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Improving the Quality and Added Value of Miana Leaves (*Coleus scutellarioides*) through Harvest and Postharvest Assistance at BUMDes Tanjung Asri, Mojokerto

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ABSTRACT

Miana leaves (Coleus scutellarioides) have significant potential as raw materials for herbal products due to their bioactive compounds; however, their quality is highly influenced by harvesting and postharvest handling practices. At BUMDes Tanjung Asri, the existing practices were still simple and not standardized, resulting in inconsistent quality and low added value. This community service program aimed to improve the quality and value addition of miana leaves through assistance in proper harvesting and postharvest handling. The program was implemented using a participatory approach involving four stages: development of standard operating procedures (SOPs), dissemination of SOPs, hands-on field practice, and post-training assistance. The developed SOPs covered harvesting criteria, postharvest handling, and storage processes and were presented in an infographic format. The results showed that partners were able to apply the SOPs more systematically, particularly in sorting, washing, and drying processes, leading to improved handling practices. The learning-by-doing approach effectively enhanced partners' technical skills, while post-training assistance ensured the sustainability of SOP implementation. Overall, this program contributed to improving the quality, consistency, and added value of miana leaves at BUMDes Tanjung Asri.

A. INTRODUCTION

Miana (*Coleus scutellarioides*) is a medicinal plant widely utilized by communities in Indonesia. In addition to its medicinal uses, it is also commonly cultivated as an ornamental plant due to its colorful foliage (Kartini, Shevira, et al., 2025; Suva, Patel, & Sharma, 2015). Miana leaves are known to contain various bioactive compounds, particularly phenolics and flavonoids, such as rosmarinic acid and quercetin, which exhibit antioxidant and anti-inflammatory properties (Bismelah, Ahmad, Kassim, Ismail, & Rasol, 2022; Cretton et al., 2018;

Kubínová et al., 2019). Empirically, miana leaves have been used to treat various inflammatory conditions and other health disorders (Astuti, Yasir, & Alam, 2019). Owing to these bioactive constituents, miana leaves have significant potential to be developed as raw materials for economically valuable herbal products.

However, the quality of medicinal plant raw materials, including miana leaves, is highly influenced by harvesting techniques and postharvest handling (Singh et al., 2023). Improper harvesting time, inappropriate harvesting methods, and suboptimal postharvest processes such as sorting, washing, drying, and storage may lead to a decline in raw material quality. These conditions can result in reduced levels of active compounds, changes in color and aroma, and an increased risk of contamination. Therefore, the implementation of proper raw material handling principles, such as Good Agricultural and Collection Practices (GACP), is essential to maintain the quality and safety of herbal raw materials (Srivastava & Misra, 2018).

BUMDes Tanjung Asri, a village-owned enterprise located in Tanjungan Village, Kemlagi District, Mojokerto Regency, has potential for developing medicinal plant-based products, including miana leaves (Kartini, Setyaningrum, Hidayat, & Pudjibudojo, 2025). The relatively abundant availability of raw materials provides an opportunity to enhance the economic value of this plant. However, based on field observations, the harvesting and postharvest handling techniques currently applied are still simple and not yet standardized. Inadequate drying processes and the absence of further processing have resulted in inconsistent product quality and low value addition. These issues contribute to the low shelf life and market value of miana leaves, limiting their economic potential. In addition, the inconsistency in raw material quality poses challenges for further development of herbal products. Therefore, efforts to enhance the capacity of the partner are needed through structured and practical assistance in harvesting and postharvest aspects.

Previous community service activities conducted in Tanjungan Village focused on community empowerment through the establishment of a medicinal plants showcase and training on organic cultivation practices to support family health independence (Kartini, Setyaningrum, Hidayat, & Pudjibudojo, 2024; Kartini, Setyaningrum, et al., 2025). These programs successfully increased community awareness and interest in cultivating medicinal plants, including miana. However, the previous activities mainly emphasized cultivation aspects and did not yet address standardized harvesting and postharvest handling of medicinal plant raw materials. As a result, challenges related to the quality consistency, shelf life, and added economic value of miana leaves remain unresolved. In addition, limited knowledge regarding proper drying, storage, and handling practices still affects the quality of the produced raw materials. Therefore, the present community service activity was designed as a continuation of the previous programs by focusing specifically on harvesting and postharvest assistance to improve the quality and economic potential of miana leaves at BUMDes Tanjung Asri.

This community service activity aims to improve the quality and added value of miana leaves through assistance in proper harvesting techniques and postharvest handling at BUMDes Tanjung Asri. The assistance was carried out through educational sessions and hands-on practice related to appropriate harvesting time and methods, as well as postharvest handling processes including wet sorting, washing, drying, and storage. Through this activity, it is expected that the knowledge and skills of the partners will improve, resulting in better raw material quality, longer shelf life, and increased economic value for BUMDes Tanjung Asri.

B. METHODS

This community service activity was conducted in Tanjungan Village, Kemlagi District, Mojokerto Regency, in September 2025, involving 25 participants consisting of the management and members of BUMDes Tanjung Asri as partners. BUMDes Tanjung Asri is a village-owned enterprise engaged in savings and loan services as well as the management of Waduk Tanjungan ecotourism. The program was implemented using a participatory approach, actively involving partners in each stage of the activity. The implementation consisted of several stages, namely the development of standard operating procedures (SOP), SOP socialization, hands-on field practice, and post-training assistance.

The first stage involved the development of SOPs for the harvesting and postharvest handling of miana leaves (*Coleus scutellarioides*). The SOPs were developed based on literature studies related to proper handling of medicinal plants and were adapted to the conditions and needs of the partners. These SOPs covered procedures for harvest preparation, plant selection, harvesting techniques, wet sorting and washing, drying, dry sorting, packaging, and storage (Kementerian Kesehatan, 2015; Rahmianna, Ginting, & Yusnawan, 2016; Widiyastuti, 2015).

The second stage was the dissemination of the SOPs to the partners of BUMDes Tanjung Asri. This activity was conducted through educational sessions and interactive discussions aimed at improving partners' understanding of the importance of proper harvesting techniques and postharvest handling in maintaining the quality of herbal raw materials .

The third stage consisted of hands-on field practice. During this stage, partners were assisted in implementing the developed SOPs, starting from harvesting to postharvest handling. This activity aimed to enhance the technical skills of the partners through a practice-based learning approach (*learning by doing*).

The fourth stage was post-training assistance. The community service team conducted monitoring and evaluation of the partners' implementation of the SOPs and provided further guidance to address challenges encountered during the implementation process.

C. RESULTS AND DISCUSSION

1.1. Standard Operating Procedures (SOP) for the Harvesting and Postharvest Handling of Miana Leaves (*Coleus scutellarioides*)

At the initial stage of the activity, standard operating procedures (SOPs) for the harvesting and postharvest handling of miana leaves (*Coleus scutellarioides*) were developed and tailored to the conditions and needs of the partner, BUMDes Tanjung Asri. These SOPs serve as technical guidelines to ensure the production of high-quality and consistent herbal raw materials. The developed SOPs cover several key aspects, including the equipment required along with their specifications, selection of harvest-ready leaves, appropriate harvesting time and methods, and postharvest handling procedures such as wet sorting, washing, draining, drying, dry sorting, packaging, and storage (Kementerian Kesehatan, 2015; Rahmianna et al., 2016; Widiyastuti, 2015).

The determination of appropriate harvesting time—at 2–3 months of plant age and conducted between 08:00 and 10:00 a.m.—aims to obtain optimal levels of bioactive compounds, while proper harvesting techniques are applied to minimize physical damage to the leaves (Kementerian Kesehatan, 2015). Postharvest processes such as wet sorting and washing function to remove impurities and foreign materials, both organic and inorganic. The draining and drying processes aim to remove surface moisture and reduce the internal moisture content of the plant material, respectively, thereby extending shelf life and preventing microbial growth. In addition, proper packaging and storage play crucial roles in

maintaining the stability and quality of the raw materials (Tanko, Carrier, Duan, & Clausen, 2005; Thakur, Thakur, & Kumar, 2025).

In addition to the development of SOPs, this community service activity also involved the transfer of drying oven technology to the partners as part of the improvement of postharvest handling practices. Previously, the partners relied mainly on traditional sun-drying methods, which were highly dependent on weather conditions, required longer drying times, and posed risks of contamination from dust and microorganisms. The introduction of a drying oven provided a more controlled drying process, enabling crude drugs to be dried more rapidly, hygienically, and consistently. As a result, the quality and stability of the herbal raw materials could be better maintained, particularly in terms of moisture reduction and shelf-life improvement. The application of appropriate technology that is relevant to local needs is considered an important strategy in community empowerment because it enhances both technical capacity and the added value of local products.

To facilitate better understanding and implementation by the partners, the SOPs were presented in the form of a communicative and easy-to-understand infographic (**Figure 1**). This infographic was printed, distributed to the partners, and displayed in the production area of Rumah Herbal Tanjung Asri as a daily operational guide. The use of visual media has been shown to be more effective in supporting knowledge transfer, particularly in practice-based community activities. In addition to serving as an output of the community service program, the developed SOPs have also been registered for copyright protection (registration number: EC002025166903) as a form of intellectual property protection. The copyright certificate is presented in Figure 2. This indicates that the SOPs possess novelty and have the potential to be further developed as a model for community-based assistance in medicinal plant processing.

With the establishment of these SOPs, the partners are expected to have standardized guidelines for conducting harvesting and postharvest activities of miana leaves. The availability of these SOPs not only contributes to improving the quality of raw materials but also serves as an initial step toward enhancing the added value and competitiveness of herbal products produced by BUMDes Tanjung Asri.

Figure 1. SOP for Harvesting and Postharvest Handling of Miana Leaves

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Figure 2. Copyright Certificate for the SOP of Harvesting and Postharvest Handling of Miana Leaves

1.2. SOP Dissemination to Partners

The dissemination of SOPs for the harvesting and postharvest handling of miana leaves was conducted as an initial stage prior to hands-on field practice. This activity was carried out through educational sessions accompanied by interactive discussions with the partners of BUMDes Tanjung Asri involved in medicinal plant management (**Figure 3**).

Figure 3. Interactive discussions with the partners to disseminate the SOP

The materials presented included an introduction to the developed SOPs, covering appropriate harvesting time and methods as well as postharvest handling procedures. The use of infographic media aimed to provide a systematic overview of the workflow, making it easier for partners to understand (Kartini et al., 2024). Through this activity, partners were introduced to the basic principles of proper herbal raw material handling and the importance of implementing standardized procedures.

During the dissemination process, the partners showed positive responses and actively participated in the discussions. Several participants shared their previous practices, which were then discussed and compared with the procedures outlined in the SOPs. This indicates that the dissemination activity functioned not only as a means of information delivery but also as a platform for aligning perceptions between the community service team and the partners. Overall, this dissemination stage served as an introduction and reinforcement of

initial understanding prior to field implementation. With this foundational knowledge, the partners are expected to be better prepared for the subsequent stage, namely the hands-on application of the SOPs for harvesting and postharvest handling of miana leaves.

1.3. Practice-Based Learning

The hands-on field practice stage was conducted as a follow-up to the SOP dissemination activity, with the aim of directly implementing the harvesting and postharvest procedures for miana leaves. At this stage, the partners of BUMDes Tanjung Asri were assisted by the community service team in applying each step of the SOP, from harvesting to postharvest handling.

The practical session (Figure 4) began with the harvesting of miana leaves according to the criteria specified in the SOP, including the selection of harvest-ready leaves and appropriate cutting techniques. The partners then proceeded to postharvest handling stages, which included wet sorting, washing, draining, and drying. Throughout the process, the community service team provided direct guidance and corrective feedback on the techniques applied, enabling the partners to properly understand and implement the procedures.

Figure 4. Assistance in harvesting and postharvest handling of miana leaves

The results of the activity indicate that the partners were able to follow the SOP stages more systematically compared to their previous practices, which were relatively simple. The sorting and washing processes were carried out more selectively, allowing impurities and unsuitable materials to be effectively removed. In addition, the drying process began to be conducted with consideration of gradual moisture reduction principles to maintain the quality of the material, including the color and aroma of the leaves.

The *learning by doing* approach applied in this stage proved effective in improving the partners' technical skills, as participants not only received theoretical knowledge but also directly practiced the procedures (Kartini, Setyaningrum, & Hidayat, 2023; Lamatenggo, 2020). Direct interaction during the practice enabled immediate feedback, allowing errors to be promptly corrected and reinforcing participants' understanding. Through the implementation of this hands-on practice, the partners not only gained conceptual understanding of the SOPs but also acquired practical experience in applying them. This represents an important step in ensuring the sustainability of SOP implementation at the partner level, as well as supporting the improvement of quality and value addition of the miana leaves produced.

1.4. Post-training assistance

The post-training assistance stage was carried out to ensure the sustainability of SOP implementation for the harvesting and postharvest handling of miana leaves by the partners of BUMDes Tanjung Asri. At this stage, the community service team conducted monitoring and evaluation of the practices carried out by the partners following the field training activities. The monitoring results indicated that the partners had begun to implement the harvesting and postharvest stages in accordance with the SOPs provided, although some adjustments were still made based on field conditions. Several aspects that were well implemented included material sorting, washing, and more controlled drying processes compared to practices prior to the assistance program.

During the assistance process, the team also identified several challenges faced by the partners, such as limited drying facilities and previously established work habits that had not yet fully changed. To address these issues, further guidance was provided through discussions and practical solutions tailored to the partners' conditions, enabling the SOPs to be implemented more effectively. This assistance stage played an important role in strengthening the partners' skills and consistency in implementing the SOPs. The monitoring and evaluation process enabled continuous improvement, thereby minimizing errors in implementation. In addition, sustained interaction between the community service team and the partners helped to enhance the partners' confidence in independently managing harvesting and postharvest processes.

Overall, the post-training assistance stage demonstrated that the SOPs could not only be applied during training conditions but also adapted to the partners' daily operational activities. This serves as an important indicator that the community service program has a sustainable impact in improving the quality and added value of miana leaves at BUMDes Tanjung Asri.

D. CONCLUSION

This community service program successfully improved the capacity of BUMDes Tanjung Asri partners in implementing proper harvesting and postharvest handling of miana leaves. The development and application of SOPs provided standardized guidelines that enhanced the quality, consistency, and shelf life of the raw materials. The combination of dissemination, hands-on practice, and post-training assistance proved effective in strengthening both knowledge and technical skills, as well as ensuring the sustainability of implementation. Despite some limitations, such as constrained drying facilities and adaptation to new work habits, the program demonstrated a positive and sustainable impact. Therefore, this approach can be considered a potential model for community-based development of medicinal plant processing to increase product value and competitiveness.

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F. AUTHOR CONTRIBUTIONS

Activity implementation: KK, IS, RH, Article preparation: KK, Impact analysis: KK, IS, RH, JKKP, Results presentation: KK, IS, Article revision: KK.

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