

Descriptions of Three New Species of the Genus *Gyrophaena* Mannerheim (Coleoptera: Staphylinidae: Aleocharinae) from Korea¹

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Abstract Three new species of the genus *Gyrophaena* Mannerheim are described from Korea: *Gyrophaena ashei* new species (type locality – Mt. Odaesan, Pyeongchang-gun, Gangwon Prov., Korea), *G. naejangsanensis* new species (type locality – Mt. Naejangsan, Jeongeup-city, Jeonbuk Prov., Korea), and *G. tubula* new species (type locality – Mt. Gaebangsan, Hongcheon-gun, Gangwon Prov., Korea). The types and paratypes of the new species are designated. Similarities and differences among Korean *Gyrophaena* species are discussed. The habitus is illustrated, with line drawings of diagnostic characters.

Key Words Staphylinidae, *Gyrophaena*, new species, Korea

More than 210 species of the genus *Gyrophaena* Mannerheim (Coleoptera: Staphylinidae) are distributed in the Palaearctic region (Smetana 2004). Most adults and larvae are commonly found on fleshy gilled mushrooms, but some occur on fleshy polypores or mushrooms on logs (Ashe 1984).

Members of *Gyrophaena* are characterized by the combination of the following features: body parallel-sided, slightly flattened to slightly robust, surface subglossy to glossy, moderately to slightly pubescent; head more or less transverse; ligula entire, protruded, rounded at apex; maxilla with tip of lacinia truncate with well-developed spore brush; eyes moderate in size; hypomera slightly visible in lateral aspect; coxae widely separated; males with posterior margin of tergite VIII variously modified; most males with tergite VII with carinae, spines, or knobs; median lobe with apical process simple to strikingly modified and complex, asymmetrical; flagellum tubular, whip-like, or complex; parameres simple to complex and asymmetrical; spermatheca simple or with slightly elongate neck (Ashe 1984).

Ashe (1984) presented a generic revision of the subtribe Gyrophaenina worldwide. In East Asia, 45 species have been reported from China (Bernhauer 1938, Pace 1998, 2003, Assing 2005) and 20 species from Japan (Motschulsky 1858, Weise 1877, Sharp 1888, Fauvel 1901, Bernhauer 1907, 1936, Cameron 1933, Sawada 1970). Six species have been recorded from Korea (Bernhauer 1936, Yuh et al. 1985, Pašník 2001).

In this paper, we describe 3 new species from Korea (*Gyrophaena ashei* new species, *G. naejangsanensis* new species, and *G. tubula* new species) and discuss the similarities and differences among Korean *Gyrophaena* species (Table 1). We also

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Table 1. Similarities and differences among Korean *Gyrophaena* species

<i>Gyrophaena</i>	Size (mm)	Antennomere			Pronotum shape (ratio of width to length)	Tubercles on male tergite VII	Male tergite VIII	Median lobe
		4	5	6 - 10				
<i>affinis</i>	2.2	quadrate	slightly transverse	transverse	1.5	one	See Palm (1968: Fig. 9C)	See Palm (1968: Fig. 11C)
<i>bihamata</i>	2.2	transverse	transverse	transverse	1.8	six	See Palm (1968: Fig. 9H)	See Palm (1968: Fig. 11H)
<i>koreana</i>	1.9-2.3	quadrate	quadrate	quadrate	1.4	absent	Figure 5, A	Figure 5, B
<i>niponensis</i>	3.5	quadrate	quadrate	quadrate	transverse	absent	two sharpened process	—
<i>pasniki</i>	1.7	transverse	transverse	transverse	1.5	two	See Pašnik (2001: Fig. 5)	See Pašnik (2001: Fig. 3, 4)
<i>sunanica</i>	1.4-1.5	transverse	transverse	transverse	1.8	two	See Pašnik (2001: Fig. 8)	See Pašnik (2001: Fig. 6, 7)
<i>ashei</i>	2.2-3.5	slightly elongate	elongate	quadrate	1.4 (Fig. 2, B)	absent	Figure 2, C	Figure 2, G
<i>naejangsanensis</i>	1.2-1.8	transverse	quadrate	quadrate	1.6 (Fig. 3, B)	four (Fig. 3, C)	Figure 3, D	Figure 3, H
<i>tubula</i>	1.2-1.8	transverse	transverse	transverse	1.8 (Fig. 4, B)	absent	Figure 4, C	Figure 4, G

illustrate the habitus, with line drawings of diagnostic characters. The type specimens of the 3 new species are deposited in Chungnam National University Insect Collection (CNUIC, Daejeon), Korea.

Gyrophana ashei Kim and Ahn, new species

Type series. Holotype, ♂, labeled as follows: 'KOREA: Gangwon Prov., Pyeongchang-gun, Jinbu-myeon, Dongsanri, Odaesan, Sangwonsa, 22 VIII 2000, M.-H. Kim, ex mushroom; Holotype, *Gyrophana ashei* Kim and Ahn, Desig. Y.-H. Kim and K.-J. Ahn 2008. Paratypes, 28 (total); 13♂♀: same data as holotype; 1♀, same data as holotype except '28 - 30 VIII 1998, K.-L. You, K.-J. Ahn, ex mushroom; 1♂, same data as holotype except '23 VI 2002, SJ Park, JS Park'; 1♀, same data as holotype except 'Bukdaesan 23 VIII 2000'; 4♂♀, Seolakkyegok, Seolaksan, Seo-myeon, Yangyang-gun, Gangwon Prov., Korea, 16 VIII 2000, M.-H. Kim, ex mushroom; 3♂♀, Unduryeong, Hongcheon-gun, Gangwon Prov., Korea, 9 - 10 IX 1998, H.-J. Lim, sifter; 2♂♀, Baekdansa Area, Taebaeksan, Taebaek-city, Gangwon Prov., Korea, 16 VII 1999, U.-S. Hwang, ex mushroom; 2♂, Kyebangsan, Jinbu-myeon, Nae-myeon, Hongcheon-gun, Gangwon Prov., Korea, 18 VIII 2000, M.-H. Kim, ex mushroom; 2♂♀, same data as former except '24 VIII 2000'.

Description. Length about 2.2 - 3.5 mm. Body broad and elongate in dorsal aspect (Fig. 1, A). Surface subglossy and slightly pubescent. Body light brown to brown, head and tergites V-VII dark brown, antenna and leg yellow. Head 1.1 times wider than long, pronotum 1.4 times wider than long (Fig. 2, B), elytra 1.6 times longer than wide. Head widest across eyes, several punctures present. Antennomere 4 about 1.1 times longer than wide, 5 about 1.2 times longer than wide, 6 about 1.1 times longer than wide, 7 - 10 as long as wide, 11 about 1.7 times longer than wide (Fig. 2, A). Pronotum widest at anterior margin, anterior margin straight, posterior margin broadly rounded (Fig. 2, B). Hypomera slightly visible in lateral aspect. Postero-lateral angles of elytra slightly sinuate. Tergites III-VI transversely impressed. Male tergite VIII with two long processes, truncate at middle (Fig. 2, C). Male sternite VIII posterior-medially

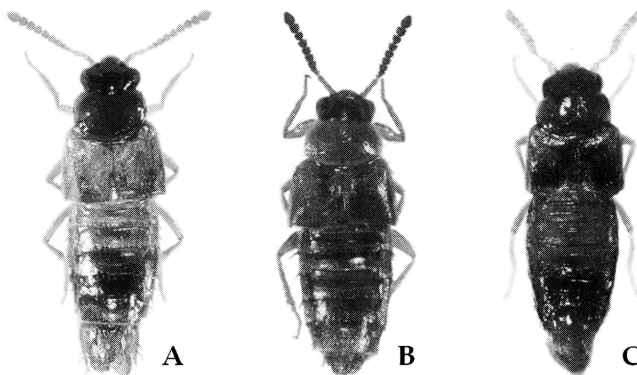


Fig. 1. A: *Gyrophana ashei*, 2.5 mm; B: *Gyrophana naejangsanensis*, 1.9 mm; C: *Gyrophana tubula*, 1.8 mm.

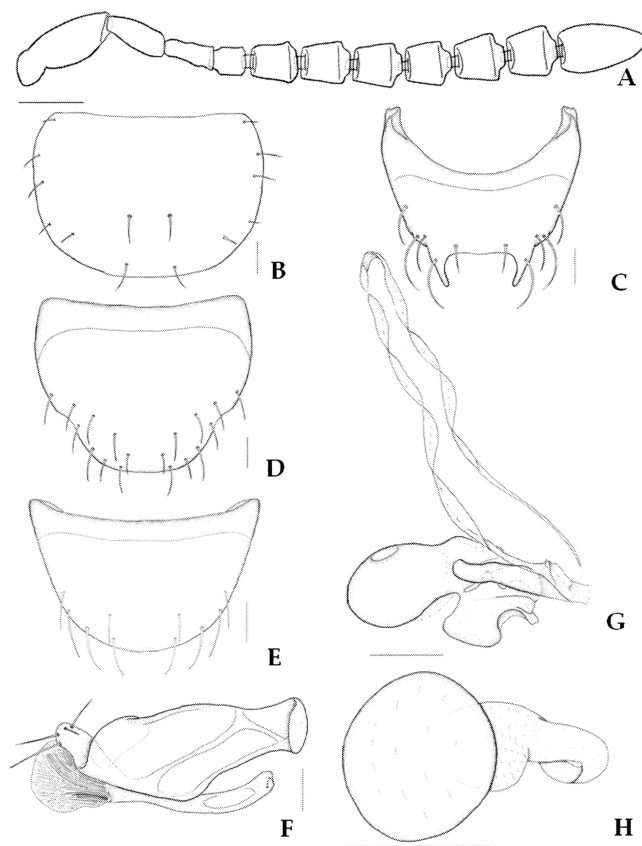


Fig. 2. *Gyrophæna ashei*. **A:** antenna, dorsal aspect; **B:** pronotum, dorsal aspect; **C:** male tergite VIII, dorsal aspect; **D:** male sternite VIII, ventral aspect; **E:** female sternite VIII, ventral aspect; **F:** paramere, lateral aspect; **G:** median lobe, lateral aspect; **H:** spermatheca, lateral aspect. Scales = 0.1 mm.

round (Fig. 2, D), female sternite VIII convex, more or less round (Fig. 2, E). Median lobe asymmetrical, apical process of median lobe strongly modified as in Fig. 2, G. Flagellum long and loosely coiled. Apical lobe of paramere cylindrical and short (Fig. 2, F). Spermatheca as in Fig. 2, H.

Distribution. Korea

Remarks. *Gyrophæna ashei* is similar to *G. niponensis*, but can be distinguished by the following features: body thicker, male tergite VIII with longer, curved process (Fig. 2, C) and median lobe (Fig. 2, G). It also differs from *G. laevior* by the male tergite VIII without a median process and two outer processes present.

Etymology. Named after the late James S. Ashe in honor of his research on the subtribe Gyrophænina.

***Gyrophæna naejangsanensis* Kim and Ahn, new species**

Type series. Holotype, ♂, labeled as follows: 'KOREA: Jeonbuk Prov., Jeongeup-city, Mt. Naejangsan, Naejangsa Area, Geumseon Valley, 25 VI 2000, K.-J. Ahn, *ex fungus*; Holotype, *Gyrophæna naejangsanensis* Kim and Ahn, Desig. Y.-H. Kim and K.-J. Ahn 2008. Paratypes, 53♂♀, same data as holotype (six on slide).

Description. Length about 1.2 - 1.8 mm. Body broad and elongate in dorsal aspect (Fig. 1, B). Body light brown to reddish brown, head and antennomeres 4 - 11 dark brown, antennomeres 1 - 3 and leg light brown. Surface subglossy and pubescent. Body widest at posterior margin of elytra. Head about 1.3 times wider than long, pronotum about 1.6 times wider than long (Fig. 3, B), elytra about 1.4 times longer

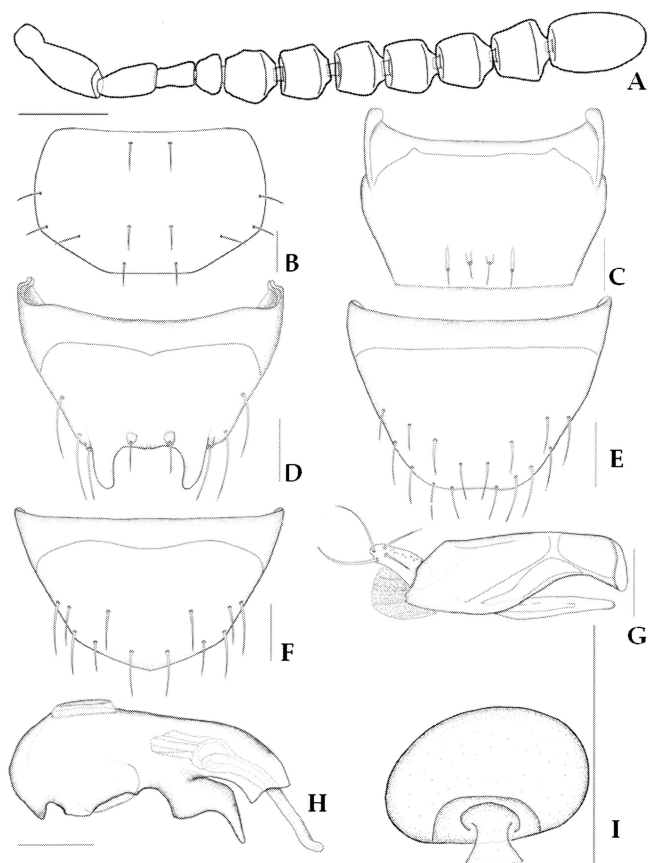


Fig. 3. *Gyrophæna naejangsanensis*. A: antenna, dorsal aspect; B: pronotum, dorsal aspect; C: male tergite VII, dorsal aspect; D: male tergite VIII, dorsal aspect; E: male sternite VIII, ventral aspect; F: female sternite VIII, ventral aspect; G: paramere, lateral aspect; H: median lobe, lateral aspect; I: spermatheca, lateral aspect. Scales = 0.1 mm.

than wide. Head widest across eyes, some punctures present. Antenna pubescent, antennomere 4 about 1.5 times wider than long, 5 - 10 more or less as long as wide, 11 about 1.7 times longer than wide (Fig. 3, A). Pronotum broadly rounded with punctures, widest at middle. Hypomera slightly visible in lateral aspect. Postero-lateral angles of elytra slightly sinuate. Tergites III-VI slightly transversely impressed. Male tergite VII with 4 tubercles at posterior margin, inner two tubercles smaller (Fig. 3, C), tergite VIII with two long processes and two small teeth medially (Fig. 3, D). Male sternite VIII posterior-medially truncate (Fig. 3, E), female sternite VIII convex, very slightly pointed (Fig. 3, F). Median lobe asymmetrical, apical process as in Fig. 3, H. Flagellum short and not coiled. Apical lobe of paramere slightly curved and a line of punctures present (Fig. 3, G). Spermatheca as in Fig. 3, I.

Distribution. Korea

Remark. *Gyrophaena naejangsanensis* is similar to *G. koreana*, but can be distinguished by the following features: body pubescent, antennomere 4 transverse, male tergite VII with four tubercles (Fig. 3, C), tergite VIII with two processes and two inner teeth (Fig. 3, D). It also differs from *G. poweri* by its pubescent body, structures of male tergites VII and tergite VIII.

Etymology. Named after the type locality Mt. Naejangsan, where all of the specimens were collected.

***Gyrophaena tubula* Kim and Ahn, new species**

Type series. Holotype, ♂, labeled as follows: 'KOREA: Gangwon Prov., Hongcheon-gun, Nae-myeon, Kyebangsan, Unduryeng, 24 VIII 2000, MH Kim, ex mushroom; Holotype, *Gyrophaena tubula* Kim and Ahn, Desig. Y.-H. Kim and K.-J. Ahn 2008. Paratypes, 18 (total); 5♂♀, same data as holotype; 4♂♀, same data as holotype except '18 VIII 2000'; 4♂♀, Seolakkyegok, Seolaksan, Seo-myeon, Yangyang-gun, Gangwon Prov., Korea, 16 VIII 2000, MH Kim, ex mushroom; 4♂♀, Songnisan, Boeun-gun, Chungbuk Prov., Korea, 12 IX 1999, MH Kim, ex mushroom.

Description. Length about 1.2 - 1.8 mm. Body parallel sided, slightly flattened (Fig. 1, C). Surface subglossy and slightly pubescent. Body brown to reddish brown, tergites VI-VII dark brown, antenna and leg yellow. Body widest at posterior margin of elytra. Head about 1.1 times wider than long, pronotum about 1.8 times wider than long (Fig. 4, B), elytra about 1.5 times longer than wide. Head widest across eyes, with punctures. Antennomere 4 about 1.4 times wider than long, 5 - 7 about 1.5 times wider than long, 8 - 9 about 1.4 times wider than long, 10 about 1.3 times wider than long, 11 about 1.7 times longer than wide (Fig. 4, A). Mandibles asymmetrical, right mandible with internal tooth. Pronotum strongly transverse with fine punctures at posterior margin, widest at anterior margin. Hypomera slightly visible in lateral aspect. Postero-lateral angles of elytra not sinuate. Tergites III-VI slightly transversely impressed. Male tergite VIII with 6 processes, four inner processes very small and one large tubercle present at middle (Fig. 4, C). Posterior margin of male sternite VIII slightly round (Fig. 4, D), female sternite VIII strongly convex, slightly pointed (Fig. 4, E). Median lobe cylindrical and asymmetrical, apical process of median lobe slightly curved, one major seta present at apex (Fig. 4, G). Flagellum moderate and coiled. Apical lobe of paramere as in Fig. 4, F. Spermatheca as in Fig. 4, H.

Distribution: Korea.

Remarks. *Gyrophaena tubula* is similar to *G. poweri*, but can be distinguished by the following features: antennomeres 4-10 transverse (Fig. 4, A), male tergite VIII

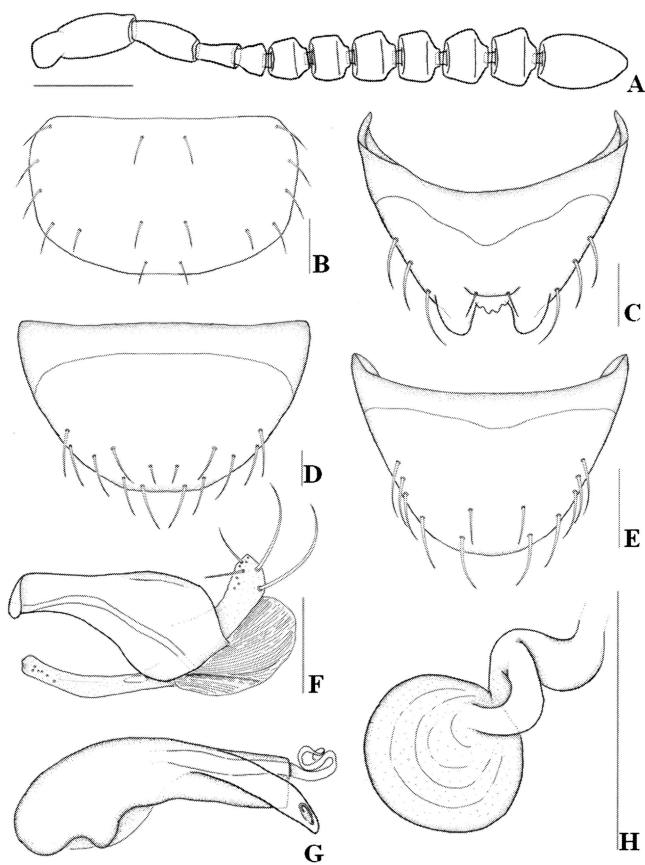


Fig. 4. *Gyrophaena tubula*. A: antenna, dorsal aspect; B: pronotum, dorsal aspect; C: male tergite VIII, dorsal aspect; D: male sternite VIII, ventral aspect; E: female sternite VIII, ventral aspect; F: paramere, lateral aspect; G: median lobe, lateral aspect; H: spermatheca, lateral aspect. Scales = 0.1 mm.

with six processes, four inner processes small and one large tubercle present at the middle (Fig. 4, C), and the structure of median lobe (Fig. 4, G).

Etymology. Named from the Latin *tubula* meaning “small pipe, tube”, which refers to the distinct tubercle on male tergite VIII.

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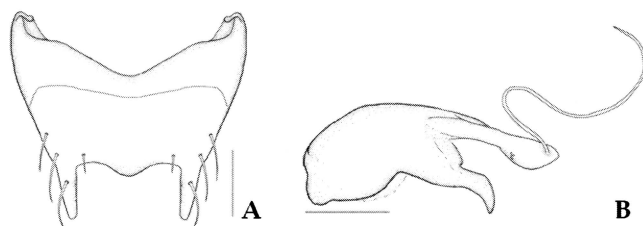


Fig. 5. *Gyrophæna koreana*. A: male tergite VIII, dorsal aspect; B: median lobe, lateral aspect. Scales = 0.1 mm.

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