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A STUDY ON THE DIVERSITY OF TAXA OF MAGNOLIOPHYTA DISTRIBUTED IN BOTH VIETNAM AND NEIGHBORING COUNTRIES

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Abstract

The paper assessed the diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and some neighboring countries. There are 2644 species, 1061 genera, 174 families and 2 classes distributed in both Vietnam and India, in which useful plants are 1585 species. 1971 species, 874 genera, 169 families and 2 classes are distributed in both Vietnam and Cambodia, in which useful plants are 1224 species. 1876 species, 905 genera, 167 families and 2 classes are distributed in both Vietnam and Indonesia, in which useful plants are 1131 species. 3478 species, 1265 genera, 205 families and 2 classes are distributed in both Vietnam and Laos, in which useful plants are 1599 species. 1839 species, 877 genera, 162 families and 2 classes are distributed in both Vietnam and Malaysia, in which useful plants are 1089 species. 2826 species, 1052 genera, 171 families and 2 classes are distributed in both Vietnam and Thailand, in which useful plants are 1642 species. 4300 species, 1469 genera, 222 families and 2 classes are distributed in both Vietnam and China, in which useful plants are 2541 species.

Keywords: *Magnoliophyta, India, Southeast Asia, China.*

1. Introduction

Scientific cooperations between Vietnam and neighboring countries have been increasingly developed in recent years, including research on biodiversity in general and plant diversity in particular. In order to facilitate the support of Vietnamese scientists to study plant diversity in neighboring countries, as well as contribute to the development and application of useful plant species, while most plant taxonomists of Vietnam only know about Vietnamese plants, it is necessary to select a list of plant species that are distributed in both Vietnam and neighboring countries. For that reason, we have studied on the diversity of taxon ranks of Magnoliophyta distributed in both Vietnam and neighboring countries.

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Objectives: Compare taxa of Magnoliophyta (also known as flowering plants) which are distributed in both Vietnam and some neighboring countries, contributing to the development of cooperation among countries on plant diversity research and orientation for application.

2. Methods

2.1. Research subjects

The plant taxa of the Magnoliophyta distributed in both Vietnam and some neighboring countries (including India, Cambodia, Indonesia, Laos, Malaysia, Thailand and China).

2.2. Research content

- Building a list of plant species belonging to the Magnoliophyta distributed in both Vietnam and some neighboring countries.

- Evaluation of the diversity of taxa levels in the Magnoliophyta distributed in both Vietnam and some neighboring countries (species, genera, families, classes).

2.3. Research methods

- Collection of documents on plants of Magnoliophyta of Vietnam and some neighboring countries.

- Investigations in Vietnam from 2007 to 2021 based on cooperation between Institute of Ecology and Biological Resources (IEBR) and Korea Research Institute of Bioscience and Biotechnology (KRIBB). Study on 11826 specimens of 3336 species collected from the investigations.

- Study on 19369 specimens of 5166 species stored at herbaria of Vietnam (HN, VNM, CPNP).

- Application of Microsoft Access for data management and analysis.

- Based on the plant data of the Magnoliophyta in Vietnam, statistic species distributed in some neighboring countries. [1-28]

- Based on the plant data of the Magnoliophyta in some neighboring countries, perform additional statistics of species also distributed in Vietnam. [29-48]

- Compile a list of plant species belonging to the Magnoliophyta distributed in both Vietnam and some neighboring countries. Collect data on their use values.

- Nomenclature correction according to Checklist of Plant Species of Vietnam, vol. 2, 3 (Nguyen Tien Ban (editor) et al. (2003, 2005)) [14], http://www.plantsoftheworldonline.org [49], http://www.theplantlist.org [50], www.tropicos.org [51].

- Evaluation of the diversity of plant taxon levels in the Magnoliophyta (species, genera, families, classes).

3. Results and discussion

3.1. Diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and India

2644 species, 1061 genera, 174 families, 2 classes (Magnoliopsida -1960 species; Liliopsida - 684 species) distributed in both Vietnam and India. In which, useful plants with 1585 species, 1061 genera, 156 families, 2 classes (Magnoliopsida -1311 species; Liliopsida - 274 species); Medicinal plants: 1319 species, 696 genera, 149 families, 2 classes; Plants for timber: 157 species, 110 genera, 43 families, 1 class; Ornamental plants: 152 species, 110 genera, 41 families, 2 classes; Edible fruits, seeds: 119 species, 96 genera, 40 families, 2 classes; Plants for essential oils: 30 species, 17 genera, 9 families, 2 classes; Edible vegetables: 169 species, 117 genera, 51 families, 2 classes;

Dyed plants: 50 species, 32 genera, 18 families, 2 classes; Fiber plants: 13 species, 13 genera, 9 families, 2 classes; Plants for food of animals: 110 species, 69 genera, 16 families, 2 classes.

3.2. Diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and Cambodia

1971 species, 874 genera, 169 families, 2 classes (Magnoliopsida -1546 species; Liliopsida - 425 species) distributed in both Vietnam and Cambodia. In which, useful plants with 1224 species, 874 genera, 144 families, 2 classes (Magnoliopsida -1040 species; Liliopsida - 184 species); Medicinal plants: 874 species, 557 genera, 141 families, 2 classes; Plants for timber: 195 species, 114 genera, 46 families, 1 class; Ornamental plants: 136 species, 92 genera, 33 families, 2 classes; Edible fruits, seeds: 126 species, 96 genera, 43 families, 2 classes; Plants for essential oils: 15 species, 14 genera, 9 families, 2 classes; Vegetables: 105 species, 85 genera, 49 families, 2 classes; Dyed plants: 43 species, 31 genera, 15 families, 1 class; Fiber plants: 12 species, 11 genera, 8 families, 2 classes; Plants for food of animals: 62 species, 45 genera, 17 families, 2 classes.

3.3. Diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and Indonesia

1876 species, 905 genera, 167 families, 2 classes (Magnoliopsida -1284 species; Liliopsida - 592 species) distributed in both Vietnam and Indonesia. In which, beneficial plants with 1131 species, 905 genera, 140 families, 2 classes (Magnoliopsida -897 species; Liliopsida - 234 species); Medicinal plants: 905 species, 545 genera, 139 families, 2 classes; Plants for timber: 112 species, 79 genera, 38 families, 1 class; Ornamental plants: 172 species, 119 genera, 36 families, 2 classes; Edible fruits, seeds: 98 species, 79 genera, 43 families, 2 classes; Plants for essential oils: 16 species, 13 genera, 8 families, 2 classes; Vegetables: 115 species, 87 genera, 46 families, 2 classes; Dyed plants: 35 species, 23 genera, 13 families, 1 class; Fiber plants: 5 species, 5 genera, 5 families, 1 class; Plants for food of animals: 71 species, 42 genera, 13 families, 2 classes.

3.4. Diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and Laos

3478 species, 1265 genera, 205 families, 2 classes (Magnoliopsida - 2601 species; Liliopsida - 877 species) distributed in both Vietnam and Laos. In which, useful plants with 1599 species, 1042 genera, 160 families, 2 classes (Magnoliopsida -1299 species; Liliopsida - 300 species); Medicinal plants: 1042 species, 673 genera, 154 families, 2 classes; Plants for timber: 210 species, 123 genera, 53 families, 1 class; Ornamental plants: 233 species, 120 genera, 37 families, 2 classes; Edible fruits, seeds: 142 species, 102 genera, 47 families, 2 classes; Plants for essential oils: 14 species, 13 genera, 8 families, 2 classes; Vegetables: 165 species, 118 genera, 60 families, 2 classes; Dyed plants: 54 species, 33 genera, 17 families, 2 classes; Fiber plants: 16 species, 16 genera, 10 families, 2 classes; Plants for food of animals: 80 species, 53 genera, 18 families, 2 classes.

3.5. Diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and Malaysia

1839 species, 877 genera, 162 families, 2 classes (Magnoliopsida -1221 species; Liliopsida - 618 species) distributed in both Vietnam and Malaysia. In which, useful plants with 1089 species, 877 genera, 139 families, 2 classes (Magnoliopsida -834 species; Liliopsida - 255 species); Medicinal plants: 824 species, 518 genera, 130 families,

2 classes; Plants for timber: 127 species, 87 genera, 39 families, 1 class; Ornamental plants: 156 species, 104 genera, 31 families, 2 classes; Edible fruits, seeds: 103 species, 78 genera, 39 families, 2 classes; Plants for essential oils: 13 species, 12 genera, 8 families, 2 classes; Edible vegetables: 92 species, 76 genera, 44 families, 2 classes; Dyed plants: 31 species, 20 genera, 12 families, 1 class; Fiber plants: 3 species, 3 genera, 3 families, 2 classes; Plants for food of animals: 79 species, 56 genera, 15 families, 2 classes.

3.6. Diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and Thailand [36]

2826 species, 1052 genera, 171 families, 2 classes (Magnoliopsida -1929 species; Liliopsida - 897 species) distributed in both Vietnam and Thailand. In which, useful plants with 1642 species, 787 genera, 147 families, 2 classes (Magnoliopsida -1267 species; Liliopsida - 375 species); Medicinal plants: 1226 species, 659 genera, 139 families, 2 classes; Plants for timber: 200 species, 115 genera, 48 families, 1 class; Ornamental plants: 305 species, 142 genera, 36 families, 2 classes; Edible fruits, seeds: 141 species, 103 genera, 43 families, 2 classes; Plants for essential oils: 14 species, 11 genera, 5 families, 2 classes; Edible vegetables: 143 species, 109 genera, 57 families, 2 classes; Dyed plants: 52 species, 33 genera, 16 families, 1 class; Fiber plants: 11 species, 10 genera, 7 families, 2 classes; Plants for food of animals: 82 species, 55 genera, 16 families, 2 classes.

3.7. Diversity of species, genera, families and classes of Magnoliophyta distributed in both Vietnam and China

4300 species, 1469 genera, 222 families, 2 classes (Magnoliopsida -3249 species; Liliopsida - 1051 species) distributed in both Vietnam and China. In which, useful plants with 2541 species, 1469 genera, 196 families, 2 classes (Magnoliopsida -2029 species; Liliopsida - 512 species); Medicinal plants: 2070 species, 982 genera, 188 families, 2 classes; Plants for timber: 319 species, 154 genera, 58 families, 1 class; Ornamental plants: 326 species, 195 genera, 59 families, 2 classes; Edible fruits, seeds: 189 species, 121 genera, 53 families, 2 classes; Plants for essential oils: 41 species, 25 genera, 13 families, 2 classes; Vegetables: 221 species, 150 genera, 67 families, 2 classes; Dyed plants: 71 species, 47 genera, 26 families, 2 classes; Fiber plants: 33 species, 26 genera, 15 families, 2 classes; Plants for food of animals: 120 species, 82 genera, 24 families, 2 classes.

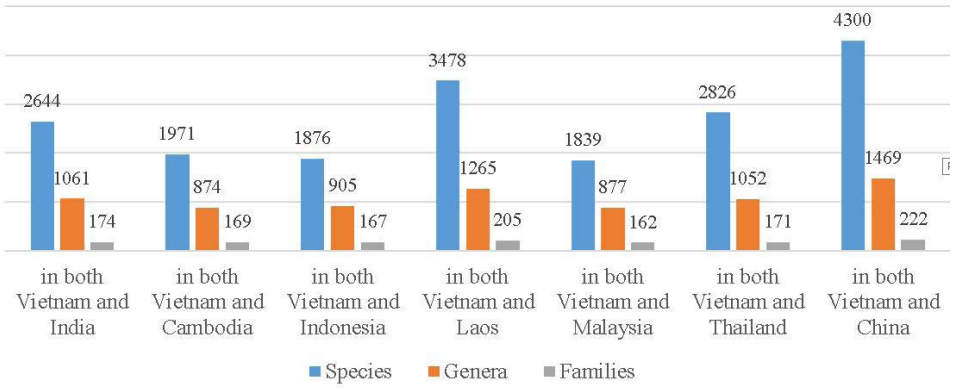

Figure 1. Diversity of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

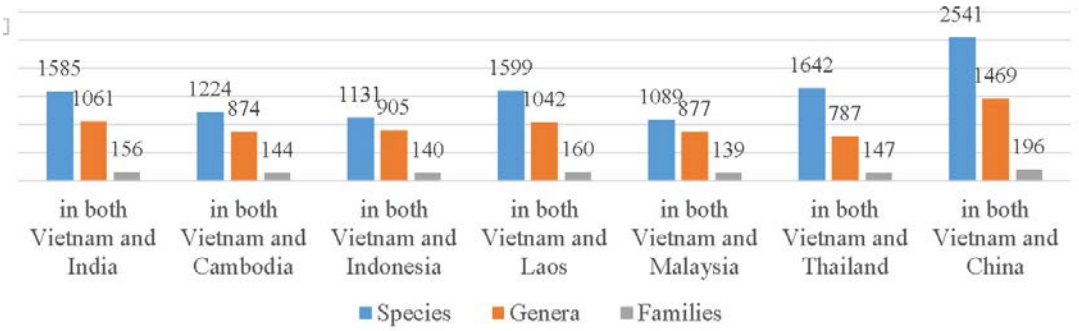

Figure 2. Diversity of useful plants of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

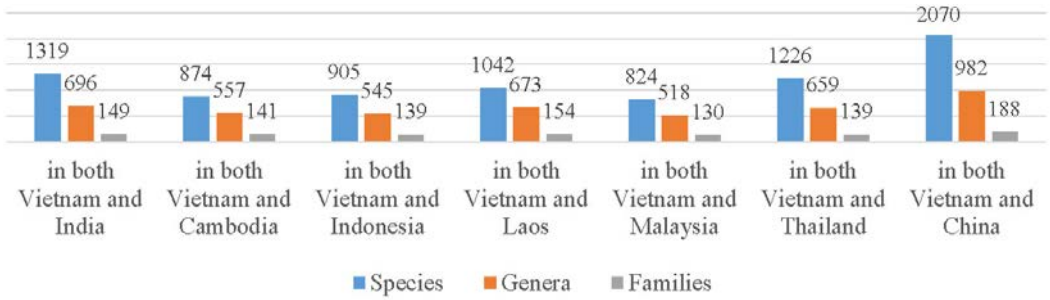

Figure 3. Diversity of medicinal plants of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

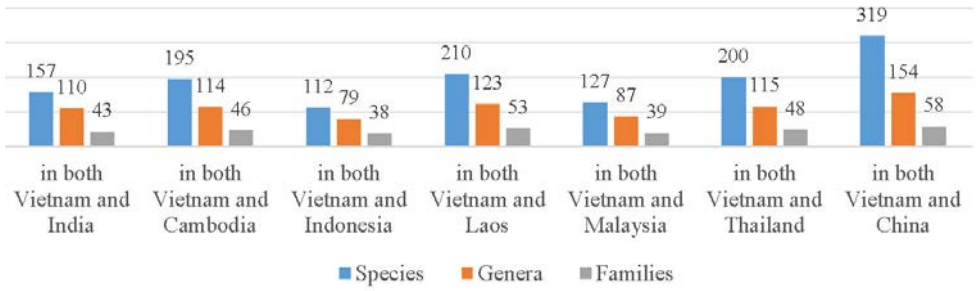

Figure 4. Diversity of timber plants of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

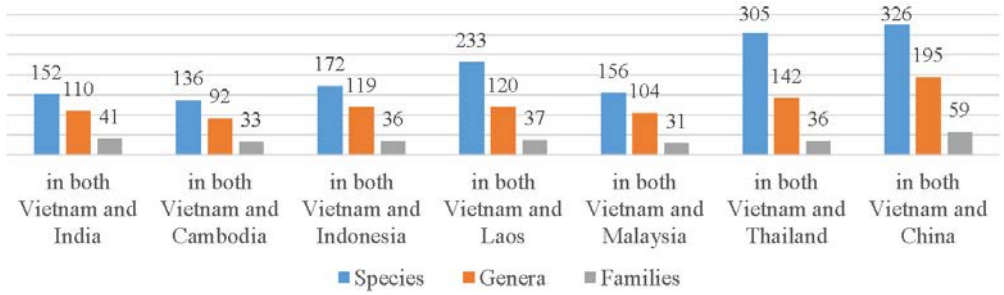

Figure 5. Diversity of ornamental plants of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

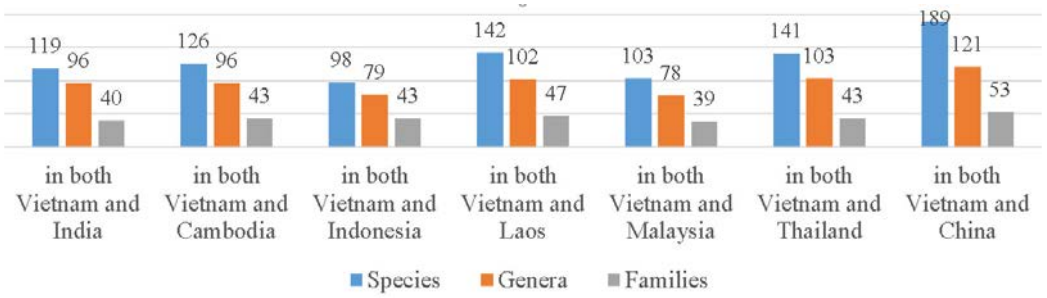

Figure 6. Diversity of edible (fruit, seed) plants of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

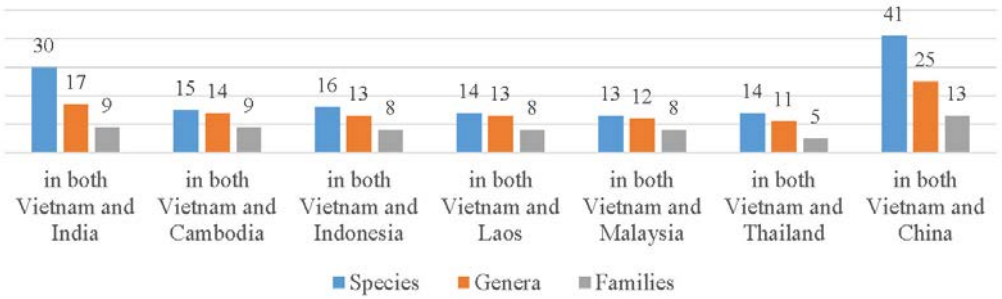

Figure 7. Diversity of plants (for essential oil) of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

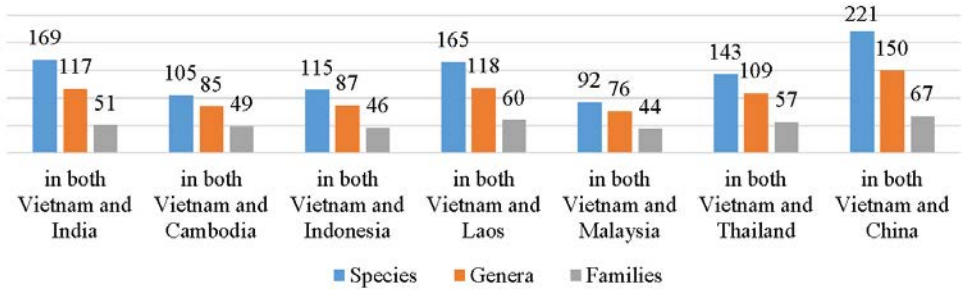

Figure 8. Diversity of vegetable plants of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

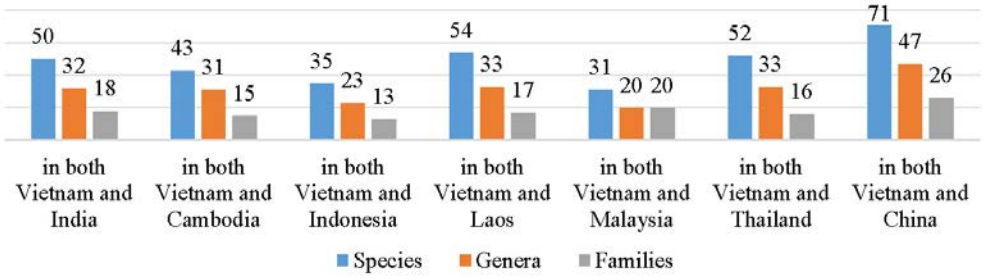

Figure 9. Diversity of dyed plants of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

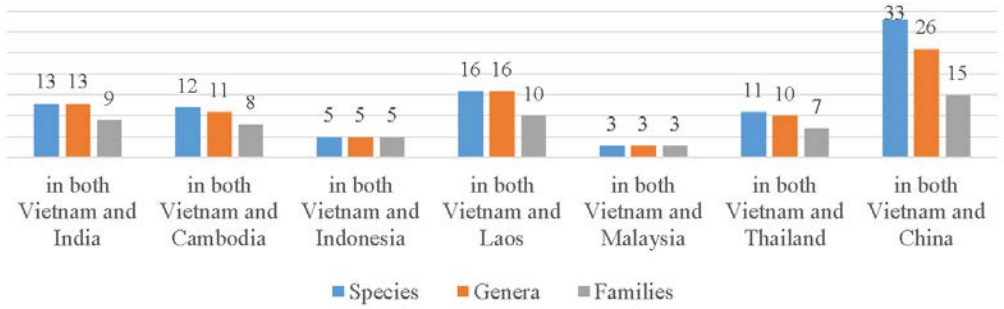

Figure 10. Diversity of plants (for fiber) of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

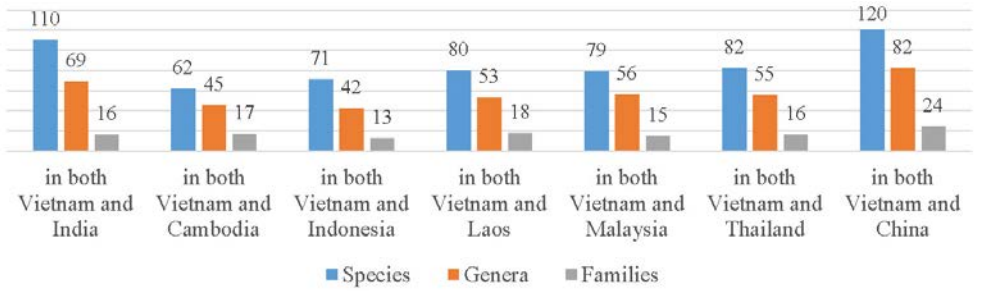

Figure 11. Diversity of plants (for animal food) of species, genera and families of the Magnoliophyta distributed in both Vietnam and some neighboring countries

4. Conclusions

The paper assessed the diversity of species, genera, families and classes of the Magnoliophyta distributed in both Vietnam and some countries such as India, Cambodia, Indonesia, Laos, Malaysia, Thailand, and China. The results provide a lot of valuable information, contributing to the development of cooperation among countries on plant diversity research and orientation for application.

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ĐA DẠNG CÁC ĐƠN VỊ PHÂN LOẠI THUỘC NGÀNH NGỌC LAN (MAGNOLIOPHYTA) PHÂN BỐ CHUNG Ở VIỆT NAM VÀ CÁC NƯỚC LÂN CẬN

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Tóm tắt

Bài báo đã đánh giá sự đa dạng về loài, chi, họ, lớp thuộc ngành Ngọc lan phân bố chung ở Việt Nam và một số nước lân cận. Có 2644 loài, 1061 chi, 174 họ, 2 lớp phân bố chung ở Việt Nam và Ấn Độ, trong đó có 1585 loài cây có ích. 1971 loài, 874 chi, 169 họ, 2 lớp phân bố chung ở Việt Nam và Campuchia, trong đó có 1224 loài thực vật có ích. 1876 loài, 905 chi, 167 họ, 2 lớp phân bố chung ở Việt Nam và Indonesia, trong đó có 1131 loài cây có ích. 3478 loài, 1265 chi, 205 họ, 2 lớp phân bố chung ở Việt Nam và Lào, trong đó có 1599 loài cây có ích. 1839 loài, 877 chi, 162 họ, 2 lớp phân bố chung ở Việt Nam và Malaixia, trong đó có 1089 loài cây có ích. 2826 loài, 1052 chi, 171 họ, 2 lớp phân bố chung ở Việt Nam và Thái Lan, trong đó có 1642 loài thực vật có ích. 4300 loài, 1469 chi, 222 họ, 2 lớp phân bố chung ở Việt Nam và Trung Quốc, trong đó có 2541 loài thực vật có ích.

Từ khóa: *Magnoliophyta, Ấn Độ, Đông Nam Á, Trung Quốc.*