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Diversity and Potential of Flowering Plants in Timau Mutis Nature Reserve, Oelmuke Village, East Nusa Tenggara

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Abstract

Background: The mountain ecosystem in Mutis Timau Nature Reserve, Oelmuke Village, has a high diversity of flowering plants but has not been recorded. Inventaritation of the flowering plant provides reference information for area conservation. This study aims to inventory the types and uses of flowering plants by the community and other potential benefits in the Mutis Timau Nature Reserve, Oelmuke Hamlet, East Nusa Tenggara. **Method:** This research was conducted in August 2019 in Oelmuke Village, East Nusa Tenggara. The plant collection was conducted using an experimental method along the Oelmuke Village area. The information on the use of flowering plants by the community using the interview method and information about other potential uses using the literature review method. **Result:** The flowering plants inventoried from Oelmuke Village is 31 species from 15 families that have been used as food, animal feed, building materials, medicinal materials, ornamental plants, hedge plants, firewood, and cigarette raw materials, and textile materials. Other potential uses are as an accumulator of Pb waste and dye for woven fabrics. **Conclusions:** The 31 species of plants that have been inventoried have been used by the community as food, animal feed, building materials, medicinal materials, ornamental plants, hedges, firewood, cigarette raw materials, and textile materials and other potential uses are accumulator Pb waste and dyes for woven fabrics.

Keywords: Mutis timau natural reserve; Oelmuke; savanna

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Introduction

Indonesia is a country that has a very high level of diversity, including plants, animals, and microorganisms. Specifically for plants, Indonesia is estimated to have 25% of flowering plants globally, with a total of 20,000 species, and 40% are endemic or native to Indonesia (Kusmana & Hikmat, 2015). This diversity is reflected in forests and nature reserves throughout Indonesia (Surya & Astuti, 2017).

The Mutis Timau Nature Reserve (CAMT) area is part of the Mutis Timau forest group and stores a large diversity of flowering plants. CAMT is located in two districts, namely South-Central Timor Regency (TTS) and North Central Timor Regency (TTU) East Nusa Tenggara Province (NTT). There are ten villages located within the area and around the area, namely Kuannoel, Fatumnasi, Nenas, and Nuapin Villages in Fatumnasi District of TTS Regency; Tutem, Tune, and Bonleu Villages in Tobu District, TTS Regency; Noepesu and Fatuneno Villages in West Miomaffo District of TTU Regency; and Tasinifu Village in Mutis District of TTU Regency (BBKSDA NTT, 2020). There has been no previous study related to the uniformity of flowering plants in CAMT, especially in Oelmuke Hamlet. Previous research has been linked to fungal diversity (Solle et al., 2017), plant types and nesting sites of Timorese cuscus (Farida et al., 2005), potential analysis and strategies for

developing non-timber forest products (Besi et al., 2021), as well as anthropogenic damage and their management efforts (Dako et al., 2019).

The diversity of flowering plants in Indonesia is very high, but information about the type and potential of plant utilization is minimal, including in Tasinifu Village. One of the hamlets in Tasinifu Village, Mutis District, TTU Regency is Oelmuke. Its location around the CAMT area causes many flowering plants to be found, but the data is not yet available. This information is needed in conservation and management efforts and the use of plants in the CAMT area in a sustainable manner by the surrounding community and related institutions. This research is the first step toward the development of the further investigation. There are still many potentials that can be studied from this location, including ethnobotany studies and secondary metabolite compounds. Therefore, this study aims to inventory the type and utilization of flowering plants by the community and other potential uses in the Mutis Timau Nature Reserve area, Oelmuke Hamlet, East Nusa Tenggara.

Method

The research was conducted in August 2019 in Mutis Timau Nature Reserve Area, Oelmuke Hamlet, Tasinifu Village, Mutis District, North Central Timor Regency, East Nusa Tenggara. Observation of morphological characteristics and identification was carried out in the Laboratory of the Faculty of Agriculture, University of Timor.

Research began with cruising and sample collection using exploration methods (Rugayah et al., 2004). Plants found are subsequently collected, and essential information is recorded, including habitus and plant characteristics that may be lost or changed after being collected. Furthermore, observations of morphological features will be used for plant identification. Given the complexity of flowering plants and the dominant plant stature at the research site, this study was only limited to shrubs and trees. Information on the utilization of flowering plants by the community in Oelmuke Hamlet uses interview methods, while information related to other utilization potentials uses library study methods.

Result

This study aims to determine the diversity of species and stature of flowering plants in Oelmuke Hamlet and the utilization of plants in Oelmuke Hamlet. The following is the diversity of flowering plants which are presented in Table 1.

Table 1. Diversity of Flowering Plants in Oelmuke Hamlet

Tribe	Stature	Spesies Name	Local Name
Fabaceae	Tree	*Acacia leucophloea* (Roxb.) Willd.	Kabesak
	Tree	*A. nilotica* (L) Willd.	Akasia
	Tree	*Calliandra calothyrsus* Meisn.	Caliandra
	Bush	*Cassia tora* L.	Ketepeng kecil
	Tree	*Gliricidia sepium* (Jacq.) Kunth	Gamal
	Tree	*Leucaena leucocephala* (Lam.) de Wit	Lamtoro
	Tree	*Pterocarpus indicus* Willd.	Angsana
Solanaceae	Bush	*Datura metel* L.	Kecubung
	Bush	*Nicotiana tabacum* L.	Tembakau
	Bush	*Solanum torvum* Sw.	Takokak, terung cepoka
	Bush	*Solanum melongena* L.	Terung
Myrtaceae	Tree	*Psidium guajava* L.	Jambu biji
	Tree	*Syzygium aqueum* (Burm.f.) Alston	Jambu air
	Tree	*Eucalyptus alba* Reinw. ex Blume	Huek
	Tree	*E. urophylla* S. T. Blake	Ampupu
Asteraceae	Bush	*Chromolaena odorata* (L.) R. M. King & H. Rob	Kirinyuh
	Bush	*Tithonia diversifolia* (Hemsl.) A. Gray	Kembang bulan
Apocynaceae	Tree	*Cascabela thevetia* (L.) Lippold	Ginje
	Bush	*Nerium oleander* L.	Bunga mentega

Malvaceae	Bush	*Abelmoschus moschatus* Medik.	Kapasan
	Tree	*Ceiba pentandra* (L.) Gaertn.	Kapuk
Verbenaceae	Bush	*Duranta erecta* L.	Sinyo nakal
	Bush	*Lantana camara* L.	Tembelekan
Casuarinacea	Tree	*Casuarina junghuhniana* Miq.	Kasuari, cemara gunung
Euphorbiaceae	Bush	*Jatropha curcas* L.	Jarak
Lamiaceae	Tree	*Tectona grandis* L. f.	Jati
Lauraceae	Tree	*Persea mericana* Mill.	Alpukat
Moraceae	Tree	*Artocarpus heterophyllus* Lam.	Nangka
Rubiaceae	Bush	*Coffea arabica* L.	Kopi
Rutaceae	Tree	*Citrus aurantiifolia* (Christm.) Swingle	Jeruk nipis
Rhamnaceae	Tree	*Ziziphus mauritiana* Lam.	Bidara, kom

Other than finding and analyzing the diversity of flowing plants in Oelmuke hamlet, this research also find out the benefits of plants for life in oelmuke

Table 2. Potential Utilization of Plants in Oelmuke Hamlet

Local Name	Utilization by Society	Other Utilization Potentials
Kabesak	Trunk: firewood	Trunk: building material (Rianawati et al., 2015).
Akasia	Trunk: firewood, building materials	Root: luster; stems: sources of tannins, ambient disease drugs, colds, tuberculosis, leprosy; bark of the branch: cough medicine; leaves: animal feed; flowers: the cure of seed syphilis disease: a source of tannins (Djufri, 2004).
Caliandra	Trunk: firewood	Leaves and twigs: animal feed (Abqoriyah & B., 2015).
Ketepeng kecil	Leaf, trunk: feed	Dried seeds: drugs for inflammation of the eyes, corneal wounds, night blindness, glaucoma, hypertension, hepatitis, cirrhosis, stomach busting water, difficulty defecating (Badrunasar & Santoso, 2016).
Gamal	Leaf: feed; trunk: fence, firewood	Firewood; hedge plant (Rugayah, Rahayu & Rahajoe, 2019).
Lamtoro	Leaf: feed; trunk: firewood, fence	Soil refiner (Bachtiar & Ura, 2017).
Angsana	Leaf: feed; trunk: fence	Shade plant, lead metal accumulator (Pb) (Yudha et al., 2013).
Kecubung	Ornamental plants	Flowers: shortness of breath medication, menstrual pain, abdominal pain (KEMENTAN, 2019); ornamental plants (Tjitrosoedirdjo et al., 2016).
Tembakau	Leaf: cigarette raw materials, complementary feeding betel nut	Leaves: natural pesticides (Emiliani et al., 2017).
Takokak	Fruit: vegetable ingredients	Roots: ulcer drugs, stiff waist, chronic cough; leaves: boils and scabs, heart palpitations; Raw fruit: lowers blood pressure (Sirait, 2009) and anti-fertilization/for contraception (Hidayati & Nofianti, 2014).
Terung	Fruit: foodstuffs	Fruits and leaves: anti-inflammatory, asthma, cancer (Naeem & Ugur, 2019).
Jambu biji	Fruit: foodstuffs; leaf: diarrhea medicine	Leaves and fruits: menstrual straightener, dengue fever (KEMENTAN, 2019).
Jambu air	Fruit: foodstuffs	Bark stems, seeds, and leaves: cause antidiarrhea, asthma, lower fever, and promote digestion (Anggarawati & Ramadhania, 2016).
Huek	Trunk: firewood, building materials	Stem (charcoal): biochar; savanna ecosystem balancer (Sutomo, 2015).
Ampupu	Trunk: building materials, firewood	Leaves: contains exclusive oils for the needs of the soap and perfume industry as well as antibacterial; wood: building materials, pulp raw materials, essential oils, and bee feed (Surata, 2015).
Kirinyuh	Flower: wound medicine	Biological control agent (Tjitrosoedirdjo et al., 2016); leaves and rhizome: medicinal ingredients (Wiryano & Lipranto, 2013).
Kembang bulan	Ornamental plants, hedge palnts	Erosion deterrent (Tjitrosoedirdjo *et al.*, 2016)
Ginje	Ornamental plants, hedge palnts	Leaves: heat-lowering and fever-lowering drugs (Sasmi et al., 2018).
Bunga mentega	Ornamental plants	Flowers: antioxidants, antimicrobials; dried leaves and flowers: anti-inflammatory (Farooqui & Tyagi, 2018).

Kapasan	Ornamental plants	Roots: heat-lowering drugs, urinary straighteners, anti-inflammatory, coughing, difficulty defecating; seeds: head pain medicine; leaves: external medicine on boils, scabs, broken bones; flowers: burns medicine; a mixture of leaves, flowers, and seeds: eradicate insects (BPTP Banten, 2020).
Kapuk	Trunk: building materials, firewood: fruit: textile materials	Trunk: building materials and crafts (Zulharan & Aryanti, 2016); leaves: deep hot medicine, ulcer (Jumiarni & Komalasari, 2017).
Sinyo nakal	Hedge palnts	Fruits: malaria and deworming drugs; leaves: abscess, heat-lowering, diuretic, and antimalarial drugs (Jayalakshmi et al., 2011).
Tembelekan	Ornamental plants	Roots: influenza drugs, glandular tuberculosis, rheumatism, vaginal discharge; flowers: tuberculosis drugs with coughing up blood, asthmatic, leaves: skin pain medicines, ulcers, swelling, itching, high heat, rheumatism, and bruising (Badrunasar & Santoso, 2016).
Kasuari	Wood: builidng materials, firewood	Wood: building materials, namely roof construction, floors (parquet), furniture raw materials, and musical instruments (Prakosa et al., 2018).
Jarak	Hedge palnts	Sap: toothache medicine (Jumiarni & Komalasari, 2017); seeds: arthritis drugs, biodiesel (Kumar & Sharma, 2008).
Jati	Trunk: builidng materials, firewood	Leaves: food wrappers, woven fabric dyes; rod: craft (Zulharan & Aryanti, 2016).
Alpukat	Fruit: foodstuffs; trunk: firewood	Leaf: antikolesterol (Muqowwiyah & Dewi, 2021).
Nangka	Trunk: firewood; fruit: foodstuffs	Trunk: building material (Zulharan & Aryanti, 2016).
Kopi	Fruit: beverage ingredients	Batang: kayu bakar (Wiryano & Lipranto, 2013).
Jeruk nipis	Leaf: cooking spices; fruit: cooking spices, traditional cough medicine	Fruit: antiolesterol, antibacterial, antioxidant, anticancer, antiosteoporosis (Silalahi, 2020).
Bidara	Fruit: foodstuffs; Trunk: firewood	Leaves: antimicrobial, antipyretic, and anti-inflammatory analgesics, anticancer, and functioning as protectors of body cells such as the kidneys, liver, and brain (Siregar, 2020).

Discussions

Diversity of Types and Stature of Flowering Plants in Oelmuke Hamlet

Based on the identification results, there are 31 types of plant members in 15 tribes (Table 1). The most common tribes found are Fabaceae (7 types), Solanaceae (4 species), Myrtaceae (4 species), Asteraceae (2 types), Apocynaceae (2 types), Malvaceae (2 types), and Verbenaceae (2 classes). Casuarinacea, Euphorbiaceae, Lamiaceae, Lauraceae, Moraceae, Rubiaceae, Rutaceae, and Rhamnaceae have one type. The types of plants found are primarily types of cultivated plants.

A total of 18 plants found in the hamlet of Oelmuke are tree-shaded, while 13 kinds of shrub-shaded plants. Tree stature is also seen because the savanna ecosystem is most likely to be overgrown with trees and shrubs (Sutomo, 2015). Shrub-shaded plants are also found around settlements and areas. This type of shrub is easy to adapt, and some types of it are invasive species, so it is easy to grow and develop in nature.

Utilization of Plants in Oelmuke Hamlet

Based on the plant species inventory in Oelmuke Hamlet, some shrubs and trees are cultivated around the settlement and in the uninhabited savanna ecosystem. The discovery of cultivated plants indicates that the community has begun to realize the importance of plant utilization so that there is an effort to grow certain types for needs.

Flowering plants in Oelmuke Hamlet have been used by the community as food, animal feed, building materials, the mob at materials, ornamental plants, fence plants, firewood, cigarette raw materials, and textile materials (Table 2). Plants used as foodstuffs include P. guajava L. and Z. mauritiana Lam. The plants used for animal feed

are gamal and lamtoro. Some plants are also used as building materials such as *T. grandis* L. f. and *E. urophylla* S. T. Blake. Plants for ornamental plants such as *N. oleander L.* and *L. camara L,.* Plants as hedges such as *J. curcas L.* and *D. erecta L.* The plant used as a textile material is *C. pentandra* (*L.*) Gaertn., and for cigarette raw materials, namely *N. tabacum L.* Dried flowering plant stems are used as fuel for example *G. sepium* (Jacq.) Kunth. The plant used as a medicinal material is *C. aurantiifolia* (Christm.) Swingle and *P. guajava L.* Flowering plants found in Oelmuke Hamlet have other potential uses such as medicinal materials such as *A. nilotica* (L) Willd., Pb waste accumulators such as *P. indicus* Willd., and tie woven fabric dyes, namely *T. grandis* L. f.

Conclusions

Based on the exploration results, there are 31 types of flowering plants from 15 tribes used by the community in the Mutis Timau Nature Reserve area, Oelmuke Hamlet, Tasinifu Village, Mutis District North Central Timor Regency, East Nusa Tenggara Province. Flowering plants in Oelmuke Hamlet are used as foodstuffs, animal feed, building materials, the mob at materials, ornamental plants, hedge plants, firewood, cigarette raw materials, and textile materials. Other utilization potentials are Pb waste accumulators and ikat woven fabric dyes.

Declaration statement

The authors reported no potential conflict of interest.

References

Abqoriyah, U. R., & B., S. (2015). Produktivitas Tanaman Kaliandra (Calliandra calothyrsus) sebagai Hijauan Pakan pada Umur Pemotongan yang Berbeda. Buletin Peternakan, 39(2), 103–108. https://doi.org/10.21059/buletinpeternak.v39i2.6714

Anggarawati, P. S., & Ramadhania, Z. M. (2016). Review Artikel: Kandungan Senyawa Kimia dan Bioaktivitas dari Jambu Air (Ayzygium aqueum Burn. f. Alston). Farmaka, 4(2), 331–344. https://doi.org/10.24198/jf.v14i2.10884.g5186

Bachtiar, B., & Ura, R. (2017). Pengaruh Tegakan Lamtoro Gung Leucaena leucocephala L. terhadap Kesuburan Tanah di Kawasan Hutan Ko'mara Kabupaten Takalar. Jurnal Ilmu Alam Dan Lingkungan, 8(15), 1–6.

Badrunasar, A., & Santoso, H. B. (2016). *Tumbuhan Liar Berkhasiat Obat*. Forda Press.

BBKSDA NTT. (2020). Profil CA Mutis Timau. http://bbksdantt.menlhk.go.id/kawasan-konservasi/ca/ca-mutis/profil-ca-mutis-timau.

Besi, A. A., Mahayasa, I. N., & Rammang, N. (2021). Analisis Potensi dan Strategi Pengembangan Hasil Hutan Bukan Kayu (HHBK) Akar Angin (Usnea barbata) di Hutan Lindung Mutis Timau (Studi Kasus di Desa Kuan Noel dan Desa Fatumnasi, Kecamatan Fatumnasi, Kabupaten Timor Tengah Selatan). Jurnal Wana Lestari, 4(1), 102–112.

BPTP Banten. (2020). Mengenal Tanaman Kapasan. http://banten.litbang.pertanian.go.id/new/index.php/publikasi/folder/964-mengenal-tanaman-kapasan.

Dako, F. X., Purwanto, R. H., Farida, L. R. W., & Sunardi. (2019). Antropogenik Kawasan Hutan Lindung Mutis Timau dan Upaya Penanggulangannya di Pulau Timor Bagian Barat. Journal of Natural Resources and Environmental Management, 9(2), 437–455. https://doi.org/10.29244/jpsl.9.2.437-455

Djufri. (2004). Review: Acacia nilotica (L.) Willd. ex Del. dan Permasalahannya di Taman Nasional Baluran Jawa Timur. Biodiversitas, 5(2), 96–104. https://doi.org/10.13057/biodiv/d050211

Emiliani, N., Djufri, & Sarong, M. A. (2017). Pemanfaatan Ekstrak Tanaman Tembakau (Nicotianae tobacum L.) sebagai Pestisida Organik untuk Pengendalian Hama Keong Mas (Pomaceace canaliculara L.) di Kawasan Persawahan Gampong Tungkop, Aceh Besar. Jurnal Ilmiah Mahasiswa Fakultas Keguruan Dan Ilmu Pendidikan Unsyiah, 2(2), 58–71.

Farida, W. S., Triono, T., Handayani, T. H., & Ismail. (2005). Pemilihan Jenis Tumbuhan Sumber Pakan dan Tempat Bersarang Kuskus (Phalanger sp.) di Cagar Alam Gunung Mutis, Nusa Tenggara Timur. Biodiversitas, 6(1), 50–54. https://doi.org/10.13057/biodiv/d060408

Farooqui, S., & Tyagi, T. (2018). Nerium oleander: Its Application in Basic and Applied Science: A Review. International Journal of Pharmacy and Pharmaceutical Sciences, 10(3), 1–4. https://doi.org/10.22159/ijpps.2018v10i3.22505

Hidayati, N. L. D., & Nofianti, T. (2014). Penelusuran Potensi Antifertilitas Buah Takokak (Solanum torvum Swartz) melalui Skrining

Fitokimia dan Pengaruhnya Terhadap Siklus Estrus Tikus Putih (Rattus norvegicus). Jurnal Kesehatan Bakti Tunas Husada, 11(1), 94–103.

Jayalakshmi, B., Raveesha, K. A., & Amruthesh, K. N. (2011). Phytochemical investigations and antibacterial activity of some medicinal plants against pathogenic bacteria. Journal of Applied Pharmaceutical Science, 1, 124–128.

Jumiarni, W. O., & Komalasari, O. (2017). Eksplorasi Jenis dan Pemanfaatan Tumbuhan Obat pada Masyarakat Suku Muna di Permukiman Kota Wuna. Traditional Medicine Journal, 22(1), 45–56.

KEMENTAN. (2019). *Tanaman Obat, Varian Tradisi Nusantara untuk Kesejateraan Rakyat*. Balai Penelitian Tanaman Rempah dan Obat.

Kumar, A., & Sharma, S. (2008). An Evaluation of Multipurpose Oil Seed Crop for Industrial Uses (Jatropha curcas L.): A Review. Industrial Crops and Products, 28(1), 1–10. https://doi.org/10.1016/j.indcrop.2008.01.001

Kusmana, C., & Hikmat, A. (2015). Keanekaragaman Hayati Flora di Indonesia. Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan, 5(2), 187–198. https://doi.org/10.29244/jpsl.5.2.187

Muqowwiyah, L. Z., & Dewi, R. K. (2021). Potensi Ekstrak Daun Alpukat sebagai Antikolesterol. Jurnal Tadris IPA Indonesia, 1(3), 403–412.

Naeem, M. Y., & Ugur, S. (2019). Nutritional Content and Health Benefits of Eggplant. Turkish Journal of Agriculture-Food Science and Technology, 7(3), 31–36. https://doi.org/10.24925/turjaf.v7isp3.31-36.3146

Prakosa, G. G., Muttaqin, T., & Harjoko. (2018). Sifat Fisik dan Keawetan Kayu Cemara Gunung (Casuarina junghuniana) di Pegunungan Bromo Kabupaten Probolinggo. Jurnal Daun, 5(2), 71–82.

Rianawati, H., Siswadi, & Setyowati, R. (2015). Sifat Fisis Mekanis Kayu Potensial Nusa Tenggara Timur: Kabesak (Acacia leucoplhoe (Roxb.) Wild) dan Timo (Timonius sericeus (Desf) K. Schum.). Prosiding Seminar Nasional Biodiversitas Nusa Tenggara, 17–29.

Rugayah, Rahayu, M., & Rahajoe, M. J. S. (2019). *Pulau Wawoni Keanekaragaman Ekosistem, Flora dan Fauna*. LIPI Press.

Rugayah, Widjaja, E. A., & Praptiwi. (2004). *Pedoman Pengumpulan Data Keanekaragaman Flora.* Pusat Penelitian Biologi Lembaga Ilmu Pengetahuan Indonesia.

Sasmi, J., Mahdi, N., & Kamal, S. (2018). Jenis Tanaman yang Digunakan untuk Obat Tradisional di Kecamatan Kluet Selatan. Jurnal Biotik, 5(1), 36–59. https://doi.org/10.22373/biotik.v5i1.2974

Silalahi, M. (2020). Pemanfaatan Citrus aurantifolia (Christm. Et Panz.) sebagai Bahan Pangan dan Obat serta Bioaktivitas. Sainmatika: Jurnal Ilmiah Matematika Dan Ilmu Penegetahuan Alam, 17(1), 80–88. https://doi.org/10.31851/sainmatika.v17i1.3637

Sirait, S. (2009). Terong Cepoka (Solanum torvum) Herba yang Berkhasiat sebagai Obat. Warta Penelitian Dan Pengembangan Tanaman Industri, 15(3), 10–12.

Siregar, M. (2020). Berbagai Manfaat Daun Bidara (Ziziphus mauritiana Lamk) bagi kesehatan di Indonesia. Jurnal Pandu Husada, 1(2), 75–81. https://doi.org/10.30596%2Fjph.v1i2.4415

Solle, H., Klau, F., & Nuhamara, S. K. (2017). Keanekaragaman Jamur di Cagar Alam Gunung Mutis Kabupaten Timor Tengah Utara, Nusa Tenggara Timur. Biota, 2(3), 105–110.

Surata, I. K. (2015). Sebaran dan Konservasi Ampupu (Eucalyptus urophylla S. T. Blake) di Nusa Tenggara Timur. Prosiding Seminar Nasional Biodiversitas Nusa Tenggara, 1–16.

Surya, M. I., & Astuti, I. P. (2017). Keanekaragaman dan Potensi Tumbuhan di Kawasan Hutan Lindung Gunung Pesagi, Lampung Barat. Prosiding Seminar Nasional Masyarakat Biodiversitas Indonesia, 3(2), 211–215. https://doi.org/10.13057/psnmbi/m030208

Sutomo. (2015). Asal Usul Formasi Savana: Tinjauan Pustaka dari Savana di Nusa Tenggara Timur dan Hasil Penelitian di Savana Baluran Jawa Timur. Prosiding Seminar Nasional Biodiversitas Nusa Tenggara, 246–265.

Tjitrosoedirdjo, S. S., Mawardi, I., & Tjitrosoedirdjo, S. (2016). 75 Important Invasive Plant Species in Indonesia. SEAMEO Biotrop.

Wiryano, & Lipranto. (2013). The Diversity of Locally Useful Plants in Batu Ampar Village Near Bukit Raja Mandara Protected Forest Area in South Bengkulu District. Jurnal Manusia Dan Lingkungan, 20(2), 119–128.

Yudha, G. P., Noli, Z. A., & Idris, M. (2013). Pertumbuhan Daun Angsana (Pterocarpus indicus Willd) dan Akumulasi Logam Timbal (Pb). Jurnal Biologi Universitas Andalas, 2(2), 83–89. https://doi.org/10.25077/jbioua.2.2.%25p.2013

Zulharan, & Aryanti, N. A. (2016). Etnobotani Tumbuhan Penghasil Bahan Bangunan, Kerajinan dan Rumah Adat Masyarakat Suku Sambori Kabupaten Bima NTB. Prosiding Seminar Nasional Dan Gelar Produk, 256–265.