

Colony Composition and Altitudinal Distribution
of Passalid Beetles (Coleoptera, Passalidae)
Observed in the Kinabalu Park, Sabah, Borneo

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Abstract Colony composition and altitudinal distribution are reported for the following five passalid beetles observed in the Kinabalu Park, Sabah: *Aceraius alpinus* KON, UEDA et JOHKI, *A. hikidai* KON, UEDA et JOHKI, *A. kinabalensis* KON et JOHKI, *A. sabanus* KON, UEDA et JOHKI and *Ophrygonius uedai* KON et JOHKI.

Passalid beetles (Coleoptera, Passalidae) have been cited as being subsocial insects (TALLAMY & WOOD, 1986, etc.). Most species are known to live in colony in the gallery excavated into logs (REYES-CASTILLO & HALFFTER, 1983).

KON and JOHKI (1992) reported the colony composition and habitats for some passalid beetles collected from the areas under 1,300 m in altitude in Sabah, Borneo. In March, 1994, we had an opportunity to observe some passalid colonies in the Kinabalu Park, Sabah (over 1,600 m) under permission. We herewith report their colony composition, habitats and altitudinal distribution.

Observations were made in the Kinabalu Park at the altitudes between 1,600 m and 2,350 m. When two or more conspecific individuals (regardless of their developmental stages) were found within the same gallery system excavated into a log or within a small depression on the ground under a log, we regarded such a group of individuals as a colony.

Before going further, we wish to express our hearty thanks to Mr. Francis LIEW and Rajibi Haji AMAN, the Sabah Parks, for giving us the permission of performing

the present research in the Kinabalu Park.

Aceraius alpinus KON, UEDA et JOHKI

Aceraius alpinus KON, UEDA et JOHKI, 1995, Jpn. J. sys. Ent., 1, p. 99.

Thirteen colonies were observed in the altitudes between 1,810 m and 2,350 m in the Kinabalu Park. Of these, two colonies consisted of a bisexual pair, eight consisted of a bisexual pair of black adults and young (either red teneral adults, pupae, larvae and/or eggs), one consisted of one black female and eggs, one consisted of one black male and two black females, and one consisted of eleven adults (2 black ♂♂, 6 black ♀♀, 1 red ♂, 2 red ♀♀), eight larvae and twenty two eggs (Table 1). In the last colony, all the eggs were found to be aggregated in a particular area in the gallery where mixture of triturated wood and adult feces were spread. They were living in the galleries excavated into rather tough logs.

Aceraius hikidai KON, UEDA et JOHKI

Aceraius hikidai KON, UEDA et JOHKI, 1993, Elytra, Tokyo, 15, p. 276.

Ten colonies were observed in the altitudes between 1,600 m and 1,840 m in the Kinabalu Park. Of these, seven colonies consisted of a bisexual pair and three consisted of a bisexual pair and young (either larvae or eggs; Table 1). They were living in the galleries excavated into rather tough logs.

UEDA *et al.* (1988) reported for *Aceraius* species collected from Sabah that altitudinal segregation was observed between species having similar body size. *Aceraius alpinus* and *A. hikidai* are similar in body size; the former is 31.0–34.2 mm in body length (KON *et al.*, 1995) whereas the latter 29.3–30.4 mm (KON *et al.*, 1993 b). In the present study, it was revealed that *A. alpinus* and *A. hikidai* appeared to be altitudinally segregated; the former was found between 1,810 m and 2,350 m whereas the latter between 1,600 m and 1,840 m, though they co-occurred in a narrow altitudinal range between 1,810 m and 1,840 m.

Aceraius kinabalensis KON et JOHKI

Aceraius kinabalensis KON et JOHKI, 1989, Jpn. J. Ent., 57, p. 533.

One colony, consisting of two black females, one pupa and one third instar, was observed at an altitude of 1,890 m (Table 1). They were living in the gallery excavated into a tough log. The two black females of this colony appeared to be imago-offspring, because they were not worn out at all. When the log, in which this *A. kinabalensis* colony was found in March, 1994, had once been examined in September, 1993, it had not yet been attacked by any passalid beetles at all (KON *et al.*, personal observation). This means that the *A. kinabalensis* colony observed in the present study

Table 1. Colony composition of passalid beetles observed in the Kinabalu Park, Sabah.

Altitude (m)	Date	Adults (black)		Adults (red)		Pupae	Larvae			Eggs
		Male	Female	Male	Female		3rd instar	2nd instar	1st instar	
<i>Aceraius alpinus</i>										
1.	1900 25-III-1994	1	1	0	0	0	0	0	0	0
2.	2350 25-III-1994	2	6	1	2	0	8	0	0	22
3.	1900 26-III-1994	1	1	0	0	0	6	0	0	0
4.	1910 26-III-1994	1	1	0	0	0	1	0	0	0
5.	1900 26-III-1994	1	1	0	0	0	0	0	0	2
6.	1900 26-III-1994	0	1	0	0	0	0	0	0	4
7.	1900 26-III-1994	1	1	0	0	0	0	0	0	0
8.	1840 27-III-2994	1	1	0	0	0	3	0	0	0
9.	1840 27-III-1994	1	1	1	2	0	2	0	0	0
10.	1830 27-III-1994	1	1	0	0	0	0	2	0	0
11.	1830 27-III-1994	1	1	0	0	0	1	1	0	0
12.	1830 27-III-1994	1	1	0	1	1	5	0	0	0
13.	1810 27-III-1994	1	2	0	0	0	0	0	0	0
<i>Aceraius hikidai</i>										
1.	1840 27-III-1994	1	1	0	0	0	0	0	0	0
2.	1830 27-III-1994	1	1	0	0	0	0	0	0	10
3.	1810 27-III-1994	1	1	0	0	0	0	0	0	0
4.	1740 27-III-1994	1	1	0	0	0	0	0	0	0
5.	1740 27-III-1994	1	1	0	0	0	0	5	0	0
6.	1600 28-III-1994	1	1	0	0	0	0	0	0	0
7.	1600 28-III-1994	1	1	0	0	0	0	0	0	0
8.	1610 28-III-1994	1	1	0	0	0	0	0	0	0
9.	1610 28-III-1994	1	1	0	0	0	0	0	0	0
10.	1620 28-III-1994	1	1	0	0	0	4	1	0	0
<i>Aceraius kinabalensis</i>										
1.	1890 25-III-1994	0	2	0	0	1	1	0	0	0
<i>Aceraius sabanus</i>										
1.	1880 25-III-1994	1	2	1	1	0	4	0	0	0
<i>Ophrygonius uedai</i>										
1.	1860 27-III-1994	1	1	0	0	0	0	0	0	0
2.	1840 27-III-1994	1	1	1	0	0	1	0	0	0
3.	1840 27-III-1994	1	1	0	0	0	0	0	0	0
4.	1840 27-III-1994	1	1	0	0	0	0	0	0	0
5.	1840 27-III-1994	1	1	0	0	0	3	0	0	0
6.	1810 27-III-1994	1	1	0	0	0	2	0	0	0
7.	1810 27-III-1994	1	1	0	0	0	0	0	0	4
8.	1600 28-III-1994	1	1	0	0	0	0	0	0	3
9.	1600 28-III-1994	1	1	0	0	0	0	0	0	6

was certainly six or less months old. Thus, it appears to take six months or less for *A. kinabalensis* to grow up to be black adults after the colony foundation.

Aceraius sabanus KON, UEDA et JOHKI

Aceraius sabanus KON, UEDA et JOHKI, 1995, Jpn. J. sys. Ent., **1**, p. 101.

One colony, consisting of three black adults (1 ♂, 2 ♀♀), two red teneral adults (1 ♂, 1 ♀) and four larvae, was observed at an altitude of 1,880 m (Table 1). Of three black adults of this colony, one female appeared to be the founding female, because it had been worn out. They were living in the gallery excavated into a seemingly old log lacking the bark.

Ophrygonius uedai KON et JOHKI

Ophrygonius uedai KON et JOHKI, 1991, Jpn. J. Ent., **59**, p. 506.

Nine colonies were observed at the altitudes between 1,600 m and 1,860 m in the Kinabalu Park. Of these, two colonies consisted of a bisexual pair and six consisted of a bisexual pair and young (either red teneral adults, larvae and/or eggs; Table 1). As reported in KON *et al.* (1993 a), they were living on the ground under logs, not tunnelling into the logs.

要 約

近 雅博・常喜 豊・菊田 融：ボルネオ、サバ州のキナバル公園で観察されたクロツヤムシの家族構成と垂直分布。—— サバ州のキナバル公園で観察した5種のクロツヤムシ, *Aceraius alpinus* KON, UEDA et JOHKI, *A. hikidai* KON, UEDA et JOHKI, *A. kinabalensis* KON et JOHKI, *A. sabanus* KON, UEDA et JOHKI および *Ophrygonius uedai* KON et JOHKI の、家族構成と垂直分布について報告した。

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