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Diversity of bees and wild pollinators in the Philippines, Thailand and Viet Nam



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Contents

Abstract	vi
Introduction	1
Methodology	3
A. The Survey Method	3
B. Diversity of Bees and Other Pollinator Species	3
Results and Discussion	5
A. Profile of the Respondents	5
B. Bee Diversity	6
a. Honey bee species	6
b. Stingless bee species	9
c. Bumble bee	11
d. Managed and wild pollinator species	13
C. Valuable Services of Bees and other Pollinators	20
D. Threats to Pollinators	21
E. Management and Conservation	23
F. Honey Production, Importation, and Export	25
Summary and Conclusion	29
Acknowledgments	31
References	32
Appendices	38

Tables

1	Trends in population and genetic diversity of honey bee in three countries	21
2	The three most important threats to the bee industry by country	22
3	Total honey production from some species of bees gathered by beekeepers/hunters in the Philippines from 2020-2021	25
4	Total honey production from some species of bees gathered by beekeepers in Thailand from 2020-2021	26
5	Total honey production from some species of bees gathered by beekeepers/hunters in from Viet Nam in 2021	27

Figures

1	Occupation of survey respondents in the Philippines, Thailand, and Viet Nam	5
2	Affiliation of parties responsible for the collection of bee population data in the three countries	6
3	a. <i>Apis</i> species observed to be present in the three countries	8
	b. The Venn diagram showing the shared and unique <i>Apis</i> species between the three countries	8
4	a. Stingless bee species observed in the three countries	9
	b. The Venn diagram showing shared and unique species of stingless bees in the three countries	10
5	a. Species of bumble bees observed to be present in the three countries	12
	b. The Venn diagram showing shared and unique species of bumble bees between three countries	12
6	Species of bees managed for pollination services	13
7	Other animals valued in pollination	14
8	Species of solitary bees observed to be present in the three countries	19
9	Valuable services of bees and other pollinators	20
10	Threats to pollinator population reported in the three countries	22
11	Responsible parties for national conservation of honey bees	24
12	Strategies for the conservation of honey bees and their genetic diversity	24

Appendices

1	a. DAD-IS data from the Philippines	38
	b. DAD-IS data from Thailand	86
	c. DAD-IS data from Viet Nam	110
2	<i>Apis</i> species in the three countries	134
3	Stingless bee-keeping in the three countries	135
4	Other bee pollinators	136
5	a. Photos during the conduct of survey in the Philippines	137
	b. Photos during the conduct of survey in Thailand	138
	c. Photos during the conduct of survey in Viet Nam	139

ABSTRACT

A survey on the diversity of bees and wild pollinators and the status of the bee industry was conducted in the Philippines, Thailand, and Viet Nam. The data were made available to the respective National Coordinators (NC) for the Management of Animal Genetic Resources and the Food and Agriculture Organization (FAO) and entered into the Domestic Animal Diversity Information System (DAD-IS). The honeybee species recorded are *Apis andreniformis*, *A. breviligula*, *A. cerana*, *A. dorsata*, *A. florea*, *A. laboriosa*, and *A. mellifera*. The subspecies of *A. cerana* are *A. c. indica* and *A. c. cerana*, while *A. mellifera* has *A. m. ligustica* and *A. m. carnica*. There are 48 species belonging to ten genera, namely, *Ebaiostrigona*, *Geniostrigona*, *Heterostrigona*, *Homostrigona*, *Lepidostrigona*, *Lisostrigona*, *Pariostrigona*, *Tetragonilla*, *Tetragonula*, and *Tetrigona*. There are shared and unique species in each of the countries. The other species of wild pollinator observed were *Bombus* and solitary bees. The profiles of the beekeepers and the status of the bee industry, threats to beekeeping, and conservation strategies for pollinators were also discussed in this paper.

Keywords: bee species, conservation, diversity, pollinators, stingless bees, subspecies

INTRODUCTION

Pollinators contribute largely to the biodiversity and resilience of the ecosystem. They are key components of global biodiversity, providing vital ecosystem services to crops and wild plants (Potts *et al.* 2010). Klein *et al.* (2007) reported that 87 out of 115 global primary food crops require some level of animal pollination. Pollinators not only increase fruit setting, but also improve the quality of fruits and seeds (Adamidis *et al.* 2019). Without pollinators, one third of flowering plant species will not produce seeds, and one half would suffer a reduction in fertility of 80 percent or more (Rodger *et al.* 2021). In order to maximize pollination services provided by wild bee species, species richness must first be accurately estimated (Russo *et al.* 2015). The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES 2016) assessed the values, status and trends in pollinators and pollination, and drivers of change, risks and opportunities, and policy and management options for pollinator conservation.

Managed pollinators, especially social bees, in agricultural and natural landscapes undoubtedly contribute to the increase in plant productivity. However, the benefits cannot be optimized if diverse wild pollinators are absent in both ecosystems (Katumo *et al.* 2022). In the three target countries—the Philippines, Thailand, and Viet Nam, honey bees (*Apis mellifera* and *A. cerana*) and stingless bees are cultivated for pollination services and production of honey, pollen and propolis. Except for *A. mellifera*, there are abundant feral colonies of the local bee species, making beekeeping with local species a sustainable enterprise. There are also diverse species of solitary bees. However, it is important to create a database for all the pollinator species to monitor their diversity and behavioral and genetic traits.

Thus, the Food and Agriculture Organization (FAO) in collaboration with the International Federation of Beekeepers Association (Apimondia), initiated a survey on the bee diversity in three Asian countries—the Philippines, Thailand, and Viet Nam. The survey covered not only managed bees, but also wild bees in general and other pollinator species of relevance for food and agriculture. The data were entered to the Domestic Animal Diversity Information System (DAD-IS), which is maintained and developed by the FAO.

The inclusion of bees in the DAD-IS will narrow the knowledge gap on the genetic diversity of the species, and this will be useful in their breeding and conservation. Behavioral traits are major factors in the management of the species for the pollination and production of valuable hive products. Among the animal species, the bees have the highest contribution to biodiversity through pollination of wild and cultivated plants. Moreover, beekeeping is an activity that can have an impact on all of the 17 Sustainable Development Goals in consideration of the possibility it offers to improve food production systems from the most subsistence production methods to the highly developed technologically advanced systems (Apimondia 2021).

This survey primarily aims to gather relevant information about the diversity of bees and other pollinators, provide a profile of the bee industry, and identify threats to beekeeping in the Philippines, Thailand, and Viet Nam. All this information is now included in the DAD- IS to serve as a reference to scientists, researchers, beekeepers, and policy makers.

METHODOLOGY

A. The Survey Method

The participating countries in Asia are the Philippines, Thailand, and Viet Nam. Each country has coordinators who are knowledgeable on bees and have contacts with beekeeping associations and other institutions and individuals who are engaged in beekeeping activities. FAO provided a template to facilitate and harmonize the data to be gathered by the participating countries. The purposive sampling method was used in selecting the respondents to ensure that they have basic knowledge on bees and beekeeping. All the sectors involved in beekeeping were represented.

The survey was done using questionnaires sent online, interviews, or the focal group method. Using online platforms is the cheapest method, but is limited to those who have access to the Internet. Those in remote communities without Internet connections cannot participate. However, they were reached through personal interviews. In most cases, interviews are conducted at the bee yards, which enabled the interviewers to inspect and identify the bee species and subspecies. The focal group method usually consisted of beekeeping organizations and beekeepers' groups. The meeting was announced at least two weeks ahead to ensure good attendance. Among the methods used, this is the most expensive. Data were also sourced from academic, government, non-governmental organizations (NGOs), and published literature.

B. Diversity of Bees and Other Pollinator Species

The primary data collected were a) demographics and characteristics of the main managed honeybee (sub-)species and other non-*Apis* species relevant for food and agriculture (e.g., geographic distribution within the country; production, behavior and biological traits; products and services) and b) estimates of national

populations' sizes (e.g., number of colonies at species or subspecies level). All of the data were made available to the respective National Coordinators (NC) for the Management of Animal Genetic Resources and FAO and entered in the DAD-IS.

Other information gathered from the survey are the occupation of the respondents and institutions which contributed to the data collection. The major threats to the bee population and conservation strategies were compared in the three countries.

RESULTS AND DISCUSSION

PROFILE OF THE RESPONDENTS

The respondents' occupations belonged to nine groups, namely beekeeper, hobbyist, farmer, researcher/scientist, teacher, businessman, national coordinator, student, and veterinarian (Fig. 1). Most of the respondents were beekeepers, since they were the real target group. The three countries also had scientists and researchers in the survey. The scientists/researchers keep bees for research purposes. In the Philippines, the hobbyists constituted the highest number, followed by farmers. Hobbyists have a regular job and keep few bee colonies, while farmers are those who raise bees purposely for crop pollination. The teachers were treated as a separate group because they also use bees for teaching purposes, especially in environmental education. Support in data gathering was also extended by government institutions, beekeeping associations, scientific, research and academic institutions (Fig. 2).

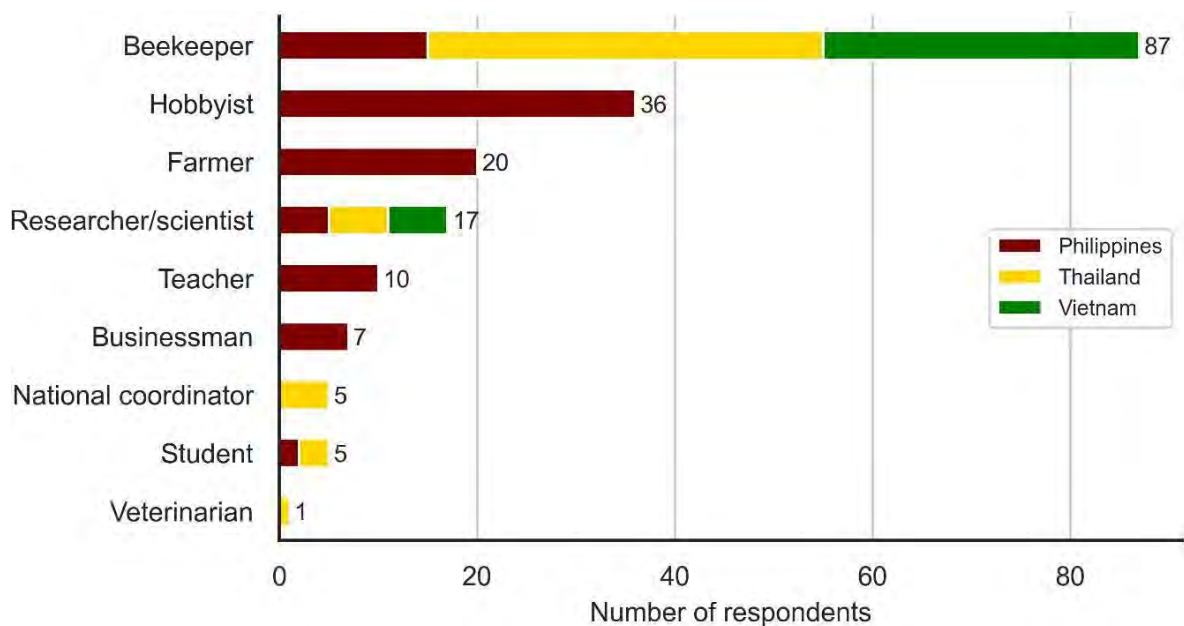


Figure.1. Occupation of survey respondents in the Philippines, Thailand, and Viet Nam

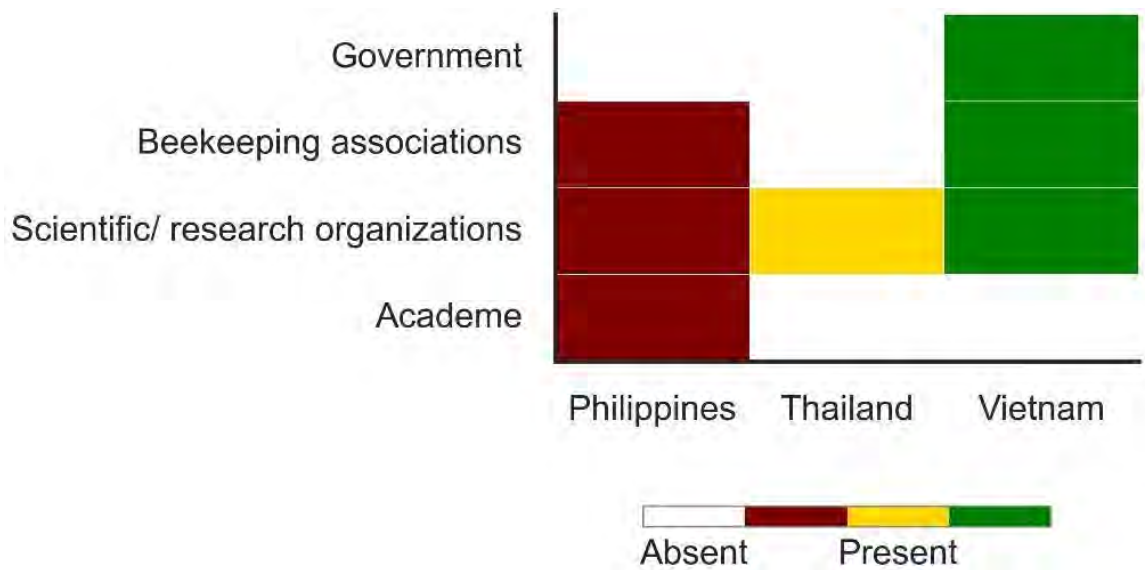


Figure 2. Affiliation of parties responsible for the collection of bee population data in the three countries

BEE DIVERSITY

Honey bee species

A survey on the diversity of pollinator species, especially bees and the status of beekeeping in the Philippines, Thailand, and Viet Nam were conducted and the data were entered in the DAD-IS template (Appendix 1 a, b, and c). A total of seven honey bee species were observed in the three countries, namely *Apis andreniformis*, *A. breviligula*,

A. cerana, *A. dorsata*, *A. florea*, *A. laboriosa*, and *A. mellifera* (Fig. 3a). There are four common species, and there are those that are unique in each country (Fig. 3b) *A. florea* and *A. laboriosa* are not observed in the Philippines. Thailand has no *A. laboriosa* and *A. andreniformis* and Viet Nam has no *A. breviligula*. The common species are *A. andreniformis*, *A. cerana*, *A. dorsata*, and *A. mellifera* (Appendix 2).

As for the distribution of the species, Ruttner (1988) mentioned that *A. cerana* occurred in all of Asia east of Iran and south of the great mountain ranges and the central deserts. In southeast Asia, it is restricted to the Malayan region west of the Wallace's line

(Philippines-Celebes-Timor) occurring in different island races. Until now, the recognized subspecies of *A. cerana* in the Philippines and Thailand is *A. c. indica*; while in Viet Nam, they have both *A. c. indica* and *A. c. cerana* (Smith *et al.* 2000; dela Rúa *et al.* 2000). Being native to the three countries, *A. cerana* is widely distributed.

The subspecies of *A. mellifera* in Asia depends largely on the breed of queen introduced in the region. In the three countries, the known subspecies are *A. m. carnica* and *A. m. ligustica*. *A. m. carnica* is native to southern Central Europe and parts of the Balkans, with the locus classicus in Slovenia. It is also widely popular with beekeepers in parts of Central and Northern Europe and other parts of the world, including the USA, Canada, and even New Zealand (Moškrič *et al.* 2022).

For *A. m. ligustica*, the most widely exported subspecies, this hybrid origin has long been obscured by the fact that in the main area of queen production (from which most of the previous *ligustica* bee samples originated) the M mitochondrial lineage is absent, whereas it is present almost everywhere else in Italy (Franck *et al.* 2000).

The giant honeybee, *A. breviligula* is present only in the Philippines, while *A. laboriosa* is present only in Viet Nam (Fig. 3a). *A. laboriosa* is endemic in the high-elevation zone of the Himalaya extending from the central to the eastern belt and its adjacent mountain ranges (Gogoi 2021). *A. cerana* is distributed throughout East Asia.

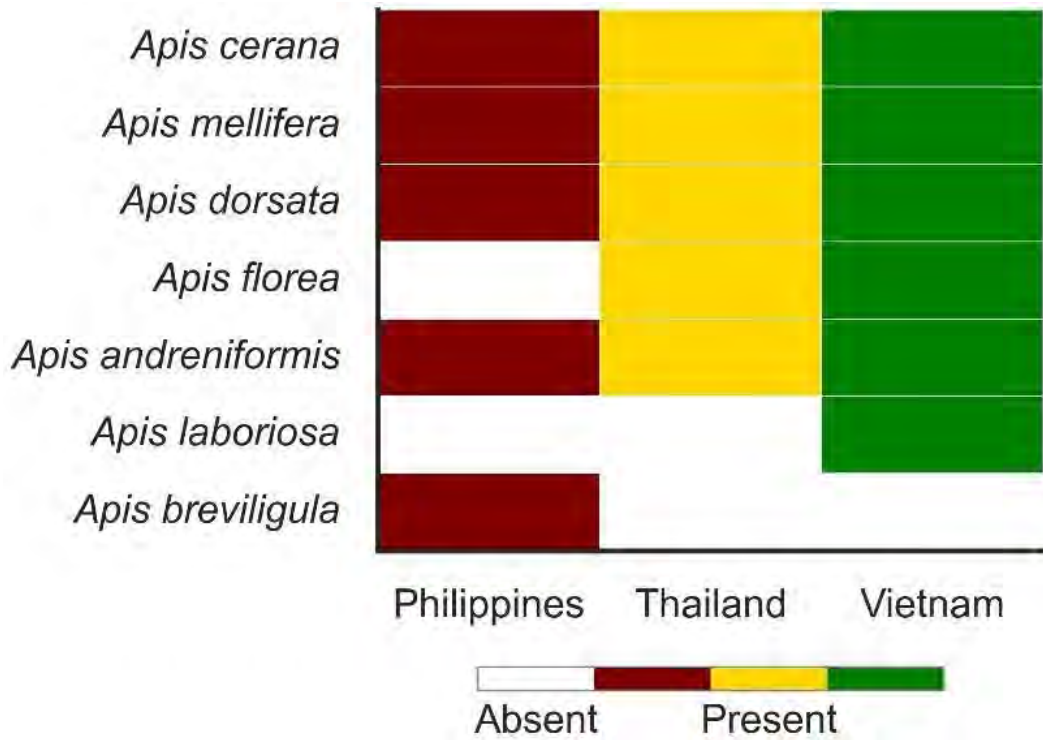


Figure 3a. *Apis* species observed to be present in the three countries

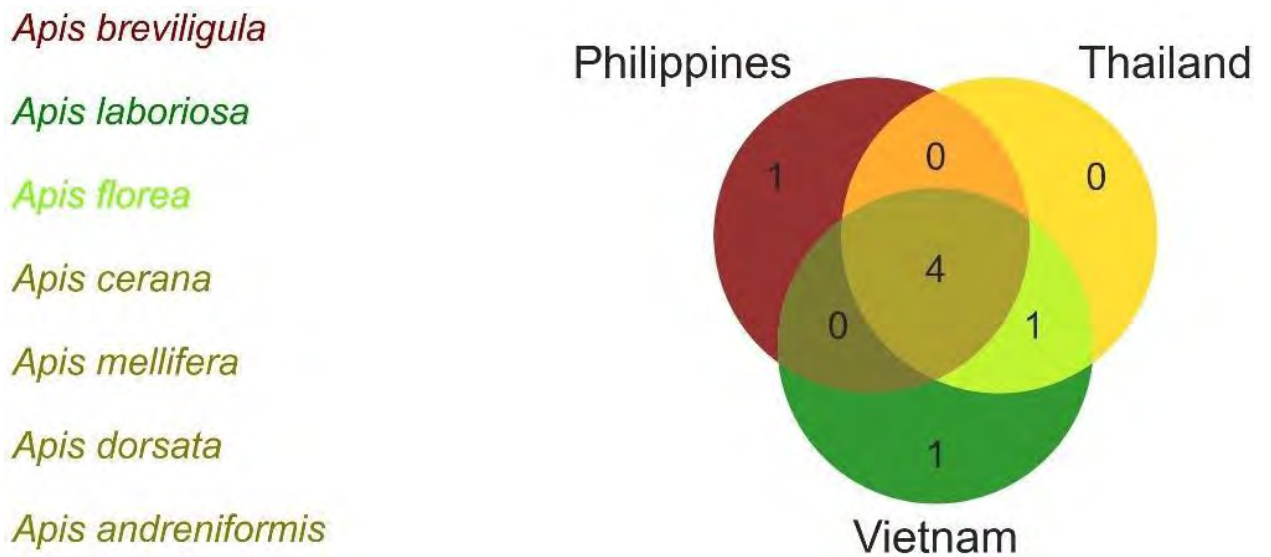


Figure 3b. The Venn diagram showing the shared and unique *Apis* species between the three countries

Stingless bee species

Among the pollinator species, stingless bees are the most diverse in the three countries (Fig. 4a). There are 48 species belonging to ten genera, namely *Ebaiotrigona*, *Geniotrigona*, *Heterotrigona*, *Homotrigona*, *Lepidotrigona*, *Lisotrigona*, *Pariotrigona*, *Tetragonilla*, *Tetragonula*, and *Tetrigona*. Thailand has 35 species, Viet Nam 16 species, and Philippines 12 species. *Tetragonula laeviceps* and *T. fuscobalteata* are the common species observed. Thailand, Viet Nam and the Philippines have 23, 5, and seven unique species, respectively (Fig. 4b).

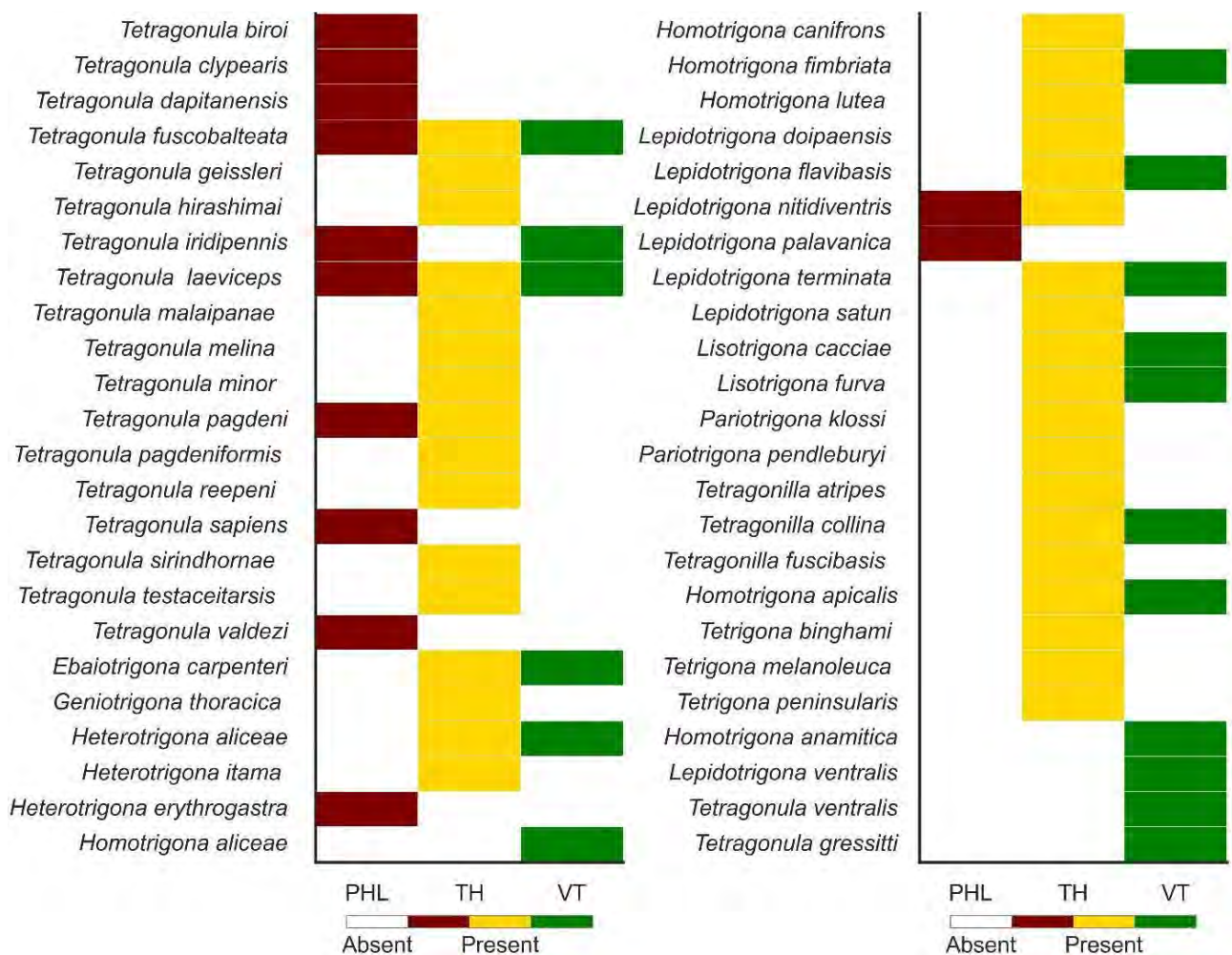


Figure 4a. Stingless bee species observed in the three countries

Tetragonula biroi
Tetragonula clypearis
Tetragonula dapitanensis
Tetragonula sapiens
Tetragonula valdezi
Heterotrigona erythrogastra
Lepidotrigona palavanica
Tetragonula geissleri
Tetragonula hirashimai
Tetragonula malaipanae
Tetragonula melina
Tetragonula minor
Tetragonula pagdeniformis
Tetragonula reepeni
Tetragonula sirindhornae
Tetragonula testaceitarsis

Geniotrigona thoracica
Heterotrigona aliceeae
Heterotrigona itama
Homotrigona canifrons
Homotrigona lutea
Lepidotrigona doipaensis
Lepidotrigona saturi
Pariotrigona klossi
Pariotrigona pendleburyi
Tetragonilla atripes
Tetragonilla fuscibasis
Tetrigona binghami
Tetrigona melanoleuca
Tetrigona peninsularis
Homotrigona fimbriata
Homotrigona anamitica

Lepidotrigona ventralis
Tetragonula ventralis
Tetragonula gressitti
Tetragonula pagdeni
Lepidotrigona nitidiventris
Tetragonula iridipennis
Ebaiotrigona carpenteri
Homotrigona aliceeae
Lepidotrigona flavibasis
Lepidotrigona terminata
Lisotrigona cacciae
Lisotrigona furva
Tetragonilla collina
Homotrigona apicalis
Tetragonula fuscobalteata
Tetragonula laeviceps

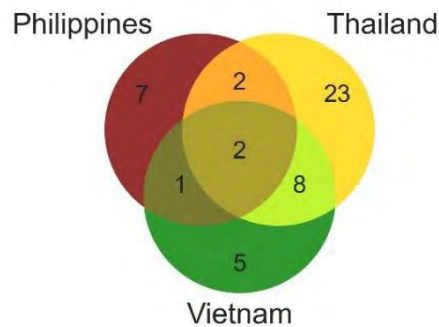


Figure 4b. The Venn diagram showing shared and unique species of stingless bees in the three countries

In the Philippines, *T. biroi* is the commonly used species for large-scale pollination services and commercialization of bee products. Propagation of *T. biroi* on a commercial scale is feasible in the country (Cervancia *et al.* 2022; Locsin *et al.* 2021). Baltazar (1966) reported the distribution of stingless in the country. In Luzon, except for Palawan, the observed species are *T. biroi*, and *T. valdezi*. Palawan has *T. fuscobalteata*, *T. laeviceps*, *T. iridipennis*, *Heterotrigona erythrogastra*, *Lepidotrigona nitidiventris*, and *L. palavanica*. In the Visayas, the species present are *T. fuscobalteata*, *T. sapiens* and *T. biroi*. In

Mindanao, the species are *T. fuscobalteata*, *T. laeviceps*, *T. dapitanensis*, *T. iridipennis*, *T. valdezi* and *T. biroi*. The specific distribution of *T. clypearis* and *T. pagdeni* in the country was not mentioned in the report. Thailand has a high diversity of stingless bees (Schwarz 1939; Sakagami & Inoue 1985; Michener & Boongird 2004). At present, among the 35 recorded species, the most widely distributed are *T. laeviceps*, *T. pagdeni*, and *T. fuscobalteata*. However, in 2007, Jongjitvimol & Wattanachaiyingcharoen reported that *T. collina* was also found throughout the country. The *Trigona* species observed in the eastern, western, and northern regions were *T. collina*, *T. terminata*, *T. apicalis*, *T. doipaensis*, *T. laeviceps*, *T. minor*, *T. thoracica*, *T. binghami*, *T. fimbriata* and *T. fuscobalteata* (Klakasikorn *et al.* 2005). In Viet Nam, *T. laeviceps* and *L. furva* are the two common species used for the production of honey and for pollination services. Currently, there are 16 species of stingless bees identified in Viet Nam (Engel *et al.* 2022; Rasmussen 2008) which include *Ebaiotrigona carpenteri*, *Homotrigona apicalis*, *H. alicaeae*, *H. anamitica*, *H. fimbriata*, *Lepidotrigona flavibasis*, *L. terminata*, *L. ventralis*, *Lisotrigona cacciae*, *L. furva*, *Tetragonilla collina*, *Tetragonula fuscobalteata*, *T. gressitti*, *T. iridipennis*, *T. laeviceps*, and *T. ventralis*. Engel *et al.* (2022) described a new genus of minute stingless bees (*Meliponini: Hypotrigonina*) from Southeast Asia—*Ebaiotrigona*. Engel & Nguyen based it on the type species *Lisotrigonacarpenteri* Engel, recorded from Viet Nam, Thailand, Laos, Cambodia, and southern China.

Bumble Bee

As shown in Figure 5a, there are 16 *Bombus* species recorded, and the highest number was observed in Viet Nam (8), followed by the Philippines (6) and Thailand (4). Two species, *B. eximus* and *B. montivagus*, are common in Thailand and Viet Nam (Fig. 5b). Bumblebees in Thailand suffer from *Nosema* infection (Sinpoo *et al.* 2019). They found

N. ceranae in *B. montivagus* (5.35%), *B. haemorrhoidalis* (4.76%), and *B. breviceps* (14.28%) and *N. bombi* in *B. montivagus* (14.28%), *B. haemorrhoidalis* (11.64%), and *B. breviceps* (28.257%). In Viet Nam, Long *et al.* (2012) and Williams & Jepsen (2016) described the distribution of bumble bees in the country. The Philippine species are *B. americanorum*, *B. baguionensis*, *B. imuganensis*, *B. flavescens bakeri*, and *B. flavescens mearmsi* (Baltazar 1966).

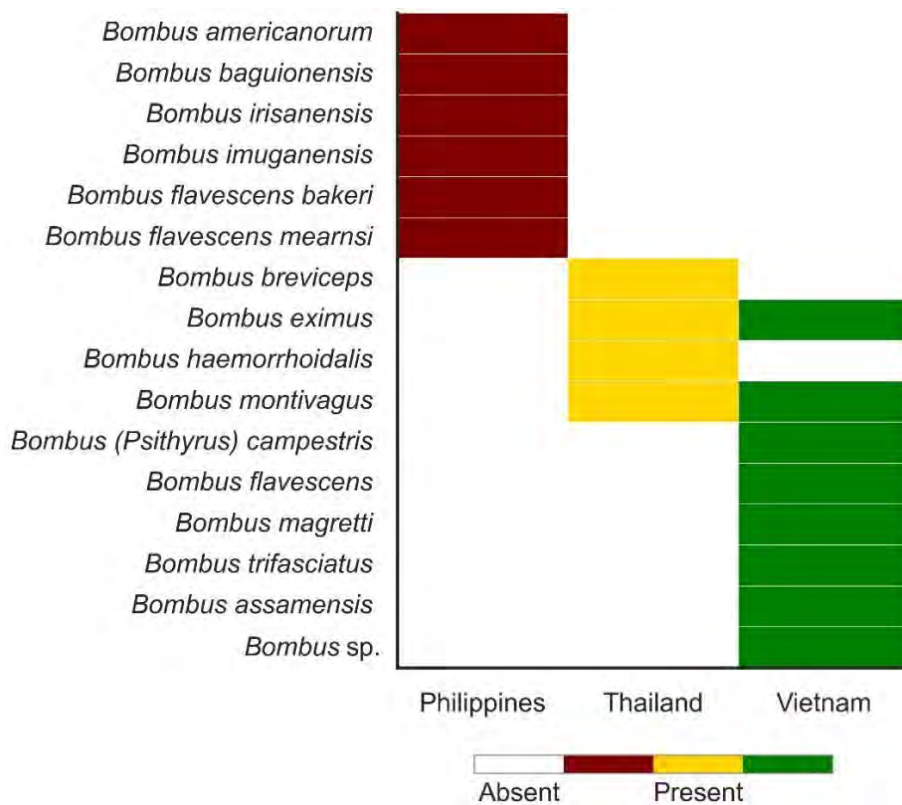


Figure 5a. Species of bumble bees observed to be present in the three countries

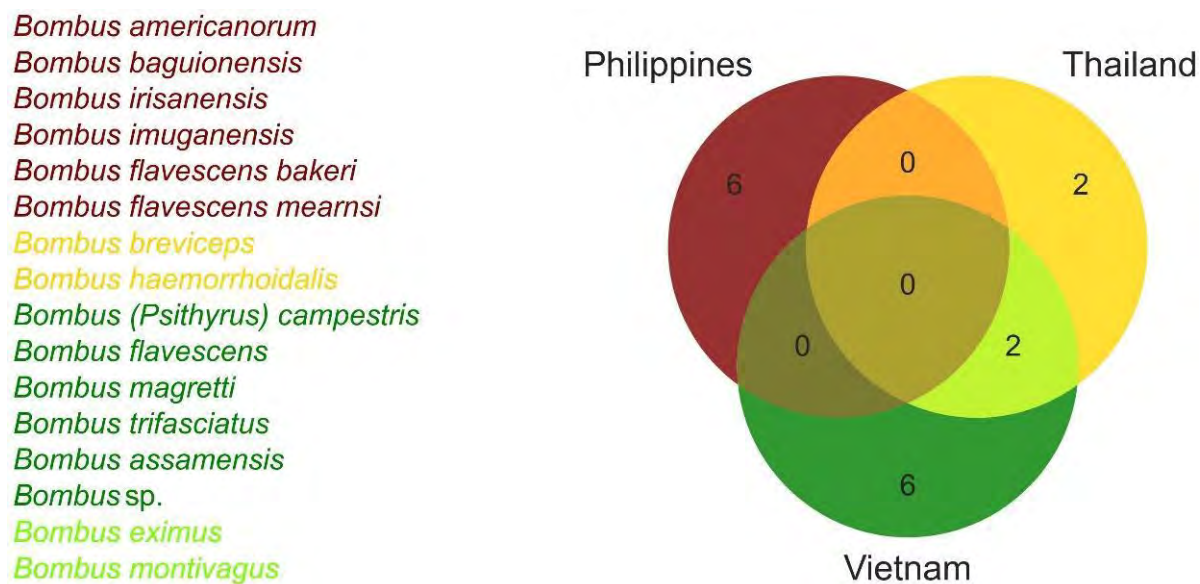


Figure 5b. The Venn diagram showing shared and unique species of bumble bees between three countries

Managed and Wild Pollinator Species

All countries use managed bee colonies for pollination services (Fig. 6). The most popular are the honeybee, *A. mellifera* and *A. cerana*. Other species used in Thailand are *Osmia* spp., stingless bees belonging to genus *Tetragonula*, *Heterotrigona*, *Geniotrigona*, and *Lepidotrigona*. In the Philippines, hived *Tetragonula* sp. are used in large-scale pollination of high value crops such as mango and avocado (Cervancia & Fajardo 2018; Cervancia 2018). For greenhouse pollination of Solanaceae, bumblebees were imported from Holland. Viet Nam use only hived *A. cerana*, *A. mellifera*, and *Tetragonula* sp. for pollination services (Hanh 2012).

Other animals valued in pollination are butterflies, flies, wasps, beetles, moths, ants, bats, and birds (Fig. 7). Bats pollinate durian in Thailand (Bumrungsiri 2009) and the African oil palm weevil *Elaeidobius kamerunicus* pollinates the African oil palm in Malaysia, Indonesia, and other oil palm growing countries. (Yousefi *et al.* 2021).

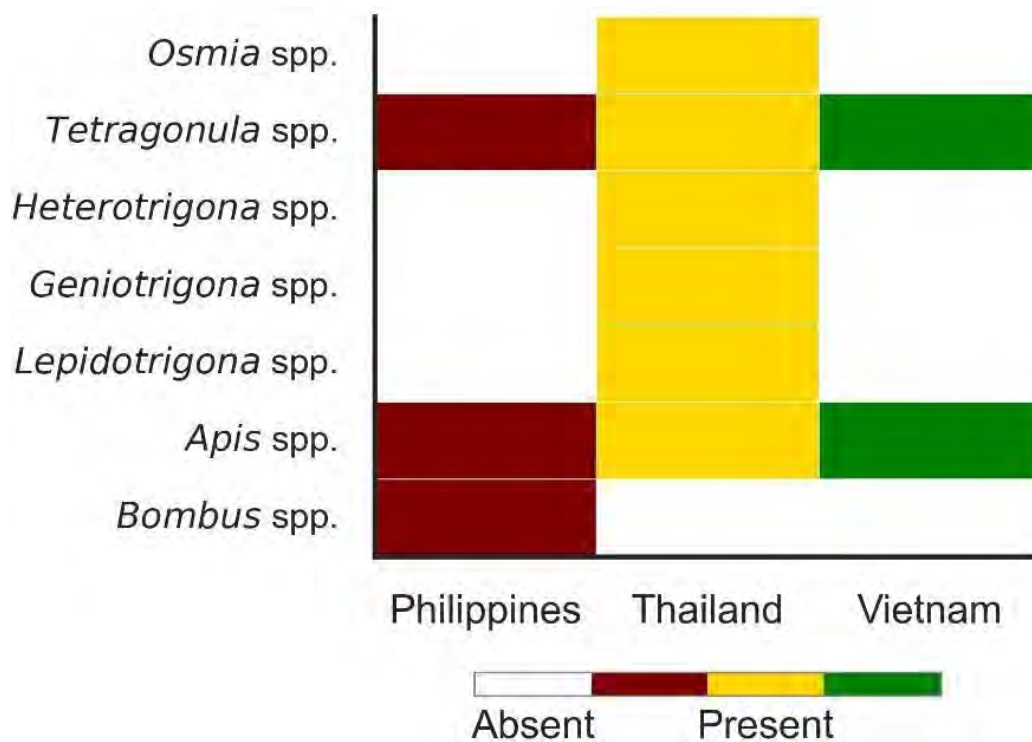


Figure 6. Species of bees managed for pollination services

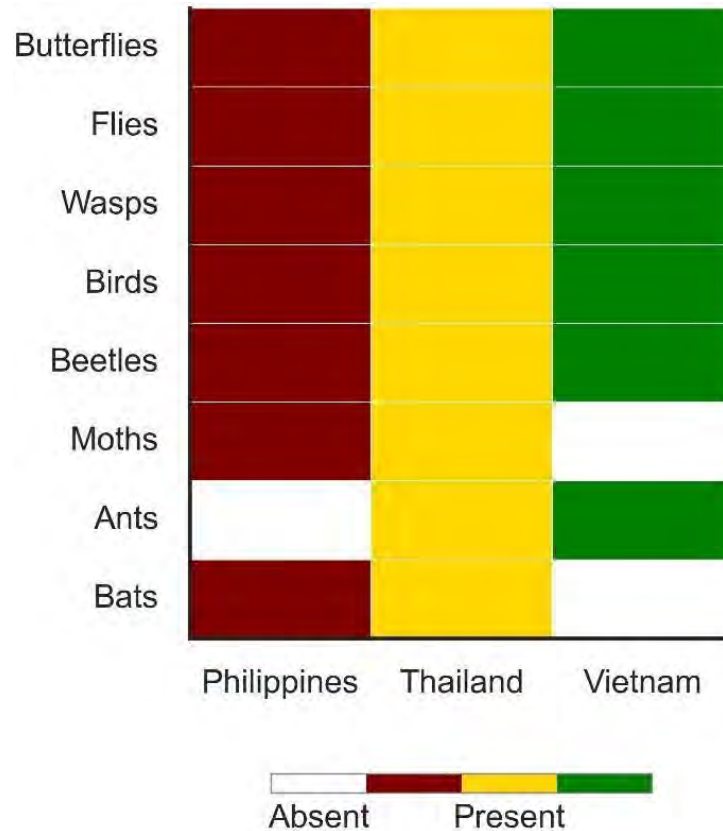


Figure 7. Other animals valued in pollination

For most managed and wild pollinator species, a harmonized method for assessment is necessary to evaluate population trends. Vaissière *et al.* (2011) presented various methods of assessing pollinator deficit in an agro-ecosystem. In response to the need to derive empirical data on the status of pollinators in Asia, Rabajante *et al.* (2020) developed a protocol to assess the pollinator population in managed, natural, and disaster-hit ecosystems. All sampling surveys were conducted during the blooming period of the plants, with consideration of the peak of anthesis, because this is the period when the pollinators are actively foraging, pollen viability is high and nectar secretion is at its peak. Moreover, a Microsoft Excel template was created to compute for diversity measures (Modified Shannon index for pollinators and Modified Shannon index for flowers), and the authors proposed pollination matching measures (P-to-P ration and index).

Social bees, such as the bumble bee, the stingless bee, and the honey bee are the popularly known pollinator species. Solitary bees and other wild pollinators are equally important in providing pollination services to both cultivated and wild plant species. Many growers rely on solitary and wild bees for pollination in their fruit farms (Garibaldi *et al.* 2014; Park *et al.* 2018). The passion fruit, for instance, needs carpenter bees for pollination (Rodriguez & Cervancia 1999; Presas *et al.* 2021).

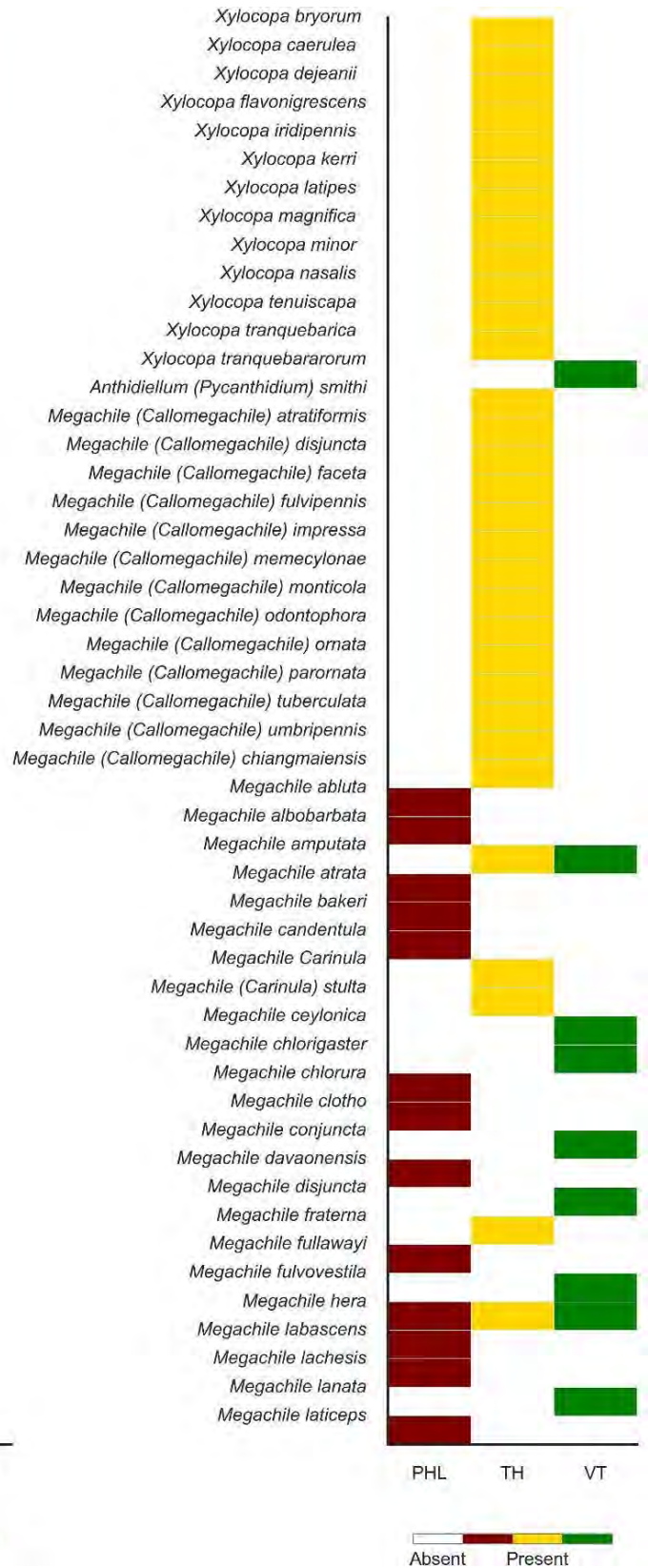
Baltazar (1966) published a Catalogue of Philippine Hymenoptera to which major species of pollinators belong. In the list, there are family Colletidae (15 species under the genus *Hylaeus*), Halictidae (59 species of *Halictus*; ten species of *Sphecodes*; eight species of *Nomioides*; and 24 species of *Nomia*); Megachilidae (a single species each under the genera *Lithurgus*, *Dianthidium*, *Androgynella*, and *Stelis*; three species of *Parevaspis*; two species of *Heriades*; 31 species of *Megachile*; and ten species of *Coelioxys*), Apidae (*Ctenoplectra vagans*; 11 species of *Nomada*; three species of *Anthophora*; seven species of *Amegilla*; nine species of *Thyreus*; eight species of *Allodape*; 15 species of *Ceratina*; and 43 species of *Xylocopa*).

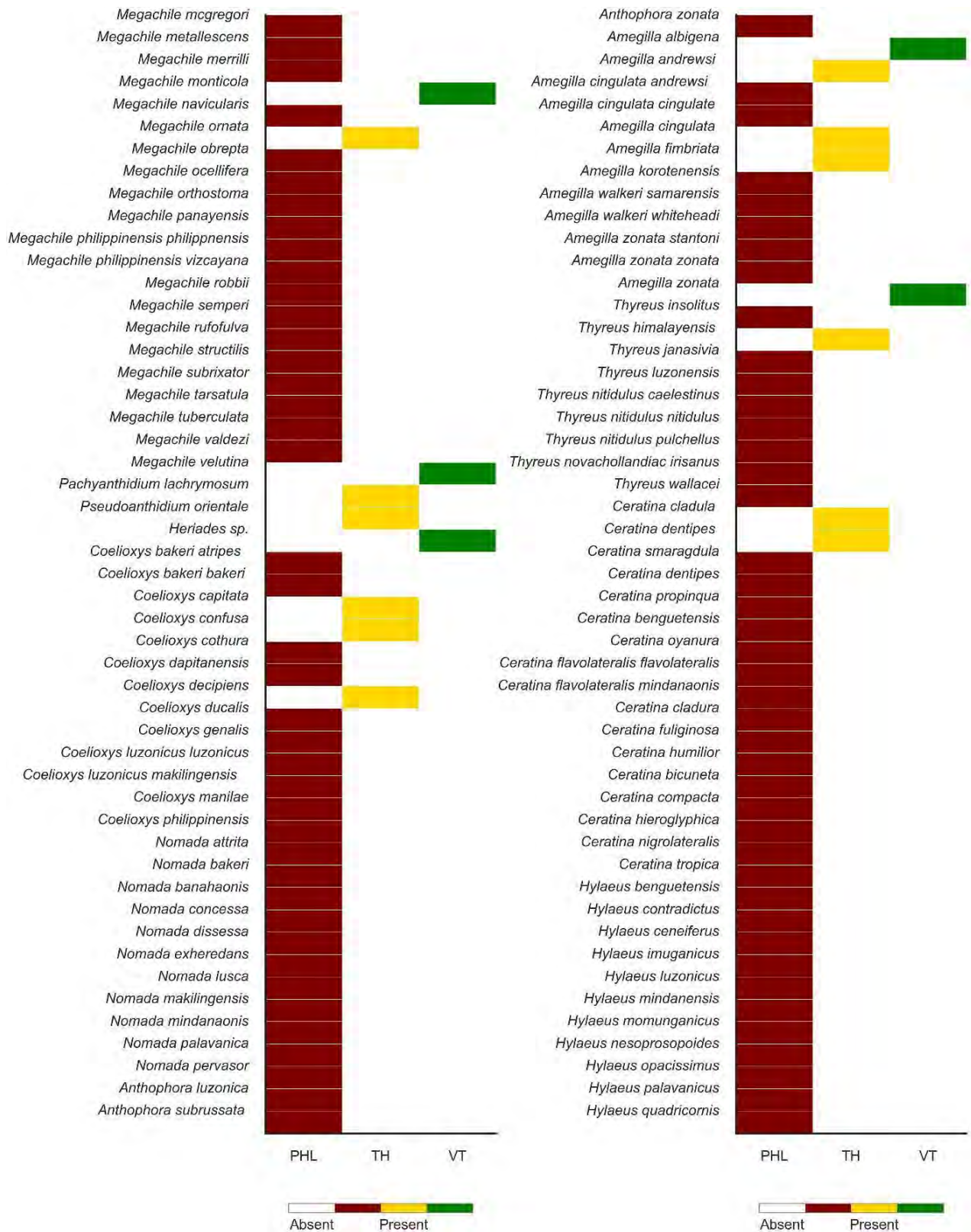
In 2009, Tadauchi & Tasen recorded the bees of natural forests, teak plantations, and agricultural fields in Thailand. A total of 20 bee species belonging to families Megachilidae (*Anthidiellum*, *Pseudoanthidium*, *Pachyanthidium*, *Megachile*, and *Coelioxys*), Halictidae (*Nomia*), and Apidae (*Thyreus*, *Ceratina*, *Amegilla*, and *Habropoda*) were noted. Resin bees of the genus *Megachile* from Thailand were studied by Chatthanabun *et al.* (2020), and a total of 15 species under the genus were listed. Warrit (2007) noted the existence of *Ceratina compacta* in Thailand, a species previously known only in the Philippines. Moreover, a redescription of the oriental burrowing bee, *Amegilla fimbriata*, was provided by Attasopa & Warrit (2012). Based on their work, they proposed to transfer *A. fimbriata* to the subgenus *Aframegilla* instead of to *Glossamegilla*.

A list of tropical bee species found in Northern and North Central Viet Nam was provided by Long and his colleagues in 2013. They recorded a total of 59 bee species belonging to 21 genera under the families Apidae, Megachilidae, Halictidae, Colletidae, and Melittidae.

Bumble bees—*Bombus magrettii* and *B. trifasciatus* and giant honey bees—*Apis laboriosa* and *A. dorsata*—were the dominant species found in high elevations and in forested and mountain areas, respectively. *Xylocopa* are abundant in orchards and fruit gardens, while several bee species (e.g. *A. cerana*, *Amegilla albigena*, *A. zonata*, *Megachile fulvovestita*, and *Xylocopa tranquebararorum*) are found in deforested areas or cultivated lowlands of Northern and North Central Viet Nam.

As shown in Figure 8, Philippines has 249 known species of solitary bees, while 52 occur in Thailand, and 14 in Viet Nam. Philippines, Thailand, and Viet Nam have 248, 50, and 12 unique species, respectively.





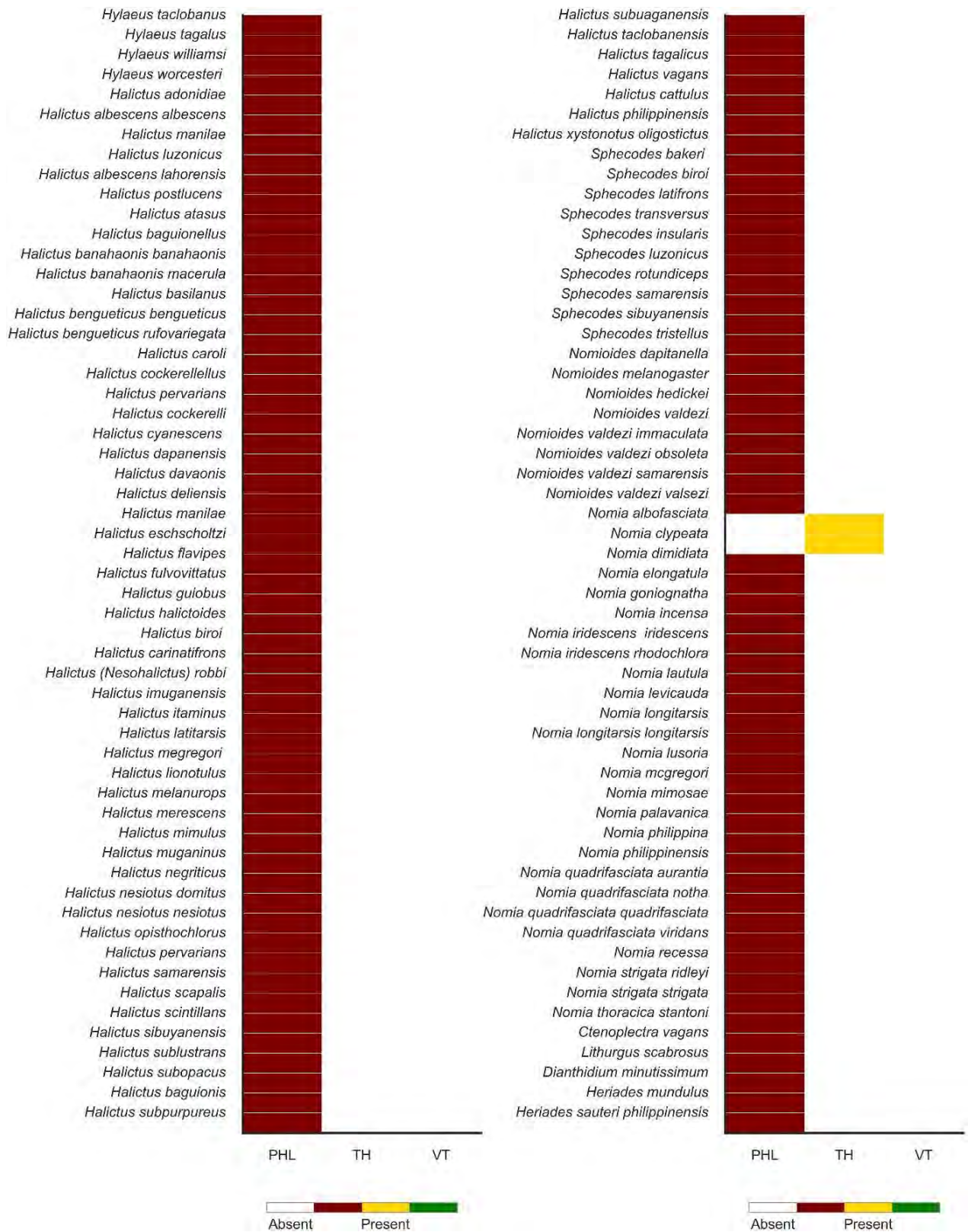


Figure 8. Species of solitary bees observed to be present in the three countries

VALUABLE SERVICES OF BEES AND OTHER POLLINATORS

The primary role of bees in the ecosystem is to maintain biodiversity through pollination services. Throughout the evolutionary timeline of angiosperms, majority of the species developed pollination syndrome as a consequence of specialization on floral phenotypes (Ollerton *et al.* 2009). Pollination syndromes are an example of coevolution between the pollinated plant taxa and their pollinators. Animal pollinators contribute largely to species richness in the tropics. Particularly with bee pollination, the probability of reproductive isolation between plant populations is greatly increased with a resultant increase in speciation rates (Dressler 1968; Dodson *et al.* 1969). The diversity of wild and managed bees has a crucial ecological, economic, and social importance which includes and goes beyond crop pollination (Patel *et al.* 2021).

In the three countries, bees are valued as food sources (honey and pollen), value-added products, production of colonies for sale, materials for scientific research, apitherapy, cultural or religious customs, biodiversity conservation, and tourism. Their additional uses in the Philippines include pollination services, as a hobby, and for training purposes (Fig. 9).

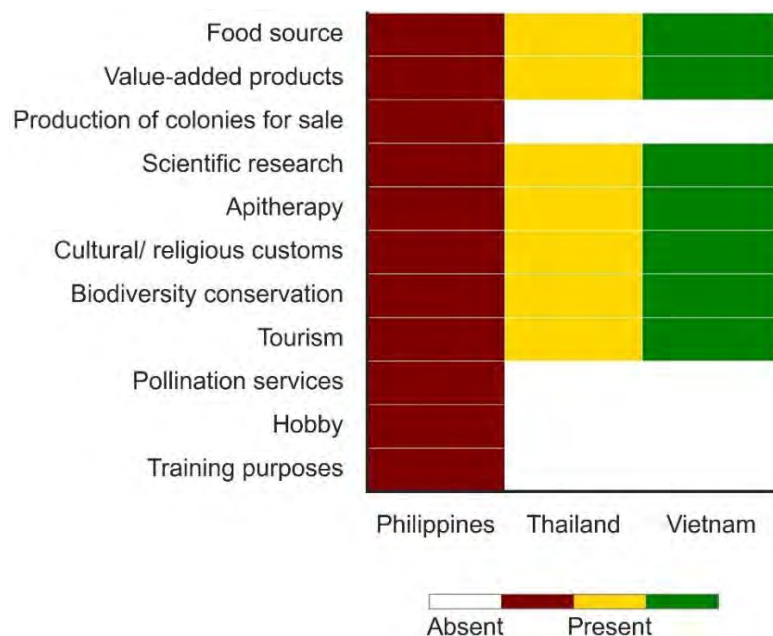


Figure 9. Valuable services of bees and other pollinators

THREATS TO POLLINATORS

The population of honey bees in all countries is declining due to external factors. Genetic diversity remains steady in the Philippines and high in Thailand, but with a low population structure. It is declining in Viet Nam (Table 1).

The identified threats to pollinators in all countries are loss, degradation or fragmentation of habitat/forage, pesticides, agricultural intensification, climate change, and pests, parasites and pathogens. Pollution is an added threat to Viet Nam and Thailand. The reduction of the number of beekeepers is also a threat to Viet Nam. Except for the reduction in the number of beekeepers, all are in the top three list of the three countries (Fig. 10; Table 2).

Table 1. Trends in population and genetic diversity of honey bee in three countries

Country	Population	Genetic diversity
<i>Philippines</i>	Declining	Steady
<i>Thailand</i>	Declining	High genetic diversity and low population substructure
<i>Viet Nam</i>	Declining	Declining

Many solitary bees are experiencing decreases in their populations and ranges, resulting in an overall loss of pollinator species richness in many areas (Kline & Joshi 2020). In their review, it showed that several interacting factors have been implicated in this decline, including increased pesticide use, climate change, and pathogens, but habitat loss remains one of the primary drivers. The widespread conversion of natural habitats into agricultural landscapes has decreased the availability of adequate nesting sites and floral diversity for many bee species.

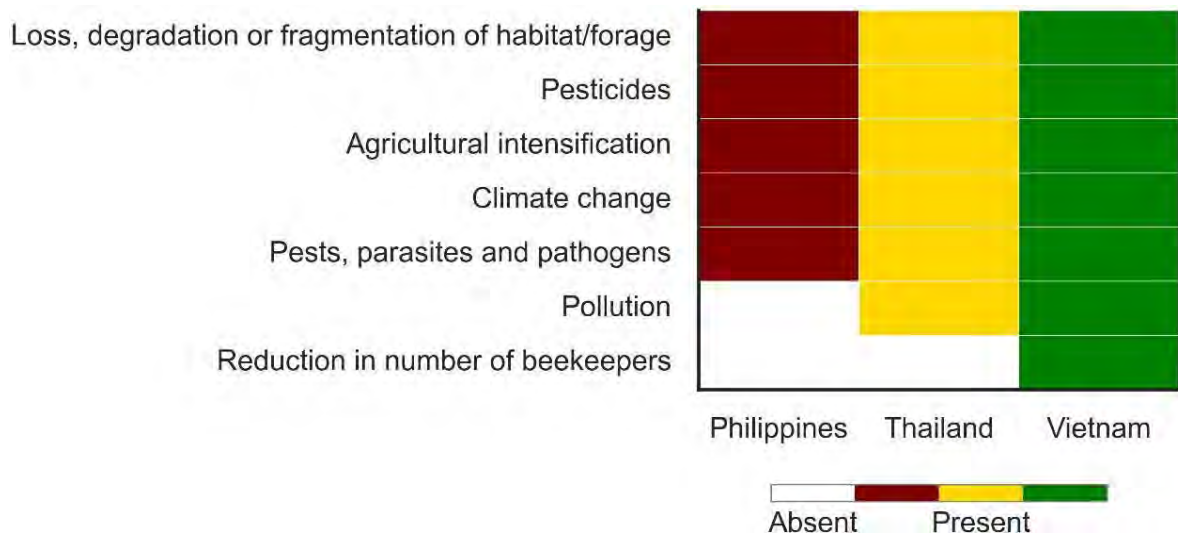


Figure 10. Threats to pollinator population reported in the three countries

Table 2. The three most important threats to the bee industry by country

Rank	Philippines	Thailand	Viet Nam
1	Loss, degradation or fragmentation of habitat/forage; Pesticides; Predators	<i>Nosema spp.</i>	Pesticides
2	Climate change; Malnutrition/starvation	Loss, degradation or fragmentation of habitat/forage; Viral Diseases	Loss, degradation or fragmentation of habitat/forage
3	Pests; Poor beekeeping management practices	Bacterial and fungal diseases	Tariff and non-tariff barriers to trade

MANAGEMENT AND CONSERVATION

In the three countries, the government, research or scientific organizations, and conservation groups craft policies or legislation on national conservation of bees (Fig. 11). In the Philippines, Thailand, and Viet Nam, beekeeping associations also participate in the legislative process. With respect to policies and legislation, in the Philippines, Republic Act 9147 (Presidential Management Staff 2001) provides for the protection of wildlife resources and their habitats, and this includes feral colonies of bees. There is also a Code of Good Beekeeping Practices (BAFS 2016) that sets the general principles of good practice and minimum requirements in commercial or backyard apiaries or meliponaries and in wild honey hunting intended for the production of honey, royal jelly, beeswax, pollen, and propolis, which applies to all species of bees. Viet Nam has the Law on Biodiversity (Law No. 20/2008/QH12 amended in 2018), the Law on Animal Husbandry (Law No. 32/2018/QH14), Decree No. 84/2021/ND-CP dated 22 January 2021 of the Government on the management of endangered, precious, and rare forest plants and animals, and the implementation of the Convention on International Trade in Endangered Species of Wild fauna and Flora. The Ministry of Agriculture and Rural Development (2015) issued Decision No. 4653/QD-BNN-CN on Good Animal Husbandry Practices for Keeping Honeybee (VIETGAHP in Beekeeping) dated 10 November 2015. This code mandates beekeepers to seek or obtain nectar sources and beekeeping tools, control bee diseases, and harvest honey in hygienic and safe conditions to ensure honey quality and food safety. In Thailand, there are two laws, namely, the National Bureau of Agricultural Commodity and Food Standards TACFS 8200-2003 and the Good Agricultural Practices for Bee Farms.

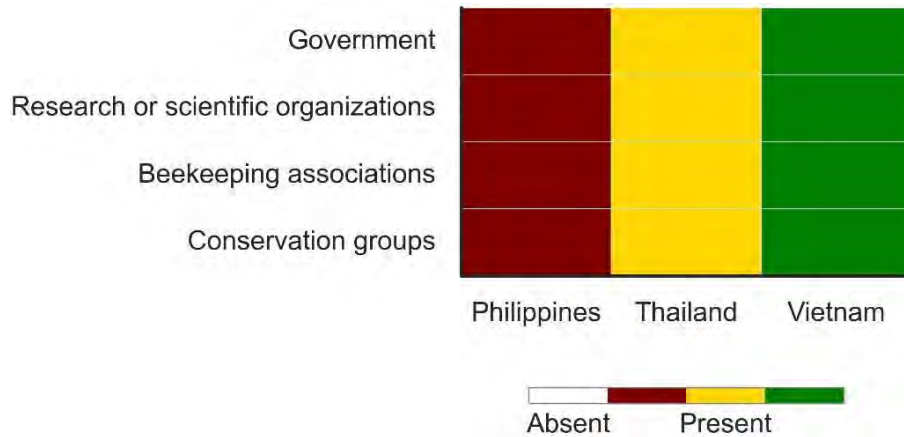
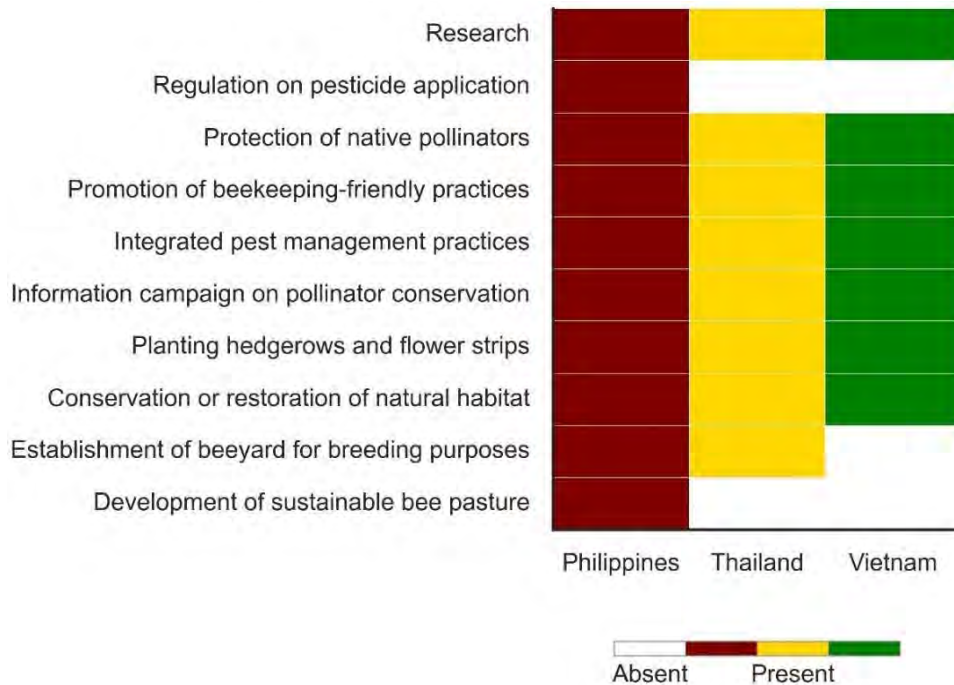


Figure 11. Responsible parties for national conservation of honey bees

The most popular strategies for bee conservation are protection of native populations and recognition or promotion of honey bee friendly practices (Fig. 12). Other approaches are through research, regulation on pesticide application, protection of native pollinators, promotion of beekeeping-friendly practices, integrated pest management practices, information campaign on pollinator conservation, planting hedgerows and flower strips, conservation or restoration of natural habitats, establishment of bee yard for breeding purposes, and development of sustainable bee



pasture.

Figure 12. Strategies for the conservation of honey bees and their genetic diversity

HONEY PRODUCTION, IMPORTATION, AND EXPORT

Philippines

The total honey production from *Apis* species in 2021 was 1,251.98MT (Table 3). The highest producers were the giant honey bees –*A. dorsata* and *A. breviligula* (900MT), followed by stingless bees (181.8MT), *A. mellifera* (165MT), and *A. cerana* (5.175MT). The low yield per colony of stingless bees is compensated by the number of colony holdings.

Table 3. Total honey production from some species of bees gathered by beekeepers/hunters in the Philippines from 2020-2021

Species	Number of beekeeper/hunter	Average number of Colony/beekeeper	Yield per colony (MT)	Total Production (MT)
Honey Bee				
<i>A. breviligula/ A. dorsata</i>	500	30	0.060	900
<i>A. mellifera</i>	150	44	0.0025	165
<i>A. cerana</i>	115	15	0.003	5.175
Stingless bee				
<i>Tetragonula</i> spp.	2,424	50	0.0015	181.8
TOTAL				1,251.98

In 2019, the total honey importation was 751.006MT, amounting to \$2,002.50K. Importation was from Australia (\$670.79K, 251.569MT), the United States of America (\$297.84K, 111.702MT), Austria (\$220.68K, 82.763MT), Germany (\$157.08K, 58.910MT), and Argentina (\$144.35K, 54.136MT) (<https://wits.worldbank.org> Philippine Honey). The country is not exporting substantial amounts of honey.

Thailand

The current honey production in Thailand is 251,523MT (Table 4), all from managed colonies of *A. mellifera* (251,181MT), *A. cerana* (312MT), and stingless bees (30MT). There are no data on the total production of *A. dorsata*, *A. florea*, and *A. andreniformis*, but the harvest per colony were 0.025MT, 0.0012MT, and 0.0004MT, respectively.

In 2019, Thailand imported honey from China (\$1,533.38K, 826.763MT), Myanmar (\$655.95K, 437.300MT), the European Union (\$360.19K, 43.873MT), Viet Nam (\$348.03K, 82.791MT), and New Zealand (\$233.07K, 7.857MT).

Thailand exported honey to other Asian countries (\$6,427.22K, 1,688.530MT), China (\$2,371.50K, 555.206MT), the United States of America (\$2,236.32K, 832.103MT), Canada (\$2,194.31K, 599.012MT), Indonesia (\$2,028.39K,

732.939MT)

(<https://wits.worldbank.org> Thailand Honey).

Table 4. Total honey production from some species of bees gathered by beekeepers in Thailand from 2020-2021

Species	Number of beekeeper	Average number of Colony/beekeeper	Yield per colony (MT)	Total Production (MT)
Honey Bee				
<i>A. mellifera</i>	23,922	300	0.035	251,181
<i>A. cerana</i>	1248	10	0.025	312
Stingless bees	1,000	20	0.0015	30
TOTAL				251,523

Viet Nam

In 2021, the total honey production in Viet Nam was 65,435.83MT from managed colonies and *A. dorsata* (Table 5). *A. mellifera* was the top producer with 55,770MT, followed by

A. cerana, stingless bees, and *A. dorsata* with 9,648MT, 15MT, and 2.83MT, respectively.

A. laboriosa produced 0.04MT of honey per colony, while *A. florea* and *A. andreniformis* produced 0.0015MT and 0.001MT, respectively. Among the three countries, Viet Nam has the highest number of *A. cerana* beekeepers.

Viet Nam imports 190.325MT honey amounting to \$507.49K. Importations were from Australia (\$373.08K, 139.920MT), New Zealand (\$64.63K, 24.240MT), Germany (\$16.36K, 6.136MT), Thailand (\$15.59K, 5.846MT), and France (\$10.21K, 3MT).

Viet Nam honey exports totalled 54,861.90MT with an amount of \$86,634.34K. Exports were to the United States of America (\$72,770.31K, 47,954.09MT), the United Kingdom of Great Britain and Northern Ireland (\$1,860.13K, 1,144.39MT), Asia (\$3,842.83K, 2,083.35MT), the European Union (\$2,496.98K, 1,447.73MT), and others (\$3,246.44K, 2,233.07MT) (Tam *In press*).

Table 5. Total honey production from some species of bees gathered by beekeepers/hunters in from Viet Nam in 2021

Species	Number of beekeeper/hunter	Average number of Colony/beekeeper	Yield per colony (MT)	Total Production (MT)
Honey Bee				
<i>A. dorsata</i>	60	3	0.0157	2.83
<i>A. mellifera</i>	6,500	130	0.0660	55,770
<i>A. cerana</i>	33,500	12	0.0240	9,648
Stingless bees	1,000	10	0.0015	15
TOTAL				65,435.83

On April 21, 2021, the US Department of Commerce (DOC) received antidumping duty (AD) petitions concerning imports of raw honey from Argentina, Brazil, India, Ukraine, and Viet Nam filed in proper form on behalf of the American Honey Producers Association (AHPA) and the Sioux Honey Association (SHA) (collectively, the petitioners), which are trade associations representing domestic producers of raw honey. In relating to this issue, Apimondia issued Apimondia Statement on Honey Antidumping case-USA by an open letter on June 23, 2021. The DOC notified of an AD investigation on the above 5 exported countries on May 18, 2021. Following an investigation, the DOC issued a preliminary determination rate on AD rates imposed on Vietnamese raw honey exported to the USA at 412.49% (wide-average rate) on November 17, 2021. Later, on April 08, 2022 the DOC announced final determination to impose an AD rate on Vietnamese raw honey at 60.03%.

The U.S. market has played an important role in the Viet Nam beekeeping industry for the past 20 years, which consumed up to 70 percent of the annual total honey produced by the nation. Therefore, the AD rate imposition on Viet Nam honey at 60.03% has taken away its opportunity in competition in the international honey market because it suffered

a much higher AD rate than others such as Indian honey at 5.52-6.24% only. With the AD duty, American importers will have to pay the highest duty if they import Vietnamese honey, leading to sharp reductions in American demands for Vietnamese honey. It has led to a loss of its biggest honey market, causing Vietnamese honey producers to reduce sharply the number of their managed colonies. Since the 2022 crop year, the number of beehives and honey output have been reduced to about 40 percent compared to the 2021 crop year. This critical circumstance for the beekeeping industry of Viet Nam has led to the loss of thousands of jobs and income for thousands of beekeepers and workers, and the closure of dozens of companies.

SUMMARY AND CONCLUSION

This survey showed the enormous diversity of bees and other pollinators in Asia, specifically in the target countries, the Philippines, Thailand, and Viet Nam, all of which are considered biodiversity hot spots. Biodiversity hot spots are exceptionally rich in species, and are thus priority targets for nature conservation.

Of the 12 species of honey bees in the world, six are native in these countries. *A. cerana*, *A. dorsata*, and *A. andreniformis* are the shared species, *A. breviligula* is unique to the Philippines, while *A. laboriosa* is unique to Viet Nam. *A. florea* is shared by Viet Nam and Thailand. All countries propagate the European honeybee, *A. mellifera*, for honey production. The subspecies of *A. cerana* are *A. c. indica* in all countries, and *A. c. cerana* in Viet Nam. There are two subspecies of *A. mellifera*—*A. m. ligustica* and *A. m. carnica*.

There are 48 species belonging to ten genera, namely *Ebaiotrigona*, *Geniotrigona*, *Heterotrigona*, *Homotrigona*, *Lepidotrigona*, *Lisotrigona*, *Pariotrigona*, *Tetragonilla*, *Tetragonula*, and *Tetrigona*. Thailand has 35 species, Viet Nam has 16 species, and the Philippines has 12 species. Thailand, Viet Nam, and the Philippines have 23, five, and seven unique species, respectively.

A total of 16 *Bombus* species were recorded, and the highest number was observed in Viet Nam, followed by the Philippines and Thailand. The bumble bee has been known for the pollination of various crops which are normally unable to be pollinated by honey bees.

Solitary bees are pollinators of both cultivated and wild plants. Their population is diverse in all countries, comprising seven families and 13 genera. The most common genera are *Thyreus*, *Ceratina*, *Amegilla*, *Habropoda*, *Megachile*, *Anthidiellum*, *Coelioxys*, *Nomia*, *Hyaleus*, *Xylocopa*, and *Halictus*. It has been documented that solitary bees are actually the threatened species.

There are several threats to wild pollinators and managed bee colonies. These are loss, degradation or fragmentation of habitat, pesticides, agricultural intensification, climate change, pests and diseases, and pollution.

Each country has existing policies and laws on the conservation of bees and other pollinator species. Apimondia and FAO have published a Code of Good Beekeeping Practices that applies to all species of bees. It covers the minimum requirements in commercial or backyard apiaries or meliponaries and in wild hunting for the production of honey, royal jelly, beeswax, pollen and propolis.

The most popular strategies for bee conservation are protection of native populations and recognition or promotion of honey bee friendly practices. Other approaches are through research, regulation on pesticide application, protection of native pollinators, promotion of beekeeping-friendly practices, integrated pest management practices, information campaign on pollinator conservation, planting hedgerows and flower strips, conservation or restoration of natural habitats, establishment of bee yard for breeding purposes, and development of sustainable bee pasture.

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Appendix 1a. DAD-IS data from the Philippines

Species	Sub-species	Most common name	Language	Native/Exotic /Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Apis andreniformis</i>		antuti	Filipino	Native	Wild							X				Palawan		
<i>Apis breviligula</i>		pukyutan; putyukan	Filipino	Native	Wild	X	X			X		X						
<i>Apis cerana</i>	<i>A. c. indica</i>	Laywan; Ligwan	Filipino	Native	Both	X	X			X	X	X				Papua New Guinea	no idea	no idea
<i>Apis dorsata</i>		pukyutan; putyukan	Filipino	Native	Wild	X	X			X		X						
<i>Apis mellifera</i>	<i>A. m. carnica</i> and <i>A. m. ligustica</i>	European honey bee; Ligwan	English; Filipino	Introduced species	Managed	X	X		X		X	X		X		Australia		
<i>Tetragonula biroi</i>		lukot; kiwot; lukutan; kiyot; libog	Filipino; Cebunao;	Native	Both	X	X	X				X						
<i>Tetragonula clypearis</i>		Kiyot	Filipino	Filipino	Both	X	X	X				X						
<i>Tetragonula dapitanensis</i>																		
<i>Tetragonula fuscobalteata</i>		monggo-monggo; kiyot	Filipino	Native	Both	X	X	X				X						
<i>Tetragonula iridipennis</i>		kiyot, kiwot, lukot, lukutan or libog	Filipino	Native	Both	X	X	X				X						
<i>Tetragonula laeviceps</i>		kiyot, kiwot, lukot, lukutan or libog	Filipino	Native	Both	X	X	X				X						
<i>Tetragonula pagdeni</i>		kiyot, kiwot, lukot, lukutan or libog																
<i>Tetragonula sapiens</i>		kiyot, kiwot, lukot, lukutan or libog	Filipino	Native	Both	X	X	X				X						
<i>Tetragonula valdezi</i>		kiyot, kiwot, lukot, lukutan or libog	Filipino	Native	Wild							X						
<i>Heterotrigona erythrogastra</i>		kiyot, kiwot, lukot, lukutan or libog	Filipino	Native	Wild							X						
<i>Lepidotrigona nitidiventris</i>		kiyot, kiwot, lukot, lukutan or libog	Filipino	Native	Wild							X						
<i>Lepidotrigona palavanica</i>		kiyot, kiwot, lukot, lukutan or libog	Filipino	Native	Wild							X						
<i>Bombus irisanensis</i>		Bumble bee	English	Native	Wild							X						
<i>Bombus baguionensis</i>		Bumble bee	English	Native	Wild							X						
<i>Bombus imuganensis</i>		Bumble bee	English	Native	Wild							X						
<i>Bombus flavescens bakeri</i>		Bumble bee	English	Native	Wild							X						
<i>Bombus flavescens mearnsi</i>		Bumble bee	English	Native	Wild							X						
<i>Bombus americanorum</i>		Bumble bee	English	Native	Wild							X						

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Apis andreniformis</i>	Palawan	no	none										
<i>Apis breviligula</i>	nationwide except Palawan	no	none	40	60								
<i>Apis cerana</i>	nationwide	no	no idea	1	3	-	-	0.5	0.5	1	3	-	-
<i>Apis dorsata</i>	Palawan	no	none	40	60	-	-					-	-
<i>Apis mellifera</i>	nationwide	no		10	25	-	0.5	1	4	-	-		
<i>Tetragonula biroi</i>	nationwide	yes		1	1.5	0.5	1.3	1	2.9				
<i>Tetragonula clypearis</i>	nationwide (distinct species)			0.3	0.05			0.2	0.3				
<i>Tetragonula dapitanensis</i>	Dapitan, Mindanao												
<i>Tetragonula fuscobalteata</i>	Lanao; Palawan; Dumaguete; Negros Oriental; Bohol			300 ml/colony	500 ml/colony			0.2	0.03				
<i>Tetragonula iridipennis</i>	Lanao; Zamboanga; Palawan; Davao				1		0.1						
<i>Tetragonula laeviceps</i>	Lanao; Zamboanga; Palawan; Cebu; Davao			0.5	1		0.1	0.3	0.5				
<i>Tetragonula pagdeni</i>													
<i>Tetragonula sapiens</i>	Dumaguete; Leyte; Cebu; Bohol			500 ml/colony	1 liter /colony			0.3	0.05				
<i>Tetragonula valdezi</i>	Laguna; Davao												
<i>Heterotrigona erythrogastra</i>	Palawan												
<i>Lepidotrigona nitidiventris</i>	Palawan												
<i>Lepidotrigona palavanica</i>	Palawan												
<i>Bombus irisanensis</i>	Mountain Province; Nueva Vizcaya												
<i>Bombus baguionensis</i>	Mountain Province												
<i>Bombus imuganensis</i>	Laguna; Nueva Vizcaya												
<i>Bombus flavescens bakeri</i>	Negros Occidental & Oriental; Misamis Occidental												
<i>Bombus flavescens mearnsi</i>	Davao; Misamis Occidental												
<i>Bombus americanorum</i>	Introduced into Philippines												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Apis andreniformis</i>	X	X			X							
<i>Apis breviligula</i>	X	X							X			
<i>Apis cerana</i>	X	X								X		
<i>Apis dorsata</i>	X	X							X			
<i>Apis mellifera</i>	X	X	X	X			X	X			X	
<i>Tetragonula biroi</i>				X	X				X			
<i>Tetragonula clypearis</i>				X	X				X			
<i>Tetragonula dapitanensis</i>												
<i>Tetragonula fuscobalteata</i>				X	X				X			
<i>Tetragonula iridipennis</i>	X						X	X				
<i>Tetragonula laeviceps</i>				X	X				X			
<i>Tetragonula pagdeni</i>												
<i>Tetragonula sapiens</i>				X	X				X			
<i>Tetragonula valdezi</i>												
<i>Heterotrigona erythrogastra</i>												
<i>Lepidotrigona nitidiventris</i>												
<i>Lepidotrigona palavanica</i>												
<i>Bombus irisanensis</i>												
<i>Bombus baguionensis</i>												
<i>Bombus imuganensis</i>												
<i>Bombus flavescens bakeri</i>												
<i>Bombus flavescens mearnsi</i>												
<i>Bombus americanorum</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Apis andreniformis</i>									
<i>Apis breviligula</i>	X								
<i>Apis cerana</i>		X	autogrooming response to the tracheal mites			X			
<i>Apis dorsata</i>	X								
<i>Apis mellifera</i>	X				X		X		
<i>Tetragonula biroi</i>	X						X		
<i>Tetragonula clypearis</i>	X					X			
<i>Tetragonula dapitanensis</i>									
<i>Tetragonula fuscobalteata</i>						X			
<i>Tetragonula iridipennis</i>	X				X				
<i>Tetragonula laeviceps</i>	X		Easily transferred to box or education			X			
<i>Tetragonula pagdeni</i>									
<i>Tetragonula sapiens</i>	X		Easily transferred to box or education			X			
<i>Tetragonula valdezi</i>									
<i>Heterotrigona erythrogastra</i>									
<i>Lepidotrigona nitidiventris</i>									
<i>Lepidotrigona palavanica</i>									
<i>Bombus irisanensis</i>									
<i>Bombus baguionensis</i>									
<i>Bombus imuganensis</i>									
<i>Bombus flavescens bakeri</i>									
<i>Bombus flavescens mearnsi</i>									
<i>Bombus americanorum</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/w weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Apis andreniformis</i>														
<i>Apis breviligula</i>		X		X	X		X							
<i>Apis cerana</i>		X	X	X	X		X	Wax moth, mites	X		lizards; frogs	<i>Varroa jacobsoni</i>		
<i>Apis dorsata</i>		X		X	X		X							
<i>Apis mellifera</i>	X (Chalkbrood)	X	X	X	X		X	Small hive beetle; wax moth	X	X	birds, frogs, lizards, wasps	<i>Varroa destructor</i>		X
<i>Tetragonula biroi</i>		X		X	X		X	nitidulid beetles	X		lizards, frogs, cockroaches			
<i>Tetragonula clypearis</i>											Spiders			
<i>Tetragonula dapitanensis</i>														
<i>Tetragonula fuscobalteata</i>											Spiders			
<i>Tetragonula iridipennis</i>		X		X	X		X	X	X		X			
<i>Tetragonula laeviceps</i>		X	X	X (Land conversion)	X		X	Spiders	X		X			
<i>Tetragonula pagdeni</i>														
<i>Tetragonula sapiens</i>				X (Land conversion)			X				Spiders			
<i>Tetragonula valdezi</i>														
<i>Heterotrigona erythrogastra</i>														
<i>Lepidotrigona nitidiventris</i>														
<i>Lepidotrigona palavanica</i>														
<i>Bombus irisanensis</i>														
<i>Bombus baguionensis</i>														
<i>Bombus imuganensis</i>														
<i>Bombus flavescens bakeri</i>														
<i>Bombus flavescens mearnsi</i>														
<i>Bombus americanorum</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Apis andreniformis</i>								
<i>Apis breviligula</i>		NO	-	NO	-	500	30	
<i>Apis cerana</i>		NO	-	NO	-	115	15	
<i>Apis dorsata</i>		NO	-	NO	-	500	30	
<i>Apis mellifera</i>		YES	Hawaii; Australia; Italy; New Zealand	NO	-	150	44	
<i>Tetragonula biroi</i>		NO				2424	87	
<i>Tetragonula clypearis</i>							60	probably distinct species (Rasmussen 2008)
<i>Tetragonula dapitanensis</i>								Cockerell 1929; Baltazar 1966
<i>Tetragonula fuscobalteata</i>						35	60	Baltazar 1966; Starr & Sakagami 1987; Rasmussen 2008
<i>Tetragonula iridipennis</i>						4	2	Baltazar 1966
<i>Tetragonula laeviceps</i>						37	10	Cockerell 1925; Rasmussen 2008
<i>Tetragonula pagdeni</i>								Brown 1906; Schwarz 1939; Baltazar 1966
<i>Tetragonula sapiens</i>							10	Starr & Sakagami 1987
<i>Tetragonula valdezi</i>								Baltazar 1966; Rasmussen 2008
<i>Heterotrigona erythrogastra</i>								Baltazar 1966; Rasmussen 2008
<i>Lepidotrigona nitidiventris</i>								Baltazar 1966; Rasmussen 2008
<i>Lepidotrigona palavanica</i>								Baltazar 1966; Rasmussen 2008
<i>Bombus irisanensis</i>								Baltazar 1966
<i>Bombus baguionensis</i>								Baltazar 1966
<i>Bombus imuganensis</i>								Baltazar 1966
<i>Bombus flavescens bakeri</i>								Baltazar 1966
<i>Bombus flavescens mearnsi</i>								Baltazar 1966
<i>Bombus americanorum</i>								Baltazar 1966

Species	Sub-species	Most common name	Language	Native/Exotic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Bees wax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Xylocopa (Biluna) auripennis mcgregori</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Biluna) auripennis mimetica</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Biluna) fallax</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) adusta</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) amauroptera</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) bakeriana</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) balteata</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) bilineata</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) bluethgeni</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) bombiformis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) canaria</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) ceballosi</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) chlorina</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) cockerelli</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) cuernosensis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) dapitanensis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) euchlora</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) ghilianii</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) levequeae</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) lucbanensis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) maesoi</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) maior</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) negligenda</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) nigroplagiata</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) occipitalis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) philippinensis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) rutcornis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) samarensis</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) subvolatilis</i>		Carpenter bee	English	Native	Solitary							X						

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Xylocopa (Biluna) auripennis mcgregori</i>	Bulacan; Manila; Mountain Province; Pangasinan; Zambales; Los Banos; Novaliches; Olongapo; Calapan, Mindoro												
<i>Xylocopa (Biluna) auripennis mimetica</i>	Camarines Sur; Manila; Quezon; Palawan												
<i>Xylocopa (Biluna) fallax</i>	Palawan; Baguio												
<i>Xylocopa (Koptortosoma) adusta</i>	Mindanao												
<i>Xylocopa (Koptortosoma) amauroptera</i>	Palawan												
<i>Xylocopa (Koptortosoma) bakeriana</i>	Laguna; Nueva Vizcaya												
<i>Xylocopa (Koptortosoma) balteata</i>	Tayabas, Quezon												
<i>Xylocopa (Koptortosoma) bilineata</i>	Luzon												
<i>Xylocopa (Koptortosoma) bluethgeni</i>	Davao; Zamboanga; Basilan												
<i>Xylocopa (Koptortosoma) bombiformis</i>	Rizal; Zambales; Baguio; Casurigan; Laguna; Bataan; Lucban, Tayabas Prov.; Obando, Bulacan Prov.; Mindanao; Panay; Culasi; Samar												
<i>Xylocopa (Koptortosoma) canaria</i>	Bohol; Samar												
<i>Xylocopa (Koptortosoma) ceballosi</i>	Manila; Nueva Vizcaya												
<i>Xylocopa (Koptortosoma) chlorina</i>	Bataan; Ilocos Norte; Laguna; Manila; Nueva Vizcaya; Quezon; Rizal; Zambales; Benguet; Mindanao, Malabang												
<i>Xylocopa (Koptortosoma) cockerelli</i>	Tayabas, Quezon												
<i>Xylocopa (Koptortosoma) cuernosensis</i>	Bohol; Cebu; Negros; Panay; Iloilo; Sibuyan; Bulacan; Laguna												
<i>Xylocopa (Koptortosoma) dapitanensis</i>	Dapitan, Zamboanga												
<i>Xylocopa (Koptortosoma) euchlora</i>	Zamboanga; Panay; Palawan; Manila; Cagayan												
<i>Xylocopa (Koptortosoma) ghiliani</i>	Camiguin; Mindoro; Samar; Davao; Lanao; Butuan; Basilan; Dapitan; Iligan; Surigao; Laguna												
<i>Xylocopa (Koptortosoma) levequeae</i>	Quezon; Panay, Capiz												
<i>Xylocopa (Koptortosoma) lucbanensis</i>	Tayabas, Quezon												
<i>Xylocopa (Koptortosoma) maesoi</i>	Quezon												
<i>Xylocopa (Koptortosoma) maior</i>	Albay; Zambales; Quezon												
<i>Xylocopa (Koptortosoma) negligenda</i>	Surigao												
<i>Xylocopa (Koptortosoma) nigroplagiata</i>	Sulu; Palawan												
<i>Xylocopa (Koptortosoma) occipitalis</i>	Mindanao												
<i>Xylocopa (Koptortosoma) philippinensis</i>	Manila; Quezon; Leyte; Zamboanga												
<i>Xylocopa (Koptortosoma) ruticornis</i>	Philippines												
<i>Xylocopa (Koptortosoma) samarensis</i>	Samar												
<i>Xylocopa (Koptortosoma) subvolatilis</i>	Davao												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Xylocopa (Biluna) auripennis mcgregori</i>												
<i>Xylocopa (Biluna) auripennis mimetica</i>												
<i>Xylocopa (Biluna) fallax</i>												
<i>Xylocopa (Koptortosoma) adusta</i>												
<i>Xylocopa (Koptortosoma) amauroptera</i>												
<i>Xylocopa (Koptortosoma) bakeriana</i>												
<i>Xylocopa (Koptortosoma) balteata</i>												
<i>Xylocopa (Koptortosoma) bilineata</i>												
<i>Xylocopa (Koptortosoma) bluethgeni</i>												
<i>Xylocopa (Koptortosoma) bombiformis</i>												
<i>Xylocopa (Koptortosoma) canaria</i>												
<i>Xylocopa (Koptortosoma) ceballosi</i>												
<i>Xylocopa (Koptortosoma) chlorina</i>												
<i>Xylocopa (Koptortosoma) cockerelli</i>												
<i>Xylocopa (Koptortosoma) cuernosensis</i>												
<i>Xylocopa (Koptortosoma) dapitanensis</i>												
<i>Xylocopa (Koptortosoma) euchlora</i>												
<i>Xylocopa (Koptortosoma) ghiliani</i>												
<i>Xylocopa (Koptortosoma) levequeae</i>												
<i>Xylocopa (Koptortosoma) lucbanensis</i>												
<i>Xylocopa (Koptortosoma) maesoi</i>												
<i>Xylocopa (Koptortosoma) maior</i>												
<i>Xylocopa (Koptortosoma) negligenda</i>												
<i>Xylocopa (Koptortosoma) nigroplagiata</i>												
<i>Xylocopa (Koptortosoma) occipitalis</i>												
<i>Xylocopa (Koptortosoma) philippinensis</i>												
<i>Xylocopa (Koptortosoma) rutilicornis</i>												
<i>Xylocopa (Koptortosoma) samarensis</i>												
<i>Xylocopa (Koptortosoma) subvolatilis</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Xylocopa (Biluna) auripennis mcgregori</i>									
<i>Xylocopa (Biluna) auripennis mimetica</i>									
<i>Xylocopa (Biluna) fallax</i>									
<i>Xylocopa (Koptortosoma) adusta</i>									
<i>Xylocopa (Koptortosoma) amauroptera</i>									
<i>Xylocopa (Koptortosoma) bakeriana</i>									
<i>Xylocopa (Koptortosoma) balteata</i>									
<i>Xylocopa (Koptortosoma) bilineata</i>									
<i>Xylocopa (Koptortosoma) bluethgeni</i>									
<i>Xylocopa (Koptortosoma) bombiformis</i>									
<i>Xylocopa (Koptortosoma) canaria</i>									
<i>Xylocopa (Koptortosoma) ceballosi</i>									
<i>Xylocopa (Koptortosoma) chlorina</i>									
<i>Xylocopa (Koptortosoma) cockerelli</i>									
<i>Xylocopa (Koptortosoma) cuernosensis</i>									
<i>Xylocopa (Koptortosoma) dapitanensis</i>									
<i>Xylocopa (Koptortosoma) euchlora</i>									
<i>Xylocopa (Koptortosoma) ghiliani</i>									
<i>Xylocopa (Koptortosoma) levequeae</i>									
<i>Xylocopa (Koptortosoma) lucbanensis</i>									
<i>Xylocopa (Koptortosoma) maesoi</i>									
<i>Xylocopa (Koptortosoma) maior</i>									
<i>Xylocopa (Koptortosoma) negligenda</i>									
<i>Xylocopa (Koptortosoma) nigroplagiata</i>									
<i>Xylocopa (Koptortosoma) occipitalis</i>									
<i>Xylocopa (Koptortosoma) philippinensis</i>									
<i>Xylocopa (Koptortosoma) rutilicornis</i>									
<i>Xylocopa (Koptortosoma) samarensis</i>									
<i>Xylocopa (Koptortosoma) subvolatilis</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Xylocopa (Biluna) auripennis mcgregori</i>														
<i>Xylocopa (Biluna) auripennis mimetica</i>														
<i>Xylocopa (Biluna) fallax</i>														
<i>Xylocopa (Koptortosoma) adusta</i>														
<i>Xylocopa (Koptortosoma) amauroptera</i>														
<i>Xylocopa (Koptortosoma) bakeriana</i>														
<i>Xylocopa (Koptortosoma) balteata</i>														
<i>Xylocopa (Koptortosoma) bilineata</i>														
<i>Xylocopa (Koptortosoma) bluethgeni</i>														
<i>Xylocopa (Koptortosoma) bombiformis</i>														
<i>Xylocopa (Koptortosoma) canaria</i>														
<i>Xylocopa (Koptortosoma) ceballosi</i>														
<i>Xylocopa (Koptortosoma) chlorina</i>														
<i>Xylocopa (Koptortosoma) cockerelli</i>														
<i>Xylocopa (Koptortosoma) cuernosensis</i>														
<i>Xylocopa (Koptortosoma) dapitanensis</i>														
<i>Xylocopa (Koptortosoma) euchlora</i>														
<i>Xylocopa (Koptortosoma) ghilianii</i>														
<i>Xylocopa (Koptortosoma) levequeae</i>														
<i>Xylocopa (Koptortosoma) lucbanensis</i>														
<i>Xylocopa (Koptortosoma) maesoi</i>														
<i>Xylocopa (Koptortosoma) maior</i>														
<i>Xylocopa (Koptortosoma) negligenda</i>														
<i>Xylocopa (Koptortosoma) nigroplagiata</i>														
<i>Xylocopa (Koptortosoma) occipitalis</i>														
<i>Xylocopa (Koptortosoma) philippinensis</i>														
<i>Xylocopa (Koptortosoma) rutilicornis</i>														
<i>Xylocopa (Koptortosoma) samarensis</i>														
<i>Xylocopa (Koptortosoma) subvolatilis</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Xylocopa (Biluna) auripennis mcgregori</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Biluna) auripennis mimetica</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Biluna) fallax</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) adusta</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) amauroptera</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) bakeriana</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) balteata</i>								Mawdsley 2015
<i>Xylocopa (Koptortosoma) bilineata</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) bluethgeni</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) bombiformis</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) canaria</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) ceballosi</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) chlorina</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) cockerelli</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) cuernosensis</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) dapitanensis</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) euchlora</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) ghiliani</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) levequeae</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) lucbanensis</i>								Mawdsley 2015
<i>Xylocopa (Koptortosoma) maesoi</i>								Mawdsley 2015
<i>Xylocopa (Koptortosoma) maior</i>								Mawdsley 2015
<i>Xylocopa (Koptortosoma) negligenda</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) nigroplagiata</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) occipitalis</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) philippinensis</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) ruticornis</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) samarensis</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) subvolatilis</i>								Baltazar 1966; Mawdsley 2015

Species	Sub-species	Most common name	Language	Native/Exotic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Polen	Propolis	Royal jelly	Bees wax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Xylocopa (Koptortosoma) sulcifrons</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) tayabanica</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) trifasciata</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) unicolor</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Koptortosoma) vachali</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Neoxylocopa) brasilianorum</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Platynopoda) latipes</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Platynopoda) tenuiscapa</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Zonohirsuta) chenghuoi</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Zonohirsuta) dejeanii dejeanii</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Zonohirsuta) fuliginata</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Zonohirsuta) indecisa</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Zonohirsuta) kanoi</i>		Carpenter bee	English	Native	Solitary							X						
<i>Xylocopa (Zonohirsuta) mazarredoi</i>		Carpenter bee	English	Native	Solitary							X						
<i>Megachile abluta</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile albobarbata</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile atrata</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile bakeri</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile candentula</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile chlorura</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile clotha</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile davaanensis</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile fullawayi</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile hera</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile labascens</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile lachesis</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile laticeps</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile robbii</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile semperi</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile mcgregori</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile metallescens</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile merrilli</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile navicularis</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile obrepta</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile ocellifera</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile orthostoma</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile panayensis</i>		Leafcutter bee	English	Native	Solitary							X						
<i>Megachile philippinensis</i>	<i>M. p. philippinensis</i>	Leafcutter bee	English	Native	Solitary							X						
<i>Megachile philippinensis</i>	<i>M. p. vizcayana</i>	Leafcutter bee	English	Native	Solitary							X						

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Xylocopa (Koptortosoma) sulcifrons</i>	Palawan												
<i>Xylocopa (Koptortosoma) tayabanica</i>	Tayabas, Quezon												
<i>Xylocopa (Koptortosoma) trifasciata</i>	Mindanao , Davao												
<i>Xylocopa (Koptortosoma) unicolor</i>	Philippines												
<i>Xylocopa (Koptortosoma) vachali</i>	Palawan; Paragua												
<i>Xylocopa (Neoxylocopa) brasilianorum</i>	Philippines												
<i>Xylocopa (Platynopoda) latipes</i>	Negros Oriental; Panay; Antique; Palawan												
<i>Xylocopa (Platynopoda) tenuiscapa</i>	Philippines												
<i>Xylocopa (Zonohirsuta) chenghuoi</i>	Palawan												
<i>Xylocopa (Zonohirsuta) dejeanii dejeanii</i>	Cape Engaño												
<i>Xylocopa (Zonohirsuta) fuliginata</i>	Albay; Laguna; Mountain Province; Quezon; Cebu; Mindoro; Samar; Davao; Lanao; Zamboanga; Basilan; Palawan; Isabela; Butuan; Negros; Panay; Samar												
<i>Xylocopa (Zonohirsuta) indecisa</i>	Samar												
<i>Xylocopa (Zonohirsuta) kanoi</i>	Luzon; Basilan; Mindanao												
<i>Xylocopa (Zonohirsuta) mazarredoi</i>	Palawan												
<i>Megachile abluta</i>	Laguna												
<i>Megachile albobarbata</i>	Negros Oriental; Surigao; Zamboanga												
<i>Megachile atrata</i>	Laguna; Samar; Surigao; Zamboanga												
<i>Megachile bakeri</i>	Laguna; Quezon; Zamboanga												
<i>Megachile candentula</i>	Zamboanga												
<i>Megachile chlorura</i>	Laguna; Panay; Antique												
<i>Megachile clotho</i>	Cape Engaño; Negros Oriental; Zamboanga												
<i>Megachile davaonensis</i>	Negros Oriental; Davao; Zamboanga												
<i>Megachile fullawayi</i>	Negros Oriental;												
<i>Megachile hera</i>	Laguna; Panay; Antique												
<i>Megachile labascens</i>	Laguna; Negros Oriental												
<i>Megachile lachesis</i>	Cape Engaño												
<i>Megachile laticeps</i>	Bataan; Bulacan; Laguna; Panay; Antique; Samar												
<i>Megachile robbii</i>	Manila												
<i>Megachile semperi</i>	Luzon												
<i>Megachile mcgregori</i>	Laguna; Antique; Panay; Dapitan; Zamboanga												
<i>Megachile metallescens</i>	Laguna												
<i>Megachile merrilli</i>	Laguna												
<i>Megachile navicularis</i>	Laguna												
<i>Megachile obrepta</i>	Zamboanga												
<i>Megachile ocellifera</i>	Davao												
<i>Megachile orthostoma</i>	Sibuyan												
<i>Megachile panayensis</i>	Panay; Antique; Zamboanga												
<i>Megachile philippinensis philippinensis</i>	Laguna; Mountain Province; Nueva Vizcaya; Zamboanga; Palawan												
<i>Megachile philippinensis vizcayana</i>	Nueva Vizcaya												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Xylocopa (Koptortosoma) sulcifrons</i>												
<i>Xylocopa (Koptortosoma) tayabanica</i>												
<i>Xylocopa (Koptortosoma) trifasciata</i>												
<i>Xylocopa (Koptortosoma) unicolor</i>												
<i>Xylocopa (Koptortosoma) vachali</i>												
<i>Xylocopa (Neoxylocopa) brasilianorum</i>												
<i>Xylocopa (Platynopoda) latipes</i>												
<i>Xylocopa (Platynopoda) tenuiscapa</i>												
<i>Xylocopa (Zonahirsuta) chenghuoi</i>												
<i>Xylocopa (Zonahirsuta) dejeanii dejeanii</i>												
<i>Xylocopa (Zonahirsuta) fuliginata</i>												
<i>Xylocopa (Zonahirsuta) indecisa</i>												
<i>Xylocopa (Zonahirsuta) kanoi</i>												
<i>Xylocopa (Zonahirsuta) mazarredoi</i>												
<i>Megachile abluta</i>												
<i>Megachile albobarbata</i>												
<i>Megachile atrata</i>												
<i>Megachile bakeri</i>												
<i>Megachile candentula</i>												
<i>Megachile chlorura</i>												
<i>Megachile clotho</i>												
<i>Megachile davaonensis</i>												
<i>Megachile fullawayi</i>												
<i>Megachile hera</i>												
<i>Megachile labascens</i>												
<i>Megachile lachesis</i>												
<i>Megachile laticeps</i>												
<i>Megachile robbii</i>												
<i>Megachile semperi</i>												
<i>Megachile mcgregori</i>												
<i>Megachile metallescens</i>												
<i>Megachile merrilli</i>												
<i>Megachile navicularis</i>												
<i>Megachile obrepta</i>												
<i>Megachile ocellifera</i>												
<i>Megachile orthostoma</i>												
<i>Megachile panayensis</i>												
<i>Megachile philippinensis philippinensis</i>												
<i>Megachile philippinensis vizzayana</i>												

Species	Abscending tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Xylocopa (Koptortosoma) sulcifrons</i>									
<i>Xylocopa (Koptortosoma) tayabanica</i>									
<i>Xylocopa (Koptortosoma) trifasciata</i>									
<i>Xylocopa (Koptortosoma) unicolor</i>									
<i>Xylocopa (Koptortosoma) vachali</i>									
<i>Xylocopa (Neoxylocopa) brasilianorum</i>									
<i>Xylocopa (Platynopoda) latipes</i>									
<i>Xylocopa (Platynopoda) tenuiscapa</i>									
<i>Xylocopa (Zonohirsuta) chenghuoi</i>									
<i>Xylocopa (Zonohirsuta) dejeanii dejeanii</i>									
<i>Xylocopa (Zonohirsuta) fuliginata</i>									
<i>Xylocopa (Zonohirsuta) indecisa</i>									
<i>Xylocopa (Zonohirsuta) kanoi</i>									
<i>Xylocopa (Zonohirsuta) mazarredoi</i>									
<i>Megachile abluta</i>									
<i>Megachile albobarbata</i>									
<i>Megachile atrata</i>									
<i>Megachile bakeri</i>									
<i>Megachile candentula</i>									
<i>Megachile chlorura</i>									
<i>Megachile clotho</i>									
<i>Megachile davaonensis</i>									
<i>Megachile fullawayi</i>									
<i>Megachile hera</i>									
<i>Megachile labascens</i>									
<i>Megachile lachesis</i>									
<i>Megachile laticeps</i>									
<i>Megachile robbii</i>									
<i>Megachile semperi</i>									
<i>Megachile mcgregori</i>									
<i>Megachile metallescens</i>									
<i>Megachile merrilli</i>									
<i>Megachile navicularis</i>									
<i>Megachile obrepta</i>									
<i>Megachile ocellifera</i>									
<i>Megachile orthostoma</i>									
<i>Megachile panayensis</i>									
<i>Megachile philippinensis philippinensis</i>									
<i>Megachile philippinensis vizcayana</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...). Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Xylocopa (Koptortosoma) sulcifrons</i>														
<i>Xylocopa (Koptortosoma) tayabanica</i>														
<i>Xylocopa (Koptortosoma) trifasciata</i>														
<i>Xylocopa (Koptortosoma) unicolor</i>														
<i>Xylocopa (Koptortosoma) vachali</i>														
<i>Xylocopa (Neoxylocopa) brasilianorum</i>														
<i>Xylocopa (Platynopoda) latipes</i>														
<i>Xylocopa (Platynopoda) tenuiscapa</i>														
<i>Xylocopa (Zonohirsuta) chenghuoi</i>														
<i>Xylocopa (Zonohirsuta) dejeanii</i>														
<i>Xylocopa (Zonohirsuta) fuliginata</i>														
<i>Xylocopa (Zonohirsuta) indecisa</i>														
<i>Xylocopa (Zonohirsuta) kanoi</i>														
<i>Xylocopa (Zonohirsuta) mazarredoi</i>														
<i>Megachile abluta</i>														
<i>Megachile albobarbata</i>														
<i>Megachile atrata</i>														
<i>Megachile bakeri</i>														
<i>Megachile candentula</i>														
<i>Megachile chlorura</i>														
<i>Megachile clotho</i>														
<i>Megachile davaonensis</i>														
<i>Megachile fullawayi</i>														
<i>Megachile hera</i>														
<i>Megachile labascens</i>														
<i>Megachile lachesis</i>														
<i>Megachile laticeps</i>														
<i>Megachile robbii</i>														
<i>Megachile semperi</i>														
<i>Megachile mcgregori</i>														
<i>Megachile metallescens</i>														
<i>Megachile merrilli</i>														
<i>Megachile navicularis</i>														
<i>Megachile obrepta</i>														
<i>Megachile ocellifera</i>														
<i>Megachile orthostoma</i>														
<i>Megachile panayensis</i>														
<i>Megachile philippinensis</i>														
<i>Megachile philippinensis vizayana</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Xylocopa (Koptortosoma) sulcifrons</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) tayabanica</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) trifasciata</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) unicolor</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Koptortosoma) vachali</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Neoxylocopa) brasilianorum</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Platynopoda) latipes</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Platynopoda) tenuiscapa</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Zonohirsuta) chenghuoi</i>								Mawdsley 2015
<i>Xylocopa (Zonohirsuta) dejeanii dejeanii</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Zonohirsuta) fuliginata</i>								Baltazar 1966; Mawdsley 2015
<i>Xylocopa (Zonohirsuta) indecisa</i>								Mawdsley 2015
<i>Xylocopa (Zonohirsuta) kanoi</i>								Mawdsley 2015
<i>Xylocopa (Zonohirsuta) mazarredoi</i>								Baltazar 1966; Mawdsley 2015
<i>Megachile abluta</i>								
<i>Megachile albobarbata</i>								
<i>Megachile atrata</i>								
<i>Megachile bakeri</i>								
<i>Megachile candentula</i>								
<i>Megachile chlorura</i>								
<i>Megachile clotho</i>								
<i>Megachile davaonensis</i>								
<i>Megachile fullawayi</i>								
<i>Megachile hera</i>								
<i>Megachile labascens</i>								
<i>Megachile lachesis</i>								
<i>Megachile laticeps</i>								
<i>Megachile robbii</i>								
<i>Megachile semperi</i>								
<i>Megachile mcgregori</i>								
<i>Megachile metallescens</i>								
<i>Megachile merrilli</i>								
<i>Megachile navicularis</i>								
<i>Megachile obrepta</i>								
<i>Megachile ocellifera</i>								
<i>Megachile orthostoma</i>								
<i>Megachile panayensis</i>								
<i>Megachile philippinensis philippinensis</i>								
<i>Megachile philippinensis vizayana</i>								

Species	Sub-species	Most common name	Language	Native/Exotic/ Endemic/Intro duced Species?	Solitary/Wild/Ma naged/Both Species	Specific uses (put "X")								Origin of species (based on availabl e literatur e)	Year of origin/imp ort since	Impo rt from	
						Honey	Pollen	Pro poli s	Royal jelly	Bee swa x	Bee venom	Pollina tion	Cultura l/Religi ous Custo ms				Queen producti on
<i>Megachile rufifulva</i>		Leafcutter bee	English	Native	Solitary							X					
<i>Megachile structilis</i>		Leafcutter bee	English	Native	Solitary							X					
<i>Megachile subrixator</i>		Leafcutter bee	English	Native	Solitary							X					
<i>Megachile tarsatula</i>		Leafcutter bee	English	Native	Solitary							X					
<i>Megachile tuberculata</i>		Leafcutter bee	English	Native	Solitary							X					
<i>Megachile valdezi</i>		Leafcutter bee	English	Native	Solitary							X					
<i>Megachile subrixator</i>		Leafcutter bee	English	Native	Solitary							X					
<i>Coelioxys bakeri</i>	<i>C. b. atripes</i>	Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys bakeri</i>	<i>C. b. bakeri</i>	Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys cothura</i>		Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys dapitanensis</i>		Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys ducalis</i>		Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys genalis</i>		Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys luzonicus</i>	<i>C. l. luzonicus</i>	Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys luzonicus</i>	<i>C. l. makilingensis</i>	Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys manilae</i>		Sharp-tailed bee	English	Native	Solitary							X					
<i>Coelioxys philippinensis</i>		Sharp-tailed bee	English	Native	Solitary							X					
<i>Nomada attrita</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada bakeri</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada banahaonis</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada concessa</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada dissesa</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada exheredans</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada lusca</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada makilingensis</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada mindanaonis</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada palavanica</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Nomada pervasor</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Anthophora luzonica</i>		Miner bee	English	Native	Solitary							X					
<i>Anthophora subrossata</i>		Miner bee	English	Native	Solitary							X					
<i>Anthophora zonata</i>	<i>A. z. atrocaerulea</i>	Miner bee	English	Native	Solitary							X					
<i>Amegilla cingulata</i>	<i>A. c. andrewsi</i>	Blue-banded bee	English	Native	Solitary							X					
<i>Amegilla cingulata</i>	<i>A. c. cingulata</i>	Blue-banded bee	English	Native	Solitary							X					
<i>Amegilla walkeri samarensis</i>	<i>A. w. samarensis</i>	Blue-banded bee	English	Native	Solitary							X					
<i>Amegilla walkeri whiteheadi</i>	<i>A. w. whiteheadi</i>	Blue-banded bee	English	Native	Solitary							X					
<i>Amegilla zonata stantoni</i>	<i>A. w. stantoni</i>	Blue-banded bee	English	Native	Solitary							X					
<i>Amegilla karotenensis</i>		Blue-banded bee	English	Native	Solitary							X					
<i>Amegilla zonata zonata</i>		Blue-banded bee	English	Native	Solitary							X					
<i>Thyreus insolitus</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Thyreus janasivia</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Thyreus luzonensis</i>		Cuckoo bee	English	Native	Solitary							X					
<i>Thyreus nitidulus caelestinus</i>	<i>T. n. caelestinus</i>	Cuckoo bee	English	Native	Solitary							X					
<i>Thyreus nitidulus nitidulus</i>	<i>T. n. nitidulus</i>	Cuckoo bee	English	Native	Solitary							X					
<i>Thyreus nitidulus pulchellus</i>	<i>T. n. pulchellus</i>	Cuckoo bee	English	Native	Solitary							X					
<i>Thyreus novachollandiac irisanus</i>	<i>T. n. irisanus</i>	Cuckoo bee	English	Native	Solitary							X					
<i>Thyreus wallacei</i>		Cuckoo bee	English	Native	Solitary							X					

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg per year and colony)		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Megachile rufofulva</i>	Quezon; Zamboanga												
<i>Megachile structilis</i>	Laguna												
<i>Megachile subrixator</i>	Bataan; Ilocos Norte; Laguna; Negros Oriental; Panay; Antique; Samar; Davao; Lanao; Zamboanga												
<i>Megachile tarsatula</i>	Negros Oriental; Davao; Zamboanga; Palawan												
<i>Megachile tuberculata</i>	Philippines												
<i>Megachile valdezi</i>	Laguna; Manila; Panay; Antique; Davao; Zamboanga												
<i>Megachile subrixator</i>	Davao												
<i>Coelioxys bakeri</i>	Laguna												
<i>Coelioxys bakeri</i>	Davao; Lanao; Zamboanga												
<i>Coelioxys cothura</i>	Laguna												
<i>Coelioxys dapitanensis</i>	Zamboanga; Palawan												
<i>Coelioxys ducalis</i>	Laguna												
<i>Coelioxys genalis</i>	Laguna; Quezon; Negros Oriental; Davao												
<i>Coelioxys luzonicus</i>	Laguna												
<i>Coelioxys luzonicus</i>	Laguna; Davao												
<i>Coelioxys manilae</i>	Manila												
<i>Coelioxys philippinensis</i>	Cape Engaño; Laguna; Quezon												
<i>Nomada attrita</i>	Agusan												
<i>Nomada bakeri</i>	Laguna												
<i>Nomada banahaonis</i>	Laguna												
<i>Nomada concessa</i>	Zamboanga												
<i>Nomada disessa</i>	Laguna												
<i>Nomada exheredans</i>	Leyte												
<i>Nomada lusca</i>	Laguna; Manila; Mountain Province												
<i>Nomada makilingensis</i>	Laguna												
<i>Nomada mindanaonis</i>	Bataan; Panay; Antique; Zamboanga; Palawan												
<i>Nomada palavanica</i>	Palawan												
<i>Nomada pervasor</i>	Mountain Province												
<i>Anthophora luzonica</i>	Laguna												
<i>Anthophora subrossata</i>	Samar												
<i>Anthophora zonata</i>	Nueva Vizcaya												
<i>Amegilla cingulata</i>	Surigao												
<i>Amegilla cingulata</i>	Philippines												
<i>Amegilla walkeri samarensis</i>	Samar												
<i>Amegilla walkeri whiteheadi</i>	Albay; Cagayan												
<i>Amegilla zonata stantoni</i>	Ilocos Norte; Laguna; Manila; Mountain Province; Quezon; Panay; Antique; Samar; Davao; Zamboanga												
<i>Amegilla karotenensis</i>	Laguna; Manila; Mountain Province; Davao; Dapitan; Zamboanga												
<i>Amegilla zonata zonata</i>	Cagayan; Manila												
<i>Thyreus insolitus</i>	Luzon												
<i>Thyreus janasivia</i>	Samar												
<i>Thyreus luzonensis</i>	Mountain Province; Nueva Vizcaya; Leyte; Negros Oriental												
<i>Thyreus nitidulus caelestinus</i>	Laguna; Negros Oriental; Cotabato; Lanao												
<i>Thyreus nitidulus nitidulus</i>	Cape Engaño												
<i>Thyreus nitidulus pulchellus</i>	Luzon												
<i>Thyreus novachollandiac irisanus</i>	Albay; Bataan; Batangas; Isabela; Laguna; Manila; Mountain Province												
<i>Thyreus wallacei</i>	Batanes; Daat; Bataan; Batangas; Cagayan; Cavite; Ilocos Norte; Laguna; Manila; Pangasinan; Quezon; Batbatan; Leyte; Negros; Panay; Antique; Romblon; Samar; Bukidnon; Cotabato; Davao; Lanao; Surigao; Zamboanga del Norte; Sulu; Jolo; Palawan												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony is warmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Megachile rufofulva</i>												
<i>Megachile structilis</i>												
<i>Megachile subrixator</i>												
<i>Megachile tarsatula</i>												
<i>Megachile tuberculata</i>												
<i>Megachile valdezi</i>												
<i>Megachile subrixator</i>												
<i>Coelioxys bakeri</i>												
<i>Coelioxys bakeri</i>												
<i>Coelioxys cothura</i>												
<i>Coelioxys dapitanensis</i>												
<i>Coelioxys ducalis</i>												
<i>Coelioxys genalis</i>												
<i>Coelioxys luzonicus</i>												
<i>Coelioxys luzonicus</i>												
<i>Coelioxys manilae</i>												
<i>Coelioxys philippinensis</i>												
<i>Nomada attrita</i>												
<i>Nomada bakeri</i>												
<i>Nomada banahaonis</i>												
<i>Nomada concessa</i>												
<i>Nomada disessa</i>												
<i>Nomada exheredans</i>												
<i>Nomada lusca</i>												
<i>Nomada makilingensis</i>												
<i>Nomada mindanaonis</i>												
<i>Nomada palavanica</i>												
<i>Nomada pervasor</i>												
<i>Anthophora luzonica</i>												
<i>Anthophora subrossata</i>												
<i>Anthophora zonata</i>												
<i>Amegilla cingulata</i>												
<i>Amegilla cingulata</i>												
<i>Amegilla walkeri samarensis</i>												
<i>Amegilla walkeri whiteheadi</i>												
<i>Amegilla zonata stantoni</i>												
<i>Amegilla korotenensis</i>												
<i>Amegilla zonata zonata</i>												
<i>Thyreus insolitus</i>												
<i>Thyreus janasivia</i>												
<i>Thyreus luzonensis</i>												
<i>Thyreus nitidulus caelestinus</i>												
<i>Thyreus nitidulus nitidulus</i>												
<i>Thyreus nitidulus pulchellus</i>												
<i>Thyreus novachollandiac irisanus</i>												
<i>Thyreus wallacei</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Megachile rufifulva</i>									
<i>Megachile structilis</i>									
<i>Megachile subrixator</i>									
<i>Megachile tarsatula</i>									
<i>Megachile tuberculata</i>									
<i>Megachile valdezi</i>									
<i>Megachile subrixator</i>									
<i>Coelioxys bakeri</i>									
<i>Coelioxys bakeri</i>									
<i>Coelioxys cothura</i>									
<i>Coelioxys dapitanensis</i>									
<i>Coelioxys ducalis</i>									
<i>Coelioxys genalis</i>									
<i>Coelioxys luzonicus</i>									
<i>Coelioxys luzonicus</i>									
<i>Coelioxys manilae</i>									
<i>Coelioxys philippinensis</i>									
<i>Nomada attrita</i>									
<i>Nomada bakeri</i>									
<i>Nomada banahaonis</i>									
<i>Nomada concessa</i>									
<i>Nomada dissessa</i>									
<i>Nomada exheredans</i>									
<i>Nomada lusca</i>									
<i>Nomada makilingensis</i>									
<i>Nomada mindanaonis</i>									
<i>Nomada palavanica</i>									
<i>Nomada pervasor</i>									
<i>Anthophora luzonica</i>									
<i>Anthophora subrussata</i>									
<i>Anthophora zonata</i>									
<i>Amegilla cingulata</i>									
<i>Amegilla cingulata</i>									
<i>Amegilla walkeri samarensis</i>									
<i>Amegilla walkeri whiteheadi</i>									
<i>Amegilla zonata stantoni</i>									
<i>Amegilla korotenensis</i>									
<i>Amegilla zonata zonata</i>									
<i>Thyreus insolitus</i>									
<i>Thyreus janasivia</i>									
<i>Thyreus luzanensis</i>									
<i>Thyreus nitidulus caelestinus</i>									
<i>Thyreus nitidulus nitidulus</i>									
<i>Thyreus nitidulus pulchellus</i>									
<i>Thyreus novachollandiac irisanus</i>									
<i>Thyreus wallacei</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Megachile rufofulva</i>														
<i>Megachile structilis</i>														
<i>Megachile subrixator</i>														
<i>Megachile tarsatula</i>														
<i>Megachile tuberculata</i>														
<i>Megachile valdezi</i>														
<i>Megachile subrixator</i>														
<i>Coelioxys bakeri</i>														
<i>Coelioxys bakeri</i>														
<i>Coelioxys cothura</i>														
<i>Coelioxys dapitanensis</i>														
<i>Coelioxys ducalis</i>														
<i>Coelioxys genalis</i>														
<i>Coelioxys luzonicus</i>														
<i>Coelioxys luzonicus</i>														
<i>Coelioxys manilae</i>														
<i>Coelioxys philippinensis</i>														
<i>Nomada attrita</i>														
<i>Nomada bakeri</i>														
<i>Nomada banahaonis</i>														
<i>Nomada concessa</i>														
<i>Nomada disessa</i>														
<i>Nomada exheredans</i>														
<i>Nomada lusca</i>														
<i>Nomada makilingensis</i>														
<i>Nomada mindanaonis</i>														
<i>Nomada palavanica</i>														
<i>Nomada pervasor</i>														
<i>Anthophora luzonica</i>														
<i>Anthophora subrussata</i>														
<i>Anthophora zonata</i>														
<i>Amegilla cingulata</i>														
<i>Amegilla cingulata</i>														
<i>Amegilla walkeri samarensis</i>														
<i>Amegilla walkeri whiteheadi</i>														
<i>Amegilla zonata stantoni</i>														
<i>Amegilla korotenensis</i>														
<i>Amegilla zonata zonata</i>														
<i>Thyreus insolitus</i>														
<i>Thyreus janasivia</i>														
<i>Thyreus luzonensis</i>														
<i>Thyreus nitidulus caelestinus</i>														
<i>Thyreus nitidulus nitidulus</i>														
<i>Thyreus nitidulus pulchellus</i>														
<i>Thyreus novahollandiac irisanus</i>														
<i>Thyreus wallacei</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Megachile rufajulva</i>								Baltazar 1966
<i>Megachile structilis</i>								Baltazar 1966
<i>Megachile subrixator</i>								Baltazar 1966
<i>Megachile tarsatula</i>								Baltazar 1966
<i>Megachile tuberculata</i>								Baltazar 1966
<i>Megachile valdezi</i>								Baltazar 1966
<i>Megachile subrixator</i>								Baltazar 1966
<i>Coelioxys bakeri</i>								Baltazar 1966
<i>Coelioxys bakeri</i>								Baltazar 1966
<i>Coelioxys cothura</i>								Baltazar 1966
<i>Coelioxys dapitanensis</i>								Baltazar 1966
<i>Coelioxys ducalis</i>								Baltazar 1966
<i>Coelioxys genalis</i>								Baltazar 1966
<i>Coelioxys luzonicus</i>								Baltazar 1966
<i>Coelioxys luzonicus</i>								Baltazar 1966
<i>Coelioxys manilae</i>								Baltazar 1966
<i>Coelioxys philippinensis</i>								Baltazar 1966
<i>Nomada attrita</i>								Baltazar 1966
<i>Nomada bakeri</i>								Baltazar 1966
<i>Nomada banahaonis</i>								Baltazar 1966
<i>Nomada concessa</i>								Baltazar 1966
<i>Nomada dissesa</i>								Baltazar 1966
<i>Nomada exheredans</i>								Baltazar 1966
<i>Nomada lusca</i>								Baltazar 1966
<i>Nomada makilingensis</i>								Baltazar 1966
<i>Nomada mindanaonis</i>								Baltazar 1966
<i>Nomada palavanica</i>								Baltazar 1966
<i>Nomada pervasor</i>								Baltazar 1966
<i>Anthophora luzonica</i>								Baltazar 1966
<i>Anthophora subrussata</i>								Baltazar 1966
<i>Anthophora zonata</i>								Baltazar 1966
<i>Amegilla cingulata</i>								Baltazar 1966
<i>Amegilla cingulata</i>								Baltazar 1966
<i>Amegilla walkeri samarensis</i>								Baltazar 1966
<i>Amegilla walkeri whiteheadi</i>								Baltazar 1966
<i>Amegilla zonata stantoni</i>								Baltazar 1966
<i>Amegilla korotenensis</i>								Baltazar 1966
<i>Amegilla zonata zonata</i>								Baltazar 1966
<i>Thyreus insolitus</i>								Baltazar 1966
<i>Thyreus janasivia</i>								Baltazar 1966
<i>Thyreus luzanensis</i>								Baltazar 1966
<i>Thyreus nitidulus caelestinus</i>								Baltazar 1966
<i>Thyreus nitidulus nitidulus</i>								Baltazar 1966
<i>Thyreus nitidulus pulchellus</i>								Baltazar 1966
<i>Thyreus novachollandiac irisanus</i>								Baltazar 1966
<i>Thyreus wallacei</i>								Baltazar 1966

Species	Sub-species	Most common name	Language	Native /Exotic /Endemic/Introduced Species ?	Solitary /Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Ceratina smaragdula</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina dentipes</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina propinqua</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina benguetensis</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina oyanura</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina flavolateralis</i>	<i>C. f. flavolateralis</i>	Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina flavolateralis</i>	<i>C. f. mindanaonis</i>	Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina cladura</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina fuliginosa</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina humilior</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina bicuneta</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina compacta</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina hieroglyphica</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina nigrolateralis</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Ceratina tropica</i>		Small carpenter bee	English	Native	Solitary							X						
<i>Hylaeus benguetensis</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus contradictus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus ceneiferus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus imuganicus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus luzonicus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus mindanensis</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus momunganicus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus nesoprosopoides</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus opacissimus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus palavanicus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus quadricornis</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus taclobanus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus tagalus</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus williamsi</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Hylaeus worcesteri</i>		Yellow-faced bee	English	Native	Solitary							X						
<i>Halictus adonidae</i>		Sweat bee	English	Native	Solitary							X						

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Ceratina smaragdula</i>	Manila; Negros; Panay; Antique												
<i>Ceratina dentipes</i>	Laguna; Manila; Rizal; Siargao; Misamis Oriental; Davao; Zamboanga												
<i>Ceratina propinqua</i>	Bukidnon												
<i>Ceratina benguetensis</i>	Mountain Province												
<i>Ceratina oyanura</i>	Nueva Vizcaya												
<i>Ceratina flavolateralis flavolateralis</i>	Laguna; Negros Oriental; Samar; Sibuyan; Davao												
<i>Ceratina flavolateralis mindanaonis</i>	Agusan; Davao; Lanao; Surigao; Zamboanga; Basilan												
<i>Ceratina cladura</i>	Basilan												
<i>Ceratina fuliginosa</i>	Palawan												
<i>Ceratina humilior</i>	Palawan												
<i>Ceratina bicuneta</i>	Mountain Province												
<i>Ceratina compacta</i>	Bataan; Ilocos Norte; Laguna; Manila; Mountain Province; Quezon; Pinal; Batbatan; Camiguin; Masbate; Mindoro; Negros Oriental; Panay; Antique; Samar; Sibuyan; Agusan; Bukidnon; Davao; Lanao; Misamis Oriental; Surigao; Zamboanga; Basilan; Palawan												
<i>Ceratina hieroglyphica</i>	Philippines												
<i>Ceratina nigrolateralis</i>	Palawan												
<i>Ceratina tropica</i>	Ilocos Norte; Laguna; Manila; Mindoro; Negros Oriental; Panay; Antique; Samar; Bukidnon; Davao; Lanao; Surigao; Zamboanga												
<i>Hylaeus benguetensis</i>	Mountain Province												
<i>Hylaeus contradictus</i>	Negros Oriental												
<i>Hylaeus ceneiferus</i>	Laguna												
<i>Hylaeus imuganicus</i>	Neuva Vizcaya												
<i>Hylaeus luzonicus</i>	Laguna												
<i>Hylaeus mindanensis</i>	Zamboanga												
<i>Hylaeus momunganicus</i>	Lanao												
<i>Hylaeus nesoprosopoides</i>	Laguna												
<i>Hylaeus opacissimus</i>	Laguna; Negros Oriental; Davao; Lanao												
<i>Hylaeus palavanicus</i>	Palawan												
<i>Hylaeus quadricornis</i>	Bataan												
<i>Hylaeus taclobanus</i>	Leyte												
<i>Hylaeus tagalus</i>	Manila												
<i>Hylaeus williamsi</i>	Laguna												
<i>Hylaeus worcesteri</i>	Laguna												
<i>Halictus adonidae</i>	Manila; Sibuyan												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Ceratina smaragdula</i>												
<i>Ceratina dentipes</i>												
<i>Ceratina propinqua</i>												
<i>Ceratina benguensis</i>												
<i>Ceratina oyanura</i>												
<i>Ceratina flavolateralis flavolateralis</i>												
<i>Ceratina flavolateralis mindanaonis</i>												
<i>Ceratina cladura</i>												
<i>Ceratina fuliginosa</i>												
<i>Ceratina humilior</i>												
<i>Ceratina bicuneta</i>												
<i>Ceratina compacta</i>												
<i>Ceratina hieroglyphica</i>												
<i>Ceratina nigrolateralis</i>												
<i>Ceratina tropica</i>												
<i>Hylaeus benguensis</i>												
<i>Hylaeus contradictus</i>												
<i>Hylaeus ceneiferus</i>												
<i>Hylaeus imuganicus</i>												
<i>Hylaeus luzanicus</i>												
<i>Hylaeus mindanensis</i>												
<i>Hylaeus momunganicus</i>												
<i>Hylaeus nesoprosopoides</i>												
<i>Hylaeus opacissimus</i>												
<i>Hylaeus palavanicus</i>												
<i>Hylaeus quadricornis</i>												
<i>Hylaeus taclobanus</i>												
<i>Hylaeus tagalus</i>												
<i>Hylaeus williamsi</i>												
<i>Hylaeus worcesteri</i>												
<i>Halictus adonidae</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Ceratina smaragdula</i>									
<i>Ceratina dentipes</i>									
<i>Ceratina propinqua</i>									
<i>Ceratina benguetensis</i>									
<i>Ceratina oyanura</i>									
<i>Ceratina flavolateralis flavolateralis</i>									
<i>Ceratina flavolateralis mindanaonis</i>									
<i>Ceratina cladura</i>									
<i>Ceratina fuliginosa</i>									
<i>Ceratina humilior</i>									
<i>Ceratina bicuneta</i>									
<i>Ceratina compacta</i>									
<i>Ceratina hieroglyphica</i>									
<i>Ceratina nigrolateralis</i>									
<i>Ceratina tropica</i>									
<i>Hylaeus benguetensis</i>									
<i>Hylaeus contradictus</i>									
<i>Hylaeus ceneiferus</i>									
<i>Hylaeus imuganicus</i>									
<i>Hylaeus luzonicus</i>									
<i>Hylaeus mindanensis</i>									
<i>Hylaeus momunganicus</i>									
<i>Hylaeus nesoprosopoides</i>									
<i>Hylaeus opacissimus</i>									
<i>Hylaeus palavanicus</i>									
<i>Hylaeus quadricornis</i>									
<i>Hylaeus taclobanus</i>									
<i>Hylaeus tagalus</i>									
<i>Hylaeus williamsi</i>									
<i>Hylaeus worcesteri</i>									
<i>Halictus adonidia</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Ceratina smaragdula</i>														
<i>Ceratina dentipes</i>														
<i>Ceratina propinqua</i>														
<i>Ceratina benguuetensis</i>														
<i>Ceratina oyanura</i>														
<i>Ceratina flavolateralis flavolateralis</i>														
<i>Ceratina flavolateralis mindanaonis</i>														
<i>Ceratina cladura</i>														
<i>Ceratina fuliginosa</i>														
<i>Ceratina humilior</i>														
<i>Ceratina bicuneta</i>														
<i>Ceratina compacta</i>														
<i>Ceratina hieroglyphica</i>														
<i>Ceratina nigrolateralis</i>														
<i>Ceratina tropica</i>														
<i>Hylaeus benguuetensis</i>														
<i>Hylaeus contradictus</i>														
<i>Hylaeus ceneiferus</i>														
<i>Hylaeus imuganicus</i>														
<i>Hylaeus luzonicus</i>														
<i>Hylaeus mindanensis</i>														
<i>Hylaeus momunganicus</i>														
<i>Hylaeus nesoprosopoides</i>														
<i>Hylaeus opacissimus</i>														
<i>Hylaeus palavanicus</i>														
<i>Hylaeus quadricornis</i>														
<i>Hylaeus taclobanus</i>														
<i>Hylaeus tagalus</i>														
<i>Hylaeus williamsi</i>														
<i>Hylaeus worcesteri</i>														
<i>Halictus adonidae</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Ceratina smaragdula</i>								Baltazar 1966
<i>Ceratina dentipes</i>								Baltazar 1966
<i>Ceratina propinqua</i>								Baltazar 1966
<i>Ceratina benguetensis</i>								Baltazar 1966
<i>Ceratina oyanura</i>								Baltazar 1966
<i>Ceratina flavolateralis flavolateralis</i>								Baltazar 1966
<i>Ceratina flavolateralis mindanaonis</i>								Baltazar 1966
<i>Ceratina cladura</i>								Baltazar 1966
<i>Ceratina fuliginosa</i>								Baltazar 1966
<i>Ceratina humilior</i>								Baltazar 1966
<i>Ceratina bicuneta</i>								Baltazar 1966
<i>Ceratina compacta</i>								Baltazar 1966
<i>Ceratina hieroglyphica</i>								Baltazar 1966
<i>Ceratina nigrolateralis</i>								Baltazar 1966
<i>Ceratina tropica</i>								Baltazar 1966
<i>Hylaeus benguetensis</i>								Baltazar 1966
<i>Hylaeus contradictus</i>								Baltazar 1966
<i>Hylaeus ceneiferus</i>								Baltazar 1966
<i>Hylaeus imuganicus</i>								Baltazar 1966
<i>Hylaeus luzonicus</i>								Baltazar 1966
<i>Hylaeus mindanensis</i>								Baltazar 1966
<i>Hylaeus momunganicus</i>								Baltazar 1966
<i>Hylaeus nesoprosopoides</i>								Baltazar 1966
<i>Hylaeus opacissimus</i>								Baltazar 1966
<i>Hylaeus palavanicus</i>								Baltazar 1966
<i>Hylaeus quadricornis</i>								Baltazar 1966
<i>Hylaeus taclobanus</i>								Baltazar 1966
<i>Hylaeus tagalus</i>								Baltazar 1966
<i>Hylaeus williamsi</i>								Baltazar 1966
<i>Hylaeus worcesteri</i>								Baltazar 1966
<i>Halictus adonidiae</i>								Baltazar 1966

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Halictus albescens</i>	<i>H. a. albescens</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus manilae</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus luzonicus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus albescens</i>	<i>H. a. lahorensis</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus postlucens</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus atasus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus baguionellus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus banahaonis</i>	<i>H. b. banahaonis</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus banahaonis</i>	<i>H. b. macerula</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus basilanus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus bengueticus</i>	<i>H. b. bengueticus</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus bengueticus</i>	<i>H. b. rufovariegata</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus caroli</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus cockerellus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus pervarians</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus cockerelli</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus cyanescens</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus dapanensis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus davaonis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus deliensis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus manilae</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus eschscholtzi</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus flavipes</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus fulvovittatus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus guiobus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus halictoides</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus biroi</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus carinatifrons</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus (Nesohalictus) robbi</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus imuganensis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus itaminus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus latitarsis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus megregori</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus lionotulus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus melanuroops</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus merescens</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus mimulus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus muganinus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus negriticus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus nesiotus</i>	<i>H. n. domitus</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus nesiotus</i>	<i>H. n. nesiotus</i>	Sweat bee	English	Native	Solitary							X						
<i>Halictus opisthochlorus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus pervarians</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus samarensis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus scapalis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus scintillans</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus sibuyanensis</i>		Sweat bee	English	Native	Solitary							X						

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Halictus albescens albescens</i>	Laguna; Manila; Mountain Province; Nueva Vizcaya.												
<i>Halictus manilae</i>	Manila												
<i>Halictus luzonicus</i>	Laguna; Mountain Province; Nueva Vizcaya												
<i>Halictus albescens lahorensis</i>	Mountain Province												
<i>Halictus postlucens</i>	Mountain Province												
<i>Halictus atopus</i>	Surigao												
<i>Halictus baguionellus</i>	Mountain Province												
<i>Halictus banahaonis banahaonis</i>	Laguna												
<i>Halictus banahaonis macerula</i>	Laguna; Quezon												
<i>Halictus basilanus</i>	Basilan												
<i>Halictus bengueticus bengueticus</i>	Mountain Province												
<i>Halictus bengueticus rufovariegata</i>	Mountain Province												
<i>Halictus caroli</i>	Palawan												
<i>Halictus cockerellellus</i>	Samar												
<i>Halictus pervarians</i>	Laguna												
<i>Halictus cockerelli</i>	Laguna												
<i>Halictus cyanescens</i>	Laguna												
<i>Halictus dapanensis</i>	Siargao												
<i>Halictus davaonis</i>	Davao												
<i>Halictus deliensis</i>	Laguna; Manila; Misamis Oriental, Zambonga.												
<i>Halictus manilae</i>	Manila												
<i>Halictus eschscholtzi</i>	Laguna; Manila; Cagayan de Oro, Misamis Oriental; Zambonga												
<i>Halictus flavipes</i>													
<i>Halictus fulvovittatus</i>	Laguna												
<i>Halictus guibus</i>	Mountain Province												
<i>Halictus halictoides</i>	Bataan; Ilocos Norte; Laguna; Manila; Mindoro; Antique; Davao; Misamis Oriental; Zamboanga												
<i>Halictus biroi</i>	Philippines												
<i>Halictus carinatifrons</i>	Manila; Lanao; Bataan.												
<i>Halictus (Nesohalictus) robbi</i>	Manila; Laguna; Cagayan de Oro; Misamis Oriental; Antique; Panay; Davao; Dapitan; Zamboanga												
<i>Halictus imuganensis</i>	Laguna; Mountain Province; Nueva Vizcaya												
<i>Halictus itaminus</i>	Laguna												
<i>Halictus latitarsis</i>	Laguna; Panay; Antique; Lanao												
<i>Halictus megregori</i>	Laguna; Antique.												
<i>Halictus lionotulus</i>	Laguna; Surigao												
<i>Halictus melanurops</i>	Laguna; Manila; Mountain Province; Nueva Vizcaya.												
<i>Halictus merescens</i>	Ilocos Norte; Laguna; Leyte, Panay; Antique; Davao												
<i>Halictus mimulus</i>	Mindoro												
<i>Halictus muganinus</i>	Nueva Vizcaya												
<i>Halictus negriticus</i>	Negros Oriental												
<i>Halictus nesiotus domitus</i>	Laguna												
<i>Halictus nesiotus nesiotus</i>	Laguna; Mountain Province;												
<i>Halictus opisthochlorus</i>	Mountain Province												
<i>Halictus pervarians</i>	Laguna; Nueva Vizcaya												
<i>Halictus samarensis</i>	Mindanao; Zamboanga												
<i>Halictus scapalis</i>	Laguna												
<i>Halictus scintillans</i>	Laguna												
<i>Halictus sibuyanensis</i>	Sibuyan												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Halictus albescens albescens</i>												
<i>Halictus manilae</i>												
<i>Halictus luzonicus</i>												
<i>Halictus albescens lahorensis</i>												
<i>Halictus postlucens</i>												
<i>Halictus atatus</i>												
<i>Halictus baguionellus</i>												
<i>Halictus banahaonis banahaonis</i>												
<i>Halictus banahaonis macerula</i>												
<i>Halictus basilanus</i>												
<i>Halictus bengueticus bengueticus</i>												
<i>Halictus bengueticus rufovariegata</i>												
<i>Halictus caroli</i>												
<i>Halictus cockerellellus</i>												
<i>Halictus pervarians</i>												
<i>Halictus cockerelli</i>												
<i>Halictus cyanescens</i>												
<i>Halictus dapanensis</i>												
<i>Halictus davaonis</i>												
<i>Halictus deliensis</i>												
<i>Halictus manilae</i>												
<i>Halictus eschscholtzi</i>												
<i>Halictus flavipes</i>												
<i>Halictus fulvovittatus</i>												
<i>Halictus guibus</i>												
<i>Halictus halictoides</i>												
<i>Halictus biroi</i>												
<i>Halictus carinatifrons</i>												
<i>Halictus (Nesohalictus) robbi</i>												
<i>Halictus imuganensis</i>												
<i>Halictus itaminus</i>												
<i>Halictus latitarsis</i>												
<i>Halictus megregori</i>												
<i>Halictus lionotulus</i>												
<i>Halictus melanuroops</i>												
<i>Halictus merescens</i>												
<i>Halictus mimulus</i>												
<i>Halictus muganinus</i>												
<i>Halictus negriticus</i>												
<i>Halictus nesiotus domitus</i>												
<i>Halictus nesiotus nesiotus</i>												
<i>Halictus opisthochlorus</i>												
<i>Halictus pervarians</i>												
<i>Halictus samarensis</i>												
<i>Halictus scapalis</i>												
<i>Halictus scintillans</i>												
<i>Halictus sibuyanensis</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Halictus albescens albescens</i>									
<i>Halictus manilae</i>									
<i>Halictus luzonicus</i>									
<i>Halictus albescens lahorensis</i>									
<i>Halictus postlucens</i>									
<i>Halictus atatus</i>									
<i>Halictus baguionellus</i>									
<i>Halictus banahaonis banahaonis</i>									
<i>Halictus banahaonis macerula</i>									
<i>Halictus basilaris</i>									
<i>Halictus bengueticus bengueticus</i>									
<i>Halictus bengueticus rufovariegata</i>									
<i>Halictus caroli</i>									
<i>Halictus cockerellellus</i>									
<i>Halictus pervarians</i>									
<i>Halictus cockerelli</i>									
<i>Halictus cyanescens</i>									
<i>Halictus dapanensis</i>									
<i>Halictus davaonis</i>									
<i>Halictus deliensis</i>									
<i>Halictus manilae</i>									
<i>Halictus eschscholtzi</i>									
<i>Halictus flavipes</i>									
<i>Halictus fulvovittatus</i>									
<i>Halictus guibus</i>									
<i>Halictus halictoides</i>									
<i>Halictus biroi</i>									
<i>Halictus carinatifrons</i>									
<i>Halictus (Nesohalictus) robbi</i>									
<i>Halictus imuganensis</i>									
<i>Halictus itaminus</i>									
<i>Halictus latitarsis</i>									
<i>Halictus megregori</i>									
<i>Halictus lionotulus</i>									
<i>Halictus melanurops</i>									
<i>Halictus merescens</i>									
<i>Halictus mimulus</i>									
<i>Halictus muganinus</i>									
<i>Halictus negriticus</i>									
<i>Halictus nesiotus damitus</i>									
<i>Halictus nesiotus nesiotus</i>									
<i>Halictus opisthochlorus</i>									
<i>Halictus pervarians</i>									
<i>Halictus samarensis</i>									
<i>Halictus scapalis</i>									
<i>Halictus scintillans</i>									
<i>Halictus sibuyanensis</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Halictus albescens albescens</i>														
<i>Halictus manilae</i>														
<i>Halictus luzonicus</i>														
<i>Halictus albescens lahorensis</i>														
<i>Halictus postlucens</i>														
<i>Halictus atatus</i>														
<i>Halictus baguionellus</i>														
<i>Halictus banahaonis banahaonis</i>														
<i>Halictus banahaonis macerula</i>														
<i>Halictus basilanus</i>														
<i>Halictus bengueticus bengueticus</i>														
<i>Halictus bengueticus rufovariegata</i>														
<i>Halictus caroli</i>														
<i>Halictus cockerellellus</i>														
<i>Halictus pervarians</i>														
<i>Halictus cockerelli</i>														
<i>Halictus cyanescens</i>														
<i>Halictus dapanensis</i>														
<i>Halictus davaonis</i>														
<i>Halictus deliensis</i>														
<i>Halictus manilae</i>														
<i>Halictus eschscholtzi</i>														
<i>Halictus flavipes</i>														
<i>Halictus fulvovittatus</i>														
<i>Halictus guiobus</i>														
<i>Halictus halictoides</i>														
<i>Halictus biroi</i>														
<i>Halictus carinatifrons</i>														
<i>Halictus (Nesohalictus) robbi</i>														
<i>Halictus imuganensis</i>														
<i>Halictus itaminus</i>														
<i>Halictus latitarsis</i>														
<i>Halictus megregori</i>														
<i>Halictus lionotulus</i>														
<i>Halictus melanuroops</i>														
<i>Halictus merescens</i>														
<i>Halictus mimulus</i>														
<i>Halictus muganinus</i>														
<i>Halictus negriticus</i>														
<i>Halictus nesiotus domitus</i>														
<i>Halictus nesiotus nesiotus</i>														
<i>Halictus opisthochlorus</i>														
<i>Halictus pervarians</i>														
<i>Halictus samarensis</i>														
<i>Halictus scapalis</i>														
<i>Halictus scintillans</i>														
<i>Halictus sibuyanensis</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Halictus albescens albescens</i>								Baltazar 1966
<i>Halictus manilae</i>								Baltazar 1966
<i>Halictus luzonicus</i>								Baltazar 1966
<i>Halictus albescens lahorensis</i>								Baltazar 1966
<i>Halictus postlucens</i>								Baltazar 1966
<i>Halictus atusus</i>								Baltazar 1966
<i>Halictus baguionellus</i>								Baltazar 1966
<i>Halictus banahaonis banahaonis</i>								Baltazar 1966
<i>Halictus banahaonis macerula</i>								Baltazar 1966
<i>Halictus basilanus</i>								Baltazar 1966
<i>Halictus bengueticus bengueticus</i>								Baltazar 1966
<i>Halictus bengueticus rufovariegata</i>								Baltazar 1966
<i>Halictus caroli</i>								Baltazar 1966
<i>Halictus cockerellellus</i>								Baltazar 1966
<i>Halictus pervarians</i>								Baltazar 1966
<i>Halictus cockerelli</i>								Baltazar 1966
<i>Halictus cyanescens</i>								Baltazar 1966
<i>Halictus dapanensis</i>								Baltazar 1966
<i>Halictus davaonis</i>								Baltazar 1966
<i>Halictus deliensis</i>								Baltazar 1966
<i>Halictus manilae</i>								Baltazar 1966
<i>Halictus eschscholtzi</i>								Baltazar 1966
<i>Halictus flavipes</i>								Baltazar 1966
<i>Halictus fulvovittatus</i>								Baltazar 1966
<i>Halictus guiobus</i>								Baltazar 1966
<i>Halictus halictoides</i>								Baltazar 1966
<i>Halictus birói</i>								Baltazar 1966
<i>Halictus carinatifrons</i>								Baltazar 1966
<i>Halictus (Nesohalictus) robbi</i>								Baltazar 1966
<i>Halictus imuganensis</i>								Baltazar 1966
<i>Halictus itaminus</i>								Baltazar 1966
<i>Halictus latitarsis</i>								Baltazar 1966
<i>Halictus megregori</i>								Baltazar 1966
<i>Halictus lionotulus</i>								Baltazar 1966
<i>Halictus melanuroops</i>								Baltazar 1966
<i>Halictus merescens</i>								Baltazar 1966
<i>Halictus mimulus</i>								Baltazar 1966
<i>Halictus muganinus</i>								Baltazar 1966
<i>Halictus negriticus</i>								Baltazar 1966
<i>Halictus nesiotus domitus</i>								Baltazar 1966
<i>Halictus nesiotus nesiotus</i>								Baltazar 1966
<i>Halictus opisthochlorus</i>								Baltazar 1966
<i>Halictus pervarians</i>								Baltazar 1966
<i>Halictus samarensis</i>								Baltazar 1966
<i>Halictus scapalis</i>								Baltazar 1966
<i>Halictus scintillans</i>								Baltazar 1966
<i>Halictus sibuyanensis</i>								Baltazar 1966

Species	Sub-species	Most common name	Language	Native/Exotic/Introduced/Endemic/Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Halictus sublustrans</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus subopacus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus baguionis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus subpurpureus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus subuaganensis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus taclobanensis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus tagalicus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus vagans</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus cattulus</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus philippinensis</i>		Sweat bee	English	Native	Solitary							X						
<i>Halictus xystonotus</i>	<i>H. x. oligostictus</i>	Sweat bee	English	Native	Solitary							X						
<i>Sphecodes bakeri</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes biroi</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes latifrons</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes transversus</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes insularis</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes luzonicus</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes rotundiceps</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes samarensis</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes sibuyanensis</i>		Blood bee	English	Native	Solitary							X						
<i>Sphecodes tristellus</i>		Blood bee	English	Native	Solitary							X						
<i>Nomioides dapitanella</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomioides melanogaster</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomioides hedickei</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomioides valdezi</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomioides valdezi</i>	<i>N. v. immaculata</i>	Sweat bee	English	Native	Solitary							X						
<i>Nomioides valdezi</i>	<i>N. v. obsoleta</i>	Sweat bee	English	Native	Solitary							X						
<i>Nomioides valdezi</i>	<i>N. v. samarensis</i>	Sweat bee	English	Native	Solitary							X						
<i>Nomioides valdezi</i>	<i>N. v. valsezi</i>	Sweat bee	English	Native	Solitary							X						
<i>Nomia dimidiata</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomia elongatula</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomia goniognatha</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomia incensa</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomia iridescens</i>	<i>N. i. iridescens</i>	Sweat bee	English	Native	Solitary							X						
<i>Nomia iridescens</i>	<i>N. i. rhodochlora</i>	Sweat bee	English	Native	Solitary							X						
<i>Nomia lautula</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomia levicauda</i>		Sweat bee	English	Native	Solitary							X						
<i>Nomia longitarsis</i>		Sweat bee	English	Native	Solitary							X						

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Halictus sublustrans</i>	Laguna; Nueva Vizcaya; Panay; Antique												
<i>Halictus subopacus</i>	Laguna; Manila; Mountain Province; Nueva Vizcaya; Quezon												
<i>Halictus baguionis</i>	Mountain Province												
<i>Halictus subpurpureus</i>	Mountain Province												
<i>Halictus subuaganensis</i>	Laguna; Nueva Vizcaya; Subuagan												
<i>Halictus taclobanensis</i>	Bataan; Laguna; Leyte; Davao; Misamis Oriental												
<i>Halictus tagalicus</i>	Mountain Province												
<i>Halictus vagans</i>	Bataan; Laguna; Manila; Mountain Province; Mindoro; Negros Oriental; Panay; Antique; Siargao; Davao; Surigao; Zamboanga; Basilan; Palawan												
<i>Halictus cattulus</i>	Lanao; Bataan; Mindoro; Siargao; Basilan												
<i>Halictus philippinensis</i>	Mountain Province; Laguna; Manila; Tacloban; Leyte; Negros Oriental; Panay; Cagayan; Davao; Basilan; Palawan												
<i>Halictus xystonotus oligostictus</i>	Laguna; Ilocos Norte												
<i>Sphecodes bakeri</i>	Negros Oriental; Samar; Davao; Lanao; Surigao; Zamboanga												
<i>Sphecodes birai</i>	Laguna; Mountain Province; Negros Oriental; Samar; Lanao; Zamboanga												
<i>Sphecodes latifrons</i>	Mountain Province												
<i>Sphecodes transversus</i>	Laguna												
<i>Sphecodes insularis</i>	Laguna												
<i>Sphecodes luzonicus</i>	Nueva Vizcaya												
<i>Sphecodes rotundiceps</i>	Laguna; Zamboanga												
<i>Sphecodes samarensis</i>	Laguna; Negros Oriental; Samar; Surigao												
<i>Sphecodes sibuyanensis</i>	Sibuyan												
<i>Sphecodes tristellus</i>	Leyte												
<i>Nomioides dapitanella</i>	Zamboanga												
<i>Nomioides melanogaster</i>	Zamboanga												
<i>Nomioides hedicki</i>	Laguna; Surigao												
<i>Nomioides valdezi</i>	Negros Oriental												
<i>Nomioides valdezi immaculata</i>	Bataan												
<i>Nomioides valdezi obsoleta</i>	Palawan												
<i>Nomioides valdezi samarensis</i>	Samar												
<i>Nomioides valdezi valsezi</i>	Cagayan; Surigao; Zamboanga; Palawan												
<i>Nomia dimidiata</i>	Sulu												
<i>Nomia elongatula</i>	Laguna; Mountain Province; Leyte; Surigao; Lanao; Palawan												
<i>Nomia goniognatha</i>	Davao												
<i>Nomia incensa</i>	Rizal												
<i>Nomia iridescens iridescens</i>	Laguna; Panay; Samar; Davao												
<i>Nomia iridescens rhadochlora</i>	Negros Oriental; Zamboanga												
<i>Nomia lautula</i>	Davao												
<i>Nomia levicauda</i>	Laguna; Mountain Province; Panay; Samar; Davao; Lanao; Zamboanga												
<i>Nomia longitarsis</i>	Mountain Province; Nueva Vizcaya												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Halictus subulstrans</i>												
<i>Halictus subopacus</i>												
<i>Halictus baguionis</i>												
<i>Halictus subpurpureus</i>												
<i>Halictus subuaganensis</i>												
<i>Halictus taclobanensis</i>												
<i>Halictus tagalicus</i>												
<i>Halictus vagans</i>												
<i>Halictus cattulus</i>												
<i>Halictus philippinensis</i>												
<i>Halictus xystonotus oligostictus</i>												
<i>Sphecodes bakeri</i>												
<i>Sphecodes birai</i>												
<i>Sphecodes latifrons</i>												
<i>Sphecodes transversus</i>												
<i>Sphecodes insularis</i>												
<i>Sphecodes luzonicus</i>												
<i>Sphecodes rotundiceps</i>												
<i>Sphecodes samarensis</i>												
<i>Sphecodes sibuyanensis</i>												
<i>Sphecodes tristellus</i>												
<i>Nomioides dapitanella</i>												
<i>Nomioides melanogaster</i>												
<i>Nomioides hedicki</i>												
<i>Nomioides valdezi</i>												
<i>Nomioides valdezi immaculata</i>												
<i>Nomioides valdezi obsoleta</i>												
<i>Nomioides valdezi samarensis</i>												
<i>Nomioides valdezi valsezi</i>												
<i>Nomia dimidiata</i>												
<i>Nomia elongatula</i>												
<i>Nomia goniognatha</i>												
<i>Nomia incensa</i>												
<i>Nomia iridescens iridescens</i>												
<i>Nomia iridescens rhadochlora</i>												
<i>Nomia lautula</i>												
<i>Nomia levicauda</i>												
<i>Nomia longitarsis</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Halictus sublustrans</i>									
<i>Halictus subopacus</i>									
<i>Halictus baguionis</i>									
<i>Halictus subpurpureus</i>									
<i>Halictus subuaganensis</i>									
<i>Halictus taclobanensis</i>									
<i>Halictus tagalicus</i>									
<i>Halictus vagans</i>									
<i>Halictus cattulus</i>									
<i>Halictus philippinensis</i>									
<i>Halictus xystonotus oligostictus</i>									
<i>Sphecodes bakeri</i>									
<i>Sphecodes birai</i>									
<i>Sphecodes latifrons</i>									
<i>Sphecodes transversus</i>									
<i>Sphecodes insularis</i>									
<i>Sphecodes luzonicus</i>									
<i>Sphecodes rotundiceps</i>									
<i>Sphecodes samarensis</i>									
<i>Sphecodes sibuyanensis</i>									
<i>Sphecodes tristellus</i>									
<i>Nomioides dapitanella</i>									
<i>Nomioides melanogaster</i>									
<i>Nomioides hedickei</i>									
<i>Nomioides valdezi</i>									
<i>Nomioides valdezi immaculata</i>									
<i>Nomioides valdezi obsoleta</i>									
<i>Nomioides valdezi samarensis</i>									
<i>Nomioides valdezi valsezi</i>									
<i>Nomia dimidiata</i>									
<i>Nomia elongatula</i>									
<i>Nomia goniognatha</i>									
<i>Nomia incensa</i>									
<i>Nomia iridescens iridescens</i>									
<i>Nomia iridescens rhodochlora</i>									
<i>Nomia lautula</i>									
<i>Nomia levicauda</i>									
<i>Nomia longitarsis</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness /decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition /starvation	Nos em a spp .	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Halictus sublustrans</i>														
<i>Halictus subopacus</i>														
<i>Halictus baguionis</i>														
<i>Halictus subpurpureus</i>														
<i>Halictus subuaganensis</i>														
<i>Halictus taclobanensis</i>														
<i>Halictus tagalicus</i>														
<i>Halictus vagans</i>														
<i>Halictus cattulus</i>														
<i>Halictus philippinensis</i>														
<i>Halictus xytonotus oligostictus</i>														
<i>Sphecodes bakeri</i>														
<i>Sphecodes biroi</i>														
<i>Sphecodes latifrons</i>														
<i>Sphecodes transversus</i>														
<i>Sphecodes insularis</i>														
<i>Sphecodes luzonicus</i>														
<i>Sphecodes rotundiceps</i>														
<i>Sphecodes samarensis</i>														
<i>Sphecodes sibuyanensis</i>														
<i>Sphecodes tristellus</i>														
<i>Nomioides dapitanella</i>														
<i>Nomioides melanogaster</i>														
<i>Nomioides hedickei</i>														
<i>Nomioides valdezi</i>														
<i>Nomioides valdezi immaculata</i>														
<i>Nomioides valdezi obsoleta</i>														
<i>Nomioides valdezi samarensis</i>														
<i>Nomioides valdezi valsezi</i>														
<i>Nomia dimidiata</i>														
<i>Nomia elongatula</i>														
<i>Nomia goniognatha</i>														
<i>Nomia incensa</i>														
<i>Nomia iridescens iridescens</i>														
<i>Nomia iridescens rhodochlora</i>														
<i>Nomia lautula</i>														
<i>Nomia levicauda</i>														
<i>Nomia longitarsis</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Halictus sublustrans</i>								Baltazar 1966
<i>Halictus subopacus</i>								Baltazar 1966
<i>Halictus baguionis</i>								Baltazar 1966
<i>Halictus subpurpureus</i>								Baltazar 1966
<i>Halictus subuaganensis</i>								Baltazar 1966
<i>Halictus taclobanensis</i>								Baltazar 1966
<i>Halictus tagalicus</i>								Baltazar 1966
<i>Halictus vagans</i>								Baltazar 1966
<i>Halictus cattulus</i>								Baltazar 1966
<i>Halictus philippinensis</i>								Baltazar 1966
<i>Halictus xystonotus oligostictus</i>								Baltazar 1966
<i>Sphecodes bakeri</i>								Baltazar 1966
<i>Sphecodes biroi</i>								Baltazar 1966
<i>Sphecodes latifrons</i>								Baltazar 1966
<i>Sphecodes transversus</i>								Baltazar 1966
<i>Sphecodes insularis</i>								Baltazar 1966
<i>Sphecodes luzonicus</i>								Baltazar 1966
<i>Sphecodes rotundiceps</i>								Baltazar 1966
<i>Sphecodes samarensis</i>								Baltazar 1966
<i>Sphecodes sibuyanensis</i>								Baltazar 1966
<i>Sphecodes tristellus</i>								Baltazar 1966
<i>Nomioides dapitanella</i>								Baltazar 1966
<i>Nomioides melanogaster</i>								Baltazar 1966
<i>Nomioides hedickei</i>								Baltazar 1966
<i>Nomioides valdezi</i>								Baltazar 1966
<i>Nomioides valdezi immaculata</i>								Baltazar 1966
<i>Nomioides valdezi obsoleta</i>								Baltazar 1966
<i>Nomioides valdezi samarensis</i>								Baltazar 1966
<i>Nomioides valdezi valsezi</i>								Baltazar 1966
<i>Nomia dimidiata</i>								Baltazar 1966
<i>Nomia elongatula</i>								Baltazar 1966
<i>Nomia goniognatha</i>								Baltazar 1966
<i>Nomia incensa</i>								Baltazar 1966
<i>Nomia iridescens iridescens</i>								Baltazar 1966
<i>Nomia iridescens rhodochlora</i>								Baltazar 1966
<i>Nomia lautula</i>								Baltazar 1966
<i>Nomia levicauda</i>								Baltazar 1966
<i>Nomia longitarsis</i>								Baltazar 1966

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")								Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Bees wax	Bee venom	Pollination	Cultural/Religious Customs			
<i>Nomia longitarsis</i>	<i>N. l. longitarsis</i>	Sweat bee	English	Native	Solitary							X				
<i>Nomia lusoria</i>		Sweat bee	English	Native	Solitary							X				
<i>Nomia mcgregori</i>		Sweat bee	English	Native	Solitary							X				
<i>Nomia mimosae</i>		Sweat bee	English	Native	Solitary							X				
<i>Nomia palavanica</i>		Sweat bee	English	Native	Solitary							X				
<i>Nomia philippina</i>		Sweat bee	English	Native	Solitary							X				
<i>Nomia philippinensis</i>		Sweat bee	English	Native	Solitary							X				
<i>Nomia quadrifasciata</i>	<i>N. q. aurantia</i>	Sweat bee	English	Native	Solitary							X				
<i>Nomia quadrifasciata</i>	<i>N. q. notha</i>	Sweat bee	English	Native	Solitary							X				
<i>Nomia quadrifasciata</i>	<i>N. q. quadrifasciata</i>	Sweat bee	English	Native	Solitary							X				
<i>Nomia quadrifasciata</i>	<i>N. q. viridans</i>	Sweat bee	English	Native	Solitary							X				
<i>Nomia recessa</i>		Sweat bee	English	Native	Solitary							X				
<i>Nomia strigata</i>	<i>N. s. ridleyi</i>	Sweat bee	English	Native	Solitary							X				
<i>Nomia strigata</i>	<i>N. s. strigata</i>	Sweat bee	English	Native	Solitary							X				
<i>Nomia thoracica s</i>	<i>N. t. stantoni</i>	Sweat bee	English	Native	Solitary							X				
<i>Ctenoplectra vagans</i>		Oil bee	English	Native	Solitary							X				
<i>Lithurgus scabrosus</i>		Leafcutter bee	English	Native	Solitary							X				
<i>Dianthidium minutissimum</i>	<i>D. m. minutissimum</i>	Pebble bee	English	Native	Solitary							X				
<i>Heriades mundulus</i>		Large-headed resin bee	English	Native	Solitary							X				
<i>Heriades sauteri</i>	<i>H. s. philippinensis</i>	Large-headed resin bee	English	Native	Solitary							X				

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Nomia longitarsis longitarsis</i>	Laguna; Quezon; Panay;												
<i>Nomia lusoria</i>	Palawan												
<i>Nomia mcgregori</i>	Panay												
<i>Nomia mimosae</i>	Samar												
<i>Nomia palavanica</i>	Palawan												
<i>Nomia philippina</i>	Palawan												
<i>Nomia philippinensis</i>	Bataan; Laguna; Mountain Province; Quezon; Davao												
<i>Nomia quadrifasciata aurantia</i>	Laguna												
<i>Nomia quadrifasciata notha</i>	Ilocos Norte; Laguna; Manila; Leyte; Davao; Zamboanga; Palawan												
<i>Nomia quadrifasciata quadrifasciata</i>	Manila; Camiguin; Panay; Lanao; Zamboanga												
<i>Nomia quadrifasciata viridans</i>	Laguna												
<i>Nomia recessa</i>	Laguna; Nueva Vizcaya; Quezon												
<i>Nomia strigata ridleyi</i>	Panay; Davao;												
<i>Nomia strigata strigata</i>	Bohol; Camiguin; Negros Oriental; Samar; Davao; Palawan												
<i>Nomia thoracica stantoni</i>	Laguna; Manila; Panay												
<i>Ctenoplectra vagans</i>	Laguna												
<i>Lithurgus scabrosus</i>	Samar; Davao; Zamboanga												
<i>Dianthidium minutissimum</i>	Palawan												
<i>Heriades mundulus</i>	Palawan												
<i>Heriades sauteri philippinensis</i>	Laguna												

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure , even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Nomia longitarsis longitarsis</i>												
<i>Nomia lusoria</i>												
<i>Nomia mcgregori</i>												
<i>Nomia mimosae</i>												
<i>Nomia palavanica</i>												
<i>Nomia philippina</i>												
<i>Nomia philippinensis</i>												
<i>Nomia quadrifasciata aurantia</i>												
<i>Nomia quadrifasciata notha</i>												
<i>Nomia quadrifasciata quadrifasciata</i>												
<i>Nomia quadrifasciata viridans</i>												
<i>Nomia recessa</i>												
<i>Nomia strigata ridleyi</i>												
<i>Nomia strigata strigata</i>												
<i>Nomia thoracica stantoni</i>												
<i>Ctenoplectra vagans</i>												
<i>Lithurgus scabrosus</i>												
<i>Dianthidium minutissimum</i>												
<i>Heriades mundulus</i>												
<i>Heriades sauteri philippinensis</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Nomia longitarsis longitarsis</i>									
<i>Nomia lusoria</i>									
<i>Nomia mcgregori</i>									
<i>Nomia mimosae</i>									
<i>Nomia palavanica</i>									
<i>Nomia philippina</i>									
<i>Nomia philippinensis</i>									
<i>Nomia quadrifasciata aurantia</i>									
<i>Nomia quadrifasciata notha</i>									
<i>Nomia quadrifasciata quadrifasciata</i>									
<i>Nomia quadrifasciata viridans</i>									
<i>Nomia recessa</i>									
<i>Nomia strigata ridleyi</i>									
<i>Nomia strigata strigata</i>									
<i>Nomia thoracica stantoni</i>									
<i>Ctenoplectra vagans</i>									
<i>Lithurgus scabrosus</i>									
<i>Dianthidium minutissimum</i>									
<i>Heriades mundulus</i>									
<i>Heriades sauteri philippinensis</i>									

Species	Main threats													
	Bacteria I And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor/jacobsoni	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other subspecies
<i>Nomia longitarsis longitarsis</i>														
<i>Nomia lusoria</i>														
<i>Nomia mcgregori</i>														
<i>Nomia mimosae</i>														
<i>Nomia palavanica</i>														
<i>Nomia philippina</i>														
<i>Nomia philippinensis</i>														
<i>Nomia quadrifasciata aurantia</i>														
<i>Nomia quadrifasciata notha</i>														
<i>Nomia quadrifasciata quadrifasciata</i>														
<i>Nomia quadrifasciata viridans</i>														
<i>Nomia recessa</i>														
<i>Nomia strigata ridleyi</i>														
<i>Nomia strigata strigata</i>														
<i>Nomia thoracica stantoni</i>														
<i>Ctenoplectra vagans</i>														
<i>Lithurgus scabrosus</i>														
<i>Dianthidium minutissimum</i>														
<i>Heriades mundulus</i>														
<i>Heriades sauteri philippinensis</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Nomia longitarsis longitarsis</i>								Baltazar 1966
<i>Nomia lusoria</i>								Baltazar 1966
<i>Nomia mcgregori</i>								Baltazar 1966
<i>Nomia mimosae</i>								Baltazar 1966
<i>Nomia palavanica</i>								Baltazar 1966
<i>Nomia philippina</i>								Baltazar 1966
<i>Nomia philippinensis</i>								Baltazar 1966
<i>Nomia quadrifasciata aurantia</i>								Baltazar 1966
<i>Nomia quadrifasciata notha</i>								Baltazar 1966
<i>Nomia quadrifasciata quadrifasciata</i>								Baltazar 1966
<i>Nomia quadrifasciata viridans</i>								Baltazar 1966
<i>Nomia recessa</i>								Baltazar 1966
<i>Nomia strigata ridleyi</i>								Baltazar 1966
<i>Nomia strigata strigata</i>								Baltazar 1966
<i>Nomia thoracica stantoni</i>								Baltazar 1966
<i>Ctenoplectra vagans</i>								Baltazar 1966
<i>Lithurgus scabrosus</i>								Baltazar 1966
<i>Dianthidium minutissimum</i>								Baltazar 1966
<i>Heriades mundulus</i>								Baltazar 1966
<i>Heriades sauteri philippinensis</i>								Baltazar 1966

Appendix 1b. DAD-IS data from Thailand

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species ?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")									Origin of species (based on available literature)	Year of origin/import since	Import from	
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production				Others (please specify)
<i>Apis andreniformis</i>		Black dwarf honey bee Peung Mim Dam (ผึ้ง มิมดำ)	Thai	Native	Wild	X										southern Asia		
<i>Apis cerana</i>	<i>A. c. indica</i>	Asiatic Honey Bee Peung prong (ผึ้งโพรง)	Thai	Native	Both	X	X	X		X		X					no idea	
<i>Apis dorsata</i>	<i>A. d. frabicius</i>	Giant honey bee Peung Loung (ผึ้งหลวง)	Thai	Native	southern Thailand (Both), Other area (wild)	X				x								
<i>Apis florea</i>		Red dwarf honey bee Peung Mim (ผึ้ง มิม)	Thai	Native	both	X						x				southern Asia		
<i>Apis mellifera</i>		European honey bee Peung Pun (ผึ้ง พันธุ์)	Thai	Introduced	managed	X	X	X	X	X		X		X		Africa or Asia		
<i>Bombus breviceps</i>			Thai	Native	Wild													
<i>Bombus eximius</i>			Thai	Native	Wild													
<i>Bombus haemorrhoidalis</i>			Thai	Native	Wild													
<i>Bombus montivagus</i>			Thai	Native	Wild													

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country ?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Apis andreniformis</i>	Nationwide			0.1 kg	0.35 kg					0.025 kg	0.07		
<i>Apis cerana</i>	nationwide	<i>A. c. indica</i>		8.5 kg	25 kg			0.05kg	0.3 kg	0.07 kg	0.9 kg		
<i>Apis dorsata</i>	Nationwide			5 kg	25kg					0.2kg	0.5kg		
<i>Apis florea</i>	Nationwide			0.3 kg	1.2kg								
<i>Apis mellifera</i>				15 kg	35kg	0.05kg	0.15kg	0.1kg	0.5kg	0.15kg	1.25kg		
<i>Bombus breviceps</i>													
<i>Bombus eximius</i>													
<i>Bombus haemorrhoidalis</i>													
<i>Bombus montivagus</i>													

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensivel	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Apis andreniformis</i>		X				x				X		
<i>Apis cerana</i>	X	X	X		x					X		
<i>Apis dorsata</i>	X	X			x							
<i>Apis florea</i>			x				x			x		
<i>Apis mellifera</i>			X				x					X
<i>Bombus breviceps</i>												
<i>Bombus eximius</i>												
<i>Bombus haemorrhoidalis</i>												
<i>Bombus montivagus</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Apis andreniformis</i>		x							
<i>Apis cerana</i>		X		x					
<i>Apis dorsata</i>		x		x					
<i>Apis florea</i>		x		x					
<i>Apis mellifera</i>	X				x				
<i>Bombus breviceps</i>									
<i>Bombus eximius</i>									
<i>Bombus haemorrhoidalis</i>									
<i>Bombus montivagus</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth) , pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Apis andreniformis</i>				X										
<i>Apis cerana</i>		X		X	X	X (Chaimanee et al 2011)		Wax moth, mites	X				DWV, BQCV,	
<i>Apis dorsata</i>	EFB (Yanez et al 2016)					X (Chaimanee et al 2011)							ABPV, BQCV	
<i>Apis florea</i>	EFB, chalkbrood (Saraithong et al 2014, Yanez et al 2016)			X		X (Chaimanee et al 2011)							DWV	
<i>Apis mellifera</i>	EFB, chalkbrood (Budge et al 2010, Theantana and Chantawanna kul 2008)					X (Chaimanee et al 2011)		Wax moth, mites			Asian hornet (Chantawanna kul et al 2016)	X	DWV,SBV BQCV, KBV,IAPV	
<i>Bombus breviceps</i>				X		X (Sinpoo et al 2019)								
<i>Bombus eximius</i>														
<i>Bombus haemorrhoidalis</i>						X (Sinpoo et al 2019)								
<i>Bombus montivagus</i>						X (Sinpoo et al 2019)								

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Apis andreniformis</i>		No		NO				
<i>Apis cerana</i>		NO		NO		1,248	10	Mookhploy et al 2015
<i>Apis dorsata</i>		No		NO				Mookhploy et al 2015
<i>Apis florea</i>		No		NO				Mookhploy et al 2015
<i>Apis mellifera</i>		Yes		NO		23,922	300	Sanpa and Chantawannakul 2009, Mookhploy et al 2015
<i>Bombus breviceps</i>		No		NO				Sinpoo et al 2019
<i>Bombus eximius</i>		No		NO				Sinpoo et al 2019
<i>Bombus haemorrhoidalis</i>		No		NO				Sinpoo et al 2019
<i>Bombus montivagus</i>		No		NO				Sinpoo et al 2019

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Ebiaotrigona carpenteri</i>																		
<i>Geniotrigona thoracica</i>		Kee-Yah-Dang (คีอ๋ ยี่ แดง)	Thai	Native	Both	x		x										
<i>Heterotrigona itama</i>		I-ta-ma	Thai	Native	Both	x	x	x										
<i>Heterotrigona aliceae</i>			Thai	Native	Wild													
<i>Homotrigona canifrons</i>			Thai	Native	Wild													
<i>Homotrigona fimbriata</i>		Kee-Yah-Dang (คีอ๋ ยี่ แดง)	Thai	Native	Both	X		X										
<i>Homotrigona lutea</i>			Thai	Native	Wild													
<i>Lepidotrigona doipaensis</i>		Pak Tare Lek	Thai	Native	Both													
<i>Lepidotrigona flavibasis</i>		Pak Tare Lek	Thai	Native	Both													
<i>Lepidotrigona nitidiventris</i>		Pak Tare Yai	Thai	Native	Wild													
<i>Lepidotrigona terminata</i>		Pak Tare Klang	Thai	Native	Both													
<i>Lepidotrigona satun</i>		Pak Tare Satun	Thai	Native	Both													
<i>Lisotrigona cacciae</i>																		
<i>Lisotrigona furva</i>			Thai	Native	Both	X		X										
<i>Pariotrigona klassi</i>			Thai	Native	Wild													
<i>Pariotrigona pendleburyi</i>			Thai	Native	Wild													
<i>Tetragonilla atripes</i>			Thai	Native	Wild													
<i>Tetragonilla collina</i>			Thai	Native	Both	x												
<i>Tetragonilla fuscibasis</i>			Thai	Native	Wild													
<i>Tetragonula fuscobalteata</i>		Lang-lai (หลวง ล้าย)	Thai	Native	Both	X		X										
<i>Tetragonula geissleri</i>			Thai	Native	Wild													
<i>Tetragonula hirashimai</i>			Thai	Native	Wild													
<i>Tetragonula laeviceps</i>		Khon-ngern (ขอนแก่น)	Thai	Native	Both	X		X										
<i>Tetragonula malajanae</i>			Thai	Native	Wild													
<i>Tetragonula melina</i>			Thai	Native	Wild													
<i>Tetragonula minor</i>			Thai	Native	Both	x												
<i>Tetragonula pagdeni</i>			Thai	Native	Both	X		X										
<i>Tetragonula pagdeniformis</i>			Thai	Native	Wild	x		x										
<i>Tetragonula reepeni</i>			Thai	Native	Wild													
<i>Tetragonula sirindhornae</i>			Thai	Native	Wild													
<i>Tetragonula testaceitarsis</i>			Thai	Native	Wild													
<i>Homotrigona apicalis</i>		Kee-Yah-Dam (คีอ๋ ยี่ ด๋ำ)	Thai	Native	Both	X		X										
<i>Tetrigona binghami</i>			Thai	Native	Wild													
<i>Tetrigona melanoleuca</i>			Thai	Native	Wild													
<i>Tetrigona peninsularis</i>			Thai	Native	Wild													

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Ebaiotrigona carpenteri</i>													
<i>Geniotrigona thoracica</i>				3	7	1	5						
<i>Heterotrigona itama</i>				0.5	3	0.3	1						
<i>Heterotrigona aliceae</i>													
<i>Homotrigona canifrons</i>													
<i>Homotrigona fimbriata</i>				1	3	0.5	3						
<i>Homotrigona lutea</i>													
<i>Lepidotrigona doipaensis</i>													
<i>Lepidotrigona flavibasis</i>													
<i>Lepidotrigona nitidiventris</i>													
<i>Lepidotrigona terminata</i>				0.8	2	0.5	1						
<i>Lepidotrigona satun</i>													
<i>Lisotrigona cacciae</i>													
<i>Lisotrigona furva</i>													
<i>Pariotrigona klossi</i>													
<i>Pariotrigona pendleburyi</i>													
<i>Tetragonilla atripes</i>													
<i>Tetragonilla collina</i>													
<i>Tetragonilla fuscibasis</i>													
<i>Tetragonula fuscobalteata</i>	Nationwide			0.2	0.8	0.2	0.5						
<i>Tetragonula geissleri</i>													
<i>Tetragonula hirashimai</i>													
<i>Tetragonula laeviceps</i>	Nationwide			0.3kg	1.5kg	0.2kg	0.5						
<i>Tetragonula malaipanae</i>													
<i>Tetragonula melina</i>													
<i>Tetragonula minor</i>													
<i>Tetragonula pagdeni</i>	Nationwide	Yes (among stinglessbees)		0.3kg	1.5kg	0.2kg	0.5						
<i>Tetragonula pagdeniformis</i>													
<i>Tetragonula reepeni</i>													
<i>Tetragonula sirindhornae</i>													
<i>Tetragonula testaceitarsis</i>													
<i>Homotrigona apicalis</i>				1	3	0.5	3						
<i>Tetrigona binghami</i>													
<i>Tetrigona melanoleuca</i>													
<i>Tetrigona peninsularis</i>													

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensivel	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Ebiastrigona carpenteri</i>												
<i>Geniotrigona thoracica</i>												
<i>Heterotrigona itama</i>												
<i>Heterotrigona aliciae</i>												
<i>Homotrigona canifrons</i>												
<i>Homotrigona fimbriata</i>												
<i>Homotrigona lutea</i>												
<i>Lepidotrigona doipaensis</i>												
<i>Lepidotrigona flavibasis</i>												
<i>Lepidotrigona nitidiventris</i>												
<i>Lepidotrigona terminata</i>												
<i>Lepidotrigona satun</i>												
<i>Lisotrigona cacciae</i>												
<i>Lisotrigona furva</i>												
<i>Pariatrigona klassi</i>												
<i>Pariatrigona pendleburyi</i>												
<i>Tetragonilla atripes</i>												
<i>Tetragonilla collina</i>												
<i>Tetragonilla fuscibasis</i>												
<i>Tetragonula fuscobaltea</i>												
<i>Tetragonula geissleri</i>												
<i>Tetragonula hirashimai</i>												
<i>Tetragonula laeviceps</i>												
<i>Tetragonula malaijanae</i>												
<i>Tetragonula melina</i>												
<i>Tetragonula minor</i>												
<i>Tetragonula pagdeni</i>												
<i>Tetragonula pagdeniformis</i>												
<i>Tetragonula reepeni</i>												
<i>Tetragonula sirindharnae</i>												
<i>Tetragonula testeitarsis</i>												
<i>Homotrigona apicalis</i>												
<i>Tetrigona binghami</i>												
<i>Tetrigona melanoleuca</i>												
<i>Tetrigona peninsularis</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Ebaiotrigona carpenteri</i>									
<i>Geniotrigona thoracica</i>		x (in managed log)							
<i>Heterotrigona itama</i>		x (in managed log)							
<i>Heterotrigona aliciae</i>									
<i>Homotrigona canifrons</i>									
<i>Homotrigona fimbriata</i>		x (in managed log)							
<i>Homotrigona lutea</i>									
<i>Lepidotrigona doipaensis</i>									
<i>Lepidotrigona flavibasis</i>									
<i>Lepidotrigona nitidiventris</i>									
<i>Lepidotrigona terminata</i>		x (in managed log)							
<i>Lepidotrigona satun</i>									
<i>Lisotrigona cacciae</i>									
<i>Lisotrigona furva</i>									
<i>Pariotrigona klossi</i>									
<i>Pariotrigona pendleburyi</i>									
<i>Tetragonilla atripes</i>									
<i>Tetragonilla collina</i>									
<i>Tetragonilla fuscibasis</i>									
<i>Tetragonula fuscobalteata</i>	x								
<i>Tetragonula geissleri</i>									
<i>Tetragonula hirashimai</i>									
<i>Tetragonula laeviceps</i>	x								
<i>Tetragonula malaipanae</i>									
<i>Tetragonula melina</i>									
<i>Tetragonula minor</i>									
<i>Tetragonula pagdeni</i>	x								
<i>Tetragonula pagdeniformis</i>									
<i>Tetragonula reepeni</i>									
<i>Tetragonula sirindhornae</i>									
<i>Tetragonula testaceitarsis</i>									
<i>Homotrigona apicalis</i>		x (in managed log)							
<i>Trigona binghami</i>									
<i>Trigona melanoleuca</i>									
<i>Trigona peninsularis</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Ebaiotrigona carpenteri</i>														
<i>Geniotrigona thoracica</i>														
<i>Heterotrigona itama</i>														
<i>Heterotrigona aliciae</i>														
<i>Homotrigona canifrons</i>														
<i>Homotrigona fimbriata</i>														
<i>Homotrigona lutea</i>														
<i>Lepidotrigona doipaensis</i>														
<i>Lepidotrigona flavibasis</i>														
<i>Lepidotrigona nitidiventris</i>														
<i>Lepidotrigona terminata</i>														
<i>Lepidotrigona satun</i>														
<i>Lisotrigona cacciae</i>														
<i>Lisotrigona furva</i>														
<i>Pariotrigona klossi</i>														
<i>Pariotrigona pendleburyi</i>														
<i>Tetragonilla atripes</i>														
<i>Tetragonilla collina</i>														
<i>Tetragonilla fuscibasis</i>														
<i>Tetragonula fuscobalteata</i>														
<i>Tetragonula geissleri</i>														
<i>Tetragonula hirashimai</i>														
<i>Tetragonula laeviceps</i>														
<i>Tetragonula malaipanae</i>														
<i>Tetragonula melina</i>														
<i>Tetragonula minor</i>														
<i>Tetragonula pagdeni</i>														
<i>Tetragonula pagdeniformis</i>														
<i>Tetragonula reepeni</i>														
<i>Tetragonula sirindhornae</i>														
<i>Tetragonula testaceitarsis</i>														
<i>Homotrigona apicalis</i>														
<i>Tetrigona binghami</i>														
<i>Tetrigona melanoleuca</i>														
<i>Tetrigona peninsularis</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Ebiaotrigona carpenteri</i>								
<i>Geniotrigona thoracica</i>								
<i>Heterotrigona itama</i>								
<i>Heterotrigona alicae</i>								
<i>Homotrigona canifrons</i>								
<i>Homotrigona fimbriata</i>		No		NO		300	5	
<i>Homotrigona lutea</i>								
<i>Lepidotrigona doipaensis</i>								
<i>Lepidotrigona flavibasis</i>								
<i>Lepidotrigona nitidiventris</i>								
<i>Lepidotrigona terminata</i>								
<i>Lepidotrigona satun</i>								
<i>Lisotrigona cacciae</i>								
<i>Lisotrigona furva</i>		No		NO		300	5	
<i>Pariotrigona klossi</i>								
<i>Pariotrigona pendleburyi</i>								
<i>Tetragonilla atripes</i>								
<i>Tetragonilla collina</i>								
<i>Tetragonilla fuscibasis</i>								
<i>Tetragonula fuscobalteata</i>		No		NO		300	5	
<i>Tetragonula geissleri</i>								
<i>Tetragonula hirashimai</i>								
<i>Tetragonula laeviceps</i>		No		NO		500	20	
<i>Tetragonula malaipanae</i>								
<i>Tetragonula melina</i>								
<i>Tetragonula minor</i>								
<i>Tetragonula pagdeni</i>		No		NO		1000	20	
<i>Tetragonula pagdeniformis</i>								
<i>Tetragonula reepeni</i>								
<i>Tetragonula sirindhornae</i>								
<i>Tetragonula testaceitarsis</i>								
<i>Homotrigona apicalis</i>		No		NO		300	5	
<i>Trigona binghami</i>								
<i>Trigona melanoleuca</i>								
<i>Trigona peninsularis</i>								

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Bees wax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Amegilla andrewsi</i>				Native	Solitary													
<i>Amegilla cingulata</i>				Native	Solitary													
<i>Amegilla fimbriata</i>				Native	Solitary													
<i>Ceratina cladula</i>				Native	Solitary													
<i>Ceratina dentipes</i>				Native	Solitary													
<i>Habropoda buconis</i>				Native	Solitary													
<i>Habropoda impatiens</i>				Native	Solitary													
<i>Thyreus himalayensis</i>				Native	Solitary													
<i>Tetraloniella siamensis</i>			Thai	Native	Solitary													
<i>Tetralonioidella habropodae</i>			Thai	Native	Solitary													
<i>Xylocopa abbotti</i>			Thai	Native	Solitary													
<i>Xylocopa acutipennis</i>			Thai	Native	Solitary													
<i>Xylocopa aestuans</i>			Thai	Native	Solitary													
<i>Xylocopa bryorum</i>			Thai	Native	Solitary													
<i>Xylocopa caerulea</i>			Thai	Native	Solitary													
<i>Xylocopa dejeanii</i>			Thai	Native	Solitary													
<i>Xylocopa flavonigrescens</i>			Thai	Native	Solitary													
<i>Xylocopa iridipennis</i>			Thai	Native	Solitary													
<i>Xylocopa kerri</i>			Thai	Native	Solitary													
<i>Xylocopa latipes</i>			Thai	Native	Solitary													
<i>Xylocopa magnifica</i>			Thai	Native	Solitary													
<i>Xylocopa minor</i>			Thai	Native	Solitary													
<i>Xylocopa nasalis</i>			Thai	Native	Solitary													
<i>Xylocopa tenuiscapa</i>			Thai	Native	Solitary													
<i>Xylocopa tranquebarica</i>			Thai	Native	Solitary													
<i>Anthidiellum (Pycanthidium) smithi</i>				Native	Solitary													
<i>Coelioxys capitata</i>				Native	Solitary													
<i>Coelioxys confusa</i>				Native	Solitary													
<i>Coelioxys decipiens</i>				Native	Solitary													

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Amegilla andrewsi</i>													
<i>Amegilla cingulata</i>													
<i>Amegilla fimbriata</i>													
<i>Ceratina cladula</i>													
<i>Ceratina dentipes</i>													
<i>Habropoda buconis</i>													
<i>Habropoda impatiens</i>													
<i>Thyreus himalayensis</i>													
<i>Tetraloniella siamensis</i>													
<i>Tetralonioidella habropodae</i>													
<i>Xylocopa abbotti</i>													
<i>Xylocopa acutipennis</i>													
<i>Xylocopa aestuans</i>													
<i>Xylocopa bryorum</i>													
<i>Xylocopa caerulea</i>													
<i>Xylocopa dejeanii</i>													
<i>Xylocopa flavonigrescens</i>													
<i>Xylocopa iridipennis</i>													
<i>Xylocopa kerri</i>													
<i>Xylocopa latipes</i>													
<i>Xylocopa magnifica</i>													
<i>Xylocopa minor</i>													
<i>Xylocopa nasalis</i>													
<i>Xylocopa tenuiscapa</i>													
<i>Xylocopa tranquebarica</i>													
<i>Anthidiellum (Pycanthidium) smithi</i>													
<i>Coelioxys capitata</i>													
<i>Coelioxys confusa</i>													
<i>Coelioxys decipiens</i>													

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensivel	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Amegilla andrewsi</i>												
<i>Amegilla cingulata</i>												
<i>Amegilla fimbriata</i>												
<i>Ceratina cladula</i>												
<i>Ceratina dentipes</i>												
<i>Habropada bucconis</i>												
<i>Habropada impatiens</i>												
<i>Thyreus himalayensis</i>												
<i>Tetraloniella siamensis</i>												
<i>Tetralonioidella habropodae</i>												
<i>Xylocopa abbotti</i>												
<i>Xylocopa acutipennis</i>												
<i>Xylocopa aestuans</i>												
<i>Xylocopa bryorum</i>												
<i>Xylocopa caerulea</i>												
<i>Xylocopa dejeanii</i>												
<i>Xylocopa flavonigrescens</i>												
<i>Xylocopa iridipennis</i>												
<i>Xylocopa kerri</i>												
<i>Xylocopa latipes</i>												
<i>Xylocopa magnifica</i>												
<i>Xylocopa minor</i>												
<i>Xylocopa nasalis</i>												
<i>Xylocopa tenuiscapa</i>												
<i>Xylocopa tranquebarica</i>												
<i>Anthidiellum (Pycanthidium) smithi</i>												
<i>Coelioxys capitata</i>												
<i>Coelioxys confusa</i>												
<i>Coelioxys decipiens</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Amegilla andrewsi</i>									
<i>Amegilla cingulata</i>									
<i>Amegilla fimbriata</i>									
<i>Ceratina cladula</i>									
<i>Ceratina dentipes</i>									
<i>Habropoda bucconis</i>									
<i>Habropoda impatiens</i>									
<i>Thyreus himalayensis</i>									
<i>Tetraloniella siamensis</i>									
<i>Tetralonioidella habropodae</i>									
<i>Xylocopa abbotti</i>									
<i>Xylocopa acutipennis</i>									
<i>Xylocopa aestuans</i>									
<i>Xylocopa bryorum</i>									
<i>Xylocopa caerulea</i>									
<i>Xylocopa dejeanii</i>									
<i>Xylocopa flavonigrescens</i>									
<i>Xylocopa iridipennis</i>									
<i>Xylocopa kerri</i>									
<i>Xylocopa latipes</i>									
<i>Xylocopa magnifica</i>									
<i>Xylocopa minor</i>									
<i>Xylocopa nasalis</i>									
<i>Xylocopa tenuiscapa</i>									
<i>Xylocopa tranquebarica</i>									
<i>Anthidiellum (Pycanthidium) smithi</i>									
<i>Coelioxys capitata</i>									
<i>Coelioxys confusa</i>									
<i>Coelioxys decipiens</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Amegilla andrewsi</i>														
<i>Amegilla cingulata</i>														
<i>Amegilla fimbriata</i>														
<i>Ceratina cladula</i>														
<i>Ceratina dentipes</i>														
<i>Habropoda buconis</i>														
<i>Habropoda impatiens</i>														
<i>Thyreus himalayensis</i>														
<i>Tetraloniella siamensis</i>														
<i>Tetralonioidella habropodae</i>														
<i>Xylocopa abbotti</i>														
<i>Xylocopa acutipennis</i>														
<i>Xylocopa aestuans</i>														
<i>Xylocopa bryorum</i>														
<i>Xylocopa caerulea</i>														
<i>Xylocopa dejeanii</i>														
<i>Xylocopa flavonigrescens</i>														
<i>Xylocopa iridipennis</i>														
<i>Xylocopa kerri</i>														
<i>Xylocopa latipes</i>														
<i>Xylocopa magnifica</i>														
<i>Xylocopa minor</i>														
<i>Xylocopa nasalis</i>														
<i>Xylocopa tenuiscapa</i>														
<i>Xylocopa tranquebarica</i>														
<i>Anthidiellum (Pycanthidium) smithi</i>														
<i>Coelioxys capitata</i>														
<i>Coelioxys confusa</i>														
<i>Coelioxys decipiens</i>														

Species	Other biological traits (please specify)	Queens/colonies /package are IMPORTED	From which countries (pls specify)	Queens/colonies /package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Amegilla andrewsi</i>								Tadauchi and Tasen, 2009
<i>Amegilla cingulata</i>								Tadauchi and Tasen, 2009
<i>Amegilla fimbriata</i>								Attasopa and Warrit, 2012
<i>Ceratina cladula</i>								Tadauchi and Tasen, 2009
<i>Ceratina dentipes</i>								Tadauchi and Tasen, 2009
<i>Habropoda bucconis</i>								Tadauchi and Tasen, 2009
<i>Habropoda impatiens</i>								Tadauchi and Tasen, 2009
<i>Thyreus himalayensis</i>								Tadauchi and Tasen, 2009
<i>Tetraloniella siamensis</i>								
<i>Tetralonioidella habropodae</i>								
<i>Xylocopa abbotti</i>								
<i>Xylocopa acutipennis</i>								
<i>Xylocopa aestuans</i>								
<i>Xylocopa bryorum</i>								
<i>Xylocopa caerulea</i>								
<i>Xylocopa dejeanii</i>								
<i>Xylocopa flavonigrescens</i>								
<i>Xylocopa iridipennis</i>								
<i>Xylocopa kerri</i>								
<i>Xylocopa latipes</i>								
<i>Xylocopa magnifica</i>								
<i>Xylocopa minor</i>								
<i>Xylocopa nasalis</i>								
<i>Xylocopa tenuiscapa</i>								
<i>Xylocopa tranquebarica</i>								
<i>Anthidiellum (Pycanthidium) smithi</i>								Tadauchi and Tasen, 2009
<i>Coelioxys capitata</i>								Tadauchi and Tasen, 2009
<i>Coelioxys confusa</i>								Tadauchi and Tasen, 2009
<i>Coelioxys decipiens</i>								Tadauchi and Tasen, 2009

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Megachile (Callomegachile) atratiformis</i>				Native	Solitary													
<i>Megachile (Callomegachile) disjuncta</i>				Native	Solitary													
<i>Megachile (Callomegachile) faceta</i>				Native	Solitary													
<i>Megachile (Callomegachile) fulvipennis</i>				Native	Solitary													
<i>Megachile (Callomegachile) impressa</i>				Native	Solitary													
<i>Megachile (Callomegachile) memecylonae</i>				Native	Solitary													
<i>Megachile (Callomegachile) monticola</i>				Native	Solitary													
<i>Megachile (Callomegachile) odontophora</i>				Native	Solitary													
<i>Megachile (Callomegachile) ornata</i>				Native	Solitary													
<i>Megachile (Callomegachile) parornata</i>				Native	Solitary													
<i>Megachile (Callomegachile) tuberculata</i>				Native	Solitary													
<i>Megachile (Callomegachile) umbripennis</i>				Native	Solitary													
<i>Megachile (Callomegachile) Chiangmaiensis</i>				Native	Solitary													
<i>Megachile Carinula</i>				Native	Solitary													
<i>Megachile (Carinula) stulta</i>				Native	Solitary													
<i>Megachile amputata</i>				Native	Solitary													
<i>Megachile fraterna</i>				Native	Solitary													
<i>Megachile hera</i>				Native	Solitary													
<i>Megachile ornata</i>				Native	Solitary													
<i>Pachyanthidium lachrymosum</i>				Native	Solitary													
<i>Pseudoanthidium orientale</i>				Native	Solitary													
<i>Nomia albofasciata</i>				Native	Solitary													
<i>Nomia clypeata</i>				Native	Solitary													

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Megachile (Callomegachile) atratiformis</i>													
<i>Megachile (Callomegachile) disjuncta</i>													
<i>Megachile (Callomegachile) faceta</i>													
<i>Megachile (Callomegachile) fulvipennis</i>													
<i>Megachile (Callomegachile) impressa</i>													
<i>Megachile (Callomegachile) memecylonae</i>													
<i>Megachile (Callomegachile) monticola</i>													
<i>Megachile (Callomegachile) odontophora</i>													
<i>Megachile (Callomegachile) ornata</i>													
<i>Megachile (Callomegachile) parornata</i>													
<i>Megachile (Callomegachile) tuberculata</i>													
<i>Megachile (Callomegachile) umbripennis</i>													
<i>Megachile (Callomegachile) Chiangmaiensis</i>													
<i>Megachile Carinula</i>													
<i>Megachile (Carinula) stulta</i>													
<i>Megachile amputata</i>													
<i>Megachile fraterna</i>													
<i>Megachile hera</i>													
<i>Megachile ornata</i>													
<i>Pachyanthidium lachryosum</i>													
<i>Pseudoanthidium orientale</i>													
<i>Nomia albofasciata</i>													
<i>Nomia clypeata</i>													

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensivel	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony s warmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood , emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Megachile (Callomegachile) atratiformis</i>												
<i>Megachile (Callomegachile) disjuncta</i>												
<i>Megachile (Callomegachile) faceta</i>												
<i>Megachile (Callomegachile) fulvipennis</i>												
<i>Megachile (Callomegachile) impressa</i>												
<i>Megachile (Callomegachile) memecylonae</i>												
<i>Megachile (Callomegachile) monticola</i>												
<i>Megachile (Callomegachile) odontophora</i>												
<i>Megachile (Callomegachile) ornata</i>												
<i>Megachile (Callomegachile) parornata</i>												
<i>Megachile (Callomegachile) tuberculata</i>												
<i>Megachile (Callomegachile) umbripennis</i>												
<i>Megachile (Callomegachile) Chiangmaiensis</i>												
<i>Megachile Carinula</i>												
<i>Megachile (Carinula) stulta</i>												
<i>Megachile amputata</i>												
<i>Megachile fraterna</i>												
<i>Megachile hera</i>												
<i>Megachile ornata</i>												
<i>Pachyanthidium lachrymosum</i>												
<i>Pseudoanthidium orientale</i>												
<i>Nomia albofasciata</i>												
<i>Nomia clypeata</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Megachile (Callomegachile) atratiformis</i>									
<i>Megachile (Callomegachile) disjuncta</i>									
<i>Megachile (Callomegachile) faceta</i>									
<i>Megachile (Callomegachile) fulvipennis</i>									
<i>Megachile (Callomegachile) impressa</i>									
<i>Megachile (Callomegachile) memecylonae</i>									
<i>Megachile (Callomegachile) monticola</i>									
<i>Megachile (Callomegachile) odontophora</i>									
<i>Megachile (Callomegachile) ornata</i>									
<i>Megachile (Callomegachile) parornata</i>									
<i>Megachile (Callomegachile) tuberculata</i>									
<i>Megachile (Callomegachile) umbripennis</i>									
<i>Megachile (Callomegachile) Chiangmaiensis</i>									
<i>Megachile Carinula</i>									
<i>Megachile (Carinula) stulta</i>									
<i>Megachile amputata</i>									
<i>Megachile fraterna</i>									
<i>Megachile hera</i>									
<i>Megachile ornata</i>									
<i>Pachyanthidium lachrymosum</i>									
<i>Pseudoanthidium orientale</i>									
<i>Nomia albofasciata</i>									
<i>Nomia clypeata</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Megachile (Callomegachile) atratiformis</i>														
<i>Megachile (Callomegachile) disjuncta</i>														
<i>Megachile (Callomegachile) faceta</i>														
<i>Megachile (Callomegachile) fulvipennis</i>														
<i>Megachile (Callomegachile) impressa</i>														
<i>Megachile (Callomegachile) memecylonae</i>														
<i>Megachile (Callomegachile) monticola</i>														
<i>Megachile (Callomegachile) odontophora</i>														
<i>Megachile (Callomegachile) ornata</i>														
<i>Megachile (Callomegachile) parornata</i>														
<i>Megachile (Callomegachile) tuberculata</i>														
<i>Megachile (Callomegachile) umbripennis</i>														
<i>Megachile (Callomegachile) Chiangmaiensis</i>														
<i>Megachile Carinula</i>														
<i>Megachile (Carinula) stulta</i>														
<i>Megachile amputata</i>														
<i>Megachile fraterna</i>														
<i>Megachile hera</i>														
<i>Megachile ornata</i>														
<i>Pachyanthidium lachrymosum</i>														
<i>Pseudoanthidium orientale</i>														
<i>Nomia albofasciata</i>														
<i>Nomia clypeata</i>														

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Megachile (Callomegachile) atratiformis</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) disjuncta</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) faceta</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) fulvipennis</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) impressa</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) memecylonae</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) monticola</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) odontophora</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) ornata</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) parornata</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) tuberculata</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) umbripennis</i>								Chatthanabun et al., 2020
<i>Megachile (Callomegachile) Chiangmaiensis</i>								Chatthanabun et al., 2020
<i>Megachile Carinula</i>								Chatthanabun et al., 2020
<i>Megachile (Carinula) stulta</i>								Chatthanabun et al., 2020
<i>Megachile amputata</i>								Tadauchi and Tasen, 2009
<i>Megachile fraterna</i>								Tadauchi and Tasen, 2009
<i>Megachile hera</i>								Tadauchi and Tasen, 2009
<i>Megachile ornata</i>								Tadauchi and Tasen, 2009
<i>Pachyanthidium lachrymosum</i>								Tadauchi and Tasen, 2009
<i>Pseudoanthidium orientale</i>								Tadauchi and Tasen, 2009
<i>Nomia albofasciata</i>								Tadauchi and Tasen, 2009
<i>Nomia clypeata</i>								Tadauchi and Tasen, 2009

Appendix 1c. DAD-IS data from Viet Nam

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species ?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from	
						Honey	Pollen	Propolis	Royal jelly	Bees wax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)				
<i>Apis cerana</i>	<i>A. c. indica</i>	Asiatic Honey Bee "Ong nôi"	Vietnamese	Native	Both	1	1			1		1			1		South and Southeast Asia (Ruttner, 1988)	no idea	
<i>Apis cerana</i>	<i>A.c. cerana</i>	Asiatic Honey Bee "Ong nôi"	Vietnamese	Native	Both	1	1			1		1			1		Southern Asia (Crane, 1990)	no idea	
<i>Apis mellifera</i>	<i>A.m.ligustica</i> & <i>A.m.carnica</i>	European honey bee "Ong ngoai"	Vietnamese	Introduced	Managed	1	1		1	1		1			1		Africa or Asia (Han et al, 2012)		Russia, Bulgaria, Hongkong, Germany, Austria, Italia, New Zealand (Tam private information (2022))
<i>Apis dorsata</i>	<i>Apis dorsata</i> Fabricius, 1793	Giant honey bee "Ong khoái" or "Ong gác kèo"	Vietnamese	Native	Wild	1				1		1	x Rafter beekeeping in the Melaleuca submerged forests of Mekong Delta Viet Nam				South and Southeast Asia (Ruttner, 1988)		
<i>Aois laboriosa</i>	<i>Apis laboriosa</i> Smith, 1871	Rock honey bee "Ong đá"	Vietnamese	Native	Wild	1				1		1							
<i>Apis florea</i>		red dwarf honey bee "Ong ruồi đỏ"	Vietnamese	Native	Wild	1						1					southern Asia		
<i>Apis andreniformis</i>		black dwarf honey bee "Ong ruồi đen" or "Ong tí hon"	Vietnamese	Native	Wild	1						1					southern Asia		

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Apis cerana</i>	X nationwide	Yes	available	5	24			no	no	430	750	no	no
<i>Apis cerana</i>	X Dong Van District, Ha Giang Province (Thai, 2008)	No	available	7	20			no	no			no	no
<i>Apis mellifera</i>	countrywide	Yes	available	23	66			500	4,000	317	3,000	2,500	4,000
<i>Apis dorsata</i>	Nationwide	No	Rafter beekeeping technique in Melaleuca forest areas of Southern Viet Nam (Thai et al, 1996)	4.09 (Tan, 2007)	15.7 (Tan, 2007)					300	1,000	no	no
<i>Aois laboriosa</i>	x Northern mountains elevations of >900 m a.s.l. (Kitnya et al, 2020)			3	40					400	1,500		
<i>Apis florea</i>	x nationwide			0.2	1.5								
<i>Apis andreniformis</i>	X nationwide			0.2	1								

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensively	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for or swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for or swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Apis cerana</i>			1				1		1	1		
<i>Apis cerana</i>			1				1		1	1		
<i>Apis mellifera</i>			1				1		1		1	
<i>Apis dorsata</i>		1			1					1		
<i>Apis laboriosa</i>			1		1					1		
<i>Apis florea</i>			1				1			1		
<i>Apis andreniformis</i>			1				1			1		

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Apis cerana</i>		1		1			1		
<i>Apis cerana</i>		1		1			1		
<i>Apis mellifera</i>	1			1			1		
<i>Apis dorsata</i>		1		1		1			
<i>Apis laboriosa</i>		1		1		1			
<i>Apis florea</i>		1		1		1			
<i>Apis andreniformis</i>		1		1		1			

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Apis cerana</i>	X Sacbrood, European foulbrood (Tuan, 2014)	1	1	1		X Nosema ceranae (Eversgren et al, 2014; Chantawannakul et al, 2016)	1	X Wax moth			X Asian hornet, birds, (Mattila et al, 2020)	X Varroa destructor (Boot et al, 1996. Boot et al, 1997. Beaurepaire et al, 2015)	X SBV, BQCV, DWV, (Tuan et al. 2012. Forsgren et al, 2014.. Reddy et al, 2017. Thai et al, 2018)	
<i>Apis cerana</i>	X Sacbrood, European foulbrood (Tuan, 2014)	1	1	1		X Nosema ceranae Forsgren et al, 2014; Chantawannakul et al, 2016	1	X Wax moth, mites			x Asian hornet, birds, (Mattila et al, 2020)	X Varroa destructor (Boot et al, 1996. Boot et al, 1997. Beaurepaire et al, 2015)	X SBV, BQCV, DWV, CBPV (Tuan et al, 2012) Forsgren et al, 2014) Thu et al, 2016)	
<i>Apis mellifera</i>	X EFB, Sacbrood, (Tuan, 2014). chalkbrood	1	1	1		X Nosema ceranae (Klee et al, 2007;. Eversgren et al, 2014; Chantawannakul, 2016)	1	X Wax moth, mites			X Asian hornet (Mattila et al, 2020)	X Varroa destructor (Boot et al, 1996. Boot et al, 1997; Beaurepaire et al, 2015; Chantawannakul et al, 2016)	X SBV, BQCV, DWV, CBPV (Tuan et al, 2012; Forsgren et al, 2014. Thu et al, 2016; Chantawannakul et al, 2016)	
<i>Apis dorsata</i>	1	1	1	1		x (Ponkit et al, 2021)	1	X Wax moth			X Asian hornet, birds, wasps	X Varroa destructor, Tropilaelap clareae (Woyke, 1996; Chantawannakul et al, 2016)		
<i>Aois laboriosa</i>		1					1	X Wax moth			1			
<i>Apis florea</i>		1		1			1	X Wax moth			1			
<i>Apis andreniformis</i>		1		1			1				1			

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Apis cerana</i>		no	-	Yes	X Nepal, Laos Cambodia	33,500	12	Lap PV, Chinh PH, Ha TD, Chinh TX, Hanh PD, Ngoc PV (1993) Some biological characteristics of <i>Apis cerana</i> queen bees in Viet Nam. In: Connor LJ, Rinderer TE, Sylvester HA, Wongsiri S (eds) Asian apiculture. Wicwas Press, Cheshire, Connecticut, pp 117–123
<i>Apis cerana</i>		colonies/ Queens	China			35	12	Crane, E 1990, <i>Bees and Beekeeping: Science Practice and World Resources</i> , Heinemann Newnes, Oxford
<i>Apis mellifera</i>		Queens/Packages	Russia, Bulgaria, Cuba, Germany, Austria, Italy, New Zealand (Private infrmtion)			6,500	100	Crane, E 1990, <i>Bees and Beekeeping: Science Practice and World Resources</i> , Heinemann Newnes, Oxford
<i>Apis dorsata</i>		No		No		60 (Est.)	3 (Est.)	Woyke J. (1996) Different reaction of <i>Apis dorsata</i> and <i>Apis mellifera</i> to brood infestation by parasitic mites. Proc 3rd AAA Conf. on Bee Res and Beekeeping Dev., Hanoi, Viet Nam: 172-175
<i>Aois laboriosa</i>								https://doi.org/10.3897/zookeys.951.49855 https://www.jstor.org/stable/25085727 https://www.researchgate.net/publication/222137752_2004_Open-air-nesting_honey_bees_Apis_dorsata_and_Apis_laboriosa_differ_from_the_cavity-nesting_Apis_mellifera_and_Apis_cerana_in_brood_hygiene_behaviour
<i>Apis florea</i>		No		No				https://www.jstor.org/stable/25085727
<i>Apis andreniformis</i>		No		NO				

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Bees wax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Bombus (Psithyrus) campestris</i>	<i>Bombus (Psithyrus) campestris</i> (Panzer, 1801)	"Ong nghệ"	Vietnamese	Native	Wild								1					
<i>Bombus flavescens</i>	<i>Bombus flavescens</i> Smith, 1852	"Ong nghệ"	Vietnamese	Native	Wild								1					
<i>Bombus magretti</i>	<i>Bombus magretti</i> Griboro	"Ong nghệ"	Vietnamese	Native	Wild								1					
<i>Bombus trifasciatus</i>	<i>Bombus trifasciatus</i> Smith, 1852	"Ong nghệ"	Vietnamese	Native	Wild								1					
<i>Bombus assamensis</i>	<i>Bombus assamensis</i> Bingham, 1897	"Ong nghệ"	Vietnamese	Native	Wild								1					
<i>Bombus eximus</i>	<i>Bombus eximus</i> Smith, 1852	"Ong nghệ"	Vietnamese	Native	Wild								1					
<i>Bombus montivagus</i>	<i>Bombus montivagus</i> Smith, 1878	"Ong nghệ"	Vietnamese	Native	Wild								1					
<i>Bombus</i> sp.		"Ong nghệ"	Vietnamese	Native									1					

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Bombus (Psithyrus) campestris</i>													
<i>Bombus flavescens</i>													
<i>Bombus magretti</i>													
<i>Bombus trifasciatus</i>													
<i>Bombus assamensis</i>													
<i>Bombus eximus</i>													
<i>Bombus montivagus</i>													
<i>Bombus sp.</i>													

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensivel	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Bombus (Psithyrus) campestris</i>												
<i>Bombus flavescens</i>												
<i>Bombus magretti</i>												
<i>Bombus trifasciatus</i>												
<i>Bombus assamensis</i>												
<i>Bombus eximus</i>												
<i>Bombus montivagus</i>												
<i>Bombus</i> sp.												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Bombus (Psithyrus) campestris</i>									
<i>Bombus flavescens</i>									
<i>Bombus magretti</i>									
<i>Bombus trifasciatus</i>									
<i>Bombus assamensis</i>									
<i>Bombus eximus</i>									
<i>Bombus montivagus</i>									
<i>Bombus sp.</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other Subspecies
<i>Bombus (Psithyrus) campestris</i>				1			1							
<i>Bombus flavescens</i>				1			1							
<i>Bombus magretti</i>				1			1							
<i>Bombus trifasciatus</i>				1			1							
<i>Bombus assamensis</i>							1							
<i>Bombus eximus</i>							1							
<i>Bombus montivagus</i>							1							
<i>Bombus sp.</i>							1							

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Bombus (Psithyrus) campestris</i>		No		NO				https://vjs.ac.vn/index.php/vjbio/article/view/2676/pdf%28Vietnamese%29 http://tailieudientu.lrc.tnu.edu.vn/Upload/Collection/brief/187640_1082020103459CTv178V184S82018115.pdf
<i>Bombus flavescens</i>		No		NO				http://iebr.ac.vn/database/HNTQ7/268.pdf
<i>Bombus magretti</i>		No		NO				
<i>Bombus trifasciatus</i>		No		NO				
<i>Bombus assamensis</i>								
<i>Bombus eximus</i>								
<i>Bombus montivagus</i>								
<i>Bombus sp.</i>								

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Beeswax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Ebaiotrigona carpenteri</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Homotrigona apicalis</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Homotrigona aliciae</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Homotrigona anamitica</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Homotrigona fimbriata</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Lepidotrigona flavibasis</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Lepidotrigona terminata</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Lepidotrigona ventralis</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Lisotrigona cacciae</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Lisotrigona furva</i>		"Ong dú"	Vietnamese	Native	Both	1						1						
<i>Tetragonilla collina</i>		"Ong dú"	Vietnamese	Native	Wild							1						
<i>Tetragonula fuscobalteata</i>		"Ong dú"	Vietnamese	Native								1						
<i>Tetragonula gressitti</i>		"Ong dú nâu to"	Vietnamese	Native	Both							1						
<i>Tetragonula iridipennis</i>		"ong dú"	Vietnamese	Native	Wild							1						
<i>Tetragonula laeviceps</i>		"Ong dú"	Vietnamese	Native	Both	1						1						
<i>Tetragonula ventralis</i>		"Ong dú"	Vietnamese	Native	Wild							1						

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country ?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Ebiaotrigona carpenteri</i>													
<i>Homotrigona apicalis</i>													
<i>Homotrigona aliciae</i>													
<i>Homotrigona anamitica</i>													
<i>Homotrigona fimbriata</i>													
<i>Lepidotrigona flavibasis</i>													
<i>Lepidotrigona terminata</i>													
<i>Lepidotrigona ventralis</i>													
<i>Lisotrigona cacciae</i>													
<i>Lisotrigona furva</i>				0.2	1.4								
<i>Tetragonilla collina</i>													
<i>Tetragonula fuscobalteata</i>													
<i>Tetragonula gressitti</i>													
<i>Tetragonula iridipennis</i>													
<i>Tetragonula laeviceps</i>	x countrywide			0.2	1.5								
<i>Tetragonula ventralis</i>													

Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensivel	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving, but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the t colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Ebaiotrigona carpenteri</i>												
<i>Homotrigona apicalis</i>												
<i>Homotrigona aliciae</i>												
<i>Homotrigona anamitica</i>												
<i>Homotrigona fimbriata</i>												
<i>Lepidotrigona flavibasis</i>												
<i>Lepidotrigona terminata</i>												
<i>Lepidotrigona ventralis</i>												
<i>Lisotrigona cacciae</i>												
<i>Lisotrigona furva</i>				1				1			1	
<i>Tetragonilla collina</i>												
<i>Tetragonula fuscobalteata</i>												
<i>Tetragonula gressitti</i>												
<i>Tetragonula iridipennis</i>												
<i>Tetragonula laeviceps</i>				1				1			1	
<i>Tetragonula ventralis</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Ebaiotrigona carpenteri</i>									
<i>Homotrigona apicalis</i>									
<i>Homotrigona aliciae</i>									
<i>Homotrigona anamitica</i>									
<i>Homotrigona fimbriata</i>									
<i>Lepidotrigona flavibasis</i>									
<i>Lepidotrigona terminata</i>									
<i>Lepidotrigona ventralis</i>									
<i>Lisotrigona cacciae</i>									
<i>Lisotrigona furva</i>					1	1			
<i>Tetragonilla collina</i>									
<i>Tetragonula fuscobalteata</i>									
<i>Tetragonula gressitti</i>									
<i>Tetragonula iridipennis</i>									
<i>Tetragonula laeviceps</i>	1				1	1			
<i>Tetragonula ventralis</i>									

Species	Main threats													
	Bacteria l And Fungal Disease s (e.g. America n foulbro od, chalkbr ood)	Climate change	Lack of competitive ness/decrea sing number of beekeepers	Loss, degradation or fragmentati on of habitat/for age	Malnutri tion/star vation	Nose ma spp.	Pestici des	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeepi ng manage ment practices	Poor/w eak queens	Predat ors (e.g. Birds, Asian hornet ...) Pls specif y	Varroa destru ctor	Viral Disea ses (e.g. DWV, BQCV , KBV, SBV) pls specif y	Importa tion of other Subspec ies
<i>Ebaiotrigona carpenteri</i>							1							
<i>Homotrigona apicalis</i>							1							
<i>Homotrigona aliceae</i>							1							
<i>Homotrigona anamitica</i>							1							
<i>Homotrigona fimbriata</i>							1							
<i>Lepidotrigona flavibasis</i>							1							
<i>Lepidotrigona terminata</i>							1							
<i>Lepidotrigona ventralis</i>							1							
<i>Lisotrigona cacciae</i>							1							
<i>Lisotrigona furva</i>				1			1			1				
<i>Tetragonilla collina</i>							1							
<i>Tetragonula fuscobalteata</i>							1							
<i>Tetragonula gressitti</i>							1							
<i>Tetragonula iridipennis</i>							1							
<i>Tetragonula laeviceps</i>		1		1			1	x small beetles (unspeci fied)				1		
<i>Tetragonula ventralis</i>							1							

Species	Other biological traits (please specify)	Queens/colonies/package are IMPORTED	From which countries (pls specify)	Queens/colonies/package are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Ebaiotrigona carpenteri</i>								Tuan A.T, Lien P.T.N (2021). Survey report on distributions and manages of stingless bees in the midland and mountainous provinces of the North Viet Nam (in Vietnamese)
<i>Homotrigona apicalis</i>								
<i>Homotrigona aliciae</i>								
<i>Homotrigona anamitica</i>								
<i>Homotrigona fimbriata</i>								
<i>Lepidotrigona flavibasis</i>								
<i>Lepidotrigona terminata</i>								
<i>Lepidotrigona ventralis</i>								
<i>Lisotrigona cacciae</i>								
<i>Lisotrigona furva</i>		No						https://doi.org/10.1016/j.fitote.2020.104821
<i>Tetragonilla collina</i>								
<i>Tetragonula fuscobalteata</i>								
<i>Tetragonula gressitti</i>								
<i>Tetragonula iridipennis</i>								
<i>Tetragonula laeviceps</i>		No				1,000	10	
<i>Tetragonula ventralis</i>								

Species	Sub-species	Most common name	Language	Native/Exotic/Endemic/Introduced Species?	Solitary/Wild/Managed/Both Species	Specific uses (put "X")										Origin of species (based on available literature)	Year of origin/import since	Import from
						Honey	Pollen	Propolis	Royal jelly	Bees wax	Bee venom	Pollination	Cultural/Religious Customs	Queen production	Others (please specify)			
<i>Amegilla albigena</i>					Solitary													
<i>Amegilla zonata</i>					Solitary													
<i>Heriades sp.</i>					Solitary													
<i>Megachile fulvovestita</i>					Solitary													
<i>Megachile ampuntata</i>					Solitary													
<i>Megachile ceylonica</i>					Solitary													
<i>Megachile chlorigaster</i>					Solitary													
<i>Megachile conjuncta</i>					Solitary													
<i>Megachile disjuncta</i>					Solitary													
<i>Megachile lanata</i>					Solitary													
<i>Megachile monticola</i>					Solitary													
<i>Megachile velutina</i>					Solitary													
<i>Megachile hera</i>					Solitary													
<i>Xylocopa tranquebararorum</i>					Solitary													

Species	Location of the species/subspecies within the country (distribution)	Dominant species in the country?	Current domestication status	Honey yield (net weight of extracted honey in kg) per year and colony		Propolis yield in grams per year and colony		Pollen yield in grams per year and colony		Beeswax yield in grams per year and colony		Royal jelly yield in grams per year and colony	
				Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight	Minimum weight	Maximum weight
<i>Amegilla albigena</i>													
<i>Amegilla zonata</i>													
<i>Heriades sp.</i>													
<i>Megachile fulvovestita</i>													
<i>Megachile ampuntata</i>													
<i>Megachile ceylonica</i>													
<i>Megachile chlogaster</i>													
<i>Megachile conjuncta</i>													
<i>Megachile disjuncta</i>													
<i>Megachile lanata</i>													
<i>Megachile monticola</i>													
<i>Megachile velutina</i>													
<i>Megachile hera</i>													
<i>Xylocopa tranquebararorum</i>													

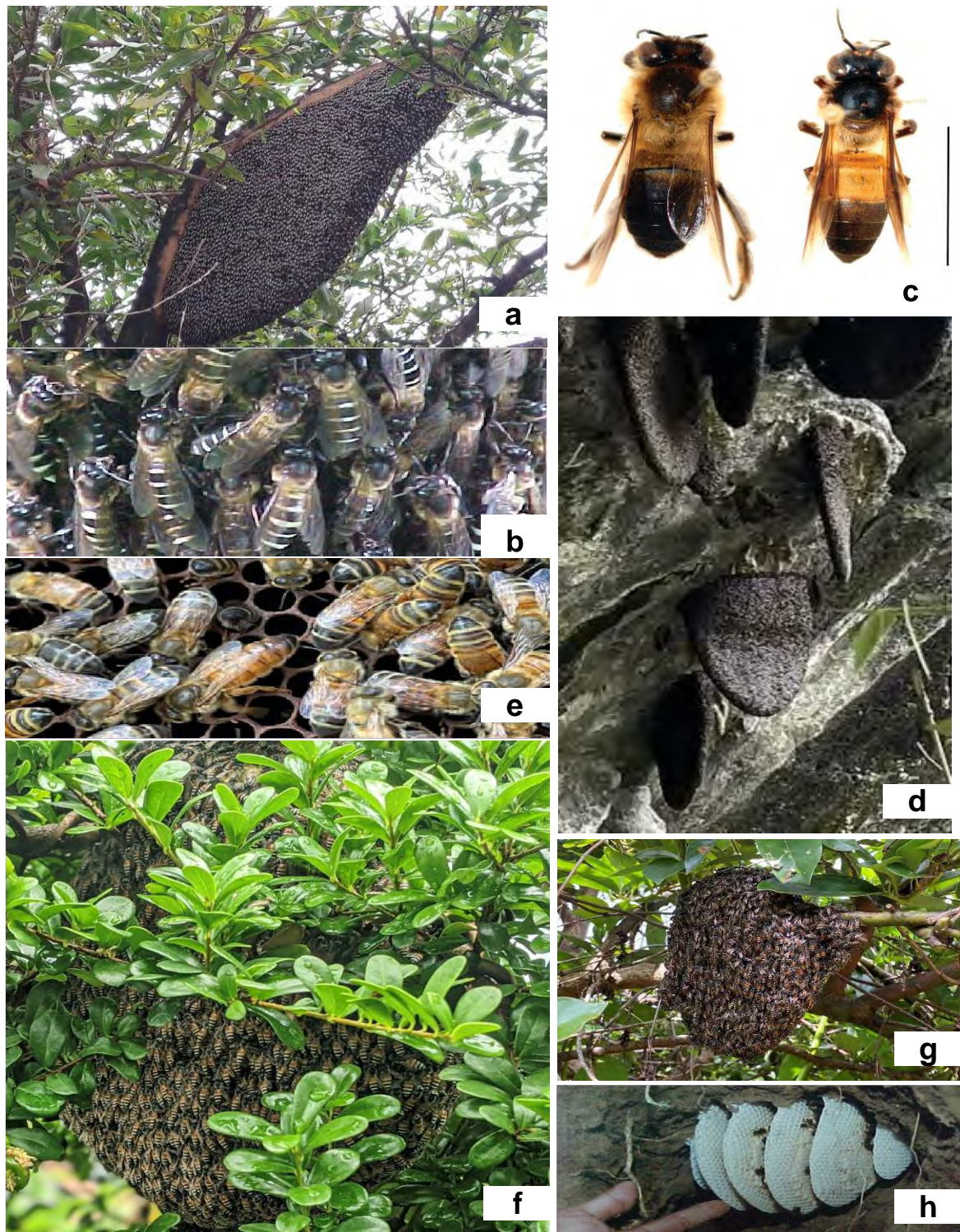
Species	Defensive behavior (gentleness)				Calmness				Swarming tendency			
	In spite of the use of smoke the colony shows a strong defence reaction on being handled, or bees attack without being disturbed	Single bees attack and sting during working procedure, even if smoke is used intensivel	Colony can easily be worked without stings, if using some smoke	No use of smoke and no protective clothes are necessary to avoid stings during normal working procedure	Bees nervously leave the combs, run out of the supers and cluster inside or outside the hive	Bees partly leave their combs and cluster in the edges of frames and supers	Bees are moving , but do not leave their combs during treatment	Bees stick to their combs like fur without any notable reaction to being handled	Active swarming: the test colony swarmed or swarming could be prevented only by extensive intervention (interim nucleus etc.)	Strong swarming tendency as indicated by repeated queen cell construction and advanced symptoms of preparation for swarming (reduction of open brood, emaciated queen, limited comb construction)	Low swarming tendency: some queen cells with brood are present, but the overall colony condition does not indicate immediate swarming activities. The preparations for swarming may be stopped by destroying the swarm cells and offering additional comb space	The colony does not show any swarming tendency. There are no swarm cells containing eggs, larvae or pupae
<i>Amegilla albigena</i>												
<i>Amegilla zonata</i>												
<i>Heriades sp.</i>												
<i>Megachile fulvovestita</i>												
<i>Megachile ampuntata</i>												
<i>Megachile ceylonica</i>												
<i>Megachile chlorigaster</i>												
<i>Megachile conjuncta</i>												
<i>Megachile disjuncta</i>												
<i>Megachile lanata</i>												
<i>Megachile monticola</i>												
<i>Megachile velutina</i>												
<i>Megachile hera</i>												
<i>Xylocopa tranquebararorum</i>												

Species	Absconding tendency		Other behavioral traits (please specify)	Spring dynamics		Bee breeding ability			
	Little tendency (colony tends to remain in the nest/hive)	Strong (colony tends to leave the nest/hive)		Quick development after start of season	Slow development after start of season	Up to 10	from 10 to 100	from 100 to 500	more than 500
<i>Amegilla albigena</i>									
<i>Amegilla zonata</i>									
<i>Heriades sp.</i>									
<i>Megachile fulvovestila</i>									
<i>Megachile ampuntata</i>									
<i>Megachile ceylonica</i>									
<i>Megachile chlorigaster</i>									
<i>Megachile conjuncta</i>									
<i>Megachile disjuncta</i>									
<i>Megachile lanata</i>									
<i>Megachile monticola</i>									
<i>Megachile velutina</i>									
<i>Megachile hera</i>									
<i>Xylocopa tranquebararorum</i>									

Species	Main threats													
	Bacterial And Fungal Diseases (e.g. American foulbrood, chalkbrood)	Climate change	Lack of competitiveness/decreasing number of beekeepers	Loss, degradation or fragmentation of habitat/forage	Malnutrition/starvation	Nosema spp.	Pesticides	Pests (e.g. Small hive beetle, Wax moth), pls specify	Poor beekeeping management practices	Poor/weak queens	Predators (e.g. Birds, Asian hornet ...) Pls specify	Varroa destructor	Viral Diseases (e.g. DWV, BQCV, KBV, SBV) pls specify	Importation of other subspecies
<i>Amegilla albigena</i>														
<i>Amegilla zonata</i>														
<i>Heriades sp.</i>														
<i>Megachile fulvovestita</i>														
<i>Megachile ampuntata</i>														
<i>Megachile ceylonica</i>														
<i>Megachile chorigaster</i>														
<i>Megachile conjuncta</i>														
<i>Megachile disjuncta</i>														
<i>Megachile lanata</i>														
<i>Megachile monticola</i>														
<i>Megachile velutina</i>														
<i>Megachile hera</i>														
<i>Xylocopa tranquebararorum</i>														

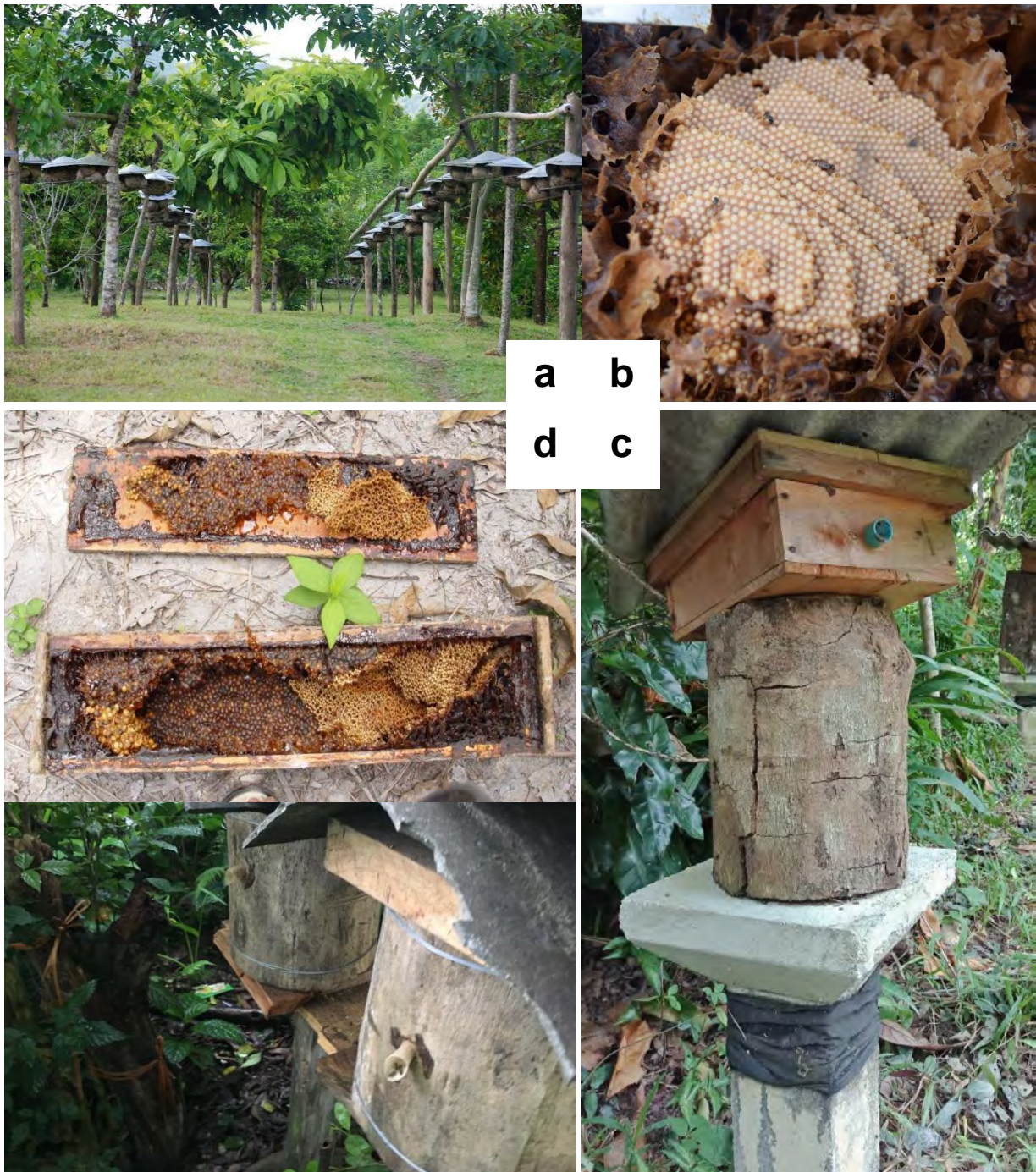
Species	Other biological traits (please specify)	Queens/colonies/packages are IMPORTED	From which countries (pls specify)	Queens/colonies/packages are EXPORTED	From which countries (pls specify)	Average number of beekeepers	Average number of colony holdings per beekeeper	References (provide link if possible)
<i>Amegilla albigena</i>								
<i>Amegilla zonata</i>								
<i>Heriades sp.</i>								
<i>Megachile fulvovestita</i>								
<i>Megachile ampuntata</i>								
<i>Megachile ceylonica</i>								
<i>Megachile chlorigaster</i>								
<i>Megachile conjuncta</i>								
<i>Megachile disjuncta</i>								
<i>Megachile lanata</i>								
<i>Megachile monticola</i>								
<i>Megachile velutina</i>								
<i>Megachile hera</i>								
<i>Xylocopa tranquebararorum</i>								

Appendix 2. *Apis* species in the three countries



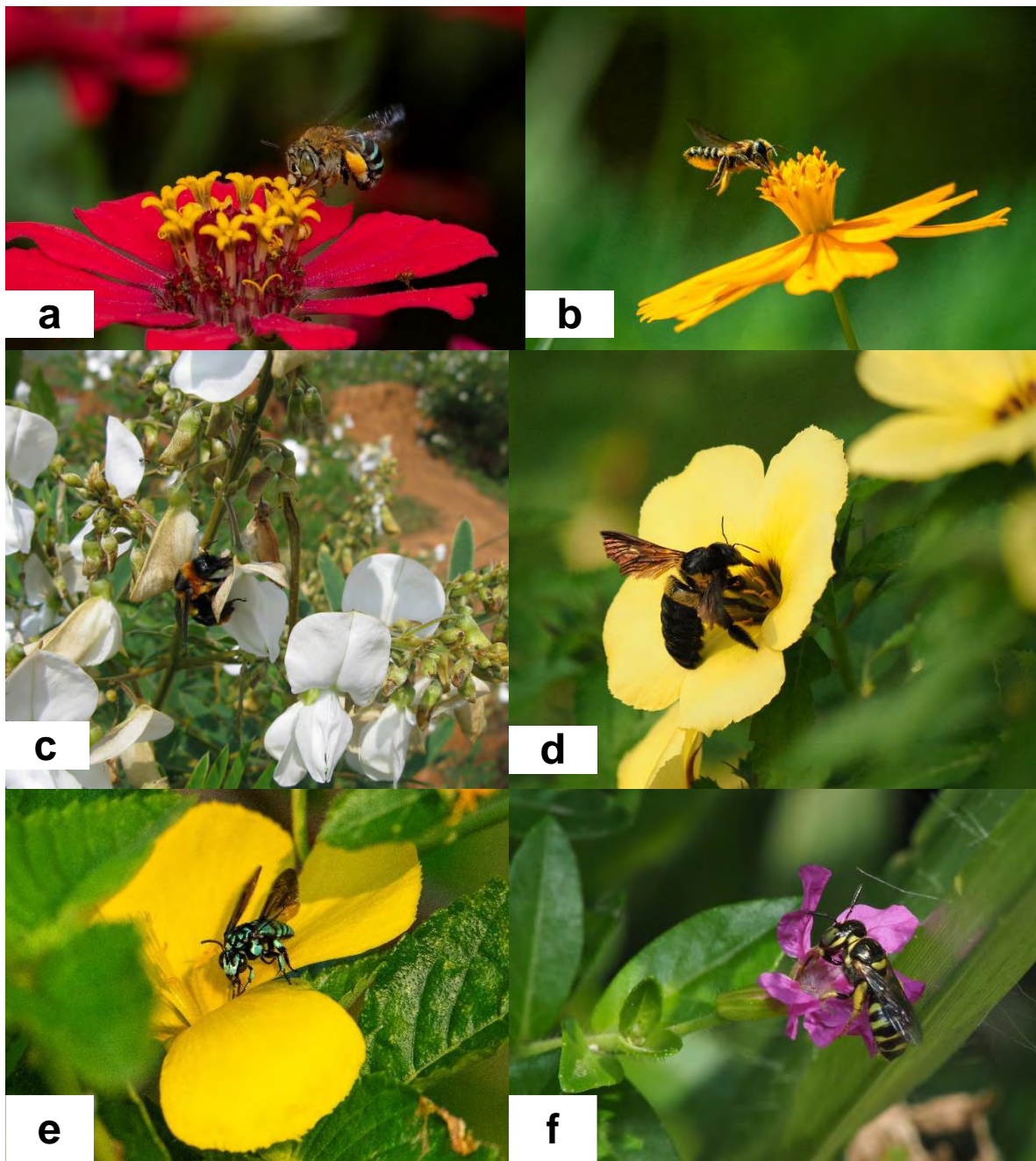
a. an *Apis breviligula* colony in a tree; **b.** *A. breviligula* workers showing the black with white stripes abdomen; **c.** *A. laboriosa* (left) and *A. dorsata* (right) worker bees [Photo credits to GW Otis]; **d.** colonies of *A. laboriosa* in Viet Nam; **e.** managed colony of *A. mellifera* in Viet Nam; **f.** nest of *A. florea* in Viet Nam; **g.** a swarm of *A. cerana* from Chiang Mai, Thailand [Photo credits to C Sinpoo]; and **h.** a nest of *A. cerana* in soil ground.

Appendix 3. Stingless bee-keeping in the three countries



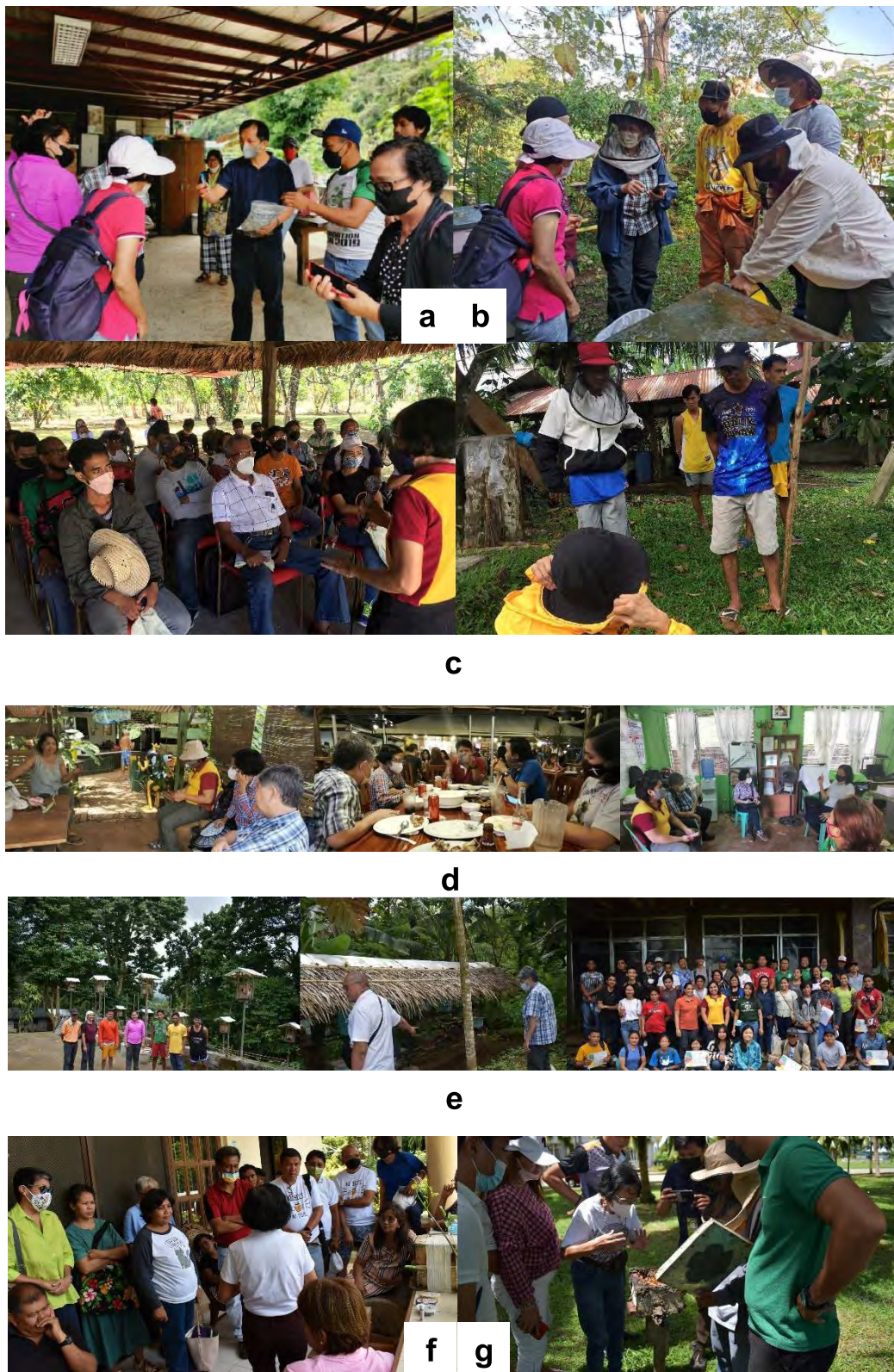
a. “coco-tech” of the Philippines, stingless bee-keeping using coconut shells; **b.** brood of *Tetragonula biroi*; **c.** managed colony of *Geniotrigona thoracica* in Thailand; and **d.** use of bamboos and logs for stingless bee-keeping in Viet Nam [Photo credits to PH Thai].

Appendix 4. Other bee pollinators



a. *Amegilla zonata* on *Zinnia elegans*; **b.** *Megachile laticeps* on *Cosmos sulphureus*; **c.** *Bombus* sp. in a mountain in Viet Nam; **d.** *Xylocopa latipes* and **e.** *Thyreus wallacei* on *Turnera ulmifolia*; **f.** *Ceratina* sp. on *Cuphea hyssopifolia*.

Appendix 5a. Photos during the conduct of survey in the Philippines



a. Benguet State University; **b.** St. Louis University Extension Institute for Small Scale Industries Foundation, Inc. (SLU-EISSIF), Benguet; **c.** Beekeepers Association of Camarines Norte, Labo, Camarines Norte; **d.** Palawan; **e.** Negros Occidental; **f.** Tagbilaran, Bohol; **g.** Panabo, Davao.

Appendix 5b. Photos during the conduct of survey in Thailand



The beekeeping group of Saraphi district, Chiang Mai Province, Thailand.

Appendix 5c. Photos during the conduct of survey in Viet Nam



a. an *Apis cerana* beekeeper; **b.** *A. cerana* farm; **c.** stingless bee-keepers; and **d.** *A. mellifera* farm.