016). Bamboo located in Southeast Asia region, Indonesia, found about 161 types of bamboo. Where 50% of Indonesian bamboo is endemic and 50% is a type of bamboo that has been widely utilized by the population and has the potential to be developed (Widjaja, 2006 in Abrori .R., 2016).

Imogiri area, Bantul, Yogyakarta is one of the areas that cultivate bamboo. Bamboo in imogiri area is cultivated based on the use of bamboo. Bamboo cultivated, in addition to maintaining its sustainability, bamboo cultivation also aims to be utilized and developed economically. Bamboo that is often cultivated is bamboo ampel (Bambusa vulgaris).

From its morphological structure bamboo is a plant that is difficult to distinguish between its species due to the similarity of morphological characteristics. According to taxonomy experts, inflorescence remains the most important part of distinguishing types, but since bamboo rarely flowers, it can be used other ways to identify bamboo. Other morphological features such as bamboo shoots, stems, leaves, branching systems, and anatomical features can clarify the differences of each type of bamboo through the bonding of vessels and fiber dimensions (Rahmi, et al. 2015). Therefore, this study aims to know the anatomical structure and morphology of bamboo ampel (Bambussa vulgaris) to find out the anatomically and morphologically.

MATERIALS AND METHODS

This research consists of two stages, namely the first stage is the stage of data retrieval and sampling using exploration methods. After the exploration phase was carried out again the manufacture and observation of preparations at the Laboratory of Gadjah Mada University Yogyakarta and the Integrated Laboratory of Sunan Kalijaga State Islamic University Yogyakarta. Stages performed :

1. **Research on Morphological Structure and Anatomy of Bamboo Ampel (*Bambusa vulgaris*)**

The location of data collection is done in Imogiri, precisely in Tegalrejo Hamlet, Girirejo, Imogiri, Bantul. With coordinate point : -7.926786,110.390255. Research on bamboo plant morphology structure was conducted in February 2020 with the method used is an exploration method, while for research the anatomical structure of bamboo rods is carried out in the Laboratory of UIN Sunan

Kalijaga and Gadjah Mada University.

2. Tools and Materials

Materials : Bamboo stem ampel, Airm, Alcohol 70%, Alcohol 80%, Alcohol 96%, absolute, xilol alcohol 3 :1, 1:1, 1:3, Aquades, Xilol, and Balsam Canada

Tools : Microtoms, Stereo microscopes, Glass objects, Glass closing objects, Ttetes Pipettes, Petri dishes, Tweezers, Falkon Bottles, Beaker glasses, Measuring glasses, and Cameras.

3. Data Analysis Techniques

The data taken is a photo of the overall morphology of bamboo ampel and a photo of the anatomical tissue of bamboo ampel that has been obtained from the research conducted. Then the photo is analyzed with the description method and compared to a valid reference.

RESULTS AND DISCUSSION

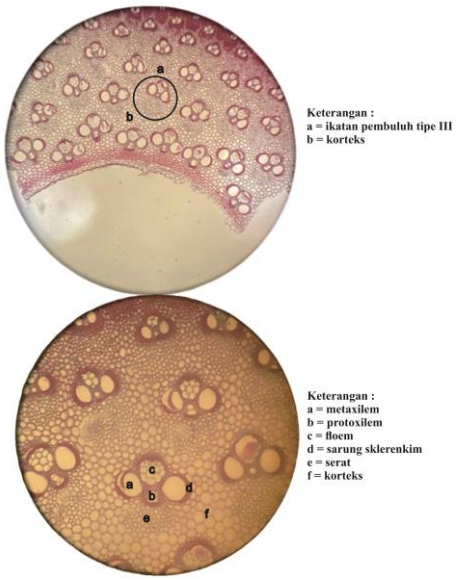
The results of this research are in the form of morphological structure data and anatomy of bamboo ampel, the following are the results that have been obtained from the research conducted :

1. Morphological Structure of Sampel Bamboo (*Bambusa vulgaris*)

No	Image	Name	Description
1.		Stem	This ampel bamboo rod (Bambusa vulgaris) is a smooth green color without white strips or lines with a smooth surface. This bamboo ampel has clumps that each clump there are about 23-60 stems. The length of this ampel bamboo stem is about 10-12.3 meters with the diameter of the stem at the base of 7-8.4cm and the tip 0.3-0.7cm. The field on the bamboo stem is about 34-42 sections (Sutardi,et al. 2015).
2.		Leave	The leaves are green with a length of 14-18.5 cm and a width of 2-2.3 cm, and have a leaf-rimping ear (Mardliyyah, et al.2017). The leaves are green with the upper surface of the leaves are hairless, the top surface of the bamboo leaves is hairless and the lower surface of the bamboo leaves is fluffy (Hingmadi, 2012).

3.		Bamboo Shoot	Bamboo shoots on bamboo ampel the actual color is green or yellow and covered by brown to black fur (Widjaja,et al., 2005). In the photo the color is close to brown. This is because the bamboo shoots lack water and dry out.
4.		Reed	The reed is easily decayed with a length of 9 cm and a lebr of 14 cm, the surface is covered with brown feathers, there are rimping ears with a height of 1.8 cm with a long fur length of 0.2 cm. The reed leaf is upright with a length of 5.7 cm and a width of 2.5 cm, in the shape of a triangular, and bald base (Mardliyyah, et al.2017).

2. The Anatomical Structure of Ampel Bamboo (*Bambusa vulgaris*)

No	Image	Descriptions
		In the cross section of the bamboo stem ampel is seen several parts of the tissue namely the epidermis, cortex, vessel bonds (protoxilem, metaxilem, and floem) , fibers, and sclerenchymal scabbards. In this cross-section of bamboo, there are fibers surrounding the bonds of the vessels. From the bond of the vessel can be known that the bond of the vessel enters in type III bond, because there is one vessel bond surrounded by one fiber. The length of bamboo fiber ampel according to (Sutardi,et al. 2015) is 3,176mm.

CONCLUSSIONS

This research covers the morphological and anatomical structures found in bamboo ampel, in addition this research is done because there is still a lack of literature in Indonesia that discusses this bamboo.

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