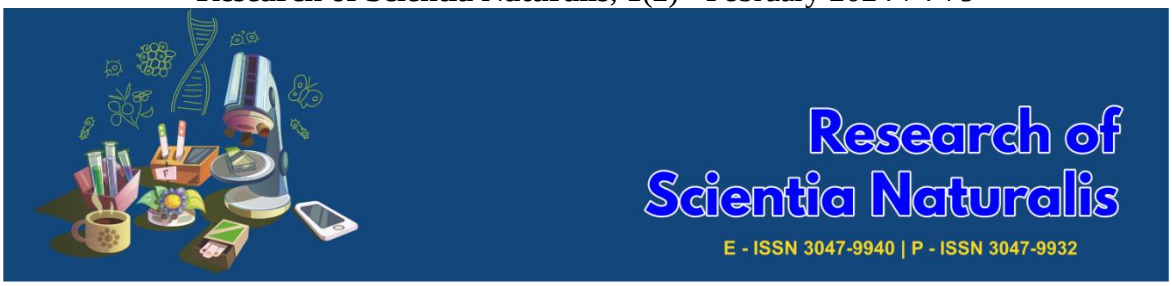
Research of Scientia Naturalis, 1(2) - February 2024 74-79



Spatial Pattern of Wild Orchids in Battambang Province, Cambodia

Net Si [1], Sovanndary Nuon [2], Mardy Serey [3]
[1] *National University of Battambang, Cambodia*
[2] *National University of Battambang, Cambodia*
[3] *Svay Rieng University, Cambodia*

Corresponding Author: Si Net, E-mail: net.orchids@gmail.com

Received: October 13, 2024	Revised: Nov 01, 2024	Accepted: Nov 01, 2024	Online: Nov 05, 2024

ABSTRACT
KESORKOL, scientifically known as Orchidaceae, is a captivating genus of flowering plants endemic to Cambodia. Despite its significance, scientific research on wild orchids in Cambodia has been limited, leading to concerns about the preservation of these unique species. To address this knowledge gap, a study was conducted over 22 months in Battambang province to identify and document wild orchids. The research focused on four districts, resulting in the discovery of 642 individual orchids belonging to 79 species and 38 genera. The study aimed to determine the genera, species, habitats, and locations of wild orchids in Battambang. This information is crucial for understanding their distribution and developing effective conservation strategies. Given the historical lack of extensive research on Cambodian orchids, it is imperative to conduct comprehensive scientific studies to identify rare and valuable species. Such efforts are essential for preserving the country's rich biodiversity.

Keywords: *Biodiversity, Conservation, Kesorlkol*

Journal Homepage https://journal.ypidathu.or.id/index.php/ijnis

How to cite: Si, N., Nuon, S & Serey, M. (2024). Spatial Pattern of Wild Orchids in Battambang Province, Cambodia. *Research of Scientia Naturalis*, 1(2), 74-79. https://doi.org/10.70177/scientia.v1i2.1437
Published by: Yayasan Pendidikan Islam Daarut Thufulah

INTRODUCTION

KESORKOL is one of the most distinctive flowering plants. Nowadays, Cambodians refer to it as Orchidaceae (Pao, 2018). Thousands of years old orchids, most of which are epiphytes, grow on bark and trees. Orchids can be epiphytic (on the trees), lithophytic (on the rocks), and terrestrial (in the soil) (Keo Omaliss, 2019). Most of these plants prefer tropical and subtropical climates (Ambius, 2017). The peculiarity of this plant lies in its ability to grow by clinging to trees or rocks. The orchids thrive in humid tropical locations like dense forests and mountains; depending on Cambodia's geography, there could be around 300 to 500 species of wild orchids found in its natural forests (Sophea, 2020). The World Checklist of Selected Plant Families (WCSP 2022) recorded 311 species of wild (native) orchids in Cambodia. We estimated a total of 500 species in Cambodia,

distributed across different biogeographical zones such as the Cardamom Mountains range, the dry forest savannah, and the Mekong Confluence (Keo Omaliss, 2019). The first checklist of wild orchids in Cambodia lists 205 species, with the main genera including Dendrobium, Bulbophyllum, Eria, Cleisostoma, and Coelogyne (OrchidCambodia, 2022). Researchers in Cambodia have been documenting about 300 species of wild orchids that are present in the wild (Sophea, 2020). Forestry Administration officials are continuing to search for wild orchids in Siem Reap province after finding 180 species (Orm Bunthoeurn, 2022). The number of recorded wild orchids is tiny compared to the neighboring countries studied before us, including Thailand with more than 1,500 species, Vietnam with more than 700 species, and Laos with more than 500 species (Ministry of Environment, 2022). New orchid records emerge from almost any area in Cambodia that still retains its natural vegetation. Simultaneously, the destruction of suitable habitats persists, and it is highly likely that species have already vanished before their recording (Schuiteman et al., 2018). Numerous factors contribute to the endangered status of these orchids, with changes in their growing environment often posing a significant threat. Increased deforestation for commercial and agricultural land can lead to the extinction of orchids (Rusea et al., 2019). This plant requires a fungus for growth, which typically thrives on old bark and is found in the wild (Sikkim, 2019). Undoubtedly, the loss of old forests and trees due to deforestation and urban sprawl poses a significant threat to wild orchids, potentially leading to their extinction without further research (Ambius, 2017). Given the ecological, economic, and pharmaceutical significance of orchids, it is crucial to conduct an exhaustive evaluation of their diversity and ecology in degraded forest areas (Besi et al., 2019).

This research aims to investigate the current status of wild orchid species in Battambang, Cambodia. By understanding their distribution and facing threats, we can develop effective conservation strategies. Historically, wild orchids in Cambodia have been severely impacted by deforestation for agriculture, illegal logging, and the collection of orchids for trade. These activities have pushed many species to the brink of extinction. This study highlights the urgent need for conservation efforts to protect these valuable plants and promote biodiversity preservation. By identifying endangered species and understanding their habitat requirements, we can take targeted steps to ensure their survival.

RESEARCH METHODOLOGY

This review uses a qualitative approach to collect data from another document of the journal that was published, the website, the book, and the report state of the Environment report. The Ministry of Environment of Cambodia combined it on the desk and analyzed it by using secondary data as a qualitative and quantitative method.

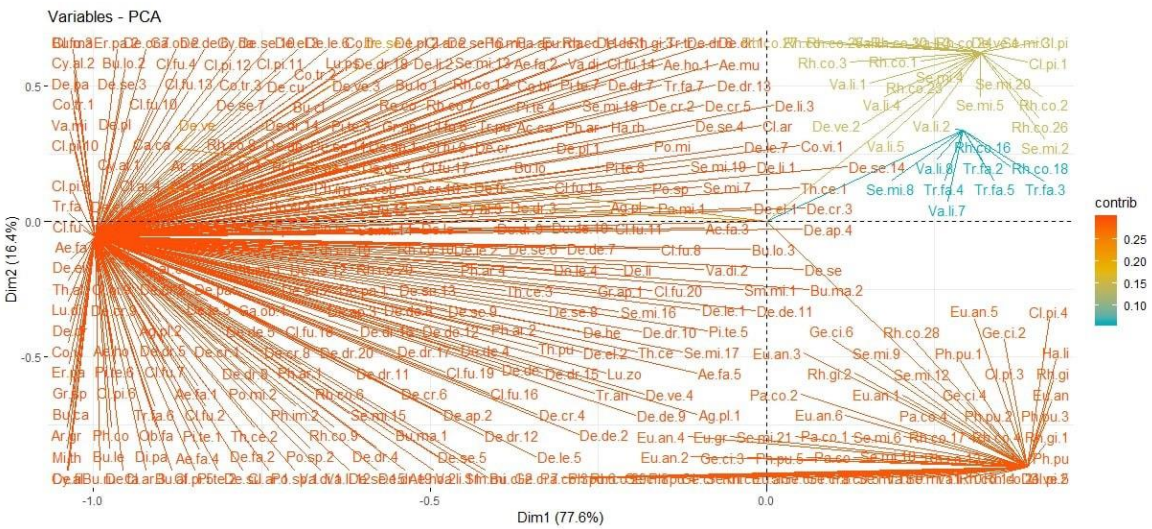
RESULT AND DISCUSSION

3.1 Habitats of the wild orchids

The research findings reveal the presence of numerous native wild orchids in Cambodia's forests, including the Cardamom Mountains, Bokor Mountains, coastal areas,

arid forests, and the confluence of the Mekong River. According to research by the Ministry of Environment, there are 300 to 500 species of wild orchids in the forest in Cambodia (Ministry of Environment, 2022). The natural forests of Cambodia may harbor approximately 300 species of wild orchids (Sophea, 2020). The first checklist of wild orchids in Cambodia lists 205 species (OrchidCambodia 2022). Forestry Administration officials are finding 180 species (Orm Bunthoeurn, 2022). Among these, 13 species are new to the flora of Cambodia (Averyanov, 2013). The checklist reports the presence of 79 species of wild orchids from 38 genera found in Battambang, Cambodia (Si et al., 2021). The Cardamom Mountains (including Bokor Mountain) are home to about 40% of Cambodia's wild orchids, followed by coastal areas at 35%, arid forests at 13%, and the confluence of the Mekong River at 10%. Additionally, the Dangrek mountain range and the area east of Tonle Sap Lake are home to Cambodian wild orchids (Sophea, 2020).

Studies based on the geographical, geological, and climatic factors of each region in Cambodia have demonstrated that the number of wild orchid follicles in each region is distributed among different cultivars, ranging from low to mountainous areas. According to the graph above, the correlation between wild orchids and the study area in each region is clear. Battambang province has 38 species of wild orchids (genus) of wild orchids. According to Si et al. (2021), there were 53 (67%) species of sympodial and 26 (33%) species of monopodial growing structures. They fall into two categories: monopodial and sympodial. They can be found in the habitats of three different growing sites: epiphyte, lithophyte, and terrestrial (Sophea, 2020).



PCA Graphic 3 shows the correlation between wild orchids and location area (Si et al., 2021)

The deep insights gained from the graph show an amazing connection between genera that are spread out in different areas, especially when seen through the lenses of

Dim1 (77.6%) and Dim2 (16.4%), resulting in an amazing 94% accuracy in interpretation. The pivotal principal component analysis (PCA) axis emerges as a crucial nexus, encapsulating a significant 94% of the racial correlation and underscoring the intrinsic interconnectedness of pivotal regions. Within the verdant landscapes of Cambodia, where vestiges of pristine natural vegetation persist, a juxtaposition unfolds the unveiling of novel orchid records against the disheartening backdrop of vanishing habitats. It is a poignant reminder that amidst the allure of discoveries, the relentless march of habitat destruction casts a shadow over undocumented species losses (Schuiteman et al., 2018). The comprehensive study further unravels the intricate tapestry of wild orchids' habitats, unveiling a mosaic of growth sites encompassing epiphytes, lithophytes, and terrestrial realms. The graphical depiction paints a vivid picture: lithophytes at a meager 1%, lithophytes and terrestrials at 5%, terrestrials at 11%, and a dominant presence of epiphytes at an impressive 62%, emblematic of the arboreal prowess of most wild orchids, intricately entwined with the bark of trees. Digging deeper into the taxonomy, we divide the 79 species into two primary categories: monopodial and sympodial, with the latter asserting dominance at 67.1% over the former's modest 32.9% (Si et al., 2021). Most of the limestone hills that we visited in Battambang Province showed signs of heavy disturbance, with little if any of the original forest cover left. Surrounded by cultivated land, we can only suspect the disappearance of sensitive and endemic species from these hills. We will probably never know (Schuiteman et al., 2018).

3.2 Reasons for the decline of wild orchids in the forest

As the population grows day by day, deforestation for commercial and agricultural purposes also increases. Consequently, old forests, also known as perennial forests, are beginning to disappear. This poses a significant threat to the endangered plant species, potentially leading to its extinction (Besi et al., 2019). Since wild orchids thrive on bark, the loss of the forest also affects the wild orchids that cling to branches or trees. This vulnerability stems from their reliance on a specific fungus for growth. This fungus is known as mycorrhizal, which works with the root follicles to help provide nutrients. The root follicles cannot extract nutrients from the soil like other plants (Sikkim, 2019). In a true demonstration of how the ecosystem works, mycorrhizal fungi need trees to grow. Mycorrhizal fungi generally live and grow in old-growth forests or perennials. Deforestation and the loss of old trees endanger mycorrhizal fungi, potentially leading to the extinction of wild orchids (Ambius, 2017).

CONCLUSION

The eight-month study conducted in Battambang province has shed light on the spatial distribution and diversity of wild orchids in the region. A total of 642 wild orchids, spanning 79 species and 38 genera, were identified, highlighting the province's rich floral heritage. This research underscores the importance of scientific investigation into Cambodian wild orchids. The discovery of rare and valuable species emphasizes the urgent

need for conservation measures to prevent their loss and safeguard biodiversity. Understanding the spatial patterns of wild orchids in Battambang is crucial for effective conservation. By documenting their occurrence and establishing correlations within the research area, we can better protect their natural habitats and ensure their survival. Future research should focus on the ecological, economic, and pharmaceutical significance of wild orchids in degraded forests. By evaluating their diversity and ecology, we can develop informed conservation strategies. Collaboration among stakeholders, researchers, and conservationists is essential for protecting wild orchids in Battambang and beyond. By taking proactive steps to combat threats like deforestation and illegal trade, we can contribute to the long-term sustainability of Cambodia's natural ecosystems.

In conclusion, the spatial patterns of wild orchids in Battambang serve as a reminder of the importance of biodiversity conservation and the need for continued research and conservation efforts to protect these valuable plant species.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to Associate Professor Dr. Serey Mardy of Svay Rieng University for his invaluable guidance and insightful comments throughout my research.

REFERENCES

Averyanov, L. (2013). New and Rare Orchids (Orchidaceae) in the Flora of Cambodia and Laos. *Turczaninowia*, *16*(4), 26–46. https://doi.org/10.14258/turczaninowia.16.4.7

Ambius. (2017). The Ultimate Guide to Orchids and Orchid Care.

Besi, E. E., Nikong, D., Mustafa, M., & Go, R. (2019). Orchid Diversity in Anthropogenic-Induced Degraded Tropical Rainforest, an Extrapolation Towards Conservation. *Lankesteriana*, *19*(2), 107–124. https://doi.org/10.15517/lank.v19i2.38775

Keo Omaliss, A. S., Pr. Marpha Telepova-Texier, N. S., & Att Sreynak, Cedric, C. J. (2019). Wild Orchids of Cambodia. Forestry Administration. Forestry Administration and with the collaboration of the Orchid Cambodia project of Action IEC, Cambodia.

OrchidCambodia. (2022). Wild orchids of Cambodia 2020 photos. Available at https://www.orchidcambodia. com/photo-checklist.html. Retrieved 20/02/2022.

Pao, S. (2018, January). Orchids Cultivation. *University of Battambang. Cambodia*, 22–29.

Sophea, C. (2020). Guidebook on Cambodia Orchid. Ministry of Environment.

Schuiteman, A., Jenny, R., Hourt, K. E., Sikhoeun, N. A. Y., & Sreynak, A. T. T. (2018). *New records of Orchidaceae from Cambodia IV Short Communication New records of Orchidaceae from Cambodia IV*. *2017*(November), 4–9.

Si, N., Ader, D., & Srean, P. (2021). A checklist of wild orchids in Battambang, Cambodia. *Asian Journal of Agricultural and Environmental Safety*, *2021*(2), 66–68.

Sikkim, E. (2019). e-Book Amanual on orchid education. ICAR-National Research Center for Orchids. India.

WCSP. (2022). World Checklist of Selected Plant Families. Facilitated by the Royal

Botanic Gardens, Kew. Published on the Internet; http://wcsp.science. kew.org. Retrieved 20/02/2022.