Евразиатский энтомол. журнал 21(Приложение 1): 42–47
doi 10.15298/euroasentj.21.Spl.1.05

A new species of the genus *Cladopelma* Kieffer from Japan (Diptera, Chironomidae)

Новый вид рода *Cladopelma* Kieffer из Японии (Diptera, Chironomidae)

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Key words: Diptera, Chironomidae, Chironominae, *Cladopelma,* new species, Japan.
Ключевые слова: Diptera, Chironomidae, Chironominae, *Cladopelma*, новый вид, Япония.

Abstract. *Cladopelma acutum* **sp.n.** is described and figured based on two males and two females collected at light in Okayama City, Okayama Prefecture, Honshu, Japan. The species is closely related to *C. costum* Yan, Jin et Wang, 2008 and *C. inflexum* (Freeman, 1957) in some aspects, but distinguished from these two species by the transverse anal tergite band lacking the posteriorly elongating median apodeme, and the lunate gonostylus which has a small membranous area on the junction with gonocoxite.

Резюме. Приведено иллюстрированное описание самцов и самок *Cladopelma acutum* **sp.n.,** пойманных на свет в городе Окаяма, префектуры Окаяма, о-ва Хонсю, Япония. Этот вид близок *C. costum* Yan, Jin et Wang, 2008 и *C. inflexum* (Freeman, 1957), но отличается от этих двух видов поперечной полосой анального тергита без удлиняющейся кзади срединной аподемы и гоностилем в виде полумесяца, который имеет небольшой перепончатый участок в месте соединения с гонококситом.

Introduction

Recently we could get an opportunity to examine the curious chironomid specimens belonging to the *Harnischia*-complex of the tribe Chironomini, the subfamily Chironominae collected at light in Okayama City, Okayama prefecture, Honshu, Japan. Although the morphological features are quite different from the typical species in general appearance, the male specimens are identified to be a member of the genus *Cladopelma* Kieffer, 1921 according to the diagnosis shown by Sæther [1977a] and Cranston et al. [1989]. Regarding the female characters of the genus *Cladopelma*, Sæther [1977b] stated as follows: Gca VIII (Gonocoxapodeme VIII) rounded caudally, joined mesally; Gc IX (gonocoxite IX, laterosternite) normal, with one seta; Segment X with 1 or 2 setae on each side. As described below, these female morphological features shown by Sæther [1977b] does not apply to the present female specimens. However we reached the conclusion that these male and female specimens are congeneric and conspecific because to share the characteristic morphological feature of the antepronotum and the legs with the same color pattern.

To date, two species, *Cladopelm viridulum* (Linnaeus, 1767) and *C. edwardsi* (Kruseman, 1933), have been known from Japan [Yamamoto, 1997; Kobayashi, Endo, 2008; Yan, Jin, Wang, 2008; Yamamoto, Yamamoto, 2014]. The newly obtained specimens are closely related to following two species, *Cladopelma costum* Yam et al., 2008 and *C. inflexum* (Freeman, 1957), which are heterogeneous among the almost all members of the genus *Cladopelma* in the hypopigeal features. The former species is characterized in having the gonostylus which is strongly swollen medially and tapering towards apex. On the other hand, the latter species is separable from other *Cldopelma* species by having a rather long epandrium, comparatively slender and simple anal point, and the gonostylus which is distinctively rounded apically. Conversely, these two species each shares the bare dorsal appendage in common. The present specimens each is distinguishable from abovementioned two known species by having the following combination of characters; transverse anal tergite band lacking the posteriorly elongating median apodeme; lunate gonostylus which has a small membranous area on the junction with gonocoxite; dorsal appendage covered with microtrichia. Here, we describe these specimens to be a new species belonging to the genus *Cladopelma*.

Material and Methods

Description of male and female coloration were based on the materials preserved in ethanol. After being mac-

erated in 5% KOH solution, the specimens were mounted temporarily on depression microscope slide in glycerol for understanding the structures three-dimensionally. The specimens used for description and illustrations finally were mounted permanently on slides in Euparal.

The terminology and measurements mainly follow Sæther [1980]. The epandrium, hypandrium, dorsal appendage and ventral appendage are each used for IX T, IX S, superior volsella and inferior volsella in the male hypopygial structure [Tokunaga 1940; Spies et al., 2009, Yamamoto, 2017], and laterosternite and egg-guide [Wensler, Rempel, 1962] are used for gonocoxite IX and the lobe of gonapophysis VIII of Sæther [1977] in the female genitalia.

Holotype and paratypes are deposited in the collection of the Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University, Fukuoka, Japan (BLKU).

Description

Cladopelma acutum Yamamoto et Yamamoto, **sp.n.**

Figs 1–26.

http://zoobank.org/NomenclaturalActs/1E3C50A5-C073-42AC-BC17-35E7878E7ACC

Material. Holotype: adult male, slide mounted in Euparal, Japan, Honshu, Okayama prefecture, Okayama City, Takebe, Asahigawa Dam. 18.IX.2021, leg. K. Ito. Paratypes: 1 male, 2 females, as in holotype.

Description. *Adult male* (n = 2). Body length 4.4–4.8 mm. Wing 1.9–2.1 mm long, 0.5–0.6 mm wide; wing length / wing width 3.43–3.55.

Coloration. Head including clypeus, maxillary palpus and labella yellowish brown, antennal pedicel and flagellomeres brown. Thorax predominantly yellow except the pale orange yellow median and lateral scutal vittae, posterior end of postnotum and ventral area of preepsternum II. Legs including all coxae, all trochanters, all femora, 1st tarsomeres of middle and hind legs yellowish white excepting the yellowish brown apical portions; tibia and 1st to 5th tarsomeres of foreleg, 2nd to 5th tarsomeres of middle and hind legs brown. Wing hyaline, thinly tinged with brown, all veins brown. Halter yellowish white. Abdomen predominantly yellow, 2nd to 6th terga each with a thin brown band along posterior margin, 2nd and 3rd of which are interrupted at middle; genitalia dark brown.

Head (Figs 1–6). AR 1.88–1.95; first flagellomere with few tiny sensory hairs on its apical portion; 2nd–4th flagellomeres each with 1–2 pairs of long sensilla basiconica on its distal portion, apical portion of ultimate flagellomere with 10 sensilla basiconica. Frontal tubercle minute, 4 µm long, 4 µm wide. Palpomere lengths (in µm): 48–52, 88–96, 152–184, 132–136, 224; with 1, 9–11, 17–18, 11–12, 10–12 setae, respectively. Temporals 19–21, multi-serial at vertex area. Clypeus with 13 setae. Prementum with 1 seta. Cornua well developed, long, and labial lonchus and labrum as in Figs 5–6.

Thorax (Figs 7–9). Lateral anteprontals 4–7; dorsocentrals 8–9, umiserial; acrostichals 10–12, biserial; prealars 4–5, uniserial; supralar 1; scutellars 14–15, biserial.

Wing (Fig. 10). VR 1.13–1.16. R with 19–20 setae, R_1 with 14–15 setae and apical 1/2 of R_{4+5} with 11–13 setae. Brachiolum with 1–2 median setae, with 11–12 basal, 12 subapical sensilla campaniformia. Squama 10–11 uniserially arranged setae.

Legs (Figs 14–19). Fore, middle and hind coxae with 3–4, 5–7, 3–4 marginal setae, respectively. Middle coxa with 5 minute sensory hairs on middle anteriorly. Fore, middle and hind trochanters with 10, 4, 7 marginal setae, respectively. First to 3rd tarsomeres of middle leg and first to 2nd tatsomeres of hind legs with moderately stout and straight spur-like setae [pseudospurs] which are arranged in a row along the ventral margins, respectively; subapical portion of 4th tarsomesere of middle leg, 3rd and 4th tarsomeres of hind leg each with a few straight spurs, respectively. Length (in µm) and proportions of leg segments as in Table 1.

Hypopygium (Figs 11–13). Epandrium without median seta. Hypandrium long, with 2–5 setae dorsolaterally. Anal point comparatively long and slender in dorsal aspect, slender and acutely pointed in lateral aspect. Dorsal appendage short, bearing two setae and covered with microtrichia. Inner margin of gonocoxite with 7–9 setae.

Adult female (n = 2). Body length 3.6–3.9 mm. Wing 2.1–2.3 mm long; 0.7–0.8 mm wide; wing length / wing width 2.97–3.00.

Coloration. Nearly the same as in male; abdomen entirely yellow. Antennal flagellum and scape yellowish white, slightly tinged with brown; last flagellomere darkened.

Head (Figs 20–22). Temporals 22–24, multi serial at vertex area. Antennal flagellomere lengths [in µm]: 124, 80, 80, 84, 180; with 8–10, 5, 5, 5, 0 setae, respectively; ultimate flagellomere with 18 sensilla basiconica. Frontl tubercle minute, 2–8 µm long, 4 µm wide. Palpomere lengths [in µm]: 44–48, 84–100,176–192, 120, 152; palpomerew with 1, 8–9, 17–20, 10, 11 setae, respectively. Clypeus with 15–16 setae. Prementum with 1 seta. Cornua well developed, long.

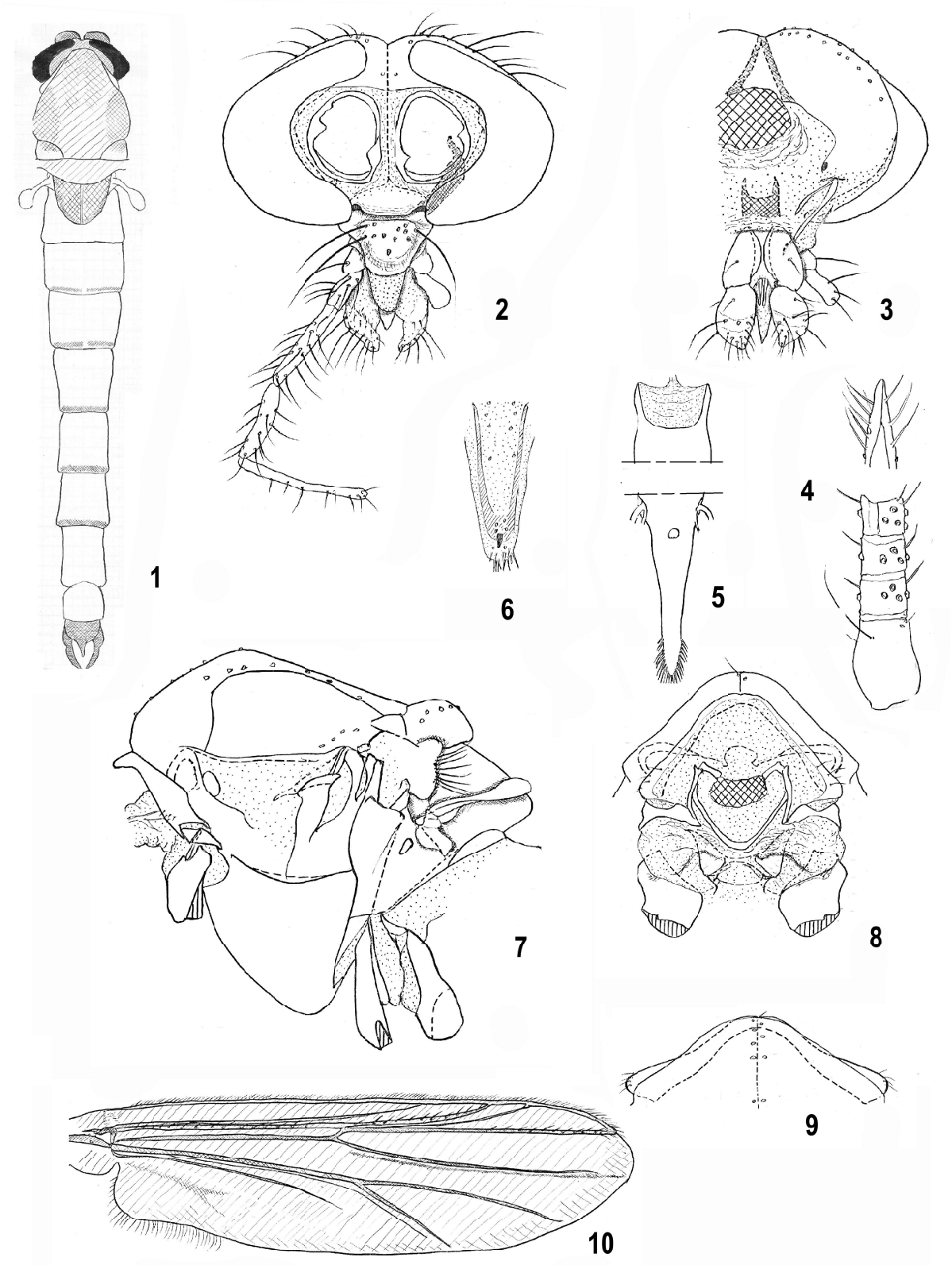
Thorax. Lateral antepronotals 5; dorsocentrals 9–12, uniserial; acrostichals 10–11, biserial; prealars 4, uniserial; supraalar 1; scutellars 14–16, biserial.

Wing. VR 1.23–1.27. R, R_1 and apical 1/2 of R_{4+5} with 23–27, 18–21, 23–30 setae, respectively. Brachiolum with 2 median setae, with 12 basal, 11–13 subapical sensilla campaniformia. Squama 18–19 uniserially arranged setae.

Legs. Fore, middle and hind coxae with 5, 5–6, 5 marginal setae, respectively. Middle coxa with 5 minute sensory hairs on middle anteriorly. Fore, middle and hind trochanters with 10–11, 8–9, 7–9 marginal setae, respectively. First to 3rd tarsomeres of middle leg and first to 2nd tatsomeres of hind legs with moderately stout and straight spur-like setae [pseu-

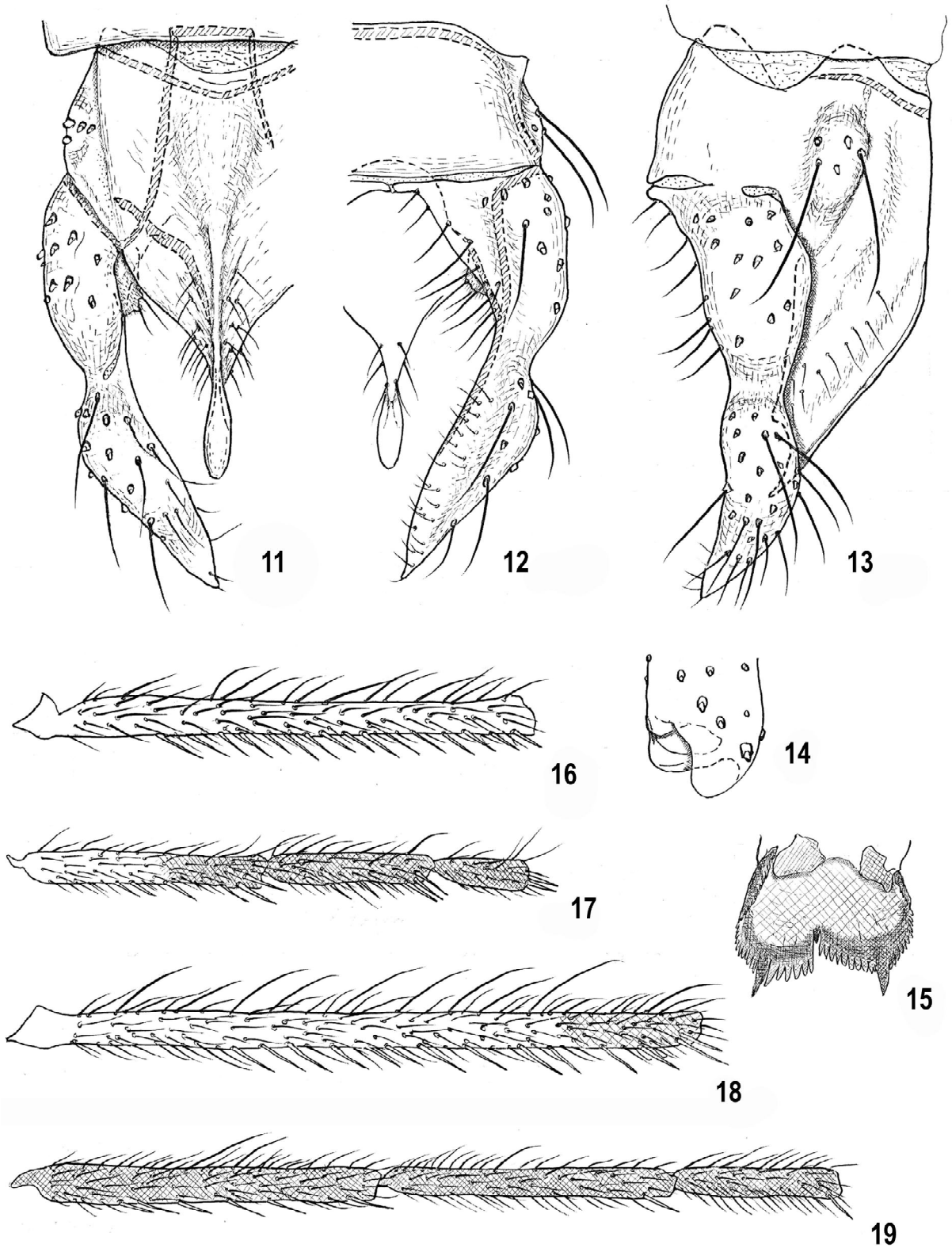
Table 1. Lengths (in µm) and proportions of leg segments of *Cldopelma acutum* sp.n., male (n = 2)
Таблица 1. Длина члеников ног (мкм) и их индексы самца *Cldopelma acutum* sp.n. (n = 2)

P	f	t	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV
P_1	1080–1120	760–780	1340–1360	690–720	500	400–420	200	1.74–1.76	1.77–1.78	1.37–140
P_2	940–1000	800–860	520–560	280	180–200	120	100	0,65	3.23–3.56	3.32–3.35
P_3	1060–1120	1080–1120	760–780	400	320–340	210–220	120–130	0,70	2.71–2.82	2.82–2.87



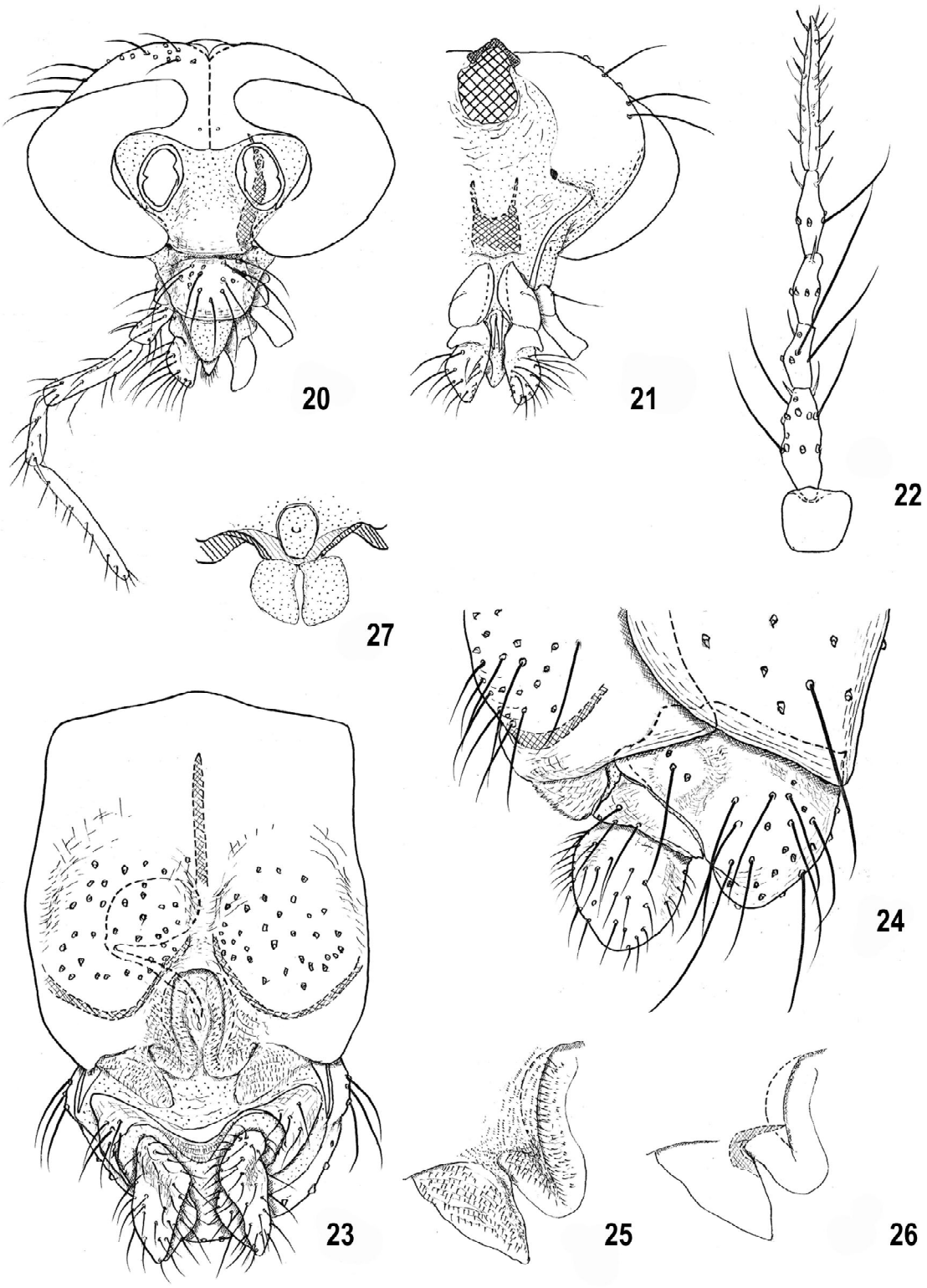
Figs 1–10. *Cladopelma acutum* sp.n., male (holotype). 1 — body, dorsal view; 2 — head, frontal view; 3 — head, caudal view; 4 — antenna; 5 — labial lonchus, frontal view; 6 — posterior surface of epipharynx; 7 — thorax, lateral view; 8 — thorax, anterior view; 9 — thorax, anterior portion of scutum and antepronotum, dorsal view; 10 — wing.

Рис. 1–10. Имаго Самец *Cladopelma acutum* sp.n. (голотип). 1 — тело, вид сверху; 2 — голова, вид спереди; 3 — голова, вид сзаид; 4 — антенна; 5 — лабиальные лонхусы, вид спереди; 6 — задняя поверхность эпифаринкса; 7 — грудь, вид сбоку; 8 — грудь, вид спереди; 9 — грудь, передняя часть скутума и переднеспинки, вид сверху; 10 — крыло.



Figs 11–19. *Cladopelma acutum* sp.n., male (holotype). 11–13 — hypopygium, 14–19 — legs. 11 — dorsal view; 12 — ventral view; 13 — lateral view; 14 — tip of fore tibia; 15 — tibial comb of mid leg; 16–17 — 1st to 4th tarsomeres of mid leg; 18–19 — 1st to 4th tarsomeres of hind leg.

Рис. 11–19. Имаго самец *Cladopelma acutum* sp.n. (голотип). 11–13 — гипопигий, 14–19 — ноги. 11 — вид сверху; 12 — вид снизу; 13 — вид сбоку; 14 — вершина передней голени; 15 — гребень голени средней ноги; 16–17 — 1–4 членики лапки средней ноги; 18–19 — 1–4 членики лапки задней ноги.



Figs 20–27. *Cladopelma acutum* sp.n., female. 20 — head, frontal view; 21 — head, caudal view; 22 — antenna; 23 — genitalia, ventral view; 24 — genitalia, lateral view; 25 — egg-guide, ventral view; 26 — egg-guide with apodeme lobe, ventral view; 27 — labia, ventral view.

Рис. 20–27. Имаго самка *Cladopelma acutum* sp.n.. 20 — голова, вид спереди; 21 — голова, вид сзади; 22 — антенна; 23 — гениталии, вид снизу; 24 — гениталии, вид сбоку; 25 — яйцевод, вид снизу; 26 — яйцевод с лопастью аподемы, вид снизу; 27 — губа, вид снизу.

Table 2. Lengths (in μm) and proportions of leg segments of *Cldopelma acutum* sp.n., female (n = 2)
Таблица 2. Длина члеников ног (мкм) и их индексы самки *Cldopelma acutum* sp.n. (n = 2)

P	f	t	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV
P_1	1080–1240	740–880	1400	660	500	420	220	1,89	1,78	1,3
P_2	960–1040	840–940	540–600	260–280	180–200	120–130	100	0,64	3.55–3.63	3.30–3.33
P_3	1080–1200	1080–1180	740–800	360–400	320–340	200–220	140	0,7	2.84–2.89	2.92–2.98

dospurs] which are arranged in a row along the ventral margins, respectively; subapical portion of 4th tarsomesere of middle leg and 3rd to 4th tarsomeres of hind leg with a few straight spurs.

Length (in μm) and proportions of legs segments as in Table 2.

Genitalia (Figs 23–26). Apodeme of sternum VIII well developed, rounded caudally, not jointed mesally. Ventrolateral lobe of egg-guide very large, nearly as large as dorsomesal lobe, weakly serrated on its inner margin. Dorsomesal lobe of egg-guide well developed, strongly concave mesially. Labium well developed, very large, membranous, and without microtrichia. Apodeme lobe slender, as in Fig. 26. Seminal capsule spherical, spermathecal duct nearly as long as the diameter of seminal capsule (Fig. 23). Laterosternite broad, contacted with tergite IX, with 3–5 setae. Segment X distinctly separated from tergite IX. Cercus comparatively large, rectangular. Postgenital plate relatively small, triangular.

Diagnosis. The new species can be separated from other known species in the genus by the characteristic color pattern on legs, the dorsal portion of antepronotum strongly produced anteriorly in lateral aspect and the scutal tubercle absent. The species is closely related to *C. costum* Yan, Jin et Wang, 2008 and *C. inflexum* (Freeman, 1957) in many aspects, but distinguished from these two species by the transverse anal tergite band lacking the posteriorly elongating median apodeme, the dorsal appendage covered with microtrichia, and the lunate gonostylus which has a small membranous area on the junction with gonocoxite.

Диагноз. Новый вид можно отличить от других известных видов рода по характерному цветовому рисунку на ногах, дорсальной части переднеспинки, сильно выступающей антеролатерально, и по отсутствующему скутальному бугорку. Этот вид близок к *C. costum* Yan, Jin et Wang, 2008 и *C. inflexum* (Freeman, 1957), но отличается от них строением поперечной аподемы (не выпуклая), дорсальный придаток покрыт микротрихиями, а гоностиль имеет небольшой мембранозный участок в месте соединения с гонококситом.

Etymology. From Latin *acutus*, acute, referring to the gonostylus which is pointed apically.

Acknowledgements

We would like to express our cordial thank to Mr. K. Ito of Osaka Prefecture for offering us invaluable specimens.

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Поступила в редакцию 26.5.2022