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Original article

A review of the genus *Cyllecoris* (Hemiptera: Miridae) from the Korean Peninsula with a key to the species

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ABSTRACT

Three species of the genus *Cyllecoris* are recognized in Korea. Of these, *Cyllecoris nakanishii* Miyamoto, 1969 has been reported in the Korean Peninsula for the first time. Morphological information such as diagnosis and genital description is provided with photographs and illustrations. *Cyllecoris vicarius* Kerzhner, 1988 has been reported based on South Korean materials for the first time, and variations of its paramere are presented. A key to *Cyllecoris* species from Korea is also provided.

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Introduction

The genus *Cyllecoris* Hahn, 1834 belongs to the subfamily Orthotylinae (Hemiptera: Heteroptera: Miridae). This group is primarily distributed in the Palaearctic Region. To date, it comprises 12 species in the world (Kerzhner and Josifov 1999; Schuh 2002–2013; Aukema et al 2013). Among them, five species have been recorded in China, two species have been recorded in Japan, and two species have been recorded in Korea [*Cyllecoris vicarius* Kerzhner, 1988 and *Cyllecoris opacicollis* Kerzhner, 1988 (Kerzhner and Josifov 1999; Aukema et al 2013)]. In this paper, *Cyllecoris nakanishii* Miyamoto, 1969 is reported for the first time in the Korean Peninsula. Morphological information such as diagnosis and genital description is provided with photographs and illustrations. *Cyllecoris vicarius* is reported in South Korea, and variations of its paramere are presented. A key to Korean *Cyllecoris* species is also provided.

Materials and methods

Photographs of specimens were obtained by Leica M165C microscope. Measurements were obtained using the software program of the same microscope. All measurements are in millimeters (mm). To observe the male genitalia, the genital segment was detached, and then soaked and boiled in 10% potassium hydroxide solution at 70°C for 3–5 minutes until it became transparent. After it had been placed in distilled water, it was dissected to examine the genitalia. Terminology primarily follows that of Yasunaga (1991) and Braimah et al (1982). The depository of specimens is Laboratory of Systematic Entomology, Chungnam National University (CNU; Daejeon, Korea). Distribution with an asterisk means its new record in this area.

Taxonomic accounts

Genus *Cyllecoris* Hahn, 1834 갈참장님노린재속

Cyllecoris Hahn, 1834: 97. Type Species by subsequent designation (Westwood, 1840: 122): *Cimex agilis* Fabricius, 1781 (= *Cimex histrionius* Linnaeus, 1767).

Perideris Fieber, 1870: 248 (junior homonym of *Perideris* Brandt, 1835, Echinodermata) (syn. Reuter, 1883: 401). Type species by monotypy: *Perideris marginata* Fieber, 1870.

Mimoperideris Kirkaldy, 1906: 129 (as subgenus of *Cyllecoris*). New name for *Perideris* Fieber, 1870.

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Diagnosis. Recognized by body generally fuscous to dark brown and elongated; compound eyes not reaching anterior margin of pronotum; vertex glossy and smooth; first antennal segment longer than width of head; pronotum divided into distinct anterior lobe and posterior lobe (Figure 1) (see Josifov and Kerzhner, (1984) and Yasunaga, (1999) for details).

***Cyllecoris nakanishii* Miyamoto, 1969** 검은빛갈참장님노린재 (신칭)
(Figures 1A–B, 2 and 4A)
Cyllecoris nakanishii Miyamoto, 1969: 79; Yasunaga, 1999: 159.

Diagnosis. Recognized by body elongated and slender; base of posterior lobe of pronotum dark brown with yellowish brown part in middle; middle part of cuneus dark brown, apex of cuneus pale brown tinged with red; legs pale brown with dark line in upper margin (Figures 1A–B); right paramere curved form with rounded hypophysis (Figure 2B), straight form in dorsal view with processes in hypophysis and apical part of sensory lobe (Figure 2C); vesica with three branched spicules and one sharp spicule (Figure 2D–E).

Description. MALE: See Miyamoto (1969) for original description in detail. FEMALE: As in male except for broader pale part of pronotum and paler hemelytra (Figure 1B).

Male genitalia. genital segment rounded with asymmetric parameres (Figures 2A–C); left paramere with somewhat wide sensory lobe and narrow hypophysis, sensory lobe with long process (Figure 2A); right paramere curved form with rounded hypophysis (Figure

2B), straight form in dorsal view with processes in hypophysis and apical part of sensory lobe (Figure 2C); vesica with three branched spicules and one sharp spicule (Figure 2D–E).

Measurements (in mm). Male (n = 1)/Female (n = 1) Body length, tylus–apex of membrane: 6.16/6.40; head length, excluding collar: 0.55/0.47; head width, including compound eyes: 0.92/0.97; vertex width: 0.37/0.43; 1st antennal segment length: 1.07/1.26; 2nd antennal segment length: 3.05/3.11; 3rd antennal segment length: 1.57/missing; 4th antennal segment length: 0.55/missing; total antennal length: 6.24/4.37(1st to 2nd); 1st rostral segment length: 0.41/0.42; 2nd rostral segment length: 0.38/0.41; 3rd rostral segment length: 0.43/0.47; 4th rostral segment length: 0.50/0.60; total rostral length: 1.72 /1.90; anterior pronotal margin width (straight): 0.50/0.52; mesal pronotal length: 0.80/0.78; basal pronotal maximal width (straight): 1.23/1.32; anterior scutellum width: 0.81/0.92; mesal scutellum length: 0.88/1.01; outer embolial margin length (straight): 2.87/3.01; outer cuneal margin length (straight): 0.96/1.11; maximal width across hemelytron: 0.66/0.64; foreleg (femur: tibia: tarsus): 1.38:1.90:0.41/1.42:1.85:0.39; midleg (femur: tibia: tarsus): 1.59:2.10:0.51/1.59:2.03:0.42; hindleg (femur: tibia: tarsus): 2.16:3.80:0.44/2.33:3.35:0.52.

Specimen examined. [CNU] 1♀, Yupo–ri, Sinbuk–eup, Chuncheon–si, Gangwon–do, Korea, 10.vii.2014, on *Ulmus davidiana* var. *japonica*, HD Lee; [CNU] 1♂, Geumdae–ri, Panbu–myeon, Wonju–si, Gangwon–do, Korea, by Light trap, 28.v.2015, JG Kim.

Distribution. Korea* (new record), China, Japan, Russia.

Hosts. *Ulmus davidiana* var. *japonica* Nakai (Ulmaceae), *Ulmus laciniata* (Trautv.) Mayr (Ulmaceae) (Yasunaga, 1999).

Remarks. This species has been attracted to light trap.

***Cyllecoris vicarius* Kerzhner, 1988** 갈참장님노린재
(Figures 1C–D, 3 and 4B)

Cyllecoris vicarius Kerzhner, 1988: 45; Yasunaga, 1999: 159.

Diagnosis. Recognized by body elongated; first antennal segment reddish; pronotum glossy; base of posterior lobe of pronotum pale brown connecting to middle part; anterior and inner part of corium pale brown; apical part of cuneus dark brown, apex of cuneus pale brown tinged with red; (Figures 1C–D); right paramere large with rounded hypophysis and prominent structure in middle part, prominent structure with processes (Figure 3C–D); vesica with four branched spicules and one sharp spicule (Figure 3E–F).

Description. MALE: See Kerzhner (1988) and Yasunaga (1999) for description in detail. FEMALE: As in male.

Male genitalia. genital segment rounded with asymmetric parameres (Figures 3A–D); left paramere with somewhat wide sensory lobe and narrow hypophysis, sensory lobe with long and somewhat wide process (Figure 3A–B); right paramere large with rounded hypophysis and prominent structure in middle part, prominent structure with sharp processes (Figure 3C–D); vesica with four branched spicules and one sharp spicule (Figure 3E–F).

Measurements (in mm). Male (n = 2)/Female (n = 1) Body length, tylus–apex of membrane: 7.31–7.45/7.61; head length, excluding collar: 0.47–0.50/0.64; head width, including compound eyes: 1.05–1.07/1.04; vertex width: 0.45–0.47/0.58; 1st antennal segment length: 1.06–1.15/1.09; 2nd antennal segment length: 2.87–2.91/2.73; 3rd antennal segment length: 1.46–1.55/1.46; 4th antennal segment length: 0.52–0.60/missing; total antennal length: 6.04–6.13/5.19 (1st to 3rd); 1st rostral segment length:

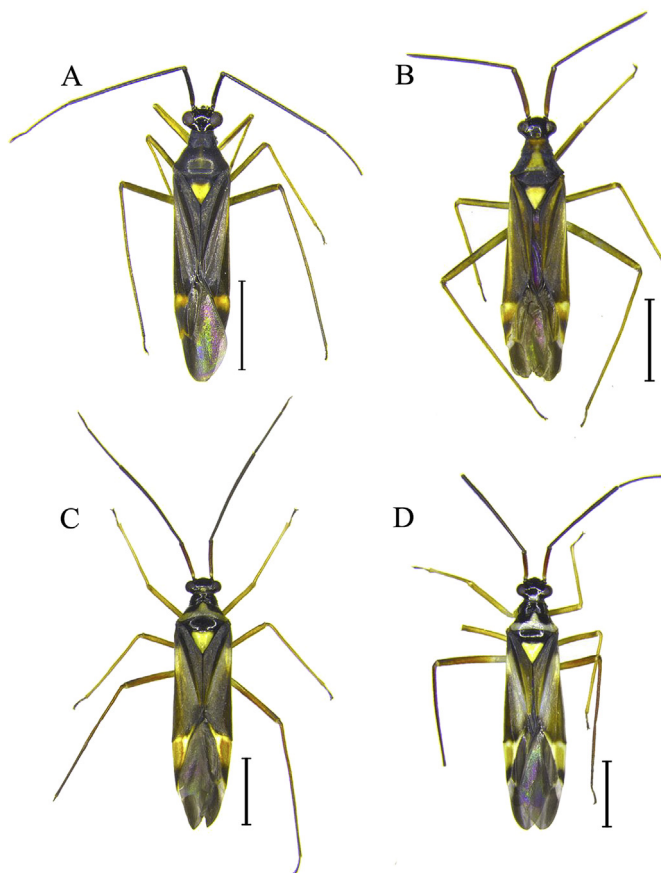


Figure 1. Dorsal habitus of the adult *Cyllecoris* spp. A, Male *Cyllecoris nakanishii*; B, Female *C. nakanishii*; C, Male *Cyllecoris vicarius*; D, Female *C. vicarius*. <scale bars: 2 mm>

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