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Species of the Orthotyline Genus *Pseudoloxops* Kirkaldy from Japan (Heteroptera: Miridae)

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Abstract. Three Japanese species of the orthotyline plant bug genus *Pseudoloxops* Kirkaldy are dealt with. Two species, *P. miyamotoi* from Kyushu and *P. takaii* from Okinawa and Ishigaki Islands of the Ryukyus, are described as new with confirmed host records. The last-instar nymph of *takaii* is also described. A known species, *P. miyatakei*, is diagnosed, and the female is described for the first time.

Key words: Heteroptera, Miridae, *Pseudoloxops*, new species, Japan.

The genus *Pseudoloxops* Kirkaldy, 1905, of the subfamily Orthotylinae includes 33 described species in the Palearctic, Oriental and Afrotropical Regions, and Pacific islands (Schuh, 1995). The species of this genus are easily recognized by the small, rather slender and densely pubescent body, unique general coloration (pale yellow, and partly sanguineous or scarlet dorsum provided with dark spots), and anteriorly projected frons. Although several authors reported 6 species from the adjacent areas of Japan (Zou, 1980; Carvalho, 1956), Japanese fauna of *Pseudoloxops* has been represented only by a single species, *P. miyatakei* Miyamoto.

In the present paper I describe two new species, *P. takaii* and *P. miyamotoi*, with confirmed host records. The last-instar nymph of *takaii* is also described. The known species, *miyatakei*, is diagnosed, and the female is described for the first time.

All measurements in the text are given in mm. Type specimens are all deposited in the Biological Laboratory, Hokkaido University of Education, Sapporo.

Genus *Pseudoloxops* Kirkaldy

Pseudoloxops Kirkaldy, 1905: 208, type species: *Capsus coccineus* Meyer-Dür, 1843, monotypic (nom. n. for *Loxops* Fieber, 1858: 314, preocc. by *Loxops* Cabanis, 1847, Aves).

This genus currently comprises 35 species (9 Afrotropical, 17 Indo-Pacific and 9 Palearctic) that are, without exception, easily recognized by the unique coloration. A single species, *P. coccineus*, was reported from North America, but it is considered to have been accidentally introduced with European ash nursery stock (Wheeler & Henry, 1992). In Japan three species actually occur, and are readily distinguished from one another by the superficial appearance alone (Figs 1-3). Although some external diagnostic characters are unique to *Pseudoloxops*, it is difficult to consider it as a monophyletic group because of the great specific variation exhibited in the male genitalia. A much broader survey on characters is required to correctly ascertain the definition of the genus.

The majority of *Pseudoloxops* species appear to be associated with broadleaf host plants, whereas predation was observed on an European species, *P. coccineus* (Wheeler & Henry, 1992).

Pseudoloxops miyatakei Miyamoto

(Figs 1, 4-7, 16)

Pseudoloxops miyatakei Miyamoto, 1969: 75, figs. 1-

5; Schuh, 1995: 185.

Diagnosis. Recognized by the rather large size, uniformly distributed dark spots on the widely scarlet dorsum, entirely yellow femur, two characteristic processes on the male genital segment (Fig. 4: In the original description, these processes were referred to as 'a sharp median projection on hind margin of ventral wall' and 'erect spatula-shaped projection'), remarkably widened sensory lobe of the left paramere, and three-branched apical appendage of the vesica. Detailed description of male was provided by Miyamoto (1969).

Description of female. Almost similar to male in general coloration and structure. Body elongate oval; dorsal surface widely scarlet, shiny, uniformly provided with dark spots, densely pubescent. Head yellowish brown, except for pale red anterior and lateral parts, with dark spots, bearing brown, long, erect setae; eyes small; vertex wide, distinctly depressed mesally, 0.52 times as wide as head including eyes, transversely carinate basally; frons rounded, not strongly projected. Antenna yellow; segment I sanguineous except for extreme apex, bearing dark, suberect setae and several, upright bristles; segments II-IV immaculate, slender, clothed with silky pubescence. Rostrum yellow, slightly exceeding middle coxa; apex of segment IV infuscate.

Pronotum pale scarlet, usually yellow mesally, uniformly furnished with dark spots and brown, suberect pubescence, bearing dark, long setae along posterolateral margins; scutellum yellowish brown, uniformly with dark spots, bearing brown, suberect pubescence, apical part narrowly pale red; thoracic side widely reddish brown; ostiolar peritreme partly yellow. Hemelytra widely sanguineous, uniformly provided with dark spots except on cuneus, densely pubescent; clavus yellow except for reddish base and apex; apical inner corner of corium yellowish brown; membrane somber pale brown, with red veins. Coxa and leg unicolorously yellow, except for infuscate apex of tarsomere III; tibial spines brown, long. Ventral surface of abdomen sanguineous, shining; vagina exterior dark brown.

Dimensions. ♂/ ♀: Body length 3.55-4.13/ 4.10; head width including eyes 0.69-0.77/ 0.73; vertex width 0.31-0.33/ 0.38; rostral length 1.14/ 1.32; length of antennal segment I 0.36-0.40/ 0.43, II 1.68-1.83/ 1.80, III 0.58-0.62/ 0.72, IV 0.45-0.48/ 0.58; mesal pronotal length 0.49-0.57/ 0.54; basal pronotal width 1.03-1.22/ 1.26; maximum width across hemelytra 1.42-1.50/ 1.61; length of hind femur 1.38-1.52/ 1.52, tibia 1.92-2.16/ 2.18, tarsus 0.31-0.36/ 0.36; length of hind tarsomere I 0.11-0.14/ 0.12, II 0.15-0.18/ 0.17, III 0.17-0.19/ 0.17.

Specimens examined. Honshu: 1♀, Mt. Haguro, Haguro T., Yamagata Pref., 19. x. 1993, K. Watanabe; 2♂, Mt. Wasamata, Kamikitayama Vil., Nara Pref., 22. viii. 1994, Y. Nakatani. Kyushu: 2♂, Shiramizu, Shonai T., Oita Pref., 27-28. vii. 1995, light trap, Y. Nakatani.

Distribution. Japan (Honshu, Shikoku*, Kyushu*). *New record.

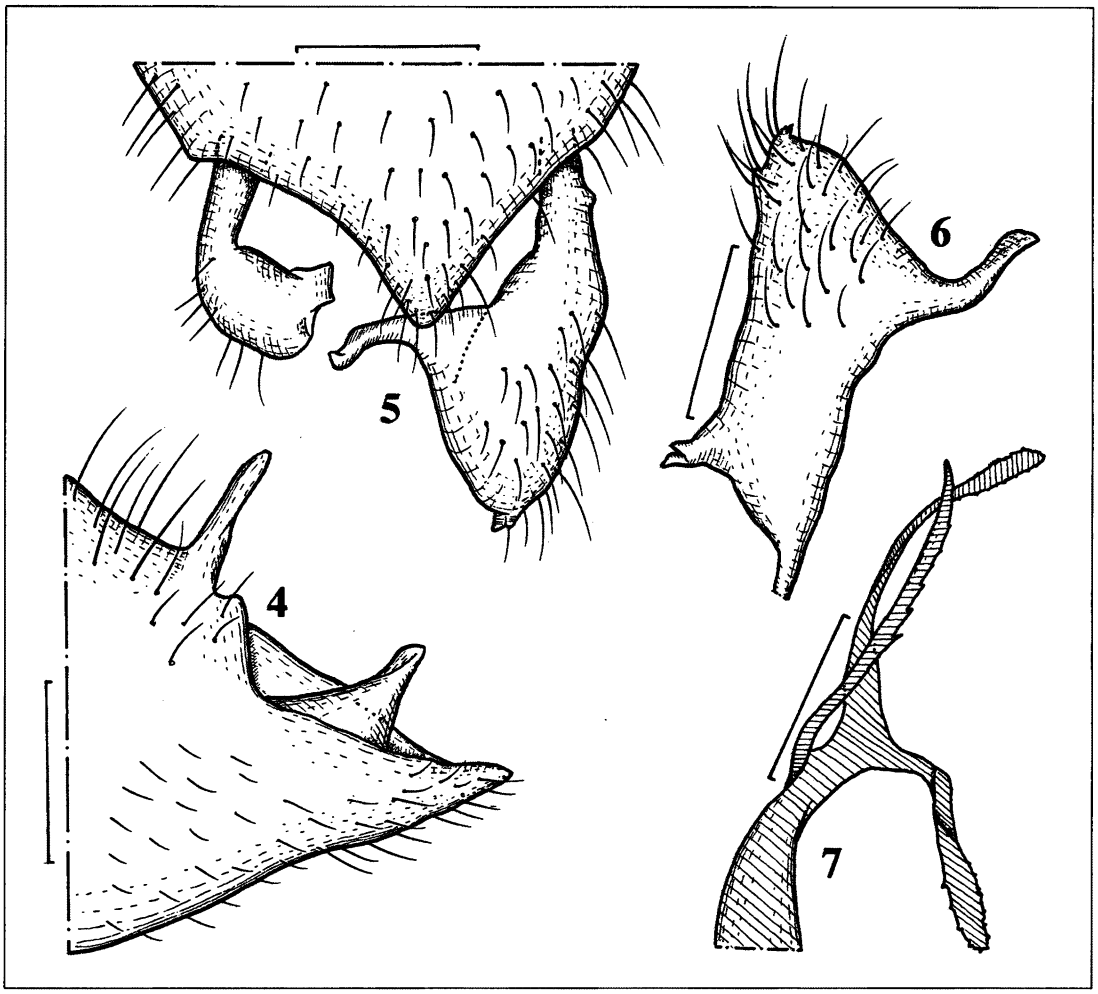
Pseudoloxops takaii n. sp.

(Figs 2, 8-12, 16)

Diagnosis. Recognized by the slender and small body, mesally yellowish dorsum that lacks dark spots, widely reddish brown apical part of the hind femur, and characteristic apical dark spines of the male genital segment.

Description of adult (Fig. 2). Body small, parallel-sided; dorsal surface rather shiny, pale red, mesally pale yellow, uniformly clothed with pale pubescence and laterally with brown, longer setae. Head yellowish brown, vertical, bearing silky pubescence; vertex with a shallow, longitudinal mesal sulcation and weak basal transverse carina; frons somewhat raised anteriorly, bearing dark, upright setae; tylus widely sanguineous, clothed with dark, erect setae and silky pubescence; jugum and lorum sanguineous, the latter swollen. Antenna yellowish brown; segment I reddish brown, bearing dark setae; segment II weakly tinged with red at middle and apex, cylindrical, about four times as long as I; segments III and IV pale red at middle and apex; length of segments I-IV (♂ /♀): 0.36-0.40/ 0.36-0.42, 1.51-1.68/ 1.32-1.49, 0.48-0.51/ 0.55-0.57, 0.45-0.48/ 0.48-0.50. Rostrum shiny yel-

Figs 1-3. Japanese species of *Pseudoloxops*. 1, *P. miyatakei* at Monobe Vil., Kochi Pref. on Aug. 6, 1994, by Takai; 2, P. takaii sp. n. at Omoto, Ishigaki Is. on Jan. 20, 1996 by Takai; 3, *P. miyamotoi* sp. n. on the host plant, *Quercus acutissima*, at Konoura, Nagasaki Pref. on Aug. 2, 1996.



Figs 4-7. Male genitalia of *Pseudoloxops miyatakei*. 4, Genital segment in left lateral view; 5, ditto in ventral view; 6, left paramere; 7, apex of vesica. Scales: 0.2 mm.

low, reaching or slightly surpassing middle coxa; apex of segment IV infuscate.

Pronotum bicolorous, reddish brown laterally and yellow mesally, reddish part provided with dark spots and brown, suberect setae, and yellow part bearing pale pubescence; mesoscutum yellow, widely exposed; scutellum yellow but widely pale red mesally, lacking dark spots; thoracic side unicolorously yellow. Hemelytra pale sanguineous, shining, with dark spots except on yellow median part of clavus and apical inner part of corium, uniformly clothed with pale, suberect pubescence; embolium with dense, darker setae laterally; apex of cuneus dark red; membrane grayish brown, with pale red veins. Leg yellow except for reddish brown apical half of hind femur; tibial spines pale brown, long; length of hind femur, tibia, tarsus (♂/♀): 1.26-1.44/ 1.32-1.40, 1.92-2.09/ 1.82-2.02, 0.30-0.35/ 0.34-0.36; that of hind tarsomeres I-III (♂/♀): 0.09-0.14/ 0.12-0.13, 0.13-0.16/ 0.12-0.15, 0.16-0.18/ 0.18-0.21. Abdomen

almost uniformly yellow; vagina exterior darkened.

Male genitalia (Figs 9-12): Genital segment bearing several dark spine apically (9), with dorsal knob-like process apically (10). Parameres as in Figs. 11-12; right paramere glabrous, long and slender.

Dimensions. ♂/♀: Body length 3.04-3.63/ 3.12-3.68; head width including eyes 0.69-0.75/ 0.64-0.69; vertex width 0.27-0.29/ 0.32-0.36; rostral length 0.96-1.10/ 1.05-1.16; mesal pronotal length 0.36-0.40/ 0.34-0.40; basal pronotal width 0.90-1.00/ 0.85-1.01; maximum width across hemelytra 1.06-1.29/ 1.15-1.35.

Holotype: ♂, Omoto-Takeda, Ishigaki Is., the Ryukyus, on flowers of *Castanopsis* sp. and *Quercus* sp., 23. i. 1996, T. Yasunaga. Paratypes: Okinawa Is.: 1♂, Yona, Kunigami Vil., 20-25. v. 1993, light trap, T. Yasunaga; 1♀, same locality, 24. v. 1993, light trap, Y. Nakatani. Ishigaki Is.: 1♀, Mt. Banna-dake, 8. v. 1993, T. Yasunaga; 1♂1♀, without detailed locality data, v. 1995, M. Takai; 2♂1♀, Mt. Omoto, 21. i. 1996, light trap, T. Yasunaga; 1♂3♀, same data as for holotype; 1♀, same locality, on flowers of *Quercus* sp., 24. i. 1996, T. Yasunaga.

Description of last-instar nymph (Fig. 8). Body elongate oval, somewhat flattened; dorsal surface pale yellow, rather densely setose, with sanguineous lateral margins. Head pale yellow with sanguineous lateral margins, about twice as long as width including eyes, sparsely clothed with silky, long, erect pubescence; eye deep red, small, apparently longer than wide in dorsal aspect. Antenna pale yellow, partly sanguineous as in Fig. 8; segment I incrassate, densely furnished with silky, long, erect pubescence; segment II rather thick, bearing silky, long, erect pubescence; segment III slightly shorter than IV; length of segments I-IV: 0.34, 0.96, 0.48, 0.53. Rostrum pale, reaching hind coxa; apex of segment IV infuscate.

Pronotum yellow with sanguineous lateral margins, bearing silky, long, erect setae; wing pads pale yellow with pale red lateral margins, bearing erect setae laterally and posteriorly; mesoscutal area with a pale red spot. Leg pale yellow; femur and tibia furnished with silky, long, erect pubescence; apical part of hind femur widely sanguineous; extreme apex of tarsus slightly infuscate; length of hind femur, tibia and tarsus: 1.03, 1.39, 0.30. Abdomen uniformly pale yellow, densely clothed with silky, long pubescence.

Dimensions. Body length 2.16; head width including eyes 0.60; rostral length 1.15; pronotal width 0.73; maximum width across wing pads 1.21.

Specimen examined. 1ex., Omoto, Ishigaki Is., on flowers of evergreen *Quercus* sp., 24. i. 1996, T. Yasunaga (preserved in 80% ethyl alcohol, Hokkaido University of Education, Sapporo).

Distribution. Japan (the Ryukyus: Okinawa & Ishigaki Isls.).

This new species is allied to *P. imperatorius* originally described from Sri Lanka by Distant (1909), but is easily distinguished from the latter by the longer antennal segment II that is four times as long as I, bicolorous segment III, widely reddish brown hind femur, etc.

Confirmed host plant of *P. takaii* is evergreen *Quercus* sp. (Fagaceae), from which a last-instar nymph was collected. Some teneral adults were also found on flowers of *Castanopsis* sp. (Fagaceae) that is considered to be another host plant. The last-instar nymph is easily recognized by the unique general coloration quite similar to that of adult. Collection records suggest the possibility of bivoltine or multivoltine life cycles for *P. takaii*; teneral adults were collected in both January and May.

***Pseudoloxops miyamotoi* n. sp.**

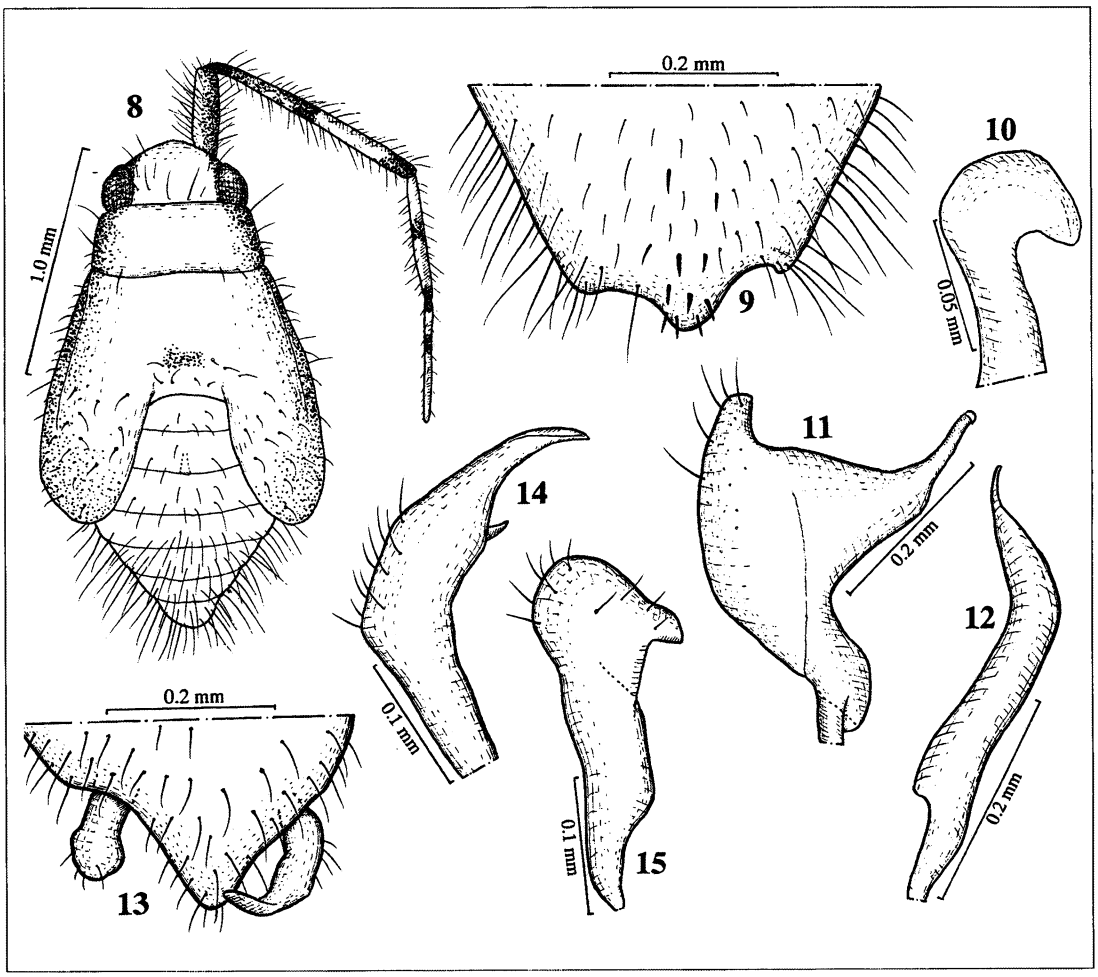
(Figs 3, 13-16)

Diagnosis. Recognized by the small and oval body, rounded frons, noticeably shortened antennal segment I, and well developed hind femur provided with an apical sanguineous spot.

Description. Body oval, slightly elongate in ♂; dorsal surface pale brown, with pale brown, uniformly distributed pubescence. Head yellowish brown, shining, lacking dark spots, rather densely bearing pale, erect setae; vertex not distinctly sulcate or carinate; frons rounded, slightly projected anteriorly, clothed with pale pubescence and a few dark setae; lorum and jugum pale red; tylus bearing several dark, erect setae basally. Antenna pale stramineous brown;

segment I pale red, very short, thickened, shorter than width of vertex, bearing brown, erect bristles; segments II, III and IV clothed with dense, recumbent pubescence and some long, erect setae; length of segments I-IV (♂/♀): 0.24-0.26/ 0.25-0.29, 1.35-1.38/ 1.32-1.43, 0.38-0.41/ 0.45-0.47, 0.36/ 0.34-0.39. Rostrum pale brown, reaching basal part of hind coxa; apex of segment IV infuscate.

Pronotum uniformly shiny pale yellow and bearing silky, long, upright pubescence mesally, with dark spots and dark, broad setae on lateral reddish brown part; scutellum pale yellow, with pale red apex, bearing silky pubescence; thoracic side pale brown, partly sanguineous; ostiolar peritreme yellow. Hemelytra widely pale reddish brown, furnished with brown spots and pale, suberect pubescence; embolium with dense, suberect setae; inner part of clavus and apex of corium pale yellow, lacking spots; cuneus sanguineous, pale yellow basally, uniformly with brown spots; membrane pale grayish brown, with apically reddish veins. Coxa and leg pale yellow; hind femur tumid, with an apical sanguineous spot; tibial spines pale brown; apex of tarsomere III infuscate; length of hind femur, tibia, tarsus (♂/♀): 1.11-1.17/ 1.17-



Figs 8-15. *Pseudoloxops* spp. 8-12, *P. takaii* n. sp.; 13-15, *P. miyamotoi* n. sp. 8, dorsal habitus of last-instar nymph; 9 & 13, male genital segment in ventral view; 10, dorsal projection of male genital segment; 11 & 14, left paramere; 12 & 15, right paramere.

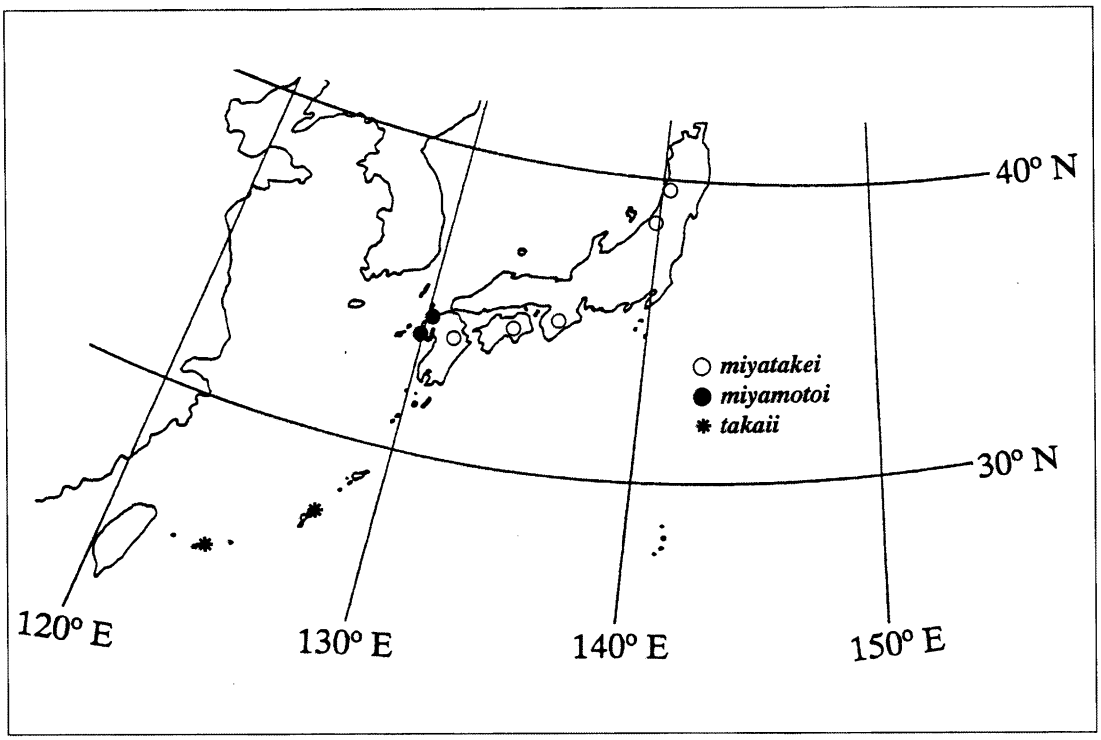


Fig. 16. Distribution map for Japanese species of *Pseudoloxops*.

1.29, 1.68-1.70/ 1.71-1.83, 0.28-0.30/ 0.27-0.33; that of hind tarsomeres I-III (♂/♀): 0.10-0.12/ 0.08-0.12, 0.12-0.16/ 0.12-0.14, 0.16-0.17/ 0.15-0.18. Abdomen yellow, ventral lateral part tinged with red; vagina exterior darkened.

Male genitalia (Figs 13-15): Genital segment triangularly developed apically, lacking distinct processes or apical spines (13). Parameres as in Figs. 14-15; left paramere slender, tapered apically, with an inner subapical pointed process (14); right paramere broadened apically, with beak-like projection (15). Vesica with a single, rather broad and not branched apical appendage.

Dimensions. ♂/♀: Body length 2.95-3.08/ 3.07-3.15; head width including eyes 0.72-0.74/ 0.69-0.74; vertex width 0.32-0.34/ 0.37-0.40; rostral length 1.09-1.12/ 1.10-1.20; mesal pronotal length 0.46-0.47/ 0.46-0.48; basal pronotal width 0.99-1.04/ 1.02-1.06; maximum width across hemelytra 1.27-1.29/ 1.35-1.42.

Holotype: ♂, Kônoura, Sotome T., Nishisonogi-gun, Nagasaki Pref., Kyushu, Japan, on *Quercus acutissima*, 4. viii. 1996, T. Yasunaga. Paratypes: 2 ♂24♀, same locality and plant as for holotype, 1-4. viii. 1996, T. Yasunaga.

Distribution. Japan (restricted areas of N. & W. Kyushu where *Q. acutissima* grows).

This new species is readily recognized by the oval body, very short antennal segment I, and apical red band of the widely yellow hind femur. Its closest relative appears to be the Chinese *P. guttatus* Zou, judging from the similarity of the parameres, but the latter significantly differs in the coloration and structure, in addition to being associated with the Rosaceae and Rhamnaceae host plants (see Zou, 1987).

P. miyamotoi is associated strictly with *Quercus acutissima* (Fagaceae), and seems to have only one generation per year. Newly emerged adults appear in early August.

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（要約）

日本産*Pseudoloxops*属メクラカメムシ類について（異翅目：メクラカメムシ科）

安永　智秀

Pseudoloxops 属に含まれるメクラカメムシは，いずれも紅色と黄色を染め分けた特徴的な色彩を呈する（図1-3参照）．旧世界（主に熱帯地域）と太平洋諸島から，これまでに33種が報じられているが，わが国においては，これまで１種（*P. miyatakei*，ヒイロメクラガメ：和名は新称）が知られているにすぎなかった．

本文では最近の調査で見出された２新種を記載し，生態面に関する若干の知見も報じた．また，既知のヒイロメクラガメについても，従来未知であった雌を，最近得られた標本に基づいて記載した．

上述の２新種には，それぞれ *P. takaii*（リュウキュウヒイロメクラガメ），*P. miyamotoi*（クヌギヒイロメクラガメ）の名称を与える．前種は南西諸島（沖縄本島，石垣島）に分布し，カシ類やシイ類に寄生して生活する．終齢幼虫も成虫とよく似た色彩を示す．

一方，クヌギヒイロメクラガメは，文字どおりクヌギだけに依存しているが，その分布域は局限される（長崎県外海町，福岡市能古島）．近年，薪炭材利用の減少にともない，本種の生息地であるクヌギの平地林が姿を消しつつあり，何らかの保護対策を講じる必要がある．

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