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A LIST OF THE BUTTERFLIES OF UJUNG KULON NATIONAL PARK, JAVA, INDONESIA

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ABSTRACT

The occurrence of butterfly species at Ujung Kulon National Park is presented based on collection and observation data obtained in 2005, 2006 and 2010 and previous reports. As many as 101 butterfly species were recorded during the recent surveys. The data are compared with previous findings. To date, there are 177 species reported from Ujung Kulon.

Key words: butterflies, species, Ujung Kulon, Java

INTRODUCTION

Ujung Kulon located at the westernmost part of Java, officially became a national park in 1992. It covers about 76,000 ha of land and 44,000 ha of surrounding reefs and sea, including some islands such as Handeuleum, Peucang and Panaitan. The national park is located within 6°30' - 6°52'S and 102°02' - 105°37'E. Almost at the same time in 1992, Ujung Kulon and Krakatau Islands were declared as one of Indonesia's Natural World Heritage sites by UNESCO.

Some reports on plants and animals of Ujung Kulon are available. However, there is very little information on invertebrates including butterflies. This paper attempts to collate the information available on butterflies at Ujung Kulon based on recent surveys and on previous published reports.

Yukawa (1984) was among the first to report the occurrence of butterfly species from Panaitan Island. New *et al.* (1987) covered the western part of Ujung Kulon Peninsula, *i.e.* Cidaon – Cibunar – Gunung Payung, Cibom – Ciramea and reported 84 species, and 35 species from Peucang Island. The field survey by de Jong *et al.* (unpublished report 1992) covered Taman Jaya – Cibiuk, Cikuya – Cibunar, and also Peucang Island.

Some colleagues and I conducted field surveys to assess the insect diversity at Ujung Kulon National Park through Indonesian government projects DIPA 2005, 2006 and 2010. The results of the butterfly surveys are presented and discussed here.

MATERIALS AND METHODS

Fieldwork was conducted at Taman Jaya – Ujung Jaya – Cibiuk in May 2005, at Taman Jaya – Cibiuk – Cikawung – Legon Pakis – Tanjung Lame in September 2006, and at Taman Jaya – Sumur – Cibayoni areas in April 2010. The selection of these locations was primarily determined by the support available and accessibility to the locations. Some other areas, especially the southern and the western part of the national park, were not easily accessed so these areas were not covered.

Specimens were obtained using insect nets and subsequently mounted at the Entomology laboratory of Museum Zoologicum Bogoriense (MZB) – LIPI. Specimens were identified using Aoki *et al.* (1982), Maruyama (1991), Morishita (1981), Seki *et al.* (1991), Tsukada & Nishiyama (1982), Tsukada (1985, 1991), Yata (1981). Additional references such as Ackery & Vane-Wright (1984) and Corbet & Pendlebury (1956) were also consulted. Recent changes in classification, such as proposed by Aduse-Poku *et al.* (2009) and Brower (2012) are accommodated. All voucher specimens have been deposited in the Museum Zoologicum Bogoriense, Indonesian Institute of Sciences, Cibinong, Indonesia.

RESULTS AND DISCUSSION

The butterfly species obtained and observed from the areas are presented in Table 1, together with previous records of Yukawa (1984), New *et al.* (1987) and de Jong *et al.* (unpublished report 1992).

Table 1. List of butterfly species at Ujung Kulon National Park

No.	Species	Pana	Peuc1	New	Peuc2	deJ	2005	2006	2010
Papilionidae (1-16)									
1	<i>Atrophaneura nox</i>	0	0	0	0	△1	0	0	0
2	<i>Graphium agamemnon</i>	1	1	0	1	1	1	1	1
3	<i>Graphium antiphates</i>	0	0	1	0	1	0	0	0
4	<i>Graphium doson</i>	1	1	1	1	0	0	0	0
5	<i>Graphium macareus</i>	0	0	△1	0	0	0	0	0
6	<i>Graphium sarpedon</i>	0	0	0	0	1	1	0	0
7	<i>Lamproptera curius</i>	0	0	0	0	0	⊙	0	0
8	<i>Losaria coon</i>	0	0	1	0	0	1	1	1
9	<i>Pachliopta aristolochiae</i>	0	1	1	0	1	1	1	1
10	<i>Papilio demolion</i>	0	0	0	0	0	0	⊙	0
11	<i>Papilio helenus</i>	1	0	1	0	1	0	1	0
12	<i>Papilio memnon</i>	0	1	1	1	1	1	1	1
13	<i>Papilio peranthus</i>	1	1	0	1	1	1	1	1

No.	Species	Pana	Peuc1	New	Peuc2	deJ	2005	2006	2010
14	<i>Papilio polytes</i>	0	0	1	0	1	1	1	1
15	<i>Troides amphrysus</i>	0	0	0	0	0	0	①	0
16	<i>Troides helena</i>	0	0	0	0	1	1	1	0
Pieridae (17-34)									
17	<i>Appias indra</i>	1	0	1	0	1	0	0	0
18	<i>Appias lycida</i>	1	0	0	0	1	1	0	0
19	<i>Appias nero</i>	1	0	0	0	1	1	1	0
20	<i>Appias olferna</i>	0	0	0	0	1	0	0	1
21	<i>Appias paulina</i>	1	0	1	0	0	0	0	0
22	<i>Catopsilia pomona</i>	1	1	1	0	1	1	1	1
23	<i>Catopsilia pyranthe</i>	0	0	0	0	①	0	0	0
24	<i>Cepora judith</i>	1	0	1	0	0	0	0	1
25	<i>Eurema alitha</i>	0	0	0	0	1	0	0	1
26	<i>Eurema blanda</i>	1	1	1	0	1	1	1	1
27	<i>Eurema hecabe</i>	0	1	1	1	0	0	0	1
28	<i>Eurema sari</i>	0	0	0	0	0	0	0	①
29	<i>Eurema tilaha</i>	0	0	0	0	①	0	0	0
30	<i>Gandaca harina</i>	1	1	1	0	1	0	0	0
31	<i>Hebomoia glaucippe</i>	0	0	1	0	1	1	1	0
32	<i>Leptosia nina</i>	0	1	1	1	0	0	0	1
33	<i>Pareronia valeria</i>	1	0	1	0	0	0	0	0
34	<i>Saletara liberia</i>	0	0	①	0	0	0	0	0
Nymphalidae-Charaxinae (35-37)									
35	<i>Charaxes (Polyura) athamas</i>	0	0	0	0	0	①	1	0
36	<i>Charaxes (Polyura) hebe</i>	0	0	0	0	0	0	0	①
37	<i>Prothoe franck</i>	0	0	①	0	0	0	0	0
Nymphalidae-Cyrestinae (38-39)									
38	<i>Chersonesia rahria</i>	1	0	1	0	0	1	0	1
39	<i>Cyrestis themire</i>	0	0	1	0	0	0	1	1
Nymphalidae-Danainae (40-57)									
40	<i>Danaus affinis</i>	0	0	0	0	0	0	①	0
41	<i>Danaus chrysippus</i>	0	0	0	0	0	①	0	0
42	<i>Danaus genutia</i>	0	0	0	0	0	①	1	1
43	<i>Euploea algea</i>	0	0	0	0	0	0	①	0
44	<i>Euploea camaralzeman</i>	0	0	①	0	0	0	0	0
45	<i>Euploea crameri</i>	1	1	0	1	0	0	0	0
46	<i>Euploea eleusina</i>	0	0	0	0	0	①	0	0
47	<i>Euploea eunice</i>	0	0	1	0	1	1	1	1
48	<i>Euploea midamus</i>	0	0	0	0	1	1	0	0
49	<i>Euploea modesta</i>	1	0	0	0	0	0	1	0
50	<i>Euploea mulciber</i>	0	1	1	1	1	1	1	1
51	<i>Euploea phaenareta</i>	0	0	0	0	0	①	0	1

No.	Species	Pana	Peuc1	New	Peuc2	deJ	2005	2006	2010
52	<i>Euploea radamanthus</i>	0	0	1	0	1	0	1	1
53	<i>Euploea tulliolus</i>	0	1	0	1	0	0	1	0
54	<i>Idea stollii</i>	0	0	0	0	0	0	①	1
55	<i>Ideopsis juvena</i>	0	1	1	1	1	1	1	1
56	<i>Ideopsis vulgaris</i>	0	0	0	0	0	△①	0	0
57	<i>Tirumala limniace</i>	0	0	1	1	0	0	0	0
Nymphalidae-Heliconiinae (58-65)									
58	<i>Cethosia hypsea</i>	1	0	0	0	1	0	0	0
59	<i>Cethosia penthesilea</i>	0	0	1	0	0	0	1	1
60	<i>Cirrochroa emalea</i>	0	0	0	0	0	①	1	0
61	<i>Cirrochroa tyche</i>	1	0	0	0	0	1	1	1
62	<i>Cupha erymanthis</i>	0	1	1	1	1	0	1	1
63	<i>Phalanta alcippe</i>	0	1	1	1	0	0	0	0
64	<i>Terinos terpander</i>	0	1	1	0	0	0	1	0
65	<i>Vindula dejone</i>	0	0	0	0	1	1	0	0
Nymphalidae-Limenitidinae (66-84)									
66	<i>Athyma nefte</i>	0	1	0	0	1	0	0	0
67	<i>Athyma pravara</i>	0	0	0	0	△1	0	0	0
68	<i>Dophla evelina</i>	0	0	△1	0	0	0	0	0
69	<i>Euthalia mahadeva</i>	△1	0	0	0	0	0	0	0
70	<i>Lebadea martha</i>	0	0	1	0	1	1	1	1
71	<i>Lexias dirtea</i>	0	0	1	1	0	1	0	0
72	<i>Moduza procris</i>	0	0	0	0	0	①	1	0
73	<i>Neptis hylas</i>	1	1	1	0	1	1	1	1
74	<i>Neptis nata</i>	0	0	0	0	△1	0	0	0
75	<i>Neptis sankara</i>	*	0	△1	0	0	0	0	0
76	<i>Neptis vikasi</i>	0	0	0	0	0	①	0	1
77	<i>Pantoporia paraka</i>	0	0	1	0	1	0	0	0
78	<i>Phaedyma columella</i>	0	0	0	0	1	0	1	0
79	<i>Tanaecia clathrata</i>	*	0	△1	0	0	0	0	0
80	<i>Tanaecia godartii</i>	0	0	1	0	1	0	0	1
81	<i>Tanaecia iapis</i>	0	0	1	0	1	1	1	1
82	<i>Tanaecia munda</i>	0	1	1	1	0	0	0	0
83	<i>Tanaecia palguna</i>	0	0	0	0	0	①	1	0
84	<i>Tanaecia trigerta</i>	0	0	0	0	1	0	0	1
Nymphalidae-Nymphalinae (85-94)									
85	<i>Doleschallia bisaltide</i>	0	0	△1	0	0	0	0	0
86	<i>Hypolimnias anomala</i>	0	0	1	0	1	0	1	1
87	<i>Hypolimnias bolina</i>	0	0	0	0	0	①	0	1
88	<i>Hypolimnias misippus</i>	0	0	0	0	0	0	0	△①
89	<i>Junonia almana</i>	0	0	1	0	1	1	1	1

No.	Species	Pana	Peuc1	New	Peuc2	deJ	2005	2006	2010
90	<i>Junonia atlites</i>	0	1	1	1	1	1	1	1
91	<i>Junonia erigone</i>	0	0	1	0	1	1	0	1
92	<i>Junonia hedonia</i>	0	0	1	0	1	1	1	1
93	<i>Junonia iphita</i>	0	0	1	0	1	1	1	1
94	<i>Symbrenthia hypselis</i>	0	0	△1	0	0	0	0	0
Nymphalidae-Satyrinae (95-112)									
95	<i>Amathusia phidippus</i>	0	0	0	0	0	①	0	1
96	<i>Elymnias hypermnestra</i>	0	0	1	0	1	1	0	1
97	<i>Elymnias nesaea</i>	0	0	0	0	0	△0	0	0
98	<i>Elymnias panthera</i>	0	0	0	0	0	0	△0	0
99	<i>Erites medura</i>	0	0	0	0	1	0	0	1
100	<i>Faunis canens</i>	0	1	0	0	1	0	0	0
101	<i>Lethe confusa</i>	0	0	△1	0	0	0	0	0
102	<i>Melanitis leda</i>	0	1	1	0	1	0	1	1
103	<i>Melanitis phedima</i>	0	0	1	0	1	0	0	0
104	<i>Melanitis zitenius</i>	0	0	0	0	△1	0	0	0
105	<i>Mycalesis horsfieldi</i>	0	0	1	0	1	0	0	1
106	<i>Mycalesis janardana</i>	0	0	1	0	0	1	0	0
107	<i>Mycalesis mineus</i>	0	0	0	0	0	①	1	1
108	<i>Mycalesis perseus</i>	0	0	0	0	0	△0	0	0
109	<i>Neorina crishna</i>	0	0	0	0	1	0	0	1
110	<i>Orsotriaena medus</i>	0	0	0	0	△1	0	0	0
111	<i>Ypthima horsfieldii</i>	0	0	1	0	1	0	0	0
112	<i>Ypthima philomela</i>	0	0	0	0	△1	0	0	0
Lycaenidae (113-149)									
113	<i>Allotinus horsfieldii</i>	0	1	1	0	0	1	0	0
114	<i>Allotinus subviolaceus</i>	0	△1	0	0	0	0	0	0
115	<i>Allotinus unicolor</i>	0	0	△1	0	0	0	0	0
116	<i>Arhopala antimuta</i> *	0	0	△1	0	0	0	0	0
117	<i>Arhopala pseudocentaurus</i>	0	0	0	0	0	0	△0	0
118	<i>Castalius rosimon</i>	0	0	0	0	0	0	0	△0
119	<i>Catochrysops panormus</i>	△1	0	0	0	0	0	0	0
120	<i>Catochrysops strabo</i>	0	1	1	0	0	0	0	0
121	<i>Chilades pandava</i>	0	△1	0	0	0	0	0	0
122	<i>Drupadia ravindra</i>	0	1	1	0	0	0	1	0
123	<i>Eooxylides tharis</i>	0	0	1	0	0	0	1	1
124	<i>Flos apidanus</i>	0	0	0	0	0	△0	0	0
125	<i>Hypolycaena amasa</i>	0	0	0	0	0	0	0	△0
126	<i>Hypolycaena erylus</i>	0	0	0	0	0	0	△0	0
127	<i>Ionolyce helicon</i>	0	0	△1	0	0	0	0	0
128	<i>Jamides alecto</i>	0	0	0	0	0	0	0	△0
129	<i>Jamides aratus</i>	0	1	1	0	0	1	1	0

No.	Species	Pana	Peuc1	New	Peuc2	deJ	2005	2006	2010
130	<i>Jamides bochus</i>	△1	0	0	0	0	0	0	0
131	<i>Jamides celeno</i>	0	1	1	0	0	0	0	0
132	<i>Jamides elpis</i>	0	0	△1	0	0	0	0	0
133	<i>Jamides malaccanus</i>	△1	0	0	0	0	0	0	0
134	<i>Jamides parasaturatus</i>	0	0	△1	0	0	0	0	0
135	<i>Jamides philatus</i>	0	0	0	0	0	△0	0	0
136	<i>Jamides pura</i>	0	0	0	0	0	△0	0	0
137	<i>Lampides boeticus</i>	0	1	1	0	0	0	0	0
138	<i>Liphyra brassolis</i>	0	0	△1	0	0	0	0	0
139	<i>Miletus boisduvali</i>	0	0	1	0	0	0	1	0
140	<i>Miletus symethus</i>	0	0	0	0	0	①	1	0
141	<i>Nacaduba pactolus</i>	△1	0	0	0	0	0	0	0
142	<i>Neopithecops zalmora</i>	0	1	1	0	0	0	0	0
143	<i>Pithecops corvus</i>	0	0	△1	0	0	0	0	0
144	<i>Prosotas dubiosa</i>	△1	0	0	0	0	0	0	0
145	<i>Prosotas nora</i>	0	0	△1	0	0	0	0	0
146	<i>Spindasis lohita</i>	0	0	0	0	0	①	1	0
147	<i>Surendra vivarna</i>	0	0	0	0	0	0	△0	0
148	<i>Zizina otis</i>	0	1	1	0	0	0	0	0
149	<i>Zizula hylax</i>	0	0	△1	0	0	0	0	0
Riodinidae (150)									
150	<i>Abisara kausambi</i>	0	0	0	0	0	0	0	△0
Hesperiidae (151-177)									
151	<i>Acerbas anthea</i>	0	△1	0	0	0	0	0	0
152	<i>Astictopterus jama</i>	0	0	0	0	△1	0	0	0
153	<i>Celaenorrhinus dhanada</i>	0	0	0	0	△1	0	0	0
154	<i>Cephrènes acalle</i>	0	0	0	0	0	0	△0	0
155	<i>Erionota thrax</i>	0	0	0	0	1	0	1	0
156	<i>Halpe pelethronix</i>	0	0	△1	0	0	0	0	0
157	<i>Hasora badra</i>	0	0	0	0	△1	0	0	0
158	<i>Isma bononia</i>	0	0	△1	0	0	0	0	0
159	<i>Isma obscura</i>	0	0	△1	0	0	0	0	0
160	<i>Koruthaialos rubecula</i>	0	0	1	0	1	0	0	0
161	<i>Matapa druna</i>	0	0	0	0	△1	0	0	0
162	<i>Notocrypta paralyso</i>	0	0	0	0	1	1	0	0
163	<i>Parnara guttatus</i>	0	0	0	0	1	1	0	0
164	<i>Pelopidas agna</i>	0	0	0	0	△1	0	0	0
165	<i>Pelopidas conjuncta</i>	0	0	0	0	△1	0	0	0
166	<i>Potanthus confucius</i>	△1	0	0	0	0	0	0	0
167	<i>Potanthus ganda</i>	0	0	0	0	1	1	0	0
168	<i>Psolos fuligo</i>	0	0	1	0	1	0	0	0
169	<i>Quedara monteithi</i>	0	0	0	0	△1	0	0	0

No.	Species	Pana	Peuc1	New	Peuc2	deJ	2005	2006	2010
170	<i>Salanoemia tavoyana</i>	0	0	△1	0	0	0	0	0
171	<i>Tagiades gana</i>	0	0	0	0	0	0	△0	0
172	<i>Taractrocera aliena</i>	0	△1	0	0	0	0	0	0
173	<i>Taractrocera archias</i>	0	0	0	0	△1	0	0	0
174	<i>Telicota colon</i>	0	0	1	0	1	0	0	0
175	<i>Udaspes folus</i>	0	0	0	0	△1	0	0	0
176	<i>Unkana ambassa</i>	0	0	0	0	0	0	△0	0
177	<i>Zographetus ogygioides</i>	0	0	△1	0	0	0	0	0
		26	35	84	16	64	57	58	53

Notes:

0 = absence of species at the location, 1 = presence of species at the location

* = no previous record from Java

Pana = Panaitan by Yukawa 1984

Peuc1 = Peucang New *et al.* 1987

New = New *et al.* 1987 Cidaon-Cibunar-G. Payung

Peuc2 = Peucang de Jong *et al.* 1992

deJ = de Jong *et al.* 1992 Taman Jaya, Cikuya-Cibunar

2005 = 2005 Taman Jaya DIPA LIPI

2006 = 2006 Taman Jaya DIPA LIPI

2010 = 2010 Taman Jaya - Cibayoni DIPA LIPI

As reported by Yukawa (1984), Panaitan Island was inhabited by 26 butterfly species. On Peucang Island, New *et al.* (1987) recorded 35 species, and de Jong *et al.* (unpublished report 1992) noted 16 species, all of which were recorded previously, by New *et al.* (1987).

On Ujung Kulon Peninsula, particularly the western part of Ujung Kulon, New *et al.* (1987) reported 84 species. It should be noted that three species (marked with * on Table 1) were not previously recorded from Java, but I could not confirm the occurrence. On Taman Jaya – Cibiuk and Cikuya – Cibunar areas, de Jong *et al.* (unpublished report 1992) reported as many as 64 species.

During my survey, collections and observation at Taman Jaya – Cibiuk – Cikawung – Legon Pakis – Tanjung Lame and also Sumur – Cibayoni resulted in 101 species of butterflies, with 57 species recorded in 2005, 58 species in 2006, and 53 species in 2010.

In total, 177 butterfly species are now recorded from Ujung Kulon (Table 1). Record by Yukawa (1984) from Panaitan Island contributed 14.7% (26 of 177 species) to the data. Record from Peucang Island contributed 15.3% (27 of 177 species), with records of New *et al.* (1987) from the Ujung Kulon Peninsula considered to be taken later than the Peucang data, merely to put more emphasis on the importance of an island. At the Ujung Kulon Peninsula we can roughly say that New *et al.* (1987) contributed 29.9% (53 additional species of 177 species), de Jong

et al. (unpublished report 1992) contributed 17.5% (31 additional species of 177 species) and the LIPI survey of 2005 contributed 11.9% (21 newly reported of 177 species), the 2006 survey contributed 6.8% (12 newly reported of 177 species), and the 2010 survey contributed 3.9% (7 newly reported of 177 species). This leads to an interesting question as to how much sampling effort we need to obtain a reasonably robust measure of the biodiversity. Further assessment using programs such as EstimateS may help elucidate the question.

As many as 21 species (the presence marked as oval on Table 1) out of 57 species obtained in 2005, 12 species (marked as oval on Table 1) out of 58 species obtained in 2006, 7 species (marked as oval on Table 1) out of 53 species in 2010 are additional to the previous reports. Thus, 40 species out of the total 101 species (39.6%) are reported here for the first time from Ujung Kulon, *i.e.* *Lamproptera curius*, *Papilio demolion*, *Troides amphrysus*, *Eurema sari*, *Charaxes (Polyura) athamas*, *Charaxes (Polyura) hebe*, *Danaus affinis*, *Danaus chrysippus*, *Danaus genutia*, *Euploea algea*, *Euploea eleusina*, *Euploea phaenareta*, *Idea stollii*, *Ideopsis vulgaris*, *Cirrochroa emalea*, *Moduza procris*, *Neptis vikasi*, *Tanaecia palguna*, *Hypolimnas bolina*, *Hypolimnas misippus*, *Amathusia phidippus*, *Elymnias nesaea*, *Elymnias panthera*, *Mycalesis mineus*, *Mycalesis perseus*, *Arhopala pseudocentaurus*, *Castalius rosimon*, *Flos apidanus*, *Hypolycaena amasa*, *Hypolycaena erylus*, *Jamides alecto*, *Jamides philatus*, *Jamides pura*, *Miletus symethus*, *Spindasis lohita*, *Surendra vivarna*, *Abisara kausambi*, *Cephrenes acalle*, *Tagiades gana* and *Unkana ambassa*.

This result shows that even some common species were missed during previous studies, and that the fauna has not been fully documented. *Hypolimnas bolina* is an example of a very common species that was not recorded previously. It is possible that the time of collection and seasonality of the species might explain why some of these species were overlooked. Also, the areas sampled are likely to be different, so that species dependent on small spatial resources or particular microhabitats could have been overlooked during previous surveys.

In terms of abundance, it is interesting to look at the rarity of the species obtained, according to their frequency of occurrence. In Panaitan, there were 7 species (the presence marked as triangle on Table 1) of 26 species not found elsewhere within the national park. In Peucang, 4 species (marked as triangle on Table 1) were found there only. From the western part of Ujung Kulon, 24 species (marked as triangle on Table 1) found nowhere else. At Taman Jaya – Cibiuk and Cikuya – Cibunar, de Jong *et al.* (unpublished report 1992) found 17 species (marked as triangle on Table 1) nowhere else. At Taman Jaya – Ujung Jaya – Cibiuk in 2005,

there were 9 species (marked as triangle on Table 1) found nowhere else. At Taman Jaya – Cibiuk – Cikawung – Legon Pakis – Tanjung Lame in 2006, 11 species (marked as triangle on Table 1) were solely found there. At Taman Jaya – Sumur – Cibayoni in 2010, 7 species (marked as triangle on Table 1) were found nowhere else. These singletons may reflect true rare species or lack of adequate sampling. Also, species of Lycaenidae and HesperIIDae were not so well represented as they are not so obvious in the field at the time of collecting, so their low representation may reflect low detectability.

It is hoped that the data presented in this report will serve as a baseline for further research on butterfly diversity in this important world heritage conservation area.

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