

***Dictyophara nekkana* Matsumura (Hemiptera: Fulgoroidea:
Dictyopharidae): Discovery of Syntypes, Lectotype Designation,
and New Distributional Records**

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ABSTRACT: *Dictyophara nekkana* Matsumura (Hemiptera: Fulgoroidea: Dictyopharidae), unrecorded since its 1940 description, is recently rediscovered. Two syntypes of *D. nekkana* are recently found and a lectotype is newly designated for the identity of this species. Diagnosis and description of the adults, with illustrations of the male genitalia, are presented. New distributional records for *D. nekkana* are given for Heilongjiang, Inner Mongolia, Hebei, Beijing, Shandong, Shanxi, and Shaanxi. This has extended the distribution range of the species considerably, which was previously known only from Manchuria in northeastern China.

KEY WORDS: Hemiptera, Dictyopharidae, *Dictyophara nekkana*, lectotype designation, new distribution records, China

Dictyophara nekkana (Hemiptera: Fulgoroidea: Dictyopharidae) was described by Matsumura in 1940 from China. In the original description, Matsumura (1940: 17) provided the following information about the type series of *D. nekkana*: “Manchoukuo; numerous specimens were collected in Shotoku, Kohokko and Onsenji by the author; 2 (1♂, 1♀) specimens were collected by T. Inukai at Wanfu (29.VIII.1938) and 4 (2♂♂, 2♀♀) specimens were presented to the author by the Fan Memorial Inst. Biol., Peking.” Since its 1940 description, *D. nekkana* has not been mentioned in the literature, except in Metcalf’s (1946) catalogue of world Dictyopharidae and in Liang and Suwa’s (1988) paper dealing with the historical types of the Fulgoroidea species described by Matsumura.

The Matsumura collection has been housed in the Hokkaido University, Sapporo, Japan. Liang and Suwa (1988) studied the type specimens of the Fulgoroidea species described by Matsumura (excluding those of the Delphacidae) in Sapporo. They found most of the original specimens of Dictyopharidae studied by Matsumura but they failed to find the type series of ten Matsumura’s dictyopharid species at that time (Liang and Suwa, 1988: 135). *Dictyophara nekkana* was one of the ten species for which type specimens were apparently missing (Liang and Suwa, 1988: 135).

Two female syntypes of *D. nekkana* were recently found and examined in the Insect Collection of the Institute of Zoology, Chinese Academy of Sciences, Beijing, China. Their authenticity as syntypes was evidenced by Matsumura’s handwritten determination and type labels and was also verified by comparing the label data on the specimens with the original descriptions. The deposition of the syntypes of *D. nekkana* in the IZCAS collection was not mentioned in Matsumura’s (1940) original descriptions. This might be the result of the acquisition of the zoological collection of the Fan Memorial Institute of Biology (Peking, 1928–1949) by the Institute of Zoology, Chinese Academy of Sciences, Beijing in 1950. As noted in the original description, Matsumura (1940) studied the specimens sent to him from

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the Fan Memorial Institute of Biology, Peking (now Beijing). Part of the material was probably later returned to the Fan Memorial Institute of Biology, Peking, together with syntypes of species for which Matsumura had duplicate examples. In 1950 the zoological collection of the Fan Memorial Institute of Biology, Peking was fully incorporated into the zoological collection of the Institute of Zoology, Chinese Academy of Sciences, Beijing.

The purposes of this paper are to report and document the two newly found syntypes of *D. nekkana* at the IZCAS collection, to designate a lectotype for the identity of the species, to redescribe the species and provide the diagnostic illustrations for recognizing it in the Chinese dictyopharid fauna and to present the new distributional records of the species in China.

Materials and Methods

Specimens studied: The specimens studied in the course of this work are deposited in the Insect Collection of the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS); Department of Biology Insect Collection, Nankai University, Tianjin, China (NU); and Tianjin Museum of Natural History, Tianjin, China (TMNH).

Format used for presentation of data: To better preserve the historical status of the types, information from each syntype was recorded exactly as given on labels, with (1), (2), (3), indicating the sequence of labels on the pin from top to bottom. Our printed red lectotype or yellow paralectotype label is attached to each specimen so designated.

Since most species of Dictyopharidae can be identified accurately only by using diagnostic characters in the males, particularly the structures of the male genitalia, and since the lectotype and the paralectotype of *D. nekkana* designated in this publication are both females, we followed Medler's (1994) action using the term plesiotype (without type status) applied to a representative male specimen which was selected for illustration of genitalia. A blue plesiotype label was attached to the specimen for reference, and the depository cited, so that future workers can recognize the specimen.

Dictyophara nekkana Matsumura (Figs. 1–14)

Dictyophara [sic] *nekkana* Matsumura, 1940: 17 [not "16" as stated by Metcalf (1946)].

Lectotype ♀, here designated, N.E. China (IZCAS) [examined].

Dictyophara nekkana Matsumura; Metcalf, 1946: 171; Liang and Suwa, 1988: 135.

Description. Length ♂ 10.0–11.2 mm, ♀ 10.5–12.4 mm.

General color green, pale yellowish green or stramineous green (probably green in life; dead dried specimens are sometimes yellowish), carinae on cephalic process, frons, pronotum and scutellum, lateral carinae on pronotum and an oblique longitudinal fascia on propleurae, dark green; cephalic process specked with blackish at extreme apex; rostrum with extreme apex blackish; hind femora with 3 fuscous specks at extreme apex; male parameres with lateral hooks black apically.

Head. (Figs. 1–5) longer than pronotum and mesonotum combined. Vertex with cephalic process relatively robust, somewhat upturned, with lateral carinae converging towards apex, median carina only conspicuous between eyes; frons with lateral carinae reaching to clypeal suture, with distinct median carina. Pronotum short, tricarinate on disc. Mesonotum more than 2 times longer than pronotum, tricarinate on disc, with lateral carinae slightly converging towards anterior margin. Forewings (Fig. 6) with Sc+R,

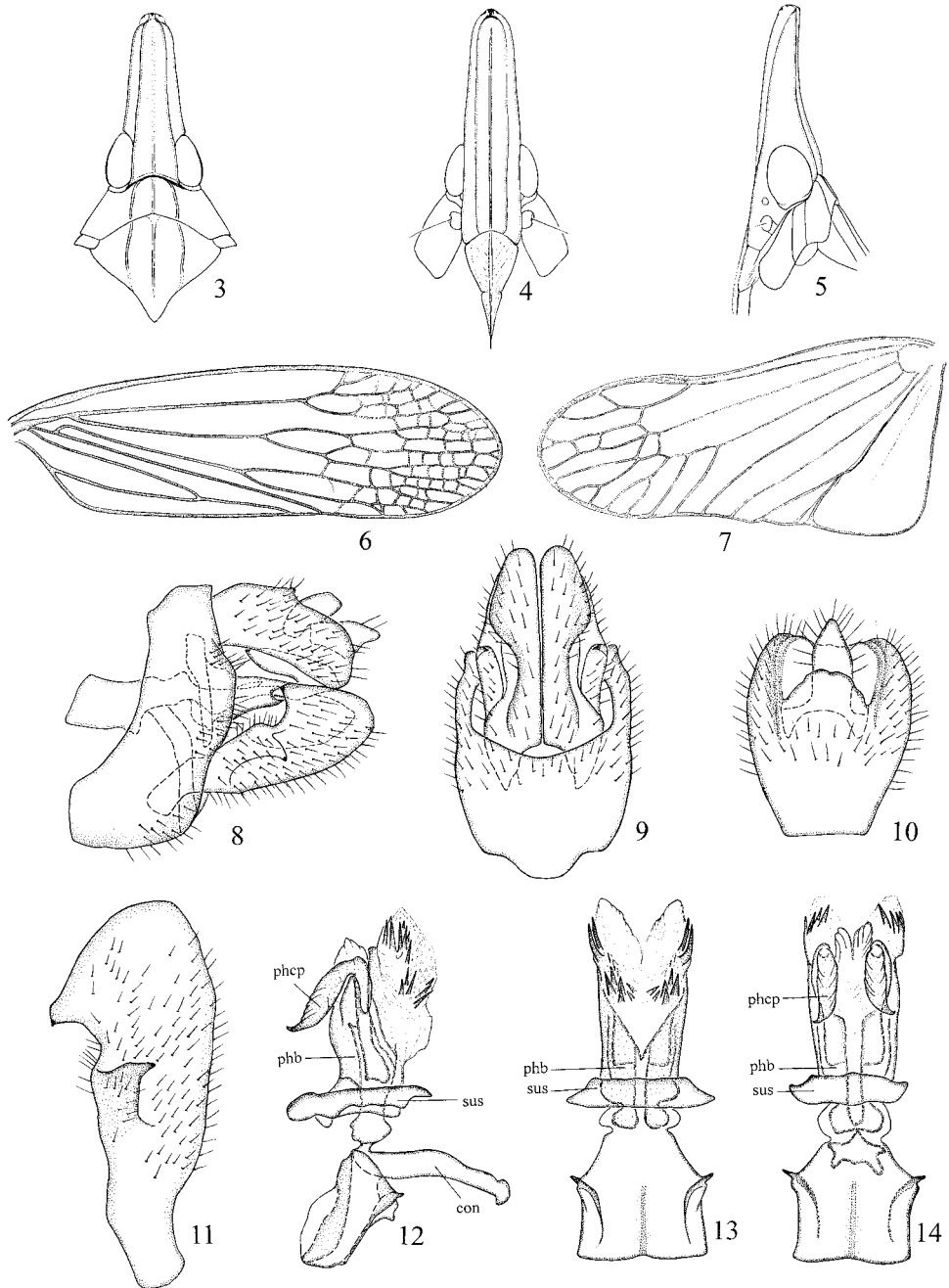


Figs. 1–2. *Dictyophara nekkana* Matsumura (♂, N.E. China: Manchoukuo: Kaigen, IZCAS). 1. dorsal habitus; 2. dorsolateral habitus.

M, and Cu₁ branched apically, respectively; stigma obsolete, with numerous netted veins on apical area, apical margin with about 16–22 cells ($n = 10, 22$ in the lectotype). Hindwing venation as in Fig 7. Rostrum reaching between hind trochanters. Hind tibiae with 6 lateral and 7 apical black-tipped spines; hind tarsomeres I and II with about 18 and 16 black-tipped apical spines, respectively.

Male genitalia. Pygofer (Fig. 8) in lateral view very narrow, ventrally distinctly broader than dorsally (about 2:1), anterior margin broadly and bluntly protruded anteriorly near base, posterior margin somewhat sinuate in lateral view. Anal tube (Figs. 8, 10) relatively short and broad, lateral margin distinctly diverging towards apex in dorsal view; anal style (Figs. 8, 10) slender, with extreme apex extended beyond posterior margin of anal tube in dorsoposterior view. Parameres (Figs. 8, 9, 11) in ventral aspect distinctly longer than pygofer, about twice as long as last ventral segment; base narrow, expanded towards apex, broadest subapically in lateral view, apex bluntly rounded, upper margin with an dorsally directed, black-tipped process at apex, outer upper edge with a ventrally directed, hook-like process near middle. Aedeagus (Figs. 12–14) symmetrical, phallobasal conjunctival processes with apical 2/5 elongately expanded, anteroventrally directed, with acute, sclerotized apex; gonopore on mid-length on outer edge. Phallobase (Figs. 12–14) with four apical membranous lobes, the dorsal two lobes smaller and shorter, without spines; the ventral two lobes larger, and longer, covered on lateroventral edge with about 18 spines (those on upper area distinctly elongate, those on lower area distinctly short).

Remarks. This species is externally similar to *Dictyophara koreana* Matsumura, 1915 (Korea) and *Centromeria manchurica* Kato, 1932 (northeastern China: Manchuria) but can be distinguished from the latter two species by the distinctly longer cephalic process



Figs. 3–14. *Dictyophara nekkana* Matsumura. 3–5 (♂, China: Beijing, IZCAS): 3. head, pronotum, and mesonotum, dorsal view; 4. head, ventral view; 5. head, lateral view. 6–7 (♀, China: Beijing, IZCAS): 6. right forewing; 7. left hindwing. 8–14. Male genitalia (male plesiotype, N.E. China: Manchoukuo: Kaigen, IZCAS): 8. pygofer, lateral view; 9. pygofer, ventral view; 10. apex of anal tube, dorsal view; 11. paramere, lateral view; 12. aedeagus, lateral view; 13. aedeagus, ventral view; 14. aedeagus, dorsal view. Abbreviations: con = connective; phb = phallobase; phcp = phallobasal conjunctival processes; sus = suspensorium.

(i.e., cephalic process distinctly shorter in the latter two species); the dorsal lateral carinae of cephalic process relatively evenly converging anteriorly (abruptly and relatively strongly converging anteriorly in the latter two species); and the lateral carinae on pronotum complete, almost reaching the hind margin of the pronotum (short, not reaching the hind margin of the pronotum in the latter two species).

Dictyophara nekkana superficially resembles *Dictyophara europaea* (L., 1767), but differs from the latter in that the head of *D. nekkana* is upturned and longer, and the forewings having strongly netted veins (see Matsumura, 1940).

Type designation. LECTOTYPE ♀, here designated, [N.E. China]: (1) Shotoku, Manchouchuo, 28–8–1940, S. Matsumura; (2) [Matsumura's handwriting] *Dictyophora* [sic] *nekkana* Mats., det. Matsumura; (3) [pink label] Paratype, Matsumura (IZCAS). The lectotype is in good condition.

PARALECTOTYPE. [N.E. China]: 1♀, (1) Shotoku, Manchouchuo, 28–8–1940, S. Matsumura; (2) [Matsumura's handwriting] *Dictyophora* [sic] *aminea* M. (IZCAS).

PLESIOTYPE. [N.E. China]: 1♂, Kaigen, Manchoukuo, no date (I. Okada) (IZCAS). The plesiotype genitalia are illustrated in figures 8–14.

New records. Heilongjiang: 1♂, Ning An, Jing Bo Hu, 2 September 1970, no collector; 1♂, Mi Shan, Xing Kai, 23 August 1970, no collector; 1♂, 3♀♀, Harbin, été 192(?) , leg. V. J. Tolmachov (Musée Heude) (IZCAS); 1♀, Chahar, Yamhkiaping, 30 August 1937, no collector (all in IZCAS). **Inner Mongolia:** 2♂♂, Helin, 1 August 1972, no collector (NU); 5♀♀, Xi Meng, Xilinhot, 22 July 1972, no collector; 3♂♂, eastern Inner Mongolia, Wu Qi, 16, 17 August 1971, no collector; 4♀♀, same locality, sweeping from vegetable garden, 15 August 1971, no collector; 4♀♀, Xi Meng, Dong Wu, 23 July 1972, no collector (all in IZCAS). **Hebei:** 1♂, Mt. Wulingshan, 29 August 1985, no collector (TMNH); 2♀♀, Mt. Xiao Wu Tai Shan, 1200 m, 25 August 1964, Y.-H. Han; 1♀, same locality and altitude, but 2 September 1964, C.-G. Wang; 1♀, Wei County, 960 m, 13 September 1964, C.-G. Wang; 4♂♂, 5♀♀, Wei County, Bai Le, 920 m, 2, 3 August 1964, Y.-H. Han; 1♂, 3♀♀, same locality and altitude, but 2, 4 August 1964, B.-Q. Li; 3♂♂, 2♀♀, same locality and altitude, but 3 August 1964, C.-G. Wang; 1♂, 3♀♀, Wei County, Xi He Ying, 860 m, 23, 28, 29 July 1964, Y.-H. Han; 5♂♂, 1♀, same locality and altitude, but 23, 29 July 1964, B.-Q. Li; 3♂♂, 1♀, same locality and altitude, but 28, 29 July 1964, C.-G. Wang (all in IZCAS). **Beijing:** 1♂, Beiping, Hopei, 21 July 1937, T. P. Chang (Fan. Inst. Biol. Peiping); 8; [Matsumura's handwriting] *Dictyophora* [sic] *nekkana* M., det. Matsumura; [pink label] Paratype Matsumura [Note: This specimen, bearing Matsumura's type label and identification label, can not be regarded as a syntype since Matsumura (1940) in his original description never mentioned 'Beiping (Beijing)' as the type locality]; 34♂♂, 42♀♀, Beiping, Hopei, 13, 16, 19, 21, 23, 27, 31 July, 5, 28 August & 8, 11 September 1937, T. P. Chang (Fan. Inst. Biol. Peiping); 1♀, Beiping, August 1950, Y.-B. Zhao; 1♂, 1♀, Badaling, 700 m, 6 September 1961, X.-Z. Zhang; 1♀, Badaling, sweeping from grass, 12 July 1972, no collector; 5♂♂, 13♀♀, Sanbao, 17, 18, 19, 22, 24 August 1964, S.-B. Liao; 1♂, 1♀, same locality, but 18 August 1964, T.-S. Li; 3♂♂, 5♀♀, 1 ex. (abdomen missing), same locality, but 21, 22 August 1964, Q. Zhou; 1♂, same locality, but 23 July 1975, Y.-S. Shi; 2♀♀, same locality, but 11, 19 August 1972, no collector (all in IZCAS). **[Shandong]:** 1♂, 3♀♀, Tsinanfou, Long-tong, 500–700 m, no date and collector (Musée Heude) (IZCAS). **Shanxi:** 2♂♂, 3♀♀, Tai Gu, 3, 15 July 1953, no collector; 1♂, Hun Yuan, Mt. Hengshan, Liyu, 1020–1250 m, 26 August 1962, Y.-L. Chen and Q.-C. Long (IZCAS). **Shaanxi:** 2♀♀, Hua Yin, 450 m, 9 August 1972, S.-Y. Wang (IZCAS). **Gansu:** 1♀, Sunan [Yugurzu], 2500 m, 22 August 1957, Y.-R. Zhang (IZCAS).

Distribution. Northern and northeastern China [Manchuria, Heilongjiang (new record), Inner Mongolia (new record), Hebei (new record), Beijing (new record), Shandong (new record), Shanxi (new record), Shaanxi (new record), and Gansu (new record)].

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