**Research of Scientia Naturalis**, 1(1) - February 2024 13-21



# Arecaceae Plants (Palms) Used for Cultural Ceremonies in Acehnese Communities in Gandapura District, Bireuen Regency

Cut Roswita <sup>1</sup>, Erlia Hanum <sup>2</sup>, Tutiliana <sup>3</sup>, Zainatul Hasanah <sup>4</sup>, Nadia Aldyza <sup>5</sup>

- <sup>1</sup> Universitas Al Muslim Matangglumpangdua Kabupaten Bireuen, Indonesia
- <sup>2</sup> Universitas Al Muslim Matangglumpangdua Kabupaten Bireuen, Indonesia
- <sup>3</sup> Universitas Al Muslim Matangglumpangdua Kabupaten Bireuen, Indonesia
- <sup>4</sup> Universitas Al Muslim Matangglumpangdua Kabupaten Bireuen, Indonesia
- <sup>5</sup> Universitas Al Muslim Matangglumpangdua Kabupaten Bireuen, Indonesia

Corresponding Author: Cut Roswita, E-mail; <a href="mailto:cutroswita@umuslim.ac.id">cutroswita@umuslim.ac.id</a>

Received: Feb 19, 2024 | Revised: Feb 22, 2024 | Accepted: Feb 25, 2024 | Online: Feb 27, 2023

#### **ABSTRACT**

Ethnobotany is a branch of science that studies the relationship between humans and plants and their environment. Arecaceae is one of the most important plant families for human life and its species are widely used in everyday life, one of which is as a material for traditional cultural ceremonies. Plant parts that are utilized by the community consist of fruit and leaves. Acehnese people who live in Gandapura District still closely hold cultural customs traditions in all kinds of traditional ceremonies in the region but have not been widely developed about the introduction of cultural customs using arecaceae plants to modern society. This research is useful to provide information to modern society about the cultural customs of the community in the traditional use of Arecaceae plants. This research has been conducted by collecting data by distributing questionnaires, semi-structured interviews and free in-depth (open ended) in various age groups. The results showed 2 types of Arecaceae plants that are utilized by the community as cultural ceremonial tools, these types are: bak U (Cocos nucifera) and bak Pineng (Areca catechu).

Keywords: Arecaceae, Aceh People, Traditional Cultural Plants

Journal Homepage <a href="https://journal.ypidathu.or.id/index.php/ijnis">https://journal.ypidathu.or.id/index.php/ijnis</a>

This is an open access article under the CC BY SA license

https://creativecommons.org/licenses/by-sa/4.0/

How to cite: Roswita, C., Hanum, E., Tutiliana, Tutiliana., Hasanah, Z & Aldyza, N. (2024). Arecaceae

Plants (Palms) Used for Cultural Ceremonies in Acehnese Communities in Gandapura District, Bireuen Regency. *Research of Scientia Naturalis*, 1(1), 13-20.

https://doi.org/10.55849/scientia.v1i1.172

Published by: Yayasan Pedidikan Islam Daarut Thufulah

# INTRODUCTION

Culture becomes a human blueprint, and becomes a very important aspect for humans in interacting reciprocally with their environment in order to sustain their lives in a sustainable manner (Adamy & Rani, 2022). The results of research by Winda, et al, (2015), the Saham Village community is a community that still upholds the value of customs, therefore every year the Saham Village community always holds traditional ceremonies (Barrett dkk., 2019). Traditional knowledge and local wisdom related to the

utilization of forest natural resources are developing as multi-disciplines in the study of ethnobiology, ethnoecology, ethnoforestry, to ethnotechnoconservation (Wilmot dkk., 2022). In this context, ethnotechnoconservation is part of ethnobotany in the perspective of a multidisciplinary study that connects the relationship between plants and local communities (ecology-culture) with traditional knowledge about sustainable use of forest natural resources through adaptive traditional technology practices (Kasneci dkk., 2023). Forestry that focuses on forest-ecology on a broad scale regarding natural resource management is commonplace (Kooli, 2023). Plants have various benefits in human life, including being used in ritual, customary and religious activities ("ChatGPT," 2023). Local wisdom is all forms of knowledge, beliefs, understanding, or insight as well as customs or ethics that guide human behavior in life in ecological communities (Van Huis, 2021). Forms of local wisdom in society can be in the form of (Patel & Lam, 2023): values, norms, ethics, beliefs, customs, customary laws, and special rules (Sugita dkk., 2021). In Bedugul Bali in general there are 101 species of plants used in Balinese Hindu religious rituals (Baihaqi dkk., 2023). The data shows that the Hindu-Balinese community uses these plants based on the community's belief in certain plants used in the implementation of religious rituals carried out for generations (Dewi dkk., 2022). The utilization of plant species in traditional ceremonies gives a mandate or message of responsibility for the preservation of plants so that the implementation of traditional ceremonies can continue (Ebimgbo dkk., 2019). The livelihoods of the Acehnese people in Gandapura Subdistrict are generally farmers and only a small number have livelihoods as private laborers, civil servants, home industries, and traders, this is because farming and fishing are the main activities to meet their needs and have become a culture that is difficult to leave (Qiao dkk., 2019). In accordance with the state of the ecosystem (Ramadhan dkk., 2024), in Gandapura Subdistrict the suitable commodities are palm plants (Arecaceae) and fishing, because it is located in the coastal area which has high economic value and as a major source of income (Chun dkk., 2020). The utilization of plants in the Acehnese community is very much like in every traditional ceremony (Nikat dkk., 2019), both marriage ceremonies, and circumcision of the apostle and others concerned in customary affairs (Cai dkk., 2021). Acehnese people use plants from Arecaceae such as young coconut leaves used in the manufacture of janur which serves to mark the place of the party placed on the side of the road, then used for making ketupat on Lebaran day (Boughton, 2021), also coconuts that have grown as the groom's luggage that is handed over to the bride, also on the event of forty-four days the baby goes down the ground coconut fruit is split over the baby and bathed in coconut water (Wang dkk., 2019). As well as betel nut for weeding (Cardoso Dos Santos dkk., 2020), the Acehnese community is synonymous with tapak sirih or cerana, in ancient times every Acehnese house must have tapak sirih because chewing betel leaves using areca nut is a habit that has been traditional since long ago, betel nut is also used in traditional ceremonies and to welcome guests (Dewi dkk., 2022). On the island of Raijua, lontar trees (Borassus flabellifer L) in the culture of the Raijua island community are cutting, cutting and tapping and weaving in everyday life and in traditional ceremonies (Ahmad dkk., 2019). The Tajo

tribe of Kasimbar Village (Azzam & Kildishev, 2021), Parigi Moutong Regency is a tribe that uses plants in traditional cultural events, at the Mombare Jalang (open the road) sago (Oryza sativa var. glutinosa) event Areca nut (Areca catechu), as the contents of a tray (small tray) used at the Pongeme (Malam pacar) and coconut (Cocos nucifera), one of the materials that are wrapped around the lanjana, (a small gate whose main material is made of yellow bamboo) and also the seat of the bride and groom when bathed, and the sprouted coconut is tied to the center pole of the house which is the king's pole (Yuziani dkk., 2023). Sago fronds are planted in the middle of the rice field when going down the rice field, coconut shells where to put the baby's placenta so that it is neatly stored, at the haircutting ceremony (Egirani dkk., 2021), a young coconut that has been hollowed out and filled with baby hair and tied with rattan then hung above the house so that later the child has high ideals (Arrazola dkk., 2021). Brown sugar made from aren palm (Arenga pinata) and areca nut (Areca catechu) is used in the Patama' or Khatam Al-Qur'an event.

#### RESEARCH METHODOLOGY

### **Area Description**

This study took 4 villages as research locations, namely West Lapang, Cot Rambat, Pante Sikumbong and Ujong Bayu (Jaja dkk., 2020). The flora of plants in Gandapura Sub-district can be divided into three parts, namely plants cultivated by the population, plants living in the forest and plants purchased from other places (Ababor dkk., 1970). Cultivated plants include rice, mango, rambutan long beans, coconut, areca nut, palm oil, and so on. In the forest area there are various types of plants such as Merante wood (Lo, 2023), Southwest, Jeumpa, Sentang, Durian, Sangen, Semarang, Jati, Damasui, and others (Petit dkk., 2020). Meanwhile, plants bought in the market are ornamental plants such as orchids, frangipani, and various types of palms (Lee, 2023). The natural fauna in Gandapura Subdistrict is quite diverse, with animals that are farmed by residents including cattle, goats or sheep, buffalo, and poultry.

Gandapura sub-district is bordered by:

- > North bordering the Malacca Strait.
- > The South is bordered by Makmur Sub-district.
- > The south is bordered by North Aceh Regency.
- > The West is bordered by Kuta Blang District (Badan Pusat Statistic Kabupaten Bireuen., 2023).

#### Research location

The research site is located in Gandapura District, Bireuen Regency, Aceh Province, which consists of the villages of Lapang Barat, Cot Rambat, Pante Sikumbong and Ujong Bayu.

#### **Tools and Materials**

The tools and materials used in the study include a map of the research location, questionnaire list, literature, as supporting material for literature, sound recording equipment, stationery and field books, camera

# **Population and Sample**

### **Population**

The population in this study are people who live in four villages in Gandapura subdistrict, namely West Lapang village with a population of 741 people, Cot Rambat village with a population of 182 people, Pante Sikumbong village with a population of 295 people, and Ujong Bayu village with a population of 329 people. These four villages were selected based on the following criteria:

- The population is still indigenous.
- The population still upholds their customs.
- Living close to forests and beaches.

### Sample

The sampling method was carried out using purposeve sampling method, namely the population has homogeneous and stratified elements/members, namely samples taken based on age groups, namely young adults (aged 20-35), medium adults (aged 36-50), and parents (>50). The sampling criteria based on the selected age grouping are: Young adult age group (20-35) years, namely they are already active in working to earn income, generally they do not have a fixed residence. The medium adult age group (36-50) years old, which is generally married and has a fixed residence. The elderly age group (>50) years old are generally considered village leaders and have a great influence in the village. Samples were taken based on sampling intensity of 10% - 20% of the population of each village.

## **Research Implementation**

In the field

During the collection of Arecaceae plant specimens, the researcher was assisted by someone who had knowledge about the utilization of these plants. Then observations were made and collected. Each Arecaceae plant specimen that has not been known by its scientific name was taken and given a hanging label that has been given a collection number and recorded the name of the area and then described.

#### RESULT AND DISCUSSION

Arecaceae plants for traditional ceremonies and culture of the Acehnese people living in Gandapura District. In traditional ceremonies plants are an inseparable part, because plants are a requirement in a traditional ceremony, this is related to the belief of the community to give blessings to everything that is done, this is also related to the community's belief in their ancestors and ancestors, in every traditional ceremony in every community always provided tepak betel to give honor to invited guests who attend the event tepak betel is also used in the engagement ceremony, until the marriage ceremony, the contents of tepak betel are betel leaves, areca nut, lime, gambier, cloves. At the marriage ceremony, old coconuts that have been peeled off the outer skin only, (U Lason) as the groom's luggage to the bride's house are filled in a basket of fresh fruits, and U Timoh, namely coconuts that have sprouted (usually 2 sheets) as a symbol that today is the starting point of building a family ark and is expected to grow like the growth of a coconut

tree where every part has benefits and nothing is in vain, while janur is installed at the gate of the party house to give a sign to the invitees who attend. According to (Sada and Jumari, 2018), there are seven types of plants of the Arecaceae family that are used as complementary materials for traditional ceremonies including areca nut or 'seu' (Areca catechu L.) used as offerings for ancestors which are usually served together with betel nut or 'nata' (Piper betle L; Piperaceae). Apart from being an offering, betel nut and areca nut are the ingredients of the banquet for ceremony participants and are usually served at the beginning of the ceremony as a form of respect for guests, a symbol of kinship and brotherhood. Betel nut equipment (ngeu) such as betel nut, areca nut (young areca nut and dried areca nut) and lime are usually always available during traditional activities. The nira water tapped from the palm trees or 'moke' (Arenga pinnata) is used as a traditional drink called moke or tua bhara. Generally, in the lives of the Ngadha people, the palm juice used in traditional ceremonies is fermented to produce a low alcohol content.

According to research (Ramadhani et al, 2012) Coconut (Cocos nucifera) used in traditional wedding ceremonies has the hope that the bride and groom can live like a coconut tree (Cocos nucifera) which has many functions and is willing to work hard. While in other areas the use of coconut (Cocos nucifera) in traditional weddings has a meaning as gratitude for the abundance of sustenance in organizing celebrations for their children. And also areca nut (Areca catechu), which is a series of sacred events carried out by the community to maintain social relations between each other.



Figure 1. a. U Timoh, b. Tapak sirih. c. Janur

Arecaceae plants used in traditional ceremonies in the Acehnese community in Gandapura District can be seen in the following table:

Table 1. Plant materials for traditional ceremonies in Gandapura Subdistrict:

No	Scientific Name	Regional Name	Parts Used	Usability
1	Areca catechu	Bak pineng	Fruit	Tepak sirih.
2	Cocos nucifera	Bak <u>U</u>	Fruit, leaf	U lason, U timoh, janur

Plants for traditional ceremonies are Areca catechu and Cocos nucifera. The parts of the palm that are utilized are fruit and leaves. The fruit (Ulason and U timoh) is used in the marriage ceremony as the lintobaro (groom) luggage to the darabaro (bride) house, the leaves are for making janur. According to Mutaqin's research, (2018), in Pangandaran

Village, Pangandaran District, Pangandaran Regency, plants used in traditional ceremonies such as: the traditional ceremony of hajat laut coconut (Cocos nucifera L.) is used as an offering, at the hajat bumi coconut event as a symbol of sharing, green coconut, at the seven monthly traditional event, the image of Arjuna and Srikandi in young coconuts with the hope that one day the child will have a face, beautiful nature, and handsome like Arjuna and Srikandi. The Saluan tribe utilizes Arecaceae species for traditional ceremonies, namely Areca catechu L, as materials carried by the male party as a request from the female party at the proposal ceremony, sprouting coconuts in the traditional ceremony of building a house/building. Coconut shells in traditional birth ceremonies are used to store the placenta neatly and safely because for the Saluan people, the placenta is the twin brother of the baby who has become his life companion while in the womb. The swing used is still made from natural materials, namely rattan (Calamus inops Becc.) and areca flowers or in the Saluan language "mayang nu popos" (Areca catechu L.). at the haircutting event a young coconut (Cocos nucifera L.) for the place where the baby's hair is inserted, coconut fruit containing baby hair is tied with rattan, so that the child has high ideals. (Purwanti, et al, 2017). The tajio tribe in kasimbar village, parigi mouton regency in the marriage ceremony, baby birth, baby hair cutting ceremony, they use coconut as a cultural custom and Mombare jalang (open the road) is a custom of opening the road where the male party visits the female party's house to discuss the proposal process by bringing food ingredients including cocos nucifera (Rahyuni, et al, Traditional tribal ceremonies in Aceh province consist of birth ceremonies (bringing rice, giving names, descending the land), marriage (proposals, fiancées, wedding receptions), death and several other traditional ceremonies such as circumcision, inauguration of a new house, kenduri blang, peusijuk padee bijeh, kenduri jeurat, Hajj kenduri, Plants used in traditional ceremonies of Aceh tribes are about 28 types of plants. Community knowledge about the use of plants in traditional ceremonies is very good, both in terms of the symbolic meaning contained therein, the parts of the plant that will be used up to the processing of these plants (Rahimah et al, 2018). People in Menanggini Village, Aceh Tamiang Regency use certain plant parts to be used in the wedding ceremony procession Coconut (Cocos nucifera) is used in the traditional wedding ceremony with the meaning of having hope that the bride and groom can live like a coconut tree (Cocos nucifera) which has many benefits and is willing to work hard. (Ramadhani et al, 2021).

# **REFERENCES**

Ababor, S., Birhanu, Z., Defar, A., Amenu, K., Dibaba, A., Araraso, D., Gebreyohanes, Y., & Hadis, M. (1970). Socio-cultural Beliefs and Practices Influencing Institutional Delivery Service Utilization in Three Communities of Ethiopia: A Qualitative Study. *Ethiopian Journal of Health Sciences*, 29(3). https://doi.org/10.4314/ejhs.v29i3.6

Adamy, A., & Rani, H. A. (2022). An evaluation of community satisfaction with the government's COVID-19 pandemic response in Aceh, Indonesia. *International Journal of Disaster Risk Reduction*, 69, 102723. <a href="https://doi.org/10.1016/j.ijdrr.2021.102723">https://doi.org/10.1016/j.ijdrr.2021.102723</a>

- Ahmad, T., Bustam, M. A., Irfan, M., Moniruzzaman, M., Asghar, H. M. A., & Bhattacharjee, S. (2019). Mechanistic investigation of phytochemicals involved in green synthesis of gold nanoparticles using aqueous *Elaeis guineensis* leaves extract: Role of phenolic compounds and flavonoids. *Biotechnology and Applied Biochemistry*, 66(4), 698–708. <a href="https://doi.org/10.1002/bab.1787">https://doi.org/10.1002/bab.1787</a>
- Aljanabi, M. (2023). ChatGPT: Future directions and open possibilities. Dalam *Mesopotamian Journal of ....* journals.mesopotamian.press. https://journals.mesopotamian.press/index.php/CyberSecurity/article/download/33/51
- Arrazola, J. M., Bergholm, V., Brádler, K., Bromley, T. R., Collins, M. J., Dhand, I., Fumagalli, A., Gerrits, T., Goussev, A., Helt, L. G., Hundal, J., Isacsson, T., Israel, R. B., Izaac, J., Jahangiri, S., Janik, R., Killoran, N., Kumar, S. P., Lavoie, J., ... Zhang, Y. (2021). Quantum circuits with many photons on a programmable nanophotonic chip. *Nature*, *591*(7848), 54–60. <a href="https://doi.org/10.1038/s41586-021-03202-1">https://doi.org/10.1038/s41586-021-03202-1</a>
- Axelrod, R. (2021). Preventing extreme polarization of political attitudes. *Proceedings of the National Academy of Sciences of the United States of America*, 118(50). https://doi.org/10.1073/pnas.2102139118
- Azzam, S. I., & Kildishev, A. V. (2021). Photonic Bound States in the Continuum: From Basics to Applications. *Advanced Optical Materials*, 9(1), 2001469. <a href="https://doi.org/10.1002/adom.202001469">https://doi.org/10.1002/adom.202001469</a>
- Baihaqi, A., Romano, R., Hamid, A. H., Indra, I., Kasimin, S., Ulya, Z., Bakar, B. A., Aziz, A., Idawanni, I., & Wahyuni, I. (2023). Coconut farming development strategy in Bireuen Regency using hierarchy process analysis. *IOP Conference Series: Earth and Environmental Science*, 1183(1), 012026. https://doi.org/10.1088/1755-1315/1183/1/012026
- Barrett, C. F., McKain, M. R., Sinn, B. T., Ge, X.-J., Zhang, Y., Antonelli, A., & Bacon, C. D. (2019). Ancient Polyploidy and Genome Evolution in Palms. *Genome Biology and Evolution*, 11(5), 1501–1511. https://doi.org/10.1093/gbe/evz092
- Cai, Z., Li, Z., Ravaine, S., He, M., Song, Y., Yin, Y., Zheng, H., Teng, J., & Zhang, A. (2021). From colloidal particles to photonic crystals: Advances in self-assembly and their emerging applications. *Chemical Society Reviews*, 50(10), 5898–5951. https://doi.org/10.1039/D0CS00706D
- Cardoso Dos Santos, M., Algar, W. R., Medintz, I. L., & Hildebrandt, N. (2020). Quantum dots for Förster Resonance Energy Transfer (FRET). *TrAC Trends in Analytical Chemistry*, 125, 115819. <a href="https://doi.org/10.1016/j.trac.2020.115819">https://doi.org/10.1016/j.trac.2020.115819</a>
- Chun, K. S., Yeng, C. M., May, C. P., Yeow, T. K., Kiat, O. T., & How, C. K. (2020). Effect of coupling agent content on properties of composites made from polylactic acid and chrysanthemum waste. *Journal of Vinyl and Additive Technology*, 26(1), 10–16. https://doi.org/10.1002/vnl.21710
- Dewi, C., Nichols, J., Izziah, I., & Meutia, E. (2022). Conserving the other's heritage within Islamic society. *International Journal of Heritage Studies*, 28(4), 444–459. https://doi.org/10.1080/13527258.2021.2010233
- Dubin, J. A., Bains, S. S., Chen, Z., Hameed, D., Nace, J., & ... (2023). Using a Google web search analysis to assess the utility of ChatGPT in total joint arthroplasty. *The Journal of ....* <a href="https://www.sciencedirect.com/science/article/pii/S0883540323003522">https://www.sciencedirect.com/science/article/pii/S0883540323003522</a>

- Ebimgbo, S. O., Obi-Keguna, C. N., Chukwu, N. E., Onalu, C. E., Abonyi, S. E., & Okoye, U. O. (2019). Culture-based Social support to Older Adults in Nnewi, South-East Nigeria. *African Population Studies*, 33(2). https://doi.org/10.11564/33-2-1402
- Jaja, I. F., Anyanwu, M. U., & Iwu Jaja, C.-J. (2020). Social distancing: How religion, culture and burial ceremony undermine the effort to curb COVID-19 in South Africa. *Emerging Microbes & Infections*, 9(1), 1077–1079. https://doi.org/10.1080/22221751.2020.1769501
- Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., ... Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, 102274. https://doi.org/10.1016/j.lindif.2023.102274
- Khan, R. A., Jawaid, M., Khan, A. R., & ... (2023). ChatGPT-Reshaping medical education and clinical management. Dalam *Pakistan Journal of ...*. ncbi.nlm.nih.gov. <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10025693/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10025693/</a>
- Kooli, C. (2023). Chatbots in Education and Research: A Critical Examination of Ethical Implications and Solutions. *Sustainability*, *15*(7), 5614. https://doi.org/10.3390/su15075614
- Korzynski, P., Mazurek, G., Altmann, A., Ejdys, J., & ... (2023). Generative artificial intelligence as a new context for management theories: Analysis of ChatGPT. Dalam ... *Management Journal*. emerald.com. <a href="https://doi.org/10.1108/CEMJ-02-2023-0091">https://doi.org/10.1108/CEMJ-02-2023-0091</a>
- Lee, H. (2023). The rise of CHATGPT: Exploring its potential in medical education. *Anatomical Sciences Education*, ase.2270. <a href="https://doi.org/10.1002/ase.2270">https://doi.org/10.1002/ase.2270</a>
- Lo, C. K. (2023). What Is the Impact of ChatGPT on Education? A Rapid Review of the Literature. *Education Sciences*, 13(4), 410. https://doi.org/10.3390/educsci13040410
- Nikat, R. F., Munfarikha, N., Henukh, A., & Samritin. (2019). Implementation e-learning as a formative assessment to explore mastery concept's student on magnetic field material. *IOP Conference Series: Earth and Environmental Science*, 343(1), 012214. https://doi.org/10.1088/1755-1315/343/1/012214
- Petit, L., Eenink, H. G. J., Russ, M., Lawrie, W. I. L., Hendrickx, N. W., Philips, S. G. J., Clarke, J. S., Vandersypen, L. M. K., & Veldhorst, M. (2020). Universal quantum logic in hot silicon qubits. *Nature*, 580(7803), 355–359. <a href="https://doi.org/10.1038/s41586-020-2170-7">https://doi.org/10.1038/s41586-020-2170-7</a>
- Qiao, J., Zhou, G., Zhou, Y., Zhang, Q., & Xia, Z. (2019). Divalent europium-doped near-infrared-emitting phosphor for light-emitting diodes. *Nature Communications*, 10(1), 5267. <a href="https://doi.org/10.1038/s41467-019-13293-0">https://doi.org/10.1038/s41467-019-13293-0</a>
- Ramadhan, G. A., Azzam, A. B., Mahendra, T. T., Zainal, M., Nanda, M., Asyqari, A., & Ismail, N. (2024). *Identification of the distribution of archaeological artifacts in the area of wastewater treatment installation in the city of Banda Aceh using magnetic methods*. 040022. https://doi.org/10.1063/5.0202411
- Sugita, A., Ling, L., Tsuji, T., Kondo, K., & Kawachi, I. (2021). Cultural Engagement and Incidence of Cognitive Impairment: A 6-year Longitudinal Follow-up of the Japan Gerontological Evaluation Study (JAGES). *Journal of Epidemiology*, *31*(10), 545–553. <a href="https://doi.org/10.2188/jea.JE20190337">https://doi.org/10.2188/jea.JE20190337</a>

- Van Huis, A. (2021). Cultural Significance of Beetles in Sub-Saharan Africa. *Insects*, 12(4), 368. https://doi.org/10.3390/insects12040368
- Wang, Y., Htwe, Y. M., Li, J., Shi, P., Zhang, D., Zhao, Z., & Ihase, L. O. (2019). Integrative omics analysis on phytohormones involved in oil palm seed germination. BMC Plant Biology, 19(1), 363. https://doi.org/10.1186/s12870-019-1970-0
- Wilmot, E., Wong, J., Tsang, Y., Lynch, A. J., Infante, D., Oleson, K., Strauch, A., & Clilverd, H. (2022). Characterizing mauka-to-makai connections for aquatic ecosystem conservation on Maui, Hawai'i. Ecological Informatics, 70, 101704. https://doi.org/10.1016/j.ecoinf.2022.101704
- Yuziani, Rizka Sofia, & Harvina Sawitri. (2023). Prediction of hypertension risk as an occupational health disease in palm oil factory workers at Gandapura District, Bireuen Regency, Aceh, Indonesia. Bali Medical Journal, 12(1), 490-494. https://doi.org/10.15562/bmj.v12i1.4019
- Zou, Y., Ge, X., Guo, S., Zhou, Y., Wang, T., & Zong, S. (2020). Impacts of climate change and host plant availability on the global distribution of Brontispa longissima (Coleoptera: Chrysomelidae). Pest Management Science, 76(1), 244-256. <a href="https://doi.org/10.1002/ps.5503">https://doi.org/10.1002/ps.5503</a>

### Copyright Holder:

© Cut Roswita et al. (2024).

#### **First Publication Right:**

© Research of Scientia Naturalis

This article is under:

