



The Potency of Akar Laka Plant (*Dalbergia parviflora* Roxb) In The Pasie Raya Forest Area, Aceh Jaya District

Mirna Tiadi Kombih¹, Triaty Handayani¹, Essy Harnelly^{1,2*}

¹Program Studi Kehutanan, Fakultas Pertanian, Universitas Syiah Kuala

²Departemen Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Syiah Kuala

INFO ARTIKEL

Diterima
Disetujui

* Penulis koresponden
email: essy.harnelly@usk.ac.id

Kata kunci:	Keywords:
Sebaran Spasial	Spatial
HHBK	Distribution
Tumbuhan Akar Laka	NTFPS
Masyarakat	Akar Laka
Kuantitas.	Plant

ABSTRAK

Tumbuhan akar laka merupakan salah satu hasil hutan bukan kayu (HHBK) yang memiliki Prospek yang menjanjikan dalam perdagangan. Bagi sebagian masyarakat etnis tertentu, akar dari tumbuhan akar laka yang sudah diolah menjadi serpihan dijadikan dupa yang digunakan untuk peribadahan agama tertentu. Tumbuhan akar laka merupakan salah satu jenis liana yaitu tumbuhan merambat yang menumpang pada tumbuhan lain hingga mencapai tajuk pohon dengan ketinggian tertentu. Tujuan dari penelitian ini adalah untuk mengetahui sebaran spasial tumbuhan akar laka yang ada di kawasan hutan Pasie Raya Desa Tuwi Peuriya Kecamatan Pasie Raya Kabupaten Aceh Jaya dan untuk mengetahui kuantitas tumbuhan akar laka yang terdapat di Kawasan hutan Pasie Raya Desa Tuwi Peuriya Kecamatan Pasie Raya Kabupaten Aceh. Metode yang digunakan dalam penelitian ini adalah survei eksploratif. Pengambilan sampel tumbuhan akar laka menggunakan plot berukuran 10 m x 10 m untuk tingkat dewasa dan 5 m x 5 m untuk tingkat anakan. Penentuan titik plot menggunakan metode purposive sampling. Pengambilan data untuk sebaran spasial tumbuhan akar laka menggunakan dengan GPS, setelah titik koordinat didapatkan akan diolah menggunakan software ArcGis 10.3. Hasil dari penelitian ini tumbuhan akar laka yang ditemukan pada tingkat dewasa 192 individu dan pada tingkat anakan 70 individu. Tumbuhan akar laka yang ada di Kawasan hutan Pasie Raya Desa Tuwi Peuriya tersebar dengan merata di setiap plot. Masyarakat sekitar hutan pasie raya memanfaatkan akar dari tumbuhan akar laka untuk menambah perekonomian masyarakat, pengambilan akar dari tumbuhan akar laka yang dilakukan masyarakat biasanya secara kelompok yang terdiri dari 2-5 orang masyarakat sekitar biasanya mendapatkan hasil panen 10-15 kg.

ABSTRACT

Akar laka plant is one of the non-timber forest products (NTFPs) that has promising prospects in trade. For some ethnic communities, the roots of akar laka plants that have been processed into flakes are used as incense used for certain religious worship. Akar laka plant is one type of liana, which is a vine that supports other plants until it reaches the crown of a tree of a certain height akar laka plants also contain resin, a sticky red oil obtained from distilling the roots of akar laka plants. The purpose of this study was to determine the spatial distribution of akar laka plants in the Pasie Raya forest area, Tuwi Peuriya Village, Pasie Raya District, Aceh Jaya Regency and to determine the quantity of akar laka plants found in the Pasie Raya forest area, Tuwi Peuriya Village, Pasie Raya District, Aceh Jaya Regency. The method used in this research is descriptive survey. Akar laka plant sampling uses a plot measuring 10 m x 10 m for adult levels and 5 m x 5 m for sapling levels to determine plot points using a purposive sampling method. Data collection for the spatial distribution of akar laka plants uses GPS, after the coordinates are obtained, they will be processed using ArcGis 10.3 software. The results of this study found akar laka plants at the adult level 192 individuals and at the sapling level 70 individuals. Akar laka plants in the Pasie Raya forest area of Tuwi Peuriya Village are evenly distributed in each plot. The community around the Pasie Raya forest utilizes the roots of the akar laka plant to increase the community's economy, taking roots from akar laka plants carried out by the community usually in groups consisting of 2-5 people, the surrounding community usually gets 10-15 kg of harvest.

1. INTRODUCTION

Forest is an ecosystem consisting of a large area rich in living natural resources, mainly dominated by trees, in its natural environment, where the elements are interrelated and inseparable (based on Law No. 41 of 1999). Forests are also known as areas that provide habitat for various types of wild flora and fauna (Fitriana, 2008). Forests provide natural resources that contribute to human welfare, both directly and indirectly. According to the provisions of Law No. 41 of 1999, communities are allowed to utilize forest resources and products. Non-timber forest resources (NTFPs) are one of the abundant natural resources in Indonesia and have a higher economic value compared to other timber (Tarigan, 2009). One of the NTFPs in Indonesia is the akar laka plant.

Akar laka plants are one of the non-timber forest products or NTFPs that have promising prospects in trade. Economically, akar laka plants can help the community's economy, for example, akar lakas are harvested and sold. Various kinds of processed akar lakas are made into bracelets, necklaces and prayer beads. For some ethnic communities, the roots of the akar laka plant in the form of flakes are used as incense used for certain religious worship. The roots of the akar laka plant are also believed to have certain properties for people who understand them (KLHK, 2021).

Akar laka plant is one of the varieties of vines, which are characteristic of tropical rainforest ecosystems and play a role in increasing the diversity of plant species in them. These vines grow leaning on other plants until they reach the crown of a tree of a certain height. Examples of vines include betel, rattan, grapes, pumpkins, and including the akar laka plant (Simamora and Bintaro, 2015). The akar laka plant also contains resin, which is a sticky red oil obtained by distilling the roots of the akar laka plant. In the process of distilling the roots of the akar laka plant that have been chopped into small pieces and mixed with water to boil until it evaporates. Red oil from akar laka plants is usually used to treat wounds.

Lianas are also a source of animal food and a support tool for crossing trees for certain animals (Setia, 2009). Lianas also have a negative role or disadvantage for their host trees, such as damage to the bark of the tree trunk due to climbing or propagation marks from lianas (Asrianny and Okta, 2008). Indriyanto (2008) states that lianas are plants that have roots that stick to the ground, but their stems and leaves creep on other plants to reach sunlight sources. The same thing happens with akar lakas that creep and wrap around other plants to grow and get sun exposure.

Akar laka plant is one type of liana that has a sharply spiny stem with rough skin that is slightly peeled off, the core of the akar laka stem is bright red to dark red and the edges of the akar laka stem are slightly yellowish white. Alternate leaves with a length of 15-20 cm compound akar laka leaf width of 5-6 cm oval leaf shape with a smooth leaf surface, white akar laka flowers with compound flower arrangements and many branching bell-shaped petals with 5 headers 10 stamens, and a flat-shaped akar laka fruit shape containing seeds (Pratama et al, 2022).

Aceh Jaya Regency, one of the regencies located in Aceh Province, was established based on Law Number 4 of 2002. The area of Aceh Jaya Regency reaches 3,814.00 km², with geographical coordinates between 04.22' to 5.16' North latitude and 95.02' to 96.03' East longitude. The Aceh Jaya region is located along the West Coast and mainland of Sumatra, stretching from West to East from the foot of Mount Geruete (Jaya District) to Krueng Paleng (Pasio Raya

District), with a coastline length of approximately 135 km. Administratively, Aceh Jaya District is bordered by Pidie and Aceh Besar Districts to the North, West Aceh District and the Indonesian Ocean to the South, the Indonesian Ocean to the West, and West Aceh District to the East.

Pasio Raya is one of the sub-districts in Aceh Jaya Regency, Aceh Province, which has forests and several large rivers that are widely utilized by the community (Calang Sharia Court, 2022). Based on information from Mr. Junaidi (63 years old), the Tuwi Peuriya community that there are akar laka plants found in several places in Aceh Jaya Regency, one of which is in Pasio Raya District, precisely in Tuwi Peuriya Village. Akar laka plants are widely used by foreigners as decoration, incense and many other preparations, but many of the Pasio Raya and surrounding communities do not know the benefits of akar laka plants and so far there has been no documentation and scientific publications about the benefits of akar laka plants and the spatial distribution of akar laka plants in the Pasio Raya forest area. Thus it is necessary to conduct research on the spatial distribution of akar laka plants in the Pasio Raya forest area.

2. RESEARCH METHODS

Research Location and Timing

This research was conducted in the Pasio Raya forest area, Tuwi Peuriya Village, Pasio Raya District, Aceh Jaya Regency, Aceh Province. This research was conducted from March to December 2023.

Research Tools and Objects

The tools and materials used in this research are ArcGis 10.3, meter, camera, stationery, knife, machete, scissors, wooden pegs, raffia, newsprint, 70% alcohol, double tip, HVS paper, newsprint, tallysheet and sasak/press.

Research Procedure

This research uses a descriptive survey method. This method is an approach that focuses on group systems, objects, conditions, thoughts, and current events and conducts direct surveys at the research site (Nazir, 2003). Akar laka sampling using purposive sampling method. The forest area in Tuwi Peuriya Village is 500 ha, and the sampling of this study is 0.25 ha with a sampling intensity of 0.05% of the sample area. The plot size used was 10m x 10m for adults and 5m x 5m for saplings. The forest in Tuwi Peuriya Village has an area of 500 hectares, while the sample plot area used in this study is 0.01 hectares. Therefore, the number of plots used in this study was 25. The plot design for this study can be found in Figure 1.

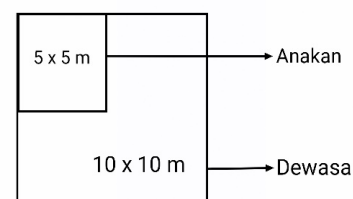


Figure 1. Plot design

The criteria for akar laka plants that will be taken according to their level are at the sapling level of akar laka plants that are still small or that have not propagated on the host tree while for the adult level are akar laka plants that have propagated on the host tree. Data collection of akar laka

distribution is carried out using GPS. Where in each plot the coordinate points will be taken using GPS, after the coordinate points are obtained then the coordinate point data will be processed using ArcGis 10.3 software. Figure 5 shows the plot points where akar laka plants were found in the Pasie Raya forest area, Aceh Jaya Regency.

Data Analysis of Spatial Distribution

Spatial distribution data analysis was conducted to determine the distribution of akar laka plants found in the research location plot. Analysis of akar laka plant distribution data was carried out using ArcGis 10.3 software, with the UTM (Universal Tranpel Marcator) coordinate system in zone 47.N. The process of making a distribution map can be seen in Figure 2.

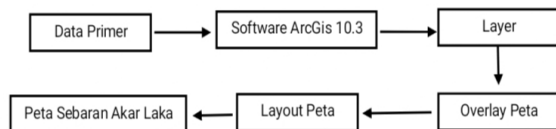


Figure 2. Process of creating a distribution map

3. RESULTS AND DISCUSSION

Spatial Distribution of Root Causes

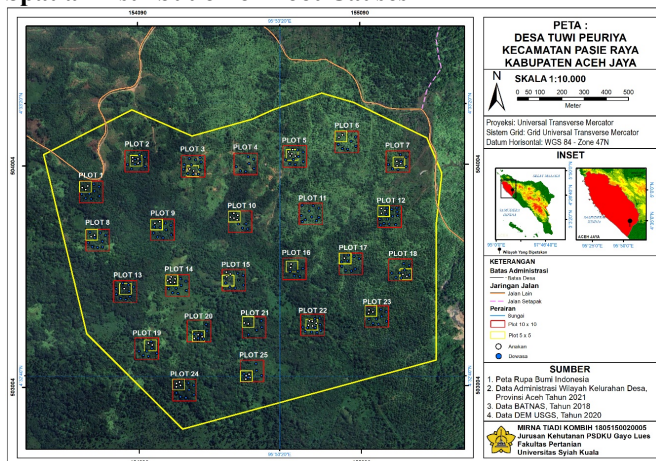


Figure 3. Spatial distribution map of the root causes of injury

Based on Figure 3 of the mapping results, it is known that the distribution of akar laka in Tuwi Peuriya Village has 25 plots with a total of 262 individual akar laka. Of the total number of individuals, there are 70 saplings and 192 adults. This shows that the distribution of akar laka at the adult level is evenly distributed. Whereas at the sapling level the roots are still unevenly distributed because the saplings do not get enough sunlight. Sunlight is very influential on the growth and reproduction of each plant.

The number of akar lakas found in each plot varies, some are many and some are few, this is because not all plots get the same sunlight intensity due to the different points and locations of the plots. Based on research by Laurence et al. (2001), forests that have experienced disturbances due to a decrease in the level of canopy closure tend to provide better opportunities for liana growth compared to forests that are still maintained due to the lack of canopy closure in the area. Meanwhile, according to Barbour and Burk (1987), the number of akar laka plants found in each plot is different due to the availability of host trees that are less supportive of liana growth for their continued growth.

Ecologically, plants from the Fabaceae family are known for their ability as nitrogen fixators, which can capture nitrogen directly from the air without going through the soil by forming symbiosis with certain bacteria on their roots and stems. Akar laka plants from the family are also known to improve soil fertility, especially when living along riverbanks, where they can maintain river quality, prevent riverbank erosion, improve landscape stability, and can even be used as natural fences (Tika, 2023).

Quantity of Akar Laka Plant

Based on the results of research in the field, the number of akar laka plants found at the sapling and adult levels was 262 individuals.

Table 1. Number of akar laka plants at sapling level

No Plot	Anakan	K	KR	F	FR
1	3	0,12	4,29	0,12	4,29
2	4	0,16	5,71	0,16	5,71
3	2	0,08	2,86	0,08	2,86
4					
5	5	0,2	7,14	0,2	7,14
6	2	0,08	2,86	0,08	2,86
7	3	0,12	4,29	0,12	4,29
8	2	0,08	2,86	0,08	2,86
9	2	0,08	2,86	0,08	2,86
10	5	0,2	7,14	0,2	7,14
11					
12	3	0,12	4,29	0,12	4,29
13	1	0,04	1,43	0,04	1,43
14	6	0,24	8,57	0,24	8,57
15	3	0,12	4,29	0,12	4,29
16	2	0,08	2,86	0,08	2,86
17	1	0,04	1,43	0,04	1,43
18	2	0,08	2,86	0,08	2,86
19	2	0,08	2,86	0,08	2,86
20	4	0,16	5,71	0,16	5,71
21	2	0,08	2,86	0,08	2,86
22	5	0,2	7,14	0,2	7,14
23	3	0,12	4,29	0,12	4,29
24	4	0,16	5,71	0,16	5,71
25	4	0,16	5,71	0,16	5,71
Total	70	2,8	100	2,8	100

In table 1, there are 70 individuals of akar laka plants at the sapling level, the most akar laka plants at the sapling level are found in plot 14 with a total of 6 individuals of akar laka plants with a density of 0.24% and a frequency of 0.24%. And the least akar laka plants were found in plots 13 and 17 with a total of 1 individual akar laka plant with a density of 0.04% and a frequency of 0.04%, while in plots 4 and 11 no akar laka plants were found. This is because the condition of the plot place is often passed by people for activities around the forest.



Figure 4. Saplings of akar laka plant

Table 2. Number of akar laka plants at mature level

PLOT	Dewasa	K	KR	F	FR
1	8	0,08	4,17	0,32	4,17
2	8	0,08	4,17	0,32	4,17
3	11	0,11	5,73	0,44	5,73
4	7	0,07	3,65	0,28	3,65
5	8	0,08	4,17	0,32	4,17
6	6	0,06	3,13	0,24	3,13
7	7	0,07	3,65	0,28	3,65
8	9	0,09	4,69	0,36	4,69
9	9	0,09	4,69	0,36	4,69
10	4	0,04	2,08	0,16	2,08
11	10	0,1	5,21	0,4	5,21
12	12	0,12	6,25	0,48	6,25
13	9	0,09	4,69	0,36	4,69
14	8	0,08	4,17	0,32	4,17
15	7	0,07	3,65	0,28	3,65
16	5	0,05	2,60	0,2	2,60
17	9	0,09	4,69	0,36	4,69
18	8	0,08	4,17	0,32	4,17
19	7	0,07	3,65	0,28	3,65
20	6	0,06	3,13	0,24	3,13
21	4	0,04	2,08	0,16	2,08
22	10	0,1	5,21	0,4	5,21
23	8	0,08	4,17	0,32	4,17
24	7	0,07	3,65	0,28	3,65
25	5	0,05	2,60	0,2	2,60
Total	192	1,92	100	7,68	100

In Table 2, the most akar lakas were found at the adult level, namely 192 individuals. The most adult level akar laka plants were found in plot 12 with a total of 12 individual akar laka plants, with a density of 0.12% and 0.48% and the least akar laka plants were found in plots 10 and 21 with a total of 4 individual akar laka plants with a density of 0.04 and a frequency of 0.16. This is because the adult level gets a lot of sunlight compared to the sapling level akar laka which is shaded by the trees underneath which tends to be closed. According to Ghollasimood (2012), it is stated that in the early stages of liana growth or akar lakas need a lot of sunlight for germination. Steege and Cornelissen (1989) also suggest that the presence of light and water has a very important role in the growth of vines or akar lakas.

Collection of Akar Laka Plant Roots by the Community

The activity of looking for akar lakas is carried out by the community in groups and individually, generally in each group consisting of 2 to 5 people. There are two ways of harvesting akar lakas carried out by the community, the first is by harvesting akar lakas in a natural way, namely by stabbing dead akar lakas with a sharp iron in the soil of dead or finished akar lakas which will make a distinctive sound like clanking iron, then digging it up to be harvested. While the second method is an unnatural way, namely by cutting down the mature kala roots which have a red core in the middle of the akar laka stem and then planted in the ground waiting for years to get akar laka products that can be sold. Most of the communities around the research site harvest akar lakas

naturally because naturally harvested akar lakas can be sold immediately.



Figure 5. Mature akar laka

The length of time the community searches for akar lakas usually takes one day, usually the harvest obtained is around 10-15 kg per individual. In this case, the akar lakas that have been harvested by the community are sold to middlemen at various prices depending on the quality of the akar lakas obtained, usually the community sells akar lakas at Rp. 7,000/Kg for poor quality akar lakas while for good quality the price is Rp.10,000/Kg, the larger the diameter of the akar laka, the more expensive the price.

Then by the middlemen of akar lakas to entrepreneurs at a price of Rp.12,000 / Kg, then entrepreneurs sell to various countries in this case akar laka entrepreneurs in Aceh only export to China at a price of Rp.35,000 / Kg. Usually entrepreneurs export 250 tons of akar laka every 2 months. Akar lakas exported to China and Arabia are usually the results purchased by entrepreneurs from Aceh and outside Aceh.



Figure 6. Harvested Akar laka

4. CONCLUSION

The potency of Akar Laka is quite good in Aceh Jaya, especially in Pasie Raya Forest, because this species is evenly distributed in each forest area of the forest. This research also found the Akar laka plants in Tuwi Peuriya Village are one of the side livelihoods of the local community.

5. REFERENCES

- Asrianny, M., dan Oka, N. P. 2008. Keanekaragaman dan kelimpahan jenis liana (tumbuhan memanjat) pada hutan alam di hutan pendidikan Universitas Hasanuddin. *Jurnal Perennial*, 5(1), 23-30
- Barbour, M. G; J. H. Burk and W. D. Pitts. 1987. Terrestrial Plant Ecology. Inc. California: The Benjamin/cummings Publishing Company.
- Fitriana, Rina. 2008. Mengenal Hutan. Bandung : PUTRA SETIA
- Ghollasimood S. 2012. Abundance and Distribution of Climbers in a Coastal Hill Forest in Perak, Malaysia. *Journal of Agricultural Science*. Vol. 4. No. 5.
- KLHK. 2021. *Ekspor Perdana Akar Laka*. [online] Available at: https://www.menlhk.go.id/site/single_post/3547/ekspor-perdana-akar-laka [Accessed 12 okt, 2022].
- Laurence, W. F., D. Pérez-Salicrup, P. DeLamonica, P. M. Femside, S. D'Angelo, A. Jerozolinski, L. Pohl and T. E. Lovejoy. 2001. Rainforest fragmentation and the structure of Amazonian liana community. *Ecology* 82: 105- 116
- Mahkamah Syariah Calang. 2022. Wilayah Yurisdiksi – MS Calang. [online] Available at: <https://ms-calang.go.id/index.php/profil-pengadilan/wilayah-yurisdiksi> [Accessed 15 okt, 2022].
- Nazir. 2003. Metode Penelitian. Yogyakarta. Bogor. Ghalia Indonesia..
- Pratama, B. A., Mahendra, T., Ibo, L. K. 2022. STUDI Populasi Akar Laka (*Dalbergia parviflora* Roxb.) di Kota Tidore Kepulauan Provinsi Maluku Utara. *Berita biologi*, 21(3), 351-363.
- Republik Indonesia. 1999. Undang Undang Republik Indonesia Nomor 41 tahun 1999 Tentang Kehutanan.
- Republik Indonesia. 2002. Undang Undang Republik Indonesia Nomor 2002 Tentang Pembentukan Kabupaten Aceh Barat Daya, Kabupaten Gayo Lues, Kabupaten Aceh Jaya, Kabupaten Aceh Jaya, Kabupaten Nagan Raya, dan Kabupaten Aceh Tamiang, di Provinsi Nanggroe Aceh Darussalam.
- Setia , T. M. 2009. Peran Liana dalam Kehidupan Orang Hutan. *Jurnal Penelitian dan Pengembangan Hutan*. 2(1): 55-61.
- Steege Ter, H. dan Cornelissen J.H.C. 1989. Distribution and ecology of vascular epiphytes in lowland rain forest of Guyana. *Biotropica* 21: 331-339