

Ornamental Palm Species of Palu City, Central Sulawesi, Indonesia

(Jenis-jenis Palem Hias di Kota Palu, Sulawesi Tengah, Indonesia)

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ABSTRAK

Sebuah penelitian berjudul Jenis-jenis palem hias di Kota Palu, Sulawesi Tengah, Indonesia telah dilakukan dari bulan Mei hingga September 2024. Tujuan dari penelitian ini adalah untuk mendokumentasikan palem hias yang ada di Kota Palu. Pengamatan langsung melalui metode eksplorasi botani dilakukan untuk menginventarisasi tanaman hias di 8 kecamatan di Kota Palu. Seluruh sampel palem hias dikumpulkan dan difoto kemudian diidentifikasi di Laboratorium Biosistemika Tumbuhan, Jurusan Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam dan Herbarium Celebense (CEB), Universitas Tadulako Palu. Data tambahan yang dicatat meliputi nama lokal, nama botani, famili, habitus (bentuk hidup) tumbuhan. Spesimen beserta labelnya disimpan di CEB, Universitas Tadulako Palu, Indonesia. Terdapat 16 (enam belas) jenis palem hias yaitu: *Areca cathechu*, *Cocos nucifera*, *Phoenix dactylifera*, *Elaeis guineensis*, *Cyrtostachys renda*, *Corypha utan*, *Roystonea regia*, *Saribus rotundifolius*, *Wodyetia bifurcata*, *Adonidia merrillii*, *Hyophorbe lagenicaulis*, *Chrysalidocarpus decaryi*, *Bismarckia nobilis*, *Chamaedorea elegans*, *Licuala grandis*, dan *Rhapis excelsa*.

Kata kunci: Tanaman hias; palem; Palu; Sulawesi; Indonesia

ABSTRACT

A research-entitled ornamental palm species of Palu city, central Sulawesi, Indonesia has been conducted from May to September 2024. The goal of the study was to document ornamental palm in Palu City. The direct observation through botanical exploration method was performed to inventory ornamental plant in 8 districts of Palu. All ornamental palms samples were collected and photographed then identified at the Laboratory of Plant Biosystematics, Department of Biology, Faculty of Mathematics and Natural Sciences and the Herbarium Celebense (CEB), Tadulako University Palu. Additional data included local name, botanical name, family, plant habitus (life form), were noted. Specimens with their label were deposited at CEB, Tadulako University Palu, Indonesia. There were 16 (sixteen) ornamental palms namely: *Areca cathechu*, *Cocos nucifera*, *Phoenix dactylifera*, *Elaeis guineensis*, *Cyrtostachys renda*, *Corypha utan*, *Roystonea regia*, *Saribus rotundifolius*, *Wodyetia bifurcata*, *Adonidia merrillii*, *Hyophorbe lagenicaulis*, *Chrysalidocarpus decaryi*, *Bismarckia nobilis*, *Chamaedorea elegans*, *Licuala grandis*, and *Rhapis excelsa*.

Keywords: Ornamental; palm; Palu; Sulawesi; Indonesia

INTRODUCTION

Palms (taxonomically belong to the family Palmae or Arecaceae, both names are accepted) are a monocotyledonous plant family containing species of tropical climbers, shrubs and trees commonly known as Palm trees or simply Palms. The family is one of the largest plant family to be found throughout equatorial, tropical, and subtropical areas of the world where they feature as a very peculiar element of the landscape. that have long delivered a wide range of provisioning services to humankind (Cámara-Leret et al., 2017; Muscarella et al, 2020). The family comprises 188 genera and approximately 2,585 species. It is distributed these are unevenly divided among the Americas (ca. 730 species), Africa (ca. 65 species),

and the Asia-Pacific region (ca. 1,600 species). Palms are highly conspicuous in tropical ecosystems. Due to their diversity, abundance and interactions, many species play key ecological roles (Palmweb, 2024).

Palms include plants of enormous economic importance for human beings. A number species of palms can be used as food sources such as; the date palm (*Phoenix dactylifera*) is highly appreciated for its elevated nutritional content and great distinctive flavor (Salomón-Torres, 2021). Sugar palm (*Arenga pinnata*), African oil palm (*Elaeis guineensis*) and coconut palm (*Cocos nucifera*). sago palm (*Metroxylon sago*), and *Borrassus flabelligera* are some of the palm species that are very important for human life (Laureto and Ciancuaruso, 2017).

Rattan is another life form of palm, a climbing plant that has high economic value. Most rattans are forest species. that use thorny stems and leaves to hold on to other plant species. Rattan is used to make goods such as furniture for national and international markets (Myers, 2015). The genus *Calamus*, *Korthalsia*, *Daemonorops*, etc are the basis of a large furniture and matting industry (Henderson and Pitopang, 2018).

Palms are also used as ornamental plants for decorative purpose in the gardens, parks, squares, avenues, landscape design, and as houseplants. Ornamental palms are important components of tropical, subtropical, and even warm temperate climate landscapes. In colder climates, they are important interiorscape plants and are often a focal point in malls, businesses, and other public areas (Broschat et al., 2014).

As a young city, Palu is developing rapidly, especially after the 2018 earthquake, various new settlements have emerged, public facilities such as city parks, improvements to transportation facilities and greening using plants as ornamental plants including palm species, but information on the diversity of ornamental palm species is not yet available. Therefore, research on the species diversity of ornamental palm in the city needs to be inventoried. The study aimed to document the palm species as ornamental plants, its origin and conservation status.

MATERIALS AND METHODS

Research site

The research was located at Palu city, the capital of central Sulawesi, Indonesia. Generally, the city is divided into 8 (eight) districts and 46 subdistricts (“kelurahan”) with a population of 363,867 people that population density 921 people/km² (BPS Central Sulawesi, 2024). Palu was designated as the city based on Law Number 13 of 1964, then its status changed to an administrative city based on Government Regulation Number 18 of 1978. In 1994, its status was increased to a Municipality based on Law Number 4 of 1994 (BAPPEDA Palu City, 2024). The city which is nicknamed the 5-dimensional city is located near the equator with a topography consisting of valleys, oceans, rivers, mountains, and bays is located extending from east to west north of the equator in coordinates 0.35 - 1.20 N and 120 - 122.90 E. Its area is 395.06 km² and is located in Palu Bay surrounded by mountains (**Figure 1**). Palu city is stretched out at an altitude of 0 - 250 m above sea level with flat to mountainous topography. while the lowlands are generally around the coast (<https://palukota.go.id/profil/>).

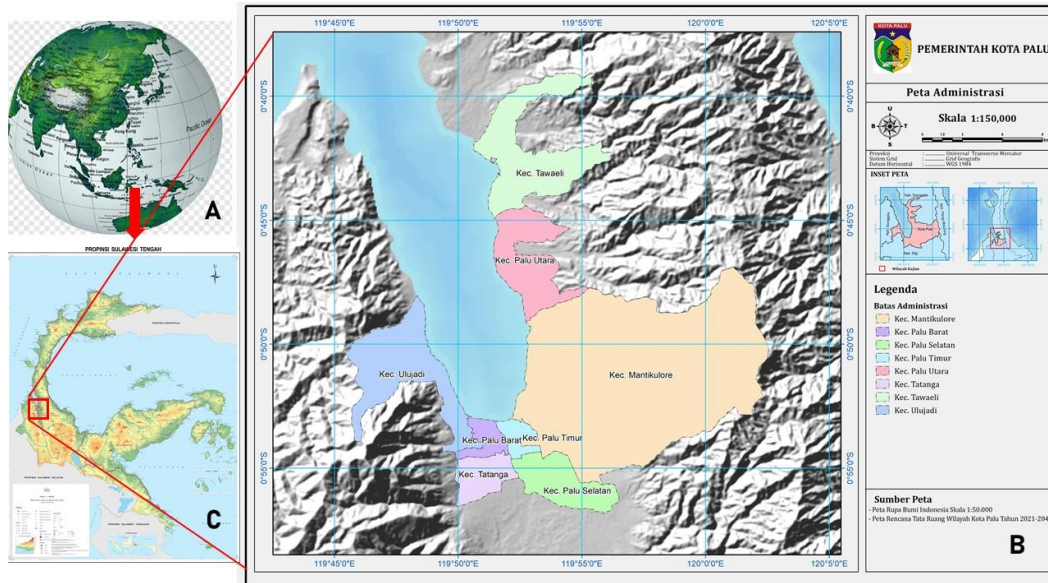


Figure 1. Map of research site, located at Palu city (square red color), the capital of central Sulawesi, Indonesia. A. Globe, B. Palu with 8 districts, and C. Central Sulawesi. (Modified from map of Palu government, 2024).

Based on meteorological data from the Meteorology, Climatology and Geophysics Agency (BMKG), Sis Al-Jufri Airport Meteorological Station (2022) indicated that the average air temperature for Palu City is between 27.1°C - 29.2°C, where the minimum temperature is in August 21.7°C, and the maximum temperature is in September which is 34.9°C with the lowest air humidity occurring in November which is 70.7%, and the highest air humidity in June which is 85.9%. The air pressure in 2019 ranges from 1010.9 mb to 1013.0 mb. The maximum air pressure occurs in February while the minimum air pressure occurs in November. Wind speed ranges from 4 - 5 knots, with the wind direction from the north. The highest rainfall in Palu City occurred in October at 124.3 mm, while the lowest occurred in November at 9.6 mm. The highest sunshine duration occurred in April at 5.9% while the lowest was in July at 3.7%. The highest wind speed occurred in April at 5 Knots, while the lowest occurred in May at 3.3 Knots. The wind direction in Palu city comes from the Northeast, North and South.

Plant collection and identification

Ornamental palm samples were collected for herbarium purpose according to Baker and Dransfield (2006), then photographed and identified at the Laboratory of Plant Biosystematics, Department of Biology, Faculty of Mathematics and Natural Sciences and the Herbarium Celebense (CEB), Tadulako University Palu. Specimens with their label were deposited at CEB, Tadulako University Palu, Indonesia. Identification was done by comparing sample with reference specimens and using relevant literature (<http://palmweb.org/>) and with the help of specialists. Additional data including local name, botanical name, family, plant habitus (life form), were recorded. Nomenclature of species followed IPNI (<https://www.ipni.org/>), the distribution followed Powo Science Kew (<https://powo.science.kew.org/>). Preliminary conservation status was evaluated in accordance with the IUCN Redlist at the sites <https://www.iucnredlist.org/en>

RESULTS AND DISCUSSION

Species of ornamental palm species

We noted that there were 16 (sixteen) species of ornamental palms species in the studied area namely: *Areca cathechu*, *Cocos nucifera*, *Phoenix dactilyfera*, *Elaeis guineensis*, *Cyrtostachys renda*, *Corypha utan*, *Roystonea regia*, *Saribus rotundifolius*, *Wodyetia bifurcata*, *Adonidia merrillii*, *Hyophorbe lagenicaulis*, *Chrysalidocarpus decaryi*, *Bismarckia nobilis*, *Chamaedorea elegans*, *Licuala grandis* and *Rhapis excelsa* (**Table 1, Figure 2-3**).

If we compare among the 8 existing sub-districts, the area where the most palm species are found is Mantikuloire, this is because Mantikulore has the largest area compared to other sub-districts, besides that in the Mantikulore sub-district there are many resident, offices and green open spaces.

Palmae (Arecaceae) one of the most important plant families in the world. It consists of 2,585 species and 188 genera. Palms are among the most charismatic plants in the world. They include record breaking species with the longest leaves and heaviest seed, as well as some of the most economically valuable of all plants (Palm of the world online, 2024: <https://palmweb.org/>).

Based on the origin of ornamental palms found in Palu, most of them are introduced species from other regions but only a few species are native to the Malesian phytogeographic region such as: *Cyrtostachys renda* from West Malesia, *Areca cathechu* (Philippines) and *Adonidia merillii* (Borneo and Philippines). Some species native to Madagascar are *Chrysalidocarpus decaryi* and *Bismarckia nobilis*. Some species from Africa and the Middle East are *Elaeis guineensis* and *Phoenix dactilyfera*. There are two palm species originated from Tropical America namely; *Roystonea regia* and *Chamaedorea elegans*, While the pantropical ones is coconut (*Cocos nucifera*).

In this study, the species that had a wide distribution was Coconut (*Cocos nucifera* L.). This species is a socioeconomically important palm in Indonesia. Alouw and Wulandari (2020) stated that Indonesia has the largest coconut palm-growing areas in the world, followed by the Philippines and India. The average national coconut productivity is still lower than the production potency of superior varieties. Indonesia and the Philippines contributed about 67% of crude coconut oil (CNO) export to global market.

The African oil palm (*Elaeis guineensis*) originates from West and Central Africa. The first seeds of the oil palm were brought from West Africa by the Dutch and planted in the Bogor Botanical Garden (Java Island) in 1848 (Wahid et al. 2004). Oil palm plantations expanded by 91,000 ha between 1916 and 1938. Nowadays, Indonesia is one of the largest palm oil producers in the world (Kubitza et al., 2018; Sulaiman et al., 2024). Oil palm is one of the most profitable commercial high-tree crops, and has undergone one of the highest rates of expansion in comparison with other crops in the tropical world (Pachecho et al, 2017). In Palu city, oil palms are planted as ornamental plant especially in the Tadulako University area.

Table 1. Ornamental palm species in Palu city, family, origin, habitus and its conservation status

No	Local name	Scientific name	Family	Origin	Habit	Palu distribution								CS
						A	B	C	D	E	F	G	H	
1	Pinang	<i>Areca cathechu</i> L	Arecaceae	Phillipines	Tree		✓	✓		✓		✓		LC
2	Kaluku	<i>Cocos nucifera</i> L	Arecaceae	Pantropical	Tree	✓	✓	✓	✓	✓	✓	✓	✓	NE
3	Gebang	<i>Corypha utan</i> Lamk.	Arecaceae	Andaman Islands to Assam and N. Australia	Tree							✓		LC
4	Palem Merah	<i>Cyrtostachys renda</i> Blume.	Arecaceae	West Malesia	Tree			✓		✓				NE
5	Sawit	<i>Elaeis guineensis</i> Jacq.	Arecaceae	Africa	Tree	✓								LC
6	Kurma	<i>Phoenix dactylifera</i> L.	Arecaceae	Middle East	Tree	✓								NE
7	Palem Raja	<i>Roystonea regia</i> (Kunth) O.F.Cook	Arecaceae	Karibia, Tropical America	Tree	✓		✓	✓					LC
8	Palem Woka	<i>Saribus rotundifolius</i> (Lam.) Blume	Arecaceae	Borneo to New Guinea	Tree	✓		✓	✓			✓		NE
9	Pinang ekor bajing	<i>Wodyetia bifurcata</i> A.K. Irvine	Arecaceae	Queensland	Tree	✓		✓	✓			✓		LR
10	Palem manila	<i>Adonidia merrillii</i> (Becc.) Becc.	Arecaceae	Borneo (Sabah) to Philippines	Tree	✓	✓	✓	✓					VU
11	Palem botol	<i>Hyophorbe lagenicaulis</i> (L. Bailey) H.E.Moore	Arecaceae	Mauritius	Tree	✓	✓	✓	✓					CR
12	Palm kuning	<i>Chrysalidocarpus decaryi</i> (Jum.) Eiserhardt & W.J.Baker	Arecaceae	Madagascar	Tree	✓		✓						NE
13	Palem Bismarck Perak	<i>Bismarckia nobilis</i> Hildebr. & H.Wendl.	Arecaceae	Endemic to Madagascar	Treelet	✓			✓					LC
14	Palem Ruang tamu	<i>Chamaedorea elegans</i> Mart.	Arecaceae	Mexico to Honduras	Treelet	✓								NE
15	Palem kipas	<i>Licuala grandis</i> (T.Moore) H.Wendl.	Arecaceae	Santa Cruz Islands to Vanuatu	Shrub	✓								NE
16	Palem	<i>Rhapis excelsa</i> (Thunb.) A.Henry	Arecaceae	China to Central Vietnam	Shrub	✓		✓						NE

Notes: Palu Distribution: A= Mantikulore, B=Palu Barat, C=Palu Selatan, D=Palu Timur, E= Palu Utara, F=Tatanga, G= Tawaeli, H=Ulujadi
 RC= Redlist Category: NA= Not applicable, NE= Not evaluation, DD= Data deficient, LC= Least concern, NT= Near threatened, VU= Vulnerable, EN=Endangered, LR= Lower Risk, CR= Critically endangered, RE= Regional extinct, EW= Extinct in the wild, EX= Extinct.

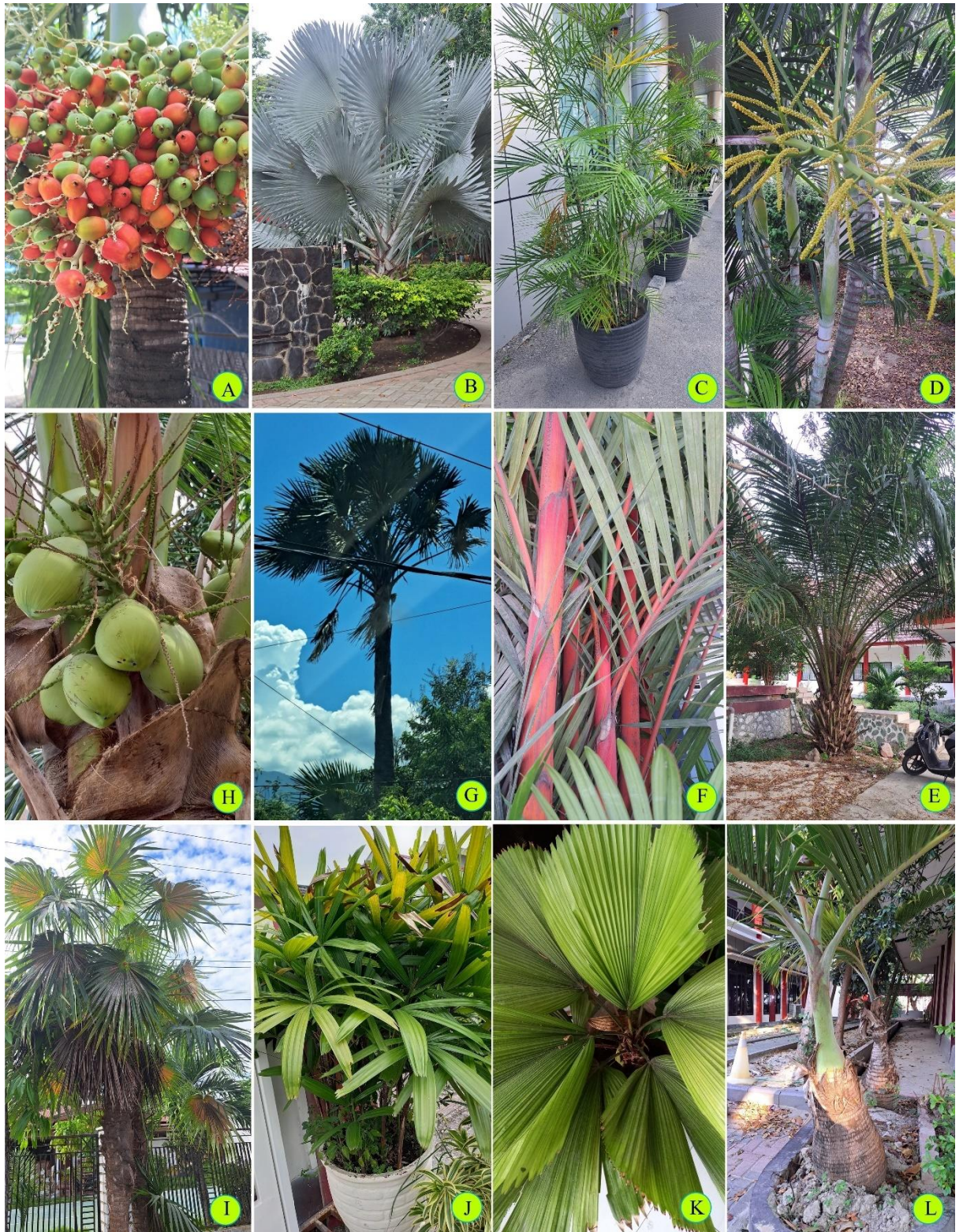


Figure 2. A. *Adonidia merrillii* (Becc.) Becc., B. *Bismarckia nobilis* Hildebr. & H.Wendl., C. *Chamaedorea elegans* Mart., D. *Chrysalidocarpus decaryi* (Jum.) Eiserhardt & W.J.Baker, E. *Elaeis guineensis* Jacq., F. *Cyrtostachys renda* Blume., G. *Corypha utan* Lamk., H. *Cocos nucifera* L., I. *Saribus rotundifolius* (Lam.) Blume J. *Rhaps excelsa* (Thunb.) A. Henry, K. *Licuala grandis* (T.Moore) H.Wendl. L. *Hyophorbe lagenicaulis* (L. Bailey) H. E.Moore.



Figure 3. M. *Wodyetia bifurcata* A.K. Irvine, N. *Phoenix dactylifera* L., O. *Areca cathechu* L, P. *Roystonea regia* (Kunth) O.F.Cook, Q. **GOR** Park Palu, S. Palm *Adonidia merrillii* (Becc.) Becc., *Adonidia merrillii* (Becc.) Becc., it is widely planted in “Perumahan Dosen UNTAD” Palu.

Palms species are found in Palu city have different conservation status (**Figure 4**). Of the 16 palm species, 5 species fall into the Least Concern (LC) category, namely; *Areca chatechu*, *Corypha utan*, *Elaeis guineensis*, *Roystonea regia* and *Bismarckia nobilis*. 8 species are Not Evaluated category namely; *Cocos nucifera*, *Cyrtostachys renda*, *Phoenix dactylifera*, *Saribus rotundifolius*, *Chrysalidocarpus decaryi*, *Chamaedorea elegans*, *Licuala grandis* and *Rhapis excelsa*. Meanwhile, *Wodyetia bifurcata* is listed as Lower Risk/conservation dependent, *Adonidia merrillii* as Vulnerable under criteria B2ab (i,ii,iii) and *Hyophorbe lagenicaulis* is listed as Critically Endangered under criteria D (<https://www.iucnredlist.org/species/38580/10126445>).

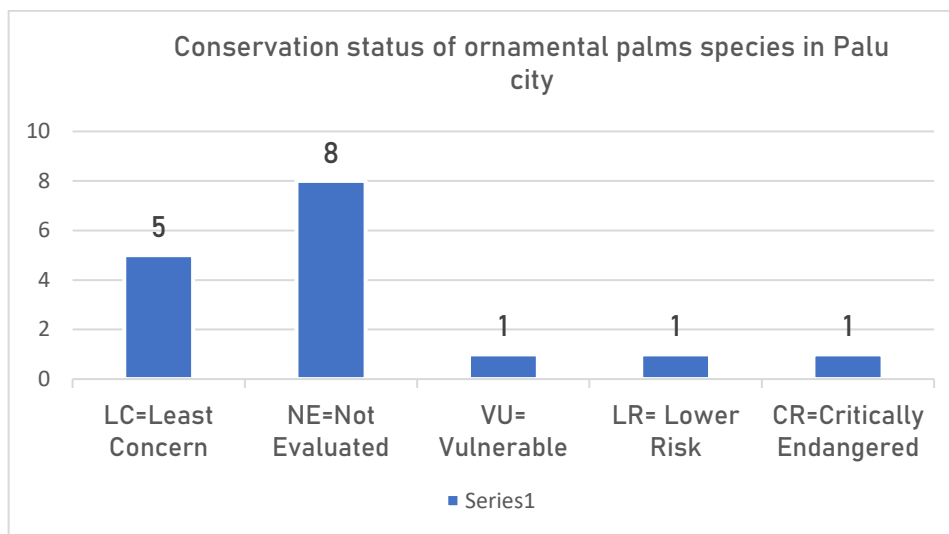


Figure 4. Conservation status of ornamental palm species in Palu city

Hyophorbe lagenicaulis (Indonesian lang: “palm botol”) is very common and widely planted in home yards, roadsides, and parks in Palu city. This palm is originally from Mauritius islands (Powo, 2024). Conservation status of the species is categorized Critically Endangered (CR), it is therefore need to be conserved.

CONCLUSIONS

It is concluded that there were 16 (sixteen) species of ornamental palms species in the studied area namely: *Areca cathechu*, *Cocos nucifera*, *Phoenix dactylifera*, *Elaeis guineensis*, *Cyrtostachys renda*, *Corypha utan*, *Roystonea regia*, *Saribus rotundifolius*, *Wodyetia bifurcata*, *Adonidia merrillii*, *Hyophorbe lagenicaulis*, *Chrysalidocarpus decaryi*, *Bismarckia nobilis*, *Chamaedorea elegans*, *Licuala grandis* and *Rhapis excelsa*. In this study, the species that had a wide distribution was Coconut (*Cocos nucifera* L.).

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