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Taxonomic Study of the Genus *Mesopsocus* Kolbe (Psocoptera: Mesopsocidae) of Japan¹

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Abstract. The genus *Mesopsocus* Kolbe from Japan are reviewed with some records from USA, Far East, and Taiwan. Four species are recognized: *Mesopsocus dislobus* sp. nov., *M. unipunctatus* (Müller, 1764), *M. laticeps* (Kolbe, 1880), and *M. hongkongensis* Thornton, 1959. The latter two species are newly recorded from Japan. A key to Japanese species of the genus *Mesopsocus* is given.

Key words: *Mesopsocus*, Mesopsocidae, Psocoptera, new species, taxonomy, Japan.

Introduction

The genus *Mesopsocus* Kolbe, 1880, comprises middle to large psocids, and is defined by the autapomorphic basal fusion of veins R and M+Cu in the hindwing (Badonnel & Lienhard, 1988). The genus includes 48 species in the world, and is most abundant in the Ethiopian and Palaearctic Regions (27 Ethiopian, 17 Palaearctic, 3 Holarctic, and 1 Oriental species).

Two species, *M. unipunctatus* (Müller, 1764) and *M. orientalis* (Vishnyakova, 1986), have been recorded from Japan. However, the latter was recently transferred to the new genus, *Idatenopsocus* (Yoshizawa & Lienhard, 1997). An undetermined species, *Mesopsocus* sp., was recorded from Honshu by Tomita & Haga (1991), but the species has subsequently been identified as *I. orientalis* (Yoshizawa & Lienhard, 1997). Thus, only one Japanese species of the genus *Mesopsocus* is presently known. In this paper, *Mesopsocus dislobus* sp. nov. is described, and two species *M. laticeps* (Kolbe, 1880) and *M. hongkongensis* Thornton, 1959, are newly recorded from Japan.

Most species of this genus are found on tree bark (Smithers, 1972). All specimens examined in this study were collected by beating tree branches or aspirating specimens from tree trunks.

In each species synonymy, only the original description and references subsequent to Smithers' Catalogue (Smithers, 1967) are listed. New distributional records are highlighted with an asterisk following the locality name. The holotype of *M. dislobus* is deposited in the collection of the Biosystematics Laboratory, Kyushu University (BLKU). Other specimens are deposited in the author's personal collection unless specified.

Genus *Mesopsocus* Kolbe

Mesopsocus Kolbe, 1880, Jahresbericht des Westfälischen Provinzial-Vereins für Wissenschaft und Kunst, 8: 112; Badonnel & Lienhard, 1988, Bulletin du Muséum national d'Histoire naturelle (4), 10: 383.

Trocticus Bertkau, 1883, Archiv für Naturgeschichte 49: 99.
Holoneura Tetens, 1891, Entomologische Nachrichten 17: 372.

Labocoria Enderlein, 1910, Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin, 1910: 71.

Type species: *Hemerobius unipunctatus* Müller, 1764.

Diagnosis. Male macropterous; female macropterous, micropterous or apterous. Forewing margin and veins glabrous; posterior margin of pterostigma rounded. Hindwing veins R and M+Cu fused with each other at base; vein An elongate. Tarsi 3-segmented; pulvillus fine. Hypandrium simple. Egg guide of female subgenital plate with distinct neck region.

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Key to the Japanese species of *Mesopsocus*

1. Macropterous 2
- Micropterous
..... *M. unipunctatus* (Müller) (Female)
2. Forewing veins Rs and M fused for a short distance 3
- Forewing veins Rs and M united at point or connected by a crossvein
..... *M. unipunctatus* (Müller) (Male)
3. Eye not stalked 4
- Eye on short stalk *M. laticeps* (Kolbe)
4. Distal margin of areola postica slightly convex. Apex of egg guide of female subgenital plate acutely pointed. Male unknown
..... *M. dislobus* sp. nov.
- Distal margin of areola postica slightly concave. Apex of egg guide of female subgenital plate round. Anterior margin of phallosome truncate
..... *M. hongkongensis* Thornton

***Mesopsocus unipunctatus* (Müller)**

Hemerobius unipunctatus Müller, 1764, Fauna insectorum Friendrichsdalina: 66.

Mesopsocus unipunctatus: Günther, 1974, Die Tierwert Deutschlands, 61: 194; New, 1976, Handbooks for the identification of British insects, 1 (7): 75, 76; Badonnel & Lienhard, 1988, Bulletin du Muséum national d'Histoire naturelle (4), 10: 402, 405, 411; Tomita & Haga, 1991, Bulletin of the Sugadaira Montane Research Center, University of Tsukuba 12: 39, 51; Mockford, 1993, Flora and Fauna Handbook, 10: 242.

Diagnosis. Male macropterous, female micropterous. Forewing veins Rs and M united at point or connected by short crossvein. Phallosome (Fig. 1A) long, about 2.5 times as long as wide; phallobase pointed at apex; paramere strongly dilated, with distinct lobe at apex. Female paraproct with large, rounded ventral lobe. Egg guide of subgenital plate broad, rounded at apex (Fig. 3E).

Material examined. [Hokkaido] 2 females, Yamunaisawa, Rishiritô Is., 29. vii. 1994, K. Yoshizawa.

Non-Japanese material examined. RUSSIA [Ussuri] 1 female, 11. vii. 1993, T. Yasunaga; 1 male, Ussurijsk Reserve, W. border, 12–13. vii. 1993 (Light Trap), T. Yasunaga. USA [Alaska] 5 males, Moose Cr., Mi. 55 of Glenn Hwy, 28. vi. 1994, T. Saigusa; 1 male, Flattop Mt., South Fork, Anchorage, 19. vii. 1993, T. Saigusa.

Distribution. Rishiritô Is.*, Hokkaido, Honshu,

Kyushu; Holarctic.

***Mesopsocus laticeps* (Kolbe)**

Elipsocus laticeps Kolbe, 1880, Jahresbericht des Westfälischen Provinzial-Vereins für Wissenschaft und Kunst, 8: 114.

Mesopsocus laticeps: Günther, 1974, Die Tierwert Deutschlands, 61: 192; New, 1976, Handbooks for the identification of British Insects, 1 (7): 75; Badonnel & Lienhard, 1988, Bulletin du Muséum national d'Histoire naturelle (4), 10: 401, 404, 411; Mockford, 1993, Flora and Fauna Handbook, 10: 241.

Diagnosis. Both sexes macropterous. Head capsule with weak dorsolateral extensions bearing compound eyes; frons with pair of large dark brown markings. Phallosome (Fig. 1B) about two times as long as wide; phallobase rounded anteriorly; paramere dilated, with distinct lobe at apex. Female paraproct with large, rounded ventral lobe. Egg guide of female subgenital plate broad, pointed at apex (Fig. 3F).

Material examined. [Honshu] 1 male, Hatsudai, Tokyo, 3. viii. 1974, T. Okazaki (National Institute of Agro-Environmental Sciences, Tsukuba); 2 males, Hirugano, Gifu, 15. vii. 1996, N. Takahashi; 1 male, 2 nymphs, Yae-Yuen station, Kyoto Pref., 4. vi. 1987, J. Anonby; [Tsushima Is.] 1 female, Mt. Ôboshiyama, 24. ix. 1993, K. Yoshizawa; [Kyushu] 2 males, Chip factory in Hisayama Town, Fukuoka, 16. vi. 1992, K. Yoshizawa; 1 male, Minamihata, Fukuoka, 25. vi. 1994, R. Matsumoto.

Distribution. Honshu*, Kyushu*, Tsushima Is.*; Holarctic.

***Mesopsocus dislobus* sp. nov.**

Diagnosis. Known from macropterous females only. Forewing veins Rs and M fused for short distance; distal margin of areola postica slightly convex. Paraproct without well developed ventral lobe. Egg guide of subgenital plate pointed at apex.

Description. Female. Head white in ground color with pale brown markings on vertex and frons; eye black, IO/D=2.2; ocelli white; postclypeus white. Antenna dark blackish brown except scape, pedicel, and basal two flagellomeres pale brown. Mouthparts pale; teeth and molar of mandible and lacinia dark brown; apical half of fourth segment of maxillary palpus brown. Thorax white in ground color; prothorax pale brown; mesonotum with dark brown markings on anterior lobe, lateral lobe, and posterior to lateral lobe of scutum, marking on anterior lobe divided bilaterally by narrow white longitudinal line; post-

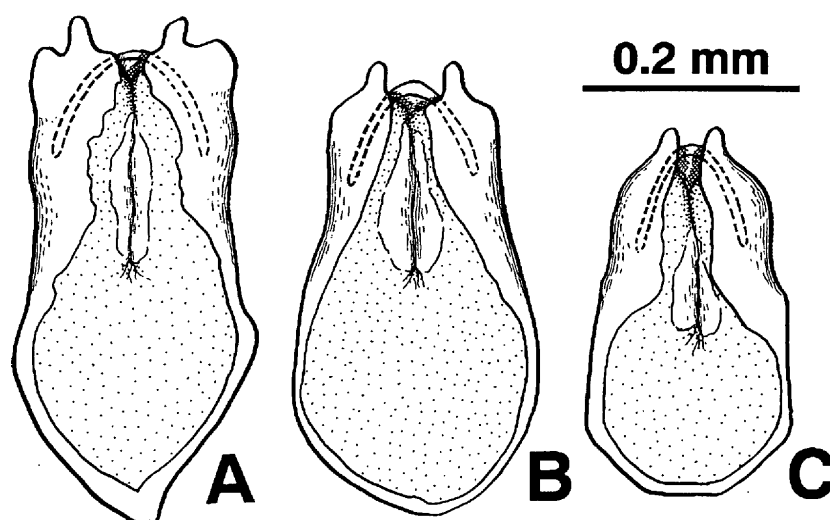


Fig. 1. Phallosome of *Mesopsocus* spp. — A, *M. unipunctatus*; B, *M. laticeps*; C, *M. hongkongensis*.

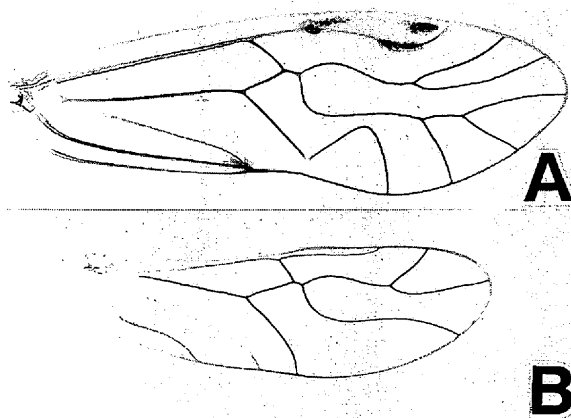


Fig. 2. Wings of *Mesopsocus dislobus* sp. nov. — A, Forewing; B, Hindwing.

notum dark brown; mesopleuron white except wing process brown; metanotum with dark brown marking on lateral lobe; postnotum dark brown; metapleuron dark brown except trochantin white. Legs pale brown; femora paler; distal end of tibiae and entire tarsi dark brown; 1st hind tarsomere with 18–21 ctenidiobothria. Forewing (Fig. 2A) hyaline, with pale brownish tinge, and with brown marking around nodulus; pterostigma white with brown markings on basal region, anterior margin of distal region, and posterior margin; veins brown except CuA_2 white; R_s and M fused for short distance; distal margin of areola postica slightly convex. Hindwing (Fig. 2B) hyaline, with some minute marginal setae between veins R_{2+3} and R_{4+5} ; cell cup with pale brownish tinge; veins brown except CuP white. Genitalia (Fig. 3): epiproct parallel sided and nearly rectangular, 1.3 times as wide as long. Paraproct with weakly developed ventral lobe, almost as long as high in lateral aspect. Subgenital plate (Fig. 3C, D): distal region of egg guide tapered to acute apex; neck region with pair of swell-

ings laterally; pigmented arm roughly U-shaped. Gonapophyses (Fig. 3B): ventral valve long and narrow, with apical process; dorsal valve long, with subapical process; external valve oval.

Length (mm). Body 4.5–5.0; 1st flagellomere 0.95–1.1; 2nd flagellomere 0.88–0.98; forewing 5.5–5.8; hindwing 4.0–4.2; hind femur 0.90–1.0; hind tibia 2.0–2.2; 1st hind tarsomere 0.47–0.50; 2nd hind tarsomere 0.10–0.12; 3rd hind tarsomere 0.16–0.19.

Male unknown

Material examined. Holotype female, Mt. Tateyama, Tsushima Is., 4. v. 1992, K. Yoshizawa. Paratypes. [Tsushima Is.] 1 female, same locality as holotype, 5. v. 1992, K. Yoshizawa; [Kyushu] 1 female, Mt. Tachibanayama, Fukuoka, 19. iv. 1992, T. Nakamura; 2 female, same locality, 30. iv. 1993, K. Yoshizawa; 5 females, same locality, 1. iv. 1994, K. Yoshizawa; 1 female nymph, same locality, 9. iii. 1997, K. Yoshizawa.

Distribution. Kyushu, Tsushima Is.

Remarks. This is a rather rare species. It appears only from early to mid-spring and is apparently restricted in habitat. For example, at Mt. Tachibanayama, all specimens were collected from a single tree (*Ligustrum japonicum*, Oleaceae) despite searching many other neighboring trees. Males of this species have not been collected and the spermathecal sac of all examined specimens were empty. This may possibly indicate that this species is parthenogenetic.

In *Mesopsocus* and related genera, the ventral lobe of the female paraproct is well developed. In contrast, *M. dislobus* is characterized by a weakly developed ventral lobe of the female paraproct that is likely derived secondarily. *M. dislobus* is similar to *M. hongkongensis*, treated below, in coloration and other general features, but they differ from each other in the

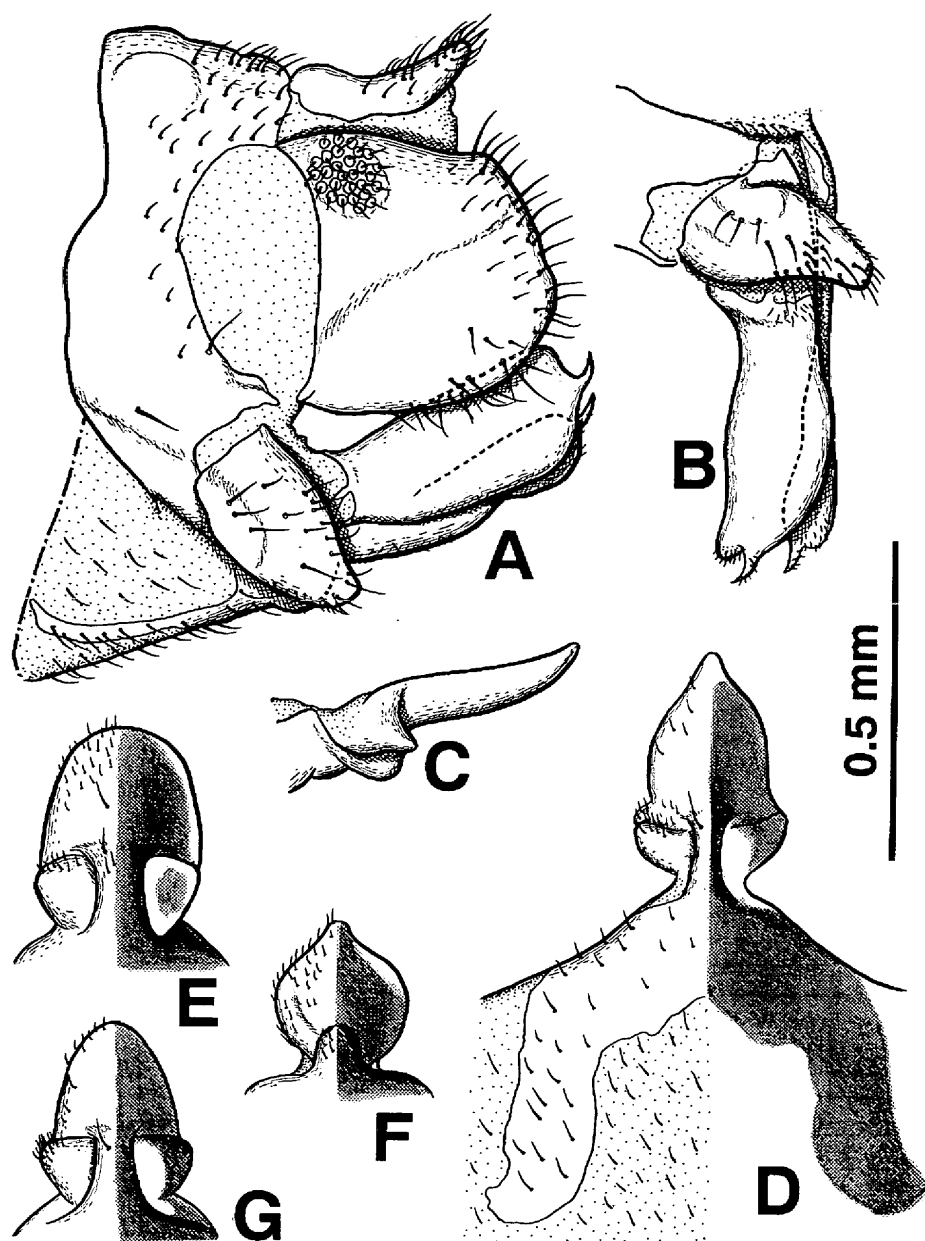


Fig. 3. Female genitalia of *Mesopsocus* spp. — A–D, *M. dislobus* sp. nov. A, Genitalia, lateral view; B, gonapophyses, ventrolateral view; C, egg guide, lateral view; D, subgenital plate, ventral view; E, egg guide of *M. unipunctatus*, ventral view; F, *M. laticeps*; G, *M. hongkongensis*.

shape of the apex of the egg guide. Phylogenetic affinities of this species remain uncertain.

Mesopsocus hongkongensis Thornton

Mesopsocus hongkongensis Thornton, 1959, Transactions of the Royal Entomological Society of London, 111: 331; Badonnel & Lienhard, 1988, Bulletin du Muséum national d'Histoire naturelle (4), 10: 401, 403, 411.

Diagnosis. Both sexes macropterous. Forewing veins Rs and M fused for short distance; distal margin of areola postica slightly concave. Phallosome (Fig. 1C) about two times as long as wide; phallobase

somewhat truncated apically; paramere dilated, gradually tapered to weakly distinct apical lobe. Female paraproct with large, rounded ventral lobe. Egg guide of female subgenital plate rounded at apex (Fig. 3G).

Material examined. [Ryukyus] 1 female, En, Tatsugô, Amami-Ôshima Is., 24. iv. 1996, K. Yoshizawa; 1 female, Sumiyô, Amami-Ôshima Is., 23. iv. 1996, K. Yoshizawa; 1 female, same locality, 26. iv. 1996, K. Yoshizawa; 1 female, Mt. Yuwandake, Amami-Ôshima Is., 22. iv. 1996, K. Yoshizawa; 4 males, 3 females, 4 nymphs, Mt. Yonahadake, Okinawajima Is., 21. v. 1993, K. Yoshizawa; 1 male, 1 female, same locality, 8. iv. 1996, K. Yoshizawa; 1 male, same

locality, 18. iv. 1996, K. Yoshizawa; 2 males, 2 nymphs, Mt. Bannadake, Ishigakijima Is., 8. iv. 1996, K. Yoshizawa; 1 female, 1 nymph, Shirahama, Iriomotejima Is., 12. iv. 1996, K. Yoshizawa.

Non-Japanese material examined. TAIWAN: 2 nymphs, Hungshuichi 500 m, Liukuei-hsiang, Kao-hsiung-hs., 22. xi. 1997, K. Yoshizawa.

Distribution. Ryukyus* (Amami-Ōshima Is., Okinawajima Is., Ishigakijima Is., Iriomotejima Is.); Taiwan*; Hong Kong.

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