Short Communication

Females of Myorhina (Asiopierretia) kayaensis Park (Diptera: Sarcophagidae) recorded from Honshu, Japan

Hiromu Kurahashi*1) and Susumu Kakinuma2)

*Corresponding author: MLB15110@nifty.com

1) Department of Medical Entomology, National Institute of Infectious Diseases, Toyama 1–23–1, Shinjuku-ku, Tokyo 162–8640, Japan

2) Yamaguchi Laboratory IDD, Aobadai 11–22, Yamaguchi-shi, Yamaguchi 753–0012, Japan (Received: 18 September 2020; Accepted: 21 October 2020)

Abstract: The female of Myorhina (Asiopierretia) kayaensis (Park, 1962) is described based on specimens collected in Shimane Pref., Honshu, Japan. The female of this Korean flesh fly has never been found and described. The description was made of three pairs of copulated specimens. The result of comparative anatomy of female genitalia suggests this species of Asiopierretia Rohdendorf has a distinct status among the generic groups such as Psuedothyrsocnema Rohdendorf and Bellieriomima Rohdendorf which usually has three pairs of postsutural dorsocentral bristles. Female genitalia of this species are also first described, anatomically analyzed and illustrated.

Key words: Asiopierretia, female description, larvipositor, Myorhina kayaensis, new locality

Introduction

Myorhina (Asiopierretia) kayaensis was described by Dr. S. H. Park from Korea based on only male specimens. Since then, its female was never recorded from anywhere else although the male was recorded from Japan (Kano et al., 1967). Very recently the second author (S. K.) happened to collect three pairs of copulated specimens of M. kayaensis in Masuda City, Shimane Prefecture, Honshu, Japan. The first author (H. K.) had an opportunity to examine these three pairs of copulated specimens for reconfirmation of identification. The first author carefully examined the copulated female specimens for the first time. The females of sarcophagine flies (Diptera: Sarcophagidae: Sarcophaginae) are very similar or almost identical with one another in general external morphology, and very difficult to identify the species. The female genitalia are not as much characteristic as in those of males. The descriptions and illustration of female flies are very few and the collections of female flies are not so much paid attention to. The first author is interested in the comparative morphology of female genitalia or larvipositors and their evolulional trends to investigate the phylogenetic relationship between the generic and species groups.

The present paper deals with the description of the general morphology of the female of M. (A.) kayaensis and its genitalia. Each abdominal segment examined, character states are scored and the total counted. The frequency percentage of derived states “derivedness” (D %) is calculated by a simple equation: Number of score/ no. of characters×maximum score 3. The developmental stage in evolution is roughly estimated and discussed.

Herein after we describe the general morphology including photographs and illustrations of genital organs.

KEY

Key to the two Japanese species of Myorhina (Asiopierretia) Rohdendorf

1. Postsutural dc 3; GS1 without mb in ♀ .............................................................. M. (A.) ugamskii (Rohdendorf)
   – Postsutural dc variable in number, sometimes apparently 4–5; GS1 with mb in ♀ .......... M. (A.) kayaensis (Park)
DESCRIPTION

*Myorhina (Asiopierretia) kayaensis* (Park, 1962), female
(Japanese name: Kaya-nikubae)  
(Figs. 1 & 2)

*Sarcophaga kayaensis* Park, 1962: 7. Type locality: Mt. Song-li (Chung-pook prefecture), South Korea.  
*Pierretia kayaensis*: Kano, Field and Shinonaga, 1967: 101. New locality: Tokyo, Yamanashi and Kyoto, Honshu, Japan.  
*Pierretia kayaensis*: Park, 1977: 269. New locality: Mt. Kaya, Mt. Jiri, Mt. Sobek, Mt. Naejang and Mt. Bogyung, South Korea, and Japan.  
*Sarcophaga (Asiopierretia) kayaensis*: Pape, 1996: 297.  
*Myorhina (Asiopierretia) kayaensis*: Kurahashi, 2014: 824.  
*Myorhina (Asiopierretia) kayaensis*: Kurahashi and Kakinuma, 2015: 189.

♀.—Head: eyes bare; frons index 0.30–0.32 (M=0.32, n=3); frontal stripe blackish, 2.5× board as width of parafrontal at level in front of anterior ocellus, parallel-sided; parafrontal silver grey pollinose, somewhat darkened toward vertex, black setulose, provided with about 9–11 pairs of oris, all of which are not crossed; two proclinate and one, sometimes two reclinate ors developed; parafacial and face silver grey pollinose, parafacial with fine, short black setulae which is not longer than width of 3rd antennal segment (AS3); ors 2+1−2; oc developed; iv long, well developed; ov less developed, about 2/3 of length of iv; poc parallel; facialis with row of short setulae on lower 1/3; mediana and vibrissaria narrow, blackish, densely silver grey pollinose; vibrissa well developed; epistome yellowish brown, silver grey pollinose; gena broad, black, silver grey pollinose, clothed with black hairs, about 0.20 of height of eyes (HE); mesothoracic spiracle small, silver; metathoracic one small, with silver posterior flap. Chaetotaxy: ac 0+1; dc 2+5; ia 1+2−3; h 3–4; ph 3; prs 1; sa 3–4; pa 2; st 1+1+1; sc 2+1−2; n 4; pp 1–2; pst 1 strong without fine one.

Wings: hyaline; veins brown; epauilet black; basicosta yellowish brown; stem vein bare; subcostal sclerite brown, somewhat yellowish basally, entirely yellowish pubescent; 1st longitudinal vein (R1) bare; cell R4+5

---

Fig. 1. Illustrations of female genitalia, *Myorhina (Asiopierretia) kayaensis* (Park, 1962). a: terminalia, caudal view and spermatheca (one of three is illustrated), b: signum, dorsal view.

Fig. 2. Photographs of female genitalia, *Myorhina (Asiopierretia) kayaensis* (Park, 1962). a: tergite 5 and female terminalia, b: spermathecae, lateral view; c: signum, dorsal view.
| Character ID | Character | Plesiomorphic (0) | Intermediate (1) | Apomorphic (2) | Apomorphic (3) |
|--------------|-----------|-------------------|------------------|---------------|---------------|
| Female       | T5 Tergite 5 | single plate without incision | with shallow incision | with deep incision | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | | | |
| Ovipositor   | T6 Tergite 6 | single plate | intermediate | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | T7 Tergite 7 | single plate | intermediate | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | T8 Tergite 8 | single plate | intermediate | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | T9 Tergite 9 | single plate | intermediate | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | SPA Supra-anal plate | single plate without incision | with incision | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | Spm Spermatheca | elongated and sculptured | gourd-shaped, and sculptured | gourd-shaped and with smooth surface | gourd-shaped, and entirely smooth and with smooth surface |
|              | S5 Sternite 5 | single plate without incision | with incision | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | S6 Sternite 6 | single plate without incision | with incision | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | S7 Sternite 7 | single plate without incision | with incision | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
|              | S8 Sternite 8 | single plate without incision | with incision | two sclerites | vestigial/disappeared |
|              | b          | with complete row of marginal bristles | row divided into two | with some lateral mb | with no mb |
|              | h          | largely haired | hairy on nearly 1/2 | hairy on less than 1/4 | bare |
Table 2. The species and forms of Sarcophagid flesh flies (genitalic characters) × (taxa) matrix: Myorhina kayaensis.

| Character ID | Myorhina kayaensis | Ancestor |
|--------------|--------------------|----------|
| S9 Sternite 9 | single plate without incision | single plate without incision |
|              | with complete row of marginal bristles | with complete row of marginal bristles |
|              | with incision | with incision |
|              | row divided into two | row divided into two |
|              | hairy on nearly 1/2 | hairy on nearly 1/2 |
|              | hairy on less than 1/4 | hairy on less than 1/4 |
|              | largely haired | largely haired |
|              | hairy on nearly 1/2 | hairy on nearly 1/2 |
|              | hairy on less than 1/4 | hairy on less than 1/4 |
|              | largely haired | largely haired |

Table 1. Continued.
open; node of 2nd (R2+3) and 3rd (R4+5) longitudinal veins setulose above and below, 3rd longitudinal vein setulose on 2/3 way from node to anterior cross vein r-m above; 4th longitudinal vein bare, bent with right angle; section of 4th vein from bend to wing edge nearly straight; alar squama pale brown, semi-transparent; thoracic squama large, pale brown with paler margin, bare on upper surface. Haltere brown, with pale knob.

Legs: black, more or less dark grey pollinose; fore tibia with 1 p on apical 1/3 and 3-4 ad on basal 1/2; mid tibia with 1 short and 2 long ad, 1 pd, 2 p and 1 short and 1 long v medially; hind tibia with 1 short and 2 long ad, 1 short and 2 long pd, 2 av present.

Abdomen: syntergite 1+2 black, slightly dark grey pollinose, with median black stripe; tergites 3-4 grey pollinose, with black median stripe and tessellate pattern; tergite 3 with decumbent black hairs on dorsal surface and 1 strong lateral mb present, but without median mb; tergites 4 with median and 3-4 lateral mb; tergite 5 with row of strong erect marginal bristles, tergite 5 grey pollinose, with median fine black stripe when viewed behind, without marginal band; sternites with marginal bristles, hairs on sternites and lateral sides of tergites black.

Terminalia: not prominent, of typical sarcophagine larvipositor; signum present; three spermathecae present, each elongate oval in shape, with sculptured surface as shown in Fig. 2b.

**Preabdominal tergite:** T5 of single plate without incision (0), with complete row of mb (0), largely haired (0).

**Postabdominal tergites:** T6 of two sclerites (2), with row of mb divided into two (1), largely haired (0); T7 vestigial/disappered (3), without mb (3), bare (3); T8 vestigial/disappeared (3), without mb (3), bare (3); T9 vestigial/disappered (3), without mb (3), bare (3); subanal plate (SPA) vestigial/disappeared (3), without mb (3), bare (3); spermatheca (Spm) (1).

**Preabdominal sternite:** S5 of single plate without incision (0), with complete row of mb (0), largely haired (0).

**Postabdominal sternites:** S6 of single plate without incision (0), with row of mb divided into two (1), hairy on less than posterior 1/4 (2); S7 of single plate without incision (0), with row of mb divided into two (1), hairy on less than posterior 1/4 (2); S8 of single plate without incision (0), with some lateral mb (2), hairy less than posterior 1/4 (2); S9 vestigial/disappeared (3), without mb (3), bare (3); subanal plate (SBA) of single plate with incision (1), with row of mb divided into two by incision (1), largely haired (0) (Table 2).

Length: 9.0–12.0 mm.

**Material examined.** HONSHU: 2♂, 2♀ (pairs A and B), Shimane Pref., Masuda City, Mukaiyokota-cho (Takatsu River) 20 Oct. 2019, S. Kakinuma; 1♂, 1♀ (pair C), same locality, 14 Oct. 2019, S. Kakinuma.

**Depository of reference specimens.** All pairs (3♂, 3♀) of specimens are deposited in the Reference Museum Collection of Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo (NIID).

**Remarks & Discussion.** The female shows peculiar combinations of genitalic characteristics such as the presence of signum, the shape of spermathecae and the presence of tergite 8 and sternite 8. In the general morphology, it differs from those of the genus *Myorhina* which has the postsutural *dc* 3. The female has the similar number of postsutural *dc* 5 which are commonly found in that of *Myorhina kanekoi* (Kano & Field).

The four character states of 37 characters of larvipositor are shown in Table 1. Table 2 shows the cord and name of taxa, the scientific name *Myorhina kayaensis* and scores (0–3) of each character which will be applied to PAUP program and calculate the "derivedness" percent (D %). Total score of larvipositor was counted up to 61. D% of 37 characters is calculated by total score (61)/no. of characters (37)×maximum score (3) up to 55.0. It shows this species seems to be moderately advanced form in evolution.

Bionomics. Nothing is known.

Distribution. South Korea and Japan (Honshu).

**Acknowledgements**

The first author (HK) wish to express his sincere thanks to the director, Dr. S. Kasai and Dr. Y. Higa, head of Laboratory of Taxonomy and Ecology/Reference Museum, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo for their encouragement and kind help. Thanks are also due to Dr. S. H. Tan, University of Malaya, Kuala Lumpur for reading the draft.

**References**

Kano, R., Field, G. and Shinonaga, S. 1967. Sarcophagidae (Insecta: Diptera). *Fauna Japonica*, 7: xii+168 pp+41 pls., Biogeographical Society of Japan, Tokyo.

Kurahashi, H. 2014. Sarcophagidae. In: Catalogue of the Insects of Japan, 8(2) Brachycera Schizophora (ed. Nakamura, N., Saegusa, T. and Suwa, M.), pp. 817–831., Entomological Society of Japan, Tokyo. (In Japanese)

Kurahashi, H. and Kakinuma, S. 2015. Keys to the flesh flies of Japan, with the description of a new genus and species from Honshu (Diptera: Sarcophagidae). *Med. Entomol. Zool.*, 66: 167–200.

Pape, T. 1996. Catalogue of the Sarcophagidae of the World (Insecta: Diptera). *Mem. Ent. Internat.*, 8: 1–558.

Park, S. H. 1962. Descriptions of two new species of sarcophagid flies (Diptera: Sarcophagidae) from Korea. *Jap. J. Sanit. Zool.*, 13: 6–10.

Park, S. H. 1977. Studies on flies in Korea II. Taxonomical studies on sarcophagid flies (Diptera). *Bull. Tokyo Med. Dent. Univ.*, 24: 249–284.