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FAUNA AND FLORA IN VIETNAM DURING THE 17th AND 18th CENTURIES THROUGH HISTORICAL MATERIALS OF WESTERNERS

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Abstract. *Introduction.* The article systematically studies animals and plants in Vietnam, which were mentioned in historical materials by Westerners who have been present in Vietnam or were interested in researching this country during the 17th and 18th centuries. Based on the analysis of the advantages and limitations of historical materials records by Westerners during this period, the authors of the article aim to initially restore a piece of natural conditions in particular, as well as the overall picture of the country and people of Vietnam in general during the 17th and 18th centuries. *Methods and materials.* The authors combine the two main research methods: comparison and collating. To complete the research of the content in the article, the authors used original historical materials, including reports, letters, travel diaries, works, etc., of Western missionaries, traders, travelers, and researchers who operated in Vietnam or were interested in researching this country during the 17th and 18th centuries. *Analysis.* In the 17th and 18th centuries, to preach the Gospel, trade, travel, and research, Westerners set foot in Vietnam or were interested in studying this country. During that process, many aspects of the country and people of Vietnam were recorded in their reports, letters, travel diaries, works, etc. Among them, natural conditions in general and Vietnam's animals and plants in particular are also the content that attracts the attention of Westerners. That is an essential premise for the article's author to conduct research and provide a statistical table of animals and plants in Vietnam during the 17th and 18th centuries. On that basis, the author analyzes and highlights the accurate and detailed description while clarifying some non-incompatibilities and shortcomings when comparing and collating historical materials recorded by Westerners about several specific animals or plants. All of the above work is aimed at evaluating as objectively and accurately as possible the value of historical materials recorded by Europeans in conveying the image of the country and people of Vietnam who came to the Western world during the 17th and 18th centuries. *Results.* The article has provided researchers and readers with an overview of the animal and plant species mentioned in historical documents recorded by Westerners during the 17th and 18th centuries through the creation of statistical tables and analysis of data from those statistical tables. Based on the analysis of the advantages and limitations of these historical documents, the article's authors initially affirm their significance in partially restoring the appearance of the system of animals and plants in Vietnam during this period. *Authors' contribution.* Truong Anh Thuan searched and collected historical materials recorded by Westerners during the 17th and 18th centuries related to Vietnam's flora and fauna and formed the article's main contents. The author analyzes the advantages and limitations of these historical materials, thereby affirming their value in initially restoring the picture of Vietnam's flora and fauna in the 17th and 18th centuries from the perspective of history and bibliology research. Vo Van Minh conducted statistics and classification and created statistical tables on Vietnam's flora and fauna mentioned in historical materials recorded by Westerners during the 17th and 18th centuries. He analyzed data from those statistical tables as a basis for making scientific judgments and assessments presented in the article.

Key words: Vietnam, fauna, flora, Westerners, historical materials.

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ФАУНА И ФЛОРА ВЬЕТНАМА XVII–XVIII вв. В ЗАПИСКАХ ЗАПАДНЫХ ПУТЕШЕСТВЕННИКОВ

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Аннотация. *Введение.* В статье систематизированы животные и растения Вьетнама, которые упоминались в исторических материалах западных путешественников, посетивших Вьетнам в XVII и XVIII веках. На основе анализа преимуществ и недостатков исторических материалов, записанных путешественниками в этот период, авторы статьи ставят своей целью реконструировать отдельные стороны природных условий Вьетнама в XVII и XVIII вв., а также представление о стране и народе Вьетнама в этот период. *Методы и материалы.* Авторы сочетают два основных метода исследования – сравнение и сопоставление. Для полноты исследования содержания статьи авторы использовали оригинальные исторические материалы, включая отчеты, письма, путевые дневники, труды и т. д. западных миссионеров, торговцев, путешественников и исследователей, посетивших страну в XVII и XVIII веках. *Анализ.* В XVII и XVIII вв. для проповедования Евангелия, торговли, путешествий и исследований западные путешественники появились на территории Вьетнама. В ходе своего продвижения они зафиксировали в своих отчетах, письмах, путевых дневниках, работах многие аспекты жизни страны и народа Вьетнама. Особое внимание они уделяли описанию природных условий, животных и растений Вьетнама. На основе этих материалов авторы анализируют и выделяют точное и подробное описание, одновременно разъясняя некоторые несоответствия и недостатки при сравнении и сопоставлении исторических материалов, записанных западными путешественниками о нескольких конкретных животных и растениях. *Результаты.* В статье представлен обзор видов животных и растений, упомянутых в исторических документах, посредством создания статистических таблиц и анализа данных из этих статистических таблиц. На основе анализа преимуществ и недостатков этих исторических документов авторы статьи изначально утверждают их значимость для частичного восстановления внешнего вида системы животных и растений во Вьетнаме в этот период. *Вклад авторов.* Анх Тхуан Труонг осуществил поиск и анализ исторических материалов, сформулировал основное содержание статьи. Ван Минь Во провел классификацию и анализ полученных данных, составил статистические таблицы.

Ключевые слова: Вьетнам, фауна, флора, западные путешественники, исторические материалы.

Цитирование. Труонг Анх Тхуан, Ван Минь Во. Фауна и флора Вьетнама XVII–XVIII вв. в записках западных путешественников // Вестник Волгоградского государственного университета. Серия 4, История. Регионоведение. Международные отношения. – 2025. – Т. 30, № 3. – С. 31–42. – (На англ. яз.). – DOI: <https://doi.org/10.15688/jvolsu4.2025.3.4>

Introduction. The 17th and 18th centuries are considered the period that laid the foundation for exchange relationships in many fields between Vietnam and the West until today. During this time, to spread the Gospel, trade, travel, and research to satisfy the passion for discovering new things brought from a distant kingdom in the Far East that had not previously been known, some Westerners from different social components

(missionaries, traders, travelers, and researchers) have set foot in Vietnam or are interested in investigating this country. While living and operating in different areas of Vietnam, Westerners have recorded things they have “seen and heard” or feelings and understandings drawn from their experiences in reports, letters, travel diaries, and works. In particular, Vietnam’s animals and plants are some of the contents that

receive their attention. These historical materials helped Western readers understand animals and plants in Vietnam during the 17th and 18th centuries.

Methods and materials. When conducting research on this issue, the author relies entirely on original historical materials, including reports, letters, travel diaries, writings, etc., of Western missionaries [1; 2; 5; 9; 11; 12; 14; 15; 18], traders [3], travelers [4; 6; 7; 17], and researchers [8; 16] who have operated in Vietnam or were interested in researching this country in the 17th and 18th centuries and whose descriptions were vividly intuitive, not too in-depth (sometimes even confused or wrong) because they were not professional animal and plant researchers or did not have in-depth knowledge about this field. The authors use comparison and collating methods to “restore” pictures of animals and plants in Vietnam during the 17th and 18th centuries, mentioned by Westerners in their historical materials, thereby clearly analyzing the characteristics, advantages, limitations, and meaning of those documents. In processing historical materials, the authors also use analysis and synthesis to provide accurate scientific data and arguments to serve the process of researching this issue.

Analysis. When researching Vietnam’s animals and plants in the 17th and 18th centuries, it would be a big mistake if scholars did not use historical materials from Westerners who had presented in Vietnam or were interested in researching this country during this period. Based on the collection, selection, collation, and comparison of the above historical materials, the authors of the article have created a statistical table to help researchers and readers have a relatively general and comprehensive overview of plants and animals in Vietnam mentioned in historical materials compiled by Westerners during the 17th and 18th centuries.

From the above statistical table, it can be seen that in historical materials compiled during the 17th and 18th centuries by eight missionaries (Christoforo Borri, Giuliano Baldinotti, Alexandre de Rhodes, Joseph Tissanier, Giovanni Filippo de Marini, Jean Koffler, Nuntius de Horta, and an unknown missionary operated in Tonkin in the second half of the 18th century), one merchant (Samuel Baron), three travelers (William Dampier, Jean-Baptiste Tavernier, John Barrow), and two

researchers (Jean-Baptiste Gabriel Alexandre Grosier, Alexis Marie de Rochon) who operated in Vietnam or were interested in researching this country at that time, directly or indirectly mentioned 82 plants and 73 animals vegetating in the Cochinchina (South of the Gianh River) and Tonkin areas (Vietnam). Based on research on the similarities in biological characteristics or functions and utilities of these 81 plant species in Vietnamese lives during the 17th and 18th centuries, the author divided them into six main groups. The first is the fruit trees group with 26 species. The second is the group of food crops with 23 species. Third is the group of woody plants with nine species. Fourth is the group of aromatic and medicinal plants with 12 species. Fifth is the group of flowers with four species. The last eight plant species (see Table 1) do not belong to the above groups, so they are classified in group six (miscellaneous). Meanwhile, based on origin and growth environment, 74 animal species are divided into two main groups: wild animals with 59 species and domesticated animals with 14 species. However, based on the evolutionary sequence, morphological characteristics, and anatomical structure of animals, researchers can classify 73 animals in Vietnam recorded by Westerners in their historical materials during the 17th and 18th centuries into mollusks (eight species), crustaceans (five species), insects (six species), fishes (two species), amphibians (two species), reptiles (five species), birds (21 species), and mammals (24 species).

Indeed, the flora and fauna of Vietnam in the 17th and 18th centuries could not stop at the 82 plant species and 73 animal species mentioned above, if not many times larger, precisely as we understand them today [13, p. 1]. So why did the historical materials of Western missionaries, traders, travelers, and researchers at that time only mention such a modest number of animals and plants in Vietnam? It must be emphasized that 82 plant species and 73 animal species in Table 1 were mentioned in personal letters, works, reports of missionaries and traders from Europe, or in diaries of travelers and historical materials that provide an overview of a particular area in Vietnam by Western researchers at that time. That shows that from the beginning, animals and plants were not the main subjects reflected

Table 1. Vietnam's plants and animals in the historical materials of Westerners during the 17th and 18th centuries

	Plants (the amount of described species)	Historical materials of Westerners		Animals	
Fruit trees (26)	Jack-tree	[5, p. 292; 14, p. 66; 15, p. 49; 3, p. 661]	[3, p. 659; 12, p. 48; 8, p. 219; 9, p. 581]	Antelope	Wild animals (59)
	Miengou tree	[8, p. 203; 11, p. 575]	[3, p. 661; 5, p. 290; 17, p. 180]	Mice	
	Durian	[5, p. 293]	[5, p. 295; 12, p. 48; 17, p. 179; 6, p. 577; 8, p. 219; 18, p. 93; 11, p. 574]	Deer	
	Pineapple	[5, pp. 293-294; 15, p. 49; 14, pp. 66-67; 16, p. 299; 17, p. 178; 6, p. 575, 594; 8, p. 217; 4, p. 315; 3, p. 662; 9, p. 581]	[12, p. 48; 8, p. 218, 220; 18, p. 93; 17, p. 179; 16, p. 296; 9, p. 581; 2, p. 278, 280; 11, p. 574]	Tiger	
	Areca	[5, p. 294; 3, p. 660; 16, p. 299; 17, p. 175; 4, p. 315]	[5, p. 295; 12, p. 48]	Wild Boar	
	Vine	[8, p. 218; 5, p. 292, 295]	[12, p. 48; 8, p. 218; 18, p. 93; 11, p. 574]	Bear	
	Fig tree	[5, p. 295; 15, pp. 49-51; 3, p. 660; 18, p. 93; 8, p. 217; 17, p. 176; 11, p. 573]	[5, pp. 301-306; 15, pp. 51-52; 12, p. 48; 1, p. 75; 17, p. 180; 6, p. 577; 8, p. 218, p. 220; 16, p. 296; 9, p. 581; 2, p. 278; 11, p. 574]	Elephant	
	Pear	[15, p. 49]	[5, pp. 306-307; 15, p. 53; 12, p. 48; 8, p. 220; 9, p. 581]	Rhino	
	Carambola	[15, p. 49]	[15, pp. 53-54; [12, pp. 48-49]	Wild cat	
	Mango	[15, p. 49; 16, p. 299; 6, p. 575]	[12, pp. 48-49]	Wolve	
	Lychee	[15, pp. 49-50; 3, p. 661; 6, p. 576; 4, p. 315]	[9, p. 581]	Wild goat	
	Orange	[3, p. 660; 17, p. 175, p. 178; 14, p. 67; 5, pp. 290-291; 16, p. 299; 6, p. 575, p. 594; 4, p. 315; 8, p. 217; 18, p. 92; 9, p. 581; 11, p. 573]	[12, pp. 48-49; 6, p. 577; 8, p. 219]	Rabbit	
	Tangerine	[6, p. 576]	[12, p. 49; 17, p. 179; 8, p. 218; 11, p. 574]	Monkey	
	Coconut	[3, p. 660; 18, p. 175; [6, p. 576]	[17, pp. 176-177]	Bat	
	Guava	[3, p. 660; 15, p. 50; 17, p. 175; 6, p. 575; 4, p. 315]	[6, p. 561]	Porpoise	
	Papaya	[3, p. 660; 17, p. 175]	[15, p. 48; 3, p. 661; 5, p. 297; 17, pp. 177-178; 8, p. 225]	Swiftlet	
Jamboger	[17, p. 175]	[5, p. 295]	Wild chicken		

Continuation of Table 1

	Plants (the amount of described species)	Historical materials of Westerners		Animals
	Banana	[3, p. 660; 5, p. 291; 6, p. 575; 4, p. 315]	[5, p. 295]	Crane
	Longan	[3, p. 661; 15, p. 50]	[5, p. 295; 6, p. 578; 17, p. 179]	Turtle- dove
	Sugar apple tree	[3, p. 661]	[8, p. 219; 11, p. 574]	Goldfinch
	Pomпельmo tree	[3, p. 661]	[8, p. 219; 11, p. 574]	Ho-kien bird
	Plum tree	[3, p. 661]	[8, p. 219; 9, p. 581]	Peacock
	Citron	[3, p. 662; 11, p. 573]	[8, p. 219; 9, p. 581]	Pheasant
	Lime	[16, p. 299; 17, p. 178; 6, p. 575, p. 594; 18, p. 92]	[6, p. 578]	Parrot
	Melon	[6, p. 575, p. 594; 5, p. 292; 14, p. 67; 4, p. 316]	[6, p. 578]	Partridge
	Pomegranate	[4, p. 315]	[6, p. 578]	Parakite
Grain and vegetable crops (23)	Rice	[15, pp. 47-48; 3, p. 660; 17, p. 174; 16, p. 299; 5, p. 290; 11, p. 573]	[6, p. 578]	Wild duck
	Millet	[9, p. 580]	[6, p. 578]	Widgeon
	Bean	[9, p. 580]	[6, p. 578]	Teal
	Maize	[9, p. 580]	[6, p. 578]	Pellican
	Sweet potato	[6, p. 574; 4, p. 315]	[6, p. 578]	Heron
	Yam	[4, p. 315; 9, p. 580]	[18, p. 94]	Quail
	Potato	[6, p. 574; 9, p. 580]	[3, p. 662; 17, p. 34, 178; 6, p. 561]	Turtle
	Chicory	[5, p. 295]	[6, p. 579]	Sea turtle
	Lettuce	[5, p. 295]	[6, p. 577]	Lizard
	Purslain	[6, p. 575]	[5, p. 297]	Chame- leon
	Water morning glory	[6, p. 575]	[6, p. 577]	Snake
	Onion	[6, p. 575]	[6, p. 577]	Toad
	Plantain	[6, p. 575]	[6, p. 577; 4, p. 312]	Frog
	Cabbage	[5, p. 295]	[4, p. 312]	Balistes (fish)
	Pumpkin	[6, p. 575, p. 594; 5, p. 295]	[4, p. 312]	Chétodons (fish)
	Fuci (algae or seaweed)	[4, pp. 313-314]	[6, p. 578]	Crawfish
	Ulvae (algae or seaweed)	[4, pp. 313-314]	[6, p. 578]	Shrimp
	Salicornia (aquatic vegetable)	[4, p. 314]	[6, p. 578]	Prawn
	Aremaria (aquatic vegetable)	[4, p. 314]	[6, p. 578]	Sea crab
Crithmum (aquatic vegetable)	[4, p. 314]	[6, p. 578]	Land crab	

Continuation of Table 1

	Plants (the amount of described species)	Historical materials of Westerners		Animals	
	Maritium (aquatic vegetable)	[4, p. 314]	[4, p. 312]	Sea cucumber (Biches de Mer)	
	Samphire (aquatic vegetable)	[4, p. 314]	[4, p. 312]	Médues (mollusk)	
	Cane	[5, p. 295; 8, p. 216; 3, p. 662; 9, p. 580]	[4, p. 312]	Holoturies (mollusk)	
Woody plants (9)	Banyan tree	[3, p. 660; 4, pp. 328-329; 17, p. 176; 8, p. 217-218; 18, p. 93]	[4, p. 312]	Actines (mollusk)	
	Ebony	[16, p. 296; 12, p. 45; 8, p. 226]	[4, p. 312]	Ascidies (mollusk)	
	Rosewood	[16, p. 296]	[4, p. 312]	Doris (mollusk)	
	Ironwood	[5, p. 299; 12, p. 45]	[7, p. 22; 5, p. 296]	Oyster	
	Sapan tree	[16, p. 296]	[5, p. 296]	Shellfish	
	Sandal tree	[16, p. 296]	[5, p. 318; 6, p. 577]	Scorpion	
	Chinaberry tree	[17, p. 175]	[6, p. 577]	Centipede	
	Pone tree	[6, pp. 576-577, p. 611; 8, p. 218]	[6, p. 578]	Locust	
	Fir	[6, p. 511]	[17, p. 180]	Mosquito	
Aromatic and medicinal plants (12)	Agarwood (calambac)	[14, p. 65; 17, p. 182; 5, pp. 299-300; 12, p. 45; 8, p. 226]	[17, p. 180]	White ant ¹	Domesticated animals (14)
	Pepper (plant)	[14, p. 65; 16, p. 299; 8, p. 218, p. 226; 9, p. 581]	[15, p. 51; 6, p. 577; 4, p. 315; 8, p. 220; 5, p. 295; 17, p. 179; 16, p. 300; 9, p. 581]	Cow	
	Cinnamon	[16, p. 296; 12, p. 45]	[15, p. 51; 17, p. 179; 1, p. 75, p. 77; 4, p. 312; 8, p. 220; 6, p. 577; 9, p. 581; 11, p. 574]	Horse	
	Rhubarb	[5, p. 319; 6, pp. 610-611]	[18, p. 94]	Donkey	
	Tea	[5, p. 315; 8, p. 218; 14, pp. 51-53; 9, p. 581]	[5, p. 295; 15, p. 51; 6, p. 577; 4, p. 315; 8, p. 220; 16, p. 300; 9, p. 581]	Buffalo	
	Mercuriale (herb)	[5, p. 318]	[5, p. 295; 15, p. 54; 6, p. 577; 9, p. 581]	Domestic goat	
	Betel	[5, pp. 294-295; 3, p. 660; 16, p. 299; 4, p. 315; 6, p. 577, p. 594]	[6, p. 577]	Sheep	
	Ginger	[6, pp. 610-611]	[5, p. 295; 15, p. 51; 6, p. 577; 4, p. 312; 8, p. 220; 17, p. 179; 9, p. 581]	Hog	
	Anise	[6, p. 611]	[17, p. 180; 6, p. 577; 4, p. 312]	Dog	
	Galingale	[6, p. 611]	[6, p. 577]	Domestic Cat	
Saffron	[8, p. 218; 9, p. 581]	[5, p. 295; 15, p. 54; 17, p. 179, p. 181; 6, p. 577; 4, p. 312; 8, p. 220; 16, p. 301; 9, p. 581]	Domestic chicken		

End of Table 1

	Plants (the amount of described species)	Historical materials of Westerners		Animals
	Clove tree	[16, p. 297]	[5, p. 295; 16, p. 301; 17, p. 179, p. 181; 6, p. 577; 4, p. 312; 8, p. 220; 9, p. 581]	Domestic duck
Flowers (4)	Rose	[3, p. 662]	[5, p. 295; 15, p. 54; 18, p. 94; 16, p. 301]	Pigeon
	Jasmine	[3, p. 662]	[5, p. 295; 6, p. 578; 8, p. 220; 9, p. 581]	Geese
	Lily	[3, p. 662]	[6, p. 574; 12, p. 58]	Silkworm
	Baguc (flower)	[17, p. 179]		
Miscella- neous (8)	Mulberry	[5, p. 298; 8, p. 218; 6, p. 575; 12, p. 58; 9, p. 581]		
	Cotton (plant)	[8, p. 218; 12, p. 58; 4, p. 315; 9, p. 581]		
	Hemp	[12, p. 58]		
	Tobacco	[5, p. 295; 4, p. 316]		
	Tsai tree ²	[8, p. 218]		
	Indigo	[8, p. 218; 9, p. 581]		
	Varnish tree	[9, p. 581]		
	Rattan	[16, p. 297]		

in Westerners' historical materials and were only one of the related contents. Therefore, there will certainly not be any specific intention or plan regarding content, types, or numbers of animals and plants determined and arranged according to a scientific system before starting the records. This work happened randomly according to a simple logic: wherever they went, they directly observed or heard about and felt impressed with Vietnam's animals or plants and would record it. With such a method, when arriving at the Vietnamese settlement areas in Cochinchina or Tonkin, Western missionaries, traders, and travelers first focused their attention on plant and animal species that are familiar or commonly used for many different purposes (food, construction, medical treatment, combat training, entertainment, etc.) in the lives of Vietnamese. Therefore, some plant species belonging to the group of fruit trees, food crops, woody plants, aromatic and medicinal plants, some flowers, or domesticated animals, and even wild animals appearing in historical materials of Westerners who were present in Vietnam during the 17th and 18th centuries are also completely understandable.

Statistical data from Table 1 also shows that there are 28 plants (jack tree, pineapple, areca, vine, fig tree, mango, lychee, orange, guava, banana, lime, melon, rice, sweet potato, yam, pumpkin, cane, banyan tree, ebony, ironwood, agarwood (calambac), pepper (plant), cinnamon, rhubarb, tea, betel, cotton (plant), mulberry) and 21 animals (mice, deer, tiger, wild boar, elephant, rhino, swiftlet, turtle-dove, frog, oyster, scorpion, cow, horse, buffalo, domestic goat, hog, dog, domestic chicken, domestic duck, pigeon, geese) are recorded in the historical materials of Westerners, whether they write about Cochinchina or Tonkin of Vietnam. From there, it can be deduced by guessing that these plants and animals grow and develop in both areas. However, it will not be difficult for researchers to find species of plants and animals that only appear in historical materials about Cochinchina or Tonkin³. Therefore, are these plants and animals unique to each land? It must be affirmed that the lands of Tonkin (from the north of the Gianh River (Quang Binh province) to the north) and Cochinchina (from the south of the Gianh River to the south) of Vietnam in the 17th and 18th centuries are located in the tropical monsoon climate zone [10, pp. 2-1]. Therefore, although the difference in flora

and fauna between these two areas exists, it is not too large. That eliminates the possibility that many plants and animals listed in Table 1 are unique to a specific geographical area; due to biological adaptation characteristics, they only appear and grow in this area but cannot be found in that land.

Meanwhile, for animal and plant species recorded by Westerners exclusively in either Cochinchina or Tonkin during the 17th – 18th centuries (see Note 2); modern research – aided by advanced visualization techniques and botanical/zoological expertise – has demonstrated that these organisms could thrive across Vietnam, including both historical regions. This raises a critical question: Why were these species recorded only in one of the two areas in Westerners' historical materials? To explain this issue, researchers should return to the primary purpose and object of Westerners' historical materials recording about Vietnam in the 17th and 18th centuries. In fact, Vietnam's natural conditions, including animals and plants, are only secondary content in the reports, letters, travel diaries, works, etc., of Western missionaries, traders, travelers, and researchers. Therefore, their recordings about biodiversity were often driven by momentary inspiration or arbitrary curiosity rather than systematic study. Consequently, these accounts frequently lacked comprehensive surveys. This explains the fragmented and uneven coverage of ecosystems, as well as the lack of comparative analysis in the documentation of plants and animals in Cochinchina and Tonkin by Western missionaries, traders, travelers, and researchers during the 17th and 18th centuries.

Besides, scholars also easily recognize the difference in recording capacity between Vietnam's plants and animals from Westerners' historical materials during the 17th and 18th centuries. Of the total of 82 plants and 73 animals mentioned by 15 historical materials of Westerners who were present in Vietnam or were interested in researching this country during the 17th and 18th centuries, the author found that there are up to 72 plants and 69 animals mentioned only by name or if their characteristics are recorded, it is very brief. However, fortunately, in these historical materials, researchers can still find detailed and in-depth descriptions based on the direct feelings and understanding of Western missionaries,

traders, travelers, and researchers about the plants and animals that grew and developed in Vietnam during this period. This isn't easy to find in historical sources recorded by Vietnamese in the 17th and 18th centuries.

From the above statistical table, researchers can recognize that 10/82 (12.19%) plant species and 4/73 (5.47%) animal species are described quite meticulously in eight historical materials from four Western missionaries (Christoforo Borri, Alexandre de Rhodes, Giovanni Filippo de Marini, and an unknown missionary who operated in Tonkin in the second half of the 18th century), a merchant (Samuel Baron), and two researchers (Jean-Baptiste Gabriel Alexandre Grosier and Alexis Marie de Rochon). They worked in Vietnam or were interested in researching this country in the 17th and 18th centuries.

Notably, *Relation de la nouvelle mission des pères de la compagnie de Jésus au royaume de la Cochinchine* by Christoforo Borri and *Histoire du Royaume de Tunquin* by Alexandre de Rhodes are two of the eight most valuable historical materials because they provide relatively complete and systematic information related to nearly all animal and plant species in Table 2. This recording comes from many different reasons. It may have originated from the popularity and closeness of certain plant species in the lives of Vietnamese at that time (jackfruit, pineapple, rice, lychee, banana, and longan) that no matter where they go (Cochinchina or Tonkin), Westerners can see its existence.

The specific records of Westerners are also sometimes inspired by their unique impression of the appearance, song (goldfinch), or strength of an animal (elephant), even the irresistibly delicious (jackfruit) or the specific characteristic taste of a particular fruit (durian). In addition, the rarity and unique utility of items related to a specific animal species (rhino horns, bird's nests) are also a driving force that stimulates Westerners' interest. The content from the above historical materials of Westerners also shows that they often begin their recording work with descriptions of the biological characteristics of animal or plant species, from the distribution area and natural factors that affect growth and development to shape, size (stems, branches, leaves, fruits in plants and animal body parts), and other unique attributes (materials and nesting methods of swiftlets, strength and intelligence of elephants, etc.).

Table 2. Vietnam's animals and plants recorded in detail in Westerners' historical materials of the 17th and 18th centuries

Classify		Historical materials of Westerners	Description contents
Plants	Jack tree	[5, p. 292; 14, p. 66; 15, p. 49; 3, p. 661]	The height of the jack tree, size, weight, and internal ingredients of the jackfruit; the distinguishing between types of jackfruit and showing a particular liking for the taste of this fruit
	Durian	[5, p. 293]	The distribution area of this tree in Southeast Asia, including Cochinchina, the external appearance of the tree and durian fruit, and its unique taste
	Pineapple	[5, pp. 293-294; 15, p. 49; 14, pp. 66-67; 16, p. 299]	The popularity of pineapple plants in India, Brazil, and Cochinchina, the appearance and reproductive characteristics of this plant, and the shape, size, weight, color, internal composition, and taste of pineapple
	Areca	[5, p. 294; 3, p. 660]	The stem and leaves of the areca tree and the shape, size, color, and internal composition of the areca nut, especially its significance in the traditional Vietnamese culture of betel chewing
	Lychee	[15, pp. 49-50; 3, p. 661]	The geographical distribution of the lychee tree, the shape and size of the branches, leaves, color, internal composition, and taste of the lychee fruit when ripe, and the harvest time of this fruit during the year
	Banana	[3, p. 660; 5, p. 291]	The stem height, shape, and size of leaves; the distinguishing banana types; reproductive characteristics; size of a bunch of bananas; the color of bananas when raw and ripe; internal ingredients; and their taste
	Longan	[3, p. 661; 15, p. 50]	The color of the peel, shape, size, internal composition, taste of the longan fruit, and the time of year when this fruit is harvested
	Rice	[15, pp. 47-48; 3, p. 660; 5, p. 290]	The hydrological conditions, soil suitable for the growth and development of wet rice plants, rice crops during the year in Tonkin and Cochinchina, flood control work for wet rice cultivation, and the role of rice in the cuisine life of Vietnamese
	Agarwood (calambac)	[14, p. 65; 5, pp. 299-300]	Geographical area of growth and development of this plant, distinguishing types of agarwood and the quality and utility of each type, the process of forming a particular kind of agarwood (calambac), and the expensiveness of this aromatic and medicinal plant
	Betel	[5, p. 294; 3, p. 660]	The betel stems and leaves, the method of preparing betel quid and chewing betel, and the positive effects of this on human health and oral hygiene; confirming that this is one of the indispensable ingredients in the Vietnamese culture of betel chewing
Animals	Rhino	[5, pp. 306-307; 15, p. 53; 12, p. 48]	The shape and size of the rhino, the process of hunting this wild animal, the value of the rhino's body parts, including meat, skin, bones, teeth, and especially the horn, in combating different types of venom, and the method to check the quality of rhino horn
	Elephant	[5, pp. 301-306; 15, pp. 51-52]	The body, legs, trunk, skin color, strength, longevity, intelligence of elephants, the living area, domestication and training of this animal, its utility, and the value of elephants in Vietnamese lives.
	Swiftlet	[15, p. 48; 3, p. 661; 5, p. 297]	The shape and size of the swiftlet, the location, the unique method and materials used to make the bird's nest, the color of the bird's nest, the process of exploiting the bird's nest of Vietnamese, and the preciousness of this luxury product
	Goldfinch	[8, p. 219; 11, p. 574]	This bird's body, including the head, eyes, beak, legs, feather colors, etc., song, nesting method, yearly reproductive cycle, and reaction when a Ho-kien bird attacks

However, there would be nothing worth mentioning if records of Westerners only stopped at these contents. It is essential that readers also find in these documents in-depth descriptions not only from a biological perspective but also other aspects (cultural, social) associated with plant and animal species mentioned above, such as the confiscation of lychees [3, p. 661] and bird's nests [5, p. 297] by the Vietnamese monarchy in Tonkin and Cochinchina, flood control work (building dikes, digging canals) for wet rice cultivation [15, pp. 47-48; 3, p. 660; 5, p. 290], the custom of chewing betel (areca nut), and the good meaning of this cultural phenomenon in the lives of Vietnamese [5, p. 294; 3, p. 660] or the wonderful utility of rhino horn in preventing various types of venom according to Vietnamese conception [5, pp. 306-307; 12, p. 48]. Among them, there are several phenomena that, despite experiencing many fluctuations and ups and downs in history, still exist today in Vietnamese society as an endorsement of the accuracy of the records of Westerners in the 17th and 18th centuries.

Results. When researching Vietnam in the 17th and 18th centuries, scholars feel happy because, in addition to the Han script documents compiled by historical writing agencies under the Vietnamese monarchy at the time, researchers can also explore different aspects related to the country and people of Vietnam through records of Westerners who were present in Vietnam or were interested in studying this country during this period. Among them, Vietnam's flora and fauna are no exception. Non-comprehensive is one of the characteristics that can be easily seen in these historical materials. That is entirely understandable because, in the conflict between political forces throughout the 17th and 18th centuries, most Westerners had one of two destination point choices, Cochinchina or Tonkin, to carry out their work (missionary, trade, or travel). Therefore, records of animals and plants certainly cannot go beyond that geographical range. Furthermore, this topic has never become the main content of Westerners' historical materials. Randomly and arbitrarily recording without a clear plan or purpose has led to another consequence that is difficult to avoid, which is the dispersion, fragmentation, and lack of systematicity and logic in the content of these documents. However, the above shortcomings have been partly compensated for by Westerners' meticulous descriptions of some animal

and plant species in Vietnam based on many different approaches. That has helped researchers visualize the appearance and value of some plant and animal species in Vietnamese society. However, are all the Westerners' records of Vietnam's animals and plants in the 17th and 18th centuries accurate? Is there no need to raise further considerations or doubts about their scientific nature? The comparison of historical materials has shown a reality that is not entirely true.

Western missionaries, traders, and travelers as foreigners recorded Vietnam's flora and fauna through vivid visual methods and their own experiences. Therefore, the relative objectivity of these documents can be affirmed. However, the difficulties encountered in integrating into Vietnamese society, especially the language barrier, have made it impossible for Westerners to comprehensively and deeply absorb all relevant local knowledge of animals and plants in Vietnam. Besides, they also are not professional animal and plant researchers or do not have in-depth knowledge about this field. Consequently, the appearance of some content lacking unities⁴, incompleteness, mistakes⁵, or excessive exaggeration⁶ in the records of Westerners in the 17th and 18th centuries is entirely understandable. Despite this, from the perspective of history and bibliography research, it can be seen that the records mentioned above of Western missionaries, merchants, travelers, etc., did not stop at personal understanding of the flora and fauna of Vietnam but also followed their footsteps back to Europe, contributing to introducing to a segment of readers in the "Old Continent" the first images of the distant country of Vietnam in the Far East. At the same time, it has become a significant source of historical materials, helping today's scholars to compare, collate, and initially study the flora and fauna of Vietnam in the 17th and 18th centuries.

NOTES

¹ In the *Relation nouvelle et singulière du Royaume de Tunquin* (in French), Jean-Baptiste Tavernier wrote "fourmis blanches", which translates into English as "white ants". However, through Jean-Baptiste Tavernier's description of the biological characteristics of this animal, it can be known that this is a termite species.

² According to Jean-Baptiste Gabriel Alexandre Grosier, the Vietnamese used this plant in Tonkin to dye jade green, which is very durable [8, p. 218].

³ A study of 15 Westerners' historical materials concerning Cochinchina, which directly or indirectly document Vietnam's animal and plant life in the 17th and 18th centuries, revealed 19 plant species. These include the durian, pomegranate, chicory, lettuce, cabbage, fuci (a type of algae or seaweed), ulvae (a type of algae or seaweed), salicornia (an aquatic vegetable), aremaria (an aquatic vegetable), crithmum (an aquatic vegetable), maritium (an aquatic vegetable), samphire (an aquatic vegetable), rosewood, sapan tree, sandal tree, mercuriale (herb), clove tree, tobacco, and rattan. It also revealed the following 13 animals: wild chicken, crane, chameleon, balistes (fish), fleadon (fish), sea cucumber (biches de mer), médues (mollusk), holoturiers (mollusk), actines (mollusk), ascidies (mollusk), doris (mollusk), shellfish, and centipedes. However, they are not mentioned in historical materials related to Tonkin. Meanwhile, there are up to 35 plants (miengou tree, pear, carambola, tangerine, coconut, papaya, jamboger, longan, sugar apple tree, pompelmo tree, plum tree, citron, millet, bean, maize, potato, purslain, water morning glory, onion, plantain, chinaberry tree, pone tree, fir, ginger, anise, galingale, saffron, rose, jasmine, lily, baguc (flower), hemp, tsai tree, indigo, varnish tree) and 39 animals (antelope, bear, wild cat, wolve, wild goat, rabbit, monkey, bat, porpoise, goldfinch, ho-kien bird, peacock, pheasant, parrot, partridge, parakite, wild duck, widgeon, teal, pellican, heron, quail, turtle, sea turtle, lizard, snake, toad, crawfish, shrimp, prawn, sea crab, land crab, locust, mosquito, white ant, donkey, sheep, domestic cat, silkworm) are only found in historical materials about Tonkin but not mentioned in historical materials about Cochinchina (see Table 1).

⁴ When comparing the records of Westerners in the 17th and 18th centuries about the same species of animals and plants in Vietnam, researchers can notice some lack of similarity in content. For example, in A Voyage to Cochinchina, in the years 1792 and 1793, John Barrow asserted that there were no sheep in the land of Cochinchina [4, p. 312]. Meanwhile, in Dampier's Voyages Consisting of a New Voyage Round the World, William Dampier recorded this animal's existence at Tonkin [6, p. 577]. Or in Relation nouvelle et singulière du Royaume de Tunquin, Jean-Baptiste Tavernier said that Vietnamese people in Tonkin did not raise cats [17, p. 180], but William Dampier asserted the opposite [6, p. 577]. In Histoire du Royaume de Tunquin and Divers Voyages et Missions, Alexandre de Rhodes said that because Vietnam had no grapes, the people of this country did not have wine [14, p. 65; 15, p. 47]. On the contrary, Jean-Baptiste Gabriel Alexandre Grosier and Christoforo Borri affirmed the existence of this fruit in the lives of Vietnamese in Tonkin and Cochinchina during the 17th and 18th centuries [8, p. 218; 5, p. 292, 295].

⁵ In Relation nouvelle et singulière du Royaume de Tunquin, Jean-Baptiste Tavernier records some animal and plant species in Tonkin [17, pp. 174-182]. In A Description of the Kingdom of Tonqueen, Samuel Barron refuted and clarified some inaccurate or erroneous records by Jean-Baptiste Tavernier about some animal and plant species in this area [3, pp. 660-664].

⁶ Recording the banyan tree, Jean-Baptiste Gabriel Alexandre Grosier excessively exaggerates the giantness of this tree, saying that the foliage is so large that it can shade 30,000 people to rest [8, pp. 217-218].

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