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REGULAR RESEARCH ARTICLE

The Illegal Online Trade of Indonesian Protected Pitcher Plants

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ABSTRACT

Indonesia is a global hotspot of pitcher plant diversity with 80 Nepenthes species recorded to date - 59 protected under Indonesian law - and more species likely to be discovered and described in the future. Under Indonesian law, these protected Nepenthes can only be traded if they originate from artificially propagated sources, and trade necessitates specific permits and government-issued certification. The present study aimed to evaluate the trade of Nepenthes species protected by Indonesian law in Indonesian-language online markets. The trade data was searched in March 2024 in the top five most visited e-commerce in Indonesia, i.e., Shopee, Tokopedia, Lazada, Blibli, and Bukalapak. We discovered that 37 Nepenthes species (29 endemic to Indonesia; 14 species globally threatened) under protection in Indonesia were sold online, with 501 advertisements from 296 sellers. The majority (89.2%) of these sellers operated from Java Island. Our research documented the sale of 2,552 Nepenthes plants, totaling IDR 56,660,000 (USD $3,480). Additionally, sellers reported having 536,757 plants in stock, potentially worth over IDR 92 billion (USD $5,664,000). None of the sellers had permits for the Nepenthes they sold, indicating that they sold them illegally. Therefore, despite being designated as protected species in name, they lack effective protection in practice. The number of traded Nepenthes recorded in our study was higher than that reported by CITES (157 plants) over a 49-year period. Among the traded species, N. clipeata and N. sumatrana are two Critically Endangered species in the top 10 most advertised. These findings could aid the Indonesian Ministry of Environment and Forestry in identifying key players and regions involved in the trade, as well as assist conservationists and policymakers in determining which species need strong protection measures.

KEYWORDS

CITES; IUCN Red List; Nepenthaceae; Nepenthes; Shopee; Tokopedia.

1. INTRODUCTION

Pitcher plants of the genus *Nepenthes* belong to the monotypic family Nepenthaceae (Ellison & Adamec, 2018). The genus currently consists of 211 accepted species (POWO, 2024), which are distributed from Seychelles, Madagascar, Southeast China to Tropical Asia, and West Pacific (Jebb & Cheek, 1997; McPherson, 2009; POWO, 2024). Due to high horticultural interest, many *Nepenthes* are illegally harvested from wild populations, placing them at considerable risk of extinction. Currently, eighteen or 40% of the threatened *Nepenthes* listed on the IUCN Red List are threatened by unsustainable harvesting (IUCN, 2024). Many plant dealers illegally poach the plants for commercial sale and offer them on online markets (Simpson, 1995; Clarke, 1997, 2001; Clarke et al., 2018; Cross et al., 2020; McPherson, 2022; Carnivorous Plant Poachers, 2024). Although the trade of all *Nepenthes* species is regulated under the

Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), compliance with this regulation, especially on online markets, has not been assessed. With the exception of *Nepenthes khasiana* and *N. rajah*, which are listed under CITES Appendix I, the entire genus is included in CITES Appendix II (https://cites.org/eng/app/appendices.php). While species listed under CITES Appendix I are completely prohibited from commercial trade, species included in CITES Appendix II can be traded with permits and Non-Detriment Findings.

Indonesia stands as the global hotspot of *Nepenthes* distribution, hosting around 80 species, accounting for about 44% of the global *Nepenthes* diversity (Mansur et al., 2021). This diversity is notably concentrated in Sumatra (44 species), followed by Kalimantan (22 species), Sulawesi (13 species), Papua (11 species), Maluku (5 species), Java (3 species), and the Lesser Sunda Islands (1 species) (Mansur, 2013; Cámara-Leret et al., 2020; Hernawati et al., 2022a; POWO, 2024). A total of 69 species have been assessed for their conservation status, of which 22 species are threatened with extinction, categorized as Critically Endangered (6 species), Endangered (7 species), and Vulnerable (9 species) (IUCN, 2024). Over the past 24 years, Indonesia has unveiled eight new *Nepenthes* species: five from Sumatra (*N. putaiguneung*, *N. longiptera*, *N. harauensis, N. samudera*, *N. tamini*) (Metusala et al., 2020; Victoriano, 2021; Hernawati et al., 2022b; McPherson & Golos, 2022; Chiu et al., 2023), and one each from Kalimantan (*N. pudica*) (Dančák et al., 2022), Sulawesi (*N. diabolica*) (Bianchi et al., 2020), and Papua (*N. misoolensis*) (McPherson & Golos, 2022).

Since 1978, Indonesia has been a signatory to CITES (Republic of Indonesia, 1978), and currently, 59 *Nepenthes* species are protected from collection for trade (Republic of Indonesia, 2018a). In the previous regulation (Republic of Indonesia, 1999a), all *Nepenthes* species were included on the list of protected species. However, based on recommendations from the Indonesian Institute of Sciences (LIPI) as the national scientific authority, the list was revised, and only 59 species were included. Under the legislation (Republic of Indonesia, 1999b), these protected *Nepenthes* can only be traded if they originate from artificially propagated sources, and trade necessitates specific permits and government-issued certification (Republic of Indonesia, 2005). Under these guidelines, species listed under CITES Appendix I can be traded only if they are second-generation offspring (F2), whereas those in Appendix II can come from first-generation offspring (F1). However, the extent of compliance with these regulations remains unmeasured. The Ministry of Environment and Forestry of Indonesia is the institution that is responsible for administering permits and ensuring that species are traded according to the law.

The present study aimed to evaluate the trade of *Nepenthes* species protected by Indonesian law in online markets using the Indonesian language. No study has focused on the Internet market of Indonesian *Nepenthes*, especially those that are protected under Indonesian law. Therefore, our objectives were: (1) to compile a list of protected *Nepenthes* species traded in Indonesian e-commerce platforms, (2) to analyze the types of *Nepenthes* products available for sale, the specific online platforms selling them in Indonesia, and their price ranges, (3) to determine the geographical locations of the sellers, (4) to evaluate the adherence of this trade to Indonesian regulatory frameworks, and 5) to assess whether declining species listed as globally threatened species by the IUCN are subject to greater trade than unlisted species.

2. MATERIALS AND METHODS

We checked the validity of each protected *Nepenthes* name (Republic of Indonesia, 2018a) using the Plant of the World Online (POWO, 2024). Their conservation status and international trade protection were cross-checked with the IUCN Red List (IUCN,

2024) and CITES Appendices[1], respectively. Additionally, we documented their current geographical distribution at the provincial level based on protologues, POWO (2024), and virtual herbariums stored in the Global Biodiversity Information Facility (GBIF.org, 2024).

Trade data were collected from the top five e-commerce platforms in Indonesia (Ahdiat, 2023): Shopee[2], Tokopedia[3], Lazada[4], Blibli[5], and Bukalapak[6]. Searches were conducted in March 2024 using the scientific names of each *Nepenthes* species as keywords. Information on the type of plant materials offered (mature individuals, seedlings, seeds, or tissue culture bottles), source of materials (wild or propagation), stock availability, government permits or certifications, seller locations (provincial level), and prices were recorded. Notably, Blibli advertisements lacked available stock data, thus assumed values of one were assigned for potential trade valuation.

Data analysis involved summarizing the total number of *Nepenthes* species offered and the total number of sellers in each province. Trade volume for each species was calculated based on the number of individual plants sold, and trade value was derived by multiplying the number of individual plants sold by their respective prices across all e-commerce platforms. A similar analysis was conducted for available stock materials to gauge the potential market value of each species. We also compared the total trade volume and value of species listed under threatened categories of the IUCN Red List (i.e., Critically Endangered, Endangered, Vulnerable) with non-threatened species

3. RESULTS

3.1 Species traded and regulation compliance

We recorded 501 advertisements offering protected *Nepenthes* on the top five most visited e-commerce platforms in Indonesia. Tokopedia hosted the majority (449 or 89.6%) of these advertisements, followed by Shopee (29 or 5.8%), Blibli (21 or 4.2%), and Bukalapak (2 or 0.4%). No advertisements offering protected *Nepenthes* were found on Lazada. Among the protected *Nepenthes*, *N. bicalcarata* Hook.f. had the highest number of advertisements (100), followed by *N. mapuluensis* J.H.Adam & Wilcock (68), and *N. boschiana* Korth. (46) (Figure 1). Additionally, the following species were each offered by only one advertisement: *N. danseri* Jebb & Cheek, *N. dubia* Danser, *N. hamata* J.R.Turnbull & A.T.Middleton, *N. lavicola* Wistuba & Rischer, *N. lingulata* Chi C.Lee, Hernawati & Akhriadi, *N. lowii* Hook.f., and *N. spathulata* Danser.

Out of the 59 *Nepenthes* species protected under Indonesian regulation, 37 species (62.7%) were found to be offered on online markets. All the species offered were listed under CITES Appendix II, with 14 species (38%) classified as threatened with extinction: 5 species as Critically Endangered (CR), 3 as Endangered, and 6 as Vulnerable (Table 1) with 29 (78.3%) endemics to Indonesia. North Sumatra Province harbored the most traded *Nepenthes*, with 16 species, followed by West Sumatra and East Kalimantan with 12 and 11 species, respectively.

[1] https://cites.org/eng/app/appendices.php
[2] https://shopee.co.id
[3] https://www.tokopedia.com
[4] https://www.lazada.co.id
[5] https://www.blibli.com
[6] https://www.bukalapak.com

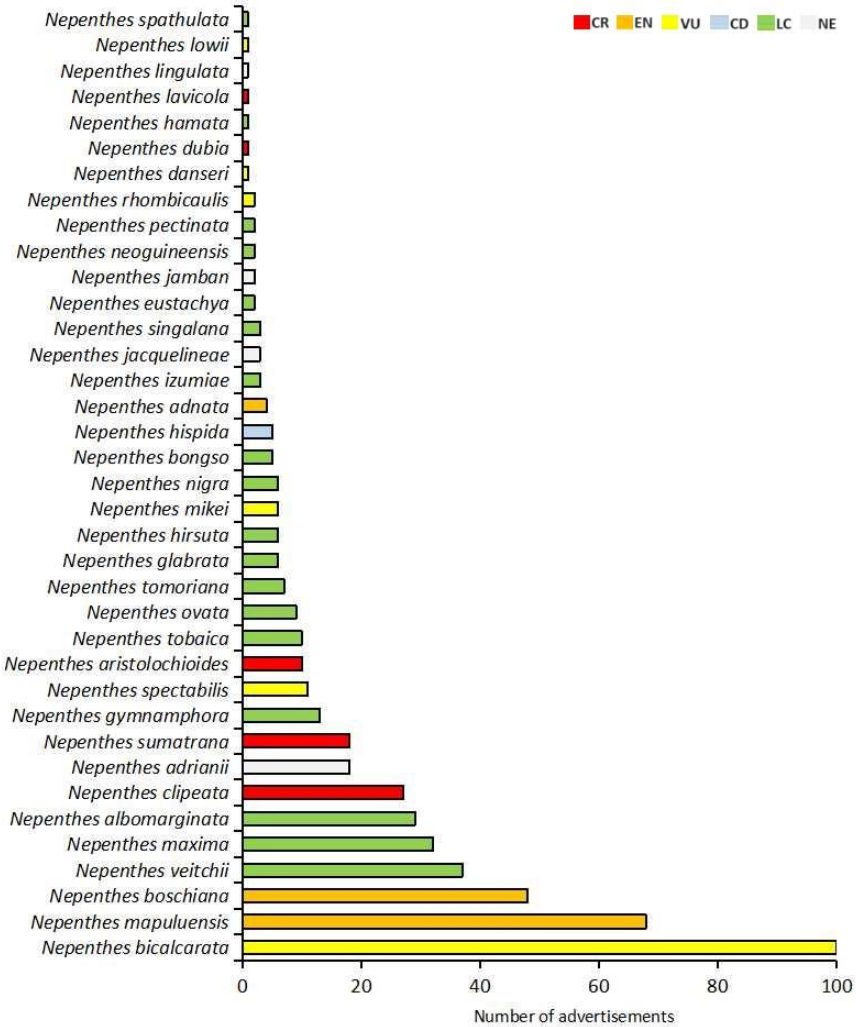

Figure 1. Number of advertisements of the Indonesian protected *Nepenthes* in the top five most visited e-commerce markets (i.e., Tokopedia, Shopee, Blibli, Bukalapak, and Lazada). CR (Critically Endangered), EN (Endangered), VU (Vulnerable), CD (Conservation Dependent), LC (Least Concern), and NE (Not Evaluated) represent the conservation status of each species according to the IUCN Red List.

We recorded that all sellers did not mention the required permit and certification to sell the protected *Nepenthes* in their advertisements. Most advertisements (63.1%) offered *Nepenthes* in the form of mature individuals, while only 27.9% and 10% offered seedlings and seeds, respectively (Figure 2A). None of the advertisements offered *Nepenthes* in the form of tissue culture bottles. Eighty-seven (17.4%) advertisements mentioned wild populations as the source of their *Nepenthes*, while only 14.4% declared their *Nepenthes* were from propagated sources (Figure 2B). The remaining advertisements did not provide any information about the source of their *Nepenthes*.

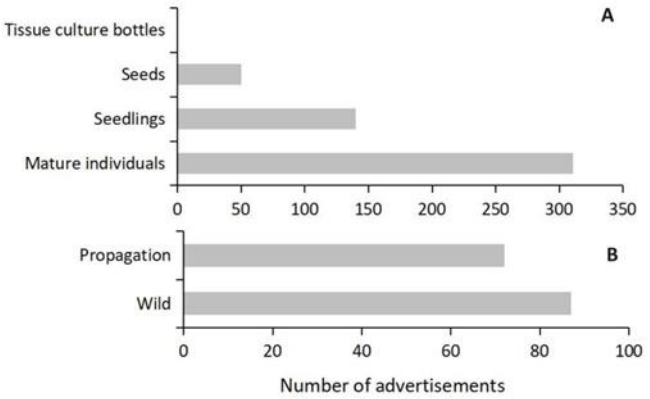

Figure 2. Number of advertisements of the Indonesian protected *Nepenthes* based on the type of plant materials offered (A) and their source (B)

3.2 Geographic pattern of sellers

There were 296 sellers who offered the Indonesian protected *Nepenthes* online, with the majority (89.2%) of them located on Java Island. Other sellers were found on the islands of Sumatra (19), Kalimantan (8), Bali (4 sellers), and Sulawesi (1). The sellers were *distributed* across 17 provinces in Indonesia. The capital city of Jakarta had the highest number of sellers (127), followed by West Java (58), East Java (41), and Central Java (24) (Figure. 3).

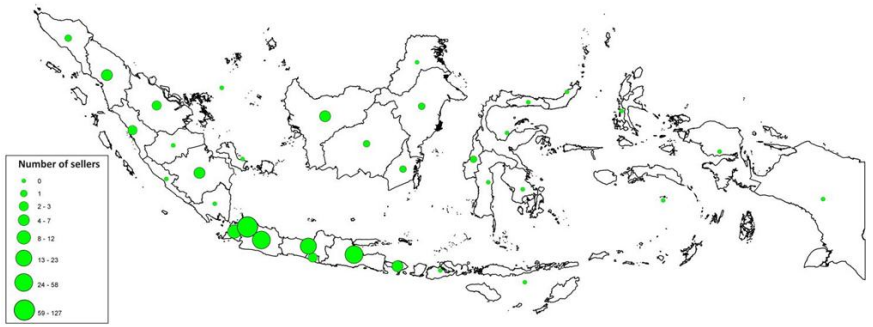

Figure 3. Map of Indonesia showing the provinces where the sellers were located during this research.

3.3 Trade volume and value

During this study, we documented 2,552 *Nepenthes* plants sold, amounting to a total trade value of IDR 56,660,000, equivalent to approximately USD $3,480 (Table 1). Additionally, sellers reported a stock of 536,757 plants, totaling a potential trade value exceeding IDR 92 billion (USD $5,664,000). *N. maxima* Reinw. emerged as the most traded species by volume, with 2,093 plants sold and over 119,000 plants available in stock. In terms of the price, *N. clipeata* Danser was ranked as the most expensive species, which was traded as high as IDR 6,668,000 for one mature individual and with 4 plants sold and 745 plants in stock (Table 1). The cheapest species was recorded for seeds of *N. maxima* Reinw., which was offered at IDR 1,980/seed pod.

Table 1. List of Indonesian protected *Nepenthes* offered on online markets and information on their endemicity, global conservation status according to the IUCN Red List, and trade volume and value. Indonesian endemic species are coded as 1 and non-endemic are coded as 0. For the IUCN Red List categories, CR, EN, VU, CD, LC, and NE are Critically Endangered, Endangered, Vulnerable, Conservation Dependent, Least Concern, and Not Evaluated, respectively.

No	Species name and authority	Indonesian endemic	IUCN Red List	Number of individuals sold	Number of available stock individuals	Price ranges (IDR)	Total trade value (IDR)	Potential trade value (IDR)
1	*Nepenthes aristolochioides* Jebb & Cheek	1	CR	5	101	100,000 - 795,000	566,000	68,336,000
2	*Nepenthes clipeata* Danser	1	CR	4	745	400,000 - 6,668,000	1,600,000	1,732,930,000
3	*Nepenthes dubia* Danser	1	CR	4	8	22000	88,000	176,000
4	*Nepenthes lavicola* Wistuba & Rischer	1	CR	0	10	120000	0	1,200,000
5	*Nepenthes sumatrana* (Miq.) Beck ex Tamin & M.Hotta	1	CR	17	741	35,000 - 350,000	1,305,000	118,452,200
6	*Nepenthes adnata* Tamin & M. Hotta ex Schlauer	1	EN	5	22	100,000 - 222,000	500,000	4,068,000
7	*Nepenthes boschiana* Korth.	1	EN	28	131588	105,000 - 302,000	3,680,000	17,126,533,356
8	*Nepenthes mapuluensis* J.H.Adam & Wilcock	1	EN	12	27452	100,000 - 860,000	2,465,000	14,397,927,070
9	*Nepenthes bicalcarata* Hook.f.	0	VU	96	2398	12,000 - 486,000	12,304,000	438,292,760
10	*Nepenthes danseri* Jebb & Cheek	1	VU	0	1	274000	0	274,000
11	*Nepenthes lowii* Hook.f.	0	VU	1	9	100000	100,000	900,000
12	*Nepenthes mikei* B.R.Salmon & Maulder	1	VU	10	255	50,000 - 500,000	1,010,000	97,798,000
13	*Nepenthes rhombicaulis* Sh.Kurata	1	VU	4	100193	150,000 - 250,000	900,000	25,028,950,000
14	*Nepenthes spectabilis* Danser	1	VU	10	485	100,000 - 500,000	1,250,000	81,575,000
15	*Nepenthes hispida* Beck	0	CD	5	14	12,500 - 165,000	125,000	756,500
16	*Nepenthes albomarginata* T.Lobb ex Lindl.	0	LC	13	146	25,000 - 225,000	760,000	12,824,500
17	*Nepenthes bongso* Korth.	1	LC	8	104	22,000 - 78,000	288,000	6,649,000
18	*Nepenthes eustachya* Miq.	1	LC	0	51	15,000 - 250,000	0	1,000,000

No	Species name and authority	Indonesian endemic	IUCN Red List	Number of individuals sold	Number of available stock individuals	Price ranges (IDR)	Total trade value (IDR)	Potential trade value (IDR)
19	*Nepenthes glabrat*a J.R.Turnbull & A.T.Middleton	1	LC	18	46	80,000 - 266,000	2,741,000	7,700,000
20	*Nepenthes gymnamphora* Reinw. ex Nees	1	LC	59	436	8,000 - 131,000	1,900,000	12,991,000
21	*Nepenthes hamata* J.R.Turnbull & A.T.Middleton	1	LC	4	1	800000	3,200,000	800,000
22	*Nepenthes hirsuta* Hook.f.	0	LC	1	213	100,000 - 1,612,000	100,000	278,728,000
23	*Nepenthes izumiae* Troy Davis, C.Clarke & Tamin	1	LC	6	24	22,000 - 118,000	216,000	1,328,000
24	*Nepenthes maxima* Reinw.	0	LC	2093	119542	1,980 - 500,000	7,665,000	15,132,194,790
25	*Nepenthes neoguineensis* Macfarl.	0	LC	0	2	200,000 - 282,000	0	482,000
26	*Nepenthes nigra* Nerz, Wistuba, Chi.C.Lee, Bourke, U.Zimm. & S.McPherson	1	LC	6	28	120,000 - 350,000	720,000	5,991,000
27	*Nepenthes ovata* Nerz & Wistuba	1	LC	21	457	100,000 - 1,200,000	3,850,000	174,324,000
28	*Nepenthes pectinata* Danser	1	LC	0	13	80,000 - 300,000	0	1,700,000
29	*Nepenthes singalana* Becc.	1	LC	2	68	50,000 - 254,000	100,000	9,977,000
30	*Nepenthes spathulata* Danser	1	LC	0	100	19000	0	1,900,000
31	*Nepenthes tobaica* Danser	1	LC	10	100238	50,000 - 525,000	1,285,000	8,555,850,000
32	*Nepenthes tomoriana* Danser	1	LC	3	55	50,000 - 140,000	250,000	7,536,000
33	*Nepenthes veitchii* Hook.f.	0	LC	32	50769	35,000 - 114,000	3,155,000	8,698,905,300
34	*Nepenthes adrianii* Bartoro & Wartono	1	NE	55	311	33,000 - 400,000	3,252,000	35,702,945
35	*Nepenthes jacquelineae* C.Clarke, Troy Davis & Tamin	1	NE	19	99	50,000 - 75,000	1,000,000	5,000,000
36	*Nepenthes jamban* Chi C.Lee, Hernawati & Akhriadi	1	NE	1	2	285,000 - 462,000	285,000	747,000
37	*Nepenthes lingulata* Chi C.Lee, Hernawati & Akhriadi	1	NE	0	30	75000	0	2,250,000

Our research found that although the number of advertisements for threatened *Nepenthes* species (298) exceeded those for non-threatened species (203), the total number of individuals sold (196) and the quantity of plants in stock (264,008) for threatened species were lower compared to non-threatened species, which reported 2,356 individuals sold and 272,749 plants available. Interestingly, while their total trade values (IDR 25,768,000 vs. IDR 30,892,000) were not significantly different, the potential trade value of threatened species (IDR 59,097,412,386) was nearly twice that of non-threatened species (IDR 32,955,337,035), indicating that threatened species commanded higher prices in the market.

4. DISCUSSION

Our study discovered that 37 *Nepenthes* species listed under Indonesian legislation were being sold online. Among these are Indonesian endemic and threatened species categorized as CR: *N. aristolochioides* Jebb & Cheek, *N. clipeata* Danser, *N. lavicola* Wistuba & Rischer, *N. dubia* Danser, and *N. sumatrana* (Miq.) Beck ex Tamin & M. Hotta. While the first three species are considered to be primarily threatened by illegal harvesting (Clarke, 2013; Clarke & Lee, 2014; Mahardika et al., 2023), the latter two face endangerment due to forest degradation and conversion (Clarke et al., 2000a; Clarke, 2014). The fact that these species were traded online, as shown by our study, will increase their extinction risk. Trade has been identified as a threat to 56 out of 123 *Nepenthes* species assessed in the IUCN Red List (Šetlíková & Berec, 2020).

We found that the number of advertisements for threatened *Nepenthes* species exceeded those for non-threatened species. Since threatened species typically have lower supply, their prices tend to be higher than those of non-threatened species. This could explain why the total number of individuals sold and the quantity of plants in stock for threatened species were lower compared to non-threatened species. Trade in these threatened species is likely to cause population decline and increase their risk of extinction.

Advertisements for the remaining 22 Indonesian protected *Nepenthes* species were not recorded in our study. However, this does not imply that these species are not traded online. For example, *N. densiflora* Danser, although not documented in our study, is found to be offered on English-language e-commerce websites such as https://www.hantsflytrap.com from the UK, https://predatoryplants.com/ from the USA, and https://www.bugbitingplants.com/ from the USA, with prices ranging from US $18 to $32.99 (authors' unpublished data). This species is endemic to Aceh Province and is currently assessed as Least Concern (Clarke, 2018a). Another unrecorded species is the globally vulnerable *N. ephippiata* Danser, endemic to Central Kalimantan Province (Clarke et al., 2000b): it was sold online for US $54 to $86 on websites like https://www.floravitro.com/ from Austria and https://wistuba.com/ from Germany. Further studies are necessary to assess the extent of trade of these protected *Nepenthes* species on English-language e-commerce platforms.

The number of advertisements offering protected *Nepenthes* on Tokopedia significantly exceeds those on Shopee or other online marketplaces. Despite Shopee's recognition as Indonesia's most frequented e-commerce platform, boasting around 157.9 million monthly visitors in 2023 (Ahdiat, 2023), a study by Putri & Setiono (2023) indicated that Tokopedia outperformed Shopee in terms of merchant services. This discrepancy potentially influences *Nepenthes* sellers' tendency to advertise on Tokopedia. Additionally, the lesser tendency of *Nepenthes* sellers to utilize Shopee for their advertisements may be linked to its strong association as a fashion-oriented e-commerce platform. A 2020 survey by Markplus revealed Shopee's dominant top-of-mind awareness among e-commerce platforms in the fashion sector (Herianto, 2023).

In our study, *N. bicalcarata* stood out as the most prominently showcased *Nepenthes* species, being featured in over 19% of the total advertisements documented. The species is assessed as globally Vulnerable according to the IUCN Red List and is known only from Borneo, where it is found in Kalimantan, Sabah, Sarawak, and Brunei Darussalam (Schnell et al., 2000; POWO, 2024). The high interest in *N. bicalcarat*a might be due to its unique characteristics, as identified by Merbach et al. (1999) possessing two well-developed, sharply pointed tooth- or thorn-like structures on the peristome, situated above the pitcher opening, b) secreting large amounts of nectar from extrafloral nectaries, c) frequently forming symbiotic relationships with ants, primarily *Camponotus schmitzi*, and d) featuring myrmecodomatia, defined as swollen, hollow tendrils typically utilized by *C. schmitzi* as nesting sites. Our data indicated that the species ranked among the most traded *Nepenthes*, with 96 plants sold and 2,398 plants listed in stock (Table 1). It was offered at prices ranging from IDR 12,500 to 486,000.

We observed that none of the sellers documented in the study mentioned that they had a permit for the *Nepenthes* they were offering. Our investigation revealed that a small proportion, 17.4% of the advertisements, indicated wild populations as the origin of their *Nepenthes*, while merely 14.4% declared their *Nepenthes* originated from propagated sources. Indonesian regulations stipulate that traded *Nepenthes* must originate from propagated sources, specifically second-generation offspring (F2) for species listed in Appendix I of CITES and first-generation offspring (F1) for those listed in Appendix II of CITES. Our findings indicate that the sellers did not comply with Indonesian trade regulations. The species were traded illegally, and while these species are designated as protected in name, they lack effective protection in practice. According to the Law Enforcement Unit of the Indonesian Ministry of Environment and Forestry (Direktorat Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan, 2023), the primary reasons for inadequate enforcement against illegal wildlife activities include a shortage of trained personnel, limited funding, poor coordination among stakeholders, and inadequate infrastructure.

Our study found that Java is a hub for the trade of protected *Nepenthes* in Indonesia. The majority (89.2%) of sellers were located on the island, with only 6.4% of sellers found in Sumatra, the island known for its high *Nepenthes* diversity. Furthermore, there were only 7 sellers found in North Sumatra, the province inhabited by the highest number (16 species) of protected *Nepenthes*. The important role of Java Island in wildlife trade in Indonesia is also evident for orchids (Santika, 2023), the most heavily traded plant group globally (Hinsley et al., 2018).

Trade data on *Nepenthes* species for Indonesia in the UNEP-WCMC-managed CITES Trade Database (see http://trade.cites.org, accessed 27 May 2024) is very limited. Only around 157 *Nepenthes* plants were reported to be exported from Indonesia in 1975-2024. During our study, we documented 2,552 protected *Nepenthes* specimens sold, along with an extra 536,757 reported as in stock. These figures are the first snapshot of the trade on Indonesian protected *Nepenthes* species. We believe that these numbers are clearly underestimated as we only recorded the trade on five e-commerce markets during a short period of time. Additionally, our research revealed *N. maxima* as the most traded species by quantity, with 2,093 plants sold and over 119,000 plants available. Prices ranged from as little as IDR 1,980 for its seed pod to as high as IDR 500,000 for fully grown individuals. *N. maxima* are native to Maluku, New Guinea, Sulawesi (POWO, 2024), and is currently assessed as Least Concern (Clarke, 2018b).

5. CONCLUSION

Our study unveiled insights into the scope of trading activities concerning nationally protected *Nepenthes* species on Indonesian online platforms. It revealed the presence of 37 protected *Nepenthes* species in Indonesia being illicitly traded online, with 501 advertisements placed by 296 vendors. Among these traded species, 14 (38%) are classified as threatened according to the IUCN Red List, which is likely to increase the risk of their extinction in the wild. We found that *N. bicalcarata* had the highest number of advertisements, while *N. maxima* emerged as the most traded species. Our results complement the data in the CITES database, which reported only a limited number of *Nepenthes* traded from Indonesia. Moreover, our investigation underscored the pivotal role of Java Island in the illegal trade of protected *Nepenthes* within Indonesia. These revelations hold significance for the Law Enforcement Unit of the Ministry of Environment and Forestry and for the Police as law enforcement agencies, enabling them to pinpoint crucial actors and regions engaged in such trade. Conservationists and policymakers can also leverage this data to discern traded species and prioritize those most threatened with extinction, thereby informing potential conservation actions and protective measures. Furthermore, reassessment of the conservation status of all traded species, especially those endemic to Indonesia, is urgently needed to more accurately depict the actual extinction risk of these species and to guide prioritization of conservation actions.

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