CHECKLIST ON FAUNA DIVERSITY GUNUNG HALIMUN SALAK NATIONAL PARK: Cikaniki-Citalahab

DAFTAR KEANEKARAGAMAN FAUNA TAMAN NASIONAL GUNUNG HALIMUN SALAK: Cikaniki-Citalahab

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ABSTRAK

Resor Cikaniki merupakan salah satu stasiun penelitian yang mudah dijangkau di kawasan Taman Nasional Gunung Halimun Salak (TNGHS). Lokasi resor ini berdampingan dengan kampung Citalahab. Pusat Penelitian Biologi, Lembaga Ilmu Pengetahuan Indonesia dan beberapa institusi lainnya telah melakukan penelitian secara intensif mengenai keanekaragaman fauna TNGHS dari stasiun ini. Studi ini memformulasi daftar keanekaragaman fauna di sekitar stasiun penelitian Cikaniki dan Citalahab, TNGHS dari berbagai sumber, seperti survei lapangan, koleksi museum (Museum Zoologicum Bogoriense), publikasi ilmiah, dan laporan. Studi dilakukan dari bulan Oktober 2019 hingga Oktober 2020. Survei lapangan terkini dilakukan pada 8-10 Oktober 2019 di bawah skema program Jungle Survival dan Manajemen Koleksi Biologi 2019. Secara keseluruhan, terdapat 821 spesies fauna tercatat di kawasan Cikaniki-Citalahab, yang terdiri dari 48 spesies moluska, lima spesies Malacostraca, 523 spesies serangga, 22 spesies Actinopterygii, 63 spesies amfibi dan reptil, 115 spesies Aves, dan 45 spesies mamalia. Keanekaragaman tersebut menyumbang 62,1% dari total 1,323 spesies fauna yang diketahui di TNGHS. Lima spesies termasuk ke dalam kategori genting dan tiga spesies kritis. Selain itu, tercatat 123 spesies endemik Jawa dan 34 spesies termasuk ke dalam daftar jenis hewan lindungan sesuai Peraturan Menteri LHK Republik Indonesia P.106/MENLHK/SETJEN/KUM.1/12/2018. Area Cikaniki dan Citalahab kaya akan keanekaragaman hayati. Walaupun kedua area berada dekat dengan aktivitas manusia dan sering digunakan sebagai lokasi riset dan ekoturisme, upaya penyadartahuan dan penegakan konservasi baik terhadap spesies maupun habitat di wilayah ini sangat penting.

Kata kunci: hutan pegunungan tropis, keanekaragaman hayati, Cikaniki, Taman Nasional Gunung Halimun Salak, fauna

ABSTRACT

The Cikaniki resort is one of the most accessible research stations located in the Gunung Halimun Salak National Park (GHSNP). It is in adjacent with Citalahab village. The Research Center for Biology, Indonesian Institute of Sciences and other institutions have conducted intensive research on the fauna diversity of GHSNP from this station. Here we formulate a checklist on fauna diversity surrounding the Cikaniki Research Station and Citalahab, GHNSP from various sources, i.e. field work, museum collections (Museum Zoologicum Bogoriense), scientific publications, and technical report. The study was conducted from October 2019 until October 2020. The latest field work was conducted from 8-10 October 2019 under the framework of the Jungle Survival and Biological Collection Management 2019 program. In total, 821 fauna species were recorded in Cikaniki-Citalahab areas which comprises of 48 species of Mollusca, five species of Malacostraca, 523 species of Insects, 22 species of Actinopterygii, 63 species of Amphibia and Reptiles, 115 species of Aves and 45 species of Mammals. The diversity contributes 62.1% of the total 1,323 known fauna species in GHSNP. Five number of species were assigned as endangered and three species critical endangered by IUCN. In addition, 123 species were endemic to Java and 34 species protected by Regulation of the Ministry of Environment and Forestry Republic of Indonesia Number P.106/MENLHK/SETJEN/KUM.1/12/2018. The areas of Cikaniki and Citalahab are rich in biodiversity. Although both areas are in close intact with human activity, research and ecotourism, the need of continuously spreading awareness and enforce species and area conservation is inevitable.

Keywords: tropical mountain forest, biodiversity, Cikaniki research station, Gunung Halimun Salak National Park, fauna

INTRODUCTION

Gunung Halimun Salak National Park (GHSNP) is the largest mountainous tropical rain forest in Java. This conservation area belongs to three regencies (Bogor and Sukabumi Regencies in West Java, and Lebak in Banten Province) and three mountains (Gunung Endut, Halimun, and Gunung Salak complexes) (GHSNPMP 2007). Based on geographical position, GHSNP is located

between 6º36'–6º52'S and 106º16'–106º38'E according to Decree of the Minister of Forestry number 282/Kpts-II/1992. There are three vegetation zones in this national park, i.e. the lowland forest colline zone, altitude between 900-1,150 m asl; the submontane forest zone, altitude between 1,050-1,400 m asl; and the montane forest zone, altitude above 1,500 m (Simbolon *et al*. 1998).

The national park plays an important and strategic role in biodiversity conservation. Various conservation projects have been conducted in GHSNP. Collaboration project between Japan International Cooperation Agency (JICA), the Research Center for Biology - LIPI, and the Directorate General for Natural Resources and Ecosystem Conservation (KSDAE) was carried out from 1999 to 2002 in the national park to reveal the diversity of fauna species, such as fish, herpetofauna, birds, mammals, and invertebrates (Kahono *et al*. 2002a, 2002b; Mumpuni 2002; Noerdjito *et al*. 2002; Prawiradilaga *et al*. 2002a, 2002c; Rachmatika 2003; Suhardjono 2002; Suyanto 2003). The Indobiosys Project in 2015-2017 (cooperation between Research Center for Biology-LIPI and Museum für Naturkunde Berlin, Germany) also conducted research on invertebrate biodiversity of GHSNP (Cancian de Araujo *et al*. 2017, 2018; Hilgert *et al*. 2019: Nurinsiyah *et al.* 2019b). Although research on biodiversity in the national park have been conducted for consecutive years, researchers still reveal interesting findings for instance new records and new species (Kamitani *et al.* 2011; Kamitani *et al.* 2012; Ng & Wowor 2018; Nurinsiyah & Hausdorf 2017; Suwito & Watabe 2010; Suwito *et al.* 2013; Toda *et al.* 2020; Wowor & Ng 2019; Yang *et al.* 2017).

Like many forests in tropical areas, GHSNP though is a conservation area, still suffers from various threats. Forest degradation is one of the major threats to GHSNP (Sahab *et al*. 2015). Logging and agricultural expansion by local and industrial plantation were suspected to have cause annual deforestration rate being around 1.2-2.3% from 1989 to 2003 (Kubo & Supriyanto 2010). Based on landsat satellite image, forest coverage of GHSNP had degraded about 5,005.71 ha from 2003 to 2007 (Carolyn *et al*. 2013). The presence of exotic and invasive species, human disturbance from infrastructure (road paths and human settlements), the increase of human population, and distance to villages are among the threats faced by biodiversity inhabiting this conservation area (Carolyn *et al.* 2013; Endangered Species Team GHSNPMP-JICA 2005; Prabowo *et al*. 2010). Compiling a list of biodiversity in GHSNP is one of important efforts to record, monitor, and conserve biodiversity and its habitat in this conservation area.

Cikaniki research station is one of the most accessible stations in GHSNP. The station is located about 73-75 km from the Research Center for Biology, Cibinong, or approximately 142 km from Jakarta, and can be reached by car. Citalahab village is located only two km away from Cikaniki research station (DESPA-KLHK 2017). It is the

nearest village located from the research station. The village is often use for ecoturism, providing accommodation for visiting researcher, students, and ecoturist who conduct activity in the Gunung Halimun Salak National Park.

Based on intensive research conducted by various institutions in Cikaniki-Citalahab, we aim to formulate a checklist of fauna covering Mollusca, Malacostraca, Insecta, Actinopterygii, Amphibia, Reptilia, Aves, and Mammalia. The list in Cikaniki-Citalahab derived from various methods. The main objective of this study is to provide updated list on fauna diversity surrounding the Cikaniki-Cilatahab of GHSNP.

MATERIALS AND METHODS

Study Area

The study area is located between 06°44'21"S 106°31'53"E and 06°44'47"S 106°32'1"E and altitude range from 973 to 1,129 m asl or in the colline zone of lowland forest according to Simbolon *et al*. (1998). The vegetation community in this area was dominated by kareumbi (*Homalantus populneus*), cangcaratan (*Nauclea lanceolata*) and mara manggong (*Macaranga* sp.) (Sadili 2011). There were four dominant trees which were recorded along the Cikaniki-Citalahab loop trail during the field work, i.e. *Lithocarpus javensis*, *Altingia excelsa* (Rasamala), *Litsea* sp., and *Elaeocarpus* sp. Based on the measurement, the results of environmental factors in the Cikaniki-Citalahab trail are pH (6-8.8), soil moisture (40-100%), light intensity (330-4,530), temperature (21-25 ^{o}C), humidity (72-89%). Mean annual rainfall in Halimun area ranges from 3,200 to 6,000 mm and annual temperature ranges from 16 °C to 30 °C (DPJLHK 2016).

Methods

The list of fauna from Cikaniki and Citalahab, GHSNP were collected from a) field work, b) museum collections, and c) literatures study.

a. Field work

The field work was carried out from 8 to 10 October 2019. The loop trail between Citalahab to Cikaniki research station of Gunung Halimun Salak National Park were surveyed (Fig. 1). The collection activities were performed during the day with the exception of herpetofauna survey which conducted mainly at night. Afterwards, the collected samples were determined into species level when possible. Nine classes of fauna groups were sampled in this research, i.e. Gastropoda, Bivalvia, Malacostraca, Insecta, Actinopterygii, Amphibia, Reptilia, Aves, and Mammalia. All collected specimens were deposited in Museum Zoologicum Bogoriense (MZB), Research Center for Biology, Cibinong Science Center (CSC), Indonesian Institute of Sciences (LIPI).

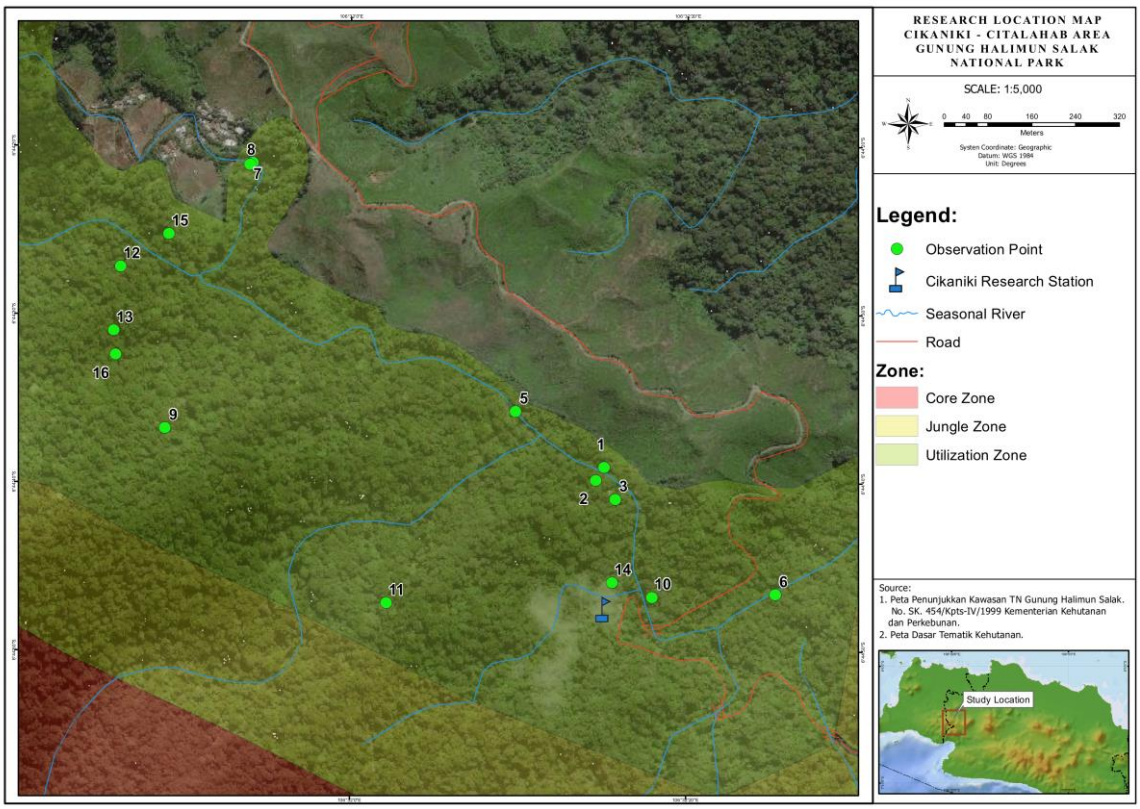


Figure 1. Observation point at Cikaniki-Citalahab track.

1) Mollusca (Gastropoda and Bivalvia)

Fauna from two classes within phylum Mollusca, namely Gastropoda and Bivalvia were collected. Gastropoda from both terrestrial and freshwater were searched, and hand collected along the trail and at several random points. Live specimens and dead shells were collected and stored in collection bottles. Live specimens were stored in the collection bottle or vial with 70% alcohol. In addition, 5 L of soil and leaf litter from each point were sampled. Later, the litter was sieved and sorted in the Cikaniki Research Station to collect microsnails. All specimens were determined into species level referring to Heryanto *et al*. (2003), Nurinsiyah & Hausdorf (2017, 2019), Nurinsiyah *et al*. (2019a), and van Benthem Jutting (1948, 1950, 1952, 1956).

2) Crustacea (Malacostraca)

Malacostraca was collected by hand collection and tray net. For each sampling location, the photo of habitat was taken. Collected specimen was photographed, labeled, and stored in 96% alcohol. Identification based on Wowor & Ng (2019).

3) Insecta

Insect samples were collected by several methods, using pitfall trap and sweep net. Pitfall trap was used to collect insects on the ground surface. Each trap consisted of plastic cup (diameter 6.5 cm x depth 9.5 cm) contained 90% alcohol and was placed for a day in each location. Trapped insects were collected and preserved into 70% alcohol and remained for 24 hours. This type of trap is commonly used for soil surface arthropods (Buchholz *et al*. 2010; Tamaddoni-Nezhad *et*

al. 2013; Ubaidillah 1999). The sweep net technique was used to collect flying insects such as Odonata and Lepidoptera. Samples of sweep net were taken at each location from 7 AM to 3 PM. Collected insects were placed in glassine paper envelopes (papilot paper). Every specimen was identified up to genus, species, and morphospecies level by a number of references (Beaver *et al*. 2019; Cameron 1931, 1932; Campbell 1982; Damaska & Aston 2019; Endrodi 1985; Jung 2013; Kondorosy 2008; Löbl & Ogawa 2016; Mawdsley 1996; Oosterbroek 1998; Pace 1999, 2014; Peggie & Noerdhito 2011; Schawaller 1989, 2016; Schilthuizen *et al*. 2019; Seevers 1978; Shanbhag & Sundararaj 2011; Sornnuwat *et al*. 2004; Strohecker 1968; Wang *et al*. 2013; Yamane 2009). For specimen verification, we involve reputable entomologists from various institutions.

4) Fishes (Actinopterygii)

Fish samples were collected from several water stream points at different habitat types from Citalahab to Cikaniki research station of GHSNP. Habitat characteristics at the sampling location were shallow riverbanks with relatively slow currents with rock, litter and mud substrates and in the center of the river which is relatively deep with sand and mud substrates. Some of the fishing gears used included hand net, tray net, and seine net. Collected fish specimens were preserved in 70% ethanol for further analyses and labeled containing field data. Every specimen was counted and identified using several key identification books such as Allen & Swainston (1988), Kottelat *et al*. (1993), and Weber & Beaufort (1922).

5) Herpetofauna (Amphibia and Reptilia)

Herpetofauna data collection was conducted through an opportunistic search and visual encounter survey (Heyer *et al*. 1994; Kusrini 2019). Herpetofauna collection was carried out by tracing along the rivers and riverbanks, as well as on land routes. Potential habitat such as deadwood, every corner of the buttress roots, in litter were searched for herpetofauna species. Specimens were manually collected by hand, then put into cotton bags. Captured specimens were recorded (species name, sampling location, date of sampling, sample code, and name of collector), photographed, euthanized, measured, injected with formaldehyde in the stomaches, and the bodies were shaped like while still alive, then preserved with formalin. After the specimens arrived at the laboratory, they were washed under running water for one to two hours, then the specimens were sorted by species and put into collection jars containing 70% alcohol. Identifications for Amphibian referred to Frost *et al*. (2006), Inger (1966), Manthey & Grossmann (1997), Iskandar (1998), and van Kampen (1923); while the reptile group referred to Das (2004), de Rooij (1915), Manthey & Grossmann (1997), and Mausfeld *et al*. (2002).

6) Birds (Aves)

Bird survey was conducted by capture and release method using mist-nets. Approximately 36 m long mist-nets (three 12 m mist-nets) were set up in the observation area opened from dawn through late afternoon (between 06.00 a.m. and 06.00 p.m.) and

checked continously. Recorded birds were identified using field guide (MacKinnon *et al.* 1998; Prawiradilaga *et al*. 2002b; Prawiradilaga *et al.* 2003).

7) Mammalia

Mammal collection methods were conducted by applying direct observation and trap method. In addition to visual encounter, records of pellet and feces were also accounted as direct observation. Trap methods were conducted using mist net and harp net for bats. Capturing flying bats especially for Megachiropthera using mist net was commonly applied because it is inexpensive, lightweight, compact, and easy to install. Meanwhile, harp net commonly used for Microchiroptera because the principle of this trap is the wires hard to detect by echolocation, and that the bank of wires is sufficient to stop the flight momentum of bats (Kunz & Kurta, 1988). Kasmin cage trap and snap trap were utilized for rats and small terrestrial mammals. All specimens were determined into species level referring to Corbet & Hill (1992), Payne *et al*. (2000), Suyanto (2001), and Suyanto *et al*. (2002).

b. Museum Collections

Scientific collections preserved in the Museum Zoologicum Bogoriense (MZB), the largest zoology museum in Southeast Asia, become one of the data sources in this study. The museum is located in the Cibinong Science Center, Bogor Regency. Specimens from previous expeditions or collection activities in Indonesia, including Gunung Halimun Salak National Park were preserved in this museum. Here we recorded specimens from various taxa, i.e. Mollusca, Malacostraca, Insecta, Actinopterygii, Amphibia, Reptilia, Aves, and Mammalia with locality "Cikaniki" and "Citalahab" or locations which include these words.

c. Literatures Study

Secondary data from scientific publications and technical reports were collected to complement the checklist (Adhikerana *et al*. 1998; Assing 2016, 2017, (2018a,b), 2019; Aswari 2004; Aswari & Cholik 2002; Atmowidi & Prawasti 2013; Atmowidi *et al*. 2007; Bordoni 2009; Chan & Setiawan 2019; Demos *et al*. 2017; den Boer 1965; Erawati & Kahono 2010; Erniwati & Ubaidillah 2011; Esselstyn *et al*. 2013; Farida *et al*. 2006; Hájek & Brancucci 2015; Hamid *et al*. 2003; Hamidy *et al*. 2018; Harahap & Sakaguchi 2002; Heryanto *et al*. 2003; Hosoishi & Ogata 2015; Ito *et al*. 2018; Kahono (2002a,b); Kamitani *et al*. 2004, 2005, 2006, 2009, 2011, 2012; Katakura *et al*. 2001; Katoh *et al*. 2018; Kimsey 2012; Kobayashi 2003; Kojima & Ubaidillah 2003; Kurniati 2002, 2004, 2005, 2006, 2010; Kusrini *et al*. 2017; Maharadatunkamsi 2001; Makihara *et al*. 2002; Marwoto 1998; Matsubayashi *et al*. 2015; Morgan *et al*. 2008; Mumpuni 2001; Murwitaningsih & Dharma 2014; Nguyen *et al*. 2006; Noerdjito 2016; Noske *et al*. 2011; Nugroho *et al*. 2016; Nurinsiyah *et al*. 2019b; Ohta-Matsubayashi *et al*. 2017; Peggie 2019; Peggie & Harmonis 2014; Prawiradilaga 2002; Prawiradilaga 2016; Prawiradilaga *et al.* (2002a,b,c);

Prawiradilaga *et al*. 2003; Prawiradilaga *et al*. 2004; Purnamasari & Ubaidillah 2007; Putra *et al*. 2019; Putri 2015; Rachmatika 2003; Rachmatika & Wahyudewantoro 2006; Rachmatika *et al*. 2001; Rachmatika *et al*. (2002a,b); Rachmatika *et al*. 2004; Ridho *et al*. 2003; Sanborn 2014; Schmidt *et al*. 2019; Sidik 1998; Somadikarta *et al*. 1970; Subekti *et al*. 2008; Sulandari *et al.* 2001; Sutrisno 2008, 2009; Sutrisno & Darmawan 2012; Sutrisno *et al*. 2015; Suwito 2007; Suwito & Watabe 2010; Suwito *et al*. 2013; Suyanto 2003; Suyanto & Sinaga 1998; Toda *et al*. 2020; Ubaidillah *et al*. 1998; Yahya & Yamane 2006; Yahya *et al*. 2009, Yang *et al*. 2017; Yoneda *et al*. 1998; Yoshitake & Noerdjito 2004). We also added data from GBIF and Indobiosys (accessed on 14-20 Oct 2020).

Validation of Scientific Name and Species Status

We validated the scientific names of all taxa according to several comprehensive database sources, i.e. Amphibian Species of the World, AntWeb, AntWiki, Avibase, Birds of the World – Cornell Lab of Ornithology, Bio-Nica.info: Lucanidae of the World, Cassidae.uni.wroc.pl, Catalogue of Life, Coreoidea Species File, FishBase, GBIF, Lamiines of World, Lepidoptera – nic.funet.fi, Lygaeoidea Species File, Molluscabase, Orthoptera Species File, Startseite Plazi, the Biodiversity of Singapore, the Moths of Borneo, the Reptile Database, Tree of Life Web Project, and Wikispecies.

The status of threatened and protected species was validated through IUCN Red List of Threatened Species and Regulation of the Ministry of Environment and Forestry Republic of Indonesia Number P.106/MENLHK/SETJEN/KUM.1/12/2018 about protected plant and animal species. Meanwhile, the status of introduced species was validated through Balon (1974), CABI, FishBase, Nurinsiyah & Hausdorf (2019), Rachmatika (2003), and Rachmatika & Wahyudewantoro (2006).

RESULTS AND DISCUSSION

Results

According to the recent field work, there were 98 species (Table 1; App.1) recorded from Cikaniki-Citalahab, GHSNP. The most abundant group was Insecta (62.9%). The rest of the percentage comprises of Actinopterygii (11.4%), Gastropoda (9.65%), Amphibia (6.4%), Malacostraca and Mammalia each 3.2%, Reptilia (2.5%), Aves (0.5%), and lastly Bivalvia (0.25%).

Based on all three sources, i.e. recent field work, museum collections, and literatures, there were 821 fauna species were recorded in Cikaniki-Citalahab (Table 1; App.2). The fauna diversity comprises of 63.7% of Insecta, 14% of Aves, 5.7% of Gastropoda, 5.5% of Mammals, 4.4% of Reptilia, 3.3% of Amphibia, 2.7% of Actinopterygii, 0.6% of Malacostraca, and 0.1% of Bivalvia. There are 123 endemic species to Java inhabit the area (Table 1; App. 3). Among the fauna diversity, 34 species (4.1%) were assigned as protected Indonesian fauna under the decree P.106/MENLHK/SET-JEN/KUM.1/12/2018, whereas five species

(0.6%) were categorized as endangered and three species (0.4%) were categorized as critically endangered by IUCN. In addition, there are eleven introduced species recorded in the area, i.e. four Actinopterygii and seven Mollusca (Table 2).

The proportion of our species compilation data compared to the fauna species data recorded in Indonesia includes 2.32% for non-marine (terrestrial and freshwater) Gastropoda, 8.98% for Insecta, 6.57% for Aves, 5.86% for Amphibia, 5.82% for Mammalia, 7.14% for non-marine (freshwater) Bivalvia, 4.51% for Reptilia, 0.42% for non-marine (fresh-water) Malacostraca, and 1.77% for non-marine (freshwater) Actinopterygii (Table 3). We believe the fauna diversity particularly the invertebrate species recorded in Indonesia were still underestimate from the actual number in nature.

Tabel 1. Species comparison between field work and compilation data (*protected by P.106/2018; **IUCN Red List status).

No.	Class	Field Work		Compilation Data (species)	Status (species)			
		Abundance (individual)	Species Richness		Endemic	Protected*	EN**	CR**
1	Mammalia	13	13	45	4	11	3	1
2	Aves	2	2	115	18	21	2	1
3	Reptilia	10	4	36	1	0	0	0
4	Amphibia	26	9	27	10	1	0	1
5	Actinopterygii	46	3	22	3	0	0	0
6	Insecta	254	51	523	77	1	0	0
7	Malacostraca	13	1	5	2	0	0	0
8	Gastropoda	39	14	47	8	0	0	0
9	Bivalvia	1	1	1	0	0	0	0
	Total	404	98	821	123	34	5	3

Table 2. Introduced species recorded in Cikaniki-Citalahab.

No.	Scientific Name	Local Name	Native Range
	Mollusca: Gastropoda		
1	*Allopeas clavulinum* (Potiez & Michaud, 1838)	Keong sumpil	Africa
2	*Allopeas gracile* (Hutton, 1834)	Keong sumpil	Neotropics, Old World
3	*Bradybaena similaris* (Férussac, 1822)	Keong semak	Probably China
4	*Physella acuta* (Draparnaud, 1805)	-	North America
5	*Pomacea canaliculata* (Lamarck, 1822)	Keong mas	South America
6	*Subulina octona* (Bruguière, 1789)	Keong sumpil	Neotropics
	Mollusca: Bivalvia		
7	*Sinanodonta woodiana* (Lea, 1834)	Kijing Taiwan	Eastern Asia

	Chordata: Actinopterygii		
8	*Cyprinus carpio* Linnaeus, 1758	Ikan mas	Japan, China, Central Asia
9	*Poecilia latipinna* (Lesueur, 1821)	Bungkreung, Ikan seribu	Mexico, Southeasthern USA
10	*Poecilia reticulata* Peters, 1859	Bungkreung	North & South America*
11	*Xiphophorus hellerii* Heckel, 1848	Cingir putri, Paris	Belize, Guatemala, Honduras, Mexico

*North America: Antigua and Barbuda, Barbados, Trinidad and Tobago
*South America: Brazil, Guyana, and Venezuela

Table 3. Comparison of fauna diversity in Cikaniki-Citalahab, GHSNP, and Indonesia.

No.	Class	Cikaniki-Citalahab* (species)	Gunung Halimun Salak National Park* (species)	Indonesia** (species)
1	Mammalia	45	83	773
2	Aves	115	271	1,751
3	Reptilia	36	61	798
4	Amphibia	27	32	461
5	Non-marine Actinopterygii	22	69	1,243
6	Insecta	523	713	5,825
7	Non-marine Malacostraca	5	7	1,200
8	Non-marine Gastropoda	47	84	2,025
9	Non-marine Bivalvia	1	3	14
	Total	**821**	**1,323**	**14,090**

*Based on field work, literatures, and museum collections
**Based on Amphibian Species of the World, Avibase, BOLD Systems, FishBase, Marwoto *et al*. (2020), Maryanto *et al*. (2019), the Reptile Database, Widjaja *et al*. (2014)

a. Mollusca (Gastropoda & Bivalvia)

Based on the recent field work, in total of 40 specimens of molluscs belonging to 14 Gastropoda (snails) and one Bivalvia (mussels) species were collected (Table. 1). Although more specimens were collected from the freshwater (57.5%) compare to the terrestrial (42.5%), they belonged to only five species (from 15 species) of freshwater molluscs. The number of species collected from the terrestrial (land snails) were ten species. The most species-rich family was Cyclophoridae (20%), while the most abundant family was Physidae (30%) (App. 1). Using the same method, Heryanto (2001) reported that land snail species (26 species from 11 families) were collected more than freshwater snail species (10 species from 5 families). All terrestrial gastropod species that were recorded in the recent field work were not new records and included in the list of land snails of GHSNP (Nurinsiyah *et al*., 2019b).

Compilation data from field work, MZB collections, and literatures resulted 48 species of Mollusca consists of 47 Gastropoda and one Bivalvia. In Java, there were at least 242 species of land snails (Nurinsiyah 2018), 67 species of freshwater snails and 14 species of freshwater bivalves (Marwoto *et al*. 2020). Molluscs in Cikaniki-Citalahab contributed 14.9% to the total non-marine molluscs in Java, 25% if the total mollusca in GHSNP are included. The molluscs diversity in GHSNP are expected to be higher than the current record since the estimated species richness of terrestrial gastropod alone might reach 93 species (Nurinsiyah *et al*. 2019).

Figure 2. Left: *Geotrochus conus* (Pfeiffer, 1841). Right: *Japonia ciliocincta* (Martens, 1865).

Figure 3. *Geosesarma cikaniki* at Cikaniki-Citalahab track.

Eight species endemic to Java were recorded in the area and all of them are terrestrial gastropoda (land snails), i.e. *Diplommatina halimunensis* Nurinsiyah & Hausdorf 2017, *Pupina junghuhni* Martens 1867, *Microcystina subglobosa* (Möllendorff 1897), *Chloritis fruhstorferi* Möllendorff 1897, *Amphidromus alticola* Fulton 1896, *Oospira salacana* (Böttger 1890), *Elaphroconcha patens* (Martens 1898), and *Geotrochus conus* (Pfeiffer 1841) (Fig. 2). There were seven introduced species recorded in Cikaniki-Citalahab which consists of four land snails and three freshwater species (Table 2). There were no molluscs in Cikaniki-Citalahab or GHSNP in general that are protected by Permen LHK P.106/2018. However, they are protected by its locality (inhabit inside a conservation area).

b. Crustacea (Malacostraca)

Previous surveys and studies recorded seven crustaceans from GHSNP, namely *Geosesarma cikaniki*, *Malayopotamon* sp., *Macrobrachium pilimanus*, *Macrobrachium empulipke*, *Occulthusa halimun*, *Parathelphusa bogorensis*, and *Parathelphusa convexa* (Hernawati unpublished; Ng & Wowor 2018; Wowor 2010; Wowor & Ng 2019). The species were recorded in Cikaniki-Citalahab area, except *M. empulipke* and *P. bogorensis*. From the current study, one crustacean was collected by hand at elevation 1,066-1,155 m asl, i.e. *Geosesarma cikaniki* (Fig. 3). Thirteen collected *G. cikaniki* specimens consist of seven males, four females, and two juveniles. Based on the recent field work, tubercle on the dactylus is only present on adult male specimen around 15-19 teeth. The fact corresponds to Wowor & Ng (2019). However, young male with mature pleopod, width length (WL) 7.32-7.62 mm and carapace length (CL) 6.9-7.17 mm, has only seven tubercles on the proximal dactylus. *G. cikaniki* and *O. halimun* are endemic to GHSNP. *M. empulipke* can be found in Java and Sumatra (Wowor 2010), *P. bogorensis* and *convexa* occurred in Java (Esser & Cumberlidge 2008), and *M. pilimanus* is distributed from Sumatra, Java, and Kalimantan (Cai *et al*. 2004; Chace & Bruce 1993).

c. Insecta

Study on insects in the Halimun Salak National Park in 2015 to 2017 under the IndoBioSys project revealed the diversity of insect species from four orders (Coleoptera, Lepidoptera, Hymenoptera, and Trichoptera) reaching around 3,500 species (Cancian de Araujo *et al*. 2017). Our recent field work collected 254 insect specimens consisted of nine orders, 23 families, and 51 species (Table 1; App. 1). The family Formicidae represented the order Hymenoptera had the highest abundance with 98 specimens (from nine species). This result was in accordance with the research of Haneda *et al*. (2019), but Kahono & Noerdjito (2002) reported that the order Homoptera was the most abundant during October 2000 or even from March 2000 until February 2001 by applying the same method. Suhardjono (2002) reported that Formicidae and Staphylinidae were two of the most abundant insect families in Cikaniki, GHSNP. Meanwhile based on the compilation

data from recent field work, museum collections, and literatures, in total of 523 species of Insecta were recorded in Cikaniki-Citalahab (Table 4). Ordo Coleoptera and Lepidoptera had greater members than other orders. The species was dominated by family Cerambycidae (20.07%), followed by family Nymphalidae (15.67%) and family Geometridae (7.45%). The three families have been recorded in Cikaniki-Citalahab and its surroundings respectively by Makihara *et al*. (2002), Peggie & Harmonis (2004) and Ubaidillah *et al*. (1998), and Sutrisno *et al*. (2015).

Table 4. Insect diversity from Cikaniki-Citalahab based on field work, MZB collections, and literatures

No.	Taxa	No. of Species	Percentage (%)
Blattodea		**5**	**0.96**
1	Blaberidae	2	
2	Blattidae	1	
3	Termitidae	2	
Coleoptera		**162**	**30.98**
4	Cerambycidae	105	
5	Chrysomelidae	10	
6	Cleridae	2	
7	Curculionidae	2	
8	Discolomatidae	1	
9	Endomychidae	1	
10	Hydrophilidae	1	
11	Lucanidae	17	
12	Passalidae	3	
13	Scarabaeidae	7	
14	Staphylinidae	12	
15	Tenebrionidae	1	
Dermaptera		**1**	**0.2**
16	Anisolabididae	1	
Diptera		**13**	**2.49**
17	Culicidae	3	
18	Drosophilidae	9	
19	Phoridae	1	
Hemiptera		**31**	**5.93**
21	Cercopidae	6	
22	Cicadellidae	9	
23	Cicadidae	6	
24	Gerridae	1	
25	Lygaeidae	1	
26	Pentatomidae	1	
27	Pyrrhocoridae	1	
28	Reduviidae	2	
29	Rhyparochromidae	1	
30	Tessaratomidae	1	
Hymenoptera		**32**	**6.1**
31	Apidae	8	
32	Chrysididae	2	
33	Eulophidae	2	
34	Eumenidae	1	
35	Formicidae	12	
36	Scoliidae	5	
37	Vespidae	2	
Lepidoptera		**238**	**45.89**
38	Bombycidae	1	
39	Crambidae	20	
40	Drepanidae	11	
41	Geometridae	39	
42	Hesperiidae	15	
43	Lycaenidae	20	
44	Noctuidae	6	
45	Nymphalidae	82	
46	Papilionidae	15	
47	Pieridae	23	
48	Pyralidae	1	
49	Riodinidae	2	
50	Saturniidae	1	
51	Sphingidae	1	
52	Thyrididae	2	
53	Uraniidae	1	
Mantodea		**2**	**0.38**
54	Mantidae	2	
Odonata		**15**	**2.87**
55	Calopterygidae	2	
56	Chlorocyphidae	1	
57	Coenagrionidae	3	
58	Euphaeidae	1	
59	Libellulidae	8	
Orthoptera		**22**	**4.2**

No.	Taxa	No. of Species	Percentage (%)
60	Chorotypidae	1	
61	Gryllidae	3	
62	Gryllotalpidae	1	
63	Tetrigidae	1	
64	Tettigoniidae	16	
Total		**523**	**100**

The recent field work revealed *Odontoponera* and *Pheidole* were more abundant genera than the others in Formicidae (App. 1). *Odontoponera* that we collected in altitude 1,060-1,076 m asl near Cikaniki research station (Fig. 4) are either *Odontoponera denticulata* or *O. transversa*. Based on two characters (relative length of antennal scape and development of raised area on vertex), our specimens are expected to be *Odontoponera transversa* which is mostly known to be found in natural habitat, while *O. denticulata* is contrary (Yamane 2009) at least when both species are overlapping in distribution. Yamane's specimens (four workers) from around Cikaniki are *O. transversa* that are rather dark-colored. Nevertheless, Yamane commented to our specimens that they are probably *O. denticulata*. There is a strong possibility that *O. transversa* and *O. denticulata* have related cryptic species. Moreover, there is a possibility that mountain populations are specifically different from lowland populations (S. Yamane 2020, pers. comm.).

Meanwhile, the beetles (Coleoptera) had the highest species richness with 21 recorded species, and the member of rove beetles (Coleoptera: Staphylinidae) was the largest (10 species) of all insect families (App.1). The greatest abundance in rove beetles was represented by tribe Athetini (subfamily Aleocharinae; fig. 5a). This result corresponded to Qodri *et al*. (2016) by the same method (pitfall trap). Seevers (1978) declared that the athetine beetles could adapt in various microhabitat, so they become the most successful small beetles. In comparison to other trap, Yamamoto *et al*. (2013) denoted the tribe Athetini occupied the second place to Oxytelini (Staphylinidae: Oxytelinae) in abundance by the dung trap method. We also collected one individual which was expected a member of genus *Stilicoderus* (Staphylinidae: Paederinae; fig. 5b) based on Cameron (1931). In Mount Halimun, Assing (2017) reported his finding of *Stilicoderus parvus* on August 2009. Another *Stilicoderus* was known to be distributed in Java, i.e. *S. bacchusi* (Rougemont, 1986), *S. brunneipennis* Cameron, 1936, and *S. drescheri* Cameron, 1936 (Assing 2016). The other staphylinid beetles were from subfamily Staphylininae, i.e. *Philonthus* sp. (Fig. 5c) and *Thoracostrongylus* sp. (Fig. 5d). Cameron (1937) has described a number of species from these two genera that were collected by Mr. F. C. Drescher in Java, one of which is from Mount Slamet.

Figure 4. *Odontoponera transversa* from Cikaniki. Left: front side, Right: lateral side. White arrow shows development of raised area on vertex (triangular bump form). The rest of the antennal scape that exceeds the head is 1.7-2.6 times longer than the first funicular segment.

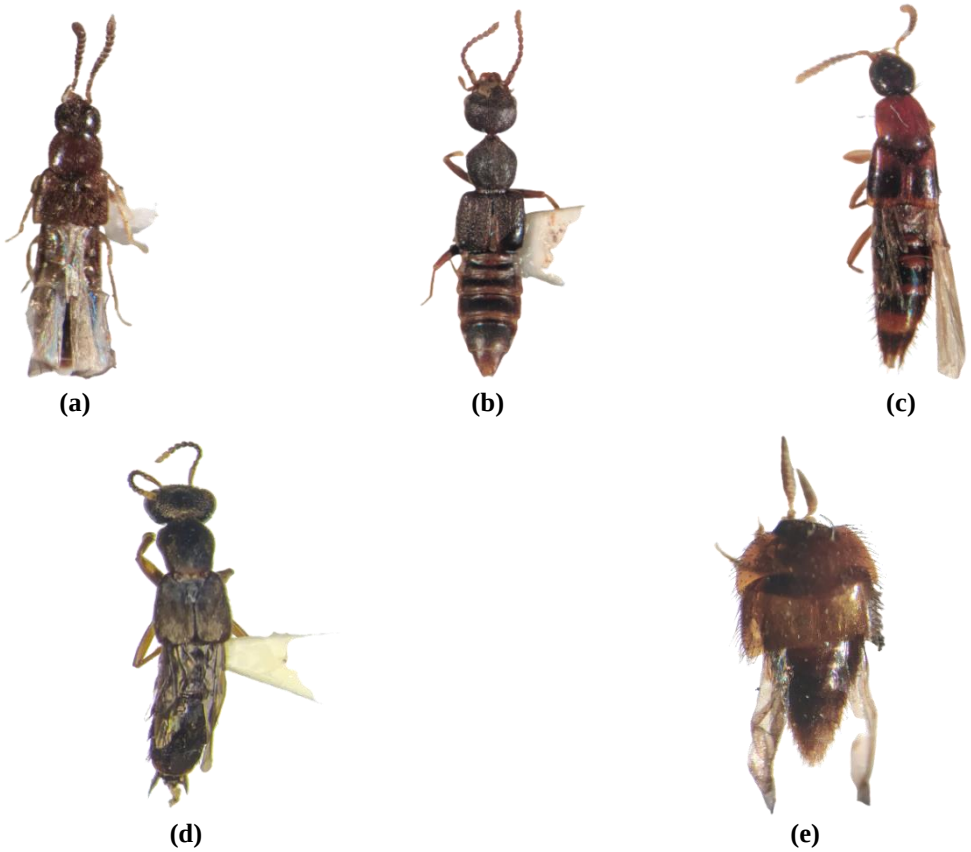


Figure 5. Rove beetles from Cikaniki. a) An athetine member (BL = ±1.5 mm), b) *Stilicoderus* sp. (BL = ±4.2 mm), c) *Philonthus* sp. (BL = ±5 mm), d) *Thoracostrongylus* sp. (BL = ±8mm), e) *Ystrixoxygymna* sp. (BL = ±1.6 mm). Annotation: BL = Body Length.

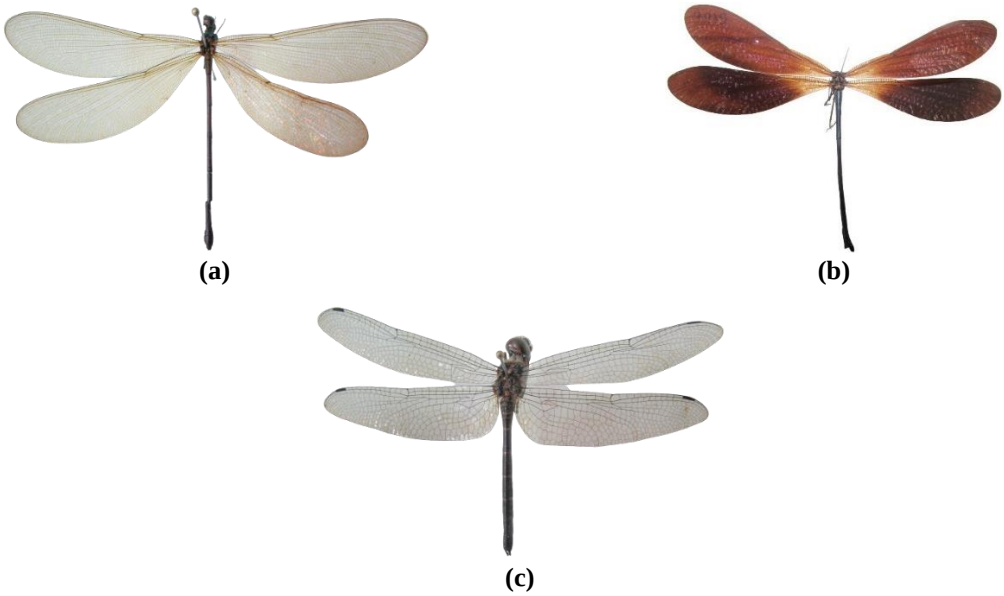
When viewed per species, *Odontotermes* sp. (termite colony; Fig. 6a-c) of the order Blattodea which was collected at Curug Macan (973 m asl) near Cikaniki research station had the highest number of collected specimens (63 individuals; App.1) consists of 52 workers and eleven soldiers. These termites were obtained through hand

collections from the decayed wood which has been crushed together with the soil. Interestingly, we found a beetle from the Tachyporine group, i.e. *Ystrixoxygymna* sp. (Fig. 5e), which was strongly suspected of being associated with termites. Based on morphological characters, it was similar to termitophilous Staphylinidae, e.g. *Coptotermocola clavicornis* (Kanao *et al*. 2012), *Discoxenus katayamai* (Kanao *et al*. 2010), and *Termitodiscus* sp. (Yamamoto *et al*. 2016). *C. clavicornis* was collected in nest of *Coptotermes gestroi*, while *D. katayamai* and *Termitodiscus* sp. were found to be symbiotic with genus *Odontotermes*.

Based on the sweep netting method, we collected five individual odonates and 13 individual lepidopterans (App. 1). The two dragonfly species were identified as *Vestalis luctuosa* (male and female; fig. 7a,b) and *Zygonyx ida* (Fig. 7c). They were previously recorded in Cikaniki and more frequently found near stream (Aswari 2004; Aswari & Cholik 2002). In line with the data compilation result, Nymphalidae is the most abundant and diverse butterfly family in recent field work.

(a) **(b)** **(c)**

Figure 6. *Odontotermes* sp. from Cikaniki. (a) Pronotum shaddle shaped, b) Head: left mandible with small tooth, c) Lateral view (scale = 1 mm).



(a) **(b)**

(c)

Figure 7. Dragonflies from Cikaniki-Citalahab loop trail. (a) *Vestalis luctuosa* ♀, (b) *V. luctuosa* ♂, (c) *Zygonix ida*.

Neptis clinia (Fig. 8a,b), *Cupha erymanthis* (Fig. 8c), and *Tanaecia iapis* (Fig. 8d) are representatives of Nymphalidae in our recent field work. The first species was collected near Cikaniki research station, and the last two were found at Cikaniki-Citalahab loop trail. *Neptis clinia* was never reported its presence in Halimun-Salak. However, Eliot (1969) described new subspesies (*N. c. phrasylas*) of *N. clinia* which was collected by Fruhstorfer one of which in Lawang, East Java in 1897. From GBIF occurence datasets, only *N. c. phrasylas* which occurred in Java and all recorded specimens were deposited in Museum Leiden. Especially for West Java, the specimens were known to be distributed in Mega Mendung, Raja Mandala, and Sukabumi (de Vos & Creuwels 2020). On the other hand, *Cupha erymanthis* and *Tanaecia iapis* were also recorded in the western part of Java (Banten and West Java) (Bahar *et al*. 2016; Dendang 2009; Lestari *et al*. 2018; Murwitaningsih & Dharma 2014; Mustari & Gunadharma 2016; Peggie 2012; Peggie & Amir 2006; Peggie & Harmonis 2014; Septianella *et al*. 2015).

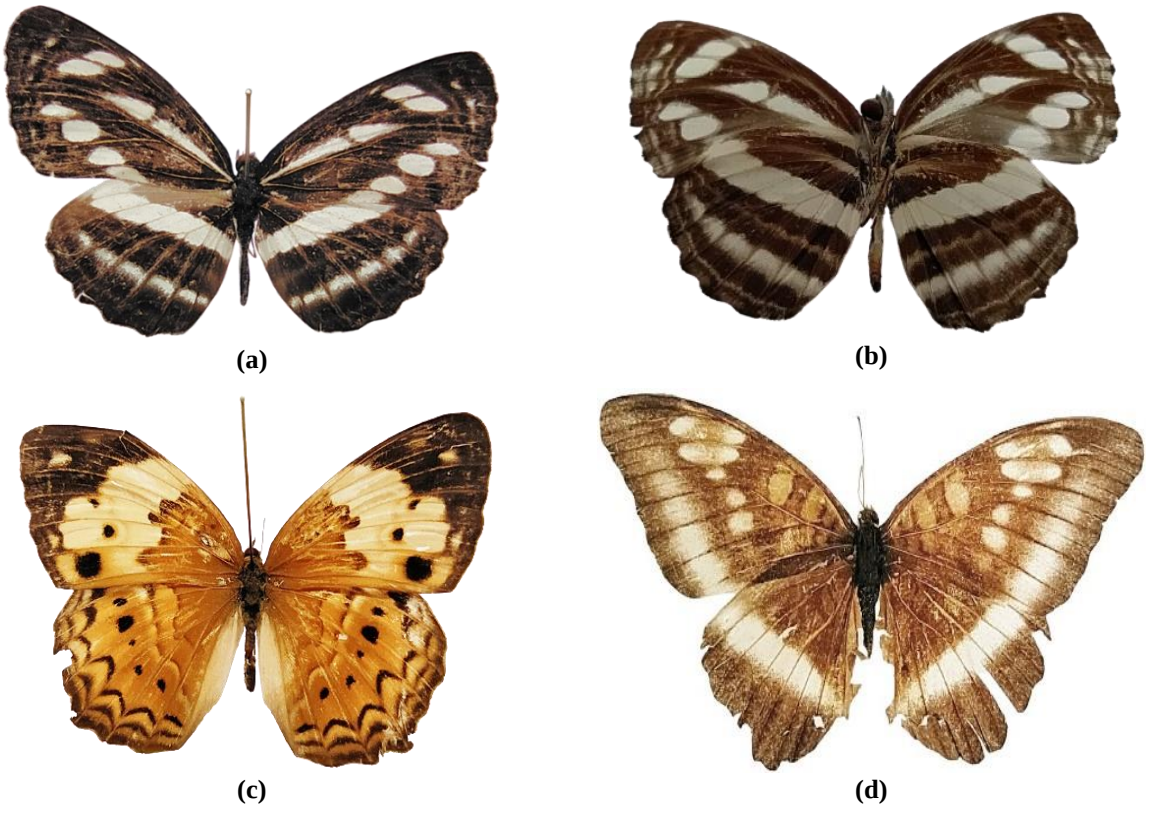


Figure 8. Brush-footed butterflies from Cikaniki-Citalahab. (a) *Neptis clinia* (upper-side; W = ±4.3 cm), (b) *N. clinia* (down-side), (c) *Cupha erymanthis* (W = ±4.5 cm), (d) *Tanaecia iapis* ♀. Annotation: W = Wingspan.

Highlighting the beetles, we did not collect longicorns due to the different method applied. However, two coleopterans were identified to species level, i.e. *Eumorphus columbinus* (Endomychidae) and *Omadius indicus* (Cleridae). We collected a handsome fungus beetle *E. columbinus* (Fig. 9a) at Curug Macan, while two checkered beetles *O. indicus* (Fig 9b) was found in groups together with *Stigmatium* sp. (Fig. 9c) in fallen rotten wood on the Cikaniki-Citalahab loop trail (1,124 m asl). Strohecker (1968) described *E. columbinus* originating from Banten and presumed to be confined to Java. In 1986, Mawdsley (1996) examined *Omadius indicus* collected by P. M. Hammond from the Bogani Nani Wartabone National Park, North Sulawesi. *Omadius indicus* recorded in Java is known to be deposited in the collection of British Museum (Gray 1849). In the meantime, *Stigmatium* badly needs revision (Gerstmeier 2020, pers.comm.).

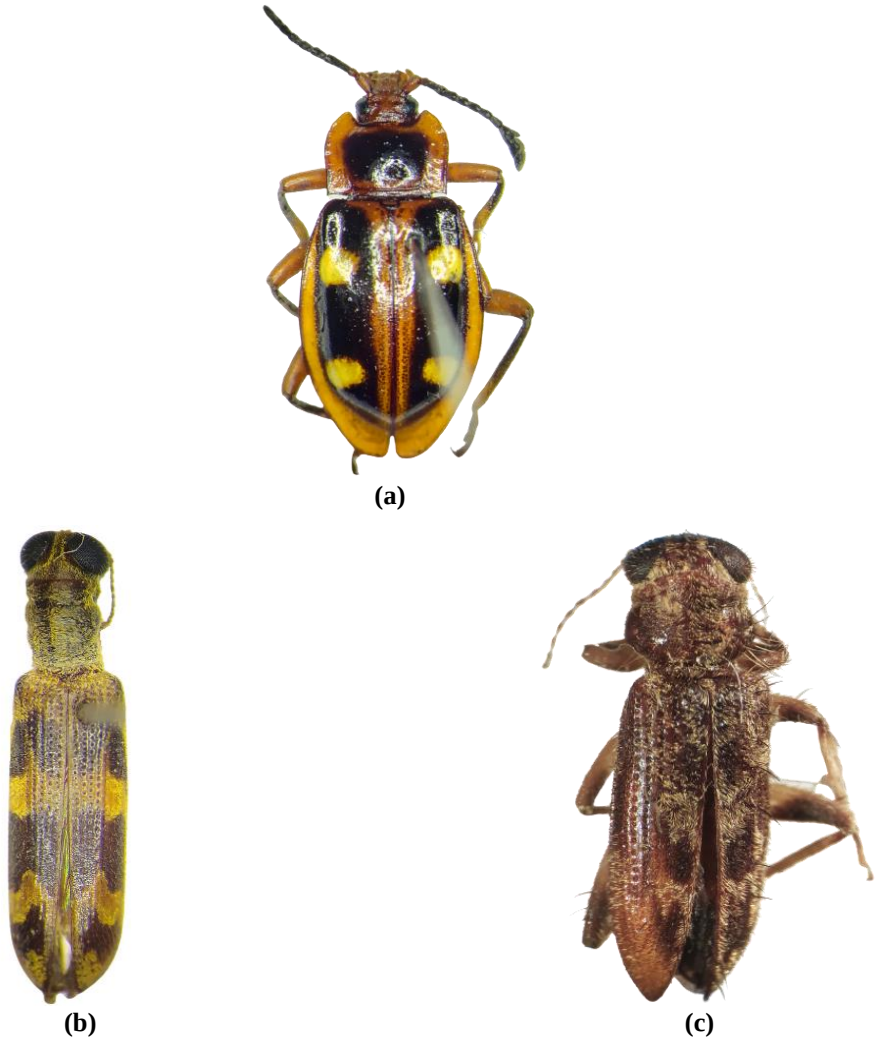


Figure 9. Endomychidae and Cleridae from Cikaniki-Citalahab. (a) *Eumorphus columbinus* (BL = ±9.7 mm), (b) *Omadius indicus* (BL = ±8.7 mm), (c) *Stigmatium* sp. (BL = ±6 mm). Annotation: BL = Body Length.

According to the compilation data, we also calculated 77 species among the insects were endemic to Java. A single species (*Troides helena*) was reported to be protected by government (Permen LHK P.106/2018). In the meantime, several species of longhorn (Cerambycidae) and stag beetles (Lucanidae), namely *Bandar pascoei*, *Batocera parryi*, *Hexarthrius rhinoceros*, *Odontolabis dalmani bellicosa*, *Prosopocoilus astacoides*, *Prosopocoilus zebra*, and *Serrognathus taurus* were registered in the list of Non-Appendix CITES based on Decree of the Directorate General of Natural Resources and Ecosystem Conservation No. SK.1/KS-DAE/KKH/KSA.2/1/2020 concerning quotas for harvesting natural plants and capturing wild animals for the period 2020.

d) Fishes (Actinopterygii)

There were 46 fish specimens that we collected covering three species from three different families, i.e. *Rasbora lateristriata* (33 specimens) and *Poecilia reticulata* (11 specimens) were collected at Cikaniki-Citalahab, and *Channa gachua* (two specimens) only found from Citalahab. We collected them in shallow river with gravel sand substrate and the flow is relatively swift. Those three species were also recorded by Rachmatika (2003). Based on the compilation data from various methods, there were 22 species of Actinopterygii from five orders and eight families that recorded in Cikaniki-Citalahab (App. 2), and four species of which are introduced species (Table 2). Due to sampling duration, the number of species found in recent field work is relatively less than previous study by Rachmatika *et al.* (2002b) which reported seven species of fishes from Cikaniki. At least, Rachmatika (2003) collected five species near our study site, i.e. *Glyptothorax platypogon*, *Rasbora aprotaenia*, *Channa gachua*, *Monopterus albus*, and *Cyprinus carpio*.

Rasbora lateristriata (Fig. 10) was found abundant during the recent field work. Rachmatika (2003) previously reported that the distribution of this freshwater fish included Sundaland, Bali, Lombok, and Sumbawa. However, the latest records state that this species is endemic to the western part of Java and adapted in the upstream and downstream rivers, with clear water condition, moderate current, and rock and gravel substrates (Kusuma *et al*. 2016; Lumban-tobing 2019). In GHSNP, this species has been found at the upstream of Cisadane and Cikaniki river, also in Kampung Central, Citalahab (Lumbantobing 2014) and inhabited rocky and gravel waters with moderate flow in Cisadane river (Rachmatika 2003). The conservation status in IUCN Red List is vulnerable (VU) and not protected by the Ministry of Environment and Forestry regulation number P.106/2018.

Poecilia reticulata is originated from part of South America (Farr 1975) and had been introduced widely around the world (CABI [accessed on 19 Nov 2020]). This species can be found in various types of freshwater and tend to be more abundant in smaller rivers or ponds than in large, deep, or fast-flowing rivers (Magurran & Philip 2001). This species is not evaluated (NE) in IUCN Red List and not protected by the government regulation.

Figure 10. *Rasbora lateristriata* from Curug Macan, Cikaniki.

Channa gachua is widespread in Asia region, including Indonesia (FishBase [accessed on 19 Nov 2020]). Adults inhabit medium to large rivers, brooks, rapid-running mountain streams, and stagnant water bodies including sluggish flowing canals (Taki, 1978) as well tributary in Halimun-Salak Mountain (Rachmatika 2003). The conservation status in IUCN Red List is least concern (LC) and also not protected by the government regulation.

e) Herpetofauna (Amphibia & Reptilia)

The recent field work recorded nine species of amphibian and four species of reptiles. The species include five families of amphibians (Ranidae, Dicroglossidae, Bufonidae, Rhacophoridae, and Megophryidae) and three families of reptiles (Scincidae, Agamidae, and Colubridae). A total of 10 species (76.92%) were listed in IUCN Red List of Threatened Species as least concern (LC). Two species of reptiles, i.e. *Gonocephalus kuhlii* (Fig. 11) and *Sphenomorphus sanctus* listed as not evaluated (NE). Among the 13 recorded species, five are endemic to Java, they are *Huia masonii*, *Leptophryne borbonica* (Fig. 12), *Limnonectes microdiscus*, *Philautus pallidipes*, and *Rhacophorus margaritifer*. According to the previous records, eight endemic herpetofauna species were recorded in GHSNP, namely *Rhacophorus margaritifer*, *Philautus pallidipes*, *Leptophryne cruentata*, *Microhyla achatina*, *Huia masonii*, *Philautus vittiger*, and *Spenomorphus puncticentralis* (Kurniati 2005; Mumpuni 2001). In October 2008, Riyanto (2011) reported four Javan endemic anurans (*Huia masonii*, *Megophrys montana*, *Microhyla achatina*, and *Rhacophorus margaritifer*) were found in Gunung Ciremai National Park. Eight herpetofauna species were recorded in lowland forest, seven of which were *Chalcorana chalconota*, *Limnonectes kuhlii*, *Gonocephalus chamaeleontinus*, *Cyrtodactylus fumosus*, *Hemidactylus frenatus*, *Sphenomorphus sanctus*, and *Sphenomorphus temminckii*. Meanwhile, *Gonocephalus kuhlii* was collected in the shrub-old pine forest (1500-1600 m asl), secondary forest (1600-1700 m asl), and primary forest (1700-2000 m asl) of Gunung Ciremai National Park.

Figure 11. *Gonocephalus kuhlii* at Cikaniki research station.

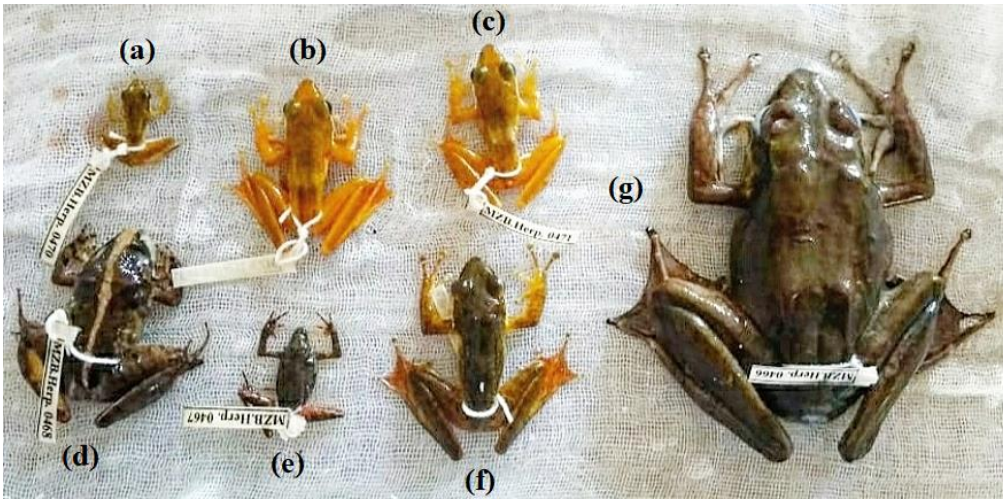


Figure 12. Amphibian species from Cikaniki-Citalahab. (a-b-c-f) *Chalcorana chalconota*, (d) *Limnonectes kuhlii*, (e) *Leptophryne borbonica*, (g) *Odorrana hosii*. Remarks: all specimens were collected at Citalahab, except for *L. borbonica* in Cikaniki.

Based on data compilation from recent field work, MZB collections, and literatures, there were 63 species recorded from Cikaniki-Citalahab (Table 1). The highest number of species came from family Rhacophoridae and Colubridae, each with seven species (App. 2). Two species of snakes, namely *Naja sputatrix* and *Malayopython reticulatus* were assigned in the list of Appendix CITES for trade quota, in which regulated globally. Among the recorded species, eleven species are endemic to Java and one species, *Leptophryne cruentata*, listed as critically endangered (CR).

f) Birds (Aves)

From the mist net method, two bird species were recorded, i.e. *Alcedo meninting* (Blue-eared Kingfisher) and *Zoothera andromedae* (Sunda Thrush) (Fig. 13). The small number of species obtained was supposed to be the result of short period of mist-netting activity and insufficient availability of bird catching nets. The presence of the blue-banded kingfisher

(*Alcedo euryzona*) on the forest floor of Gunung Kendeng, GHSNP was previously reported in May and October 2001, while Sunda Thrush (*Zoothera andromedae*) was reported from August to November 2001 (Prawiradilaga *et al*. 2002). In Cikaniki, we recorded *A. meninting* near the stream. *A. meninting* was reportedly suitable to inhabit not far from river shingles (Noske *et al*. 2011) and stream (Chan & Setiawan 2019). The natural habitat of *A. meninting* was streams, creeks, channels and estuaries in evergreen and wet deciduous forest, bamboo-forest and dense mangroves, regenerating and tall secondary forest, forest edge, and occasionally found at streams through tree plantations (Woodal 2020). Meanwhile, *Z. andromedae* can be found in understorey of dense primary mossy hill forest and montane forest (Collar 2020). Since 2016, the conservation status of *Alcedo meninting* and *Z. andromedae* was reportedly included in the least concern (LC) category (Prawiradilaga 2016).

Figure 13. *Alcedo meninting* (left) and *Zoothera andromedae* (right) in Cikaniki.

Based on the compilation data from field work, MZB collections, and literatures, there were 115 species of birds recorded in Cikaniki-Citalahab (Table 1) consist of 12 orders and 42 families (App. 2). Ordo Passeriformes (77 species) contributed as the most diverse species than others, in which, family Muscicapidae (19 species) had the largest members. The two bird species (*Nisaetus bartelsi* & *Chloropsis cochinchinensis*) were categorized as endangered and one species (*Alcedo euryzona*) as critically endangered according to the IUCN Red List. They were also assigned in the list of protected species based on Permen LHK No. P.106/2018, except *C. cochinchinensis*. Five species were registered in the list of Non-Appendix CITES for trade quota regulated by the government, i.e. *Alophoixus bres*, *Erythrura prasina*, *Pomatorhinus montanus*, *Prinia familiaris*, and *Zosterops palpebrosus*. For the migratory birds, one species (*Cyornis brunneatus*) was recorded before in Cikaniki-Citalahab (Noske *et al.* 2011). Mahood *et al.* (2013) confirmed that *C. brunneatus* as a migratory bird and its status in the IUCN Red List was globally vulnerable. We also recorded 16 species of Javan endemic birds from Cikaniki-Citalahab and surroundings. Prawiradilaga (2016)

revealed that GHSNP is very important for the survival of 43 endemic bird species (17 are endemic to Indonesia, 26 are endemic to Java and Bali), in which 32 of the total endemic species in the national park are birds with restricted distribution.

g) Mammalia

Three bats were collected during the recent field work. They consist of two common species, i.e. *Chironax melanocephalus* and *Cynopterus brachyotis* (Fig. 14) which were both trapped in mist net. In addition, ten mammal species were encountered by direct observation. *Cuon alpinus* was not encountered by visual observation but recorded by its sound. Based on previous studies, ten species were reported in Cikaniki Research Station (Tobing 2002, Mustari *et al*. 2015). Chiroptera was captured on this site in 2002 (Mustari *et al*. 2015), however identification did not carry out up to species level. One of interesting findings was Sunda Stink-badger (*Mydaus javanensis*) which visually encountered in the observation track (Fig. 13). Sunda Stink-badger was reported to have nocturnal activity (Higashide *et al*. 2018, Vickers *et al*. 2017). Nevertheless, *Mydaus javanensis* at Halimun was active during the day (Suyanto 2003). At the Gunung Botol resort, also belongs to GHSNP, *M. javanensis* was reportedly caught by camera trap between October and November 2012 (Mustari *et al*. 2015).

Figure 14. *Cynopterus brachyotis* (left) from Cikaniki and *Mydaus javanensis* (right) at Cikaniki-Citalahab loop trail.

Based on the recent field work, MZB collections, and literatures there were 45 species of Mammalia in Cikaniki-Citalahab (Table 1). The family Pteropodidae and Muridae had the most species (each 11.11%), followed by Vespertilionidae and Viverridae (each 8.89%). Another family member ranged between 2.22%–6.67% (App. 2). However, several species were not found in this recent field work such as *Panthera pardus*, *Prionailurus bengalensis*, *Prionodon linsang*, *Amblonyx cinereus*, *Muntiacus muntjak*, and Muridae species. It might be caused by short collecting time and inappropriate tools. Some mammals required different methods and efforts. The two species of mammals were only identified to genus level. According to the IUCN Red List, one mammal species was

assigned as Critically Endangered (CR), i.e. *Manis javanica*. A single species (*Viverricula indica*) recorded from Cikaniki-Citalahab was registered in the list of Appendix CITES and eleven species were listed in protected species.

Discussion

There are 552 conservation areas in Indonesia which covers 27.4 million ha comprises of 22.1 milion ha or terrestrial conservation area and 5.3 milion ha of marine conservation area (KLHK, 2018). Approximately 59.79% from the total conservation area assigned as national parks. These areas are the center for Indonesian biodiversity (DESPA-KLHK 2017). In Indonesia, there are 54 national parks which covers 16.52 milion ha. Among twelve national parks in Java, Gunung Halimun Salak National Park is the largest tropical mountain rain forest remaining in Java with total area of 113,357 ha (DESPA-KLHK 2017). Based on compilation data from field work, literatures, and museum collections, at least 1,323 fauna species (Table 3) inhabit the national park. This number might underestimate the actual number of fauna diversity in GHSNP. The Indobiosys project estimated around 3,500 insect species of specimen collection from 2015 to 2017 in GHSNP (Cancian de Araujo *et al*. 2017). Prawiradilaga *et al*. (2016) emphasized that GHSNP is one of the National Parks which has the highest bird species richness in Java and Bali.

In the last decade alone, at least 13 new species were described from GHSNP. Most of the newly described species were insects, namely *Cardiodactylus erniae* Robillard & Gorochov 2014, *Drosophila sungaicola* Suwito & Watabe 2010, *Drosophila hitam* Suwito & Watabe 2010, *Drosophila barobusta* Suwito & Watabe 2010, *Drosophila sundaensis* Suwito & Watabe 2010, *Drosophila albipalpis* Katoh, Toda & Gao 2018, *Dichaetophora javaensis* Yang & Gao 2017, *Halimunella tadauchii* Kamitani 2012, *Hishimonus bilobatus* Kamitani 2011, *Phortica halimunensis* Toda 2020. There were two Malacostraca described from GHSNP in the past decade, i.e. *Occulthusa halimun* Ng & Wowor 2018 and *Geosesarma cikaniki* Ng & Wowor 2019. In addition, one terrestrial Gastropoda was described from the national park which was *Diplommatina halimunensis* Nurinsiyah & Hausdorf 2017.

The fauna diversity in GHSNP also higher compare to most of national parks in Java. Compare to Gunung Ciremai National Park (GCNP), GHSNP inhabits 2.65 times more species of Cerambycidae (106 species) in Cikaniki-Citalahab alone. Noerdjito (2011), Aswari (2011), and Peggie & Noerdjito (2011) reported 40 species of Cerambycidae, 20 species of dragonflies, and 109 species of butterflies from 2006 to 2008 at Mount Ciremai. The number of terrestrial gastropods also higher in GHSNP compare to GCNP which recorded 48 species (Heryanto 2012). The total vertebrate species recorded in Cikaniki-Citalahab were 245 species. The number is higher compare to vertebrate diversity reported from GCNP which was 165 species (Gunawan *et al*. 2008;

Maharadatun & Maryati 2008; Rachmatika & Wahyudewantoro 2009; Riyanto 2011; Surahman 2010).

Compare to the neighbouring montane forest, Gunung Gede Pangrango National Park (GGPNP), species richness of vertebrates recorded in GHSNP was 1.4 times greater than the species found in GGPNP. Birds in GGPNP consist of 48 families and 262 species (Ario 2010), while in GHSNP at least 53 families and 271 species were reported (Prawiradilaga 2016). Mammals in GGPNP consist of seven orders, 20 families, and 50 species (Ario 2010). A total of 39 mammal species in GHSNP based on our compilation data were also recorded in GGPNP. From the seven species of fishes reported in GGPNP (Ario 2010), all were recorded in GHSNP and six species among them occurred in Cikaniki-Citalahab.

The number of species richness in GHSNP is slightly higher compare to Alas Purwo National Park (APNP) which located in the most eastern part of Java. Nugraha *et al*. (2012) revealed 46 species of mammals, 283 species of birds, 49 species of reptiles, 15 species of amphibians, and 10 species of fish in APNP. The species composition between the two national parks is somewhat different. Based on the 13 species recorded by Ainullah *et al*. (2015), only one species was recorded both in GHSNP and APNP namely *Caranx sexfasciatus*. Broto & Subeno (2012) recorded 18 species of reptiles and 13 species of amphibians in 2008-2009 and eight species among them were not recorded in GHSNP. The different species composition might be caused by different climatic conditions. Annual temperature and soil pH in Java increased and the annual precipitation decreased toward the eastern part of Java (Whitten *et al*. 1997; Wikramanayake 2002).

Among other stations in GHSNP, fauna diversity in Cikaniki-Citalahab is quite high which supported about 62.1% of fauna diversity in GHSNP (Table 3). However, increasing human activity might lead to the disruption on the fauna habitat and diversity. GHSNP, especially Cikaniki research station and its surroundings, is an important conservation area which inhabits high number of endemic species. Some species among them are currently under critical or critically endangered status. This shows that information on biodiversity needs to be continuously disclosed because of the role of national park as conservation area. Furthermore, periodic research needs to be carried out with the aim of uncovering population trends of each species group, conservation management, and uncovering new species discoveries.

CONCLUSION

Gunung Halimun Salak National Park is the largest tropical mountain rainforest in Java. Cikaniki and Citalahab area of GHSNP, although located near human settlement, the number of species inhabited the area was still high. 821 species were recorded based on recent field work, MZB collection, and literatures study. 123 endemic species to Java inhabit the area. Furthermore, five species were assigned as endangered, three species as

critically endangered by IUCN, and 34 species were included in the list of protected species based on P.106/MEN-LHK/SETJEN/KUM.1/12/2018. Further and comprehensive research on the fauna biodiversity in the Gunung Halimun Salak National Park are still needed. Species inventory and monitoring are compulsory as part of biodiversity conservation in particular and area conservation in general. Moreover, raising awareness and enforcing conservation effort in these areas are very important to protect both the species and the habitat.

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AUTHOR CONTRIBUTIONS

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None of authors has a conflict of interest. The details of our contribution are as follows: AQ, ASN, E, IVU, M, NS, PRF, PSS, RTH, SR, and UN conducted sampling at the study sites. ED is in charge for mammalian taxa, Y for birds and mapping, AENH for herpetofauna, IVU and R for fishes, RTH for crustaceans, ASN for mollusks, and finally AQ, ASB, and E are responsible for insect taxa. FS and GA assisted in the manuscript work and data checking. ASN reviewed the manuscript before submission. AQ coordinated and ensured the entire process in the manuscript processing.

SUPPLEMENTARY DOCUMENTS

Appendix 1. Field Work Specimens from Cikaniki-Citalahab (https://hdl.handle.net/20.500.12690/RIN/KNT3WX)

Appendix 2. Fauna Diversity at Cikaniki-Citalahab Resort, GHNSP (https://hdl.handle.net/20.500.12690/RIN/KNT3WX)

Appendix 3. Endemic Fauna at Cikaniki-Citalahab Resort, GHSNP (https://hdl.handle.net/20.500.12690/RIN/KNT3WX)

REFERENCES

Adhikerana, A. S., Komeda, S., Wijamukti, S., & Marakarmah, A. (1998). The Birds of Gunung Halimun National Park, West Java: with particular reference to altitudinal distribution. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors), *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. 121-138). Bogor: Biodiversity Conservation Project in Indonesia. A Joint Project with LIPI, PHPA, and JICA.

Ainullah, M. V., Sudarmadji, & Utami, E. T. (2015). Keanekaragaman Jenis Ikan di Blok Bedul Segoro Anak Taman Nasional Alas Purwo (Fish Diversity in Blok Bedul Segoro Anak Alas Purwo National Park). *Berkala Sainstek*, 3(1): 16-19.

Allen, G. R. & Swainston, R. (1988). *The marine fishes of north-western Australia: a field guide for anglers and divers*. Perth: Western Australian Museum.

Ario, A. (2010). *Mengenal Satwa Taman Nasional Gunung Gede Pangrango* [field guide]. Jakarta: Conservation International Indonesia.

Assing, V. (2016). On Stilicoderus and Stiliderus V. Two new species, additional records, and a catalogue (Coleoptera: Staphylinidae: Paederinae). *Linzer biol. Beitr.*, 48(1): 281-300.

Assing, V. (2017). On Stilicoderus VI. Two new species from South Vietnam and additional records (Coleoptera: Staphylinidae: Paederinae). *Linzer biol. Beitr.*, 49(1): 369-376.

Assing, V. (2018a). A revision of *Medon*. XI. Five new species, additional records, and the first confirmed records from the Oriental region (Coleoptera: Staphylinidae: Paederinae). *Beiträge zur Entomologie*, 68(1): 69–81.

Assing, V. (2018b). A revision of Palaearctic and Oriental *Pseudolathra*. V. Two new species from Cambodia and Thailand, and additional records (Coleoptera: Staphylinidae: Paederinae). *Linzer biol. Beitr.*, 50(2): 1005-1014.

Assing, V. (2019). A revision of Palaearctic and Oriental Rugilus. VI. Two new species Irom China, a new synonymy, and additional records (Coleoptera, Staphylinidae, Paederinae). *Linzer biol. Beitr.*, 51(1): 5-20.

Aswari, P. (2004). Ekologi Capung Jarum Calopterygidae: *Neurobasis chinensis* Dan *Vestalis luctuosa* di Sungai Cikaniki, Taman Nasional Gunung Halimun [Ecology of Dragonflies in Cikaniki River, Gunung Halimun National Park]. *Berita Biologi*, 7: 57 – 63.

Aswari, P. (2011). Capung di Kawasan Gunung Ciremai. In Peggie, D. (Editor), *Fauna Serangga Gunung Ciremai: Kumbang Sungut Panjang, Capung, Kupu-Kupu* (pp. 35-52). Jakarta: LIPI Press.

Aswari, P. & Cholik, E. (2002). Keragaman Serangga Air di Taman Nasional Gunung Halimun. In Kahono, S., Okayama, T., Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I* (pp. 126-139). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI, PHKA, and JICA.

Atmowidi, T., Buchori, D., Manuwoto, S., Suryobroto, B., & Hidayat, P. (2007). Diversity of Pollinator Insects in Relation to Seed Set of Mustard (Brassica rapa L.: Cruciferae). *Hayati Journal of Biosciences*, 14: 155-161. https://doi.org/10.4308/hjb.14.4.155

Atmowidi, T. & Prawasti, T. S. (2013). *Kajian biologi kumbang Rove (Paederus spp.) dan organisme simbion penghasil senyawa toksik* [Research Report]. Bogor: LPPM IPB.

Bahar, I., Atmowidi, T., & Peggie, D. (2016). Keanekaragaman Kupu-Kupu Superfamili Papilionoidea (Lepidoptera)

di Kawasan Hutan Pendidikan Gunung Walat Sukabumi, Jawa Barat (Diversity of Butterflies Superfamily Papilionoidea (Lepidoptera) in Gunung Walat Education Forest, West Java). *Zoo Indonesia*, 25(1): 71-82.

Balon, E. K. (1974). *Domestication of the carp Cyprinus caprio L*. Toronto: The Royal Ontario Museum.

Beaver, R. A., Smith, S. M., & Sanguansub, S. (2019). A review of the genus *Dryocoetiops* Schedl, with new species, new synonymy and a key to species (Coleoptera: Curculionidae: Scolytinae). *Zootaxa*, 4712 (2): 236-250. DOI: https://doi.org/10.11646/zootaxa.4712.2.4

Bordoni, A. (2009). New data on species of the Xantholinini from the Oriental Region. XX. Species collected by Riedel in Sumatra, Java and Bali in 2005-2007 (Coleoptera, Staphylinidae). *carolinea*, 67: 109-115.

Broto, B. W. & Subeno. (2012). Keanekaragaman Jenis Herpetofauna di Seksi Pengelolaan Taman Nasional (SPTN) I, Alas Purwo, Banyuwangi, Jawa Timur [Diversity of Herpetofauna Species at the Section I of Alas Purwo National Park, Banyuwangi, East Java]. *Widyariset*, 15(3): 519–526.

Buchholz, S., Jess, A., Hertenstein, F., & Schirmel, J. (2010). Effect of the colour of pitfall traps on their capture efficiency of carabid beetles (Coleoptera: Carabidae), spiders (Araneae) and other arthropods. *Eur. J. Entomol.*, 107(2): 277-280. doi: 10.14411/eje.2010.036.

Cai, Y., Naiyanetr, P., & Ng, P. K. L. (2004) The freshwater prawns of the genus *Macrobrachium* Bate, 1868, of Thailand (Crustacea: Decapoda: Palaemonidae). Journal of Natural History, 38(5): 581-649. DOI: 10.1080/0022293021000033238

Cameron, M. (1931). *The Fauna of British India, Including Ceylon and Burma. Coleoptera. Staphylinidae – Vol.II*. London: Taylor and Francis, Red Lion Court, Fleet Street.

Cameron, M. (1932). *The Fauna of British India, Including Ceylon and Burma. Coleoptera. Staphylinidae – Vol.III*. London: Taylor and Francis, Red Lion Court, Fleet Street.

Cameron, M. (1937). Fauna Javanica. The Staphylinidae collected by Mr. F. C. Drescher. Part II. *Tijdschrift voor entomologie*, 80: 1 – 37.

Campbell, J. M. (1982). A revision of the genus *Lordithon* Thomson of north and central America (Coleoptera: Staphylinidae). *Memoirs of the Entomological Society of Canada*, 119:1-116.

Cancian de Araujo, B., Schmidt, S., Schmidt, O., von Rintelen, T., Ubaidillah, R., & Balke, M. (2018). The Mt Halimun-Salak Malaise Trap project - releasing the most species rich DNA Barcode library for Indonesia. *Biodiversity*

Data Journal, 6: e29927. https://doi.org/10.3897/BDJ.6.e29927

Cancian de Araujo, B., Schmidt, S., von Rintelen, T., Sutrisno, H., von Rintelen, K., Ubaidillah, R., Häuser, C., Peggie, D., Narakusumo, R. P., & Balke, M. (2017). Indobiosys – DNA Barcoding as A Tool for the Rapid Assessment of Hyperdiverse Insect Taxa in Indonesia: A Status Report. *Treubia*, 44: 67–76.

Carolyn, R.D., Baskoro, D.P.T. & Prasetyo, L.B. (2013). Analisis degradasi untuk penyusunan arahan strategi pengendaliannya di Taman Nasional Gunung Halimun-Salak Provinsi Jawa Barat. Majalah Ilmiah Globe, 15, 39-47.

Chan, B. P-L. & Setiawan, A. (2019). New record of the Critically Endangered Javan Blue-banded Kingfisher *Alcedo euryzona* in Central Java, Indonesia. *BirdingASIA*, 31: 24–27.

Chace, F. A. & A. J. Bruce. (1993). The caridean shrimps (Crustacea: Decapoda) of the *Albatross* Philippine Expedition, 1907–1910, Part 6: Superfamily Palaemonoidea. *Smithsonian Contribution to Zoology*, 543: 1–152. https://doi.org/10.5479/si.00810282.543

Collar, N. (2020). Sunda Thrush (*Zoothera andromedae*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

Corbet, G. B. & Hill, J. E. (1992). *The Mammals of the Indomalayan Region: A Systematic Review*. Oxford: Oxford University Press.

Damaska, A. F. & Aston, P. (2019). Leaf litter and moss-inhabiting flea beetles of Hong Kong (Coleoptera: Chrysomelidae: Alticini). *Acta Entomologica Musei Nationalis Pragae*, 59(1): 151–161.

Das, I. (2004*). A Pocket Guide. The Lizards of Borneo*. Kota Kinabalu: Natural History Publications (Borneo) Sdn Bhd.

de Rooij, N. (1915). *The reptiles of the Indo-Australian Archipelago. I. Lacertilia, Chelonia, Emydosauria*. Leiden: E. J. Brill.

de Vos, R. & Creuwels, J. (2020). Naturalis Biodiversity Center (NL) - Lepidoptera. Naturalis Biodiversity Center. Occurrence dataset https://doi.org/10.15468/n4q0sa [accessed via GBIF.org on 2020-12-16].

Demos, T. C., Achmadi, A. S., Handika, H., Maharadatunkamsi, Rowe, K. C., & Esselstyn, J. A. (2017). A new species of shrew (Soricomorpha: Crocidura) from Java, Indonesia: possible character displacement despite interspecific gene flow. *Journal of Mammalogy*, 98: 183-193. https://doi.org/10.1093/jmammal/gyw183

den Boer, M. H. (1965). Revisionary notes on the genus *Metrocoris* Mayr (Heteroptera, Gerridae), with

descriptions of four new species. *Zoologische Verhandelingen*, 74(1): 1–38.

Dendang, B. (2009). Keragaman Kupu-Kupu di Resort Selabintana Taman Nasional Gunung Gede Pangrango, Jawa Barat (The Diversity of Butterflies in Selabintana Resort, Gunung Gede Pangrango National Park, West Java). *Jurnal Penelitian Hutan dan Konservasi Alam*, 4 (1): 25-36.

DESPA (Directorate of Environmental Services on Protected Area). (2017). *Natural tourism of Indoneisa 54 National Park*. Bogor: Directorate of Environmental Services of Protected Area-Directorate General of Natural Resources and Ecosystem Conservation-Ministry of Environmen and Foresty. ISBN: 978-602-1254-07-3

DPJLHK (Direktorat Pemanfaatan Jasa Lingkungan Hutan Konservasi). (2016). Profil kawasan TN Gunung Halimun Salak. *http://jasling.net/profil_kawasan/detail_kawasan.php?id_kawasan=190&cat=1* . (accessed on 19 February 2020).

Eliot, J. N. (1969). *An analysis of the Eurasian and Australian Neptini (Lepidoptera: Nymphalidae)*. London: The British Museum (Natural History).

Endangered Species Team GHSNPMP-JICA (2005). Ecological Study Halimun-Salak Corridor Mount Halimun-Salak National Park. Accessed from https://report.nat.gov.tw/ReportFront/PageSystem/reportFileDownload/C10202500/003

Endrodi, S. (1985). *The Dynastinae of the World*. Dordrecht: Dr. W. Junk Publisher.

Erawati, N. V. & Kahono, S. (2010). Keanekaragaman dan Kelimpahan Belalang dan Kerabatnya (Orthoptera) pada Dua Ekosistem Pegunungan di Taman Nasional Gunung Halimun-Salak. *J. Entomol. Indon.*, 7(2): 100-115.

Erniwati & Ubaidillah, R. (2011). Hymenopteran parasitoids associated with the banana-skipper *Erionota thrax* L. (Insecta: Lepidoptera, Hesperiidae) in Java, Indonesia. *Biodiversitas*, 12(2): 76-85.

Esselstyn, J. A., Maharadatunkamsi, Achmadi, A. S., Siler, C. D., & Evans, B. J. (2013). Carving out turf in a biodiversity hotspot: multiple, previously unrecognized shrew species co-occur on Java Island, Indonesia. *Mol Ecol.*, (19):4972-87. doi: 10.1111/mec.12450

Esser, L. and Cumberlidge, N. 2008. *Parathelphusa bogorensis*. The IUCN Red List of Threatened Species 2008: e.T134080A3891518. https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T134080A3891518.en. Downloaded on 15 November 2020.

Esser, L. and Cumberlidge, N. 2008. *Parathelphusa convexa*. The IUCN Red List of Threatened Species 2008: e.T134682A3997689.

https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T134682A3997689.en. Downloaded on 15 November 2020.

Farida, W. R., Semiadi, G., Handayani, T. H., & Harun. (2006). Habitat distribution and diversity of plants as feed resources for mouse deer (*Tragulus javanicus*) and barking deer (*Muntiacus muntjak*) in Gunung Halimun National Park. *Tropics*, 15(4): 371 – 376.

Farr, J. A. (1975). Role of predation in evolution of social behavior of natural populations of guppy, *Poecilia reticulata* (Pisces-Poeciliidae). Evolution, 29(1):151-158. doi: 10.1111/j.1558-5646.1975.tb00822.x

Frost, D.R., Grant, T., Faivovich, J., Bain, R.H., Haas, A., Haddad, C.F.B., de Sá, R.O., Channing, A., Wilkinson, M., Donnellan, S.C., Raxworthy, C.J., Campbell, J.A., Blotto, B.L., Moler, P., Drewes, R.C., Nussbaum, R.A., Lynch, J.D., Green, D.M., & Wheeler, W.C. (2006). The Amphibian Tree of Life. *Bulletin of the American Museum of Natural History*, 297: 1-370.

Gray, J. E. (1849). Nomenclature of coleopterous insects in the collection of the British Museum: Part IV. London: British Museum.

Gunawan, Kartono, A. P., & Maryanto, I. (2008). Keanekaragaman Mamalia Besar Berdasarkan Ketinggian Tempat di Taman Nasional Gunung Ciremai. *Jurnal Biologi Indonesia*, 4(5): 321-334.

Gunung Halimun-Salak National Park Management Project (Indonesia). (2007). *Rencana Pengelolaan Taman Nasional Gunung Halimun Salak periode 2007-2026*. Kabandungan: Gunung Halimun-Salak National Park Management Project – JICA.

Hájek, J. & Brancucci, M. (2015). A taxonomic review of the Oriental *Laccophilus javanicus* species group (Coleoptera: Dytiscidae). *Raffles Bulletin of Zoology*, 63: 309–326.

Hamid, H., Buchori, D., & Triwidodo, H. (2003). Keanekaragaman Parasitoid dan Parasitisasinya pada Pertanaman Padi. *Hayati*, 10(3): 85 – 90.

Hamidy, A., Munir, M., Mumpuni, M., Rahmania, M., Kholik, A. A. (2018). Detection of Cryptic taxa in the genus *Leptophryne* (Fitzinger, 1843) (Amphibia; Bufonidae) and the description of a new species from Java, Indonesia. *Zootaxa*, 4450(4):427-444. doi: 10.11646/zootaxa.4450.4.2. PMID: 30313831.

Haneda, N. F., Hilwan, I., Irfani, E. (2019). Arthropod community at different altitudes in Gunung Halimun-Salak National Park, Western Java, Indonesia. *Biodiversitas*, 20: 1735-1742. DOI: 10.13057/biodiv/d200633

Harahap, S. A. & Sakaguchi, N. (2002). Monitoring Research on Leopards (Panthera pardus) in Cikaniki Area, Gunung Halimun National Park. In Kahono, S., Okayama, T., & Arief, A. J. (Editors), *Research and Conservation*

of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I (pp. 189-210). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI, PHKA, and JICA.

Hartono, T. H., Kobayashi, H., Widjaya, M., & Suparmo. (2007). *Taman Nasional Gunung Halimun – Salak*. Bogor: JICA-BTNGHS-Puslit Biologi LIPI-PHKA.

Haryono. (2012). Sumber Daya Ikan dan Potensinya di Perairan Kawasan Gunung Slamet Serta Pengelolaannya. In Maryanto, I., Noerdjito, M., & Partomihardjo, T. (Editors), *Ekologi Gunung Slamet* (pp. 161-180). Bogor: Pusat Penelitian Biologi – LIPI.

Heryanto. (2012). Keanekaragaman Keong Darat di Dua Macam Habitat Makro di Gunung Slamet Jawa Tengah. In Maryanto, I., Noerdjito, M., & Partomihardjo, T. (Editors), *Ekologi Gunung Slamet* (pp. 193-204). Bogor: Pusat Penelitian Biologi – LIPI.

Heryanto, Marwoto, R. M., Munandar, A., & Susilowati, P. (2003). *Keong dari Taman Nasional Gunung Halimun, Sebuah Buku Panduan Lapangan*. Cibinong: Biodiversity Conservation Project-LIP-JICA-PHKA.

Higashide, D., Tanaka, K., Nakama, E., Faudi, H., Satriadi, T., & Aryadi, M. (2018). Camera-trap records of Sunda Stink-badger Mydaus javanensis and other small carnivores in South Kalimantan, Indonesia. *Small Carnivore Conservation*, 56: 54-59.

Hilgert, M., Akkari, N., Rahmadi, C., & Wesener, T. (2019). The Myriapoda of Halimun-Salak National Park (Java, Indonesia): overview and faunal composition. *Biodiversity Data Journal*, 7: e32218. https://doi.org/10.3897/BDJ.7.e32218

Hosoishi, S. & Ogata, K. (2015). Taxonomy and DNA Sequencing of *Crematogaster coriaria* Mayr, 1872 (Hymenoptera: Formicidae), with Redescriptions of the Worker, Queen, and Male Castes. *Psyche*, 2015: 1-8. https://doi.org/10.1155/2015/541351

Inger, R. F. (1966). *The Systematics and Zoogeography of the Amphibia of Borneo*. Chicago: Field Museum of Natural History Pr.

Iskandar, D. T. (1998). *Amfibi Jawa dan Bali – Seri Panduan Lapangan*. Bogor: Puslitbang LIPI.

Ito, F., Jaitrong, W., Hashim, R., & Mizuno, R. (2018). Colony composition, brood production and caste dimorphism in two species of the doryline genus *Lioponera* in the Oriental tropics (Formicidae: Dorylinae). *Asian Myrmecology*, 6: 1-31.

Jung, B. H. (2013). First Record of Ades masidai (Nakane, 1963) from Korea (Coleoptera: Tenebrionidae: Leiochrinini). *Korean J. Appl. Entomol.*, 52(2): 75-77. DOI:

http://dx.doi.org/10.5656/KSAE.2013.02.1.062

Kahono, S. (2010). Asosiasi Kumbang Lembing Pemakan Daun Subfamili Epilachninae (Coleoptera: Coccinellidae) dengan Tumbuhan Inangnya di Gunung Slamet, Provinsi Jawa Tengah. In Maryanto, I., Noerdjito, M., & Partomihardjo, T. (Editors), *Ekologi Gunung Slamet* (pp. 231-246). Bogor: Pusat Penelitian Biologi – LIPI.

Kahono, S. (2002a). Lebah dan Tawon "Penyerbuk" yang Berukuran Besar di Hutan Tropis Basah Taman Nasional Gunung Halimun dan Distribusinya di Indonesia. In Kahono, S., Okayama, T., Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I* (pp. 64-70). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI, PHKA, and JICA.

Kahono, S. (2002b). Monitoring Koloni Lebah Madu Apis dorsata F. (Hymenoptera: Apidae) di Daerah Jawa Barat. In Kahono, S., Okayama, T., Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I* (pp. 44-51). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI, PHKA, and JICA.

Kahono, S. & Noerdjito, W. A. (2002). Fluctuation of Rainfall and Insect Community in Gunung Halimun National Park, West Java [Fluktuasi Curah Hujan dan Komunitas Serangga di Taman Nasional Gunung Halimun]. In Kahono, S., Okayama, T., & Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I* (pp 34-43). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI, PHKA, and JICA.

Kamitani, S., Kahono, S., Ubaidillah, R., Herwint, S., & Partomihardjo, T. (2004). A New Species of the Genus *Cofana* (Hemiptera : Auchenorrhyncha : Cicadellidae) Associated with a Climbing Vine of Bamboo in Java,Indonesia. *Esakia*, 44: 135-141.

Kamitani, S., Kahono, S., Ubaidillah, R., Herwint, S., & Partomihardjo, T. (2005). Notes on the Genus *Balclutha* (Hemiptera: Auchenorrhyncha: Cicadellidae) in Indonesia. *Esakia*, 45: 61-67.

Kamitani, S., Ubaidillah, R., Kahono, S., & Ghani, I. A. (2009). Taxonomic Study on Four Southeast Asian Species of the Genus *Xestocephalus* (Auchenorrhyncha, Cicadellidae). *Esakia*, 49: 95-101.

Kamitani, S., Ubaidillah, R., Kahono, S., Herwint, S., & Partomihardjo, T. (2006). Two New Species of Selenocephalinae (Auchenorrhyncha, Cicadellidae) in Java, Indonesia. *Esakia*, 46: 83-87.

Kamitani, S., Ubaidillah, R., Kahono, S., Herwint, S., & Partomihardjo, T. (2011). Two New Species and a New Record of the Genus *Hishimonus* (Hemiptera: Auchenorrhyncha: Cicadellidae) in the Krakatau Isls. and Java, Indonesia. *Esakia*, 50: 75-80.

Kamitani, S., Ubaidillah, R., Kahono, S., & Partomihardjo, T. (2012). A New Genus and a New Species of Indonesian Leafhopper (Auchenorrhyncha,Cicadellidae). *Esakia*, 50: 75-80.

Kanao, T., Eldredge, K. T., Maruyama, M. (2012). Two new genera and species of the termite symbiont lineage Termitohospitini (Coleoptera, Staphylinidae, Aleocharinae) from Bolivia and peninsular Malaysia. *ZooKeys*, 254: 67–87. doi: 10.3897 /zookeys.254.4043

Kanao, T., Maruyama, M., & Sakchoowong, W. (2010) Two new species of Aleocharinae (Coleoptera, Staphylinidae) found in fungus gardens of Odontotermes termites (Isoptera, Termitidae, Macrotermitinae) in Khao Yai National Park, Th ailand. ZooKeys 49: 77–86. doi: 10.3897/zookeys. 49.468

Katakura, H., Nakano, S., Kahono, S., Abbas, I., & Nakamura, K. (2001). Epilachnine Ladybird Beetles (Coleoptera, Coccinellidae) of Sumatra and Java. *Tropics*, 10 (3): 325-352.

Katoh, T. K., Zhang, G., Toda, M. J., Suwito, A., & Gao, J-J. (2018). A revision of the subgenus *Dudaica* Strand of the genus *Drosophila* Fallén, with descriptions of six new species (Diptera, Drosophilidae). *ZooKeys*, 781: 19–50. https:// doi.org/10.3897 /zookeys.781.27354

Kimsey, L. S. (2012). Review of the odd chrysidid genus *Loboscelidia* Westwood, 1874 (Hymenoptera, Chrysididae, Loboscelidiinae). *ZooKeys*, 213: 1–40. doi: 10.3897/ zookeys.213.2985

KLHK (Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia). (2018). Status hutan dan kehutanan Indonesia2018. Jakarta: Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia. ISBN: 978-602-8358-85-9

Kobayashi, H. (2003). Preliminary Report on Wild Animal Species Utilization by Local People in and Around Gunung Halimun National Park. In Gelgel, M. S., Setyono, D., Mori, K. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume XII), Gunung Halimun National Park: A Model of Improved Park Management* (pp. 25-34). Bogor: Biodiversity

Conservation Project LIPI – PHKA – JICA.

Kojima, J. & Ubaidillah, R. (2003). Two new species of the cryptic chrysidid parasitoid subfamily Loboscelidiinae: The second species in *Rhadinoscelidia* and the first *Loboscelidia* for the Indonesian fauna. *Entomological Science*, 6: 199–207.

Kondorosy, E. (2008). A revision of the *Entisberus* group (Hemiptera: Heteroptera: Rhyparochromidae). *Acta Entomologica Musei Nationalis Pragae*, 48(2): 591-610.

Koneri, R. (2013). Pola Populasi Kumbang Lucanid (Coleoptera:Lucanidae) pada Berbagai Tipe Habitat di Hutan Gunung Salak, Jawa Barat. *Jurnal Ilmiah Sains*, 13(1): 20 – 26.

Kottelat, M., Whitten, A. J., Kartikasari, S. N., & Wirjoatmodjo, S. (1993). *Freshwater fishes of Western Indonesia and Sulawesi*. Hong Kong: Periplus Edition.

Kubo, H. & Supriyanto, B. (2010). From fence-and-fine to participatory conservation: mechanism of transformation in conservation governance at the Gunung Halimun-Salak National Park, Indonesia. Biodiversity Conservation, 19, 1785-1803.

Kunz, T. H., & Kurta, A. (1988). Capture methods and holding devices In: *Ecological and Behavioural Methods for the Study of Bats*. Boston, Massachusetss: Department of Biology, Boston University.

Kurniati, H. (2002). Frogs and Toads of Ujung Kulon, Gunung Halimun and Gede-pangrango National Park [Jenis-jenis Kodok Di Taman Nasional Ujung Kulon, Gunung Halimun Dan Gede-pangrango]. *Berita Biologi*, 6(1): 75 – 84.

Kurniati, H. (2004). The Reptiles Species in Gunung Halimun National Park, West Java, Indonesia [Reptilia di Taman Nasional Gunung Halimun, Jawa Barat, Indonesia]. *Berita Biologi*, 7: 73 – 79.

Kurniati, H. (2005). Species Richness and Habitat Preferences of Herpetofauna in Gunung Halimun National Park, West Java [Kekayaan Jenis dan Preferensi Habitat Herpetofauna di Taman Nasional Gunung Halimun]. *Berita Biologi*, 7 (5): 263-271.

Kurniati, H. (2006). The amphibians species in Gunung Halimun National Park, West Java. *Zoo Indonesia*, 15 (2): 107-120.

Kurniati, H. (2010). Dampak deforestasi pada laju penurunan keragaman jenis kodok di Taman Nasional Gunung Halimun. *Zoo Indonesia*, 19 (1): 11-17.

Kusrini, M. D. (2019). *Metode Survei dan Penelitian Herpetofauna*. Bogor: PT Penerbit IPB Press.

Kusrini, M. D., Lubis, M. I., Darmawan, B., & Nuraini, L. (2017). Morphological and Ecological Observations on *Chiromantis vittiger* (Anura: Rhacophoridae) in Mount Halimun - Salak National Park, Indonesia. *Treubia*, 44: 47–66.

Kusuma, W. E., Ratmuangkhwang, S., Kumazawa, Y. (2016). Molecular phylogeny and historical biogeography of the Indonesian freshwater fish *Rasbora lateristriata* species complex (Actinopterygii: Cyprinidae): Cryptic species and west-to-east divergences. *Mol Phylogenet Evol.*, 105: 212-223. doi: 10.1016/j.ympev.2016.08.014

Lestari, V. C., Erawan, T. S., Melanie, Kasmara, H., & Hermawan, W. (2018). Keanekaragaman Jenis Kupu-Kupu Familia Nymphalidae dan Pieridae di Kawasan Cirengganis dan Padang Rumput Cikamal Cagar Alam Pananjung Pangandaran. *Jurnal Agrikultura*, 29 (1): 1-8.

Löbl, I. & Ogawa, R. (2016). On the Scaphisomatini (Coleoptera, Staphylinidae, Scaphidiinae) of the Philippines, IV: the genera *Sapitia* Achard and *Scaphisoma* Leach. *Linzer biol. Beitr.*, 48 (2): 1339-1492. DOI: 10.5281/zenodo.247206

Lumbantobing, D. N. (2014). Four new species of *Rasbora* of the Sumatrana group (Teleostei: Cyprinidae) from northern Sumatra, Indonesia. *Zootaxa*, 3764(1): 1–25. doi:http://dx.doi.org/10.11646/zootaxa.3764.1.1

Lumbantobing, D. (2019). *Rasbora lateristriata*. The IUCN Red List of Threatened Species 2019: e.T91073440A91073474. https://dx.doi.org/10.2305/IUCN.UK.2019-2.RLTS.T91073440A91073474.en. Downloaded on 19 November 2020.

MacKinnon, J., Phillips, K., & van Balen, B. (1998). *Burung-Burung Di Sumatera, Jawa, Bali Dan Kalimantan (Termasuk Sabah, Sarawak, Dan Brunei Darussalam)* (*Birds in Sumatera, Java, Bali, Borneo include Sabah, Serawak and Brunei Darussalam*). Bogor: Puslit Biologi-LIPI & Birdlife-IP.

Magurran, A. E. & Philip, D. A. T. (2001). Evolutionary implications of large-scale patterns in the ecology of Trinidadian guppies, *Poecilia reticulata*. *Biological Journal of the Linnean Society*, 73(1): 1–9. doi:10.1006/bijl.2000.0519

Maharadatunkamsi. (2001). Relationship Between Altitudinal Changes and Distribution of Rats: A Preliminary Study from Gunung Botol, Gunung Halimun National Park. *Berita Biologi*, 5(6): 697 – 701.

Maharadatunkamsi. (2012). Potensi Mamalia Kecil dalam Mendukung Fungsi Lindung Gunung Slamet. In Maryanto, I., Noerdjito, M., & Partomihardjo, T. (Editors), *Ekologi Gunung Slamet* (pp. 95-120). Bogor: Pusat Penelitian Biologi – LIPI.

Maharadatunkamsi & Maryati. (2008). Komunitas Mamalia Kecil di Berbagai Habitat pada Jalur Apuy dan Linggarjati Taman Nasional Gunung Ciremai. *Jurnal Biologi Indonesia*, 4(5):309-320.

Mahood, S. P., Delonglée, S., Klingel, F., Wicker, F., & Craik, R. (2013). The

status of Brown-chested Jungle Flycatcher *Rhinomyias brunneatus* in Vietnam. *Forktail*, 29: 124–127.

Makihara, H., Woro, A. N., & Sugiarto. (2002). Longicorn beetles from Gunung Halimun National Park, West Java, Indonesia from 1997-2002 (Coleoptera, Disteniidae and Cerambycidae). *Bulletin of FFPRI*, 1(3): 189-223.

Manthey, U. & Grossmann, W. (1997). *Amphibien & Reptilien Südostasiens*. Münster: Natur und Tier.

Marwoto, R. M. (1998). A Preliminary Study of Land Snails in Gunung Halimun National Park. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors), *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. 148-154). Bogor: Biodiversity Conservation Project in Indonesia. A Joint Project with LIPI, PHPA, and JICA.

Marwoto, R. M., Heryanto, Isnaningsih, N. R., Mujiono, N., Alfiah, & Prihandini, R. (2020). *Moluska Jawa (Gastropoda & Bivalvia)*. Bogor: IPB Press.

Maryanto, I., Maharadatunkamsi, Achmadi, A. S., Wiantoro, S., Sulistyadi, E., Yoneda, M., Suyanto, A., & Sugardjito, J. (2019). *Checklist of The Mammals of Indonesia: Scientific, English, Indonesia Name and Distribution Area Table in Indonesia including CITES, IUCN, and Indonesian Category for Conservation*. Bogor: RCB-LIPI.

Matsubayashi, K. W., Kahono, S., Fujiyama, N., Yokoyama, J., Hartini, S., Basnagala, S., Monthum, Y., Hashim, R., & Katakura, H. (2015). Geographic distribution, host plants, and morphological variation of the currently radiating phytophagous ladybird beetle *Henosepilachna diekei*, *Journal of Natural History*, DOI: 10.1080/00222933.2015.1079339

Mausfeld, P., Schmitz, A., Böhme, W., Misof, B., Vrcibradic, D., & Rocha, C.F.D. (2002). Phylogenetic Affinities of *Mabuya atlantica* Schmidt, 1945, Endemic to the Atlantic Ocean Archipelago of Fernando de Noronha (Brazil): Necessity of Partitioning the Genus *Mabuya* Fitzinger, 1826 (Scincidae: Lygosominae). *Zoologischer Anzeiger*, 241(3): 281–293. DOI: 10.1078/0044-5231-00081

Mawdsley, J. R. (1996). Key to Species of *Omadius* (Coleoptera: Cleridae) from Manado, Sulawesi (Indonesia) with New Records and Systematic Notes. *ENT. NEWS*, 107(5) 329-331.

Mirmanto, E. & Simbolon, H. (1998). Vegetation Analysis of Citorek Forest, Gunung Halimun National Park. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors), *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. 41-59). Bogor: Biodiversity Conservation Project in Indonesia. A Joint Project with LIPI,

PHPA, and JICA.

Morgan, E., Jungnickel, H., Billen, J., Ito, F., Bergmann, J., & Gobin, B. (2008). Contents of the exocrine glands of the ant subfamily Cerapachyinae. *Biochemical Systematics and Ecology*, 36: 260-265.

Mumpuni. (2001). Keanekaragaman Herpetofauna di Taman Nasional Gunung Halimun, Jawa Barat. *Berita Biologi*, 5(6): 711 – 720.

Mumpuni. (2002). Keanekaragaman Herpetofauna di Taman Nasional Gunung Halimun, Jawa Barat [Diversity of Herpetofauna at Gunung Halimun National Park, West Java]. In Kahono, S., Okayama, T., Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I* (pp. 86-90).

Murwitaningsih, S. & Dharma, A. P. (2014). Species Diversity of Butterflies at Suaka Elang (Raptory Santuary) at Gunung Halimun Salak National Park in West Java. *Asian Journal of Conservation Biology*, 3(2): 159–163.

Mustari, A. H. & Gunadharma, N. (2016). *Kampus Biodiversitas: Kupu-Kupu di Wilayah Kampus IPB Dramaga*. Bogor: PT Penerbit IPB Press.

Mustari, A. H., Setiawan, A., & Rinaldi, D. (2015). Kelimpahan Jenis Mamalia Menggunakan Kamera Jebakan Di Resort Gunung Botol Taman Nasional Gunung Halimun Salak (The Abundance of Mammals Using Camera Trap in Gunung Botol Resort, Halimun Salak National Park). *Media Konservasi*, 20(2): 93 – 101.

Ng, P. K. L. & Wowor, D. (2018). A new genus and new species of a semi-terrestrial freshwater crab from montane tropical rainforests in Java, Indonesia (Decapoda: Brachyura: Gecarcinucidae). *Journal of Crustacean Biology*. 1–8. doi:10.1093/jcbiol/ruy016.

Nguyen, L. T. P., Saito, F., Kojima, J., & Carpenter, J. M. (2006). Vespidae of Viet Nam (Insecta: Hymenoptera) 2. Taxonomic Notes on Vespinae. *Zoological Science*, 23: 95–104.

Noerdjito, W. A. (2011). Kumbang Sungut Panjang di Kawasan Gunung Ciremai. In Peggie, D. (Editor), *Fauna Serangga Gunung Ciremai: Kumbang Sungut Panjang, Capung, Kupu-Kupu* (pp. 3-34). Jakarta: LIPI Press.

Noerdjito, W. A. (2016). *Keanekaragaman Kumbang Stag (Coleoptera: Lucanidae) di Pulau Jawa*. Jakarta: LIPI Press.

Noerdjito, W. A., Makihara, H., & Kahono, S. (2002). Keragaman Kumbang Cerambycidae di Taman Nasional Gunung Halimun. In Kahono, S., Okayama, T., Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung*

Halimun National Park Part I (pp. 86-90). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI, PHKA, and JICA.

Noske, R., Prawiradilaga, D. M., Drynan, D., Leishman, A., & Rutherford, W. (2011). Understorey birds of Cikaniki Research Station, Gunung Halimun-SalakNational Park, West Java: Report of the Indonesian Bird Banding Scheme Training Programme. *Kukila*, 15:50-65.

Nugraha, R. T., Tisnawati, V., Mala, Y. A., Utami, J., Yanuarefa, M. F., Pratiwi, L. E., Purwanto, Fahrurozi, R., Haryono, E., Wijayanti, A., Hariyanto, G., & Noris. (2012). *Buku Informasi Penelitian Taman Nasional Alas Purwo*. Banyuwangi: Balai Taman Nasional Alas Purwo.

Nugroho, H., Ubaidillah, R., & Kojima, J. (2016). Taxonomy of the Indo-Malayan presocial potter wasp genus *Calligaster* de Saussure (Hymenoptera, Vespidae, Eumeninae). *Journal of Hymenoptera Research*, 48: 19–32. doi: 10.3897 /JHR.48.7045

Nurinsiyah, A. S. (2018). *Land snails of Java: a study on systematics, ecology, and biogeography* [Dissertation]. Hamburg: University Hamburg.

Nurinsiyah, A. S. & Hausdorf, B. (2017). Revision of the Diplommatinidae (Gastropoda: Cyclophoroidea) from Java. *Zootaxa*, 4312 (2): 201-245.

Nurinsiyah, A. S. & Hausdorf, B. (2019). Listing, impact assessment and prioritization of introduced land snail and slug species in Indonesia. *Journal of Molluscan Studies*, 85: 92-102.

Nurinsiyah, A. S., Neiber, M. T., & Hausdorf, B. (2019a). Revision of the land snail genus Landouria Godwin-Austen, 1918 (Gastropoda, Camaenidae) from Java. *European Journal of Taxonomy*, 526: 1-73.

Nurinsiyah, A. S., Faizah, I., Prasetio, Y., Setiadi, T., Marwoto, R. M., & Hausdorf, B. (2019b). Diversity and ecology of land snails in Gunung Halimun Salak National Park (GHNSP) in Java, Indonesia. *Zoo Indonesia*, 28(1): 46-58.

Ohta-Matsubayashi, Y., Katakura, H., Kahono, S., & Kikuchi, N. (2017). A taxonomic review of the phytophagous ladybird beetles of the *Diekeana alternans* complex (Coleoptera: Coccinellidae: Epilachnini) with descriptions of eight new species and one new subspecies. *Ins. matsum. n. s.*, 73: 1–37.

Oosterbroek, P. (1998). *The Families of Diptera of the Malay Archipelago (Fauna Malesiana Handbooks, No 1)*. Leiden: Brill.

Pace, R. (1999). Aleocharinae della Cina: Parte V (conclusione) (Coleoptera, Staphylinidae). *Revue suisse de Zoologie*, 106: 107-164.

Pace, R. (2014). Aleocharinae from Sabah (Borneo) collected by Guillaume de Rougemont (Coleoptera,

Staphylinidae). *Linzer biol. Beitr.*, 46(1): 727-794.

Payne, J., Francis, C. M., Phillips, K., & Kartikasari, S. N. (2000). Panduan Lapangan: Mamalia di Kalimantan, Sabah, Sarawak dan Brunei Darussalam. Jakarta: Prima Centra Indonesia.

Peggie, D. (2012). A list of the butterflies of Ujung Kulon National Park, Java, Indonesia. *Treubia*, 39: 67-76.

Peggie, D. (2019). Biological Aspects of *Papilio peranthus* (Lepidoptera: Papilionidae) as Observed at Butterfly Research Facility - LIPI, Cibinong, Indonesia. *Treubia*, 46: 85–102. DOI:10.14203/treubia.v46i0.3795

Peggie, D. & Amir, M. (2006). Practical guide to the butterflies of Bogor Botanic Garden (Panduan praktis kupu-kupu di Kebun Raya Bogor). Bogor: Bidang Zoologi, Pusat Penelitian Biologi LIPI.

Peggie, D. & Harmonis. (2014). Butterflies of Gunung Halimun-Salak National Park, Java, Indonesia, with an overview of the area importance. *Treubia*, 41: 17-30.

Peggie, D. & Noerdjito, W. A. (2011). Kupu-Kupu Gunung Ciremai dan Sekitarnya. In Peggie, D. (Editor), *Fauna Serangga Gunung Ciremai: Kumbang Sungut Panjang, Capung, Kupu-Kupu* (pp. 53-103). Jakarta: LIPI Press.

Prabowo, S. A., Basuni, S., & Suharjito, D. (2010). Konflik Tanpa Henti: PHKA, and JICA.

Permukiman dalam Kawasan Taman Nasional Halimun Salak. *Jurnal Manajemen Hutan Tropika*, 16(3): 137-142. Retrieved from http://journal.ipb.ac.id/ index.php/jmht/article/view/3176

Prawiradilaga, D. M. (2002). Diversity and Distribution of Raptors at Gunung Halimun National Park with Particular Reference to Javan Hawk- Eagle. *Berita Biologi*, 5: 649-657.

Prawiradilaga, D. M. (2016). Birds of Halimun Salak National Park, West Java, Indonesia: endemism, conservation and threatened status. *Treubia*, 43: 47-70.

Prawiradilaga, D.M., A. Marakarmah & S. Wijamukti 2003. *A Photographic Guide to the Birds of Javan Montane Forest: Gunung Halimun National Park*. Bogor: Biodiversity Conservation Project LIPI-JICA-PHKA.

Prawiradilaga, D. M., Marakarmah, A., Wijamukti, S., Adiputra, J., & Ozawa, T. (2002a). Additional New Records on the Birds of Gunung Halimun National Park Based on Raptor Survey & Monitoring. In Kahono, S., Okayama, T., Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I* (pp 24-25). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI,

Prawiradilaga, D. M., Marakarmah, A., Wijamukti, S., & Kundarmasno, A.

(2002b). Monitoring the Bird Community at G. Kendeng-Gunung Halimun National Park [Pemantauan Komunitas Burung di G. Kendeng-Taman Nasional Halimun]. *Berita Biologi*, 6: 57-66.

Prawiradilaga, D. M., Marakarmah, A., Wijamukti, S., & Kundarmasno, A. (2004). Additional New Records of Birds of Gunung Halimun National Park Based on Banding Studies [Rekaman Baru Burung (Tambahan) dari Taman Nasional Gunung Halimun Berdasarkan Studi Pemitaan]. *Berita Biologi*, 7: 107-108.

Prawiradilaga, D. M., Wijamukti, S., & Marakarmah, A. (2002c). *Buku Panduan Identifikasi Burung Pegunungan di Jawa: Taman Nasional Gunung Halimun*. Bogor: Biodiversity Conservation Project – LIPI – JICA – PHKA.

Purnamasari, H. & Ubaidillah, R. (2007). Notes on parasitic wasp genus *Pediobius* Walker (Hymenoptera: Eulophidae) of Java-Indonesia, with five new records. *Treubia*, 35: 117 – 136.

Putra, A. D., Giri, M. S., Ardiwibawa, R., Supriatna, A., & Sutisna, C. (2019). *Pesona Tersembunyi Gunung Salak, Taman Nasional Gunung Halimun Salak*. Kabandungan: Balai Taman Nasional Gunung Halimun Salak.

konservasinya). *Jumal Iktiologi Indonesia*, 2(2): 1-14.

Putri, E. M. (2015). *Keanekaragaman Kumbang Sungut Panjang (Coleoptera: Cerambycidae) di Kawasan Resort Salak 2 – Taman Nasional Gunung. Halimun Salak (TNGHS)* [Skripsi]. Jakarta: UIN Syarif Hidayatullah.

Qodri, A., Raffiudin, R., & Noerdjito, W. A. (2016). Diversity and Abundance of Carabidae and Staphylinidae (Insecta: Coleoptera) in Four Montane Habitat Types on Mt. Bawakaraeng, South Sulawesi. *HAYATI Journal of Biosciences*, 23: 22-28.

Rachmatika, I. (2003). *Fish Fauna of the Gunung Halimun National Park, West Java*. Bogor: Biodiversity Conservation Project – LIPI – JICA – PHKA.

Rachmatika, I. & Wahyudewantoro, G. (2009). Fishes Diversity at the area of Gunung Ciremai National Park, West Java. *Jurnal Biologi Indonesia*, 5(3): 381-385.

Rachmatika, I., Sjafei, D. S., & Nurcahyadi, W. (2001). Fish Fauna in Gunung Halimun National Park and the Adjacent Area. *Berita Biologi*, 5(6): 667-678.

Rachmatika, I., Sjafei, D. S., & Nurcahyadi, W. (2002a). Fish Diversity in Cibareno River, Gunung Halimun National Park: its unique assemblage, management, and conservation consideration (Keanekaragaman Ikan di S. Cibareno, TN. Gunung Halimun: keunikan, manajemen, dan

Rachmatika, I., Sjafei, D. S., & Nurcahyadi, W. (2002b). Fish fauna of Gunung

Halimun National Park Region: additional information on the utilization [Fauna Ikan Taman Nasional Gunung Halimun: Informasi Tambahan Tentang Pemanfaatannya]. *Berita Biologi*, 6(1), 13-24.

Rachmatika, I., Wahyudewantoro, G., & Sauri, S. (2004). Fauna Ikan di Sungai Cimadur, Ciujung dan Ciberang di Sekitar Taman Nasional Gunung Halimun, Kabupaten Lebak, Banten [Fish Fauna of Cimadur, Ciujung and Ciberang River, Gunung Halimun National Park, Lebak, Banten]. *Berita Biologi*, 7(1-2): 33-40.

Ridho, M. R., Patriono, E., & Tjakrawidjaja, A. H. (2003). Keanekaragaman Jenis Ikan di Hulu Sungai Cikaniki Taman Nasional Gunung Halimun, Jawa Barat. Jurnal Penelitian Sains, 14: 25 – 33. doi:10.36706/jps.v0i14.287

Riyanto, A. (2011). Herpetofaunal Community Structure and Habitat Associations in Gunung Ciremai National Park, West Java, Indonesia. *Biodiversitas*, 12: 38-44.

Riyanto, A. & Trilaksono, W. (2012). Komunitas Herpetofauna di Lereng Timur Gunung Slamet, Jawa Tengah. In Maryanto, I., Noerdjito, M., & Partomihardjo, T. (Editors), *Ekologi Gunung Slamet* (pp. 151-160). Bogor: Pusat Penelitian Biologi – LIPI.

Sadili, A. (2011). Keanekaragaman, Persebaran dan Pemanfaatan Jenis-Jenis *Journal*, 7: e32555. https://doi.org/ 10.3897/BDJ.7.e32555

Anggrek (Orchidaceae) di Resort Citorek, Taman Nasional Gunung Halimun-Salak, Jawa Barat. *Biosfera*, 28(1): 15-22.

Sahab, A., Darusman, D., & Muladno, M. (2015). Penguatan Pengelolaan Taman Nasional Gunung Halimun Salak Melalui Pemberdayaan Masyarakat Berbasis Pengembangan Peternakan Ruminansia. Risalah Kebijakan Pertanian dan Lingkungan, 2(2): 87-97.

Sanborn, A. (2014). *Catalogue of the Cicadoidea (Hemiptera: Auchenorrhyncha)*. Amsterdam : Academic Press.

Schawaller, W. (1989). New Discolomidae (Coleoptera) from the Himalayas•. *Tropical Zoology*, 2: 45-58.

Schawaller, W. (2016). Leiochrinini (Coleoptera: Tenebrionidae: Diaperinae) from north-eastern India and China, with descriptions of six new species[1]. *Stuttgarter Beiträge zur Naturkunde A, Neue Serie*, 9: 197–205. DOI: 10.18476/sbna.v9.a12

Schilthuizen, M., Berenyi, A., Limin, A., Brahim, A., Cicuzza, D., Eales, A., Escoubas, P., Grafe, U., de Groot, M., Hayden, W., Paterno, M., Jambul, R., Slik, J., Ting Teck Wah, D., Tucker, A., & Njunjić, I. (2019). A new species of *Clavicornaltica* (Coleoptera: Chrysomelidae), discovered and described on a field course to Kuala Belalong, Brunei. *Biodiversity Data*

Schmidt, S., Hamid, H., Ubaidillah, R., Ward, S., Polaszek, A. (2019). A review of the

Indonesian species of the family Signiphoridae (Hymenoptera, Chalcidoidea), with description of three new species. *ZooKeys*, 897: 29–47. https://doi.org/10.3897/zookeys.897.38148

Seevers, C. H. (1978). A generic and tribal revision of the North American Aleocharinae (Coleoptera: Staphylinidae). *Fieldiana Zoology*, 71: 1–275.

Septianella, G., Peggie, D., Sasaerila, H. Y. (2015). Keanekaragaman kupu-kupu (Lepidoptera) di kawasan Desa Pasirlangu, Kecamatan Cisarua, Kabupaten Bandung Barat, Jawa Barat [Diversity of butterflies (Lepidoptera) in Pasirlangu Village, Cisarua, District of West Bandung, West Java]. *Pros Sem Nas Masy Biodiv Indon*, 1 (8): 1816-1820.

Shanbhag & Sundararaj. (2011). An identification guide to the wood destroying termites of south India. *J Indian Acad Wood Sci*, 8(2):148–151. DOI 10.1007/s13196-012-0028-9

Sidik, I. (1998). An Inventory of Amphibians and Reptiles at Gunung Halimun National Park. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors), *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. 141-147). Bogor: Biodiversity Conservation Project in Indonesia. A Joint Project with LIPI, PHPA, and JICA.

Simbolon, H., Yoneda, M., & Sugardjito, J. (1998). Biodiversity and Its Conservation in Gunung Halimun National Park. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors.) *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. v-vi). Bogor: Biodiversity Conservation Project in Indonesia. A Joint Project with LIPI, PHPA, and JICA.

Somadikarta, S., Kadarsan, S., & Djajasasmita, M. (1970). Primary Type Specimens of the Museum Zoologicum Bogoriense (V). *Treubia*, 27: 417 – 431.

Sornnuwat, Y., Vongkaluang, C., & Takematsu, Y. (2004). A Systematic Key to Termites of Thailand. *Kasetsart J. (Nat. Sci.)* 38 : 349 – 368.

Strohecker, H. F. (1968). A Synopsis of the Genus *Eumorphus* (Coleoptera: Endomychidae). *Pacific Insects*, 10(1): 79-112.

Subekti, N., Duryadi, D., Nandika, D., Surjokusumo, S., & Anwar, S. (2008). Sebaran dan Karakter Morfologi Rayap Tanah *Macrotermes gilvus* Hagen di Habitat Hutan Alam (Distribution and Morphology Characteristic of

Macrotermes gilvus Hagen in The Natural Habitat). *Jurnal Ilmu dan Teknologi Hasil Hutan*, 1(1): 27-33.

Suhardjono, Y. R. (2002). Keanekaragaman Fauna Tanah di Cikaniki, Taman Nasional Gunung Halimun. In Kahono, S., Okayama, T., & Arief, A. J. (Editors), *Research and Conservation of Biodiversity in Indonesia (Volume IX), Biodiversity of the Last Submontane Tropical Rain Forest in Java: Gunung Halimun National Park Part I* (pp 34-43). Bogor: Biodiversity Conservation Project in Indonesia, A Joint Project with LIPI, PHKA, and JICA.

Sulandari, S., Astuti, D., Kundarmasno, A., Marakarmah, A., & Wijamukti, S. (2001). Collection of Material DNA Samples from Birds in the Gunung Halimun National Park (GHNP) for Establishing of DNA Bank. *Berita Biologi*, 5: 729-734.

Sulistyadi, E. (2012). *Komunitas Mamalia Besar Gunung Slamet*. In Maryanto, I., Noerdjito, M., & Partomihardjo, T. (Editors), *Ekologi Gunung Slamet* (pp. 121-134). Bogor: Pusat Penelitian Biologi – LIPI.

Surahman, M. (2010). *Keanekaragaman dan Kelimpahan Burung pada Berbagai Tipe Habitat di Taman Nasional Gunung Ciremai* [Tesis]. Bogor: Institut Pertanian Bogor.

Sutrisno, H. (2008). Species status of yellow stem borer *Scirpophaga incertulas* (Lepidoptera: Pyralidae) based on CO I gene sequences. *Treubia*, 36: 37-47.

Sutrisno, H. (2009). A new record of *Euhampsonia roepkei* Holloway, 1983 (Lepidoptera: Notodontidae) from Gunung Halimun-Salak National Park. *Zoo Indonesia*, 18(1): 41-43.

Sutrisno, H. & Darmawan. (2012). *Series of Indonesian Insects: Moths of Gunung Halimun-Salak National Park (Part 1: Thyridoidea and Pyraloidea)*. Jakarta: LIPI Press.

Sutrisno, H., Darmawan, Septiana, W., Sundawiati, A., & Suparno, M. (2015). *Moths of Gunung Halimun-Salak National Park (Part 2: Drepanoidea and Geometroidea)*. Jakarta: LIPI Press.

Suwito, A. (2007). Keanekaragaman jenis nyamuk (Diptera: Culicidae) yang dikoleksi dari tunggul bambu Taman Nasional Gn. Gede-Pangrango dan Taman Nasional Gn. Halimun. *Zoo Indonesia*, 16 (1): 31-47.

Suwito, A. & Watabe, H. (2010). Discovery of the *Drosophila (Drosophila) robusta* species group (Diptera, Drosophilidae) from Southeast Asian tropics, with the descriptions of six new species. *Entomological Science*, 13: 381–391. doi:10.1111/j.1479-8298.2010.00398.x

Suwito, A., Watabe, H., & Toda, M. J. (2013). Review of the *Drosophila (Drosophila) quadrisetata* species group (Diptera: Drosophilidae), with descriptions of three new species from the Oriental

Region. *Entomological Science*, 16: 66–82. doi:10.1111/j.1479-8298.2012. 00530.x

Suyanto, A. (2001). *Kelelawar di Indonesia, LIPI – Seri Panduan Lapangan*. Bogor: Puslitbang Biologi LIPI.

Suyanto, A. (2003). *Mammals of Gunung Halimun National Park, West Java*. Bogor: Puslit Biologi-LIPI.

Suyanto, A. & Sinaga, M. H. (1998). Note on additional collection of small mammals in Gunung Halimun National Park. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors), *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. 82-95). Bogor: Biodiversity Conservation Project in Indonesia. A Joint Project with LIPI, PHPA, and JICA.

Suyanto, A., Yoneda, M., Maryanto, I., Maharadatunkmsi, & Sugardjito, J. (2002). *Checklist of the Mammals of Indonesia*. Bogor: LIPI-JICA-PHKA.

Taki, Y. (1978). *An analytical study of the fish fauna of the Mekong basin as a biological production system in nature*. Tokyo: Research Institute of Evolutionary Biology.

Tamaddoni-Nezhad, A., Milani, G.A., Raybould, A., Muggleton, S., & Bohan, D.A., 2013. Construction and validation of food webs using logic-based machine learning and text mining. In Bohan, W. (Editor), *Advanced in Ecological Research: Ecological Networks in an Agricultural World* (pp. 225 – 290). San Diego USA: Academic Press.

Tobing, I. S. L. (2002). Respon Primata Terhadap Kehadiran Manusia Di Kawasan Cikaniki, Taman Nasional Gunung Halimun [Response of Primata to the Presence of Human in Cikaniki Area, Gunung Halimun National Park]. *Berita Biologi*, 6(1): 99 – 105.

Toda, M., Bänziger, H., Sati, P., Fartyal, R., Suwito, A., & Katoh, T. (2020). Taxonomy and evolution of asymmetric male genitalia in the subgenus *Ashima* Chen (Diptera: Drosophilidae: Phortica Schiner), with descriptions of seven new species. *Zootaxa*, 4789(1): 1–54. doi:http://dx.doi.org/10.11646/zootaxa.4789.1.1

Ubaidillah, R. (1999). Pengelolaan Koleksi Serangga dan Artropoda Lainnya. In Suhardjono, Y. R. (Editor), *Buku Pegangan Pengelolaan Koleksi Spesimen Zoologi* (pp. 144 – 145). Bogor: Balai Penelitian dan Pengembangan Zoologi, Puslitbang Biologi – LIPI.

Ubaidillah, R., Sofyan, M. R., Kojima, H., Kamitani, S., & Yoneda, M. (1998). Survey on Butterflies in Gunung Halimun National Park. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors), *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. 155-161). Bogor: Biodiversity Conservation Project in

Indonesia. A Joint Project with LIPI, PHPA, and JICA.

van Benthem Jutting, W.S.S., (1948). Systematic studies on the non-marine Mollusca of the Indo-Australian archipelago. I. Critical Revision of the Javanese Pulmonate land-shells of the families Hydrocenidae, Helicinidae, Cyclophoridae, Pupinidae and Cochlostomatidae. *Treubia*, 19: 539–604.

van Benthem Jutting, W.S.S., (1950). Systematic studies on the non-marine Mollusca of the Indo-Australian archipelago. II. Critical Revision of the Javanese Pulmonate land-shells of the families Helicarionidae, Pleurodontidae, Fruticicolidae and Streptaxidae. *Treubia*, 20: 381–505.

van Benthem Jutting, W.S.S., (1952). Systematic studies on the non-marine Mollusca of the Indo-Australian archipelago. III. Critical Revision of the Javanese Pulmonate land-shells of the families Ellobiidae to Limacidae, with an Appendix on Helicarionidae. *Treubia*, 21: 291–435.

van Benthem Jutting, W.S.S., (1956). Systematic studies on the non-marine Mollusca of the Indo-Australian archipelago. V. Critical Revision of the Javanese Freshwater Gastropods. *Treubia*, 23 (2): 259–477.

van Kampen, P. N. (1923). *The Amphibia of the Indo-Australian Archipelago*. Leiden: E. J. Brill Ltd.

Vickers, S. H., Evans, M. N., Abu Bakar, M. S., & Goossens, B. (2017). The first recorded activity pattern for the sunda stink-badger *Mydaus javanensis* (Mammalia: Carnivora: Mephitidae) using camera traps. *Raffles Bull. Zool.*, 65: 316–324.

Wang, Z., Wu, K., & Che, Y. (2013). New record of the cockroach genus *Pseudophoraspis* (Blaberidae, Epilamprinae) from China with descriptions of three new species. *ZooKeys*, 273: 1–14. doi: 10.3897/zookeys.273.4122

Weber, M. & De Beaufort, L. F. (1922). *The fishes of the Indo-Australian Archipelago. IV. Heteromi, Solenichthyes, Synentognathi, Percesoces, Labyrinthici, Microcyprini*. Leiden: E. J. Brill.

Whitten, T., Soeriaatmadja, R.E. & Afiff, S.A. (1997). *The ecology of Java and Bali*. Hong Kong: Periplus Editions.

Widjaja, E. A., Rahayuningsih, Y., Rahajoe, J. S., Ubaidillah, R., Maryanto, I., Walujo, E. B., & Semiadi, G. (2014). *Kekinian Keanekaragaman Hayati Indonesia*. Jakarta: LIPI Press.

Widodo, W. (2009). Komparasi Keragaman Jenis Burung-Burung di Taman Nasional Baluran dan Alas Purwo pada Beberapa Tipe Habitat. *Berk. Penel. Hayati*, 14: 113–124.

Widodo, W. (2012). Keragaman Jenis Burung di Hutan Gunung Slamet, Jawa Tengah. In Maryanto, I., Noerdjito, M., & Partomihardjo, T. (Editors), *Ekologi Gunung Slamet* (pp. 135-150). Bogor: Pusat Penelitian Biologi – LIPI.

Widodo, W. (2016). Distribusi dan Keragaman Spesies Burung Sebaran Terbatas di Taman Nasional Alas Purwo, Jawa Timur [Distribution and Diversity of Restricted-Range Bird Species in the Alas Purwo National Park]. *Proceeding Biology Education Conference*, 13(1): 690-700.

Wikramanayake, E., Diverstein, E., Loucks, C.J., Olson, D.M., Morrison, J., Lamoreux, J. McKnight, M., Hedao, P. (2002). *Terrestrial ecoregions of the Indo-Pacific a conservation management*. Island Press. Washington.

Woodall, P. F. (2020). Blue-eared Kingfisher (*Alcedo meninting*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

West Java, Indonesia (Crustacea: Brachyura: Sesarmidae: *Geosesarma*). *Raffles Bulletin of Zoology*, 6: 217-246.

Wowor, D. (2010). *Macrobrachium empulipke*, a new freshwater prawn species (Decapoda, Palaemonidae) from Indonesia. In Fransen, C. H. J. M., De Grave, S., & Ng, P. K. L. (Editors), *Studies on Malacostraca: Lipke Bijdeley Holthuis Memorial Volume* (pp. 715-726). Leiden: Koninklijke Brill NV. doi: https://doi.org/10.1163/9789047427759_053

Wowor, D. & Ng, P. K. L. (2019). The vampire crabs of Java, with descriptions of five new species from Mount Halimun Salak National Park,

Yahya, B. E., Yamane, S., & Mohamed, M. (2009). Morphological and Behavioral Characters of the Two Species Groups of the Ant Genus *Myrmicaria* (Insecta: Hymenoptera: Formicidae: Myrmicinae) from Southeast Asia. *Species Diversity*, 14: 249-265.

Yahya, B. E. & Yamane, S. (2006). Nesting Biology of a Tropical Myrmicine Ant, *Myrmicaria arachnoides* (Formicidae), in West Java, Indonesia. *Journal of Hymenoptera Research*, 15: 307-316.

Yamamoto, S., Ikeda, K., & Kamitani, S. (2013). Species diversity and community structure of rove beetles (Coleoptera: Staphylinidae) attracted to dung of sika deer in coniferous forests of southwest Japan. *Entomological Science*, 17(1):52-58. DOI: 10.1111/ens.12036

Yamamoto, S., Maruyama, M., & Parker, J. (2016). Evidence for social parasitism of early insect societies by Cretaceous rove beetles. *Nat Commun*, 7: 13658. https://doi.org/10.1038/ncomms13658

Yamane, S. (2009). *Odontoponera denticulata* (F. Smith) (Formicidae: Ponerinae), a distinct species inhabiting disturbed areas. *ARI*, 32:1-8.

Yang, J-H., Toda, M. J., Suwito, A., Hashim, R., & Gao, J-J. (2017). A new species group in the genus *Dichaetophora*, with descriptions of six new species from the Oriental region (Diptera,

Drosophilidae). *ZooKeys*, 665: 121–146. https://doi.org/10.3897/zookeys.665.11609

Yoneda, M., Ladjar, L. N., & Sakaguchi, N. (1998). Camera Trap Study in Cikaniki, Gunung Halimun National Park. In Simbolon, H., Yoneda, M., & Sugardjito, J. (Editors), *Research and Conservation Biodiversity in Indonesia (Volume IV), Gunung Halimun: The Last Submontane Tropical Forest in West Java* (pp. 82-95). Bogor: Biodiversity Conservation Project in Indonesia. A Joint Project with LIPI, PHPA, and JICA.

Yoshitake, H. & Noerdjito, W. A. (2004). Taxonomic Notes on the Indonesian *Belonnotus* Schultze (Coleoptera: Curculionidae), with Descriptions of Two New Species from Java. *Esakia*, 44: 199-209.