

Passalid Beetles (Coleoptera, Passalidae) Collected from
Sabah, Borneo, with Special Reference to their Colony
Composition and Habitats¹⁾

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Abstract Nineteen species of passalid beetles are recorded from Sabah, Borneo. The colony composition and habitats are also reported for some species.

The Passalidae are a pan-tropical family of the Coleoptera and often cited in the entomological literature as being subsocial insects (WHEELER, 1923; GRAY, 1946; WILSON, 1971; R. W. & J. R. MATTHEWS, 1978; EICKWORT, 1981; HALFFTER, 1982; REYES-CASTILLO & HALFFTER, 1983). However, relatively little is known about the Oriental species (GRAVELY, 1914; KON & JOHKI, 1987; KON & ARAYA, 1991, 1992). We had an opportunity to collect some passalid beetles during the Kyoto University Expeditions to Sabah, Borneo, between July and October, 1985 and between July and September, 1987. We herein record them and report the colony composition and habitats for some species.

Collections were made in Kundasang near Mt. Kinabalu, Ranau, Tambunan, Keningau, Sepilok near Sandakan and Brumas near Tawau (Fig. 1). 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.

Subfamily Aulacocyclusinae

Comacupes cylindraceus (PERTY)

Passalus cylindraceus PERTY, 1831, Obs. nonnullae Coleopt. Ind. orient., p. 36.

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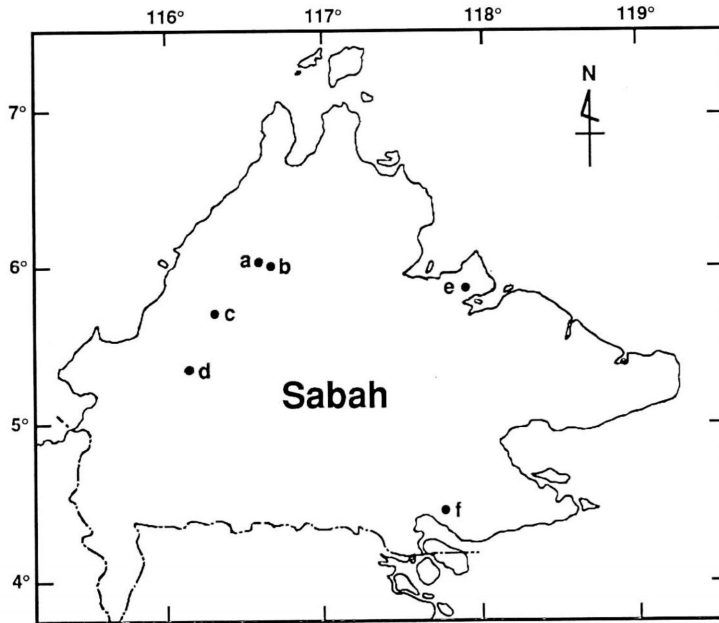


Fig. 1. A sketch map of Sabah, showing the localities at which collections were made. a, Kundasang; b, Ranau; c, Tambunan; d, Keningau; e, Sepilok; f, Brumas.

One adult was collected from a decayed stump in the plantation in Brumas.

Specimen examined. 1 ♂, Brumas, 25-VIII-1985.

Distribution. Malay Peninsula, Sumatra, Java, Borneo.

Comacupes stoliczkae GRAVELY

Comacupes stoliczkae GRAVELY, 1914, Mem. Ind. Mus., 3, p. 206.

Two colonies consisting of a bisexual pair were collected from the plantation in Brumas (Table 1). They were living in the gallery excavated into a decayed stump.

Specimens examined. 2 ♂♂, 2 ♀♀, Brumas, 24-VIII-1985.

Distribution. Malay Peninsula, Sumatra, Java, Borneo.

Taeniocerus bicanthatus (PERCHERON)

Passalus bicanthatus PERCHERON, 1841, Mag. Zool., 11, p. 41.

Nineteen colonies were collected from the plantation in Brumas. Eighteen of these consisted of either a bisexual pair or a pair and larvae and one consisted of a female and larvae (Table 1). As reported by KON and JOHKI (1987), they were living in the interface between logs and the ground, not tunnelling into the logs. In addition, two single adults were collected from the same kind of microhabitat and one on the trail in Brumas.

Specimens examined. 1 ♀, Brumas, 21-VIII-1985; 1 ♂, 1 ♀, ditto, 25-VIII-1985; 5 ♂♂, 6 ♀♀, ditto, 26-VIII-1985; 6 ♂♂, 6 ♀♀, ditto, 27-VIII-1985; 2 ♂♂, 3 ♀♀, ditto, 22-VII-1987; 1 ♂, 1 ♀, ditto, 24-VII-1987; 3 ♂♂, 3 ♀♀, ditto, 26-VII-1987.

Distribution. Malay Peninsula, Sumatra, Borneo.

Subfamily Passalinae

Macrolinus latipennis (PERCHERON)

Passalus latipennis PERCHERON, 1841, Mag. Zool., 11, p. 8.

One colony consisting of a bisexual pair was collected from a decayed log in Sepilok (Table 1). Two adults were collected at light in Kundasang and one in Sepilok.

Specimens examined. 1 ♀, Kundasang, 19-VII-1987; 1 ♂, ditto, 12-VIII-1987; 1 ♂, 1 ♀, Sepilok, 13-VIII-1985; 1 ♀, ditto, 5-VIII-1987.

Distribution. Myanmar, Malay Peninsula, Sumatra, Borneo, Philippines, Moluccas.

Ophrygonius singapurae GRAVELY

Ophrygonius singapurae GRAVELY, 1914, Mem. Ind. Mus., 3, p. 26.

One adult was collected on the trail in Sepilok.

Specimen examined. 1 ♀, Sepilok, 8-VIII-1985.

Distribution. Laos, Malay Peninsula, Borneo.

Ophrygonius wallacei (KUWERT)

Heterochilus wallacei KUWERT, 1898, Nov. zool., 5, p. 334.

One adult was collected at light in Sepilok.

Specimen examined. 1 ♀, Sepilok, 2-VIII-1987.

Distribution. Malay Peninsula, Sumatra, Borneo.

Aceraius borneanus KAUP

Aceraius borneanus KAUP, 1871, Berl. ent. Z., 15 (suppl), p. 52.

Thirteen colonies were collected from the forest in Sepilok. Ten of these consisted of either a bisexual pair of black beetles or a pair and larvae, one consisted of a black female and a larva and two consisted of ten or more adults including red (teneral) beetles, pupae and larvae (Table 1). They were living in the gallery excavated into logs on the forest floor. One adult was collected at light in Sepilok.

Specimens examined. 1 ♀, Sepilok, 10-VIII-1985; 1 ♀, ditto, 17-VIII-1985;

10 ♂♂, 12 ♀♀, ditto, 18-VIII-1985; 9 ♂♂, 10 ♀♀, ditto, 21-VII-1987; 2 ♂♂, 2 ♀♀, ditto, 10-VIII-1987.

Distribution. Malay Peninsula, Sumatra, Java, Borneo.

Aceraius kuwerti ZANG

Aceraius kuwerti ZANG, 1903, Insekten-Borse., 20, p. 339.

This species was previously synonymized with *A. tricornis* (GRAVELY, 1918), but the validity of *A. kuwerti* was recently confirmed (KON & JOHKI, 1989).

Four colonies were collected from the forest in Ranau. Three of these consisted of either a bisexual pair or a pair and eggs and one consisted of one black and two red (teneral) adults and three pupae (Table 1). They were living in the gallery excavated into tough logs on the forest floor. The galleries of the former three colonies which appeared to be in the early stages were simple and short (50 cm or less), whereas that of the latter mature colony including teneral adults and pupae was branched and longer (2 m or more). In addition, one adult was collected at light in Kundasang and one adult on the trail in Ranau.

Specimens examined. 1 ♀, Kundasang, 31-VII-1985; 4 ♂♂, 5 ♀♀, Ranau, 13-VIII-1987; 1 ♂, ditto, 5-IX-1987.

Distribution. Borneo.

Aceraius laevicollis (ILLIGER)

Passalus laevicollis ILLIGER in WIEDEMANN, 1800, Archiv Zool., 1, p. 103.

This species is one of the commonest passalid beetles in Sabah. Four colonies were collected from the plantation in Brumas, one from the cultivated open area in Kundasang and ten from the forest in Keningau. Thirteen of these consisted of either a bisexual pair or a pair and larvae and two consisted of a female and larvae (Table 1). They were living in the gallery excavated into tough logs. The gallery was filled with a lot of tritulated wood. In addition, several black adults were collected at light in Kundasang, Brumas and Sepilok and two single red (teneral) adults from decayed logs in Brumas.

Specimens examined. 1 ♀, Kundasang, 31-VII-1985; 1 ♂, 1 ♀, ditto, 18-VII-1987; 1 ♀, ditto, 12-VIII-1987; 1 ♂, Brumas, 18-VIII-1985; 1 ♀, ditto, 21-VIII-1985; 1 ♂, 1 ♀, ditto, 23-VIII-1985; 1 ♂, ditto, 24-VIII-1985; 1 ♂, 1 ♀, ditto, 25-VIII-1985; 1 ex., ditto, 3-IX-1985; 1 ex., ditto, 20-IX-1985; 3 exs., ditto, 2-X-1985; 6 exs., ditto, 17-X-1985; 1 ♂, 1 ♀, ditto, 22-VII-1987; 1 ♂, 1 ♀, ditto, 24-VII-1987; 1 ex., ditto, 25-VII-1987; 2 exs., ditto, 27-VII-1987; 1 ex., Sepilok, 5-VIII-1985; 1 ex., ditto, 29-VII-1987; 2 exs., ditto, 8-VIII-1987; 4 ♂♂, 5 ♀♀, Keningau, 15-VIII-1987; 1 ♂, 1 ♀, ditto, 16-VIII-1987; 4 ♂♂, 4 ♀♀, ditto, 17-VIII-1987.

Distribution. Malay Peninsula, Sumatra, Java, Borneo, Philippines, ?Sulawesi.

Aceraius laevimargo ZANG

Aceraius laevimargo ZANG, 1905, Dt. ent. Z., 1905, p. 244.

This species had long been regarded as being conspecific with *A. perakensis* KUWERT, but recently re-evaluated to be a distinct species (KON & JOHKEI, 1992).

One adult was collected at light in Kundasang.

Specimen examined. 1 ♀, Kundasang, 31-VII-1985.

Distribution. Borneo.

Aceraius moeschleri KUWERT

Aceraius moeschleri KUWERT, 1891, Dt. ent. Z., 1891, p. 163.

Two adults were collected at light in Kundasang.

Specimens examined. 1 ♂, Kundasang, 18-VII-1987; 1 ♀, ditto, 19-VII-1987.

Distribution. Malay Peninsula, Sumatra, Java, Borneo.

Aceraius pilifer (PERCHERON)

Passalus pilifer PERCHERON, 1835, Monogr. Passal., p. 23.

One adult was collected on the trail in Kundasang.

Specimen examined. 1 ♀, Kundasang, 12-VIII-1987.

Distribution. Sumatra, Java, Borneo.

Aceraius tricornis ZANG

Aceraius tricornis ZANG, 1903, Insekten-Borse., 20, p. 339.

Two adults were collected at light in Kundasang.

Specimens examined. 2 ♀♀, Kundasang, 18-VII-1987.

Distribution. Borneo.

Pelopides monticulosus (SMITH)

Passalus monticulosus SMITH, 1852, Nomencl. Coleopt. Ins. Coll. Brit. Mus., 6, p. 6.

Two colonies were collected from the plantation in Brumas and one colony from the forest in Tambunan. One colony from Brumas consisted of seven adults (two black and five red beetles) and the other consisted of seven larvae alone without adults. The colony from Tambunan consisted of a bisexual pair and two larvae (Table 1). They were living in the gallery excavated into a heavily decayed log. In addition, four adults were collected at light and one from decayed log in the plantation in Brumas, and one from decayed log in Tambunan.

Specimens examined. 1 ex., Brumas, 18-VIII-1985; 1 ex., ditto, 24-VIII-1985; 1 ex., ditto, 2-X-1985; 1 ex., ditto, 25-VII-1987; 3 ♂♂, 4 ♀♀, ditto, 27-VII-1987;

1 ex., ditto, 28–VII–1987; 2 ♂♂, 1 ♀, Tambunan, 15–VIII–1987.

Distribution. Thailand, Malay Peninsula, Sumatra, Borneo.

***Pelopides symmetricus* (ZANG)**

Parapelopides symmetricus ZANG, 1904, Zool. Anz., 27, p. 695.

One colony consisting of a bisexual pair and five larvae was collected from the forest in Kundasang (Table 1). They were living in wood detritus within a heavily decayed log on the forest floor.

Specimens examined. 1 ♂, 1 ♀, Kundasang, 12–VIII–1987.

Distribution. Borneo.

***Leptaulax bicolor* (FABRICIUS)**

Passalus bicolor FABRICIUS, 1801, Syst. Eleuth., 2, p. 256.

One colony was collected from the plantation in Brumas, one from the open area in Ranau, four from the open area in Kundasang and two from forest-side in Tambunan. In two of these colonies, a bisexual pair of black (mature) adults was found, but in the other six, no black adult male was found (on the contrary, one of them consisted of two black females alone; Table 1). This species was living in the gallery excavated shallowly into sap wood of logs. In addition some adults were collected at light in Brumas and Kundasang.

Specimens examined. 1 ex., Brumas, 18–VIII–1985; 2 ♀♀, ditto, 25–VIII–1985; 1 ex., ditto, 23–IX–1985; 4 exs., Kundasang, 18–VII–1987; 2 exs., ditto, 19–VII–1987; 1 ♂, 5 ♀♀, ditto, 14–VIII–1987; 1 ♀, Ranau, 13–VIII–1987; 4 ♂♂, 7 ♀♀, Tambunan, 15–VIII–1987.

Distribution. India, Sri Lanka, E. Himalayas, Myanmar, Thailand, Vietnam, Cambodia, Formosa, Malay Peninsula, Sumatra, Java, Borneo, Philippines, Sulawesi, Moluccas, New Guinea, Australia.

***Leptaulax cyclotaenius* KUWERT**

Leptaulax cyclotaenius KUWERT, 1891, Dt. ent. Z., 1891, p. 188.

Several colonies were found in the forest in Sepilok. They were living gregariously under the bark of logs on the forest floor. The colonies consisted of several black adults, red (teneral) adults, pupae, various-sized larvae and eggs, although the exact data concerning colony composition were not available.

Specimens examined. 3 exs., Sepilok, 4–VIII–1985; 2 exs., ditto, 14–VIII–1985; 14 exs., ditto, 17–VIII–1985; 1 ex., ditto, 21–VII–1987.

Distribution. E. Himalayas, Myanmar, Thailand, Vietnam, Cambodia, Malay Peninsula, Sumatra, Borneo, Sulawesi.

Leptaulax dentatus (FABRICIUS)

Passalus dentatus FABRICIUS, 1792, Ent. Syst., 1 (2), p. 241.

One adult was collected at light in Sepilok.

Specimen examined. 1 ex., Sepilok, 15-IX-1987.

Distribution. India, E. Himalayas, Myanmar, Thailand, Vietnam, Cambodia, China, Formosa, Malay Peninsula, Sumatra, Java, Borneo, Philippines, Sulawesi, Lesser Sundas, Moluccas, New Guinea, Australia.

Leptaulax planus (ILLIGER)

Passalus planus ILLIGER in WIEDEMANN, 1800, Archiv Zool., 1, p. 104.

One colony consisting of a bisexual pair was collected from the plantation in Brumas (Table 1). They were living under the bark of a large tough log. Seventy-eight adults were collected at light in Sepilok and Brumas.

Specimens examined. 2 exs., Sepilok, 3-VIII-1985; 1 ex., ditto, 7-VIII-1985; 2 exs., ditto, 15-VIII-1985; 1 ex., ditto, 18-VIII-1985; 1 ♂, 1 ♀, Brumas, 23-VIII-1985; 68 exs., ditto, 23-IX-1985; 1 ex., ditto, 24-IX-1985; 1 ex., ditto, 25-IX-1985; 1 ex., ditto, 26-IX-1985; 1 ex., ditto, 17-X-1985.

Distribution. Myanmar, Thailand, Malay Peninsula, Sumatra, Java, Borneo, Sulawesi.

Discussion

REYES-CASTILLO and HALFFTER (1983) schematically described the pattern of passalid colony development as follows: 1) A bisexual pair founds a colony digging the gallery into the log. 2) The founding pair, larvae and eggs were found in the gallery. 3) The founding pair, pupae and larvae were found. 4) The founding pair and imago-offspring were found.

The colony compositions of the Bornean passalid beetles observed in the present study appear to agree well with some stage in the above-mentioned schema. However, the founding pair was not always found in all the colonies (Table 1). The colonies lacking a black (mature) male were observed in several species; *Taeniocerus bicanthatus* (1/19), *Aceraius borneanus* (1/13), *A. kuwerti* (1/4), *A. laevicollis* (2/15) and *Pelopides monticulosus* (2/3; one colony consisted of larvae alone without adults). In *Leptaulax bicolor*, colonies with a black (mature) male were rather rare (2/8). Thus, males may be inclined to desert the partner and young earlier than females.

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Table 1. Colony compositions of passalid beetles collected in Sabah. Abbreviations for collection localities as follows: BMS, Brumas; KDN, Kundasang; KNG, Keningau; RNU, Ranau; SPK, Sepilok; TBN, Tambunan.

Locality	Date	Adults (black)		Adults (red)		Pupae	Larvae			Eggs	
		Male	Female	Male	Female		3rd instar	2nd instar	1st instar		
Subfamily Aulacocyclusinae											
<i>Comacupes stoliczkae</i>											
1. BMS	24 Aug. 1985	1	1	0	0	0	0	0	0	0	0
2. BMS	24 Aug. 1985	1	1	0	0	0	0	0	0	0	0
<i>Taeniocerus bicanthatus</i>											
1. BMS	25 Aug. 1985	1	1	0	0	0	0	0	0	0	0
2. BMS	26 Aug. 1985	1	1	0	0	0	0	0	0	0	0
3. BMS	26 Aug. 1985	1	1	0	0	0	0	0	0	1	0
4. BMS	26 Aug. 1985	1	1	0	0	0	0	0	0	1	0
5. BMS	26 Aug. 1985	1	1	0	0	0	0	0	0	2	0
6. BMS	26 Aug. 1985	0	1	0	0	0	0	0	1	1	0
7. BMS	26 Aug. 1985	1	1	0	0	0	2	1	3	0	0
8. BMS	27 Aug. 1985	1	1	0	0	0	0	0	0	0	0
9. BMS	27 Aug. 1985	1	1	0	0	0	0	0	0	0	0
10. BMS	27 Aug. 1985	1	1	0	0	0	0	0	0	0	0
11. BMS	27 Aug. 1985	1	1	0	0	0	0	0	0	1	0
12. BMS	27 Aug. 1985	1	1	0	0	0	0	0	0	2	0
13. BMS	27 Aug. 1985	1	1	0	0	0	0	6	4	0	0
14. BMS	22 Jul. 1987	1	1	0	0	0	0	0	0	0	0
15. BMS	22 Jul. 1987	1	1	0	0	0	7	2	0	0	0
16. BMS	24 Jul. 1987	1	1	0	0	0	0	1	0	0	0
17. BMS	26 Jul. 1987	1	1	0	0	0	0	0	0	0	0
18. BMS	26 Jul. 1987	1	1	0	0	0	0	1	4	0	0
19. BMS	26 Jul. 1987	1	1	0	0	1	3	1	0	0	0
Subfamily Passalinae											
<i>Macrolinus latipennis</i>											
1. SPK	13 Aug. 1985	1	1	0	0	0	0	0	0	0	0
<i>Aceraius borneanus</i>											
1. SPK	17 Aug. 1985	0	1	0	0	0	1	0	0	0	0
2. SPK	18 Aug. 1985	1	1	0	0	0	0	0	0	0	0
3. SPK	18 Aug. 1985	1	1	0	0	0	0	0	0	0	0
4. SPK	18 Aug. 1985	1	1	0	0	0	0	0	0	0	0
5. SPK	18 Aug. 1985	1	1	0	0	0	0	0	0	0	0
6. SPK	18 Aug. 1985	1	1	0	0	0	0	0	2	0	0
7. SPK	18 Aug. 1984	1	1	0	0	0	0	0	2	0	0
8. SPK	18 Aug. 1985	1	2	3	4	1	3	3	1	0	0
9. SPK	21 Jul. 1987	1	1	0	0	0	0	0	0	0	0
10. SPK	21 Jul. 1987	1	1	0	0	0	0	0	0	0	0
11. SPK	21 Jul. 1987	2	3	5	5	2	2	3	1	0	0
12. SPK	10 Aug. 1987	1	1	0	0	0	0	1	0	0	0
13. SPK	10 Aug. 1987	1	1	0	0	0	4	2	0	0	0

Table 1. Continued

Locality	Date	Adults (black)		Adults (red)		Pupae	Larvae			Eggs
		Male	Female	Male	Female		3rd instar	2nd instar	1st instar	
<i>Aceraius laevicollis</i>										
1. BMS	23 Aug. 1985	1	1	0	0	0	1	0	0	0
2. BMS	25 Aug. 1985	1	1	0	0	0	0	0	0	0
3. BMS	22 Jul. 1987	1	1	0	0	0	0	0	0	0
4. BMS	24 Jul. 1987	1	1	0	0	0	0	1	0	0
5. KDN	12 Aug. 1987	0	1	0	0	0	5	0	0	0
6. KNG	15 Aug. 1987	1	1	0	0	0	0	0	0	0
7. KNG	15 Aug. 1987	1	1	0	0	0	0	1	0	0
8. KNG	15 Aug. 1987	1	1	0	0	0	0	2	0	0
9. KNG	15 Aug. 1987	1	1	0	0	0	0	2	2	0
10. KNG	15 Aug. 1987	0	1	0	0	0	2	2	0	0
11. KNG	16 Aug. 1987	1	1	0	0	0	1	0	0	0
12. KNG	17 Aug. 1987	1	1	0	0	0	0	0	4	4
13. KNG	17 Aug. 1987	1	1	0	0	0	0	1	5	0
14. KNG	17 Aug. 1987	1	1	0	0	0	7	0	0	0
15. KNG	17 Aug. 1987	1	1	0	0	0	7	0	0	0
<i>Aceraius kuwerti</i>										
1. RNU	13 Aug. 1987	1	1	0	0	0	0	0	0	0
2. RNU	13 Aug. 1987	1	1	0	0	0	0	0	0	0
3. RNU	13 Aug. 1987	1	1	0	0	0	0	0	0	4
4. RNU	13 Aug. 1987	0	1	1	1	3	0	0	0	0
<i>Pelopides monticulosus</i>										
1. BMS	27 Jul. 1987	0	2	3	2	0	0	0	0	0
2. BMS	27 Jul. 1987	0	0	0	0	0	7	0	0	0
3. TBN	15 Aug. 1987	1	1	0	0	0	2	0	0	0
<i>Pelopides symmetricus</i>										
1. KDN	12 Aug. 1987	1	1	0	0	0	5	0	0	0
<i>Leptaulax bicolor</i>										
1. BMS	25 Aug. 1985	0	1	0	1	0	1	0	0	0
2. RNU	13 Aug. 1987	0	1	0	0	0	0	1	0	2
3. KDN	14 Aug. 1987	1	1	0	0	0	0	0	0	0
4. KDN	14 Aug. 1987	0	2	0	0	0	0	0	0	0
5. KDN	14 Aug. 1987	0	1	0	0	0	1	4	0	0
6. KDN	14 Aug. 1987	0	1	0	0	1	3	0	0	0
7. TBN	15 Aug. 1987	0	1	3	4	1	4	3	9	2
8. TBN	15 Aug. 1987	1	1	0	1	2	2	1	2	0
<i>Leptaulax planus</i>										
1. BMS	23 Aug. 1985	1	1	0	0	0	0	0	0	0

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要 約

近 雅博・常喜 豊: ボルネオ, サバ州のクロツヤムシ, そのコロニー構成と生息場所について。
— ボルネオ, サバ州から 19 種のクロツヤムシを記録した。いくつかの種について, そのコロニー構成と生息場所もあわせて報告した。

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