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Chironomids of the Diamesinae (Diptera, Chironomidae) from Japan
IV. *Pagastia* OLIVER, 1959[1)]

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Abstract The neotype of *Pagastia lanceolata* (TOKUNAGA) and a newly recorded species from Japan, *P. angarensis* (LINEVICH), are described for males, pupae and larvae from Honshu, Hokkaido and Russian Far East. Keys for separating of *Pagastia* from similar genera and for Japanese species are given.

Key words: Chironomidae; Diamesinae; *Pagastia*; taxonomy; Japan

Introduction

The revisions of Japanese Diamesinae were mainly carry out by TOKUNAGA (1936, 1937 a–b, 1939, 1964 a–b). At that time *Pseudodiamesa* GOETGHEBUER and *Pagastia* OLIVER were not yet established. TOKUNAGA described some new species under the name *Syndiamesa* KIEFFER. Later, SASA (1989) transfered *Syndiamesa nivis* (TOKUNAGA) and *S. crassipilosa* (TOKUNAGA) to the genus *Pseudodiamesa*. He did not revise all the TOKUNAGA's species of *Syndiamesa* because the holotypes and paratypes of some species were lost. By personal information from Dr. SASAKAWA (Kyoto Prefectural University), the holotypes of *S. lanceolata* TOKUNAGA and *S. yosiii* TOKUNAGA were lost. For *S. nivis* and *S. crassipilosa* are known females only.

I have analyzed the materials of TOKUNAGA and SASA collections and collected additional specimens of males, pupae and larvae in Hokkaido and Honshu in spring times of 1990 and 1992. Also was collected the male of "*S.*" *lanceolata* by Dr. Y. TAKEMON (University of Osaka Prefecture) at type locality for describing neotype.

The author adduces the key for separating *Pagastia* from *Pseudodiamesa* and *Hesperodiamesa* SUBLETTE, descriptions of the neotype of *Pagastia lanceolata* (TOKUNAGA) and a newly recorded species from Japan, *P. angarensis* (LINEVICH), with distribution in the Far East.

The terminology follows SAETHER (1980). For some structures of hypopygium, namely for gonocoxal lobes and aedeagal lobes, were used terms of HANSEN & COOK (1976). Material was fixed by 70% ethanol.

1) Parts I, II and III of this investigation were published in Bull. Natn. Sci. Mus., Ser. A, Tokyo at 1993, 19 (3) and 1994, 20 (1–2).

Key for separating of *Pagastia* OLIVER from similar genera

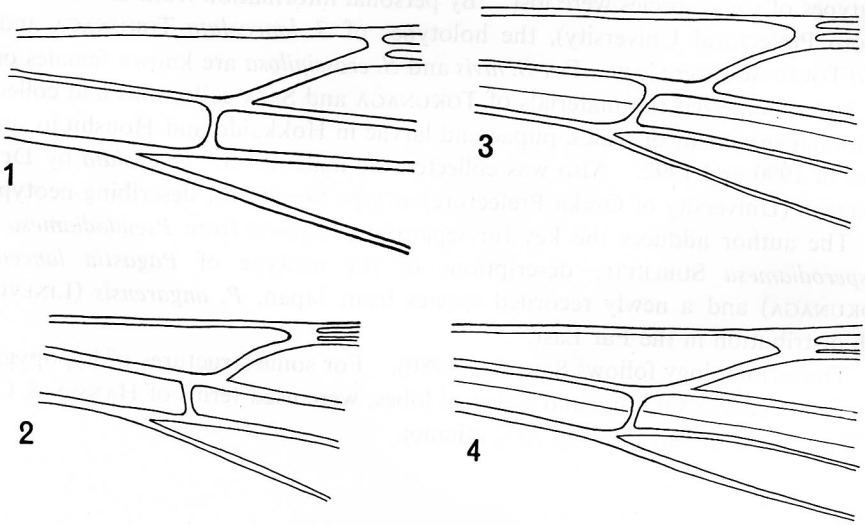
Males

1. Antepronotum with only lateral antepronotals. MCu beyond FCu (Fig. 1–2) 2
— Antepronotum with both median and lateral antepronotals. MCu almost at FCu (Figs. 3–4) 3
2. LR greater than 5.6 ..... *Pseudodiamesa* (s. str.) GOETGHEBUER
— LR less than 5.6 ..... *Pseudodiamesa* (*Pachydiamesa*) OLIVER
3. Eyes pubescent. One or two aedeagal lobes present (Fig. 11) ..... *Pagastia* OLIVER
— Eyes hairy. Aedeagal lobes reduced ..... *Hesperodiamesa* SUBLETTE

Genus *Pagastia* OLIVER

OLIVER, 1959, 49 (Type species: *Pagastia orthogonia* Oliver, 1959); 1983, 119; 1986, 123; 1989, 136; OLIVER & ROUSSELL, 1982, 849; MAKARCHENKO, 1985, 45.

Male. Body length 5–7 mm. Generally color dark brown and black. Eyes pubescent, strongly extended dorsomedially. Clypeus with setae. Coronals, verticals, preoculars and postorbitals present. Antenna with 13 plumose flagellomeres; AR=1.4–4.2. Antepronotum with both median and lateral setae; antepronotal lobes separated V-shaped notch. Acrostichals present; dorsocentrals multiserial; prealars in two groups, extending anterior to level of median anepisternum II. Wing



Figs. 1–4. Radial median sections of wing. — 1, *Pseudodiamesa* (s. str.) *nivosa*; 2, *Ps.* (*Pachydiamesa*) *arctica*; 3, *Pagastia lanceolata*; 4, *Hesperodiamesa sequex*.

with microtrichia, sometimes macrotrichia present on apex. MCu almost at FCu; R_{4+5} with or without setae. Front and hind legs with long setae; ta_4 cylindrical, equal or slightly longer than ta_5. Hypopygium with anal point which sometimes has an apical peg; phallapodeme with one or two lateral lobes. Gonocoxite with well developed basal plate. Megaseta of gonostylus short.

Pupa. Length 6–9 mm. Color brown or dark brown. Exuviae brownish-yellow, or yellow. Thorax weakly smooth. Dorsocentral setae simple, thoracal horn absent; middle precorneal seta (Pc_2) longest. Tergites II–VIII with median extensive shagreen. D_2 and D_4 on some tergites forked; L_4 and often L_2 on segments II–VIII with some branches. Anal lobes with simple or branched median setae. Each lobe with terminal, tooth-like ventral tubercle and three anal macrosetae.

Larva of 4th instar. Length 7–12 mm. Head light yellow, sometimes with dark spots. Antenna yellow, with 5 segments, 2 ring organs on basal 1/3 of first segment. Lauterborn organs as long as segment 3; style as long as combined length of segments 3 and 4. Labral setae simple, S_I seta-like to lamelliform. Pecten epipharyngis consisting of 3 narrow, pointed scales. Five pairs of simple chaetulae laterales present, median pair broad. Premandible brownish-yellow, with 6–10 teeth; simple lateral spine present. Mandible with basal part brownish-yellow, in distal black apically; apical tooth longer or shorter than combined width of 4 inner teeth; seta interna with 4–5 or 14–20 branches. Median area without teeth; 5–8 pairs of lateral teeth; outer lateral tooth sometimes very small. Ventromental plates ventrally fused beneath median area of dorso-mentum, extending laterally anteriorly to mental teeth. Procercus slightly longer than width, strongly sclerotized, with posterobasal projection.

Pagastia lanceolata (TOKUNAGA)

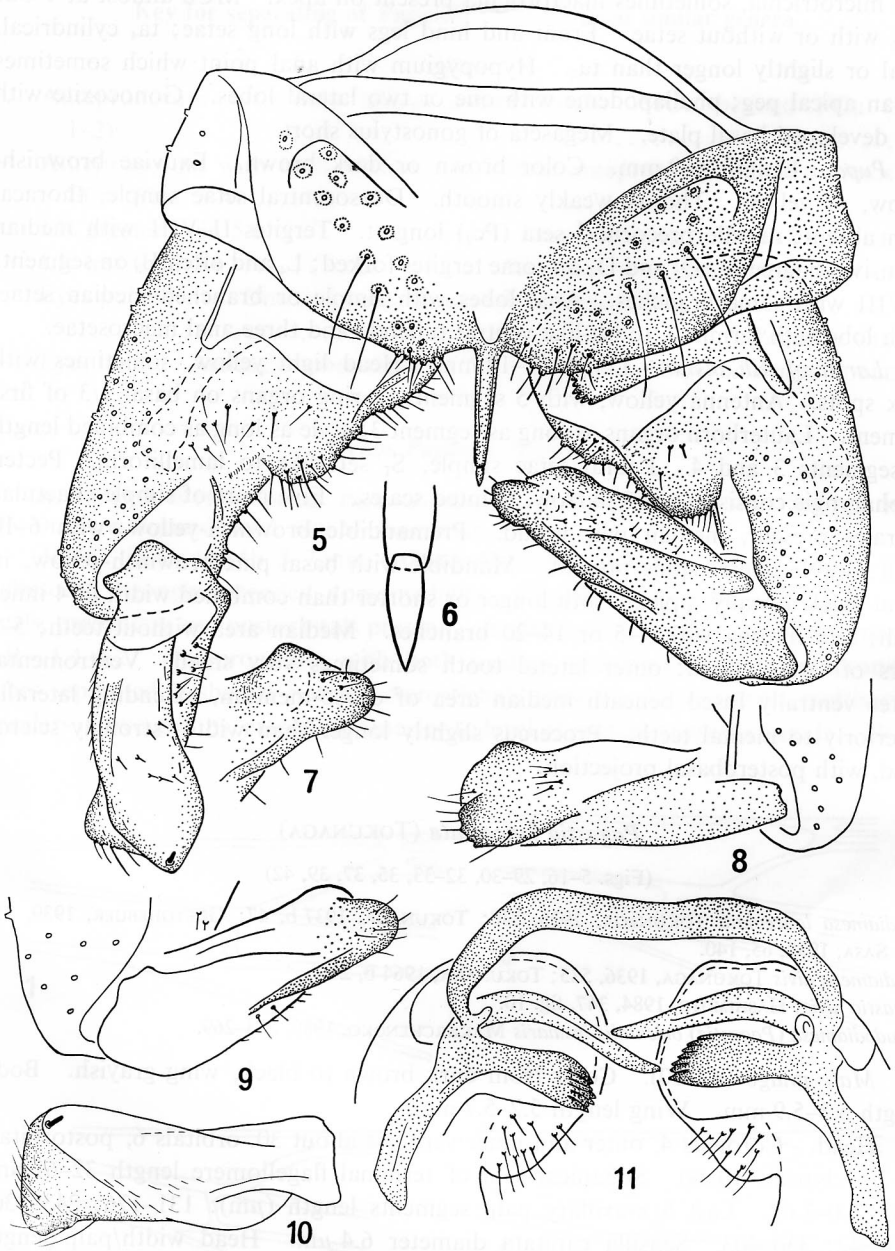
(Figs. 5–16, 29–30, 32–33, 35, 37, 39, 42)

Syndiamesa lanceolata TOKUNAGA, 1936, 530; TOKUNAGA, 1937 b, 47; GOETGHEBUER, 1939, 25; SASA, 1989, 65, 140.
Syndiamesa nivis TOKUNAGA, 1936, 535; TOKUNAGA, 1964 b, 21.
Pagastia nivis: HASHIMOTO, 1984, 347, fig. 10.
Pseudodiamesa (*Pagastia*) *orientalis insularis* MAKARCHENOKO, 1989, 268–269.

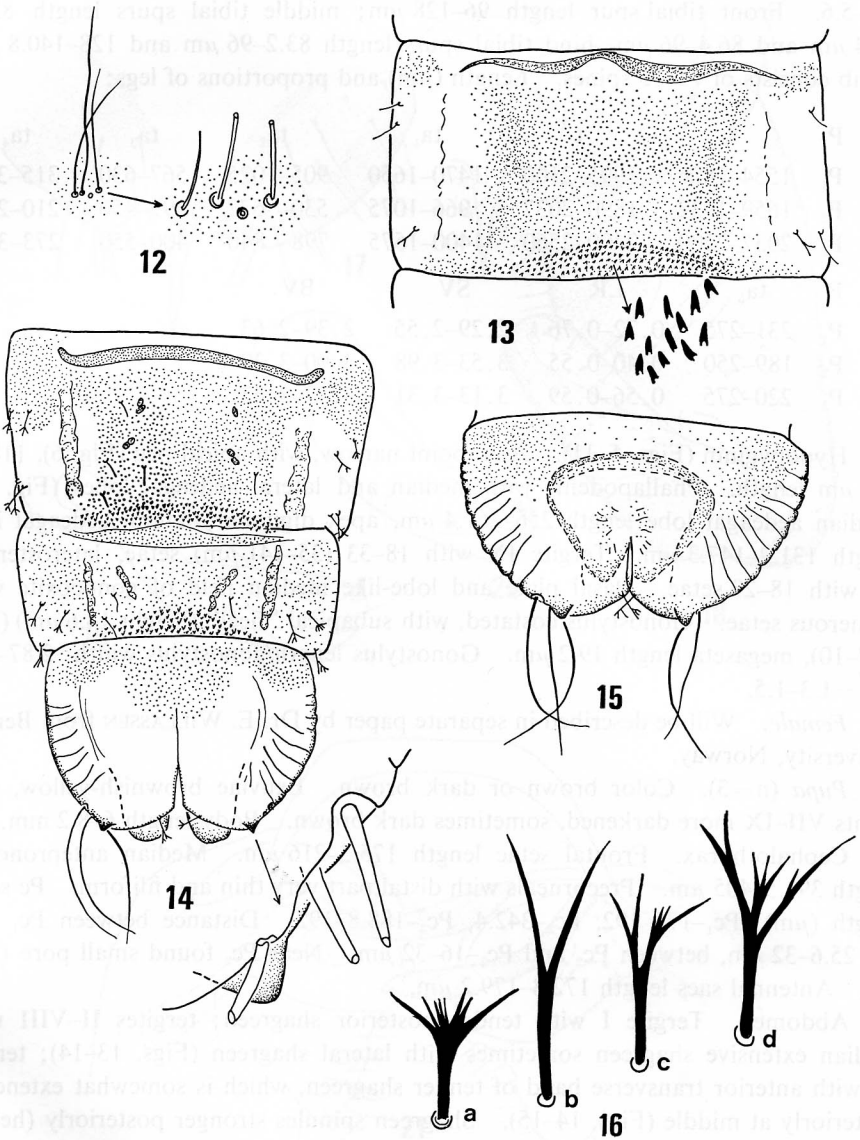
Male imago (n=10). Color from dark brown to black, wing grayish. Body length 5.3–5.9 mm. Wing length 5.2–5.7 mm.

Head. Coronals 4, outer and inner verticals about 30. orbitals 6, postorbitals 18–20, clypeals 40–60. Subapical seta of terminal flagellomere length 32–61 μm. AR=3.0–3.62. Last 4 maxillary palp segments length (μm): 131–176: 243–330: 266–342: 330–403. Sensilla capitata diameter 6.4 μm. Head width/palp length 0.74–0.85.

Thorax. Antepronotum with 10–17 (67.2–102.4 μm) median and 16–26 (112–198 μm) lateral setae. Acrostichals 19 (64–80 μm), dorsocentrals 36–46, prealars 32–46, scutellars 50–60.



Figs. 5–11. Male hypopygium of *P. lanceolata*. — 5, total view (neotype); 6, distal part of anal point; 7–10, gonostylus from Hokkaido (7), Nikko Nat. Park (Honshu) (8), Sakhalin (9) and Kunashir Island (10); 11, basal part of hypopygium without tergite IX.



Figs. 12–16. Pupa of *P. lanceolata*. —— 12, Pc-setae; 13, tergite V; 14, tergites VII-IX (♂); 15, anal segment (♀); 16, abdominal setae, a-L_2, b-L_4, c-median seta anal lobe, d-L_3.

Wing. Top of wing sometimes with macrotrichiae. R and R_1 with 31–44 (35.2–38.4 μm) macrotrichia, R_{4+5} with 16–20 macrotrichia. Squama dark gray, with 68–79 (115–224 μm) setae.

Legs. Front and hind legs with long setae, BR_1=5.2–8, BR_2=2.4–2.9, BR_3=

3.9–5.6. Front tibial spur length 96–128 μm; middle tibial spurs length 83.2–86.4 μm and 86.4–96 μm, hind tibial spurs length 83.2–96 μm and 128–140.8 μm, comb consists of 13–15 spines. Length (μm) and proportions of legs:

P	f	t	ta_1	ta_2	ta_3	ta_4
P_1	1554–1806	1995–2100	1470–1650	905–1025	567–630	315–350
P_2	1659–1932	1890–2037	966–1075	530– 672	399–450	210–275
P_3	2037–2200	2400–2560	1400–1575	798– 840	400–550	273–300

P	ta_5	LR	SV	BV
P_1	231–275	0.72–0.76	2.29–2.55	2.39–2.63
P_2	189–250	0.40–0.55	3.53–3.98	3.00–3.39
P_3	220–275	0.56–0.59	3.13–3.31	3.32–3.43

Hypopygium (Figs. 5–11). Anal point narrow, with apical peg (Fig. 6), 118.4–144 μm length. Phallapodeme with median and lateral aedeagal lobes (Fig. 11). Median aedeagal lobe length 256–261.4 μm, apex digitated; lateral aedeagal lobe length 131.2–147.3 μm. Tergite IX with 18–33 (35–141 μm) setae, laterosternite IX with 18–29 setae. Basal plate and lobe-like median field of gonocoxite with numerous setae. Gonostylus costated, with subapical "heel" (height 14.6 μm) (Fig. 5, 7–10), megaseta length 19.2 μm. Gonostylus length/gonostylus width: 2.87–3.3. HR=1.3–1.5.

Female. Will be described in separate paper by Dr. E. WILLASSEN from Bergen University, Norway.

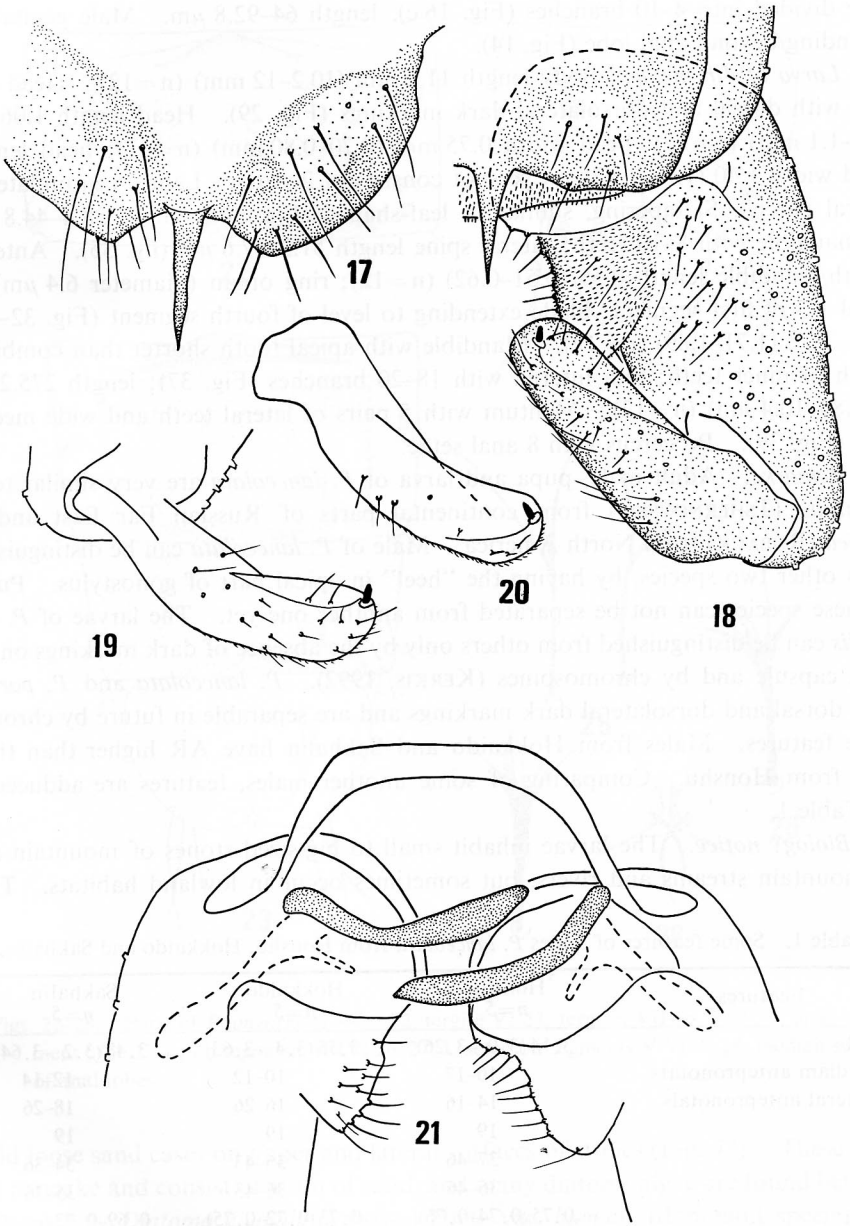
Pupa (n=3). Color brown or dark brown. Exuviae brownish-yellow, segments VII–IX more darkened, sometimes dark brown. Body length 6–8.2 mm.

Cephalothorax. Frontal setae length 175.5–216 μm. Median antepronotals length 391.5–405 μm. Precorneals with distal part very thin and filiform. Pc setae length (μm): Pc_1–176–192, Pc_2–342.4, Pc_3–188.8–192. Distance between Pc_1 and Pc_2 25.6–32 μm, between Pc_2 and Pc_3–16–32 μm. Near Pc_2 found small pore (Fig. 12). Antennal sacs length 172.8–179.2 μm.

Abdomen. Tergite I with tender posterior shagreen; tergites II–VIII with median extensive shagreen sometimes with lateral shagreen (Figs. 13–14); tergite IX with anterior transverse band of tender shagreen, which is somewhat extending posteriorly at middle (Figs. 14–15). Shagreen spinules stronger posteriorly (height 6.4–9.6 μm).

Abdominal setation (Fig. 16 a–d). D_2 on tergite I and D_4 on tergite VIII forked. Another D-setae simple, sometimes D_5 forked apically. Segment I with 2 L-setae, anterior setae simple (89.6–118.4 μm), posterior setae with 2–3 branches (length 121.6–128 μm). Segments II–VIII with 4 L-setae. L_4 on segments II–VI very often divided into 2–5 branches. L_1–L_4 on segments VII–VIII with 4–15 branches, setae length 71–153 μm.

Anal macrosetae pallid and filiform, length 378–513 μm. Median seta anal



Figs. 17–21. Male hypopygium of *P. angarensis*. —— 17, tergite IX (♂ from Honshu); 18, total view (♂ from Primorye); 19–20, gonostyles from Primorye (19) and Honshu (20); 21, basal part of hypopygium without tergite IX.

lobe divided into 4–10 branches (Fig. 16 c), length 64–92.8 μm. Male genital sac extending beyond anal lobe (Fig. 14).

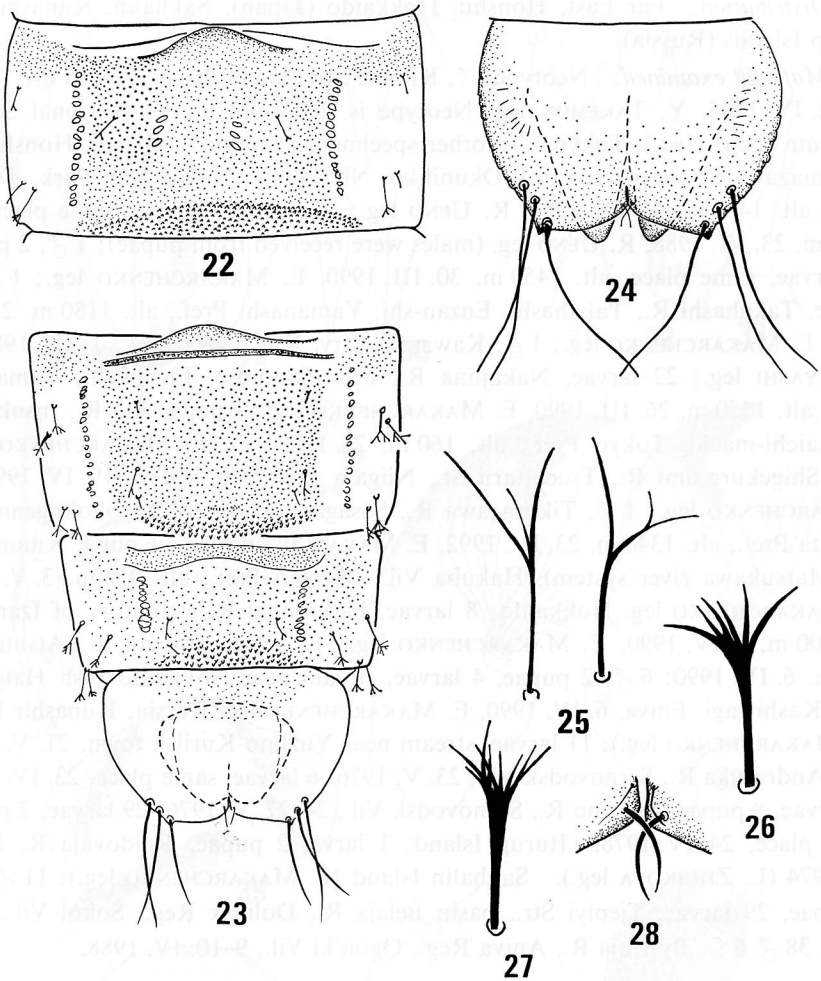
Larva of 4th instar. Body length 11.2 mm (10.2–12 mm) (n=12). Head capsule with dorsal and dorsolateral dark markings (Fig. 29). Head length 1.06 mm (1.0–1.1 mm) (n=12); head width 0.75 mm (0.70–0.80 mm) (n=12); head length/head width 1.40 (1.33–1.47). Eye spot consists of 2 parts. Labrum granulated in lateral patch. S_I tapering, similar to leaf-shaped (Fig. 30), length 38.4–44.8 μm. Premandible with 8–10 teeth; lateral spine length 51.2–57.6 μm (fig. 35). Antenna length/mandible length 0.55 (0.51–0.62) (n=12); ring organ (diameter 6.4 μm) on basal 1/3 of first segment; blade extending to level of fourth segment (Fig. 32–33); AR=1.78 (1.71–1.89) (n=12). Mandible with apical tooth shorter than combined width of inner teeth; seta interna with 18–20 branches (Fig. 37); length 275.2 μm (252.83–10.4 μm) (n=12). Mentum with 5 pairs of lateral teeth and wide median area (Fig. 39). Procercus with 8 anal setae.

Remarks. Adult male, pupa and larva of *P. lanceolata* are very similar to *P. orientalis* (TSHERNOVSKIJ) from continental parts of Russian Far East and *P. partica* (ROBACK) from North America. Male of *P. lanceolata* can be distinguished from other two species, by having the "heel" in apical part of gonostylus. Pupae of these species can not be separated from another one yet. The larvae of *P. orientalis* can be distinguished from others only by the absence of dark markings on the head capsule and by chromosomes (KERKIS, 1992). *P. lanceolata* and *P. partica* have dorsal and dorsolateral dark markings and are separable in future by chromosome features. Males from Hokkaido and Sakhalin have AR higher than these ones from Honshu. Comparing of some another males, features are adduced in the Table 1.

Biology notice. The larvae inhabit small to big-sized stones of mountain and submountain streams and rivers, but sometimes occur in lowland habitats. They

Table 1. Some features of males *P. lanceolata* from Honshu, Hokkaido and Sakhalin.

Features	Honshu *n*=5	Hokkaido *n*=5	Sakhalin *n*=5
AR	3.14 (3.0 –3.26)	3.55 (3.4 –3.63)	3.48 (3.2 –3.64)
Mediam antepronotats	10–17	10–12	12–14
Lateral antepronotals	14–16	16–26	18–26
Ac	19	19	19
Dc	37–46	36–43	34–36
Pa	36–46	36–43	35–36
LR_1	0.75 (0.74–0.76)	0.73 (0.72–0.75)	0.69–0.72 (*n*=4)
SV_1	2.35 (2.29–2.46)	2.54 (2.52–2.55)	2.54–2.66 (*n*=4)
BV_1	2.41 (2.39–2.43)	2.55 (2.51–2.63)	2.56–2.63 (*n*=4)
Anal point length, μm	136.5 (128–144)	133.3 (128–137.6)	130.2 (118.4–131.2)
Tergite's IX setae	24–28	18–33	21–24
Wing length, mm	5.3 (5.2 –5.5)	5.4 (5.2 –5.7)	5.4 (5.3 –5.7)
Total length, mm	5.4 (5.3 –5.7)	5.5 (5.4 –5.8)	5.8 (5.6 –5.9)



Figs. 22–28. Pupa of *P. angarensis*. —— 22, tergite V; 23, tergites VII-IX (♀); 24, anal segment (♂); 25, L_4 on segments II-IV; 26–27, L-setae on segments V-VIII; 28, median setae of anal lobes.

build loose sand cases on upper and lateral surfaces of stones (Fig. 42). These cases like pancake and consist of grain of sand, and many diatoms algae are found between grits, namely *Diatoma hiemale* (LYNGB.) HIEB. var. *hiemale* (dominant species), *D. hiemale* var. *mesodon* (EHR.) GRUN., *Cymbella ventricosa* KTTZ., *Hannaea arcus* (EHR.) *Patz.* var. *linearis*, *Holmboe* f. *recta* (SKV. *et* MEYER). The larvae are using them for eating. A big accumulation of larvae are met in moss *Hygrohypnum ochraceum* (WILS.) of streams of Nikko and Hokkaido Fish Hatcheries (Japan) and Sokol Fish Hatchery (Sakhalin).

Distribution. Far East, Honshu, Hokkaido (Japan), Sakhalin, Kunashir and Iturup Islands (Russia).

Material examined. Neotype: ♂, Kibune Str., Jadani-bashi, Kyoto Pr., Japan, 10–12. IV. 1985, Y. TAKEMON leg. Neotype is deposited in the National Science Museum (Nat. Hist.), Tokyo. Another specimens examined. Japan, Honshu: ♂, Toyamazawa R. (upper stream), Okunikko, Nikko-city, Nikko Nat. Park, Tochigi Pref., alt. 1450 m, 21. IX. 1988, R. UENO leg.; 2 ♂ 1 ♀, 3 pupae, same place, alt. 1250 m, 23. VI. 1988, R. UENO leg. (males were received from pupae); 1 ♂, 2 pupae, 18 larvae, same place, alt. 1450 m, 30. III. 1990, E. MAKARCHENKO leg.; 1 ♂, 12 larvae, Takahashi R., Takahashi, Enzan-shi, Yamanashi Pref., alt. 1180 m, 25. III. 1990, E. MAKARCHENKO leg.; 1 ♂, Kawasaki City, Kanagawa Pref., 17. X. 1988, T. KOBAYASHI leg.; 22 larvae, Nakajima R., near San-nose, Enzan-shi, Yamanashi Pref., alt. 1350 m, 26. III. 1990, E. MAKARCHENKO leg.; 1 pupa, Aki R., Insukaichi, Insukaichi-machi, Tokyo Pref., alt. 160 m, 26. III. 1990, E. MAKARCHENKO leg.; 1 ♂, Shigekuratami R., Tsuchitaru St., Niigata Pref., alt. 800 m, 19. IV. 1992, E. MAKARCHENKO leg.; 1 ♂, Tikusazawa R., Sasagamínebokujo, Myokokogenmachi, Niigata Pref., alt. 1340 m, 23. IV. 1992, E. MAKARCHENKO leg.; 1 pupa, Kitamatairi R. (Matsukawa river system), Hakuba Vil., Nagano Pref., alt. 950 m, 3. V. 1992, E. MAKARCHENKO leg. Hokkaido: 8 larvae, Paramunai R. (tributory of Izari R.), alt. 300 m, 3. IV. 1990, E. MAKARCHENKO leg.; 12 larvae, Atsuta R., Atsuta, alt. 100 m, 6. IV. 1990; 6 ♂, 2 pupae, 4 larvae, stream near Hokkaido Fish Hatchery, Kita-Kashiwagi, Eniva, 6. IV. 1990, E. MAKARCHENKO leg. Russia, Kunashir Island (E. MAKARCHENKO leg.): 11 larvae, stream near Yuzhno-Kurilsk town, 21. V. 1976; 1 ♂, Andreevka R., Sernovodsk Vil., 23. V. 1976; 6 larvae, same place, 23. IV. 1978; 96 larvae, 8 pupae, Tyurino R., Sernovodsk Vil., 24–27. V. 1976; 29 larvae, 3 pupae, same place, 24. IV. 1978. Iturup Island: 1 larva, 2 pupae, Reidovaja R. 17–18. VI. 1974 (L. ZHUIKOVA leg.). Sakhalin Island (E. MAKARCHENKO leg.): 11 ♂ 5 ♀, 8 pupae, 29 larvae, Tjeplyi Str., basin Belaja R., Dolinsk Reg., Sokol Vil., 9. V. 1986; 38 ♂ 6 ♀, Bystraja R., Aniva Reg., Ogon'ki Vil., 9–10. IV. 1988.

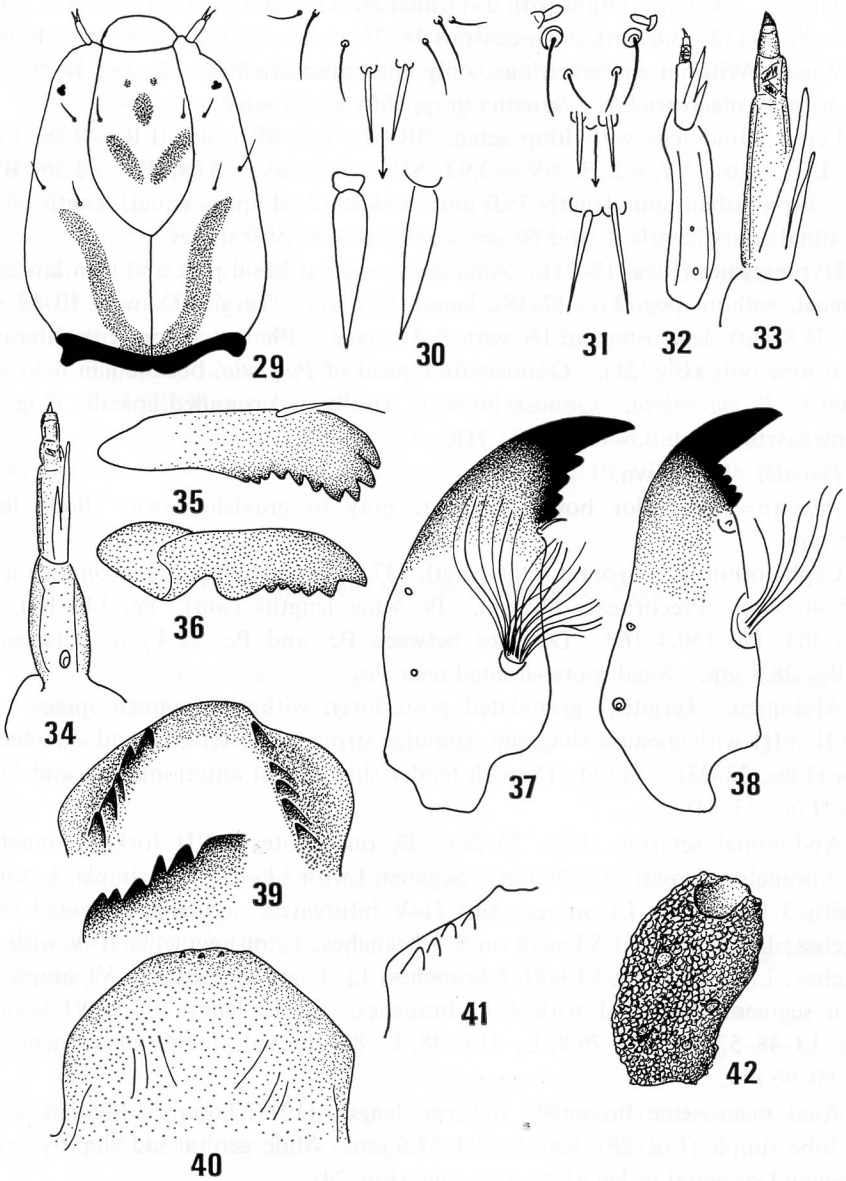
Pagastia angarensis (LINEVICH)

(Figs. 17–28, 31, 34, 36, 38, 40–41)

Syndiamesa angarensis LINEVICH, 1953, 162.
?*Pagastia* sp. A: OLIVER & ROUSSEL, 1982, 854.
Potthastia angarensis: LINEVICH, 1984, 127.
Pagastia lanceolata: HASHIMOTO, 1985, 347, fig. 10.
Pseudodiamesa (*Pagastia*) *oliveri* MAKARCHENKO, 1989: 270.

Male imago (n=3). Color dark brown. Body length 4–4.5 mm. Wing length 3.9–4.0 mm. Total length/wing length 1.1.

Head. Coronals 4, outer and inner verticals 6–11, orbitals 5–6, postorbitals 14–15, clypeals 15–16. AR=2.0–2.1. Head width/palp length 1.3.



Figs. 29–42. Larvde of *P. lanceolata* (29–30, 32–33, 35, 37, 39, 42) and *P. angarensis* (31, 34, 36, 38, 40–41). —— 29, head; 30–31, lateral setae; 32–34, antenna; 35–36, premandible; 37–38, mandible; 39–41, mentum; 42, larval case.

Thorax. Antepronotum with 2–11 median setae and 6–11 lateral setae. Acrotichals 20–30 (32–73.6 μm), dorsocentrals 18–25, prealars 10–20, scutellars about 60.

Wing. Without macrotrichiae, only with microtrichiae. R and R_1 with 40, R_{4+5} with 19 macrotrichia. Squama gray, with 35–40 setae.

Legs. Hind legs with long setae, BR_1–2=2.3, BR_3=4.6, LR_1=0.78, LR_2=0.49, LR_3=0.61, SV_1=2.33, SV_2=3.93, SV_3=3.08, BV_1=3.04, BV_2=3.36, BV_3=3.41. Front tibial spur length 75.9 μm; middle tibial spurs equal, length 66 μm; hind tibial spurs length 76 and 60 μm, comb consists of 9 spines.

Hypopygium (Figs. 17–21). Anal point wide at basal part and thin lanceolate at apical, without peg (Fig. 17–18), length 86.4 μm. Tergite IX with 10–17 setae (28.8–76.8 μm), laterosternite IX with 9–11 setae. Phallapodeme with lateral aedeagal lobe only (Fig. 21). Gonocoxite typical of *Pagastia*, but median field small as that of *P. lanceolata*. Gonostylus wide basally and rounded apically (Figs. 18–20), megaseta length 9.6–12.8 μm. HR=1.5.

Female. Unknown.

Pupa (n=3). Color bown. Exuviae gray to grayish-brown. Body length 3.7–5 mm.

Cephalothorax. Frontal setae length 137.6 μm. Median antepronotals length 391.5–405 μm. Precorneals filiform. Pc setae lengths (μm): Pc_1–144–160, Pc_2–281.6–304, Pc_3–150.4–160. Distance between Pc_1 and Pc_2 22.4 μm, between Pc_2 and Pc_3–28.8 μm. Small pore situated near Pc_2.

Abdomen. Tergite I granulated posteriorly, without shagreen spines. Tergites II–VIII with median shagreen, spinules stronger posteriorly and directed anterior (Figs. 22–23). Tergite IX with tender shagreen at anteriomedian and lateral parts (Figs. 23–24).

Abdominal setation (Figs. 25–28). D_2 on tergites I–VII forked, sometimes with 3 branches; length 73.6–96 μm. Segment I with 3 L-setae: L_1 simple, L_2 forked, L_4 with 3 branches. L_2 on segments II–V bifurcated, sometimes divided into 3 branches; L_2 on segment VI with on 8–9 branches; L_4 on segments II–V with on 3 branches; L_4 on segment VI with 6 branches; L_1, L_3 on segments II–VI simple; L_1–L_4 on segments VII–VIII with 4–11 branches. L_1–L_4 length of II–VI segments (μm): Lt–48–57.6, L_1–58–76.8, L_2–41.6–48, L_3–80–108.8. L_4 length of segments VII–VIII 80–96 μm.

Anal macrosetae brownish, filiform, length 112–137.6 μm. Median seta of anal lobe simple (Fig. 28), length 38.4–57.6 μm. Male genital sac slightly extending beyond or equal in length to anal lobe (Fig. 24).

Larva of 4th instar. Body length 4.5–8 mm. Head capsule yellow, without dark markings. Head length 0.59 mm, head width 0.36 mm; head length/head width 1.6. Eye spot consists of 2 parts. Labrum granu-lated in lateral patch. S_I setalike (Fig. 31). Premandible with 6–7 teeth (Fig. 36). Antenna length/mandible length 0.28–0.3; ring organ (diameter 6.7 μm) on basal half of first segment; blade reaching the base of fourth segment (Fig. 34); AR=1.78 (1.71–1.89) (n=12).

Apical mandibular tooth longer than combined width of inner teeth; seta interna with 4–5 branches (Fig. 38); length 140.8–160 μm. Mentum with 5–6 pairs of lateral teeth and with wide median area (Figs. 40–41). Procercus with 7–8 anal setae.

Distribution. Far East; Japan, Honshu; Russia, Sakhalin, Primorye. East Siberia, rivers of Baikal L. basin. North America (?).

Material examined. **Japan**, Honshu: 1 mature pupa, Akigawa R., Itsukaichi, Itsukaichi-machi, Tokyo Pref., 26. III. 1990 (E. MAKARCHENKO leg.); 4 larvae, Minanogawa R., Tsukuba Mnt., Ibaraki Pref., 29. III. 1990 (E. MAKARCHENKO leg.); 2 larvae, Sekigawa River, Sasagaminebo-kujo, Myokokogenmachi, Niigata Pref., alt. 1340 m, 23. IV. 1992 (E. MAKARCHENKO leg.). **Russia**: ♂, Jasnaja River, Sikhote-Alin preserve, Terneiskyi Reg., Primorye, Far East, 11. IX. 1983 (E. POTIKAH leg.); 3 ♂, 3 pupae, 12 larvae, Volchanka River, Partisansk Reg., Primorye, Far East, 5. V. 1991 (E. MAKARCHENKO leg.), males were reared from larvae; 6 larvae, Belaya R., upper stream, Sakhalin, 30. V. 1986 (E. MAKARCHENKO leg.); 3 mature pupae, Bolshoi Pit R., Angara R. basin, East Siberia, 10. VIII. 1988 (L. BAZHINA leg.).

Key to the Japanese Species of the geuus *Pagastia*

Males

1. Phallapodeme with both median and lateral aedeagal lobes. Gonostylus with subapical "heel" (Fig. 7–10) ..... *P. lanceolata* (TOKUNAGA)
— Phallapodeme with lateral aedeagal lobe only. Gonostylus without "heel" (Fig. 19–20) ..... *P. angarensis* (LINEVICH)

Pupae

1. Median seta of anal lobe branched (Fig. 16 c). Tergite I with tender shagreen spines posteriorly. L_2 on segments II–VI simple.. *P. lanceolata* (TOKUNAGA)
— Median seta of anal lobe simple (Fig. 28). Tergite I without shagreen spines and granulated posteriorly. L_2 on segments II–VI branched .... *P. angarensis* (LINEVICH)

Larvae of 4th instar

1. Head capsule with dark markings (Fig. 29). AR greater than 1.6 Apical tooth of mandible shorter than combined width of inner teeth .... *P. lanceolata* (TOKUNAGA)
— Head capsule without dark markings. AR less than 1.2. Apical tooth of mandible longer than combined width of inner teeth.... *P. angarensis* (LINEVICH)

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