FIFTY-ONE VIETNAMESE TRADITIONAL MEDICINES DERIVED FROM INVERTEBRATE ARTHROPDS (ARTHROPODA) AND ANNELIDS (ANNELIDA)

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Abstract

To develop the Bio-pharmacology major at the university level, a comprehensive survey of invertebrate arthropods (Arthropoda) and annelids (Annelida) utilized as Vietnamese traditional medicines was conducted. The survey was organized according to six criteria: (1) Vietnamese and medicinal name, (2) classification and scientific name, (3) distribution and habitat, (4) medicinal properties, (5) pharmaceutical effects, (6) discussion and comments.

A total of fifty-one invertebrate species were identified, comprising forty-six arthropod species and five annelid species used in traditional medicine. Among these, the phylum Arthropoda includes four classes (Insecta, Arachnida, Chilopoda, Diplopoda), seventeen orders and forty-six species species. The phylum Annelida comprises four classes (Oligochaeta, Polygochaeta, Hirudinea, Sipunculidae), five orders, and five species. According to class, the number of species used in traditional medicines decreases as follows: Insecta is the most numerous, followed by Diplopoda and Oligochaeta, each represented by two orders and two species. The four classes Chilopoda, Polygochaeta, Hirudinea and Sipunculidae each have one order and one species.

Insecta is the class with the dominant species number, used in traditional Vietnamese medicines, with 40/51 species, accounting for 78.43%. The distribution of insect species across increasingly orders is as follows: Thysanura = Mantoptera = Termites = Isoptera = Diptera = Siphonaptera, all have 1 species. Then the orders Odonata = Blattoptera = Lepidoptera, all have 2 species, and the Orthoptera = Hemynoptera, all have 5 species. The Hemiptera and Coleoptera have the most species, with 9 and 11 species, respectively. Notably, the species giant water bug Lethocerus indicus, has been listed in the Vietnam Red Data Book since 1992. This highlights the necessity to adhere to Vietnam's diversity laws when exploiting and using these species.

Năm mươi mốt bài thuốc truyền thống Việt Nam có nguồn gốc từ động vật không xương sống Chân khớp (Arthropoda) và Giun đốt (Annelida)

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Tóm tắt

Nhằm phát triển Bộ môn "Sinh dược học" ở bậc đại học, khảo sát tổng quan về động vật không xương sống Chân khớp (Arthropoda) và Giun đốt (Annelida) được thực hiện. Chúng được khảo sát theo 6 tiêu chí (1) Tên Việt Nam và bài thuốc, (2) Hệ thống phân loại và tên khoa học, (3) Phân bố và môi trường sống, (4) Vị thuốc, (5) Tác dụng y dược học, (6) Thảo luận và nhận xét.

Đã xác định được năm mươi mốt loài động vật không xương sống gồm 46 loài Chân khớp (Arthropoda) và 5 loài Giun đốt (Annelida), được sử dụng trong các bài thuốc truyền thống Việt Nam. Trong đó, Arthropoda có 4 lớp (Insecta, Arachnida, Chilopoda, Diplopoda), với 17 bộ và 46 loài; và Annelida có 4 lớp (Oligochaeta, Polygochaeta, Hirudinea, Sipunculidae), với 5 bộ và 5 loài. Theo lớp động vật, số lượng loài giảm dần như sau: nhiều nhất là Insecta; tiếp đến là Arachnida với 2 bộ và 3 loài; và Diplopoda và Oligochaeta, đều có 2 bộ và 2 loài. Bốn lớp Chilopoda, Polygochaeta, Hirudinea và Sipunculidae đều có 1 bộ và 1 loài.

Côn trùng là lớp có số lượng loài ưu thế trong nhóm động vật không xương sống sử dụng trong các bài thuốc y học cổ truyền Việt Nam, với 40/51 loài, chiếm 78,43%. Số lượng loài côn trùng sử dụng làm thuốc ở các bộ tăng dần theo thứ tự sau: các bộ Thysanura = Mantoptera = Isoptera = Diptera = Siphonaptera, đều có 1 loài. Tiếp đến là các bộ Odonata = Gián Blattoptera = Cánh phấn Lepidoptera, đều có 2 loài. Rồi các bộ Orthroptera = Hemynoptera, đều có 5 loài. Bộ Cánh nửa Hemiptera và Coleoptera có nhiều loài nhất, tương ứng có 9 và 11 loài. Trong đó, loài cà cuống Lethocerus indicus có tên trong Sách Đỏ Việt Nam (1992). Cần chú ý khi khái thác và sử dụng đúng luật "Đa dạng Sinh học của Việt Nam".

1. Introduction

Vietnam is among the top 20 countries with the highest biodiversity resources in the world. Our country is ranked 14th in the World, with a biodiversity index of 221.77. Our country is in the top three Southeast Asian countries in terms of biodiversity, behind Indonesia and above Malaysia (Vietnamnet).

Vietnam's rich biodiversity resources are also reflected in the use of this rich source of raw materials in traditional medicines (Van, Tap 2008). The use of Arthropods and Annelids in traditional Vietnamese medicines has a long history, accumulating many approaches and rich experiences for thousands of years. However, the use of animal resources in traditional medicines or therapies, in some cases, is often based on oral habits and experiences, without full information on medicinal preparation methods. In particular, in many cases there is no morphological description and exact scientific name of invertebrate. From the aspect of exploitation and conservation of sustainable development of animal resources, their accurate identification and naming is an important initial basis for use in traditional Vietnamese medicine.

This overview survey was conducted to comprehensively investigate animal resources, describe, identify and accurately scientifically name the invertebrate animals used in traditional Vietnamese medicines. This is an important initial scientific data, serving as a basis for building a subject Bio-Pharmacology in the field of Medicine and Pharmacy, on the biodiversity of animal resources and their use in traditional Vietnamese medicines.

2. Approach Method

The authors used accessible domestic and international sources on traditional Vietnamese herbal medicines to survey invertebrates

commonly used in traditional Vietnamese medicines. These are documents of Chi (1998), Loi (1999), Quy, Phuong (2002), Institute of Medicinal Materials (2006), Ministry of Health (2017), Tianren Xu et al. (2022), etc.

Many national and international specific documents on particular invertebrate animals and species, such as of Tieu (1928); Manh, et al. (2007); Hue, et al. (2009) ; Thai, et al. (2009) ; Manh, Thin (2009); Huang Y. et al. (2016); Tung, et al. (2016); Ministry of Health (2017); Manh, et al. (1992, 2015, 2022); Phuong, et al. (2022), Phommavongsa, et al. (2022); MilliBase (2024).

3. Result and discussion

3.1. Arthropods (Arthropoda) and Annelids (Annelida) resources used in Vietnmamese traditional medicines

Table 1 presents the results of the analysis of arthropod and annelid invertebrates used in traditional Vietnamese medicines. In this table, invertebrates were surveyed according to 6 criteria including (1) Vietnamese and medicinal name, (2) classification and scientific name, (3) distribution and habitat, (4) medicinal properties, (5) pharmaceutical effects, (6) discussion and comments (Table 1).

Table 1. Arthropoda and Annelida Resources Used in Vietnmamese Traditional Medicines

No	Vietnamese names	Scientific names and Classification	Distribution, Habitat	Medicinal properties	Medicinal effects
1	Silverfis = Bọ bạc = Nhạy = Rệp sách = Y ngư.	1. Lepisma saccharina (Linnaeus 1758). Insecta -Apterygota. I. Order - Bộ Ba đuôi - Zygentoma = Thysanura), Họ - Family Lepismatidae.	Usually lives in old damp books, cellulose papers.	Salty taste, warm property	Diuretic, anti-wind, detoxifying. Treats hematuria, bright-ens eyes. Treats children with con-vulsions and itch-ing.
2	Dragonfly Anax imperator = Chuồn chuồn ngô = Thanh đình.	2. Anax parthenope (Selys, 1839). Insecta - Pterygota. II. Bộ Chuồn chuồn - Order Odonata, Họ - Family Aeshnidae.	Cosmpolites. Usually lives in wet grassland habitat, near water.	Sweet taste, slightly cold.	Treats whooping cough, sore throat and pharynx, asthma due to kidney failure. Treats spermatorrhea and impotence.
3	Red dragonfly = Chuồn chuồn đỏ = Xích thanh linh.	3. Crocothemis servillia (Drury 1773). II. Bộ - Order Chuồn chuồn -Odonata, Họ - Family Chuồn ớt - Libellulidae.	Usually lives in wet grassland habitat, near water.	Sweet taste, slightly cold.	Blood tonic, cures headaches due to anemia, dizziness, whooping cough, swollen throat. Kidney tonic, spermatorrhea, impotence treatment.
4	Oriental cockroach = Gián nhà = Chương lang.	4. Blatta oirienialis (Linnaeus 1758). III. Bộ Gián - Order Blattoptera. Họ - Family Gián nhà - Blattidae.	Usually lives in moist and dark habitats, near to hmans. Active at night.	Slightly sweet taste, slightly fishy smell, toxic.	It has the effect of promoting blood circulation, elimi-nating phlegm, diu-retic, detoxifying. Treats stomach pain, respiratory diseases and some other diseases.
5	Chinese medicinal cockroach = Gián đất = Địa biết.	5. Eupolyphaga sinensis (Walker 1868). III. Bộ Gián - Order Blattoptera Họ - Family Gián đất - Corydiidae.	Usually lives in topsoil and forest litter.	Salty taste, cold nature.	It has the effects of promoting blood circulation, dispersing stagnation, reducing swelling, and relieving pain. It treats tumors and postpartum blood stasis
6	- European mantis - Mulberry tree mantis nest = Bọ ngựa = Đường lang. = Tổ bọ ngựa cây dâu = Tang phiêu tiêu.	6. Mantis religiosa (Linnaeus, 1758). IV. Bộ Bọ ngựa - Order Mantoptera Họ - Family Bọ ngựa - Mantidae.	Usually lives on shrubs and low trees.	Sweet and salty taste, slightly fishy, moist and normally non-toxic.	Treats night sweats, frequent urination at night, bedwetting in children, incontinence in the elderly and amenorrhea in women. Helps cure sore throat, hemorrhoids, epilepsy, convulsions. Kidney tonic, cure premature ejaculation, impotence.
7	Small rice grasshopper = Châu chấu hại lúa = Hoàng trùng.	7. Oxya chinensis (Thunberg 1815). = Oxya sinuosa Mishchenko, 1951 = Oxya lobata Stål, 1877 = Gryllus chinensis Thunberg 1815. V. Bộ Cánh thẳng - Order Orthoptera. Họ Châu chấu - Family Grasshopper - Acrididae.	Usually lives in habitats of land growing food crops and food plants.	Sweet and spicy taste, neutral and warm.	Effects: cough and asthma relief, tonic, penetrating. Treats children with epilepsy, whooping cough, and prevents measles from growing.

8	Yellow-spined Bamboo Locust = Châu chấu tre lưng vàng.	8. Ceracris kiangsu, Tsai 1929. V. Bộ Cánh thẳng - Order Orthoptera. Họ Châu chấu - Family Acrididae.	Usually lives in secondary habitats, with bamboo bushes.		Cough suppressant, asthma suppressant, sedative and detoxifying effects. Treat children with whooping cough, asthma, epilepsy.
9	African mole cricket = Dế trũi = Dế dụi = Dế nhủi.	9. Gryllotalpa africana (Palisot de Beauvois, 1805). V. Bộ Cánh thẳng - Order Orthoptera. Họ Dế trũi - Family Gryllotalpidae.	It is distributed all over temperate and tropical regions of Africa, Europe, Australia Asia.	Salty taste, cold nature, non-toxic.	Helps with urination, frequent and painful urination, eliminates kidney stones. Treats body aches, relieves headaches, and removes thorns. Has the effect of curing "cirrhosis of the liver".
10	The Chinese cricket = Dế mèn nhỏ.	10. Gryllus chinensis (Weber 1801). = Eumodicogryllus chinensis (Weber, 1801). V. Bộ Cánh thẳng - Order Orthoptera. Họ Dế mèn - Family Gryllidae	Usually lives in holes in moist topsoil.	Salty taste, cold, non-toxic.	Treats urinary retention, edema, promotes urination and defecation; induces labor.Treatment for mothers with placenta not coming out and constipation.
11	Rice field cricket, = Brown field cricket = large brown cricket = Dế mèn lớn	11. Tarbinskiellus portentosus (Lichtenstein, 1796) = Gryllus (Acheta) achatinus (Stoll, 1813). = Brachytrupes ustulatus (Serville, 1838). = Liogryllus formosanus (Matsumura, 1910). V. Bộ Cánh thẳng - Orthoptera, họ Dế mèn - Gryllidae.	Usually lives in non-flooded food crop fields.	Spicy, salty, warm and toxic.	Anti-inflammatory effect.
12	Lychee giant stink bug = Bọ xít nâu = Bọ xít hại nhãn vải.	12. Tessaratoma papillosa (Drury, 1770). VI. Bộ Cánh nửa –Order Hemiptera. Họ Bọ xít nhãn -Family Tessaratomidae.	Parasites suck sap on longan and lychee fruit trees. Both larvae and adults parasitize the tree.		Effects of activating blood circulation, reducing swelling and pain.
13	Southern green stink bug = Bọ xít xanh = Bù hút cam.	13. Nezara viridula (Linnaeus, 1758) = Cimex smaragdulus Fabricius, 1775. = Nezara approximata Reiche, Fairmaire, 1848. VI. Bộ Cánh nửa – Order Hemiptera. Họ Bọ xít cam - Family Pentatomidae.	Mainly damages citrus fruit trees, such as oranges, tangerines, and lemons.	No data	Effects of activating blood circulation, reducing swelling and relieving pain; reducing blood stasis and swelling.
14	Bedbugs = Rệp = Bích sắt hay sàng sắt	14. Cimex lectularius (Linnaeus 1758) Nhóm động vật hút máu - Bloodsucking animals -Hematophagy. VI. Bộ Cánh nửa –Order Hemiptera. Family Cimicidae.	Live near people, in crevices between beds, mats and mattresses.	Spicy taste, warm nature.	Treats choking, epilepsy in children; eyes with entropion or smooth eyelid growth. Cure urinary retention, leg ulcers, centipede bites.
15	Giant water bug-1 = Cà cuống-1 = Đà cuống = Rận rồng/ = Long sắt. = Sâu quế	15. Lethocerus indicus (Lepeletier et Serville, 1775) = Belostoma indica Vitalis. VI. Bộ Cánh nửa - Order Hemiptera. Họ Chân bơi - Family Belostomatidae.	Lives in aquatic habitats, rice fields or small water shrubs. It has been recorded in the whole of Vietnam.	Sweet and spicy taste, neutral and non-toxic.	Kidney tonic and yang tonic effects, creating excitement outside the genitals. Stimulates appetite and aids digestion.
16	Giant water bug-2 = Cà cuống -2	16. Lethocerus deyrollei (Vuillefroy, 1864) = Kirkaldyia deyrollei (Vuillefroy, 1864) VI. Bộ Cánh nửa - Order Hemiptera. Họ Chân bơi - Family Belostomatidae.	Lives in aquatic habitats, rice fields or small water shrubs. Its distribution was restricted only in the Central area of Vietnam.		

17	Cicadas = Ve sầu = Trách thiền = Kim thuyền.	17. Cryptotympana japonensis Kato, 1925. VI. Bộ Cánh nửa - Order Hemiptera (+Cánh giống - Homoptera). Họ Ve sầu - Family Cicadidae.	Widely distributed. Adults live attached to and suck green plant sap. Larvae live in soil; larval development in soil can last for many years.	Odorless, bland taste. The medicinal properties of the medicine are light, thin, hollow, and easily broken.	Treats colds, bronchitis, hoarseness; new pimples on the head and face. Treat vestibular disorders, headaches, dizziness, tinnitus. Treatment of albuminous urine, body edema due to chronic nephritis.
18	Lac Insect = Cánh kiến đỏ = Rệp son = Từ thảo nhung = Tử giao = Xích giao = Tử trùng giao.	18. Kerria lacca (Kerr, 1782) = (?) Lacccifer lacca chinensis Mahdihassan, 1923. VI. Bộ Cánh nửa - Order Hemiptera (+Cánh giống - Homoptera), họ Cánh kiến đỏ - Laccifridae.	Usually lives in mountainous areas of Vietnam, 500-700m above sea level; grows on host trees, Thường sống ở vùng rừng núi Việt Nam, 500-700m trên mặt biển; phát triển trên cây chủ.	Bitter taste, cold nature.	Helps clear heat, detoxify, promote blood circulation, stop bleeding, treat acne and scabies. Treatment of amenorrhea and postpartum hemorrhage. Helps prevent and treat tooth decay.
19	Chinese sumac aphid = Sâu muối = Ngũ bội tử = Bơ pật = /Bách trùng thương. -Tổ của sâu ngũ bội tử.	19. Schlechtendalia chinensis (Bell, 1851). VI. Bộ Cánh nửa - Order Hemiptera. Họ Rệp muội - Family Aphididae	Living commensally on salt trees (Rhus chinensis, Anacardiaceae, Sapindales), forming nests in young branches or leaf petioles.	Sour taste, neutral properties, enters three meridians: lung, kidney, large intestine.	Effects of lung-clearing, fire-reducing, hemostatic, perspiration-suppressing, intestinal-tightening; hemostasis by coagulation, and alkaloid detoxification. Treats cough due to lung deficiency, external hemorrhoids due to long-term dysentery, diarrhea, bloody dysentery, liver detoxification, sweating, acne.
20	Insect Epicauta = Ban miêu đen, sọc trắng, dọc thân. = Sâu đậu = Nguyên thanh = Ban mao.	20. Epicauta gorhami (Marseul, 1873) VII. Bộ Cánh cứng - Order Coleoptera. Họ Ban miêu - Family Meloidae.	Usually lives on food plants, low bushes.	Spicy, hot, toxic.	Treat amenorrhea, dysmenorrhea, acne, inhibit tumors. Used as a skin blister medicine, to lead poison; treat sore throat, cough with phlegm for many years.
21	Meloid Mylabris = Ban miêu đỏ ba sọc đen đậm, ngang thân	21. Mylabris phalerata (Pallas, 1781). VII. Bộ Cánh cứng - Order Coleoptera. Họ Ban miêu - Family Meloidae.	Usually lives on food plants, low bushes (Fabaceae).	Spicy, cold, and toxic. Salty, negative.	Effect of expelling stasis and breaking up clots. Treating syphilis, poisonous epidemics, and rabid dog bites.
22	Scarabeid Lepidiota =Bọ dừa	22. Lepidiota bimaculata (Saunders, 1839). VII. Bộ Cánh cứng - Order Coleoptera. Họ Bọ hung - Family Scarabaeidae.	Live on tree trunks.	Undetermined.	Cure stomach ache.
23	Scarabeid Bug, male only =Bọ hung =Khương lang, cá thể đực.	23. Catharsius molossus (Limaeus 1756) VII. Bộ Cánh cứng - Order Coleoptera. Họ Bọ hung - Family Scarabaeidae.	Usually lives in the dung of grazing animals, such as buffalo, cows, goats, horses, and sheep.	Salty taste, cold nature, toxic.	Treats dysmenorrhea, hemoptysis, and stasis. Treats dysmenorrhea, breaks up stasis, and clears bowels.
24	Firefly Luciola = Đom đóm = Huỳnh hoả.	24. Luciola vitticollis (Kiesenwetter, 1874) VII. Bộ Cánh cứng - Order Coleoptera. Họ Đom đóm - Family Lampyridae.	Usually lives in humid habitats of forest edges, bushes, gardens, fields.	Spicy and salty taste, slightly warm, cold, non-toxic.	Detoxifying, anti-inflammatory, antiseptic, treats acne in children. Cure ghost spells (fake death and fainting), blurred vision, and paralysis.
25	Bombardier beetle = Bọ thẹt = Bọ phịt = Bọ nổ bom.	25. Pheropsophus jessoensis (A. Morawitz, 1862) VII. Bộ Cánh cứng - Order Coleoptera. Họ Chân chạy - Family Carabidae.	Usually lives in leaf litter, topsoil, under rocks and trees.	Undetermined.	Effect of activating blood circulation, removing blood stasis and eliminating perforation. Cure abdominal pain, neck pain.

26	Darkling beetle = Quy = Sâu quy = Sâm quy = Phân quy = Mọt khuẩn đen.	26. Alphitobius diaperinus (Panzer 1797) (?). VII. Bộ Cánh cứng - Order Coleoptera. Họ Bọ hung - Family Tenebrionidae.	Usually lives in grain storage.	Its manure is used as medicine, odorless, tasteless.	Treats children with indigestion, slow growth, weakness, and poor appetite. Treats inflammation of the nasal and oral mucosa, eye discharge, bloated stomach, and loose stools.
27	Cerambieid Holotrichia = Sùng đất	27. Holotrichia morosa Waterhouse, 1875 =(?) Holotrichia sauteri (Moser 1912). VII. Bộ Cánh cứng - Order Coleoptera. Họ Xén tóc - Family Cerambycidae.	Lives in the soil around the roots of plants and feeds on plant roots.	Salty taste, neutral, toxic.	Treats boils, broken bones, blurred vision. Effective in breaking up blood stasis, dispelling wind, relieving asthma, and improving eyesight.
28	Citrus longhorned beetle = Xén tóc = Tinh thiên ngưu.	28. Anoplophora chinensis (Forster, 1771) (?). VII. Bộ Cánh cứng - Order Coleoptera. Họ Xén tóc - Family Cerambycidae.	Usually live on wood trees.		Anti-cold, anti-heat, cure epilepsy in children.
29	Longhorn beetle Apriona = Xén tóc dâu = Tang thiên ngưu.	29. Apriona germari Hope, 1831 (?). VII. Bộ Cánh cứng - Order Coleoptera. Họ Xén tóc - Family Cerambycidae.	Usually live on mulberry trees.	Sweet taste, warm nature	Pain relieving, calming effect; promotes blood circulation, eliminates blood stasis. Treats amenorrhea, epilepsy in children.
30	Longhorn beetle Nadezhdiella = Xén tóc nâu = Cát hạ = Thiên ngưu.	30. Nadezhdiella cantori (Hope, 1843). VII. Bộ Cánh cứng - Order Coleoptera. Họ Xén tóc - Family Cerambycidae	Usually live on eucalyptus and longan trees.		Effects of sedative, tranquilizer, blood circulation, and wind dispersal.
31	Formosan subterranean termite = Mối trắng = Gia bạch nghĩa	31. Coptotermes formosanus Shiraki 1909 VIII. Bộ Cánh đều - Order Isoptera. Họ Mối - Family Rhinotermitidae.	Usually lives in high humidity habitats, prefers shade and low light.	Sweet, slightly bitter taste.	The effect of strengthening the body, supporting the elderly with weakened bodies.
32	Dog flea = Bọ chét = Bọ chó.	32. Ctenocephalides felis (Bouchés, 1835). IX. Bộ Cánh ống - Order Siphonaptera (= Aphaniptera = Suctoria). Họ Family Pulicidae.	Ectoparasite on dogs and cats.	Not determined.	Treatment of chronic malaria in humans.
33	Tabanid obsoletus = Ruồi trâu = Mang trùng	33. Tabanus obsoletus Wiedemann, 1821 = Tabanus bivittatus, Macquart, 1846. X. Bộ Hai cánh - Order Diptera. Họ Ruồi trâu - Family Tanabidae.	Lives in stagnant ponds, near large animals. Sucks their blood.	Bitter taste, slightly cold, enters the liver meridian.	Treats external trauma pain; breaks up long-term blood stasis, treats blood clots and boils. Treats amenorrhea in women.
34	Silkworm = Tằm = Tằm vôi = Bạch cương tằm = Chế thiên trùng	34. Bombyx mori L. XI. Bộ Cánh phấn - Order Lepidoptera. Họ Tằm - Family Bombycidae.	Domesticated insects, usually feed on mulberry leaves.	Salty taste, neutral nature.	Dispel wind, expectorant; aphasia, gangrene; sedative, hemorrhage, leucorrhea. Treats mouth distortion, sweating, epilepsy, convulsions; facial paralysis, hives, mumps.
35	Yartsa gunbu ="dông chóng xià căo". = Đông trùng - Hạ thảo	35. Thitarodes sp. XI. Bộ Cánh phấn - Order Lepidoptera. Họ Hepialidae. - Nấm ký sinh trên ấu trùng cánh phấn Thitarodes sp., là Ophiocordyceps sinensis (Berk.) G.H. Sung, J.M. Sung, Hywell-Jones & Sparafora, 2007 = Cordyceps sinensis (Berk.) Sacc. (1878).	Ophiocordyceps sinensis fungus is distributed in the Tibetan Plateau, Hymalaya, Nepal, ~4000m a.s.l.		Cordiceps spp. is the special parasitic complex Thitarodes/ Hepialus ghost moths. It is a highly valuable biological resource for medicine and health foods in Asian countries (Baral 2017).

36	Dark-bodied ant = Kiến đen = Hắc mã nghị - Trứng kiến	36. Formica fusca (Linnaeus 1758). XII. Bộ Cánh màng –Order Hymenoptera. Họ Kiến - Family, Forrmicidae.	Usually live in the litter layer, topsoil, on wood trees.	Salty, spicy, toxic.	Treats snake bites, boils and swelling; arthritis, rheumatism; chronic hepatitis. Used ss a tonic, increases physical strength and beautifies the skin.
37	Asiatic honey bee = Eastern honey bee. = Ong mật	37. Apis cerana Fabricus 1793, and Apis group, Linnaeus, 1758. XII. Bộ Cánh màng - Order Hymenoptera. Họ ong mật - Family Apidae.	Lives in the wild or is semi-domesticated, near flowering plants.	Not determined.	Honey is good for health, cures rheumatism, heart, stomach.
38	Carpenter bee. = Ong đen = Ong mướp = Hùng phong = Tượng phong = Trúc phong.	38. Xylocopa (Biluna) nasalis Westwood, 1838 = Xylocopa dissimilis Lepeletier, 1841 = Xylocopa minensis, Cockerell, 1909 XII. Bộ Cánh màng - Order Hymenoptera. Họ Ong mật - Family Apidae: Xylocopinae.	Widely distributed in Southeast Asian countries. Usually lives in rotten tree holes, bamboo tree trunks.	Sweet and sour taste, cold nature. Regulates meridians, enters the two stomach meridians.	Cooling effect, cure epilepsy, treat boils, sore throat. Used to treat tooth decay, mouth ulcers, sore throat; children with high fever, convulsions.
39	European hornet = Ong vàng = Ong bắp cày = Ong bò vẽ = Lộ phong.	39. Vespa crabro Linnaeus 1758. = (?) Vespa orientalis Linaeus 1771 XII. Bộ Cánh màng - Order Hymenoptera. Họ Ong bắp cày - Family Vestidae. Vespa crabro is the largest eusocial wasp native to Europe.	European hornet Vespa crabro is the largest eusocial wasp native to Europe. It is wide-spread in Eurasia, and now eastern North America. Vespa crabro is usually found in sheltered above-ground places. It have been found also in subterranean sites as well.	Sweet taste, neutral, toxic.	Cure epilepsy, convulsions, exogenous toxic gas. Detoxifying, anti-inflammatory, anti-itching effects. Treats dysentery, urinary retention and impotence and is a diuretic. Stimulates blood clotting.
40	Digger wasp = Tò vò = Thổ phong sào.	40. Sphex sp. XII. Bộ Cánh màng - Order Hymenoptera. Họ Tò vò - Family Sphecidae.	Live near people, build nests of dirt, under eaves and walls of houses.	Sweet taste, neutral and non-toxic.	Treats headaches, sedative; detoxifies, reduces swelling, astringents and reduces edema. Treats cholera, malaria, indigestion, bloating in children, high fever; children with convulsions, scrofula.
41	Nocturnal orbweaver spider = Nhện nâu = Võng công = Tri thù thoái xác chỉ xác nhện. = Tri thủ võng chỉ Màng tơ nhện.	41. Aranea ventricosus (L. Koch, 1878) Lớp Hình nhện - Arachnida. XIII. Bộ Nhện tơ - Order Araneida. Họ Nhện tơ - Family Araneidae.	They live near residential areas, indoors, in dark, damp places. This spider species is a found primarily in China, Japan, and Korea.	Sweet, slightly bitter, slightly cold and toxic.	Anti-inflammatory, detoxifying, anti-swelling, pain relief and wind dispelling. Treats intestinal music, children with jaundice, bedwetting; swollen tonsils, gingivitis, nosebleeds, bleeding hemorrhoids, boils with yellow discharge, hemorrhage.
42	Tent-web spider Uroctea = Nhện ôm trứng = Bích tiền = Bích trùng	42. Uroctea compactilis L. Koch, 1878 = (?) (1) Tegenaria domestica, (2) Torania gloriosa). Lớp Hình nhện -Arachnida. XIII. Bộ Nhện tơ - Order Araneida. Họ Nhện trứng - Family Oecobiidae.	Often found in old houses in villages or small towns, on the walls or wood, in China, Korea, Japan. It has presumably spread with the migration of humans.	Salty taste, neutral nature.	Cure urinary retention, cough, acne. Spider egg sac is used to treat cam tau ma, sore throat, postpartum breast swelling; toothache, boils, bleeding wounds.

43	Asian forest scorpions Heterometrus = Bọ cạp đen = Toàn yết = yết vĩ.	43. Heterometrus silenus (Simon, 1884) (?) = Buthus sp., họ Buthidae). Lớp Hình nhện - Class Arachnida. XIV. Bộ Bọ cạp - Order Scorpionida. Họ Bọ cạp - Family Scorpionidae.	This scorpion species is found in Thailand, and Cambodia. In Vietnam it is found in humid mountain forests.	Salty, slightly spicy taste, neutral properties.	Effects of expelling wind and calming the nerves. Cure hemiplegia, aphasia, abdominal pain. Effect of dispelling wind and calming the nerves, treating convulsions, crooked mouth and eyes, hemiplegia, tetanus, scrofula, and toxic boils.
44	Red-headed centipede = Tansanian blue ringleg = Rết = Ngô công.	44. Scolopendra morsitans (Linnaeus, 1758). Lớp Chân hàm - Class Chilopoda XV. Bộ Rết - Order Scolopendromorpha. Họ Rết - Family Scolopendridae.	Lives on limestone mountain topsoil and moist forest foliage.	Spicy, warm, toxic, enters the liver meridian.	Stop convulsions, treat epilepsy, epilepsy, snake bites. Detoxification, blood circulation, support treatment of chronic joint disease, impotence, acne.
45	Common Flat-backed Millipede = Cuốn chiếu = Cuốn chiếu lưng phẳng.	45. Polydesmus angustus (Latzel, 1884). Lớp Chân kép - Diplopoda. XVI. Bộ Cuốn chiếu - Order Polydesmida. Họ Cuốn chiếu - Polydesmidae.	Lives in tree trunks or wood chips, in moist and dark places.	Spicy taste, damp, toxic.	Effect of breaking up accumulation, detoxifying. Treating cysts and tumors in the abdomen.
46	Pill millipede Glomeris = Sâu đá = Côn sơn trùng.	46. Glomeris sp. (?) Lớp Chân kép - Diplopoda XVII. Bộ Sâu đá - Order Glomerida. Họ Sâu đá - Family Glomeridae	Usually lives in soil and humus layers, in limestone mountains	Spicy salty taste, slightly warm.	Tonic to promote blood circulation, strengthen bones and relieve pain, and disperse blood stasis. Treats edema, rheumatism, bone damage, uterine prolapse, and rectal prolapse.
47	Earthworm-1 Pheretima Giun đất -1 = Địa long- = Giun quắn = Khâu dẫn = Guang di long (in Chinese).	47. Pheretima aspergillum (Perrier, 1872) = ?Amynthas aspergillum (Perrier, 1872). = ?P. asiatica (Michaelsen, 1900) = ?P. Posthuma (Vailliant, 1868), Ngành Giun đốt - Annelida Lớp Giun ít tơ - Class Oligochaeta, XVIII. Bộ Opisthopora. Họ Giun - Family Megascolecidae.	Lives in soil ecosystems, forest litter; and can climb on tree trunks and leaves.	Salty taste, cold nature, enters the liver, spleen, lungs, stomach and kidneys.	Contains many vitamins, beneficial amino acids, fatty acids, trace elements such as lumbritin, lumbrofebrin, terrestrolum, brolysin, purine, choline, cholesterin. Effects of clearing heat, calming the nerves, clearing the meridians, relieving asthma, diuretic, and treating urinary tract infections. Used for high fever, muscle spasms, joint pain, numbness in limbs, malaria and high blood pressure.
48	Earthworm-2 Giun đất-2 = Common worm = Lob worm = Dew worm. = Địa long = Khâu dẫn	48. Lumbricus terrestris (Linneaus, 1758). Ngành Giun đốt - Annelida. Lớp Giun ít tơ - Class Oligochaeta. XIX. Bộ Haplotaxida, họ Giun -Family Lumbricidae.	Almost similar to the number 47.	Almost similar to the number 47.	
49	Ragworm = Wawo worm = Japanese palolo = Rươi = Hoa trùng	49. Tylorrhynchus heterochaetus (Quatrefages, 1866). Ngành Giun đốt - Annelida. Lớp Giun nhiều tơ - Polygochaeta. XX. Bộ - Order Phyllodocida. Họ Rươi - Family Nereididae.	Lives in coastal soil ecosystems, tidal wetlands and brackish water.	Spicy, aromatic, sweet and warm.	Tonifies the spleen and stomach, produces blood, clears dampness and promotes urination. Dissolve phlegm, regulate gas, treat indigestion, poor appetite, diarrhea. Treats blood deficiency, nourishes; used topically to treat acne.
50	Peanut worms = Earth bamboo shoot = Sá sùng = Sâu đất = Đồn đột = Giun biển.	50. Spunculus nudus (Linnaeus, 1766) Ngành Giun đốt - Phulum Annelida Lớp - Class Sipunculidea. Bộ XXI. Bộ Sipunculiformes Họ Sá sung –Family Sipunculidae.	It is commonly found on subtidal zones of sandy shores to seabeds 900 metres deep in temperate or tropical waters worldwide.	Sweet taste, warm and cool.	There are about 18 amino acids and 17 trace elements, necessary for human body development. Treats malnutrition and rickets, helping children develop comprehensively. Functional neurological disorders, respiratory. Kidney tonic, blood production as well as increased blood circulation. Can support erectile dysfunction in men.

51	European medicinal leech - Nhóm loài Đỉa. - Thủy điệt.	51. Hirudo medicinalis Linnaeus, 1758. =? Hirudo verbana, Carena 1820. =? Hirudo orientalis Utevsky and Trontelj, 2005 =? Hirudo officinalis (Savigny, 1822). =? Hirudo roctina, Johnson, 1816. Ngành: Giun đốt - Phylum Annelida. Lớp Đỉa - Class Hirudinea, XXII Bộ - Order Arhynchobdellida (Hirudiniformes).	Widely distributed, worldwide. Commonly found in freshwater and slightly brackish aquatic ecosystems, moist soil.	Salty, bitter, neutral, toxic.	Treats amenorrhea, postpartum hematoma, swelling due to trauma. Treats coronary artery occlusion, stroke, and spleen swelling. Note the strong blood-breaking properties, be careful when using for pregnant women, or in cases of risk of bleeding.

The data in Table 1 and Table 2 show that, fifty-one invertebrate species, including forty-six arthropod and five annelid species used in traditional medicine were identified. Of these, Arthropoda has four classes (Insecta, Arachnida, Chilopoda, Diplopoda), seventeen orders and forty-six species species; Annelida has four classes (Oligochaeta, Polygochaeta, Hirudinea, Sipunculidae), five orders and five species. According to the class, the number of species decreases as follows: the most numerous is Insecta with seventeen orders and forty-six species; then Arachnida with two orders and three species; Diplopoda and Oligochaeta both with two orders and two species. The four classes Chilopoda, Polygochaeta, Hirudinea and Sipunculidae each have 1 order and 1 species (Table 1, 2).

The survey analyzed and revised the common and special names, determined and revised the scientific names and taxonomic positions of most of the different medicinal animal species and groups. Such as animal species and groups, including 1. Silverfis, 2. Dragonfly Anax imperator, 3. Small rice grasshopper, 4. Yellow-spined Bamboo Locust, 5. African mole cricket, 6. Chinese cricket, 7. Rice field cricket, 8. Southern green stink bug, 9. Citrus longhorned beetle, 10. Meloid *Epicauta,* 11. Meloid *Mylabris,* 12. Southern green stink bug, 13. Dark-bodied, 14. European hornet, 15. Digger wasp, 16. Asian forest scorpions *Heterometrus*, 17. Red-headed *centipede,* 18. Common Flat-backed millipede, 19. Pill millipede *Glomeris,* 20. Earthworm's and 21. Ragworm's group.

The authors have described, analyzed and clarified the medicinal values and uses of many species and groups of animals living together, commensalism, symbiosis or parasitism used as sources of medicine, such as 1. White silkworms are individuals that die due to bacterial infection, 2. Red ants or Salt worms are nests of worms, living commensally on salt trees, 3. *Cordyceps sinensis,* in winter it is an individual worm (worm), and in summer it is a fungus (herb) that lives parasitically on worms. Identified and revised also the scientific names, values and medicinal uses of various species and groups of medicinal animals, such as 1. Praying mantis and its nest, 2. Male dung beetle, 3. Groundworm and its excrement, 4. Brown spider, its carcass and silk (Table 1).

3.2. Insect Resources (Insecta) Used in Vietnamese Traditional Medicines

Table 2 introduces the classified structure of arthropod (Arthropoda) and annelid (Annelida) groups used in Vietnamese traditional medicines. Insecta is the class with the dominant number of invertebrate species, used in Vietnamese traditional medicine, with 40/51 species, accounting for 78.43%. According to the class, the number of species decreases as follows: the most numerous is Insecta with seventeen orders and forty-six species (Table 1 and 2).

Table 2. Classified Structure of Arthropod (Arthropoda) and Annelid (Annelida) Invertebrates Used in Vietnamese Traditional Medicines

Phylum	Classes	Order	Species
I. Chân khớp - Arthropoda	1. Côn trùng – Insecta	1. 12	1. 40
	II. Giun đốt - Annelida	2. 02	2. 03
	3. Chân hàm /Rết - Chilopoda	3. 01	3. 01
	4. Chân kép /Cuốn chiếu - Diplopoda	4. 02	4. 02
II. Giun đốt - Annelida	5. Giun ít tơ /Giun đất - Oligochaeta	5. 02	5. 02
	6. Giun nhiều tơ /Rươi - Polygochaeta	6. 01	6. 01
	7. Đỉa - Hirudinea	7. 01	7. 01
	8. Sá sùng - Sipunculidea	8. 01	8. 01
Total 02 Phyla	**08 Classes**	**22 Orders**	**51 Species**

The number of insect species in the orders increases in the following order: Thysanura = Mantoptera = Termites = Isoptera = Diptera = Siphonaptera, all have 1 species. Then the orders Odonata = Blattoptera = Lepidoptera, all have 2 species, and the Orthoptera = Hemynoptera, all have 5 species. The Hemiptera and Coleoptera have the most species, with 9 and 11 species, respectively. In which, the species giant water bug *Lethocerus indicus* species has been listed in the Vietnam Red Data Book. Therefore, it is necessary to comply with Vietnam's diversity law when exploiting and using (National Assenbly of Vietnam, 2008).

4. Conclusion

(1). Fifty-one invertebrate species, including forty-six arthropod and five annelid species used in traditional medicines were identified. Of which, Arthropoda has four classes (Insecta, Arachnida, Chilopoda, Diplopoda), seventeen orders and forty-six species species; and Annelida has four classes (Oligochaeta, Polygochaeta, Hirudinea, Sipunculidae), five orders and five species. According to the class, the number of species used in traditional medicine decreases as follows: the most numerous is Insecta, then Diplopoda and Oligochaeta both with two orders and two species. The four classes Chilopoda, Polygochaeta, Hirudinea and Sipunculidae each have one order and one species.

(2). Insecta is the most numerous class of invertebrate species, used in traditional Vietnamese medicines, with 40/51 species, accounting for 78.43%. The number of insect species in the orders increases in the following order: Thysanura = Mantoptera = Termites = Isoptera = Diptera = Siphonaptera, all have one species. Then the orders Odonata = Blattoptera = Lepidoptera, all have two species, and the Orthoptera = Hemynoptera, all have five species. The Hemiptera and Coleoptera have the most species, with nine and eleven species, respectively. In which, the species giant water bug *Lethocerus indicus* species has been listed in the Vietnam Red Data Book.

(3). This survey is the necessary initial data, the scientific basis for building the Bio -Pharmacology Major on invertebrate animals and their use in traditional Vietnamese medicines.

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