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Taxonomic review of the genus *Castanopsides* Yasunaga (Hemiptera: Heteroptera: Miridae: Mirinae) from the Korean PeninsulaJunggong Kim^a, WonGun Kim^b, Ki-Gyoung Kim^c, Kwang Su Lee^c, Sunghoon Jung^{a,*}^aLaboratory of Systematic Entomology, Department of Applied Biology, College of Agriculture and Life Sciences, Chungnam National University, Daejeon, South Korea^b207–404, Dogok Rexle Apartment 221, Seolleung-ro, Gangnam-gu, Seoul, South Korea^cNational Institute of Biological Resources, Incheon, South Korea

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ABSTRACT

A genus *Castanopsides* Yasunaga (Hemiptera: Heteroptera: Miridae: Mirinae) is reviewed from the Korean Peninsula. *Castanopsides falkovitshi* (Kerzhner 1979) is reported for the first time. Descriptions of male genitalia, diagnoses, and a key to the Korean *Castanopsides* are provided with illustrations and photographs.

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Introduction

The genus *Castanopsides* Yasunaga comprises, to date, 11 extant species in the world (Aukema et al 2013; Kerzhner and Josifov 1999; Schuh 2002–2013), and some of them are known to live primarily on the family Fagaceae such as *Quercus* spp. and *Castanopsis* spp. and on the family Juglandaceae (Yasunaga 1998, Yasunaga and Duwal 2008). The *Castanopsides* species, with the exception of two recently recorded Nepalian species *Castanopsides katsutai* and *Castanopsides michaili*, occur in East Asia, and two of them, *Castanopsides kerzhneri* and *Castanopsides potanini*, are recorded from the Korean Peninsula (Josifov 1985). In this paper, the genus *Castanopsides* is taxonomically reviewed with the finding of a new record of *Castanopsides falkovitshi* from the Korean Peninsula. Morphological information such as description and diagnosis, biological information, and a key to the *Castanopsides* from Korea are presented.

Materials and methods

Photographs of dorsal habitus and genital structures were taken with a Leica M165C microscope. Measurements were taken using the software program (LAS Interactive Measurements) installed with the same microscope. All measurements are given in millimeters (mm). To observe male genitalia, a genital segment of each specimen was detached, and then soaked and heated in 10% KOH solution at 70°C for approximately 5 minutes until it became clear. After it was placed in distilled water, it was dissected to examine the paramere and endosoma. Terminology mainly follows Yasunaga (1998). The depository of specimens is the Laboratory of Systematic Entomology, Chungnam National University (CNU), Daejeon, Korea. Distribution with an asterisk means a new record.

Taxonomic accounts

Genus *Castanopsides* Yasunaga 고운고리장님노린재속
Castanopsides Yasunaga, 1992: 45. Type species: *Castanopsides hasegawai* Yasunaga, 1992, 1998; Zheng et al, 2004; Yasunaga and Duwal, 2008.

Diagnosis. Differs from other representatives of Mirini as follows: body elongated oval, covered with golden setae; head

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projected dorsally; vertex shorter than first antennal segment; first antennal segment much longer than fourth antennal segment; antennae originating above ventral margin of compound eye laterally; spines of tibia dark and distinct; third tarsal segment much longer than first tarsal segment, as long as second tarsal segment; hypophysis of left paramere hook-shaped; endosoma membranous with distinct one spicule (Yasunaga 1998).

Castanopsides falkovitshi (Kerzhner, 1979) 두눈장님노린재 (신칭) (Figures 1A, 2A–D, and 3A)

Lygocoris (*Arbolygus*) *falkovitshi* Kerzhner, 1979: 28.

Castanopsides falkovitshi Yasunaga, 1998: 114.

Diagnosis. Recognized by body relatively small and oval, fuscous coloration; antennae almost dark brown; pronotum glabrous and dark brown with longitudinal pale line; scutellum dark brown except for pale apex; hemelytra fuscous with silvery pubescences; cuneus grayish and subhyaline; vein pale brown (Figures 1A and 3A); left paramere with somewhat broad sensory lobe (Figure 2A); endosoma with distinctly long and sharp spicule; median sclerite lacking (Figure 2D).

Description. See Kerzhner (1979) or Yasunaga (1998) for original or detailed description, respectively.

Male genitalia. Left paramere with setae, hypophysis distinctly prominent at apex, sensory lobe somewhat broad, with erect short setae (Figure 2A); right paramere with setae, hypophysis prominent upward (Figures 2B and 2C); endosoma membranous with one spicule and one sclerite; spicule long and thin, its apex distinctly sharp; sclerite broad (Figure 2D).

Measurements (in mm). Male ($n = 1$). Body length, tylus–apex of membrane: 5.46; head length, excluding collar: 0.37; head width, including compound eyes: 1.04; vertex width: 0.43; 1st antennal segment length: 0.64; 2nd antennal segment length: 1.80; 3rd antennal segment length: 0.80; 4th antennal segment length: 0.34; total antennal length: 3.58; 1st rostral segment length: 0.51; 2nd rostral segment length: 0.41; 3rd rostral segment length: 0.44; 4th rostral segment length: 0.38; total rostral length: 1.74; mesal pronotal length: 1.02; basal pronotal width (straight): 1.93; anterior scutellum margin width (straight): 0.91; mesal scutellum length: 1.05; outer embolial margin length (straight): 2.61; outer cuneal margin length (straight): 0.93; maximum width across hemelytra: 1.14; foreleg (femur: tibia: tarsus): 1.17:1.41:0.52; midleg (femur: tibia: tarsus): 1.29:1.75:0.49; hindleg (femur: tibia: tarsus): 1.88:2.86:0.68.

Specimen examined. 1♂, Wolsong-ri, Jijeong-myeon, Wonju-si, Gangwon-do, Korea, by Light trap, 28 v 2016, (WG Kim)-coll. CNU.

Distribution. Korea*, Japan, China (Central, North, South Eastern, South Western), Russia (Far East).

Hosts. *Juglans mandschurica* (Juglandaceae), *Pterocarya rhoifolia* (Fagaceae) (Yasunaga 1998).

Castanopsides kerzhneri (Josifov, 1985) 참고은고리장님노린재 (Figures 1B, 2E–H, and 3B)

Lygocoris (*Arbolygus*) *kerzhneri* Josifov, 1985: 91.

Castanopsides kerzhneri Yasunaga, 1998: 112.

Diagnosis. Recognized by body elongated oval, reddish brown; anterior part of pronotum with a pair of dark spots; pronotum glabrous; scutellum entirely reddish pale brown; hemelytra with golden pubescences; cuneus reddish brown; hindfemur dark brown (Figures 1B and 3B); left paramere with large tooth laterally (Figure 2F); spicule long and straight (Figure 2H).

Description. See Yasunaga (1998) for detailed description.

Male genitalia. Left paramere with some specialized large tooth, tooth form sometimes individual variation, sensory lobe somewhat narrow (Figures 2E–F); hypophysis of right paramere prominent upward, its apex projected (Figure 2G); endosoma membranous with one spicule and three sclerite; spicule tapered to its apex, thick and straight; median sclerite slender; light lateral sclerite broad; left lateral sclerite with circular apex, apex with tiny spinules (Figure 2H).

Measurements (in mm). Male ($n = 3$)/female ($n = 3$). Body length, tylus–apex of membrane: 7.16–7.32/7.65–7.73; head length, excluding collar: 0.42–0.46/0.50–0.52; head width, including compound eyes: 1.27–1.32/1.28–1.32; vertex width: 0.51–0.54/0.55–0.58; 1st antennal segment length: 0.78–0.80/1.00–1.02; 2nd antennal segment length: 2.38–2.41/2.65–2.69; 3rd antennal segment length: 1.20–1.22/1.32–1.37; 4th antennal segment length: 0.58–0.61/0.57–0.60; total antennal length: 4.94–5.04/5.54–5.68; 1st rostral segment length: 0.70–0.72/0.75–0.77; 2nd rostral segment length: 0.59–0.60/0.60–0.61; 3rd rostral segment length: 0.69–0.71/0.62–0.64; 4th rostral segment length: 0.79–0.82/0.79–0.81; total rostral length: 2.77–2.85/2.76–2.83; mesal pronotal length: 0.90–0.93/0.95–0.98; basal pronotal width (straight): 2.50–2.53/2.69–2.72; anterior scutellum margin width (straight): 1.41–1.47/1.61–1.64; mesal scutellum length: 1.70–1.74/1.69–1.71; outer embolial margin length (straight): 3.84–3.89/3.92–3.96; outer cuneal margin length (straight): 1.26–1.30/1.44–1.49; maximum width across hemelytra: 1.46–1.48/1.74–1.76; foreleg (femur: tibia: tarsus): 1.53–1.57:1.94–1.99:0.74–0.77/1.74–1.76:1.85–1.88:0.66–0.69; midleg (femur: tibia: tarsus): 1.85–1.89:2.42–2.47:0.72–0.78/



Figure 1. Dorsal habitus of *Castanopsides* spp: A, *Castanopsides falkovitshi*; B, *Castanopsides kerzhneri*; C, *Castanopsides potanini*. <scale bar: 2mm>

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