

A NEW SPECIES OF THE GENUS *GERGITHOIDES* SCHUMACHER (HEMIPTERA: FULGOROIDEA: ISSIDAE) FROM KOREA¹

Mohammad Atikur Rahman,^{2,3} Yong Jung Kwon,³ and Sang Jae Suh⁴

ABSTRACT: This paper is written to provide a new species, *Gergithoides jejuensis* sp. nov., that was previously misidentified as *Gergithoides carinatifrons* Schumacher, 1915 from Korea. The new species is similar to *G. carinatifrons* and *G. gibbosus*, Chou & Wang but can be easily distinguished from the latter by the structure of lateral sclerotized processes of aedeagus, apical process of genital styles, and other characters. The new species is described and illustrated, and a revised key to the known species of the genus is presented.

KEY WORDS: Auchenorrhyncha, Fulgoromorpha, planthopper, taxonomy

INTRODUCTION

The genus *Gergithoides* was established by Schumacher (1915), with the type species *G. carinatifrons* Schumacher, based on external morphology. He also described *G. carinatifrons* var. *uniformis*, based on the material which was colorously brownish in his original description (Schumacher, 1915). Later, Jacobi (1944) transferred a second species, *G. rugulosus* (Melichar) from the genus *Gergithus* Stål. Recently, Che et al. (2003) revised this genus with the descriptions of two new species, *G. undulatus* Wang & Che and *G. gibbosus* Chou & Wang, from China. In their revisionary work, they treated *G. carinatifrons* var. *uniformis* Schumacher as a color variation of the nominate species. A total of only four species belonging to this genus have been hitherto known. Previously from Korea, the species, *G. carinatifrons* was first reported by Kwon and Huh (1995) without any description and illustrations. Recently, after studying Korean fauna of Issidae in detail, it was found that the previously recorded species, *G. carinatifrons* from Korea by Kwon and Huh (1995; 2001), was based on a misidentification, and that the species is distinct and needs a new name. So, the opportunity is taken here to describe this species as new in the genus *Gergithoides*.

MATERIALS AND METHODS

The terminology used in this study follows Che et al. (2007). The genital segments of examined specimens were observed in glycerin jelly using a stereoscopic microscope (Olympus SZX 12). Photographs of the specimen were made using JUJAK 5.5 (DIXI 3000) digital camera. Image and plate compositions are

¹ Received on January 1, 2012. Accepted on April 19, 2012.

² Department of Entomology, Patuakhali Science and Technology University, Dumki, Patuakhali 8602, Bangladesh. E-mail: atikentom@yahoo.com

³ School of Applied Biosciences, Kyungpook National University, Daegu 702-701, Korea. Corresponding author (Y. J. Kwon): E-mail: yjkwon@knu.ac.kr

⁴ School of Applied Ecological Resources, Kyungpook National University, Sangju 742-711, Korea. E-mail: sjsuh@knu.ac.kr

produced using the software Helicon Focus 5.1, and Adobe Photoshop CS3 respectively. Spinal formula means the numbers of apical spines of the hind tibiae and 1st and 2nd hind tarsomeres.

Specimens examined in the present study are deposited in the collection of the School of Applied Bio-Sciences, Kyungpook National University, Daegu, Republic of Korea (KNU).

SYSTEMATICS

Genus *Gergithoides* Schumacher, 1915

Gergithoides Schumacher, 1915: 126. Type species. *Gergithoides carinatifrons* Schumacher, 1915, by original designation.

Gergithoides: Ishihara, 1965: 208; Hori, 1969: 62; Kwon & Huh, 1995: 40; 2001: 310; Che et al., 2003: 107; Gnezdilov, 2009: 85.

Daruma Matsumura, 1916: 103 (preoccupied). Type species. *Daruma nitobei* Matsumura, 1916, by original designation.

Darumara Metcalf, 1952: 227, new name of *Daruma* Matsumura, 1916, synonymized by Gnezdilov (2009).

Diagnosis. Vertex elongate and narrow with acutely angulate anterior margin. Frons with prominent median carina and series of tubercles laterally. Pronotum and mesonotum with median carina. Forewings and hind wings with distinctly reticulate venation. Spinal formula of hind leg 6-(7-11)-2. The aedeagus U-shaped with two pairs of spinose process near middle. Genital styles sub-triangular with a process.

Checklist of species of *Gergithoides* Schumacher

Gergithoides carinatifrons Schumacher, 1915; China (Hainan), Japan, Taiwan.

Gergithoides rugulosus (Melichar, 1906); Malaysia (Perak), China (Fujian, Guangxi, Sichuan, Yunnan).

Gergithoides undulatus Wang & Che, 2003; China (Guangxi, Hainan).

Gergithoides gibbosus Chou & Wang, 2003; China (Hainan).

Gergithoides jejudoensis sp. nov.; Korea (Jeju-do).

Key to species of the genus *Gergithoides* Schumacher

1. Forewings dark brown with blackish and/or light yellowish pattern2
 - Forewings yellow brown with light yellowish pattern4
2. Aedeagus (Figs. 6-8, 15-17) with two lateral processes originated from separate points, upper process extended more than half of lower process, directed cephalad, and lower process subapically curved, directed ventrad
 -*G. jejudoensis* sp. nov.
 - Aedeagus with two lateral processes originated from a single point, shape of processes not like above.....3

3. Aedeagus with W-shaped lateral processes in left lateral view (Che et al., 2003: Fig. 9); lateroapical angles of anal segment view (Che et al., 2003: Fig. 7) produced caudad into thumb-shaped processes.....*G. gibbosus* Chou & Wang
- Aedeagus with S-shaped lateral process in left lateral view (Hori 1969: Fig. 2:6); lateroapical angles (Hori 1969: Fig. 2:7) not produced like above, shallowly rise*G. carinatifrons* Schumacher
4. Forewings without spot; lateroapical angles of anal segment (Che et al., 2003: Fig. 1) angulately produced; spinal formula of hind leg 6-11-2.....*G. undulatus* Wang & Che
- Forewings with white spot; lateroapical angles of anal segment not produced like above, straight; spinal formula of hind leg 6-10-2*G. rugulosus* (Melichar)

***Gergithoides jejuensis* sp. nov.**

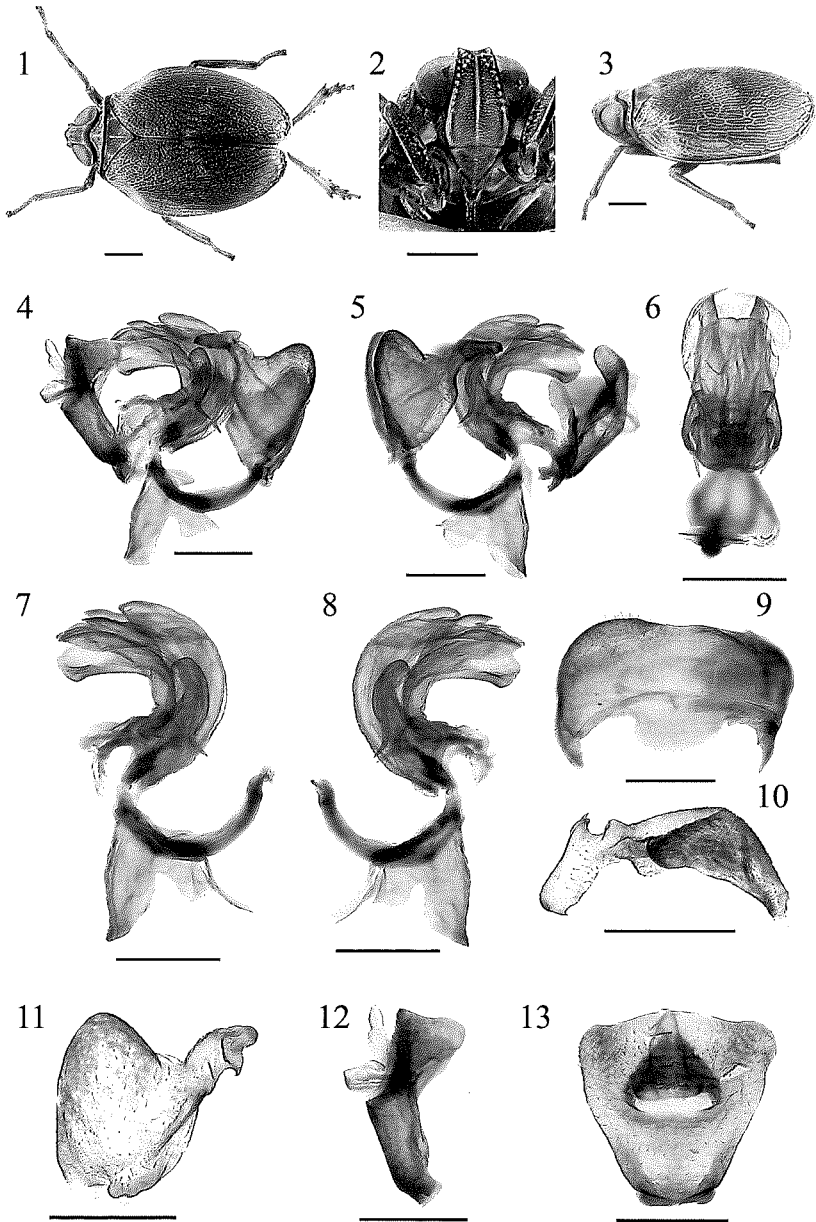
(Figs. 1-17)

Kwon & Huh, 1995: 40; 2001: 310 (misidentification).

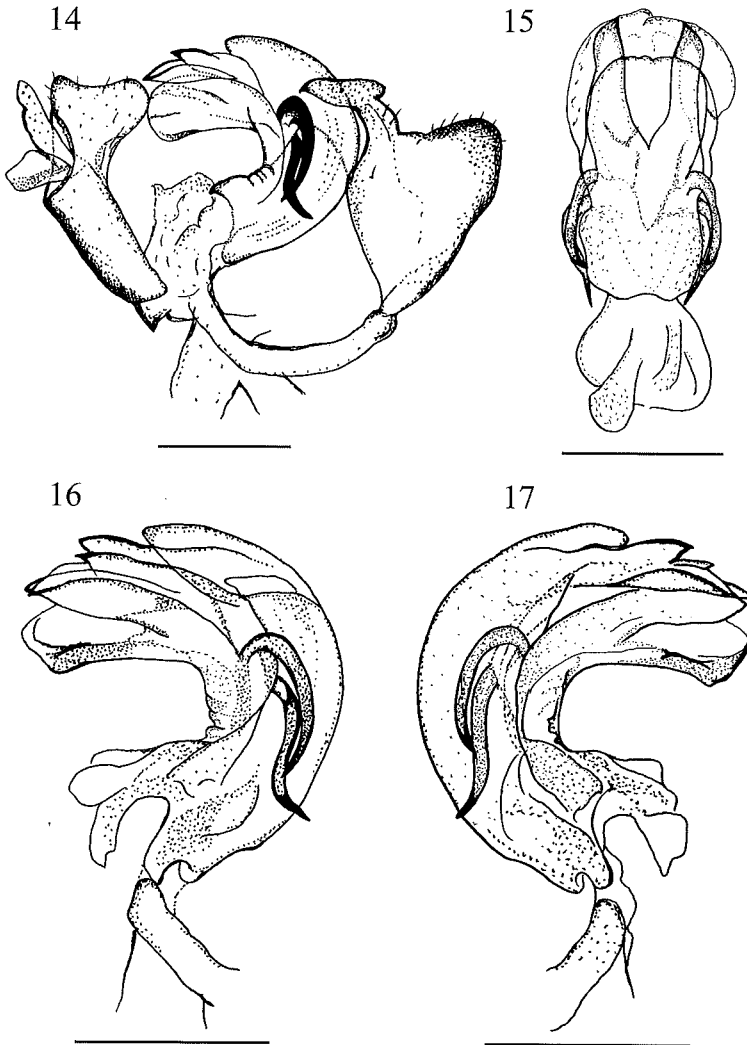
Description. Body length (including forewing): male 6.0-6.2 mm (N=04), female 6.6-6.8 mm (N=12); Forewing length: male 4.9-5.0 mm (N=04), female 5.5-5.7 mm (N=12).

Coloration. General color (Figs. 1, 3) dark brown with blackish and yellowish pattern. Vertex (Fig. 1) brown with yellowish margins. Frons (Fig. 2) deep brown with yellowish carinae and tubercles, median and lateral carinae bordered with black stripes. Clypeus (Fig. 2) comparatively dark brown. Eyes brown. Pronotum (Fig. 1) yellow brown with yellowish tubercles and median carina. Mesonotum (Fig. 1) dark brown except carinae, yellowish. Forewings (Fig. 1, 3) dark brown with yellow pattern, distinct yellow band across the base and middle. Legs generally yellow brown to dark brown, femora of fore and middle legs black, hind femora black with yellow stripes. Abdominal segments dark brown.

Head and thorax. Head with eyes distinctly narrower than pronotum (1:1.28). Vertex in dorsal view pentagonal, elongate and narrow with acutely angulate anterior margins, longer than wide in middle line (1.12:1), lateral and transverse carinae prominent, posterior margin concave, disc moderately depressed, median carina absent. Frons with prominent median carina, half of lateral margins from the base covered with tubercles, lateral margins divergent anteriorly, and widest subapically and then slightly convergent, longer in middle line than widest part (1.42:1), narrowest at base, 0.52 times narrower than widest part, disc rough in entire length. Frontoclypeal suture straight. Clypeus distinctly produced downward, 2.6 times shorter than frons in middle line, widest at base and convergent towards the apex with a weak median carina. Eyes large, 1.18 times as wide as distance between eyes. Ocelli absent. Pronotum short and wide, with two



Figs. 1-13. *Gergithoides jejudensis* sp. nov. 1. Dorsal habitus (male); 2. Frons and clypeus; 3. Lateral habitus (male); 4. Male genitalia with anal segment, aedeagus, genital styles, left lateral view; 5. Ditto, right lateral view; 6. Aedeagus, ventral view; 7. Ditto, left lateral view; 8. Ditto, right lateral view; 9. Pygofer, lateral view; 10. Genital stylus, lateral view; 11. Ditto, dorsal view; 12. Anal segment, lateral view; 13. Ditto, dorsal view. Scale bar = 1.0 mm (1-3); 0.5 mm (4-13).



Figs. 14-17. *Gergithoides jejudoensis* sp. nov. 14. Male genitalia with anal segment, aedeagus, genital styles, left lateral view; 15. Aedeagus, ventral view; 16. Ditto, left lateral view; 17. Ditto, right lateral view. Scale bar = 0.5 mm (14-17).

pits on disc, anterior margin distinctly convex with median carina, anterior margin with a series of tubercles. Mesonotum large, nearly triangular, about 2.33 times wider at widest part than long in middle line, lateral and median carinae present. Forewings strongly convex, coarsely reticulate. Hind wings almost equal in length to forewings and with reticulate venation. Legs relatively long, lateral margin of hind tibia with 2 teeth. Spinal formula of hind leg 6-7(8)-2.

Male genitalia. Anal segment (Figs. 12-13) moderately long, with middle placement of anal styles, broadest apical half in dorsal view (Fig. 13), narrowing to base, almost as long as wide at apex, lateroapical angles shallowly rise, apical margin at middle convex; in lateral view (Fig. 12), narrower at base than apex, medially concave, anal style in length at same level of anal segment at apex. Pygofer (Fig. 9) in profile slightly longer ventrally than dorsally; dorsocaudal angle slightly produced, convex. Aedeagus (Figs. 6-8, 15-17) strongly curved, U-shaped, dorsad, with two pairs of moderately long processes laterally at middle and apparently sclerotized, both processes originated from separate points of aedeagus shaft; in lateral view (Figs. 7-8, 16-17), upper process extended more than half of lower process, directed cephalad, and lower process subapically curved, directed ventrad, and acute at apex. Genital styles, in dorsal view (Fig. 11), 1.48 times longer than wide except process, lateroapical margin strongly produced and convex, apical process short and stout, about 2 times longer than wide at base, outer margin deeply incised with hook-like spine, subapically concave; in lateral view (Fig. 10), apical process at base deeply incised with two tiny spines outwardly, one sharp and acute, and the other blunt, subapical inner margin slightly concave with a tiny hook.

Type Data. Holotype: Male, Seogwipo, Jeju-do province, Korea, 9 October 1990, Y. J. Kwon; Paratype: 3 males, 12 females, same data as holotype. (KNU)

Etymology. The specific name refers to the type locality, Jeju-do province, Korea.

Host plant. Unknown.

Distribution. Korea (Jeju-do)

Remarks. This species can be easily distinguished from any other species of this genus by the unique structure of lateral sclerotized processes of aedeagus (Figs. 6-8, 15-17).

ACKNOWLEDGEMENTS

We wish to thank Dr. V. M. Gnezdilov (Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia) and Dr. Ying-lun Wang (Key Laboratory of Plant Protection Resources and Pest Management, Northwest Sci-Tech University of Agriculture and Forestry, Yangling, Shaanxi, China) for their critical reading and valuable comments on the manuscript.

LITERATURE CITED

- Che, Y. -L., Y. -L. Wang, and I. Chou.** 2003. Taxonomic study on the genus *Gergithoides* Schumacher (Homoptera: Fulgoromorpha: Issidae). *Entomotaxonomia* 25(2): 102-108.
- Che, Y. -L., Y. -L. Zhang, and Y. -L. Wang.** 2007. Seven new species and one new record of *Gergithus* Stål (Hemiptera: Fulgoroidea: Issidae). *Proceedings of the Entomological Society of Washington* 109(3): 611-627.
- Gnezdilov, V. M.** 2009. Revisionary notes on some tropical Issidae and Nogodinidae (Hemiptera: Fulgoroidea). *Acta Entomologica Musei Nationalis Pragae* 49(1): 75-92.
- Hori, Y.** 1969. Hemisphaeriinae of the Japan Archipelago (Hemiptera: Issidae). *Transactions of the Shikoku Entomological Society* 10(2): 49-66.
- Ishihara, T.** 1965. Some species of Formosan Homoptera. *Special Bulletin of the Lepidoptera Society of Japan* 1: 201-221.
- Jacobi, A.** 1944. Die Zikadenfauna der Provinz Fukien in Südchina und ihre tiergeographischen Beziehungen. *Mitteilungen der Münchner Entomologischen Gesellschaft* 34: 19.
- Kwon, Y. J. and E. Y. Huh.** 1995. A check list of the Auchenorrhyncha from Chejudo (Homoptera). *Insecta Koreana (Supplement)* 5: 19-54.
- Kwon, Y. J. and E. Y. Huh.** 2001. Suborder Auchenorrhyncha. *Economic Insects of Korea* 19, *Insecta Koreana (Supplement)* 26: 308-312.
- Matsumura, S.** 1916. Synopsis der Issiden (Fulgoriden) Japan. *Transactions of the Sapporo Natural History Society* 6: 85-118.
- Melichar, L.** 1906. Monographie der Issiden. (Homoptera). *Abhandlungen der K. K. Zoologisch-botanischen Gesellschaft in Wien. Wien* 3: 1-327.
- Metcalf, Z. P.** 1952. New names in the Homoptera. *Journal of the Washington Academy of Sciences* 42: 226-231.
- Schumacher, F.** 1915. Der gegenwärtige Stand unserer Kenntnis von der Homopteren-Fauna der Insel Formosa unter besonderer Berücksichtigung von Sauter'schem Material. *Mitteilungen aus dem Zoologischen Museum in Berlin* 8: 126-129.