Pacific Insects 11 (3-4): 627-632 10 December 1969

DESCRIPTION OF A NEW GENUS OF EUPELMINAE FROM HAWAII WITH REMARKS ON ITS BIOLOGY (Hymenoptera: Encyrtidae)[1]

By **Carl M. Yoshimoto**

BISHOP MUSEUM, HONOLULU, HAWAII, 96819

Abstract: This paper describes *Reikosiella melina* n. gen., n. sp. from the Hawaiian Islands and includes notes on its biology.

While arranging and classifying the Hawaiian Eupelminae, I found a striking form with a metallic blue-green head and predominantly honey-yellow thorax, gaster, and legs. No other Hawaiian eupelmine known possesses this combination of colors. This species appears to represent an undescribed genus and is of interest because of the great variation in wing development.

Genus **Reikosiella** Yoshimoto, new genus

Head (fig. 1 i) wider than mesoscutum, somewhat rounded in front view and declivous in side view. Face widest at level of lower ends of eyes, upper part nearly flat and following contour of inner margin of eyes. Vertex broad. Eyes sparsely, finely pilose, oblong-ovate in front view and 2/3 as wide as upper inter-ocular distance in dorsal view. Ocelli in an equilateral triangle, slightly closer to each other than distant from occipital angulation (margin). Antennal scrobes very small. Antenna 13-segmented, inserted at widest part of face; scape compressed, basal 1/4 slightly dilated below; ring segment slightly longer than wide; flagellum elongate, each segment widened apicad; funicle 7-segmented, segment 1 more than 2× as long as ring segment.

This genus is close to *Zaischnopsis* Ashmead (type-species: *Ischnopsis ophthalmica* Ashm.) but differs in having a broad vertex and narrow, bell-shaped pronotum and in lacking the distinct V-shaped antennal grooves. In other respects, it stands near *Lutnes* Cameron (type-species: *Lutnes ornaticornis* Cam.) which can be separated from the new genus by the deep antennal grooves, densely hairy eyes, short, narrow, ovate pronotum, flattened

1. Partial results of a U. S. National Science Foundation grant (GB-6463).
2. My special thanks go to G. J. Kerrich and R. D. Eady, Commonwealth Institute of Entomology, % British Museum (Nat. Hist.), London, and B. D. Burks, U. S. National Museum, Washington, D. C. who kindly examined and made comments on the specimens. I am indebted to G. J. Kerrich, T. C. Maa, P. D. Ashlock, E. C. Zimmerman, J. W. Beardsley and the late Miss Amy Suehiro for reading and criticizing the manuscript. I appreciate the cooperation of F. Bianchi of the Hawaiian Sugar Planters' Association and Miss M. Chong of the Hawaii Department of Agriculture for the loan of the specimens from their institutions. Thanks are due Mrs Judy Torres, who prepared the drawings and to Y. Hirashima, Kyushu University, Fukuoka, Japan for comparing the species with the type of *Lutnes* Cameron during his visit to the British Museum (Nat. Hist.), London. I am grateful to Lubomir Masner, Czechoslovakia Academy of Sciences, Prague, for naming the platygasterid wasp.

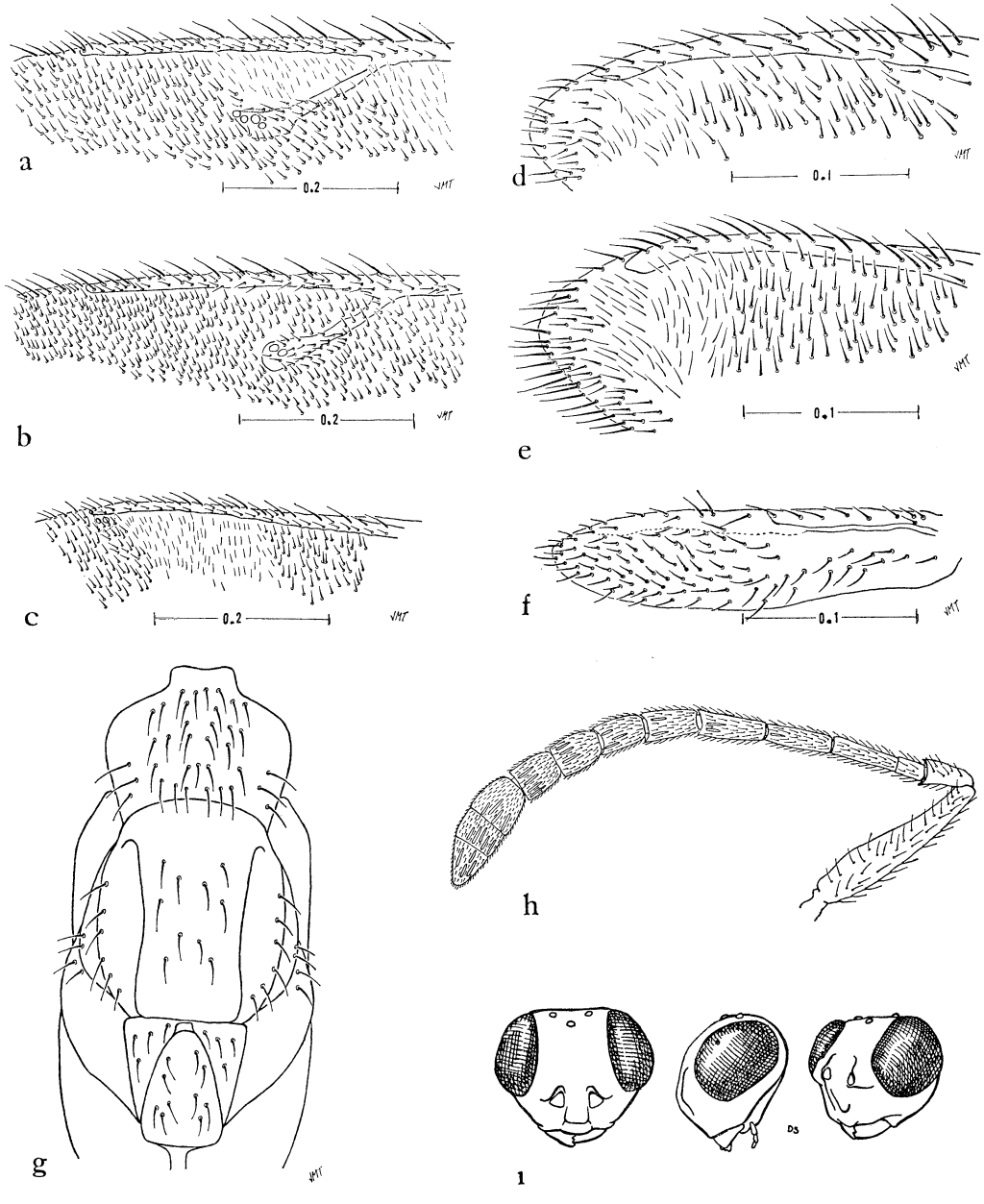

Fig. 1. Type of wing reduction of ♀ *R. melina*: a, Macropterous; b, Brachypterous, intergradation 1; c, Brachypterous, intergradation 2; d, Brachypterous, intergradation 3; e, Brachypterous, intergradation 4; f, Micropterous; g, Dorsal view of pronotum and mesonotum; h, ♀ antenna; i, Head (3 views).

hind tibia and short (shorter than head plus thorax) and flattened gaster.

Type-species: *Reikosiella melina* Yoshimoto.

This genus is named after my wife, Reiko.

Reikosiella melina Yoshimoto, new species Fig. 1 a-i.

Macropterous ♀. Head metallic blue-green, with brassy reflections, surface finely reticulate, a whitish hair arising from each minute puncture. Antennal scape and pedicel honey-yellow; funicle and club aeneous, densely pubescent; funicle segments 1-3 subequal in length, 4 slightly shorter than 3, 5-7 each shorter than 4, club 3-segmented, apex acuminate; relative length of segments of funicle and club, 2.3, 2.3, 2.3, 2.0, 1.6, 1.6, 1.6: 1.6, 1.0, 1.6. Eye large, dull reddish brown.

Thorax, including legs honey-yellow. Pronotum 1.5 × as wide as long, anterior and median areas with 18-20 scattered strong black setae. Mesoscutum bordered by pair of parallel lateral ridges, and each often with a narrow longitudinal brown streak; interspace between ridges deeply concave but anteriorly with triangular raised area; axillae vertical, not on same plane with mesoscutum; scutellum triangular, raised, rotundate posteriorly, with scattered setae. Anterior margin of metepimeron with long whitish setae (fig. 1g). Forewing brownish, with 2 fuscous fasciae; relative lengths of submarginal, marginal, stigmal and postmarginal veins, 3: 3: 5: 2: 3: stigmal vein slightly curved, stigma with ancus. Metacoxa purplish, with long whitish setae.

Gaster honey-yellow; tergite 1 longer than others, posterior margin deeply concave; tergite 2 slightly less deeply concave posteriorly. Ovipositor sheath yellow, dark brown at both ends, projecting by about combined 2 tarsal segments of hind leg. Underside of gaster with a row of 6 or 7 whitish setae on anterior margin of each segment. Measurements of mesoscutum, wings, gaster and ovipositor sheath as in Table 2.

Brachypterous ♀. Similar to macropterous ♀ but wings proportionately shorter and narrower (fig. 1 a-f); fasciae of forewing often merged together and stigmal vein vestigial or absent in intergradation 2 and absent in intergradation 3 and 4; stigmal vein present in intergradation 1; Ovipositor-sheath sometimes shorter than in macropterous ♀.

Micropterous ♀. Similar to macropterous and brachypterous ♀♀ but antenna slightly more slender, pronotum 2 × as wide as long and nearly as wide as mesoscutum, posterior end of scutellum slightly wider, legs more stout and hairy, wings greatly reduced in size, forewing always only with rudimentary vein, ovipositor-sheath shorter than in brachypterous ♀.

♂. Unknown.

Holotype, a macropterous ♀ (BISHOP 8021), Mt. Kaala, Oahu, VI. 1967, C. M. Yoshimoto; 47 paratypes listed in Table 1. Paratypes deposited in the British Museum (Nat. Hist.), London, the U. S. National Museum, Washington, D. C., B. P. Bishop Museum, Honolulu, University of Hawaii, Honolulu and in the Entomology Research Institute, Ottawa, Canada.

BIOLOGICAL NOTES

Reikosiella melina was first reported by Fullaway (1947: 10) and was determined as *Solindenia* sp. The first specimen was collected by J. S. Rosa in Honolulu, Hawaii, in May 1946 on the grounds of the Hawaiian Sugar Planters' Association, Experiment Station. Later, in 1955, B. D. Burks determined (unpublished) another specimen as *Zaischnopsis* sp.

Table 1. List of specimens of *Reikosiella melina* examined and arranged according to wing reduction.

Type of Wing	Locality	Date	Collector	Total No. of specimens
Macropterous	Mt. Kaala, Oahu	VI. 1967	Yoshimoto	6
〃	〃	VIII. 1968	〃	1
〃	Makuleha, Mokuleia, Oahu	I. 1953	Hoyt	1
〃	Lanaihale, Lanai	III. 1966	Beardsley	1
〃	〃	VI. 1963	Hardy	1
〃	Lanai Mts., Lanai	XI. 1947	Krauss	1
〃	Honolulu, Oahu (HSPA Exp. Sta.)	VII. 1965	Beardsley	1
〃	Kokee, Kauai	VIII. 1955	〃	1
〃	〃	VIII. 1961	Maa, Miyatake, Yoshimoto	2
〃	Honolulu, Oahu (HSPA Exp. Sta.)	V. 1946	Rosa	1
〃	nr. Halawa Val., Molokai	IX. 1956	Beardsley	1 (18)*
〃	Kolekole Pass, Schofield, Oahu	II. 1967	Yoshimoto	1
Brachypterous 1st Intergradation	Mt. Kaala, Oahu	VI. 1967	Yoshimoto	1
〃	Kokee, Kauai	VIII. 1965	Beardsley	1
〃	nr. Halawa Val., Molokai	IX. 1956	Beardsley	1
〃	Kaunakakai, Molokai	XI. 1956	〃	1 (4)*
2nd Intergradation	Kaunakakai, Molokai	XI. 1956	〃	1
3rd Intergradation	Waipio, Oahu	XI. 1965	Beardsley	1
〃	Ewa, Oahu	III. 1960	〃	3
〃	Mama Kapu, Oahu	IX. 1968	Yoshimoto	1
〃	〃	〃	Tsuda	1
〃	Honolulu, Oahu	VIII. 1947	Williams	1
〃	Kalaupapa Lookout, Molokai	III. 1966	Beardsley	1
〃	nr. Halawa Val., Molokai	IX. 1956	〃	2
〃	Kokee, Kauai	IX. 1965	〃	1 (11)
4th Intergradation	Ewa, Oahu	X. 1955	〃	1
〃	nr. Halawa Val., Molokai	IX. 1956	〃	1
〃	Mapulehu, Molokai	X. 1954	〃	1
〃	Kokee, Kauai	VIII. 1961	Maa, Miyatake, Yoshimoto	1 (4)*
Micropterous	Kolekole Pass, Schofield, Oahu	II. 1967	Yoshimoto	2
〃	Ewa, Oahu	III. 1960	Beardsley	1
〃	〃	VIII. 1965	〃	1
〃	〃	IX. 1965	〃	1
〃	Mt. Kaala, Oahu	VII. 1945	Bianchi	1
〃	nr. Halawa Val., Molokai	IX. 1956	Beardsley	1
〃	Kalaupapa Lookout, Molokai	III. 1966	Yoshimoto	2
〃	Kokee, Kauai	VIII. 1961	Maa, Miyatake, Yoshimoto	1 (10)*

* subtotals

which was deposited in the HSPA insect collection. Since 1946, specimens have been collected from Oahu, Kauai, Molokai, and Lanai but there have been no records from Maui and Hawaii. It is of interest to note that the only rearing record is by J. W. Beardsley (unpublished), who reared specimens from *Orneodes objurgatella* Walsingham (Lepidoptera: Alucitidae) from fruits of *Canthium odoratum* (Forst.), a plant which is widely distributed in the Pacific. Swezey (1954: 171) reported that "Larvae of this moth infest the fruits of *Plectronia* [=*Canthium*-] wherever that tree is found. Moths have been reared from the following localities: Palolo, Wailupe, Kealia and Keawaula, Oahu; Kaupo and Makena, Maui; Pahala, Kau, Hawaii. Parasites reared from *Orneodes* are *Euderus metallicus* (*Ashmead*) (1901: 327) and *Eupelmus* near *aporostichus* Perkins (1910 H.: 648)." According to Zimmerman (1958: 413) *objurgatella* "is not a member of the native fauna and...it will some day be reported from its true home outside of Hawaii."

On 26 January 1967, about 20 terminal twigs of *Canthium odoratum* in various stages of fruiting were collected near Kolekole Pass, Waianae Mts., Oahu. The panicles of this plant contain clusters of about 7 to 10 fruits. Single fruits measure 5-8 mm in diameter, and the ripe fruit is dark green. The larva of *Orneodes objurgatella* attacks the developing fruit when it is small and pale green. About 30 *Canthium* fruits in various stages of maturity were examined. Many of these fruits were near maturity and contained 1 or 2 entrance holes which were probably made by *Orneodes* larvae eating their way into the fruits after hatching from eggs laid on the surface of the fruit or on nearby spikelets. A full-grown moth larva was found within one of the hard-shelled seeds.

A single female *Eupelmus* was found in an empty seed chamber of one of 30 fruits examined. In other fruits, 10 or 15 cocoons (most of them empty) of *Euderus* lay deep within the mesocarp. Empty cocoons of *Orneodes* were found inside the endocarp. The entrance to the moth larval cell was closed with a thick substance made of the same materials as that of the moth cocoons. Approximately 80-90 % of the examined fruits had been infested at one time or another with *Orneodes* larvae. In the abandoned fruits were found scattered frass, empty cocoons, living mites and in some silk webbing was on the inner wall of the seed.

Swezey (1938: 9) reported that a total of 52 *Orneodes* and 21 *Eupelmus* sp. were reared from 154 fruits of *Canthium* which were collected at Kaupo, Maui.

Only 1 macropterous and 2 micropterous females of *Reikosiella* emerged from the *Canthium* fruits collected at Kolekole Pass. They emerged on 16 and 17 February. Also, 135 *Orneodes*, 20 *Eupelmus* (10 ♀♀, 10 ♂♂) and 8 *Euderus* (4 ♀♀, 4 ♂♂) emerged during the 3 weeks (Table 2). The first ♂ and ♀ *Eupelmus* emerged 3 days after the fruits were placed in the rearing jars and the rest of the *Eupelmus* emerged within the next 22 days. *Euderus* and the plume moths emerged at about the same time. Six moths emerged on the first day, and emergence continued for the next 8 days, reaching a peak on the 6th and 7th days when 30 and 31 specimens emerged. In addition, there were 9 probably 2nd or 3rd instar larvae of *Orneodes* found dead in the rearing jar. Three ichneumonid wasps, *Pristomerus hawaiiensis* Perkins, and 9 endemic platygasterid wasps, *Fidiobia* sp., emerged from 15 to 17 February.

It may be surmised that *Pristomerus*, *Eupelmus*, *Reikosiella* and *Euderus* may be larval or pupal parasites of *Orneodes*. *Fidiobia* is probably an egg parasite of *Orneodes*.

Table 2. Measurements (in mm) of the forewing, mesoscutum, ovipositor sheath, and gaster of *Reikosiella melina*.

		Macropterous	Brachypterous				Micropterous
			1	2	3	4	
Wing	Length	1.65-1.8	1.65	1.2	0.6	0.4	0.3 -0.35
	Width	0.3 -0.5	0.5	0.5	0.25	0.1 -0.08	0.05
Mesoscutum	Length	0.5 -0.3	0.55	0.5	0.3	0.4 -0.3	0.4 -0.3
	Width	0.5 -0.3	0.5	0.5	0.3	0.3 -0.2	0.2
Ovipositor Sheath	Length	0.5 -0.3	0.3	0.3	0.3	0.15-0.2	0.15-0.2
	Width						
Gaster	Length	1.65-1.5	1.65	1.1	1.1	1.0 -1.1	1.0 -0.6
	width						

Table 3. Tabulation of insects reared from *Canthium odoratum* (Forst.) fruits, Jan.—Feb., 1967

	JAN.		FEB.																TOTAL
	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Orneodes								6	2	16	15	16	30	31	15	4				135
Reikosiella																		1	2	3
Eupelmus	2	2	2	2	2										2	1	2		5	20
Euderus							2	3	3											8
Pristomerus																	1	1	1	3
Fidiobia																	3	2	4	9

REFERENCES

Fullaway, D. T. 1947. Notes. *Proc. Haw. Ent. Soc.* **13**(1): 10.

Perkins, R. C. L. 1910. Supplement to Hymenoptera. *Fauna Hawaiiensis* **2** (4): 600-90.

Swezey, O. H. 1938. Note. *Proc. Haw. Ent. Soc.* **10** (1): 9.

1954. Forest Entomology in Hawaii. *B. P. Bishop Mus. Spec. Publ.* **44**: 266 pp.

Zimmerman, E. C. 1958. Insects of Hawaii: Lepidoptera: Pyraloidea **8**: 456 pp. Univ. of Hawaii Press, Honolulu.