FLORA DIVERSITY IN THAC TIEN – DEO GIO NATURAL FOREST OF XIN MAN DISTRICT, HA GIANG PROVINCE

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SUMMARY

This article presents the results of a research on flora of Thac Tien - Deo Gio natural forest, Ha Giang province. The research showed that the flora of the Thac Tien - Deo Gio natural forest is rather diverse, and there are 766 species of 435 genera in 148 families belonging to 6 divisions of vascular plants. Among them, the Angiospermae is the most dominant with 693 species (90.47%), 391 genera (89.89%), and 121 families (81.76%); the next Polypodiophyta with 63 species (8.22%), 38 genera (8.74%), 22 families (14.86%); the Lycopodiophyta with 6 species (0.78%), 3 genera (0.69%), 2 families (1.35%); the Psilototphyta with 2 species (0.26%), 1 genera (0.23%), 1 families (0.68%); the two last Gymnospermae and Equisetophyta with 1 species (0.13%), 1 genus (0.23%), 1 family (0.68%). In the Angiospermae, the Dicotyledonae is dominant. The ratio of Dicotyledonae to Monocotyledonae is 6.62 for species, 5.41 for genera, and 5.05 for families. There are 257 plant species in the 10 most diverse families, representing for 33.55% of the total species numbers and 110 plant species in the 13 most diverse genera, representing for 14.36% of the total species numbers in the study area. The forest plant resources of the Thac Tien - Deo Gio area is rather diverse. There are 608 useful plant species, representing for 75.91% of the total species numbers recorded, can be classified by 15 different useful groups.

Keywords: Flora, natural forest, Thac Tien - Deo Gio, Xin Man district.

1. INTRODUCTION

Thac Tien - Deo Gio natural forest which has total area of about 4,000 ha is located in the territory of Na Chi, Nam Dan, and Quang Nguyen communes of Xin Man district, Ha Giang province. This area is mainly characterized by the tropical closed evergreen seasonal forest ecosystem classified by nine formations (Phe et al., 2019). The Thac Tien - Deo Gio natural forest not only has important value for environmental and watershed protection, climate regulation in the region, and landscape protection of the famous scenic area nationally ranked but also has the conservation value of genetic resources and biodiversity.

Although, there are many important values, but it has still not been properly interested in studying. There are few studies carried out in this area up to now. Therefore, conducting plant biodiversity evaluation in the Thac Tien - Deo Gio natural forest for conserving them is very necessary. This paper presents some research results of flora diversity in the study area.

2. RESEARCH METHODOLOGY

2.1. Research objects

This study was focused on flora of vascular plants and conducted in Na Chi, Nam Dan and Quang Nguyen communes of Xin Man district, Ha Giang province.

2.2. Methods

Methods of data collecting

*** Desk study**: Collecting secondary data related to the study area such as map of forest status, scientific reports, and data of natural and social-economic conditions. Data collected were reviewed to get understanding of the study area.

*** Field surveys**

- *Survey of transect line*: Ten transect lines crossing different forest types, forest status, terrains were set up as shown in table 1. The information of species names, life forms, and habitas of all vascular plant species observed on the transect lines were recorded. GPS were used in order to navigate the direction of the way and to determine total length of each transect line. On the other hand, recognizing some plant species and their use value were

associated with local guides in the field. Photos of plant species and/or their habitats were also taken. Samples of plant species that can not be recognized in the field were collected for preparing specimens and species identification.

Table 1. List of transect lines in the study area

Transect lines	Starting points			Ending points			Total length (km)
	Coordinates (VN-2000)	Altitude (m, a.s.l)	Places	Coordinates (VN-2000)	Altitude (m, a.s.l)	Places	
No. 1	395976; 2498475	1027	Thac Tien	396104; 2498418	998	Thac Tien river	1.7
No. 2	396706; 2497230	1329	Deo Gio peak	396621; 2497226	1345	Deo Gio peak	3.3
No. 3	396617; 2497217	1345	Deo Gio peak	396806; 2498036	1296	Ngam Lam village, Nam Dan commune	4.4
No. 4	396807; 2498044	1295	Ngam Lam village, Nam Dan commune	395950; 2498483	1027	Thac Tien	6.5
No. 5	396768; 2497171	1282	Deo Gio peak	395391; 2494627	765	Nam Khuong village, Na Chi commune	6.6
No. 6	395382; 2494639	769	Nam Khuong village, Na Chi commune	396759; 2497202	1276	Deo Gio peak	19.7
No. 7	396774; 2497179	1291	Deo Gio peak	397675; 2496320	1026	Nam Cuong village, Quang Nguyen commnue	2.8
No. 8	396784; 2497189	1326	Deo Gio peak	399118; 2498379	1318	Nam La village, Quang Nguyen commnue	6.6
No. 9	399203; 2498318	1272	Nam La village, Quang Nguyen commnue	396824; 2497185	1305	Deo Gio peak	11.0
No. 10	397163; 2497043	1292	Deo Gio peak	395286; 2501781	653	Nam Dan commune	12.1

VN-2000: VN-2000 coordinate system, 105.5-degree central meridian, projection zone of 3 degrees of longitude; m, a.s.l: metter, above sea level

- *Survey of sample plot*: Survey of sample plots were carried out according to Richards (1996) and Thin (1997). Five representative sample plots of 40 x 25 m for forest status, habitats, vegetation types, and different altitudes were established (Table 2) in the

study site to survey woody trees, regenerating trees, shrubs, herbs, and vines. The information of all sample plots such as coordinates, elevation above sea level, slope, direction of exposuration and inclination was difined. In each sample plot, Vietnamese and scientific names, diameters at the breast height (DBH), under branch height (ubH), full length height (flH), crown diameter (cD) of all tree of DBH more than 6 cm were determined. In addition, there were five small sample plots (5 m x 5 m) set up to investigate regenerating trees, shrubs, herbs, and vines in each sample plot, including four plots established at four corners of the sample plot and the rest one located in the center of the sample plot. Vietnamese and scientific names, individual quantity, sizes, growth characteristics, and regenerated origin of all regenerating tree with DBH less than 6 cm were defined in each small sample plot. Shrubs and herbs were also listed and noted about species composition, quantity, sizes, ground cover percentage. Instrument and equipment were used including GPS Map 60CSx, digital camera, compasses, measurement tape, sample clips, pruning scissors...

Table 2. Locations of study plots in the study area

Study plots	Places	Coordinates (VN-2000)	Altitudes (m, a.s.l)	Slopes
No.1	Nam Dan commune	397037; 2497829	1294	10°
No.2	Na Chi commune	395285; 2496568	1079	35°
No.3	Na Chi commune	397634; 2496357	1093	15°
No.4	Nam Dan commune	397504; 2497078	1368	10°
No.5	Quang Nguyen commune	398265; 2498050	1550	30°

VN-2000: VN-2000 coordinate system, 105.5-degree central meridian, projection zone of 3 degrees of longitude; m, a.s.l: metter, above sea level.

- *Identification of plant specimens:* Scientific names of plant species were identified by morphological comparison based on the major literatures such as "Flora of Hong Kong" (Agriculture, Fisheries and Conservation Department - Government of the Hong Kong Special Administrative Region, 2007–2009), "Yunnan Ferns of China" (Cheng-Sen & Yu, 2007), "Vietnam Forest Trees" (JICA, 2009), "An Illustrated Flora of Vietnam" (Ho, 1999–2003), "Flora of China" and "Flora of China Illustrations" (Zhengyi & Reven, 1994–2010). Besides, some plant specimens were also compared with type specimens which have been kept at the various botanical museums or herbaria.

- *Development of plant species checklist*: The checklist of plant species of the flora in the study area was conducted according to Brummitt (1992), Turland et al. (2018).

- *Evaluation of plant diversity of the flora*: Diversity of the flora in the study area was conducted according to Thin (1997).

- *Analysis of use values of forest plant resources*: The use values of the forest plant resources in the study area was identified and classified according to Bich et al. (2006), Chi (2012), Chi and Hop (1999-2002), Ho (1999-2003), Loi (2005), Ly (1993), Moi, Cu, Hoi, Thai, and Ban (2001-2002), PROSEA (1989-2003).

3. RESULTS AND DISCUSSION

3.1. Diversity of plant taxa in the study site

3.1.1. Diversity of plant composition

The flora in Thac Tien - Deo Gio natural forest is diverse with 766 species belonging to 435 genera, 148 families of 6 vascular plant phyla including Psilotophyta, Lycopodiophyta, Equisetophyta, Polypodiophyta, Gymnospermae, and Angiospermae (Table 3).

Of which, Angiospermae consists of the highest number of species (693), genera (391), and families (121) followed by Polypodiophyta with 63 species, 38 genera, 22 families. Lycopodiophyta has 6 species, 3 genera and 2 families, while Psilotophyta has 2 species, 1 genus, and 1 family. Equisetophyta and Gymnospermae both have only one species, one genus of one family.

Table 3. Composition and percentage of taxa in study site

Plant division	Family		Genus		Species	
	Number of families	Percentage (%)	Number of genera	Percentage (%)	Number of species	Percentage (%)
Psilotophyta	1	0.68	1	0.23	2	0.26
Lycopodiophyta	2	1.35	3	0.69	6	0.78
Equisetophyta	1	0.68	1	0.23	1	0.13
Polypodiophyta	22	14.86	38	8.74	63	8.22
Gymnospermae	1	0.68	1	0.23	1	0.13
Angiospermae	121	81.76	391	89.89	693	90.47
- Dicotyledonae	101	68.24	330	75.86	602	78.59
- Monocotyledonae	20	13.51	61	14.02	91	11.88
Total	**148**	**100**	**435**	**100**	**766**	**100**

Although Angiospermae is dominant, but the dominant characteristics are different between Dicotyledonae and Monocotyledonae (Table 4). Of which, the families, genera, and species of Dicotyledonae are more dominant than that of Monocotyledonae. The ratio of Dicotyledonae to Monocotyledonae in terms of family, genus and species are 5.05, 5.41, and 6.62, respectively.

Table 4. Distribution of taxa in Angiospermae

Taxa	Family		Genus		Species	
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
Dicotyledoneae	101	83.47	330	84.4	602	86.87
Monocotyledoneae	20	16.53	61	15.6	91	13.13
Angiospermae	121	100	391	100	693	100
Dicotyledonae/ Monocotyledonae	5.05		5.41		6.62	

3.1.2. Diversity of plant families and genera

Ten most diverse plant families

There are 10 most diverse plant families in the study site, accounting for 6.76% of the total families of the flora such as Euphorbiaceae, Fabaceae, Rubiaceae, Moraceae, Gramineae, Compositae, Lauraceae Verbenaceae, Orchidaceae, Myrsinaceae (Table 5). Of which, the Dicotyledonae has 8 families, and Monocotyledonae has 2 families. These families have the highest species number, more than 12 species. The total of species number of these 10 families are 257 species, accounting for 33.55% of the total species of the flora. Among them, there are not any plant families which have the percentage of species number more than 10% of the total species numbers of the flora. Moreover, these ten families are also very diverse families of the flora of Vietnam.

Table 5. Ten most diverse families in study site

No.	Families	Number of genera	Percentage (%)	Number of species	Percentage (%)
1	Euphorbiaceae	21	4.83	48	6.27
2	Fabaceae	17	3.91	35	4.57
3	Rubiaceae	16	3.68	28	3.66
4	Moraceae	5	1.15	27	3.52
5	Gramineae	19	4.37	25	3.26
6	Compositae	21	4.83	25	3.26
7	Lauraceae	9	2.07	24	3.13
8	Verbenaceae	8	1.84	17	2.22
9	Orchidaceae	10	2.30	15	1.96
10	Myrsinaceae	2	0.46	13	1.70
	Total	**128**	**29.43**	**257**	**33.55**

Diversity of plant genera

The Flora of Thac Tien - Deo Gio area is not only diverse in terms of plant families but also it is very diverse in terms of genera. The thirteen most diverse genera has 110 species accounting for 14.36% of the total species numbers and 2.99% of the total genera in the study area (Table 6). *Ficus* is the highest diverse genus with 23 species, followed by *Ardisia* with 10 species, *Elaeocarpus* with 9 species, *Magnolia* and *Mallotus* with 8 species. Four genera of *Castanopsis, Litsea, Pteris,* and *Syzygium* have 7 species, the remaining genera with equal numbers of 6 species, including *Begonia, Clerodendrum, Lygodium, Persicaria.*

Table 6. Thirteen most diverse genera in study site

No.	Genera	Families	Numbers of species	Percentage (%)
1	*Ficus*	Moraceae	23	3.00
2	*Ardisia*	Myrsinaceae	10	1.31
3	*Elaeocarpus*	Elaeocarpaceae	9	1.17
4	*Magnolia*	Magnoliaceae	8	1.04
5	*Mallotus*	Euphorbiaceae	8	1.04
6	*Castanopsis*	Fagaceae	7	0.91
7	*Litsea*	Lauraceae	7	0.91
8	*Pteris*	Pteridaceae	7	0.91
9	*Syzygium*	Myrtaceae	7	0.91
10	*Begonia*	Begoniaceae	6	0.78
11	*Clerodendrum*	Verbenaceae	6	0.78
12	*Lygodium*	Schisaeaceae	6	0.78
13	*Persicaria*	Polygonaceea	6	0.78
	Total (2.99%)		**110**	**14.36**

3.2. Diversity of use values of forest plant resources

Forest plant resources in Thac Tien - Deo Gio area have 608 useful plant species accounting for 75.91% of total known species and they can be classified into 15 different groups.

- **Timber trees**: This plant group contains 273 species representing for 34.08% of total species numbers. They are mainly concentrated in families Lauraceae, Fagaceae, Euphorbiaceae, Moraceae, Clusiaceae, Anacardiaceae, Annonaceae, Fabaceae, Hamamelidaceae, Elaeocarpaceae, Myrtaceae, Sapotaceae, Meliaceae, etc. Some valuable timber species in this area were recorded as

Aglaia spectabilis, *Actinodaphne pilosa*, *Duabanga grandiflora*, *Heritiera macrophylla*, *Castanopsis indica*, *Elaeocarpus* spp., *Amesiodendron chinense*, *Canarium* spp., *Bischofia javanica*, *Acer* spp., *Choerospondias axillaris*, *Peltophorum dasyrrhachis*, *Madhuca pasquieri*, *Sterculia lanceolata*, etc.

- **Medicinal plants**: There are 171 medicinal plant species accounting for 21.35% of total species numbers. They belong to families Lamiaceae, Menispermaceae, Rutaceae, Rubiaceae, Araliaceae, Acanthaceae, Fabaceae, Loganiaceae, Asteraceae, Euphorbiaceae, Verbenaceae, Smilacaceae, Costaceae, Amaranthaceae, Zingiberaceae, etc. Some common medicinal plants in the study area consisting of *Disporopsis longifolia*, *Cratoxylum pruniflorum*, *Achyranthes aspera*, *Achyranthes bidentata*, *Acronychia pedunculata*, *Paris chinensis*, *Cibotium barometz*, *Goniothalamus vietnamensis*, *Streptocaulon juventas*, *Rauvolfia verticillata*, *Ardisia silvestris*, *Asarum glabrum*, *Gynostemma pentaphyllum*, *Choerospondias axillaris*, *Bombax malabaricum*, *Sargentodoxa cuneata*, *Jasminum subtriplinerve*, *Codonopsis javanica*, *Stemona tuberosa*, *Leea rubra*, *Oroxylum indicum*, *Stephania dielsiana*, *Costus tonkinensis*, *Imperata cylindrica*, *Ophiopogon* spp., *Sargentodoxa cuneata*, *Eurycoma longifolia*, *Senna tora*, *Tinospora sinensis*, *Asplenium nidus*, etc.

- **Ornamental plants**: This group represents 182 species (22.72% of total species) such as *Adenanthera microsperma*, *Bischofia javanica*, *Angiopteris polytheca*, *Desmos chinensis*, *Peltophorum dasyrrhachis*, *Streblus asper*, *Allospondias lakonensis*, *Saraca dives*, *Chukrasia tabularis*, *Begonia* spp., *Millettia ichthyochtona*, *Ixora coccinea*, *Rhododendron* spp., *Vitex* spp., *Barringtonia* sp., *Ficus* spp., *Caryota* spp., etc.

- **Vegetable plants:** Total of 43 species accounting for 5.37% of total species numbers are found such as *Gnaphalium polycaulon*, *Melientha suavis*, *Schefflera heptaphylla*, *Diplazium esculentum*, *Centella asiatica*, *Ocimum basilicum*, *Artemisia vulgaris*, *Fagopyrum dibotrys*, *Blumea lanceolaria*, *Elsholtziaciliata*, *Ampelocalamus patellaris*, *Amaranthus* spp., *Erythropalum scandens*, *Physalis angulata*, *Piper lolot*, *Gynura ovalis*, etc.

- **Edible fruits and nuts**: There are 31 species accounting for 3.87% of total species numbers such as *Baccaurea ramiflora*, *Dracontomelon duperreanum*, *Averrhoa carambola*, *Canarium* spp., *Rhodomyrtus tomentosa*, *Allospondias lakonensis*, *Acronychia peduncunata*, *Tamarindus indica*, *Syzygium jambos*, *Ficus auriculata*, *Phyllanthus emblica*, *Bischofia javanica*, *Nauclea orientalis*, *Arenga pinnata*, *Livistona saribus*, *Choerospondias axillaris*, etc.

- **Spicy and drinking water**: The species have been used to make spicy or drinking water with 14 species including *Centella asiatica*, *Cratoxylum pruniflorum*, *Vernonia cumingiana*, *Elsholtzia ciliata*, *Ocimum basilicum*, *Cleistocalyx operculatus*, *Jasminum subtriplinerve*, *Senna tora*, *Sargentodoxa cuneata*, *Ampelopsis cantoniensis*, *Adenosma caeruleum*, etc. Those species are represented for 1.75% of total species numbers.

- **Vegetable oils and fats**: There are 22 species recorded in the research area, accounting for 2.75% of total species numbers such as *Rhus chinensis*, *Vernicia montana*, *Ricinus communis*, *Canarium album*, *Garcinia oblongifolia*, *Camellia oleifera*, *Hodgsonia macrocarpa*, *Sterculia lanceolata*, *Gacinia multiflora*, *Sapium* spp., *Eberhardtia tonkinensis*, *Livistona saribus*, *Madhuca pasquieri*, *Canarium pimela*, etc.

- **Essential oil plants**: The total of 57 essential oil species representing for 7.12% of total species numbers are recorded such as *Litsea* spp., *Desmos chinensis*, *Canarium* spp., *Cinnamomum* spp., *Magnolia coco*, *Styrax tonkinensis*, *Ocimum* spp., *Elsholtzia* spp., *Zanthoxylum avicenniae*, *Liquidambar formosana*, *Evodia lepta*, *Zingiber zerumbet*, etc.

- **Fibre plants**: There are 91 fiber plant species, found in the study area. They are accounting for 11.36% of total species numbers, for instance *Antiaris toxicaria*, *Broussonetia papyrifera*, *Trema orientalis*,

Wikstroemia indica, *Arenga pinnata*, *Helicteres* spp., *Mallotus barbatus*, *Calamus* spp., *Mallotus paniculatus*, *Pterospermum heterophyllum*, *Microcos paniculata*, *Livistona saribus*, *Caryota mitis*, *Mallotus apelta*, *Gnetum montanum*, *Ampelocalamus patellaris*, *Sterculia lanceolata*, *Carex* spp., *Rhapis* spp., *Imperata cylindrica*, *Dillenia indica*, *Urena lobata*, *Sida rhombifolia*, *Mallotus philippensis*, etc.

- **Tannin-producing plants**: This group consists of 24 species representing for 3% of total species numbers such as *Choerospondias axillaris*, *Adenanthera microsperma*, *Rhus chinensis*, *Toxicodendronsuccedaneum*, *Acronychia peduncunata*, *Rhodomyrtus tomentosa*, *Dioscorea cirrhosa*, *Broussonetia papyrifera*, *Sapium sebiferum*, *Trema orientalis*, *Archidendron clypearia*, *Phyllanthus emblica*, *Castanopsis* spp., *Senna siamea*, *Engelhardia roxburgiana*, etc.

- **Food plants**: There are 12 species of this group representing for 1.50% of total species such as *Gnetum montanum*, *Livistona saribus*, *Arenga pinnata*, *Castanopsis* spp., *Cibotium barometz*, *Dioscorea persimilis*, etc.

- **Dye producing plants**: This group consists of 14 species (1.75%) such as *Oroxylum indicum*, *Mallotus philippinensis*, *Rhus chinensis*, *Pterocaria stenoptera*, *Peltophorum dasyrrhachis*, *Dioscorea cirrhosa*, *Strobilanthes pateriformis*, *Fibraurea tinctoria*, *Adenanthera microsperma*, *Peristrophe bivalvis*, etc.

- **Materials for making handicrafts and constructing houses**: 24 species of this group representing for 3% of total species numbers are found consisting of *Caryota mitis*, *Livistona saribus*, *Imperata cylindrica*, *Dicranopteris linearis*, *Neohouzeaua dullooa*, *Musa* spp., *Calamus platyacanthus*, *Arenga pinnata*, *Phrynium* spp., etc.

- **Plants producing exudates:** 31 plant species accounting for 3.87% of total species numbers are recorded to produce exudates such as *Horsfieldia amygdalina*, *Garcinia* spp., *Toxicodendron succedanea*, *Canarium* spp., *Wrightia* spp., *Alstonia scholaris*, *Styrax tonkinensis*, *Eberhardtia tonkinensis*, *Liquidambar formosana*, *Cratoxylum cochinchinense*, *Cratoxylum pruniflorum*, *Ficus* spp., etc.

- **Poisonous plants**: This group includes 10 species representing for 1.25% of total species numbers such as *Gelsemium elegans*, *Toxicodendron succedanea*, *Derris elliptica*, *Millettia ichthyochtona*, *Melia azedarach*, *Antiaris toxicaria*, etc.

4. CONCLUSION

1. The Flora in Thac Tien – Deo Gio area is assessed to have high diversity of plant species composition with total of 766 species of 435 genera in 148 families. Of which, the Angiospermae is dominant in terms of families (81.76%), genera (89.89%) and species (90.47)%).

2. In the Angiospermae, Dicotyledonae is the most dominant. In terms of the family, genus and species numbers, the ratios of Dicotyledonae to Monocotyledonae are 5.05, 5.41, and 6.62, respectively.

3. The ten most diverse families in the study area have 257 species, accounting for 33.55% of the total species numbers of the region. Each family all has more than 12 species, decreasing as the following order: Euphorbiaceae, Fabaceae, Rubiaceae, Moraceae, Gramineae, Asteraceae, Lauraceae, Verbenaceae, Orchidaceae, and the last Myrsinaceae.

4. Thirteen most diverse genera has 110 species accounting for 14.36% of the total species numbers and 2.99% of the total genera in Thac Tien - Deo Gio area. Among them, the highest diverse genus is *Ficus* with 23 species, followed by *Ardisia* with 10 species, *Elaeocarpus* with 9 species, the remaining genera with nearly equal numbers of 6–8 species, including *Magnolia*, *Mallotus*, *Castanopsis*, *Litsea*, *Pteris*, *Syzygium*, *Begonia*, *Clerodendrum*, *Lygodium*, *Persicaria*.

5. The forest plant resources of the Thac Tien - Deo Gio natural forest are considered to have diversity of use values, and can be classified into 15 different groups of uses.

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TÍNH ĐA DẠNG HỆ THỰC VẬT Ở KHU RỪNG TỰ NHIÊN THÁC TIÊN – ĐÈO GIÓ, HUYỆN XÍN MẦN, TỈNH HÀ GIANG

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[2]Trung tâm Con người và Thiên nhiên

TÓM TẮT

Bài báo này giới thiệu kết quả nghiên cứu về hệ thực vật ở khu rừng tự nhiên Thác Tiên - Đèo Gió, tỉnh Hà Giang. Nghiên cứu đã chỉ ra rằng hệ thực ở khu vực Thác Tiên - Đèo Gió là khá đa dạng, với 766 loài thuộc 435 chi và 148 họ của 6 ngành thực vật bậc cao có mạch. Trong đó, ngành Hạt kín (Angiospermae) chiếm ưu thế nhất với 121 họ (81,76%), 391 chi (89,89%), 693 loài (90,47%). Tiếp theo là ngành Dương xỉ (Polypodiophyta) có 63 loài (8,22%), 38 chi (8,74%), 22 họ (14,86%); ngành Thông đất (Lycopodiophyta) có 6 loài (0,78%), 3 chi (0,69%), 2 họ (1,35%); ngành Khuyết lá thông (Psilotophyta) có 2 loài (0,26%), 1 chi (0,23%), 1 họ (0,68%); cuối cùng là ngành Hạt trần (Gymnospermae) và Cỏ tháp bút (Equisetophyta) đều có 1 loài (0,13%), 1 chi (0,23%), 1 họ (0,68%). Trong ngành Hạt kín (Angiospermae) thì lớp Hai lá mầm (Dicotyledonae) chiếm ưu thế. Tỷ trọng giữa lớp Hai lá mầm (Dicotyledonae) và lớp Một lá mầm (Monocotyledonae) lần lượt là 6,62 đối với số loài; 5,41 đối với số chi và 5,05 đối với số họ. Mười họ đa dạng nhất có 257 loài, chiếm 33,55% tổng số loài. Mười ba chi đa dạng nhất có 110 loài, chiếm 14,36% tổng số loài của khu vực nghiên cứu. Tài nguyên thực vật rừng ở khu vực Thác Tiên - Đèo Gió là khá đa dạng, với tổng số 608 loài cây có ích, chiếm 75,91% tổng số loài đã biết, có thể được phân loại vào 15 nhóm công dụng khác nhau.

Từ khoá: Hệ thực vật, huyện Xín Mần, rừng tự nhiên, Thác Tiên - Đèo Gió.

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