

Italochrysa nigrovenosa Kuwayama, an Undescribed Species (Neuroptera:Chrysopidae) New to Korea

Seulki Kim and Soowon Cho*

Department of Plant Medicine, Chungbuk National University, Cheongju, 362-763, KOREA

풀잠자리과 한국 미기록종 *Italochrysa nigrovenosa* Kuwayama (풀잠자리목)

김슬기 · 조수원*

충북대학교 농업생명환경대학 식물학과

ABSTRACT: The genus *Italochrysa* Principi in Korea has been recorded with only one species, *I. japonica* (McLachlan) so far. Here we report that *Italochrysa nigrovenosa* Kuwayama is recognized for the first time in Korea. Specific description, a key based on diagnostic characters, and adult and genital images of the species are provided.

Key words: Neuroptera, Chrysopidae, *Italochrysa*, *I. nigrovenosa*, Korean fauna

초록: 그 동안 한국 풀잠자리과 *Italochrysa*속은 오직 1종만이 기록되었으나, 한국 미기록종인 몸노랑풀잠자리(*Italochrysa nigrovenosa* Kuwayama, 신칭)의 국내 분포를 추가로 보고한다. 이 종에 대한 간략한 기재와 속내 분류학, 그리고 암컷 성충과 생식기의 사진을 제공한다.

검색어: 풀잠자리목, 풀잠자리과, 네모날개풀잠자리속, 몸노랑풀잠자리, 미기록종

Chrysopidae (green lacewings) is a cosmopolitan family of Neuroptera, with over 1,200 species recognized in the world. Most chrysopid adults show green color and fine, complicated wing venation. The larvae of all species and the adults of some genera are predaceous and most feed on aphids, coccids and other soft-bodied insects. For this reason some species have been successfully used on the biological control of agricultural pests (New, 1975). However, identification of green lacewings is often very difficult because many species are superficially very similar (Brooks, 1983).

Studies on Korean neuropterans have been so scarce and most were studied by Japanese and east European scientists.

The family Chrysopidae of Korea had been reported to have one tribe, three genera, and 13 species (Paik, 1984). A decade later, based on an unpublished report (Rhee, 1993), the Korean Chrysopidae included two tribes, seven genera and 15 species, and this result was reflected to the Check List of Insects from Korea (ESK and KSAE, 1994).

The genus *Italochrysa* Principi include nearly 70 species in the world. Most species are distributed in tropical and subtropical regions, e.g., 30 species in tropical Africa, in which 19 of them were described or re-described by Tjeder (1966).

So far in Korea *Italochrysa* has been known with only one species, *I. japonica* (McLachlan). This species was first collected by Okamoto (1922) in Korea and rediscovered after over 60 years by Rhee (1993). In this study, we report another species, *I. nigrovenosa* Kuwayama in Korea. *Italochrysa nigrovenosa*

*Corresponding author: soowon@chungbuk.ac.kr

Received April 16, 2015; Revised June 15, 2015

Accepted June 22, 2015

was first reported from Japan (Kuwayama, 1970), and Kuwayama described the new species based on female characters of the species. We also collected female specimens only, and the identification based on its morphology was confirmed by comparing its COI barcode sequences with that of *I. nigrovenosa* from the BOLD site (www.boldsystems.org) and matching 99.74% in sequence similarity.

Here we provide brief descriptions of the genus and the species, with the female images of the adult and genitalia, the COI barcode sequence, and a key for the genus *Italochrysa* of Korea.

Materials and Methods

We used light traps and bucket traps for collecting. The specimens collected were saved either as a dry material or in 100% EtOH. For genital examination, a specimen was soaked in glycerol and examined through a stereo light microscope, often with an imaging facility. We also sequenced the barcoding region of the COI sequence of its mtDNA and compared with the COI barcoding sequences of the same species listed in the BOLD site. The specimens examined are deposited in the Insect Specimen room of the Department of Plant Medicine at the Chungbuk National University in Korea.

Systematic Account

Order Neuroptera Linnaeus, 1758

Family Chrysopidae Schneider, 1851

Genus *Italochrysa* Principi, 1946 네모날개플잠자리속

Italochrysa Principi, 1946: 86; 1952: 13; Tjeder, 1966: 264; Kuwayama, 1970: 67; Hölzel, 1970: 51; Kis et al., 1970: 343; Hölzel, 1973: 378; Séméria, 1974: 254; New, 1980: 19; Aspöck et al., 1980: 237; Leraut, 1980: 242; Tsukaguchi, 1985: 503; Brooks and Barnard, 1990: 125, 157, 266.

Type-species: *Hemerobius italicus* Rossi, 1790.

Adult body size medium to very large. Antennae usually shorter than forewing, rarely longer in some species; labrum normally emarginate. Wings slightly narrow in width, with subacute apices; pterostigma unmarked, or rarely spotted at base; especially, intra-median cell 1 (im 1) subrectangular; forewing with 6 to 10 crossveins from Psm (pseudomedia) to Psc (pseudocubitus).

***Italochrysa nigrovenosa* Kuwayama, 1970 몸노랑플잠자리 (신칭)** (Figs. 1, 2, 3a)

Diagnosis. Female. Body length 18-22 mm, forewing 25-30 mm, hindwing 22-26 mm (8n).

Head light yellow; palpi and vertex yellow; scape and pedicel yellow, flagella blackish with black hair; eyes dark blue. Thorax partially yellowish; both fore- and hind wings with veins consisting of yellow and black; costal veinlets blackish from 2nd to 10th; im cell far beyond Rs-M cross vein; setae chiefly hyaline, not pigmented (Fig. 1). Abdomen testaceous, immaculate, sparsely clothed with whitish hair; 7th sternite smoothly curved forward on hind margin; subgenitale with distinct, large ventral projection on apical lobe. Genitalia (male

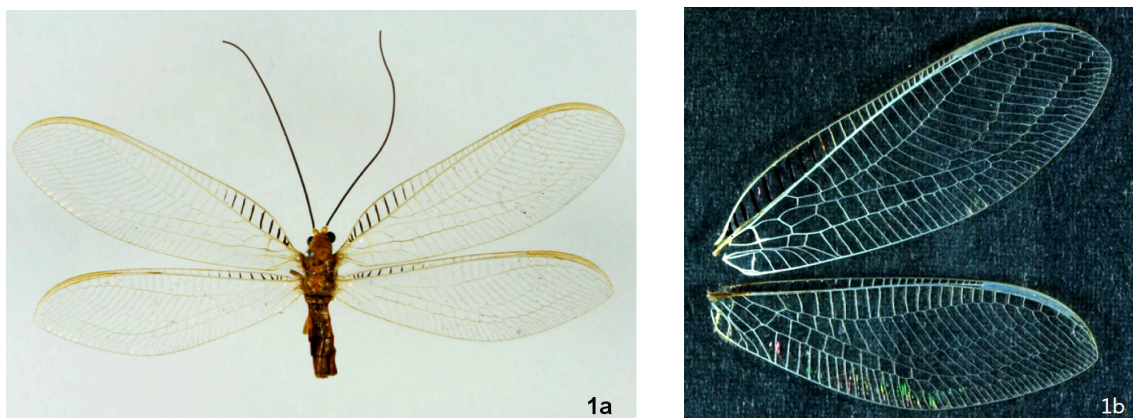


Fig. 1. Adult of *Italochrysa nigrovenosa*. 1a, adult; 1b, wing venation.

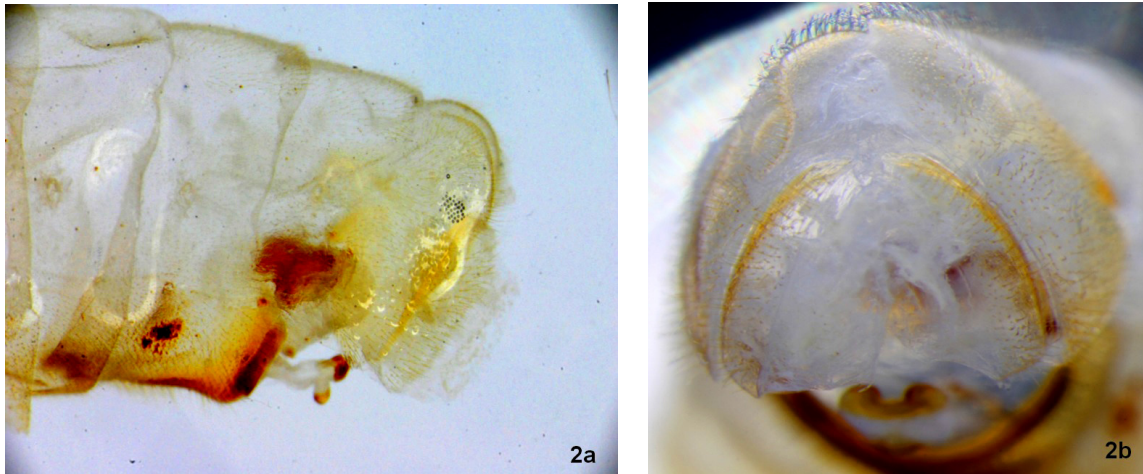


Fig. 2. Female genitalia of *I. nigrovenosa*. 2a, lateral view; 2b, caudal view.

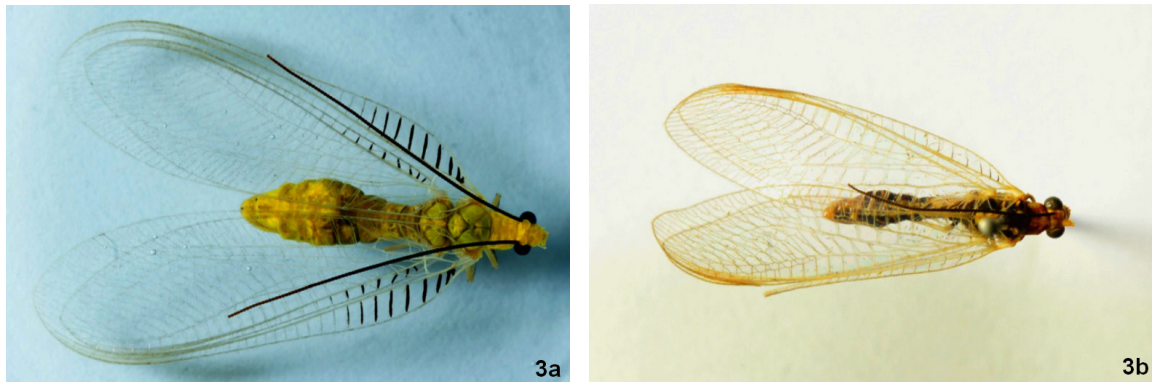


Fig. 3. Species of *Italo-chrysa* in Korea. 3a, *I. nigrovenosa*; 3b, *I. japonica*.

unavailable) 7th sternite densely short-haired, rather hardened and concave at its ventral hind margin; 4th tergite + ectoproct longer and not so abruptly expanded; lateral gonapophysis narrow with almost straight hind margin in lateral view (Fig. 2a); subgenitale in ventral view broad (Fig. 2b).

Material Examined

4 females: Weolag [Mt.], Mileug-li, Sangmo, Chungju, coll. S.K Kim, S.W Cho, Sep. 18, 2007; 2 females Weolag [Mt.], Gwangcheon-li, Deogsan, Jechon, coll. S.K Kim, S.W Cho, Sep. 19, 2009; 1 female: Weolag [Mt.], Mileug-li, Sangmo, Chungju, coll. S.K Kim, S.W Cho, Aug. 10, 2007; 1 female: Sasong-ri, Baekgok-myeon, Jincheon-gun, coll. E.J Lim, Aug. 14, 2009; 2 females: Dung-eok-ri, Sangbuk-myeon, Ulju-gun, Ulsan-si, coll. S.K Kim, J.C Sohn, S.K Lee, Aug. 24, 2012; 1

female: Yong-ri, Yuga-myeon, Dalseong-gun, Daegu-si, coll. J.C Sohn, S.K Lee, Aug. 23, 2012.

Distribution

The species is widely distributed throughout the Ethiopian, Oriental and Australian regions, also occurring in the southern parts of the Palearctic region.

Remarks

Italo-chrysa nigrovenosa is morphologically distinguishable from *I. japonica* as noted in the following key to the species. In addition, *I. nigrovenosa* has yellowish thorax and abdomen while *I. japonica* has bright pinkish spot on prothorax and light brownish stripes on meso- and metathorax and abdomen.

Key to the species of *Italoichrysa* in Korea

1. Large species; body size 18-22 mm, body color yellowish, eyes dark blue, length of forewing 25-30 mm, and most proximal cross veinlets strongly blackish
..... *I. nigrovenosa* 몸노랑풀잠자리(신칭) (Fig. 3a)
- 1'. Medium-sized species; body size 8-10 mm, body color reddish and yellowish, eyes reddish, length of forewing 18-20 mm, and cross veins mostly yellowish
..... *I. japonica* 등빨간풀잠자리 (Fig. 3b)

COI barcode sequence

ANATACTTATTTTGGCATTGATCTGGATTAGTA
GGTACAAGATTAAGTTTATTAATTCGAGCTGAATT
AGGTCAACCTGGTCTTTAATTGGAGATGATCAAA
TTTATAATGTTATTGTTACAGCTCATGCCTTTATTA
TGATTTTTTTCATAGTAATACCAATTATAATTGGA
GGATTTGGTAATTGATTAGTTTCTTTAATATTAGC
AGCTCCAGATATAGCTTTTCCACGAATAAATAATA
TAAGATTTTGAATACTCCACCATCATTAATTTTA
CTACTATCCTCTTCAATAGTAGAAAGAGGTGCAG
GAACTGGTTGAACAGTATACCCACCTTTATCTTCT
AATATTGCTCATGCAGGAGCTTCTGTAGATTTAGC
TATTTTTAGTTTACACTTAGCAGGAATTTCTCAA
TTCTAGGAGCTGTAAATTTTATTACTACAGTAATT
AATATACGATTAATTATATAACATTAGATCGTAT
ACCTTTATTTGTTTGGATCAGTAGTAATTACAGCTTT
ATTATTATTATTATCATTACCTGTATTAGCAGGAG
CTATTACTATATTATTAACAGATCGAAATTTAAAT
ACCTCTTTTTTTGATCCTGCAGGTGGTGGTGACCC
TATTTTATATCAACA

Acknowledgment

This work was supported by the research grant of Chungbuk National University in 2013.

Literature Cited

Aspöck, H., Aspöck, U., Hölzel, H., 1980. Die Neuropteren Europas, 2 vols. 1: 495pp.; 2: 355pp. Krefeld.

- Brooks, S.J., 1983. A new genus of Oriental lacewings (Neuroptera: Chrysopidae) Bull. br. Mus. nat. hist. (entomol.) 47, 1-26.
- Brooks, S.J., Barnard, P.C., 1990. The green lacewings of the world: a generic review (Neuroptera: Chrysopidae). Bull. br. Mus. nat. hist. (entomol.) 59, 117-286.
- ESK, KSAE (Entomological Society of Korea, Korean Society of Applied Entomology), 1994. Family Chrysopidae, in: Check list of insects from Korea. Konkuk univ. Press, Seoul.
- Hölzel, H., 1970. Zur generischen Klassifikation der palaarktischen Chrysopinae. Eine neue Gatt. zweineue Untergattungen der Chrysopidae Planipennia Z. der Arbeitsgemeinschaft Osterreichischer entomol. 22, 44-52.
- Hölzel, H., 1973. Neuroptera aus Nepal, I. Chrysopidae. Khumbu Himal 4, 333-388.
- Kis, B., Nagler, C., Mándru, C., 1970. Insecta: Neuroptera (Planipennia). Fauna Republicii Socialiste Rom. 8(6), 1-343.
- Kuwayama, S., 1970. The genus *Italoichrysa* of Japan (Neuroptera: Chrysopidae). Kontyû 38, 67-69.
- Leraut, P., 1980. Liste des Planipennes de France [Neuroptera]. Bull. de la soc. entomol. de Fr. 85, 237-253.
- New, T.R., 1975. Lacewings (Neuroptera) as biological control agents. vic. entomol. 5, 102-103.
- New, T.R., 1980. A revision of the Australian Chrysopidae (Insecta: Neuroptera) Aust. j. zool., suppl. Ser. 77, 1-143.
- Okamoto, H., 1922. The insect fauna of Quelpart island. Bull. agric. exp. stn. gov.-gen. Chosen I, 69-71.
- Paik, W.H., 1984. Key to species of the insects of Korea. 2. Chrysopidae (Neuroptera: Insecta). Seoul natl. univ., coll. agric., exp. for. rep. 9, 99-104.
- Principi, M.M., 1946. Contributi allo studio dei Neurotteri Italiani, IV. Nothochrysa italica Rossi. boll. dell'Istituto di entomol. della univ. di Bologna 15, 85-102.
- Principi, M.M., 1952. Ricerche zoologiche sul Massiccio del Pollino (Lucania-Calabria). VI. Neurotteri. Annuario dell'Istituto e mus. di zool. dell'Università di Napoli 4, 1-22.
- Rhee, H.J., 1993. Systematic of Chrysopidae in Korea. M.S. thesis, Korea univ., Seoul, Korea.
- Séméria, Y., 1974. Introduction a l'etude des Chrysopidae (Neuroptera, Planipennia). Entomops, Nice 32, 249-256.
- Tjeder, B., 1966. Neuroptera-Planipennia. The Lace-wings of Southern Africa. 5. Family Chrysopidae, in: Hanstrom B., Brinck P., Rudebeck G., (Eds.) South African animal life: results of the Lund University expeditions in 1950-1951, vol. 12, pp. 228-534. Swed. nat. sci. res. coun., Stockh.
- Tsukaguchi, S., 1985. A check list of published species of Japanese Chrysopidae (Neuroptera). Kontyû 53, 503-506.