



Title	Redescription of <i>Mepleres suzukii</i> (Okamoto), with Comments on Synonymy among <i>Mepleres</i> , <i>Pseudoscottiella</i> and <i>Meniscopsocus</i> (Psocodea : 'Psocoptera' : Pseudocaeciliidae)
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Redescription of *Mepleres suzukii* (Okamoto), with Comments on Synonymy among *Mepleres*, *Pseudoscottiella* and *Meniscopsocus* (Psocodea: 'Psocoptera': Pseudocaeciliidae)*

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Abstract. *Mepleres suzukii* (Okamoto, 1910) (Psocoptera: Pseudocaeciliidae) was redescribed. *Mepleres* Enderlein, 1926 had been incorrectly treated by some authors as an invalid synonym of *Pseudoscottiella* Badonnel, 1946. Thus, *Pseudoscottiella* was appropriately treated here as a junior synonym of *Mepleres*. *Meniscopsocus* Li, 1993 was newly synonymized with *Mepleres*. All new species combinations resulting from these taxonomic treatments were listed. Within *Mepleres*, African and Oriental-Pacific-Australian species groups had been recognized, with *Mep. suzukii* assigned to the latter group. However, monophyly of the latter group could not be justified, whereas the African group was regarded as monophyletic. A key to Japanese *Mepleres* was provided.

Key words: *Mepleres suzukii*, *Meniscopsocus*, *Pseudoscottiella*, synonymy, new combinations, re-description, taxonomy, Pseudocaeciliidae.

Introduction

Okamoto (1910) described *Hemicaecilius suzukii* based on two female specimens collected at Kyoto, Honshu, Japan. Roesler (1944) transferred all species of *Hemicaecilius* except its type species, *Hemicaecilius bogotanus* Enderlein, 1903, to the genus *Mepleres* Enderlein, 1926 of the family Polypsocidae (=superfamily Caeciliusoidea in the present sense). Subsequently, Badonnel (1969) and Vaughan *et al.* (1991) assigned *Mepleres* to the family Pseudocaeciliidae. However, neither authors directly referred to *H. suzukii*.

In a taxonomic study of Japanese Pseudocaeciliidae (Yoshizawa, 1996), I overlooked the above-mentioned taxonomic treatments, and omitted *H. suzukii*. Subsequently, several specimens of the genus *Mepleres* (= *Pseudoscottiella*, see Taxonomy section) were collected which agreed with the original description of *H. suzukii*. Unfortunately, I could not find the type specimens of *H. suzukii* in the collection of Systematic

Entomology at Hokkaido University where several type specimens described by Okamoto (1910) are stored. However, these newly collected specimens possess prominent forewing characters unique to *H. suzukii*, and all other Japanese species collected during my faunal investigations of Japan fail to agree with the original description of *H. suzukii*. Thus, I confidently identify the above-mentioned *Mepleres* specimens as *Mepleres suzukii*.

In this paper, I redescribe *Mep. suzukii* based on 11 female specimens collected from Honshu, Shikoku and Kyushu, Japan, and discuss its taxonomic position. *Pseudoscottiella* is treated here as a junior synonym of *Mepleres*, correcting some confusion in the literature. *Meniscopsocus* Li, 1993 is treated as a new synonym of *Mepleres*. All new species combinations resulting from these taxonomic treatments are listed. A key to species of Japanese *Mepleres* is also given. Methods follow that of Yoshizawa (1995).

Taxonomy

Genus *Mepleres* Enderlein

Mepleres Enderlein, 1926: 61. (Type species: *Mepleres maeandricus* Enderlein, 1926, a junior synonym of *Hemicaecilius nigroguttatus* Karny, 1925.)

Pseudoscottiella Badonnel, 1946: 170. (Type species: *Pseudoscot-*

* Forth part of a taxonomic study on the family Pseudocaeciliidae

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tiella megops Badonnel, 1946.)

Meniscopsocus Li, 1993: 382. n. syn. (Type species: *Meniscopsocus sinicus* Li, 1993.)

See Yoshizawa (1996) for generic diagnosis under *Pseudoscottiella*.

Synonymy. Badonnel (1969) showed that this genus should be assigned to the family Pseudocaeciliidae. Subsequently, Vaughan *et al.* (1991) recognized that the type species of *Mepleres* was congeneric with the pseudocaeciliids of the genus *Pseudoscottiella*. The latter authors recognized the synonymy of *Pseudoscottiella* and *Mepleres* but by inadvertence they incorrectly treated *Mepleres* as an invalid synonym of *Pseudoscottiella*. Following the principle of priority, *Pseudoscottiella* must be treated as an invalid junior synonym of *Mepleres*. This synonymy has also been accepted by Mockford (1999). To avoid future confusion, all species previously described under *Pseudoscottiella* are herein transferred to *Mepleres* and listed as new combinations in Appendix 1.

Li (1993) described a new genus, *Meniscopsocus*,

under the family Trichopsocidae. As he mentioned, type species of the genus, *Meniscopsocus sinicus*, is very similar to species of the genus *Mepleres* (*Pseudoscottiella* in his text). However, based on the following two character states, he considered the species was not a pseudocaeciliid but a trichopsocid: forewing veins with one row of setae; forewing marginal setae not obviously crossing. However, two rows of setae on the forewing veins and the crossing marginal setae are sometimes not obvious in *Mepleres*, as also seen in *Mep. suzukii* (Fig. 1). Additionally, judging from the hypandrium illustrated by Li (1993), *Men. sinicus* has a pair of posterolateral hypandrial processes which is regarded as a synapomorphy of Pseudocaeciliidae and Calopsocidae (Yoshizawa, 1999). Consequently, this species should be placed within the clade composed of Pseudocaeciliidae and Calopsocidae, and is thus apparently excluded from Trichopsocidae. Then, within the pseudocaeciliid-calopsocid clade, *Men. sinicus* must be assigned to the genus *Mepleres* or *Scottiella* Enderlein, 1931, of the family Pseudocaeciliidae based on a two-branched M vein (derived feature). The former

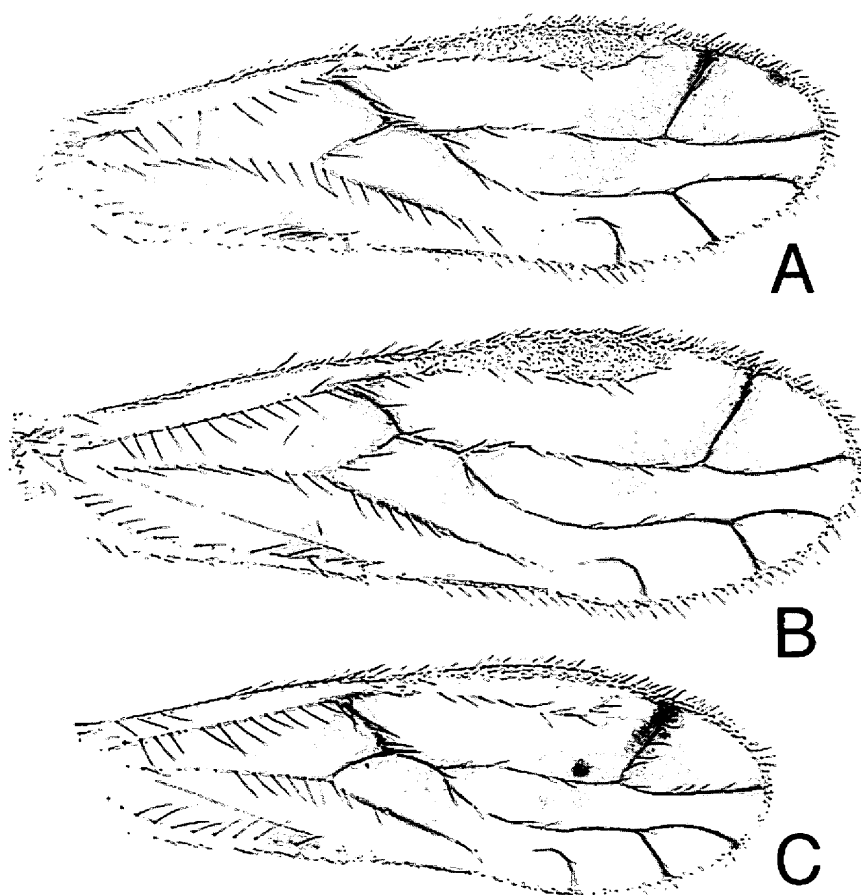


Fig. 1. Forewings of *Mepleres suzukii*. A. specimen from the Imperial Palace, Tokyo; B. from Nogochi, Fukuoka; C. from Nishi-Aburayama, Fukuoka.

genus can be distinguished from the latter by the thickened costal margin in the forewing. This character is not obvious from the forewing illustrated by Li (1993). However, his figure of the female subgenital plate clearly shows that the species has the following two apomorphic conditions, egg guide absent and subgenital plate with two apical setae, which suggest a closer relationship with some species of *Mepleres* (see discussion below). Based on the above evidence, *Men. sinicus* is classified within *Mepleres* and the genus *Meniscopsocus* is treated here as a new junior synonym of *Mepleres*. New species combinations accompanied with this taxonomic treatment are listed in Appendix 2.

Mepleres suzukii (Okamoto)

Hemicaecilius suzukii Okamoto, 1910: 193.

Mepleres suzukii: Roesler, 1944: 124; Smithers, 1967: 50;

Morimoto, 1989: 63; Tomita & Haga, 1991: 38, 49.

Redescription. Female. Head pale yellow in basal color, with long pale setae; coronal suture pale brown; antennal socket narrowly bordered with brown; pale brown band between eye and antennal socket; post-occiput pale brown; postclypeus pale yellow; anteclypeus white; eye black, IO/D=5.8 (Pearman's method); ocelli white. Antenna pale brown; pedicel

and scape darker; flagellomeres setose on anterior surface only. Mouthparts pale brown; 4th segment of maxillary palpus darker. Thorax: Prothorax brown; pronotum paler, with pair of long brown setae. Meso- and metapleuron pale brown, with blackish brown longitudinal stripe. Mesonotum pale yellow, covered with long pale setae, with pale brown markings on posterolateral region; postnotum brown laterally. Metanotum brown; anterior lobe of scutum and middle of scutellum pale yellow; postnotum dark brown. Legs pale yellow; claws black; hind 1st tarsomere with 9–11 ctenidiobothria. Forewing (Fig. 1) hyaline including pterostigma; brown marking from branching of R to branching of Rs+M, usually narrowing along Rs+M; large brown marking on median region of cell r_5 and distal end of cell r_1 extending to basal region of cell r_3 ; small brown marking in distal end of cell cup extending to cell cua; paler longitudinal marking each in proximal regions of cells br and bcu; veins brown to blackish brown except CuA_2 pale; areola postica short and rather high. Hindwing hyaline, veins pale brown. Abdomen pale yellow, each segment with pale brown transverse band dorsally. Genitalia pale brown: Epiproct (Fig. 2A) trapezoidal; anterior margin shallowly incised by membranous region medially; pair of very long setae medially with shorter lateral setae; distal margin with dense, short but rather thick setae. Paraproct (Fig. 2B) with

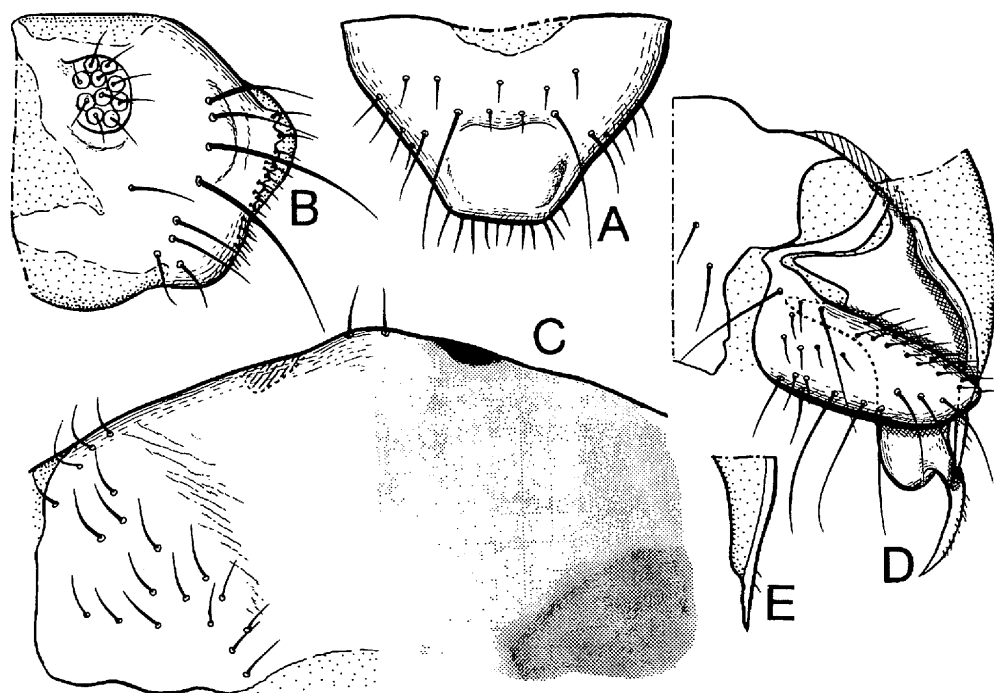


Fig. 2. Female genitalia of *Mepleres suzukii*. A. epiproct, dorsal view; B. left paraproct, posterolateral view; C. subgenital plate, ventral view, showing structure (left) and coloration (right); D. right gonapophyses, ventrolateral view; E. ventral valve of gonapophyses, lateral view.

unsclerotized lobe posterointernally; anterior margin incised by membranous region; dorsal and ventral margins unsclerotized basally; trichobothrial field with 10 trichobothria; distal margin with densely short setae in ventral half; lateral surface with pair of very long setae medially. Subgenital plate (Fig. 2C) weakly sclerotized, distally rounded, egg guide reduced, with 1 or 2 apical setae, anterolateral region setose, other regions bare. Gonapophyses (Fig. 2D, E): Ventral valve with weakly developed dorsal lobe, apical process with few fine setae ventrally; dorsal valve with well developed apical lobe; subapical process long and curved, with row of fine setae ventrally; external valve narrow, transversally long, almost parallel sided, with long setae; anterior margin with 2 rows of short setae internally.

Length (mm). Body 2.0–2.4; forewing 2.1–2.5; hindwing 1.5–1.9; first flagellomere 0.40–0.47; second flagellomere 0.19–0.22; hind femur 0.38–0.45; hind tibia 0.60–0.73; hind first tarsomere 0.16–0.19; hind second tarsomere 0.09–0.10.

Male. Unknown.

Material examined (stored in author's collection unless specified). [HONSHU] 1 female, Imperial Palace, Tokyo Met., 21. x. 1998, K. Yoshizawa (National Science Museum, Tokyo); 1 female, Godaihata, Kimitsu City, Chiba Pref., 18–24. xii. 1996, M. Nitta *et al.* (Malaise Trap: MT); 2 females, Chiiwa, Horai Town, Aichi Pref., 21. vi. 1997, K. Yoshizawa; 1 female, Yawata Shrine, Asahi (400 m alt.), Aichi Pref., 18–28. vii. 1998, K. Yamagishi (MT); 1 female, same locality, 12–21. viii. 1998, K. Yamagishi (MT); [SHIKOKU] 1 female, Sameura Dam, Kochi Pref. 17. vi. 1997, K. Yoshizawa; [KYUSHU] 1 female, Nishi-Aburayama, Fukuoka City, Fukuoka Pref., 16. vii. 1999, K. Yoshizawa; 2 females, Nogochi, Fukuoka City, Fukuoka Pref., 7. vi. 1997, K. Yoshizawa; 1 female, same locality, 16. vii. 1999, K. Yoshizawa.

Distribution. Japan (Honshu, Shikoku, Kyushu).

Remarks. The above examined specimens differ from the original description of *Hemicaecilius suzukii* in the following points: large distal marking of the forewing always extends to the proximal region of cell r_3 , whereas in the original description and illustration cell r_3 lacks markings; setae of the apical margins of fore- and hindwings partly crossing whereas not crossing in the original description. Similar disagreements were observed between the original description and type specimens of *Kolbea kagoshimensis* Okamoto, 1910 (Yoshizawa, 1995). Additionally, as shown in Fig. 1, forewing markings of the present series show some variation in size and shape, and the large distal

forewing marking is sometimes paler in cell r_3 than in cells r_1 and r_5 . Thus, I consider that the above-mentioned differences between the original description and the present material are minor intraspecific variations and/or caused by inaccurate original drawings.

In contrast, all other features, including other forewing markings and venation, completely agree with the original description. Especially, the unique and characteristic pattern of forewing markings and venation (e. g., two-branched vein M, short and high areola postica, presence of longitudinal marking each in cells br and bcu, marking around $Rs+M$, large marking in cells r_1 and r_5). On the basis of these features, I have confidently identified the above specimens as *Mepleres suzukii* (Okamoto, 1910).

Key to Species of Japanese *Mepleres*

The addition of the present species does not alter the key to genera of the family Pseudocaeciliidae given by Yoshizawa (1996), but read *Pseudoscottiella* as *Mepleres*. The following key is provided to distinguish the two known Japanese species of *Mepleres*.

1. Forewing with faint brown markings. External valve constricted in middle. Distributed in the Yaeyama group of the Ryukyu Islands.
 *Mep. sakishimensis* (Yoshizawa, 1996)
- Forewing with distinct brown markings. External valve not constricted in middle. Distributed in Honshu, Shikoku and Kyushu.
 *Mep. suzukii* (Okamoto, 1910)

Taxonomic Position of *Hemicaecilius suzukii* and Classification within the Genus *Mepleres*

By the present study, I confirm that *Hemicaecilius suzukii* must be assigned to the family Pseudocaeciliidae based on the following apomorphic character states: crossing marginal setae of the forewing and apical lobe of the ventral valve of the gonapophyses present. Additionally, the two-branched vein M and thickened costal margin of the forewing show that the species should be classified in the genus *Mepleres*.

As some authors mentioned, *Mepleres* (= *Pseudoscottiella* in their texts) can be divided into two species groups, African and Oriental-Pacific-Australian groups (Thornton, 1981; Thornton *et al.*, 1972; New, 1974; Yoshizawa, 1996, 1997). Recently, Yoshizawa (1997) showed that some Oriental species were apparently closely related to the African group. The Oriental-Pacific-Australian group has been characterized by

the presence of rod-like sclerites on the endophallus and presence of apical setae on the egg guide. On the basis of the latter character state, *Mep. suzukii* can be assigned to the Oriental-Pacific-Australian group. Among the Oriental-Pacific-Australian species, *Mep. suzukii* shares the following unique character states with *Mep. sakishimensis* (Yoshizawa, 1996) (Japan), *Mep. sinicus* (Li, 1993) (China) and *Mep. suella* (Thornton, 1984) (Indonesia): egg guide absent and subgenital plate with rounded posterior margin; subgenital plate with at most two apical setae. These character states are apomorphic and support the monophyly of this subgroup.

As New (1974) and Yoshizawa (1996) mentioned, differences between the African and Oriental-Pacific-Australian groups are clear and considerable, and may be regarded as generic. However, all character states that define the Oriental-Pacific-Australian group appear to be plesiomorphic and monophyly of this group cannot be justified. Therefore, the term Oriental-Pacific-Australian group should be used only for convenience. In contrast, the African group is defined by some autapomorphies, such as a pair of dorsal processes on the male clunium, lateral sclerites on the hypandrium, absence of rod-like sclerites on the endophallus, and less developed and bare egg guide of the female subgenital plate. Thus, this group can be considered as monophyletic.

As discussed under the generic synonymy, *Meniscopsocus* Li, 1993 is here synonymized with *Mepleres*. The grouping proposed by Li (1993) cannot be justified, not only as an independent genus but also as a subgroup within *Mepleres* because no synapomorphies are shared by all members of *Meniscopsocus*. *Meniscopsocus* could be maintained as a valid subgenus for the above-mentioned monophyletic subgroup composed of *Mep. sakishimensis*, *Mep. sinicus*, *Mep. suella* and *Mep. suzukii*, but this would lead to an unacceptable proliferation of additional subgeneric names.

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Appendix 1

The following species up to now assigned to the genus *Pseudoscottiella* are transferred here to *Mepleres* as **new combinations**. Gender of *Mepleres* is considered as masculine whereas *Pseudoscottiella* is feminine. Therefore, many mandatory changes of specific names are involved.

Mep. alettae (Smithers, 1996), *Mep. bifasciatus* (Thornton, Lee & Chui, 1972), *Mep. circularis* (Thornton, Lee & Chui, 1972), *Mep. clarkei* (Thornton, Lee & Chui, 1972), *Mep. cornutus* (Lee & New, 1992), *Mep. fuscistigma* (Thornton, Lee & Chui, 1972), *Mep. gressitti* (Thornton, Lee & Chui, 1972), *Mep. indicus* (Lee & New, 1992), *Mep. insularis* (Baz, 1990), *Mep. lomus* (Thornton, 1981), *Mep. megops* (Badonnel, 1946), *Mep. morimotoi* (Yoshizawa, 1997), *Mep. pallidus* (Thornton, Lee & Chui, 1972), *Mep. papillosus*

(Schmidt & Thornton, 1993), *Mep. pisiformis* (Lee & New, 1992), *Mep. posticus* (Thornton, Lee & Chui, 1972), *Mep. pseudornatus* (Thornton, Lee & Chui, 1972), *Mep. radialis* (Thornton, 1984), *Mep. raphalis* (Lee & New, 1992), *Mep. sakishimensis* (Yoshizawa, 1996), *Mep. similis* (Lee & New, 1992), *Mep. solenocerus* (Lee & New, 1992), *Mep. urbanus* (Vaughan, Thornton & New, 1991), *Mep. venusae* (Baz, 1990), *Mep. vilus* (Lee & New, 1992), *Mep. yenoides* (Schmidt & Thornton, 1993)

Appendix 2

The following species were transferred from *Pseudoscottiella* to *Meniscopsocus* by Li (1993). As *Meniscopsocus* was synonymized with *Mepleres* in the present paper, they are transferred here to the latter genus as **new combinations**.

Mep. avisonus (Turner, 1975), *Mep. crenulatus* (New, 1974), *Mep. decolor* (Badonnel, 1955), *Mep. fasciatus* (Smithers & Thornton, 1975), *Mep. forcipiformus* (Turner & Cheke, 1983), *Mep. hollowayi* (Smithers & Thornton, 1975), *Mep. hyalinus* (Badonnel, 1955), *Mep. immaculatus* (Badonnel, 1955), *Mep. lunai* (Badonnel, 1969), *Mep. maculatus* (Broadhead & Richards, 1982), *Mep. pictus* (Badonnel, 1977), *Mep. rotundatus* (New, 1974), *Mep. sinicus* (Li, 1993), *Mep. suella* (Thornton, 1984), *Mep. tanei* (Smithers, 1977), *Mep. tuberculatus* (Badonnel, 1955), *Mep. watti* (Smithers, 1973), *Mep. yeni* (New, 1974)

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