

HPU2 Journal of Sciences: Natural Sciences and Technology

TAP CHÍ KHOA HOC

Journal homepage: https://sj.hpu2.edu.vn

Article type: Research article

Some data about endangered and rare plant species in Me Linh Station for Biodiversity, Vinh Phuc province

Thuy-Diu Tran^{a,b}, Thi-Nga Tran^{a,c}, Thi-Phuong Dong^{a,d*}, Thanh-Hoa Mai^c, Minh-Tam Ha^a

^aHanoi Pedagogical University 2, Vinh Phuc, Vietnam ^bVietnam Russia Vocational Training College 1, Vinh Phuc, Vietnam ^cTran Nguyen Han Secondary School, Bac Giang, Vietnam ^dLuong The Vinh High School, Hanoi, Vietnam ^eTay Bac University, Son La, Vietnam

Abstract

Me Linh Station for Biodiversity has an area of 170.3 hectares, near Tam Dao National Park. Although the area is not large, it has with high biodiversity and rich flora, including many rare and threatened plant species. So, this place not only preserves biodiversity but also organizes research and educational activities to protect biodiversity and the environment. Some research projects have been done on species diversity, ecosystem diversity, and forest biomass... This study identifies 38 endangered and rare plant species. Among them, 20 species in *Vietnam Red Data Book 2007; 20* species belong to *Decree No. 84/2021/ND-CP;* 16 species belong to *Appendix II of CITES (2024)*, and 4 species belong to IUCN (2024). Simultaneously, this study added summary information about the conservation status, life forms, geographical factors, and uses of 38 plant endangered and rare species in Me Linh Station for Biodiversity, Vinh Phuc province.

Keywords: Endangered plant, rare plant, life forms, geographical factors, uses, Me Linh Station for Biodiversity

1. Introduction

Me Linh Station for Biodiversity has an area of 170.3 hectares, near Tam Dao National Park. This place not only preserves biodiversity but also organizes research and educational activities to protect biodiversity and the environment. According to statistics, the flora here currently has 852 plant

^{*} Corresponding author, E-mail: dongphuong291299@gmail.com

https://doi.org/10.56764/hpu2.jos.2024.3.3.52-59

Received date: 16-9-2024 ; Revised date: 08-10-2024 ; Accepted date: 05-11-2024

This is licensed under the CC BY-NC 4.0

species, which are endangered and rare. These plant species play an essential role in nature and are of great value to humans, requiring in-depth research and updating their current status. Up to now, there has been some of research on species diversity. A study by S. C. Kim, N. V. Sinh, and D. V. Hai describes some of the typical plant species in this area, including some endangered and rare plant species [1]. D. V. Hai, N. T. Cuong, R. K. Choudhary, Z. Lin, and Y. Deng discovered and announced *Cosmianthemum melinhense* - a new species from the Me Linh Station for Biodiversity [2]. However, in-depth research on endangered and rare plant species has not been mentioned. Therefore, we have research endangered and rare plant species here to provide a database to protect biodiversity and the environment.

2. Research methods

To research endangered and rare species in Me Linh Station for Biodiversity, we used a method described by N. N. Thin in references [3] and [4]. This method is based on the characteristics of plant organs, especially the reproductive organs.

2.1. Study area and sample collection

The study area was in Me Linh Station for Biodiversity; data collection was carried out during field trips to sample, photograph, observe, and to record the characteristics of specimens in their living state, observing their distribution, habitat, and other characteristic.

2.2. Classification

Specimens were analyzed from whole to detail, from outside to inside where the analysis was combined with the description. Then, the monographs were used to classify. The species names were identified by using a comparative morphological method based on P. H. Ho's works [5]–[7] and Flora of Vietnam [8]–[11]. The nomenclature of species was accorded to Flora of Vietnam and Checklist of plant species of Vietnam [12]–[14]; the species names were updated according to The Plant list [15].

2.3. Conservation status assessment

The conservation status assessment was based on the classification of the Vietnam Red Book part II – Plants [16], Decree no. 03/VBHN-BTNMT [17], Decree no. 84/2021/ND-CP [18], CITES [19], and IUCN [20].

2.4. Life form and geographical element classification

Life forms (biological spectrum) were based on the division scale of Raunkiær [21], geographical factors [22], and plant resources in T. M. Hoi's work [23].

3. Results and discussion

3.1. Conservation value of plant species in the Me Linh Station for Biodiversity

We have been determined 38 endangered and rare plant species in Me Linh Station for Biodiversity, Table 1. In Table 1, the life form was denoted base on the Raunkiaer's work [21]. Ph (Phanerophytes) includes Mg (Megaphanerophytes: over 30 meters high), Me (Mesophanerphytes: from 8 to 30 meters high), Mi (Microphanerophytes: from 2 to 8 meters high), and Na (*Nanaphanerophytes*: from 0.5 to 2 meters high). Some abbreviations including Ch (Chamerophytes), Hm (Hemicryptophytes), Cr (Cryptophytes), Ep (Epiphytes phanerophytes), and Lp (Lianes phanerophytes).

		X 7 . 4	1.0			Conservation value					
						National International					
TT	Science names	Vietnam	Life	Geographical	Uses	Red	-				
		names	form	element	0.505	data	Decree	ILICN	CITES		
						11-	84	IUUN	CILLS		
			DOLL			DOOK					
			POLY	PODIOPHYTA							
		1	1.	Cyatheaceae	1	1	1	1			
	Cyathea gigantea	Ráng gỗ									
1.	(Wall. ex Hook)	Rang go	Mi	19	Or, M		IIA		P1.II		
	Holttum	nnan									
			2. I	Dicksoniaceae							
	Cibotium barometz	Lông cu									
2.	(L) I Sm	li	Ch	29	Or, M		IIA		Pl.II		
	(1.) 5. 5111.	11	3 1	Polypodiaceae			I				
	3. Polypodiaceae										
3.	Drynaria bonii Chr.		Ep	18	М	VU	IIA				
	2	bo									
			MAG	NOLIOPHYTA							
			DICO	TYLEDONEAE							
L			4 . <i>A</i>	Anacardiaceae							
4	Gluta laccifera (Pierre)	G 1	M	17	W/ T	X/TT					
4.	Ding Hou	Son huyet	Mg	17	W, L	VU					
		1	5	Annonaceae		1					
	Goniothalamus	Giác đế	5.								
5.	takhtajanji Don	tom đảo	Mi	16	W	CR					
		tani uao	(A							
	D 10	D	0								
6.	Rauvolfia verticillata	Ba gạc	Mi	17	М	VU					
0.	(Lour.) Baill.	vòng		17							
			7. A	ristolochiaceae							
7.	Asarum glabrum Merr.	Hoa tiên	Hm	17	М	VU					
			8.	Burseraceae							
	Canarium nimela K.			10	W. F.						
8.	D. Koenig	Trám đen	Me	18	M	VU					
	Diffeeing		9.0	ampanulaceae	111						
	Codonongia imanica		<i>.</i> . C								
9.	(Dhuma) Haala f	Đẳng sâm	Lp	33	M	VU	IIA				
	(Blume) Hook. I.	Ũ									
	1	T	1	0. Fabaceae							
10	Dalbergia assamica	Co khet	Me	17	WМ				P1 II		
10.	Benth.	Cộ khột		17	,				1 1.11		
11	Dalbergia rimosa	Trắc đây	In	21	м		ПА		DIII		
11.	Roxb.	Trac day	Lp	21	IVI		IIA		P1.11		
			1	1. Fagaceae							
1.0	Castanopsis ferox										
12.	(Roxb.) Spach	Dé gai	Me	17	W	VU					
	Castanonsis tossollata	Cà ổi lá									
13.	Hick & A Com	do la	Me	17	W	VU					
12. Lauraceae											
14.	Cinnaaenia paniculata	Khao	Me	33	W.E	VU		VU			
L	(Hook.f.)Kosterm.	xanh			, 2						
13. Menispermaceae											
15	Stephania dielsiana Y.	Ců dàm	T	10	м				7		
15.	C. Wu	Cu dom	гр	18	IVI	VU	IIA				
16.	Stephania longa Lour.	Lưỡi tiền	Ch	17	М		IIA				
	Stenhania rotunda		~	- ,							
17.	I our	Bình vôi	Cr	21	M		IIA				
	Tinospong aggittata										
18.	(Oliv) Communication	Củ gió	Ch	13	М	VU					
L	(Oliv.) Gagnep.	L Č									

Table 1	Comprehensi	ve checklist of	endangered at	nd rare plant s	necies in M	e Linh Station	for Biodiversity
Table 1.	comprehensi	ve enceknist of	endangered a	ia raie prant s	pecies in m		Tor Droutversity

https://sj.hpu2.edu.vn

		Science names	Vietnam names	Life form	Geographical		Conservation value					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	ТТ					Uses	National		International			
Image: Second							Red					
$\begin{tabular}{ c c c c c c } \hline c c c c c c c c c c c c c c c c c c $					element		data	Decree	IUCN	CITES		
14. Myrsinaceae19.Ardisia silvestris Pit.Lá khôiHm16MVUImage: Colspan="4">VU20.Embelia parvifora Wall. ex A. DC.Thiên İý NurongCh25MVUImage: Colspan="4">VU21.Melientha suavis Pierre (Dubard) H. J. LamRau sângMi17VVUENImage: Colspan="4">VU22.Madhuca pasquieri (Dubard) H. J. LamSên mậtMg13W, Oil, MVUENImage: Colspan="4">Image: Colspan="4">VU23.Kadsura coccinea (Lem, A. C. SmithNám comLp17MIIAImage: Colspan="4">Image: Colspan="4"25.Colona poilanei 							book	84				
	14. Myrsinaceae											
20.Embelia parvilora Wall. ex A. DC.Thien Iý huongCh25MVUImage: constraint of the state of the stat	19.	Ardisia silvestris Pit.	Lá khôi	Hm	16	М	VU					
20.Wall, ex A. D.C.hươngCi2.5MVU \sim 15. Opiliaceae21. Melientha suavis PierreRau sắngMi17VVU \sim 16. Sapotaceae7. Kadsura coccinea21.Madhuca pasquieriSén mậtMg13Ni,VUEN7. Schisandraceae7. Schisanthes tetu Andr.Sâm cauCr21MVUIIAM7. Saparagaceae7. Peliosanthes tetu Andr.Sâm cauCr21MVUIIAPI. II10. Schisanthes tetu Andr.Sâm cauCr21OrIIAPI. II9. BulbophyllumCâu diệp gambleCr10 orIIAPI. II11. Dendrobum nobile Bulbophyllum, fischeriTong gambleIIAPI. II11. Schisanthe Cr11OrIIAPI. II11. Schisanthe Cr <td< td=""><td>20</td><td>Embelia parviflora</td><td>Thiên lý</td><td>Ch</td><td>25</td><td>м</td><td>VII</td><td></td><td></td><td></td></td<>	20	Embelia parviflora	Thiên lý	Ch	25	м	VII					
15. Opliaceae15. Opliaceae16. Sapotaceae16. Sapotaceae22. Madhuca pasquieri (Dubard) H. J. LamNám cmII.7. Schisandraceae23. Kadsura coccinea (Lem.) A. C. SmithNám comLp17. Schisandraceae24. Maultaria crassna Pierre ex LecomteNám comLp17. W. M. W. M. EIIAColona poilanei Gagnep.Co mai nháp lá mháp lá Me13. WNTOSIONOTYLEDONEAE 20. Convallariaceae21. Asparagaceae21. Asparagaceae21. Asparagaceae22. Orchidaceae21. Asparagaceae22. OrchidaceaeUSINGROUP MILLAnoectochlur, Bistaria gamble Gainby Staria gambleTI21. Asparagaceae21. Asparagaceae21. Asparagaceae21. Asparagaceae21. Anoectochlur, Bistaria Bublophyllum (Scheri Lindl.Jong Bublophyllum CrIIAOrIIAPi IIAdvactochlur, Andr.Sim colspan="4">Advactochlur, Andr.Asparagaceae21. Asparagaceae21. Aspa	20.	Wall. ex A. DC.	hương	Cli	23	111	10					
21. Melientha suavis Pierre Rau sâng Mi 17 V VU Image: Constraint of the second se				15	5. Opiliaceae							
16. Sapotaceae22.Madhuca pasquieri (Dubard) H. J. LamSén måtMg13W, Oil, MVUEN17. Schisandraceae17. Schisandraceae17. Schisandraceae18. Thymelaeaceae19. Tiliaceae25.Colona poilanei Gagnep.Or mai nháp lá nhóMM13WW26.Disporopsis longifolia tinh hoaCr21MVUIIA28.Monotothilas Gagnep.Giái thiy to and rahóCr21MVUIIAPlisporopsis longifolia tinh hoaCr21MVUIIAPlisporopsis longifolia tinh hoaCr21MVUIIAPlisporopsis longifolia tinh hoaCr21MVUIIAPlisporopsis longifolia tinh hoaCr21MVUIIAPlisporopsis longifolia tinh hoaCr18Or, MIIA<	21.	Melientha suavis Pierre	Rau sắng	Mi	17	V	VU					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		16. Sapotaceae										
InterpretationInterpretationInterpretationInterpretation23.Kadsura coccinea (Lem.) A. C. SmithNám com LpIp17MIIA24.Aquilaria crassna Pierre ex LecomteTråm hurongMi17W, M, EENCRPI.II24.Aquilaria crassna Pierre ex LecomteTråm hurongMi17W, M, EENCRPI.II25.Colona poilanei Gagnep.Co mai nháp lá nhóMe13WNTNTVONOTYLEDONEAE20. Convallariaceae21. Asparagaceae21. Asparagaceae21. Asparagaceae22. Orchidaceae28.Anoectochilus brevilabris Lindl.Giải thủy ba rằngCr18Or, MENIAPI. II29.Bulbophyllum Scidenf.Câu điệp gambleHm21OrIIAPI. II30.Bulbophyllum fischeri Scidenf.Long gambleHm21OrIIAPI. II31.Dendrobium nobile Lindl.Thách hoệEp25Or, MIIAPI. II33.Geodorum densiflorum (Lamk) Schlecht.Dia kim rahaCr21OrIIAPI. II34.(Lindl.) Benth, x. C. IIáCr13Or, MIIAPI. II35.Tainia wiridifisca ráina wiridifisca tidiémEp23OrIIAPI. II <td>22.</td> <td>Madhuca pasquieri</td> <td>Sến mật</td> <td>Mg</td> <td>13</td> <td>W,</td> <td>VU</td> <td></td> <td>EN</td> <td></td>	22.	Madhuca pasquieri	Sến mật	Mg	13	W,	VU		EN			
23.Kadsura coccinea (Lem.) A. C. SmithNám comLp17MIIA24.Aquilaria crassna Pierre ex LecomteTrầm hươngMi17W, M, EENCRPI.II24.Aquilaria crassna Pierre ex LecomteTrầm hươngMi17W, M, EENCRPI.II25.Colona poilanei Gagnep.Co mai nhấp là nhốMe13WNTNT25.Colona poilanei Gagnep.Co mai nhấp là nhốMe13WNTNT26.Disporopsis longifolia Craib.Hoàng CrCr21MVUIIA27.Peliosanthes teta Andr.Sâm cauCr21MVUIIA28.Anoectochilus bervilabris Lindl.Giải thỳ ba râng gambleCr18Or, MENIAPI. II29.Sulbophyllum fischeri Lindl.Long gambleHm21OrIIAPI. II30.Bulbophyllum fischeri Lindl.Long gambleGr17OrIIAPI. II33.Geodorum densiflorum (Lamk.) Schlecht.Dia kim hoa dayCr21OrIIAPI. II34.(Lindl.) Benth, ex C. B. ChichesIáGa day CrCr21OrIIAPI. II34.Ga doyer afoliosa (Lindl.) Benth, ex C. B. CrIáGa day CrCr21OrIIAPI. II35.Tainia wi		(Dubard) H. J. Lam		17.5	Schisandraceae	Oil, M						
23.(Lem.) A. C. SmithNăm comLp17MIIAIII Tiliaceae24.Aquilaria crassna Pierre ex LecomteTrầm hươngMi17W, M, EENCRPLII19. Tiliaceae25.Colona poilanei Gagnep.Co mai nhắp lầ nhỏMe13WNTNT20. Convallariaceae20. Convallariaceae20. Convallariaceae21. Asparagaceae21. Asparagaceae21. Asparagaceae28.Anoectochilus brevilabris Lindl.Giải thủy ba rằngCr18Or, MENIAPI. II29.Bulbophyllum Concinnum Hook, f.Câu điệp gambleHm21OrIIAPI. II30.Bulbophyllum nobile Lindl.Thạch hôcEp25Or, MIIAPI. II31.Dendrobium nobile Lindl.Thach hôcEp25Or, MIIAPI. II33.Geodorum densiflorum (Lamk.) Schlecht. Mo dâyCr21OrIIAPI. II35.Taina viridifusca (Hook, Benth. xanh nâuTài lan xanh nâuCr13Or, MIIAPI. II36.Chiled Lur.điềm Lindl.Ep23OrIIAPI. II37.Taina viridifusca (Hook, Benth. xanh nâuEp23OrIIAPI. II36.Tainia viridifusca (L		Kadsura coccinea		-								
18. Thymelaeaceae24.Aquillaria crassna Pierre ex LecomteTrầm hươngMi17W, M, EENCRPI.II25.Colona poilanei Gagnep.Co mai nhấp lắ nhốMe13WNTNT25.Colona poilanei Gagnep.Co mai nhấp lắ nhóMe13WNTNT26.Disporopsis longifolia Craib.Hoàng TinhoCr21MVUIIA27.Peliosanthes teta Andr.Sâm cauCr21MVUIIA28.Anoectochilus brevilabris Lindl.Giải thủy brevilabris Lindl.Giải thủy xinhCr18Or, MENIAPI. II29.Bulbophyllum concinum Hook. f. gambleCâu diệp xinhHm21OrIIAPI. II30.Seidenf. gambleLong HoHm21OrIIAPI. II31.Lindl. Lindl.Dandrobium nobile hộcThach hộcEp25Or, MIIAPI. II33.Geodrum densiflorum (Lank.) Schlecht. h(chick.Dia kim kanh nâuCr21OrIIAPI. II34.Goodyera foliosa (Lank.) Schlecht. centinged Lour.Tài lan kanh nâu kanh nâuCr21OrIIAPI. II35.Taina viridifusca (Lindl.) Benth. centinged Lour.Tài lan kanh nâu kanh nâuCr13Or, MIIAPI. II36.Trichotosia pulvinata <b< td=""><td>23.</td><td>(Lem.) A. C. Smith</td><td>Năm cơm</td><td>Lp</td><td>17</td><td>M</td><td></td><td>IIA</td><td></td><td></td></b<>	23.	(Lem.) A. C. Smith	Năm cơm	Lp	17	M		IIA				
24.Aquilaria crassna Pierre ex LecomteTrầm hươngMi17W, M, EENCRPI.II25.Colona poilanei Gagnep. $\stackrel{Co}{nai}$ nhóMe13WNTNT25.Colona poilanei Gagnep. $\stackrel{Co}{nai}$ nhóMe13WNTNT26.Disporopsis longifolia Craib.Hoàng Thinh hoaCr21MVUIIA7.Peliosanthes teta Andr.Sâm cauCr21MVUIIA28.Anoecochilus brevilabris Lindl.Giải thủy ba rằng Scidenf.Cr18Or, MENIAPI. II29.Bulbophyllum fischeri scidenf.Giải thủy ang angCr18Or, MIIAPI. II30.Seidenf. gamble Indiana in the continue mobile Lindl.Thach hộcEp25Or, MIIAPI. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPI. II33.Geodorum densiforum (Lindl.) Benth. ex C. B. ClarkeHáo lan láCr21OrIIAPI. II34.Goodyera foliosa (Hook) Benth.Tài lan xanh nâuCr13Or, MIIAPI. II35.Taina viridifusca (Hook) Benth. Child Lindl.Tài lan xanh nâuCr13Or, MIIAPI. II36.Trinixopermum (Hook) Benth.Bach chiệnEp23OrIIAPI. II <td< td=""><td></td><td></td><td></td><td>18. 7</td><td>Thymelaeaceae</td><td>1</td><td></td><td></td><td></td><td></td></td<>				18. 7	Thymelaeaceae	1						
24.Pierre ex LecomtehuongMI17EENCRFLI19. Tiliaceae25.Colona poilanei Gagnep.Comai nháp lá nhóMe13WNTNT26.Colona poilanei Garaib.Cr21MVUIIANT20. Convallariaceae26.Disporopsis longifolia Craib.Hoàng tinh hoaCr21MVUIIA21. Asparagaceae22. Orchidaceae22. Orchidaceae28.Anoectochilus brevilabris Lindl.Giải thủy ba răng gambleCr18Or, MENIAPI. II29.Bulbophyllum Scidenf.Caù diệp gambleHm21OrIIAPI. II30.Bulbophyllum Scidenf.Caù diệp gambleHm21OrIIAPI. II31.Dendrobium nobile Lindl.Thach hôcEp25Or, MIIAPI. II33.Goodyara foliosa (Lamk.) Schlecht.Hào lan lâCr21OrIIAPI. II34.(Lindl.) Benth. ex C. B. ClarkeTài lan lâCr13Or, MIIAPI. II35.Tainia virid/fusca (Lamk.) Schlecht.Tài lan dâiCr13Or, MIIAPI. II35.Tainia virid/fusca (Lindl.) Benth. xanh nă (Hook.) Benth.Mao làn chi enEp23OrIIAPI. II	24	Aquilaria crassna	Trầm	м	17	W, M,	EN		CD	DIII		
19. Tiliaceae25. $Colona poilaneiGagnep.Co mainháp lánhóMe13WNTNTMONOTULEDONEAE20. Convallariaceae20. Convallariaceae21. Asparagaceae21. Asparagaceae21. Asparagaceae22. Orchidaceae28.Anoectochilusbrevilabris Lindl.Giải thủyba rănggambleCr18Or, MENIAPI. II29.Bulbophyllum ficheriseident.Câu diệpgambleHm21OrIIAPI. II30.Seident.Seident.Cr17OrIIAPI. II31.Dendrobium nobileLindl.ThachhộcEp25Or, MIIAPI. II33.Geodorum densiflorum(Lindl.) Benth. ex C.B. ClarkeHáo lanláCr21OrIIAPI. II34.(Lindl.) Benth. ex C.(Lindl.) Benth. ex C.B. ClarkeHáo lanláCr21OrIIAPI. II35.Tainia viridificaa(Hook.) Benth.xanh nâuAt hanCrCr13Or, MIIAPI. II36.Trichotosia pulvinata(Hook.) Benth.Schlecht.Tái lananh nâucentiged alour.Cr13OrIIAPI. II37.Torinosanum (Hayata)centiged alour.GiáEp23OrIIAPI. II38.Trichotosia pulvinatacentiged alour.Mao tir$	24.	Pierre ex Lecomte	hương	IVII	17	Е	EIN		СК	P1.11		
25.Colona poilanei Gagnep.Co mai nháp lá nháp lá nháp lá nháp lá nháp lá nháp lá nháp lá nháp lá nháp lá nháp lá nhóMe13WNTNTMONUTYLEDONEAE TUREDONEAE 20. Convallariaceae20. Convallariaceae20. Convallariaceae20. Convallariaceae21. Asparagaceae22. Orchidaceae22. Orchidaceae28.Anoectochilus brevilabris Lindl.Giải thủy ba rằng ba rằng ba rằngCr18Or, MENIAPl. II29.Bulbophyllum Scidenf.Câu diệp gambleHm21OrIIAPl. II30.Bulbophyllum Scidenf.Chang gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPl. II33.Geodorum densiflorum (Lamk) Schlecht.Hào lan LindCr21OrIIAPl. II34.(Lindl.) Benth, ex C. B. ClarkeHào lan LindCr21OrIIAPl. II35.Tainia viridifusca (Hook) Benth, schlecht.Tái lan Anh nầu Anh nầu Anh nầu CrCr13Or, MIIAPl. II36.Thrixspernum (Lindl.) Benth, anh nầu CrEp23OrIIAPl. II37.Thrixspernum (chook) Benth, Schlecht.Mao từ dài loan CrEp33Or <td< td=""><td></td><td></td><td></td><td>1</td><td>9. Tiliaceae</td><td></td><td></td><td></td><td></td><td></td></td<>				1	9. Tiliaceae							
25.Correction of aggnep.nháp lá nhóMe13WNTGagnep.nháp lá nhóMe13WNTMONOTYLEDONEAE20. Convallariaceae20. Convallariaceae21. Asparagaceae21. Asparagaceae27. Peliosanthes teta Andr.Sâm cauCr21MVUIIA22. Orchidaceae28.Anoectochilus brevilabris Lindl.Giải thủy ba răng gambleCr18Or, MENIAPl. II29.Bulbophyllum concinuum Hook f.Cầu diệp xinhHm21OrIIAPl. II30.Bulbophyllum fscheri Seidenf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Dia kim hoa dàyCr21OrIIAPl. II34.(Lindl.) Benth. ex C. B. ClarkeHão lan lắCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan anh nâu anh nâuCr13Or, MIIAPl. II36.Thrixspernum centiged Lour.Giải dan dầt loanEp23OrIIAPl. II37.Jornosanun (Hayata) schlecht.Mao từ dầi loanEp23OrIIAPl. II		Colona poilanei	Cọ mai									
MONOTYLEDONEAEMONOTYLEDONEAE20. Convallariaceae26.Disporopsis longifolia Craib.Gr21. Asparagaceae27.Peliosanthes teta Andr.Sâm cauCr21. Asparagaceae27.Peliosanthes teta Andr.Sâm cauCr21. MVUIIAPeliosanthes teta Andr.Cai diâpCr21MVUIIAPeliosanthes teta Andr.Cr18Or, MENIAPeliosanthes teta Andr.Cr118Or, MIIAPI. II29.Concinnum Hook.F.II <th co<="" td=""><td>25.</td><td>Gagnen.</td><td>nháp lá</td><td>Me</td><td>13</td><td>W</td><td></td><td></td><td>NT</td><td></td></th>	<td>25.</td> <td>Gagnen.</td> <td>nháp lá</td> <td>Me</td> <td>13</td> <td>W</td> <td></td> <td></td> <td>NT</td> <td></td>	25.	Gagnen.	nháp lá	Me	13	W			NT		
MONOTYLEBONEAE20. Convallariaceae20. Convallariaceae26.Disporopsis longifolia Craib.Hoàng tinh hoaCr21MVUIIA27.Peliosanthes teta Andr.Sâm cauCr21MVUIIA28.Anoectochilus brevilabris Lindl.Giải thủy ba rằng Bulbophyllum Câu diệp gambleCr18Or, MENIAPl. II29.Bulbophyllum concinnum Hook. f.Câu diệp sinhHm21OrIIAPl. II30.Bulbophyllum Seidenf.Câu diệp gambleHm21OrIIAPl. II30.Bulbophyllum Seidenf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPl. II32.Epipogium roseum (D. Don) Lindl.Thuợng lanCr21OrIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht. hoa dàyCr21OrIIAPl. II34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeTài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centiged Lour.Bach diểmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao từ dãi loan centiged Lour.Ep23OrIIAPl. II38.Trichotosia pulvinata dâi loan schlecht.		oughtp:	nhỏ									
20. Convaliariaceae26.Disporopsis longifolia Craib.Hoàng tinh hoaCr21MVUIIA27.Peliosanthes teta Andr.Sâm cauCr21MVUIIA27.Peliosanthes teta Andr.Sâm cauCr21MVUIIA28.Anoectochilus brevilabris Lindl.Giải thủy ba răng concinnum Hook. f.Giải thủy tainhCr18Or, MENIAPl. II29.Bulbophyllum concinnum Hook. f.Câu diệp xinhHm21OrIIAPl. II30.Bulbophyllum fischeri gendelf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thạch hộcEp25Or, MIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Dia kim hoa dàyCr21OrIIAPl. II34.Goodyera foliosa (Ichok.) Benth. ex C.Háo lan ká ká diểmCr13Or, MIIAPl. II36.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II37.Trichotosia pulvinata Schlecht.Mao từ diễnEp23OrIIAPl. II38.Trichotosia pulvinata schlecht.Mao lan centiged Lour.Ep23OrIIAPl. II				MONC	<u>DTYLEDONEAE</u>							
26.Disporpsis tongyond Craib.Hoang tinh hoaCr21MVUIIA21. Asparagaceae27.Peliosanthes teta Andr.Sâm cauCr21MVUIIA22. Orchidaceae28.Anoectochilus brevilabris Lindl.Giải thủy ba rằng CrCr18Or, MENIAPl. II29.Bulbophyllum concinnum Hook. f.Cầu diệp xinhHm21OrIIAPl. II30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPl. II33.Geodorum densiforum (Lamk.) Schlecht. B. ClarkeThái lan xanh nâuCr21OrIIAPl. II34.Goodyera foliosa (Hook.) Benth.Tái lan xanh nâuCr13Or, MIIAPl. II36.Traina viridifusca (Hook.) Benth.Tái lan xanh nâuCr13Or, MIIAPl. II37.Trichotosia pulvinata Schlecht.Mao từ diễi loan schlecht.Ep23OrIIAPl. II38.Trichotosia pulvinata schlecht.Mao từ diễnEp23OrIIAPl. II38.Trichotosia pulvinata schlecht.Mao lan céEp21OrIIAPl. II		Dim maria lanaifalia	Habra	20. 0	Jonvallariaceae							
21. Asparagaceae27.Peliosanthes teta Andr.Sâm cauCr21.MVUIIA28.Anoectochilus brevilabris Lindl.Giải thủy ba rằng concinnum Hook. f.Cr18Or, MENIAPl. II29.Bulbophyllum concinnum Hook. f.Chủ diệp gambleHm21OrIIAPl. II30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thạch hộcEp25Or, MIIAPl. II32.Epipogium roseum (D. Don) Lindl.Thương lanCr17OrIIAPl. II33.Geodorum densiflorum (Lank.) Schlecht.Địa kim hoa dâyCr21OrIIAPl. II34.(Lindl.) Benth, ex C. B. ClarkeHảo lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâu centiped Lour.Cr13Or, MIIAPl. II36.Thrixspermum formosanum (Hayata) Schlecht.Mao từ dải loan centiped Lour.Ep23OrIIAPl. II37.Trichotosia pulvinata formosanum (Hayata) Schlecht.Mao từ dải loanEp21OrIIAPl. II38.Trichotosia pulvinata formosanum (Hayata) Schlecht.Mao từ dài loanEp21OrIIAPl. II	26.	Craib	tinh hoa	Cr	21	М	VU	IIA				
27.Peliosanthes teta Andr.Sâm cauCr21MVUIIA28.Anoectochilus brevilabris Lindl.Giải thủy ba răng Bulbophyllum Cầu diệp gambleCr18Or, MENIAPl. II29.Bulbophyllum Scidenf.Câu diệp gambleHm21OrIIAPl. II30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thạch hộcEp25Or, MIIAPl. II32.Epipogium roseum (D. Don) Lindl.Thuợng lanCr21OrIIAPl. II33.Geodorum densiflorum (Lamk) Schlecht.Địa kim hoa dàyCr21OrIIAPl. II34.(Lindl.) Benth. ex C. B. ClarkeHào lan lấCr13Or, MIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspernum formosanum (Hayata) Schlecht.Mao từ dải loan schlecht.Ep23OrIIAPl. II37.Trichotosia pulvinata formosanum (Hayata) Schlecht.Mao từ dải loan schlecht.Ep21OrIIAPl. II38.Trichotosia pulvinata formosanum (Hayata) Schlecht.Mao từ dải loan schlecht.Ep21OrIIAPl. II38.Trichotosia pulvinata formosanum (Hayata) Schlecht. <td< td=""><td></td><td>Cialo.</td><td>unn noa</td><td>21</td><td>Asparagaceae</td><td></td><td></td><td></td><td></td><td></td></td<>		Cialo.	unn noa	21	Asparagaceae							
28.Anoectochilus brevilabris Lindl.Giải thủy ba răng ba răngCr18Or, MENIAPI. II29.Bulbophyllum concinnum Hook, f.Cầu diệp xinhHm21OrIIAPI. II30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPI. II31.Dendrobium nobile Lindl.Thạch hộcEp25Or, MIIAPI. II32.Epipogium roseum (D. Don) Lindl.Thạch lanEp25Or, MIIAPI. II33.Geodyara foliosa (Lamk.) Schlecht.Đại kim láCr21OrIIAPI. II34.(Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPI. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPI. II36.Thrixspermum formosanum (Hayata) Schlecht.Mao từ dãi loanEp23OrIIAPI. II37.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan epEp21OrIIAPI. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan pEp21OrIIAPI. II	27.	Peliosanthes teta Andr.	Sâm cau	Cr	21	М	VU	IIA				
28.Anoectochilus brevilabris Lindl.Giải thủy ba răng ba răngCr18Or, MENIAPl. II29.Bulbophyllum concinnum Hook. f.Cầu diệp xinhHm21OrIIAPl. II30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thạch hộcEp25Or, MIIAPl. II32.Epipogium roseum (D. Don) Lindl.Thượng lanCr17OrIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPl. II34.(Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth. xanh nâuTái lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum formosanum (Hayata) Schlecht.Mao từ dài loanEp23OrIIAPl. II37.Trichotosia pulvinata (Lind.) Kraenzl.Mao từ dài loanEp21OrIIAPl. II38.Trichotosia pulvinata (Lind.) Kraenzl.Mao lan sohlecht.Ep21OrIIAPl. II	27. 1 cuosumnes tetu Filur. Sain cau Ci 21 Ivi VO IIA 22. Orchidaceae											
28.brevilabris Lindl.ba răngCr18Or, MENIAPI. II29.Bulbophyllum concinnum Hook. f.Cầu diệp xinhHm21OrIIAPI. II30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPI. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPI. II32.Epipogium roseum (D. Don) Lindl.Thượng lanCr17OrIIAPI. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPI. II34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeHào lan láCr21OrIIAPI. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPI. II36.Thrixspermum formosanum (Hayata) Schlecht.Bach dài loanEp23OrIIAPI. II37.Trichotosia pulvinata (Lindl. Kaenzl.)Mao từ dài loanEp21OrIIAPI. II38.Trichotosia pulvinata (Lindl. Kaenzl.)Mao lan eốiEp21OrIIAPI. II	20	Anoectochilus	Giải thùy	C	10	0. M	EN	ТА		рі ц		
29.Bulbophyllum concinnum Hook, f.Càu diệp xinhHm21OrIIAPI. II30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPI. II31.Dendrobium nobile Lindl.Thạch hộcEp25Or, MIIAPI. II32.Epipogium roseum (D. Don) Lindl.Thuợng lanCr17OrIIAPI. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hóa dàyCr21OrIIAPI. II34.(Lindl.) Benth. ex C. B. ClarkeHào lan láCr21OrIIAPI. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPI. II36.Thrixspermum formosanum (Hayata) Schlecht.Bạch dià loanEp23OrIIAPI. II37.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan sójEp21OrIIAPI. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan sójEp21OrIIAPI. II	28.	brevilabris Lindl.	ba răng	Cr	18	Or, M	EN	IA		PI. II		
25.concinnum Hook, f.xinhIIII21OIIIAIIAIII30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPl. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPl. II32.Epipogium roseum (D. Don) Lindl.Thuợng lanCr17OrIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPl. II34.(Lindl.) Benth, ex C. B. ClarkeHảo lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum formosanum (Hayata) Schlecht.Bach dài loanEp23OrIIAPl. II37.Trichotosia pulvinata (Lindl.) KraenzlMao lan sóiEp21OrIIAPl. II38.Trichotosia pulvinata (Lindl.) KraenzlMao lan sóiEp21OrIIAPl. II	20	Bulbophyllum	Cầu diệp	Цm	21	Or		ПА		D1 11		
30.Bulbophyllum fischeri Seidenf.Long gambleHm21OrIIAPI. II31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPI. II32.Epipogium roseum (D. Don) Lindl.Thượng lanCr17OrIIAPI. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPI. II34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPI. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPI. II36.Thrixspermum formosanum (Hayata) Schlecht.Bach diémEp23OrIIAPI. II37.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan sóiEp21OrIIAPI. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan sóiEp21OrIIAPI. II	27.	<i>concinnum</i> Hook. f.	xinh	11111	21	01		шл		1 1. 11		
Seidenf.gambleIndextIndextIndextIndextIndextIndext31.Dendrobium nobile Lindl.Thach hộcEp25Or, MIIAPl. II32.Epipogium roseum (D. Don) Lindl.Thượng lanCr17OrIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPl. II34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeHảo lan lấCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum formosanum (Hayata) Schlecht.Bach dià loanEp23OrIIAPl. II37.Trichotosia pulvinata (Lindl.) KraenzlMao lan sójEp21OrIIAPl. II38.Trichotosia pulvinata (Lindl.) KraenzlMao lan sójEp21OrIIAPl. II	30.	Bulbophyllum fischeri	Long	Hm	21	Or		IIA		Pl. II		
31.Dendroblum nobile Lindl.Thạch hộcEp25Or, MIIAPI. II32.Epipogium roseum (D. Don) Lindl.Thượng lanCr17OrIIAPI. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPI. II34.(Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPI. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPI. II36.Thrixspermum centipeda Lour.Bach điểmEp23OrIIAPI. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao từ dài loanEp33OrIIAPI. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan sóiEp21OrIIAPI. II		Seidenf.	gamble									
32.Epipogium roseum (D. Don) Lindl.Thượng lanCr17OrIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPl. II34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeHào lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bach diểmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao từ dài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gốiEp21OrIIAPl. II	31.	Dendrobium nobile	Thạch	Ep	25	Or, M		IIA		Pl. II		
32.Epipoguan roseum (D.Huong lanCr17OrIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPl. II33.Geodorum densiflorum (Lamk.) Schlecht.Địa kim hoa dàyCr21OrIIAPl. II34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bạch diễmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử dài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gộiEp21OrIIAPl. II		Enipogium vosaum (D	Thương	_								
33.Geodorum densiflorum (Lamk.) Schlecht.Dia kim hoa dàyCr21OrIIAPl. II34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bach diễmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử dài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gộiEp21OrIIAPl. II	32.	Don) Lindl	lan	Cr	17	Or		IIA		Pl. II		
33.Original LineDrainingCr21OrIIAPl. II(Lamk.) Schlecht.hoa dàyCr21OrIIAPl. II34.(Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bach điểmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử đài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gốiEp21OrIIAPl. II		Geodorum densiflorum	Địa kim									
34.Goodyera foliosa (Lindl.) Benth. ex C. B. ClarkeHảo lan láCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bach điểmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao từ đài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gộiEp21OrIIAPl. II	33.	(Lamk.) Schlecht.	hoa dày	Cr	21	Or		IIA		Pl. II		
34.(Lindl.) Benth. ex C. B. ClarkeHao Ian IáCr21OrIIAPl. II35.Tainia viridifusca (Hook.) Benth. centipeda Lour.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bach điểmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử đài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gộiEp21OrIIAPl. II		Goodyera foliosa	TT? 1									
B. ClarkeIaIaIaIa35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bach diễmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử dài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gộiEp21OrIIAPl. II	34.	(Lindl.) Benth. ex C.	Hao lan	Cr	21	Or		IIA		Pl. II		
35.Tainia viridifusca (Hook.) Benth.Tài lan xanh nâuCr13Or, MIIAPl. II36.Thrixspermum centipeda Lour.Bạch điểmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử đài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lind.) Kraenzl.Mao lan gốjEp21OrIIAPl. II		B. Clarke	la									
35.(Hook.) Benth.xanh nâuCl13Ol, MIIAPI. II36.Thrixspermum centipeda Lour.Bach điểmEp23OrIIAPI. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử đài loanEp33OrIIAPI. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gốjEp21OrIIAPI. II	25	Tainia viridifusca	Tài lan	Cr	12	Or M		ПА		D1 II		
36.Thrixspermum centipeda Lour.Bach diễmEp23OrIIAPl. II37.Thrixspermum formosanum (Hayata) Schlecht.Mao tử dài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gộiEp21OrIIAPl. II	33.	(Hook.) Benth.	xanh nâu	U.	1.5			ШA		1 1. 11		
Construction </td <td>36.</td> <td>Thrixspermum</td> <td>Bạch</td> <td>Ep</td> <td>23</td> <td>Or</td> <td></td> <td>IIA</td> <td></td> <td>PL II</td>	36.	Thrixspermum	Bạch	Ep	23	Or		IIA		PL II		
Thrixspermum formosanum (Hayata) Schlecht.Mao từ đài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gốiEp21OrIIAPl. II	30.	centipeda Lour.	điêm	~r								
37.formosanum (Hayata) Schlecht.dài loanEp33OrIIAPl. II38.Trichotosia pulvinata (Lindl.) Kraenzl.Mao lan gójEp21OrIIAPl. II	37.	Thrixspermum	Mao tử	Ep	33	Or						
Schlecht. Mao lan Ep 21 Or IIA Pl. II		formosanum (Hayata)	đài loan					IIA		PI. 11		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Schlecht.	Mag lan									
	38.	(Lindl.) Kraenzl	σόι	Ep	21	Or		IIA		Pl. II		

Also, in Table 1, the geographical element was numbered based on L. T. Chan's work [22] as follows:

- 13. Bacbo endemic
- 16. Vietnam endemic
- 17. Indochina endemic
- 18. Southern China endemic
- 19. Hainam, Taiwan, Philippines element
- 21. India element
- 23. Indonesia, Malaysia element
- 25. Topical Asia element
- 29. Asia element
- 33. Unknown element

CR (Critically Endangered), EN (Endangered), VU (Vulnerable), and NT (Near Threatened) were marked based on Vietnam Red Data Book [16] and IUCN [20].

In Table 1, column Decree 84, IA and IIA notes are correspond to the appendixes of the Governments Decree No. 84/2021/ND-CP [17]. Appendix IA lists species threatened with extinction, prohibited from export, import, re-export, introduction from the sea and transit of natural specimens for commercial purposes. Appendix IIA lists species that, although currently not threatened with extinction, may become so without control of export, import, re-export, introduction from the sea and transit of natural specimens thereof for commercial purposes. In the CITIES column, the notations were based on CITES [19], in which Appendix I lists species threatened with extinction, prohibited from export, import, re-export, introduction from the sea, and transit of natural specimens for commercial purposes and Appendix II lists species that, although currently not threatened with extinction, may become so without control of export, import, re-export, introduction from the sea and transit of natural specimens for commercial purposes. The "Uses" column was based on T. M. Hoi's work [13] with following notations: F (Fruit), Or (ornamental plant), Oil (fatty oils), W (woods), L (latex), E (essentials), M (medicines), and V (vegetable) respectively.

Table 1 shows that 38 endangered and rare plant species belong to 2 phyla, 22 families in Me Linh Station for Biodiversity. Among them, Magnoliophyta accounts for the majority with 19 families (accounting for 86.36%), 35 species (accounting for 92.1%); in there, 22 species belong to the Magnoliopsida (accounting for 57,89% of the total number of species), and 13 species belong to the Liliopsida (accounting for 34.21% of the total number of species); Polypodiophyta has three species belong to 3 families (Table 2).

Phyla	Fai	mily	Ge	nus	Species		
	Quantity	Rate (%)	Quantity	Rate (%)	Quantity	Rate (%)	
POLYPODIOPHYTA	3	13.64	3		3		
MAGNOLIOPHYTA	19	86.36	29	90.63	35	92.1	
Magnoliopsida	16		18		22	57,89	
Liliopsida	3	13.64	11	34.76	13	43.21	
Total	22	100	32	100	38	100	

Table 2. Distribution of taxa in phyla

The family with the most species is Orchidaceae, with 11 species (accounting for 28.95% of the total number of species); next is the Menispermaceae with 4 species (accounting for 10.53% of the total number of species); Fabaceae, Fagaceae and Myrsinaceae, each family has 2 species (accounting

for 5.26% of the total number of species); 17 remaining families, each family has 1 species (accounting for 2.63% of the total number of species).

At the national level: Among 38 endangered and rare plant species in Me Linh Station for Biodiversity, there are 20 species in *Vietnam Red Data Book* 2007. Among them, *Goniothalamus takhtajanii* Ban is at a very critical level (CR), 3 species are endangered (EN), and 16 are vulnerable (VU).

Belongs to Government Decree No. 84/2021/ND-CP, there are 20 species; among them, 1 species (*Anoectochilus brevilabris* Lindl.) in appendix IA and 19 species in appendix IIA.

At the international level: Among 38 endangered and rare plant species in Me Linh Station for Biodiversity, 4 species in IUCN (2024); among them, *Aquilaria crassna* is at a very critical level (CR) *Madhuca pasquieri* is at an Endangered (EN), *Cinnadenia paniculata* is at a Vulnerable (VU), and *Colona poilanei* is at a Near Threatened (NT).

Belongs to Appendix II of CITES (2024), there are 16 species whose trade must be controlled to avoid being threatened with extinction.

3.2. Geographical element of endangered and rare plant species in the Me Linh Station for Biodiversity

Me Linh Station's endangered and rare plant species belong to 10 geographical elements. Among them, the Indochina endemic has the highest number of species with 11 species (accounting for 28.94%); next is the Indian element, which has 9 species (23.68%); Bacbo endemic and Southern China endemic there are 4 species together (each element accounts for 10.52%); Vietnam endemic and Topical Asia element there are 2 species together (each element accounts for 5.26%); Hainan, Taiwan, Philippines element; Indonesia, Malaysia element; Asia element there is 1 species together (each element accounts for 2.63%). Further, there are 3 species whose geographical factors cannot be determined (accounting for 7.89% of the total species).



Figure 1. Life forms of endangered and rare plant species.

https://sj.hpu2.edu.vn

3.3. Life forms of endangered and rare plant species in the Me Linh Station for Biodiversity

For biodiversity, 38 endangered and rare plant species in Me Linh Station belong to 4 main life forms. Include: Phanerophytes (Ph) dominates with 22 species (accounting for 57.89%. Among them, *Megaphanerophytes* – Mg with 2 species, *Mesophanerphytes* – Me with 6 species, *Microphanerophytes* – Mi with 5 species, *Nanaphanerophytes* – Na with 9species); Chamerophytes (Ch) and Hemicryptophytes (Hm) there are with 4 species together (each group accounting for 10.52%); Cryptophytes (Cr) with 8 species (accounting for 21.05%), Figure 1.

3.4. Usage value of endangered and rare plant species in Me Linh Station for Biodiversity

Besides their conservation value, endangered and rare plant species in Me Linh Station are also used for many different purposes, including 8 groups of uses indicated below in Figure 2.

Medicinal value (M): This is the biggest, with 23 species (accounting for 60.52%). Some species have high value, such as Aquilaria crassna, Asarum labrum, Codonopsis javanica, and *Stephania rotunda*.

Ornamental plants (O): with 13 species (accounting for 34.21%). Most of them belong to Orchidaceae. Among them, some species have high value and beautiful flowers, such as Anoectochilus breviaries, and *Dendrobium nobile*.

Timber trees (W): with 9 species (accounting for 23.68%). Some species have high value, especially *Madhuca pasquieri*, which is considered one of the four best types of wood.

Essential oils plants (E): with 2 species, *Cinnadenia paniculata* and *Aquilaria crassna* (accounting for 5.26%). Among them, essential oils of *Aquilaria crassna* are especially famous and valuable.

In addition, there is also 1 species for fruit (*Canarium pimela*), 1 species of fatty oil (*Madhuca pasquieri*), 1 species of latex (*Gluta laccifera*), 1 species for famous delicious vegetables (*Melientha suavis*).



Figure 2. Usage value of endangered and rare plant species.

4. Conclusion

In the Me Linh Station for Biodiversity has 38 endangered and rare plant species. 20 species in Vietnam Red Data Book 2007; 20 species belong to Decree No. 84/2021/ND-CP; 16 species belong to Appendix II of CITES (2024), and 4 species belong to IUCN (2024). Endangered and rare plant species in the Me Linh Station are divided into 4 main groups of life forms and 10 geographical elements (not to mention 3 unidentified species). All of them have been used for many different purposes, with 8 groups of uses, many of which have great economic value.

References

- S. C. Kim, N. V. Sinh, and D.V. Hai, *Biodiversity of Me Linh Station, Vietnam: Vascular plants*. Incheon, Korea: Nat Inst Biol Resour, 2015.
- [2] D. V. Hai, N. T. Cuong, R. K. Choudhary, Z. Lin, and Y. Deng, "Cosmianthemum melinhense (Acanthaceae), a new species from the Me Linh Station for Biodiversity in northeastern Vietnam," *Phytotaxa*, vol. 538, no. 2, pp. 124–132. Mar. 2022, doi: 10.11646/phytotaxa.538.2.4. https://doi.org/10.11646/phytotaxa.538.2.4.
- [3] N. N. Thin, Handbook of biodiversity research. Hanoi. Vietnam: Hanoi Nat. Univ. Press, 1997.
- [4] N. N. Thin, Methods of plant research. Hanoi, Vietnam: Hanoi Nat. Univ. Press, 2007.
- [5] P. H. Ho, An illustrated Flora of Vietnam, Vol. 1. Ho Chi Minh, Vietnam: Tre Publishing House, 1999.
- [6] P. H. Ho, An illustrated Flora of Vietnam, Vol. 3. Ho Chi Minh, Vietnam: Tre Publishing House, 2000.
- [7] P. H. Ho, An illustrated Flora of Vietnam, Vol. 2. Ho Chi Minh, Vietnam: Tre Publishing House, 2003.
- [8] N. T. Ban, Flora of Vietnam Vol 1: Ho Na Anonaceae Juss. Hanoi, Vietnam: Science and Technics Publishing House (in Vietnamese), 2000.
- [9] D. D. Huyen, Flora of Vietnam Vol 9: Ho Lan Orchidaceae Juss. Chi Hoàng Thảo Dendrobium Sw. Hanoi, Vietnam: Science and Technics Publishing House (in Vietnamese), 2007.
- [10] T. D. Ly, Flora of Vietnam Vol 5: Ho Trúc dào Apocynaceae Juss. Hanoi, Vietnam: Science and Technics Publishing House (in Vietnamese), 2007.
- [11] N. K. Dao, Flora of Vietnam Vol 20: Ho Long não Lauraceae Juss. Hanoi, Vietnam: Publishing House for Science and Technology (in Vietnamese), 2017.
- [12] VNU central for natural resources and environmental studies, *Checklist of plant species of Vietnam, Vol. I.* Hanoi, Vietnam: Agriculture Publishing House (in Vietnamese), 2001.
- [13] N. T. Ban, Checklist of plant species of Vietnam, Vol. II. Hanoi, Vietnam: Agriculture Publishing House (in Vietnamese), 2003.
- [14] N. T. Ban, Checklist of plant species of Vietnam, Vol. III. Hanoi, Vietnam: Agriculture Publishing House, (in Vietnamese), 2005.
- [15] The Plant List, Version 1.1,2013. [Online]. Available: http://www.theplantlist.org/.
- [16] Ministry of Science and Technology, *Vietnam Red Data Book Part II. Plant*. Hanoi, Vietnam: Publishing House for Science and Technology (in Vietnamese), 2007.
- [17] Vietnam Ministry of Natural Resources and Environment, Decree No. 03/VBHN-BTNMT (2020, May 11), Criteria to determine species and the regime of managing species under lists of endangered, precious and rare species prioritized for protection, [Online]. Available: https://vanban.chinhphu.vn/.
- [18] Vietnam Governments, Decree No. 84/2021/ND-CP (2021, Sept. 22), Amendments to Governments Decree No. 06/2019/ND-CP dated September 22, 2021 on Management of endangered, rare and precious of forest fauna and flora and observation of convention on international trade in endangered species of wild fauna and flora. [Online], Available: https://vanban.chinhphu.vn/?pageid=27160&docid=204157.
- [19] CITES, The convention on international trade in endangered species of wild fauna and flora. [Online], Available: https://cites.org/eng/appendices.php.
- [20] IUCN, The IUCN red list of threatened species. [Online], Available: http://www.iucnredlist.org [Accessed: Sep. 12, 2024].
- [21] C. Raunkiaer, *The life forms of plants and statistical plant geography, Vol. 1.* London, UK: Oxford Univ. Press, 1934, p. 104.
- [22] L. T. Chan, Some basic characters of Vietnam Flora. Hanoi, Vietnam: Science and Technics Publishing House (in Vietnamese), 1999.
- [23] T. M. Hoi, *Plant resources of Vietnam*. Hanoi, Vietnam: Publishing House for Science and Technology (in Vietnamese), 2013.