

## **THE BEHAVIOR OF URBAN COMMUNITIES IN PLANTING USEFUL PLANTS IN THE YARD DURING COVID-19 PANDEMIC**

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**Accepted August 22, 2020/Approved December 28, 2020**

### **ABSTRACT**

*Corona Virus Disease (COVID-19) pandemic that forces restrictions on movement between people is thought to impact the utilization of yards in urban areas positively. However, there is not much information about yard management practices, including plant species managed by urban communities. In the framework of biodiversity conservation, this research aims to explore the variety of plant species planted in the yards, the area of managed yards, and the planting motivation of the urban community, especially during the COVID-19 pandemic. The research was conducted from May to August 2020 using an online questionnaire (Google Form), and direct interviews with target respondents consisted of communities spread across two major cities in Lampung Province, i.e. Metro City and Bandar Lampung City. The research findings showed that only 8% of respondents planted various useful plant species during the COVID-19 pandemic, while the rest of them planted long before the pandemic occurred. The plant groups that the respondents commonly owned were ornamental plants (70%), while 30% of the existing species were medicinal plants and spices. The motivations included enjoying the yield (herbs and medicine), filling the spare time, enjoy gardening and love plants, making the house beautiful and cool, and even planting it for sale. Of the five planting goals or motivations of the urban community, the motivation to enjoy the yield was the highest, followed by the desire to have a beautiful yard and enjoy gardening. This condition is believed to continue to exist even though modernization is expanding.*

Keywords: *COVID-19 pandemic, ethnobotany, ornamental plants, residential landscape, useful plants*

### **INTRODUCTION**

The residential landscape is the main cover in the urban landscape in addition to the spaces for commerce, industry, and infrastructure, as well as narrow green space. The residential landscape consists of houses and various plant species managed in the yard or pots arranged in front of or behind the house of urban communities. The yard and plant species in it are a mosaic of habitat that serves as an ecosystem (Goddard et al. 2013) to minimize negative environmental impacts due to landscape changes from open space into a built-up area (Prihatiningsih et al. 2013).

Corona Virus Disease (COVID-19) is a disease spreading massively since this virus is transmitted through droplet (from saliva) when infected people cough, sneeze, or exhale. As it happens quickly and massively, the disease becomes a pandemic that forces restrictions on movement between humans and triggers decreased activities outside the house. Urban communities that generally work at the office and outside the house now work from home since COVID-19 emerges. Physical interaction is reduced and replaced with virtual activities, including the sale and purchase of foods. Some people have a lot of free time due to the pandemic so that it is suspected to bring a positive impact on the increasing utilization of yards in the city.

Planting is a positive habit that has already existed for generations in Indonesia (Sari et al. 2015). Planting in

the yard from the view of forestry is one form of agroforestry practice (Wulandari 2005; Yustha 2017) or *agrosilvopastura* (Sardjono et al. 2003). It shows that managing plant species in the yards do not close the urban community interaction with nature (Breuste et al. 2008). It also indicates the presence of self-awareness in managing the environment (Goddard et al. 2010). Also, people have an understanding and ecological knowledge about useful herbs such as the community around the urban forest in Jambi Province (Nursanti et al. 2018).

Integration of various plant species with the social, economic, and cultural aspects of urban communities is crucial for improving urban community life quality. Its because the contact between humans and the richness of green space species has psychological benefits (Fuller et al. 2007), and promotes the presence of other variety of ecosystem services (Mohri et al. 2013; Kusmana 2015). Based on these reasons, the sustainable management of residential landscapes on each scale, especially in each province in Indonesia, is vital to achieving the future of cities in the formidable developing country. Nevertheless, data and information regarding the planting habits and the plant types planted by urban communities, whether done before or during the COVID-19 pandemic, have not been widely studied scientifically. Some reports discuss the habitual practice of planting species of medicinal, ornamental, and food plants in the yard of the communities who live around the forest (Wulandari 2005; Nahlunnisa et al. 2015) before the COVID-19

pandemic. The studies also found in the villages that are closely related to the utilization of plant (Sari et al. 2015; Lais et al. 2017; Sugito et al. 2017; Yustha 2017; Rosdiana and Sugiarti 2018) before the onset of COVID-19 pandemic. Based on this matter, it is necessary to study several aspects, including the variation of the plant species planted in the yard, yard managed area, and planting motivation of the urban communities, especially during the COVID-19 pandemic. Data on types of plant managed by the urban communities in their yards are needed to redevelop awareness of the traditional knowledge that is useful in the future. Besides, this research is expected to support the Government of Indonesia, mainly the Government of Lampung Province, to be part of National Strategic Research through the biodiversity variation data that can be used as the follow-up material to prevent biodiversity loss.

## **RESEARCH METHOD**

The research was carried out during the COVID-19 pandemic from May to August 2020 in Bandar Lampung City (5°23'28"S, 105°15'59"W) and Metro City (5°6'47"S, 105°18'28"W) (Figure 1). The two locations are the dense population municipality in Lampung Province; however, both have land cover classified as green and have many yards based on the preliminary survey.

This research is interdisciplinary research that uses and develops a mixed method that combines an online questionnaire (Google Form platform) with direct interviews to the respondents along with the ecological survey of the house yard. The direct interviews were conducted by applying strict protocols of COVID-19. Each family could only be represented by one respondent. The respondents to be studied were randomly determined using the Google Form platform with the criteria of domiciled in Bandar Lampung City and willing to fill the questionnaire provided on the home page. The respondents who were interviewed directly were determined based on the ownership of the yard without limitation of the yard area. Given the pandemic condition that limited the communities' movement, the respondents' willingness became one of the most important things because only a few respondents were willing to be interviewed. With the limitation of the willingness, then the respondents in each sub-district were determined to be 10-13 people. The total number of respondents of this research were 275 people. Total respondents of Bandar Lampung City were 208 people representing 20 sub-districts, while 67 respondents from 5 sub districts represented metro City.

The yard includes green open space and the Indonesian traditional garden house model, which is fostered and managed by the households. Mitchell and Hanstad (2004) make several yard characteristics as

follows, 1) it is located near residence; 2) has a high diversity of plant types; 3) the production yields become additional food and income; and 4) occupies a relatively small/narrow area. Based on these characteristics, the research data were classified into three, i.e.: 1) plant types managed by the communities independently in the residential landscape, 2) area of the yard or the remnant land planted by plant species, and 3) motivation consists of reason for planting a specific plant species, is there any purpose to support biodiversity conservation, meet the subsistence needs, enjoy the free time or any other purposes; since when such practices occur in the community; and knowledge about the usefulness of each plant species, both in the yard and those that are not planted.

The data obtained were analyzed using descriptive statistics. Data regarding the area of the yard were classified by assessing the data distribution statistically. Then the results of frequency distribution analysis were presented in illustration of table or figure.

## **RESULT AND DISCUSSION**

### **1. Variation of Useful Plant Species in the Yard of Urban Communities Based on Planting Time**

The plant is one of the forest components that has many benefits, such as as a source of energy-rich foods. The plant also serves as the growth factor of a healthy body because it contains vitamins and other various essential substances for the body (van Holthoon 1999). During the COVID-19 pandemic, the people's immune system should be strong, while the public should bear up with the restrictions on movement and keep staying at home. One of the efforts to keep moving is to carry out planting activity around the house. Planting various species of plants in the living environment has positive impacts on health and subsistence food provision.

The results showed that only 8% of people were planting to fill their spare time during the COVID-19 pandemic (Figure 2). These findings mean that at least 1 of 5 people in the city utilized his/her spare time to plant various plant species in the yard during COVID-19. Urban communities have various species of plants in the yard before the pandemic happened. The yard is a mosaic of urban green open space that consists of a mixture of cultivated plants such as vegetables, fruits, plantation, spices, and medicinal plants (toga) (Galhena et al. 2013). However, the analysis results showed that plant species widely planted by the communities both before and during the COVID-19 pandemic was an ornamental plant. These ornamental plants mostly filled the yard of urban communities compared with medicinal plants, spices, and vegetables (Figure 3). Plant species planted in the yard of the urban community since the COVID-19 pandemic can be seen in Table 1.

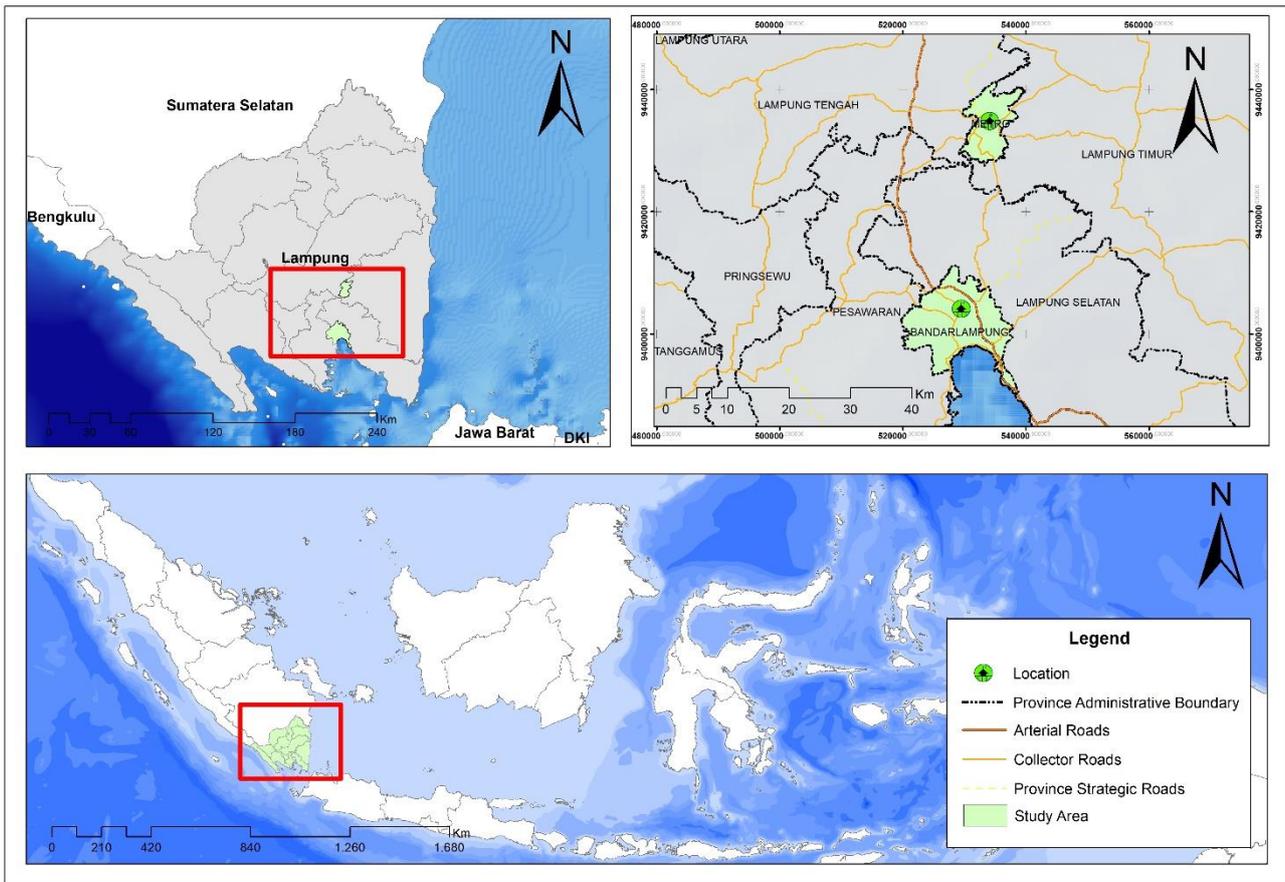


Figure 1 Research location map

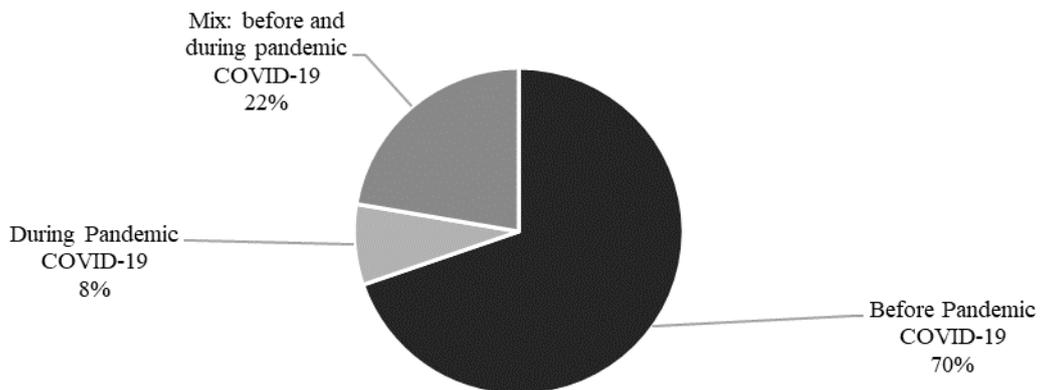


Figure 2 Planting time of useful plants in the yard of urban community

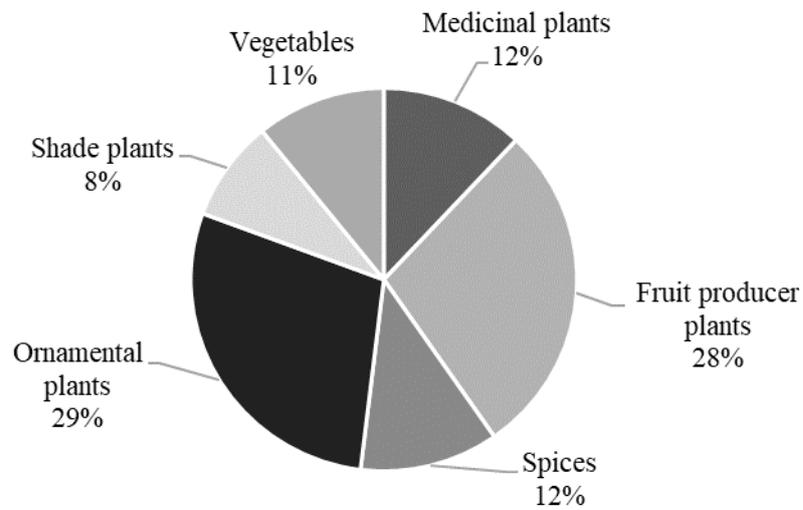


Figure 3 Group of plant species used in the yard of the urban community before and during the COVID-19 pandemic

Table 1 Plant species planted in the yard of the urban community since the COVID-19 pandemic

Plant species	Scientific name	Source	Plant classification
Devil's tongue 	<i>Sansevieria</i> sp.	Buying	Ornamental
Aloe vera 	<i>Aloe</i> sp.	Planted	Ornamental and medicinal
Coconut bonsai 	<i>Cocos nucifera</i>	Planted	Ornamental
Chinese evergreen 	<i>Aglaonema</i> spp.	Planted	Ornamental
Aster 	<i>Aster</i> sp.	Planted	Ornamental

Plant species	Scientific name	Source	Plant classification
Primadona (a type of Chinese evergreen) 	<i>Aglaonema</i> spp.	Planted	Ornamental
Orchid 	<i>Dendrobium nobile</i>	Planted	Ornamental
Galangal 	<i>Alpinia galanga</i>	Planted	Medicinal
Temulawak (Javanese ginger) 	<i>Curcuma zanthorrhiza</i>	Planted	Medicinal
Red ginger 	<i>Zingiber officinale</i>	Planted	Medicinal

## 2. Yard Area of Urban Communities

Based on the total target respondents data, either fill out a questionnaire online or interviewed directly, it was found that the average area of the yard in the two research locations was different. Based on the average area, the yard of the Bandar Lampung City community was in the range of  $34.1801 \pm 7.2139 \text{ m}^2$ , while the yard of Metro City was in the range of  $280.4538 \pm 70.8340 \text{ m}^2$ . The most spacious area of the yard obtained from the survey results in Metro City reached  $3000 \text{ m}^2$ , while in Bandar Lampung City only reached  $1000 \text{ m}^2$ . Based on these results, it is concluded that the yard in Bandar Lampung City is much smaller than Metro City because the average area of the yard of Metro City community is eight times the average area of the yard in Bandar Lampung City. The Green Open Space Area of Metro City was around  $154.043 \text{ Ha}$ , or about 2.24 per cent of the total area of the region (Amri 2020), while the Green Open Space (RTH) area of Bandar Lampung City was around 12.62% of the total area (Pratama 2015). The population demographics of Bandar Lampung City are

greater than the population in Metro City, so that the available land is also very narrow.

This research found that more than 88% of the yards had an area up to  $100 \text{ m}^2$ . Based on the findings of the area of the yard in this research, they were classified into five categories. Data processing showed the interval of the five classes of the area of the yard, which were, 1) very narrow (less than  $20 \text{ m}^2$ ), 2) narrow ( $20\text{-}50 \text{ m}^2$ ), 3) medium ( $50\text{-}100 \text{ m}^2$ ), 4) wide ( $100\text{-}200 \text{ m}^2$ ), and 5) very wide (more than  $200 \text{ m}^2$ ). Data processing results were in accordance with the classifications done by Sarwadi and Irwan (2018) in Yogyakarta City. The frequency distribution showed that most of the yard in the cities under study was very narrow (Figure 4). If the two cities are compared, the majority of the yard in Bandar Lampung City (94%) had an area up to  $100 \text{ m}^2$ , while in Metro City, only 67.69% of the yard had an area of  $100 \text{ m}^2$ , and the remaining 32.31% had an area  $>100 \text{ m}^2$ . The yard condition of the majority of people in Bandar Lampung City and Metro City can be seen in Figure 5

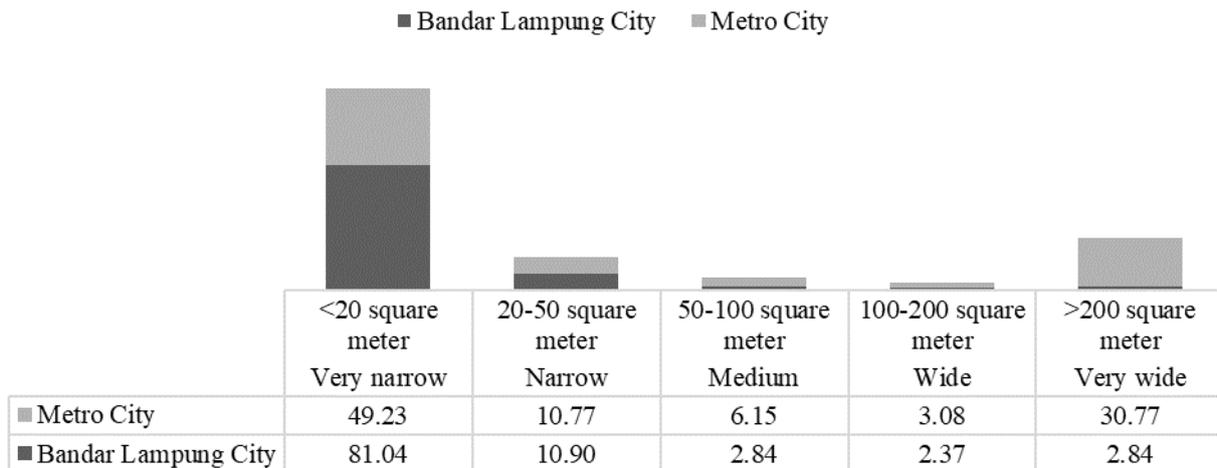


Figure 4 Percentage of respondents based on the classification of the area of yard owned



Figure 5 Yard Condition of the majority of people of Bandar Lampung City that is narrow (left), while in Metro City looks wider (right)

The smallest area of yard obtained from the survey results in Metro City was 6 m<sup>2</sup>, while in Bandar Lampung City, the smallest area of yard found was zero square meters or did not have a yard at all (Figure 4). Similar conditions are believed to also occur in different urban areas in Indonesia because of the generally difficult yard to find there. However, to assess the relationship between the area of the yard or remnant land in the residential landscape with high and low diversity of plant species managed by the community needs to be analyzed further. So far, the research results have not found the answer. The results of this research suspect that there is no relationship between the area of remnant land and the variation of plant species planted, except the motivation to plant.

### 3. The motivation of Urban Communities to Plant in the Yard

The life of the community is inseparable from the utilization of useful plant species in the surrounding areas. With the limited land indicated by the dominance of the narrow-size yard, the urban communities under study are still trying to manage various plant species

inside their house by using pots or other media. From direct observation, ornamental plants are primarily planted in the pot, while the medicinal plants are planted directly in the yard (Table 1). Their motivation is to enjoy the yield (herbs and medicines), fill the spare time, enjoy gardening and love plants, make the house beautiful and cool, and even plant it for sale. Of the five planting goals or motivation of the urban community, the motivation to enjoy the yield is the highest, followed by the desire to have a beautiful yard and enjoy gardening (Figure 6).

The ornamental plant is a collection plant (hobby) with aesthetic value and is enjoyed visually (Irwan and Sarwadi 2015). Medicinal plants, which are primarily rhizomes, are planted in the ground to grow and develop optimally. In addition, medicinal plants also function as a condiment for cooking, so planting them directly in the ground will make it easier to harvest. The action of the urban community with planting and maintaining the plant affects productive landscape development (Irwan and Sarwadi 2016). Productive landscapes can benefit the ecosystem as a whole. The benefit to the ecosystem can be discovered in the presence of wildlife species that help

develop landscapes such as birds. One of the findings regarding the composition of vegetation and its relationship to bird species diversity was found at the Universitas Lampung. The variety of plant species that develop at the Universitas Lampung presents 37 species of birds (Iswandaru et al. 2020). So this can be a good start for environmental restoration and improved quality of life.

This condition is believed to keep existing during the COVID-19 pandemic and after the pandemic ends or until the modernization keeps expanding. This is because humans who have a long history of the plant will

continue to need it to support their lives (Hakim 2014). To improve the quality of life, the relationship of humans and biodiversity elements will continue to develop despite many limitations. People in big cities with minimal land like Boston in the United States keep planting fruits and vegetables even on top of the roof of their house to support life (Saha and Eckelman 2017). However, there are also groups of people who are not used to manage their yard by planting useful plant species, thus raising awareness is necessary (Rosdiana and Sugiarti 2018; Solihin et al. 2018).

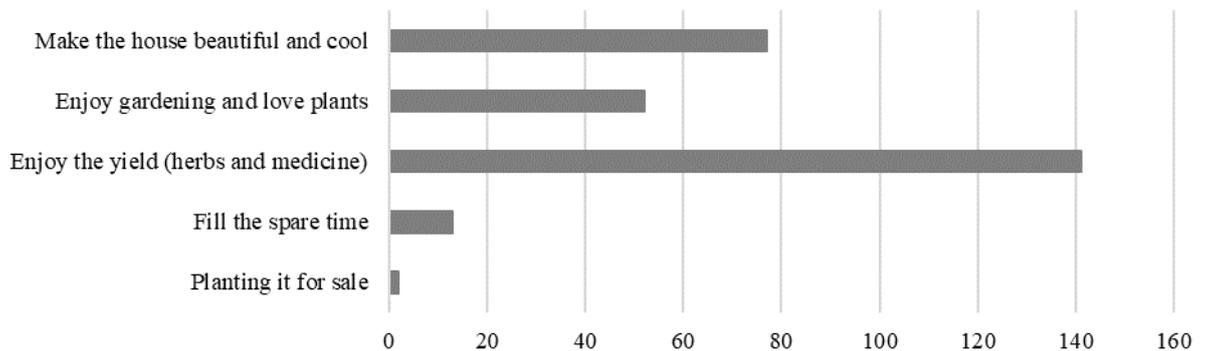


Figure 5 Planting motivation of the urban communities.

## CONCLUSION

Plant species planted by urban communities are varied, ranging from ornamental plants, medicinal plant, spices, shade plants, vegetables, and fruits. However, the ornamental plants are most widely planted during the COVID-19 pandemic. The urban communities should try to plant different herbs to maintain health and increase the immune system considering the pandemic conditions. The habit of planting in the urban community has existed long before the onset of the pandemic. The motivations include enjoying the yield (herbs and medicines), fill the spare time, enjoy gardening and love plants, make the house beautiful and cool, even planting them for sale. Of the five planting goals or motivation of the urban community, the motivation to enjoy the yield is the highest, followed by the desire to have a beautiful yard and enjoy gardening. This condition is believed to keep existing despite the modernization that keeps expanding.

## ACKNOWLEDGEMENT

This research was published on a research grant from DIPA BLU the University of Lampung in 2020 with Contract number 5742.001.002.053.C.525119, the Fiscal year 2020, and SP DIPA 023.17.2.677516/2020 dated December 27, 2019, entitled "Biodiversity Variation in the Housing Landscape as an Improvement

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