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Handicraft of butterflies and moths (Insecta: Lepidoptera) in Bantimurung Nature Recreation Park and its implications on conservation

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Abstract. *Putri IASLP. 2016 Handicraft of butterflies and moths (Insecta: Lepidoptera) in Bantimurung Nature Recreation Park and its implications on conservation. Biodiversitas 17: 823-831.* The abundance of butterflies in Bantimurung Nature Recreation Park of Bantimurung-Bulusaraung National Park, South Sulawesi, Indonesia provides economic benefits to the community through butterfly's handicrafts trading. This study aims to determine local species of commodified butterfly that are traded in various forms of craft and its implications for the conservation of butterflies. The study was conducted through the direct identification of butterfly species which are sold as crafts or deposited directly by the catchers to collectors. Data of commodified butterfly were collected using direct interviews. Data were analyzed by descriptive quantitative and qualitative. The results showed that there are 142 species of butterfly which are traded in the period of 2010-2015. The seller participants on butterfly handicrafts consist of the butterfly catchers, middlemen, craftsmen, stall employee, stall employers, and street vendors. The buyer participants consist of local tourists, tourists from outside district/province, traders from outside district/province, buyers from overseas and scientists or butterfly collectors. The butterfly price range was in between Rp. 500.00-Rp. 150,000.00/head at collectors' level. The butterfly selling prices increased up to Rp. 7,500.00-Rp. 1,000,000.00 when they were processed into various souvenirs forms. Considering that there were so many traded butterfly souvenirs in the market, it raised an impression that there were more butterflies trapped for souvenir than free-living butterfly escaped from the trap. Commodification of butterflies needs to be regulated by setting the butterflies harvesting quota based on population in nature, sex, season and age (especially for female butterfly), accompanied by socializing rules of law, increasing public awareness about the importance of conservation butterflies, and creating new jobs for the people who depend on the butterflies trading.

Keywords: Bantimurung Nature Recreation Park, butterfly and moth, handicrafts, tourism, trade

INTRODUCTION

Butterfly (Insecta: Lepidoptera) is the most popular insect (and New Sands 2013) and most beautiful (Wagner et al. 2008; Rau 2013) in the world. Butterfly is also the most familiar insect for human (Davis and Butler 2008), ranging from children to adults. Butterfly has long become an insect that gives economic benefits for society (Ramana 2010; Boppre and Vane-Wright 2012). Several species of butterfly, such as bird wings butterfly (Sands and New in 2013), are the most wanted butterfly by collectors and are traded at a high price because it has large wings with beautiful, colorful and interesting pattern.

In the forest having butterfly richness, such as Bantimurung Nature Recreation Park (Bantimurung NRP or *Taman Wisata Alam Bantimurung*) and its surrounding areas inside the area of the Bantimurung-Bulusaraung National Park (Babul NP), the butterfly is widely used as a source of income for the local community, particularly through butterfly trading. Various forms of handicrafts of butterfly can be found to be sold at souvenir stalls alongside the entrance to this tourism place. The role of butterfly in the tourism industry in Bantimurung was very interesting to be analyzed, so the study was conducted in order to determine the species of local butterfly traded in various forms of handicrafts and its implications for the conservation of butterflies in Bantimurung NRP of Babul NP, South Sulawesi, Indonesia.

MATERIALS AND METHODS

Study area

The study was conducted at the butterfly trade center in Bantimurung Nature Recreation Park of Bantimurung-Bulusaraung National Park, Maros, South Sulawesi, Indonesia (Figure 1). Observation on the local species of butterfly which are traded in 2010-2015 was done first. Gathering information on the price at the butterfly catchers and middlemen was based on recent data collected in August 2015.

Procedures

Data retrieval on butterfly species that are traded was done by direct identification of butterfly species which are sold in various forms of handicrafts at stalls in Bantimurung NRP. Identification is also done on butterflies deposited by the butterfly catcher to middlemen or craftsmen. Photograph is taken on handicrafts of butterfly which species is difficult to be identified, and it is used in observation and further identification using identification books namely Tsukada and Nishiyama (1982, 1981, 1985, 1991), Vane-Wright and de Jong (2003), Cassidy (1995), and Peggie and Amir (2006). In addition, the photos of

crafted butterfly were also identified by matching butterfly species on it with the result of identification that have been done before in the Research Center for Biology, Indonesian Institute of Sciences (LIPI), Cibinong-Bogor, West Java, Indonesia. Initial identification on butterfly handicraft market is done by a survey method. Once market participants are identified, data collection regarding the commodification of butterflies into the handicraft by traders used interviews method (Dawson 2010; Turner 2010), both semi-structured (Laforest et al. 2009), to the merchant of butterfly craft, or in-depth interviews (DiCicco-Bloom and Crabtree 2006; Guion et al. 2011), to middlemen and butterfly catchers. Respondent selection of butterfly catchers was conducted with accidental sampling method (Pereira et al. 2005), namely doing a direct interview to a butterfly catcher who coincidentally are catching butterflies in the forest. Respondents selection of butterflies middlemen is done by snowball sampling method (Pereira et al. 2005) that is based on information from key informants about the people who work as collectors of butterflies. Respondents selection of butterfly merchants is by picking up randomly the merchants who are selling their stuffs in stalls. Topics of interview were the selling price of butterflies, the newly caught butterflies and the crafted butterflies.

Data analysis

Analysis of data on traded species of butterflies is a descriptive quantitative, namely describing the number of traded species of butterfly, the number of species in each family, as well as forms of crafts made from any species of butterfly. Data taken from interview with butterfly catchers, butterfly middlemen, craft makers, and traders were analyzed descriptively and qualitatively (Creswell et al. 2007; Vaismoradi et al. 2013; Richard 2015).

RESULTS AND DISCUSSION

There are about 142 local species of butterflies and moths (Order Lepidoptera) from seven families (Hesperiidae, Lycaenidae, Nymphalidae, Papilionidae, Pieridae, Riodinidae, and Saturniidae) which were used as materials for butterfly handicrafts in the butterfly trade center of Bantimurung NRP-Babul National Parks. Species of butterflies which are most widely used as a craft comes from the family of Nymphalidae (86 species), Papilionidae (23 species), and Pieridae (23 species) (Table 1).

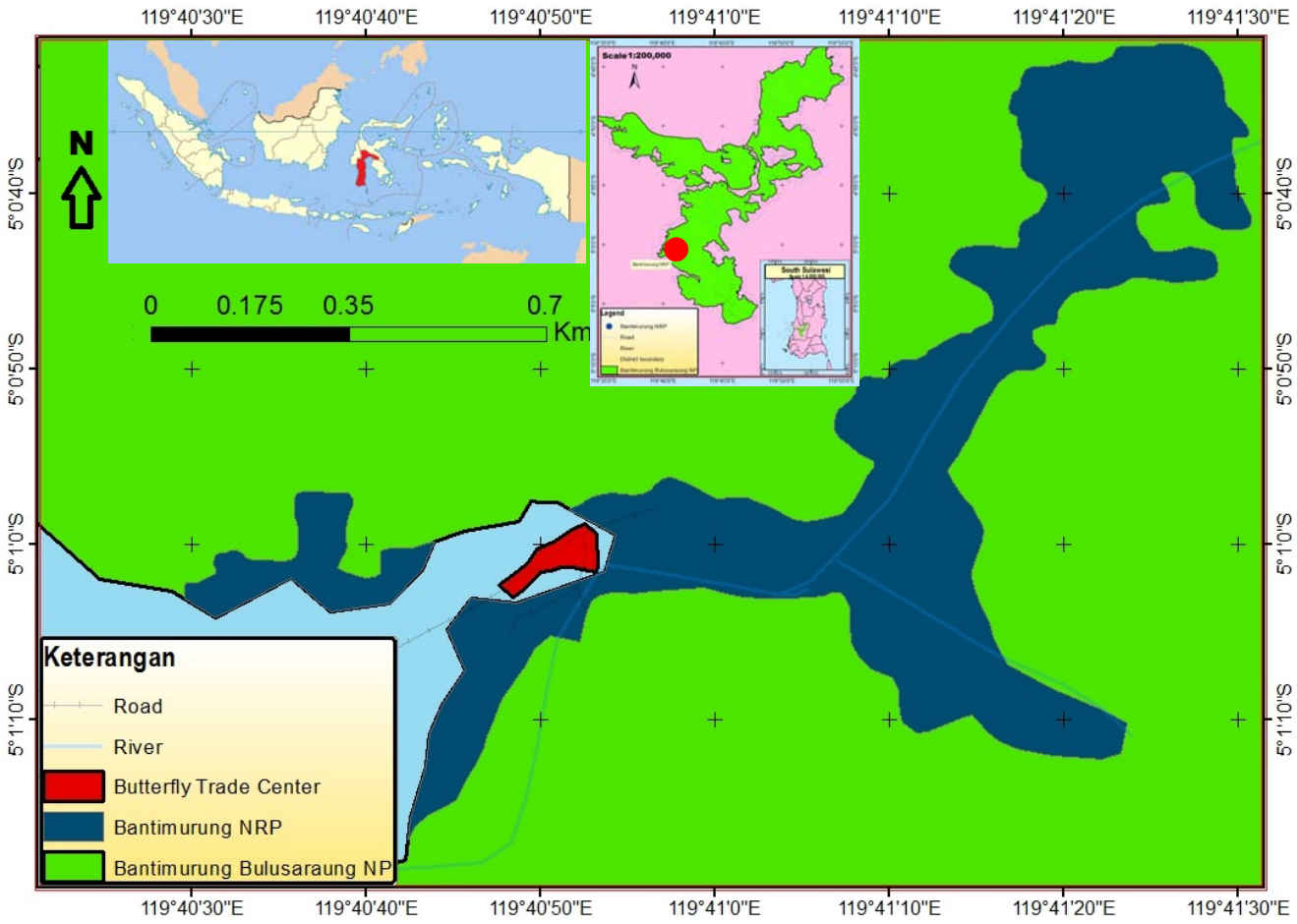

Figure 1. Location of the study at butterfly trade center of Bantimurung NRP of Babul NP, South Sulawesi, Indonesia

Table 1. Species of local butterflies traded at the butterfly trade center Bantimurung NRP of Babul NP, South Sulawesi, Indonesia

Scientific name	Family	Item price at the level of the middlemen (Rp.)	Form of craft
Tagiades sp.	Hesperiidae	500	Key chains
Arhopala irregularis	Lycaenidae	1,000	Key chains, frame
Arhopala argentea	Lycaenidae	1,000	Key chains, frame
Curetis sp.	Lycaenidae	2,000	Bracelet, necklace
Deudorix sp.	Lycaenidae	2,000	Bracelet, necklace
Jamides sp.	Lycaenidae	2,000	Bracelet, necklace
Rapala sp.	Lycaenidae	2,000	Bracelet, necklace
Tajuria sp.	Lycaenidae	2,000	Bracelet, necklace
Acraea moluccana	Nymphalidae	1,000	Key chains
Amathusia sp.	Nymphalidae	3,000	Key chains, frame
Amathuxidia plateni	Nymphalidae	3,000	Key chains, frame
Bassarona labotas	Nymphalidae	1,000	Key chains, frame
Bletogona mycalesis	Nymphalidae	1,000	Key chains, frame
Cethosia biblis	Nymphalidae	5,000	Triangular envelope, frame
*Cethosia myrina**	Nymphalidae	5,000	Triangular envelope, frame
Charaxes affinis	Nymphalidae	1,000	preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Charaxes nitebis	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Charaxes solon	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Chersonesia rahria	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Cirrochroa semiramis	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Cirrochroa thule	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Cupha maeonides	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Cyrestis strigata	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Cyrestis thyonneus	Nymphalidae	1,000	Key chains, frame
Danaus chrysippus	Nymphalidae	1,000	Preserved butterfly in triangular envelope, key chains, frame
Danaus genutia	Nymphalidae	1,000	Preserved butterfly in triangular envelope, key chains, frame
Danaus ismare	Nymphalidae	1,000	Preserved butterfly in triangular envelope, key chains, frame
Discophora bambusae	Nymphalidae	1,000	Key chains
Dophla evelina	Nymphalidae	1,000	Key chains
Elymnias cumaea	Nymphalidae	1,000	Key chains
Elymnias hewitsoni	Nymphalidae	1,000	Key chains
Elymnias hicetas	Nymphalidae	1,000	Key chains
Elymnias mimalon	Nymphalidae	1,000	Key chains
Euploea algea	Nymphalidae	1,000	Key chains, frame
Euploea configurata	Nymphalidae	1,000	Key chains, frame
Euploea eleusina	Nymphalidae	1,000	Key chains, frame
Euploea eupator	Nymphalidae	1,000	Key chains, frame
Euploea hewitsonii	Nymphalidae	1,000	Key chains, frame
Euploea latifasciata	Nymphalidae	1,000	Key chains, frame
Euploea phaenareta	Nymphalidae	1,000	Key chains, frame
Euploea redtenbacheri	Nymphalidae	1,000	Key chains, frame
Euploea westwoodii	Nymphalidae	1,000	Key chains, frame
Euripus robustus	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Euthalia amanda	Nymphalidae	♂5,000; ♀15,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Faunis menado	Nymphalidae	1,000	Key chains
Helcyra celebensis	Nymphalidae	2,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Hypolimnas anomala	Nymphalidae	1,000	Key chains, frame
Hypolimnas bolina	Nymphalidae	1,000	Key chains, frame
Hypolimnas diomea	Nymphalidae	1,000	Key chains, frame
Hypolimnas misippus	Nymphalidae	1,000	Key chains, frame
Idea blanchardi	Nymphalidae	3,000	Preserved butterfly in triangular envelope, frame

Ideopsis juventa	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Ideopsis vitrea	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Junonia almana	Nymphalidae	500	Bracelet, key chains
Junonia atlites	Nymphalidae	500	Bracelet, key chains
Junonia erigone	Nymphalidae	500	Bracelet, key chains
Junonia hedonia	Nymphalidae	1,000	Bracelet, key chains
Lamasia lyncides	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Lasippa neriphus	Nymphalidae	1,000	Key chains, frame
Lethe europa	Nymphalidae	1,000	Key chains
Lexias aeetes	Nymphalidae	1,000	Key chains, frame
Libythea geoffroy	Nymphalidae	1,000	Key chains, frame
Lohora decipiens	Nymphalidae	1,000	Key chains
Lohora dinon	Nymphalidae	1,000	Key chains
Lohora unipupillata	Nymphalidae	1,000	Key chains
Melanitis boisduvalia	Nymphalidae	2,000	Key chains, frame
Melanitis leda	Nymphalidae	2,000	Key chains, frame
Melanitis pyrrha	Nymphalidae	1,000	Key chains
Melanitis velutina	Nymphalidae	1,000	Key chains
Moduza libnites	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Moduza lycone	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Moduza lymire	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Mycalesis horsfieldii	Nymphalidae	1,000	Key chains
Neptis celebica	Nymphalidae	1,000	Key chains
Neptis ida	Nymphalidae	1,000	Key chains
Orsotriaena jopas	Nymphalidae	500	Key chains
Parantica cleona	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Parantica menadensis	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Parthenos sylvia	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Phaedyma daria	Nymphalidae	1,000	Key chains
Phalanta alcippe	Nymphalidae	500	Key chains
Polyura alphius	Nymphalidae	5,000	Key chains, frame
Polyura cognata	Nymphalidae	♂10,000; ♀50,000	Key chains, frame
Rhinopalpa polynice	Nymphalidae	1,000	Key chains, frame
Rohana macar	Nymphalidae	1,000	Key chains
Symbrenthia sp.	Nymphalidae	1,000	Key chains, frame
Tarattia lysanias	Nymphalidae	1,000	Key chains, frame
Terinos taxiles	Nymphalidae	1,000	Key chains, frame
Tirumala choaspes	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Vindula dejone	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Vindula erota	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Yoma sabina	Nymphalidae	1,000	Frame
Ypthima nynias	Nymphalidae	1,000	Key chains
Zethera incerta	Nymphalidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium agamemnon	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium androcles	Papilionidae	5,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium antiphates	Papilionidae	15,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium codrus	Papilionidae	5,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium deucalion	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame

Graphium encelades	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium eurypylus	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium meyeri	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium milon	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Graphium rhesus	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Lamproptera meges	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Pachliopta polyphontes	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio ascalaphus	Papilionidae	♂3,000; ♀5,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio blumei	Papilionidae	10,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio demoleus	Papilionidae	3,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio fuscus	Papilionidae	3,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio gigon	Papilionidae	3,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio peranthus	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio polytes	Papilionidae	1,500	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Papilio sataspes	Papilionidae	1,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
*Troides haliphron***	Papilionidae	3,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
*Troides helena***	Papilionidae	♂5,000; ♀7,500	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
*Troides hypolitus***	Papilionidae	♂15,000; ♀25,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Aoa affinis	Pieridae	1,000	Key chains, frame
Appias albina	Pieridae	500	Key chains, frame
Appias hombroni	Pieridae	500	Key chains, frame
Appias lyncida	Pieridae	500	Key chains, frame
Appias paulina	Pieridae	500	Key chains, frame
Appias zarinda	Pieridae	500	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Catopsilia pomona	Pieridae	500	Key chains, frame
Catopsilia pyranthe	Pieridae	500	Key chains, frame
Catopsilia scylla	Pieridae	500	Key chains, frame
Cepora celebensis	Pieridae	500	Key chains, frame
Cepora timnatha	Pieridae	500	Key chains, frame
Delias rosenbergi	Pieridae	2,000	Preserved butterfly in triangular envelope or wrapped in a plastic, key chains, frame
Eurema alitha	Pieridae	500	Key chains, frame
Eurema blanda	Pieridae	500	Key chains, frame
Eurema celebensis	Pieridae	500	Bracelet, key chains
Eurema hecabe	Pieridae	500	Key chains, frame
Eurema tominia	Pieridae	1,000	Necklace, bracelet, key chains
Gandaca butyrosa	Pieridae	1,000	Key chains, frame
Hebomoia glaucippe	Pieridae	1,000	Key chains, frame
Leptosia lignea	Pieridae	1,000	Necklace, bracelet, key chains
Leptosia nina	Pieridae	1,000	Necklace, bracelet, key chains
Pareronia tritaea	Pieridae	500	Key chains, frame
Saletara panda	Pieridae	500	Key chains, frame
Abisara kausambi	Riodinidae	1,000	Key chains, frame
Attacus atlas	Saturniidae	10,000	Frame

Note: The protected status: *) Government Regulation No. 7 of 1999, **) Government Regulation No. 7 of 1999, CITES Appendix II, Annex B of European Union Wildlife Trade Regulation, and Forestry Ministerial Decree No. 57 of 2008

Commodification of butterflies as craft materials

Generally, in the international market, the majority of sales of butterflies are live butterflies (Nijman 2010; Boppre and Vane-Wright 2012), caterpillars (Ramos-Elorduy et al. 2011), pupa (Shambu and Heyden 2010; Heyden 2011; Boppre and Vane-Wright 2012), or specimens of dead butterfly (Leary 1991; Pyle 1995), whereas in Bantimurung NRP-TN Babul, most butterflies are sold in dead condition and has been processed into various forms of crafts. Commodification of butterflies as craft materials were from all kinds of butterflies and were caught from the wild regardless of species, size, condition, and quality. Craft making is done on butterflies with folded (vertical) wings or with stretched wings. Butterflies with folded (vertical) wings were crafted into small to medium sized key chains, preserved butterfly in a triangular envelope, pendant necklaces, and bracelets. Butterfly with stretched wings were used as preserved butterfly display in plastic containers, frames and large key chains.

Boppre and Vane-Wright (2012) states that trade on butterflies are generally conducted on species of large butterflies, such as butterfly from the family of Nymphalidae (*Danaus, Idea, Morpho, Caligo, Cethosia, Heliconius, Hypolimnas, Parthenos*), Papilionidae (*Papilio*), and Pieridae (*Hebomoia*). However, in Bantimurung NRP-Babul NP, commodification of butterflies is on various sizes. Small butterflies, like a butterfly coming from Family Lycaenidae (*Tagiades, Jamides*), are commonly used in the manufacture of bracelets and pendant necklaces. Medium-sized butterfly is generally used for a keychain or as a display in a frame. Sized butterflies are generally only on display in the frame although there is also used as a keychain-sized. Utilization of small-sized butterfly is harder to do than of bigger one. Smaller body size and wings causes fragile butterflies. Small size is more easily damaged than the larger size butterfly. This causes the making process of pendants, key chains, and bracelets using this species of butterfly are more difficult and requires more patience than using butterfly of medium to large size. However, the selling price of the craft using small-sized butterfly is quite cheap. This condition makes the quantity of crafts using small size butterfly is far less than the crafts using bigger size of butterflies.

Colorful and beautiful butterfly wings became the main interest of butterfly (Sandved and Cassie 2004), so the butterfly trade is generally conducted on the butterfly having attractive colors of wings (Bopprea and Vane-Wright 2012). But in Bantimurung NRP-Babul NP, utilization of butterflies were also conducted on the butterfly which color was less attractive, e.g. dark brown and black butterflies. Some species of butterflies with less attractive color actually have a slightly higher price at the collectors' level because it's harder to find in nature, e.g. in *Melanitis* sp. with brown wings.

Utilization of butterflies is also conducted on all genders. In some species of butterflies, individual male, female and transvestite have a different pattern, style, and color of the wings. Such differences lead to differences in price. At the collector's level, the females have a higher price than the male butterflies. This is mainly due to the number of catches of male butterflies in nature which is always more numerous than the female butterflies. Transvestite butterflies and butterfly with peculiar wings or body have a much higher price because it is very rare and have the distinction which will not be found in normal butterflies. Those butterfly price range were in between Rp 150,000.00 – Rp. 1,000,000.00/head at middlemen's level and becomes object of hunting by collectors, especially those collectors from abroad.

Collins and Morris (1995) states that the traded butterflies have a wide range of quality. Lower quality of butterflies is generally used for ornamentation or decoration materials. High quality butterflies sometimes are completed by additional data such as the date and location of capture, and are mostly purchased by the museum or collectors of butterflies. In Bantimurung NRP-Babul NP, commodification of butterflies is carried out on several quality or level of wings damage (wing quality). A1 Quality is a butterfly with good quality of wings and no flaw at all. A$^-$ quality butterfly is a butterfly that has a little torn on the wings. A2 quality butterfly is a butterfly having slightly faded wing colors or few defects. A3 quality butterfly is a butterfly having faded wings color and/or defective wings and/or torn wings. The butterfly collectors receive all butterfly caught in nature with varying levels of quality. With a little skill, a butterfly that was heavily damaged or lightly damaged can still be used as craft materials. Utilization of butterfly with severely damaged wings or body is by removing part of the damaged body then replaced by good body parts of other butterflies, taken from the same species or from different species of butterfly, as long as it looks congenial and beautiful. Then, this butterfly can be packed into butterfly with folded wings and put into triangular envelopes (papilot envelopes), in a plastic package, or in the form of a keychain, or a display in the frame. Torn wings of butterfly can be cut neatly, while butterflies with faded colors of wings can be used as craft materials by peeling its scales, so that the butterfly wings are transparent (Figure 2).

Commodification of butterflies as craft materials were also conducted on the following species, namely *Troides haliphron, T. helena, T. hypolitus,* and *Cethosia myrina*, which are protected species of butterflies, listed in Government Regulation No. 7 of 1999 as protected species, Appendix II of CITES, and Annex B of European Union Wildlife Trade Regulation, and are classified as species of high priority for conservation by Forestry Minister Regulation No. 57 Year 2008 (Government Regulation No. 7 of 1999). Though based on Government Regulation No. 8 of 1999 on the use of plants and wildlife, the protected species may not be traded but their second generation and third generation breeded in captivity are free to be traded.

Prices of butterfly crafts and market participants

Prices of butterflies traded are various. However, the selling price of a butterfly craft abroad is relatively much higher than the price at the local level. To trade on an international scale, etsy.com puts *Troides haliphron* at a price of $43.18 per pair (etsy.com 2015). Ebay.com puts up

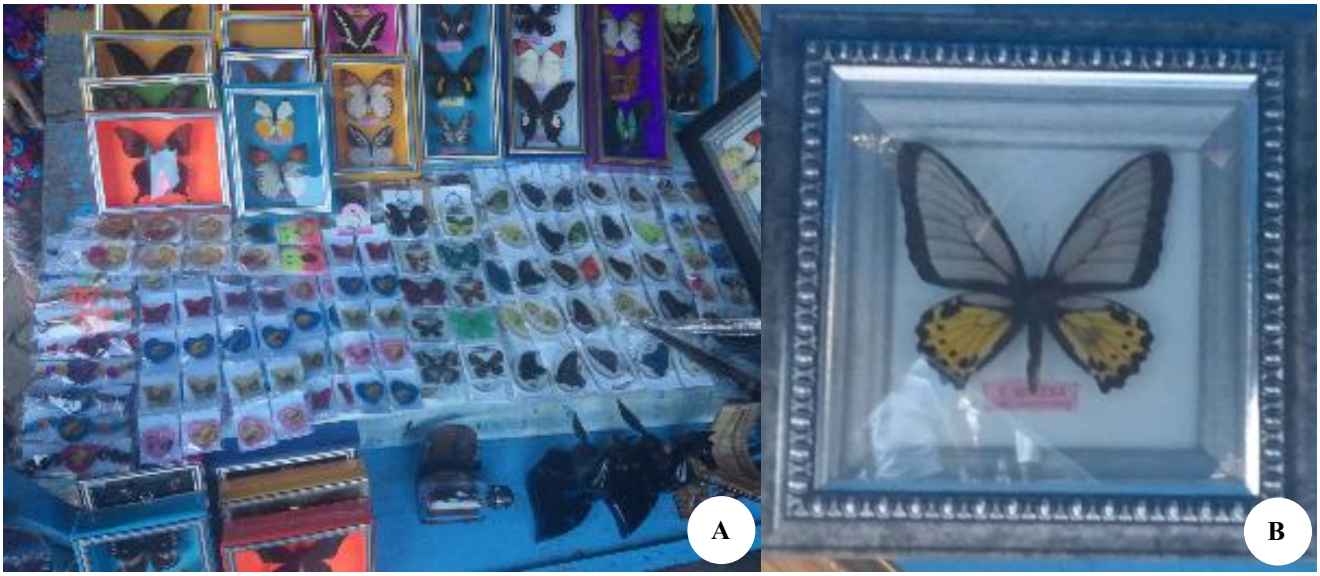

Figure 2. A. Various forms of butterfly handicrafts in Bantimurung NRP of Babul NP, South Sulawesi, Indonesia. B. Crafts on protected species of *Troides helena* in which the its scales on the wings has been peeled off

the price of $15 per head for *Troides helena*, $85 per pair for *Troides Hypolitus*, and $7.98 per head for *Cethosia myrina* (ebay.com 2015). In Bantimurung NRP-Babul NP, the selling price of butterflies depends on the level of trade, species of butterflies, quality, size, gender, season, inventories of butterflies and butterfly craft forms. For example, at the catcher level, the highest purchase price of the collectors is for *Polyura cognata*. The selling price of butterflies will increase as it is sold in the stalls. Butterflies that have been packed in the frame have a higher price than other craft forms.

There are a number of market participants (buyers and sellers) in butterfly crafts in Bantimurung NRP. Despite the fixed number of market players, there will be a change in number of individual market participants, depending on the season and market demand. First type of sellers is the butterfly catcher. Butterfly catchers are local people around Babul NP at various ages ranging from children to adults, but the butterfly catchers are mostly at the level of school age. The second type of sellers is the butterfly breeders (owner of butterflies breeding cage). Around Bantimurung NRP, the numbers of butterfly breeder left are only two persons. The advantage of butterfly breeders is that they can sell live butterflies. In general, the sale is made at the time the butterflies has reached cocoon phase. These cocoon will be sent anywhere, from Sulawesi island to overseas. Third type of sellers is butterfly middlemen who are also the local communities living around Babul NP. Some middlemen, in his spare time, are butterfly catchers. Some middlemen are also butterfly breeders. Fourth type of seller is the butterfly artisans. In general, these butterfly craftsmen are also collectors of butterflies. Butterfly middlemen and artisans whose business has gone well usually employ several craftsmen. The fifth type of seller is the owner of the kiosk. In Bantimurung NRP, there is a middlemen who also serves as a butterfly artisan as well as kiosk owner who hires employees as a kiosk assistant.

Other market participants are buyers. There are several species of butterfly buyers in Bantimurung NRP. The first kind of buyers is the local tourists who come to visit the Bantimurung NRP and, being attracted to insect's beauty of wings, they buy butterfly. Local buyers are generally not familiar with the species of butterflies that are marketed as well as having a low knowledge and understanding of the species of butterflies that exist. Local buyers also have little understanding of the condition of butterflies they buy, so they often buy the butterfly that has received specific treatment, for example, has a body of a different kind with wings, or an upper wing and a lower wing derived from different species of butterflies. The second type of buyers is traders of butterfly from outside the district/province but still in the territory of the Republic of Indonesia. These buyers generally come from the island of Java, Bali, Sumatra, and Borneo. They generally buy butterflies that will be sold again. The third type of buyer is a butterfly merchant from abroad. This kind of buyer has a good knowledge about butterflies and just buys a butterfly with good quality. Just like the second type of buyer, this buyer will also resell their purchase from Bantimurung NRP at much higher prices. The fourth type of buyer is a collector of butterflies. Butterfly collectors generally come from abroad and have a good understanding of the butterfly. Butterfly collectors from abroad often hunt for very rare butterflies, like an abnormal butterfly or a pansy butterfly and are willing to pay at a high price. Fifth type of buyer is researchers or scientists who buy butterflies for scientific purposes. In the 1970s and 1980s, the numbers of this type of buyers are still quite a lot and generally come from Japan. But this time, it can be said that there is almost no longer butterfly purchase for research purposes.

Conservation management

A large number of species of butterflies which are traded in the form of craft shows that the forest area around Bantimurung NRP of Babul NP is rich in species of butterfly. The richness of butterfly species in Bantimurung NRP even amazed Wallace while visiting Bantimurung in the past decade, so Wallace gave the nickname of The Kingdom of Butterfly on Bantimurung (Bantimurung-Bulusaraung National Park 2008; Koterman 2013). Unfortunately, the wealth of the butterfly can not be enjoyed to the fullest in the wild. When we are traveling in Bantimurung NRP, fluttering butterfly is very rarely to be found (Rahmanto 2012; Wijanarko 2012; Koterman, 2013; Gassing 2015). The disappointed visitors will only be informed that it was not in season of butterfly (Rahmanto 2012; Wijanarko 2012; Nofrianti 2015). In fact, a very contrastive situation can be seen at the entrance to the Bantimurung NRP, i.e. the numerous of butterflies are being traded continuously and abundantly (Wijanarko 2012; Nofrianti 2015) without season consideration. This gives the impression that more butterflies are displayed as a souvenir than flying freely in nature. In addition, these conditions may be indirect clues that the number of butterflies around the place was actually numerous, but most of them were captured and used as material for handicrafts and trade.

The impact of the excessive butterflies captures are the decreasing number of individual butterflies flying freely in Bantimurung NRP. In 2008, the authors conducted an interview with one of the collectors who stated that during the day, the collectors can collect up to 900-1000 butterflies from butterfly catchers. When the author interviewed him again in 2010, he claimed that butterfly catches has been reduced to only about 500-600 per day. And, at the last interview in 2014, he claimed that he could only collect 200-300 live butterflies per day (pers. comm. 2014). Based on interviews with former old butterfly catchers, in the late 1970s and 1980s, catching butterflies in large quantities can be done only around the yard. But now, to catch butterflies in large quantities, the catcher must go in a long distance into the woods (pers. comm. 2015).

Currently, the number of species of butterflies found in the area of Babul NP is still considered to be in great quantities, but, considering that many species of butterflies are traded in the form of the craft, the excessive captures will continue to be happened, and one day, the number of butterflies will not only be decreased, but certain species of butterfly will come to an extinction due to high levels of exploitation. To prevent further decline in butterfly populations, it is necessary to manage the butterfly wisely. The basic thing that is important to be done immediately is the enforceable regulation of use. This is in accordance with the opinion of Giles et al. (2006), Nijman (2006), Nekaris and Nijman (2007), Shepherd and Nijman (2007a, b), Eudey (2008) and Zhang et al. (2008) which states that in the Asian region, the laws governing wildlife trade classified as inadequate and needed initiative to create legal mechanisms in order to work more effectively. In trading butterflies in Bantimurung NRP of Babul NP, it is needed for legal enforceable regulations governing the number of individuals that can be captured based on availability in nature, gender, season, and age (especially for female butterflies). Rules of butterfly commodification should be set out in the binding and enforceable local rules and should be adhered by all participants involved in the exploitation of the butterfly. The rules need to be routinely monitored and enforcement of sanctions for offenders. Also socialization of the rules is needed, especially regarding endemic species which are rare and protected. Besides that, it would also require an increase in public awareness about the importance of conservation of butterflies, awareness improvement, and the community's role in the conservation of butterflies, for example, by no longer capturing protected butterfly in nature, by no longer catching young female butterflies that haven't laid eggs, by planting food plants around their neighborhood, as well as by increasing the number of breeding facility which is managed by the community. Another important step that can be done is to create new jobs that can provide promising income for people who depends his life on the butterfly trade.

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