

STUDIES ON MEDICALLY IMPORTANT FLIES IN THAILAND II.
RECORD OF FOUR SPECIES OF *LUCILIA*
ROBINEAU-DESVOIDY
(Diptera: Calliphoridae)

BY

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ABSTRACT

As for the genus *Lucilia*, only one species, *Lucilia papuensis* Macquart, has been recorded by R. Senior-White *et al.* in Thailand. During our survey in Thailand in 1975, we found newly 3 more species belonging to the genus *Lucilia*. These are *L. cuprina* (Wiedemann), *L. porphyrina* (Walker) and *L. sinensis* Aubertin. The female of *L. sinensis* has never been reported. Therefore, the female genitalia of *L. sinensis* are illustrated in this paper and compared with those of *L. papuensis*. The male genitalia of *L. sinensis* and *L. papuensis* are also illustrated in this paper.

INTRODUCTION

Some species of this group are very important myiasis-producing flies. Usually, they are scavengers, but frequently invade the injured human tissue¹⁾. In most instances the damages produced by these larvae are traumatic, such as extension of the preexisting wounds, but there are several records of at least temporary parasitism in the nares, adjacent sinuses and buccal cavities, intestinal tract and external ear²⁻⁴⁾. Beside these, some cases of enteric myiasis caused by the member of this group have been reported, and the clinical symptoms of this type of myiasis are sometimes severe. These, however, depend on the number of fly larvae and their location in the digestive tract. In

severe infestation, there are nausea, vertigo and more or less violent pain in the abdomen, and sometimes diarrhea with discharge of blood may occur as the result of injury of the intestinal mucosa by the larvae^{5,6)}. In addition, these flies inhabit in filthy places, therefore it is easy to understand that they carry pathogenic organism to human food, such as poliovirus⁷⁾. Moreover, sheep or cow myiasis caused by certain members of this group is the severest problem to the breeders in many countries, not only damaging the wool fiber but also causing secondary bacterial infections. Parasitized animals may refuse to feed, and death may occur, probably as the result of toxemia or even septicemia⁸⁻¹¹⁾.

This report is based on our collection of

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calliphorid flies in Thailand and on the zoogeographical survey of the dipterous insects of medical importance in the South Pacific Area (Tokyo Medical & Dental University Overseas Scientific Research Project, August to December 1975).

Examination of the material has revealed the presence of four species of the genus *Lucilia*. Three of them are newly recorded in Thailand, namely *L. cuprina*, *L. porphyryna* and *L. sinensis*. The female of *L. sinensis* has never been reported, therefore its sternites and ovipositor are illustrated in this paper and compared with those of *L. papuensis*. The male genitalia of *L. sinensis* and *L. papuensis* are also illustrated in this paper.

KEY TO THE SPECIES OF *LUCILIA*
IN THAILAND

1. Postsutural *ac* 3 pairs; basicosta light brown; subcostal sclerite pubescent; body cupreous in color
..... *L. cuprina* (Wiedemann)
Postsutural *ac* 2 pairs; basicosta fuscous black; subcostal sclerite with several upstanding hairs; body metallic green, blue or purple in color 2
2. Anterior pair of postsutural *ac* usually more advanced than the second pair of postsutural *dc*; 3rd to 5th abdominal tergites without dark marginal bands posteriorly
..... *L. porphyryna* (Walker)
Anterior pair of postsutural *ac* on the level with or slightly posterior to the second pair of postsutural *dc*; 3rd to 5th abdominal tergites with dark marginal bands posteriorly 3
3. Anterior part of upper squama of male creamy or fuscous, usually with a tuft of blackish brown (sometimes brown) hairs at the inner lower margin; upper and lower squamae of female entirely creamy; narrowest part of

male frons sometimes broader than the distance between both posterior ocelli; metacephalon usually with black hairs; occiput with more than 2 irregular rows of black postocular setae; frontal index in female 0.24 to 0.25 *L. papuensis* Macquart

Anterior part of upper squama creamy, with a tuft of yellowish white hairs at the inner lower margin; lower squama usually infuscated; narrowest part of male frons narrower than the distance between both posterior ocelli; metacephalon with several yellowish hairs; occiput with only one row of black postocular setae; frontal index in female 0.19 to 0.20
..... *L. sinensis* Aubertin

DESCRIPTION

Lucilia porphyryna (Walker)

Musca porphyryna Walker, 1857. J. Proc. Linn. Soc. Lond. 1:24.

Body length: 5.0 to 10.0 mm.

Head: Frons narrow, about the same width as the ocellus in the male, but about the same width as one eye in the female; parafrofrontalia dark brown with silvery sheen; gena and metacephalon black with numerous black hairs and posterior part of metacephalon with yellow hairs; antennae dark brown, 3rd segment about four times as long as the 2nd, arista plumose and dark brown; palpi orange. Thorax: Scutum metallic blue to purple, slightly dusted in front; *ac* 2+2, *dc* 3+3, *ia* 1+2, *prs* 1, *h* 3, *ph* 3, *n* 2, *sa* 3, *pa* 2, *acs* 1, *dsc* 1, *lsc* 3; upper part of propleuron hairy; suprasquamal ridge with numerous black hairs; spiracles dark brown. Wings: Hyaline, slightly infuscated anteriorly and basally; basicosta dark brown; subcostal sclerite with stiff black hairs; upper squamae light brown; lower squamae dark brown and bare; halteres brown. Legs: Femora and

tarsi dark brown to black; tibiae brown, mid tibia with 1 *ad.* Abdomen: Metallic blue to purple tergites with numerous black hairs.

Specimens examined: THAILAND: 1 ♀, Doi Inthanon, Chiang Mai, 19, XII, 1975, Shinonaga; 2 ♂♂, 4 ♀♀, Ban Yang, 1400 m, Doi Inthanon, 19 and 23, IX, 1975, Kano, Kurahashi and Tumrasvin; 2 ♂♂, 23 ♀♀, nr. Top, 2300 m, Doi Inthanon, 17, IX, 1975, Kano and Kurahashi; 6 ♂♂, 24 ♀♀, Top, 2667 m, Doi Inthanon, 19, IX, 1975, Kano and Kurahashi; 15 ♂♂, 23 ♀♀, Doi Pui, 1685 m, Chiang Mai, 16, IX, 1975, Kano, Kurahashi and Tumrasvin; 1 ♀, Ban Pong Din, 10 km N.E. Doi Saket, 20, IX, 1975, Kurahashi; 1 ♂, Hill, 300 m, Sa Kaeo, 30 km S.E., 3, IX, 1975, Kurahashi; 1 ♀, Doi Suthep, Chiang Mai, 20 and 21, XII, 1975, Shinonaga; 1 ♂, nr. Burma border, 1200 m, Fang, 26, IX, 1975, Tumrasvin; 1 ♀, Erawan Waterfall, 500 m, Kanchana Buri, 7, IX, 1975, Kano; 1 ♂, Sai Yok, 500 m, Kanchana Buri, 9–13, XII, 1975, Shinonaga; 2 ♀♀, nr. Sai Yok, 500 m, Kanchana Buri, 11, IX, 1975, Kurahashi; 8 ♂♂, 16 ♀♀, Khao Khiaw, 1351 m, 80 km S. Pak Chong, 3 and 6, X, 1975, Kurahashi; 1 ♂, 2 ♀♀, Khao Yai, 366 km S. Pak Chong, 5 and 6, X, 25 and 26, XII, 1975, Kurahashi, Tumrasvin and Shinonaga, 3 ♂♂, 2 ♀♀, Khao Yai, 800 m 60 km S. Pak Chong, 3 and 6, X, 1975, Kano and Tumrasvin.

Distribution: India, Sri Lanka, Malaysia, Thailand, China, Hong Kong, Taiwan, Indonesia, Philippines, Japan and Australia.

Bionomics: This is one of the mountainous species found throughout the year, especially in the summer. The adults are often found in the houses. The larvae feed on decaying animal matter. We studied the life cycle of this species in the laboratory with $27 \pm 1^\circ\text{C}$ and a relative humidity of 80 to 85%. It was revealed that the eggs hatched within

1 day after oviposition, and the larval stage, pupal stage and the life span of the adult took about 5 to 7, 6 to 8 and 22 to 35 days, respectively.

Remarks: The first pair of postsutural *ac* is more advanced than the second pair of postsutural *dc*.

Lucilia papuensis Macquart

Lucilia papuensis Macquart, 1842. Dipt. Exot. 2: 141.

The general external appearance is similar to that of the former species except for the following characters:

Body length: 4.0 to 9.0 mm. Thorax: Scutum metallic yellowish to bluish green; upper part of propleuron sometimes bare; anterior part of upper squama creamy or entirely fuscous, usually with a tuft of blackish brown hairs at the inner lower margin. The anterior pair of postsutural *ac* is on the level with or slightly posterior to the second pair of postsutural *dc*. Abdomen: Tergites metallic yellowish to bluish green; posterior margins of tergites with dark green bands. Female sternites and ovipositor are shown in Plate 1.

Specimens examined: THAILAND: 8 ♂♂, 19 ♀♀, Hill, 300 m, 30 km S.E. Sa Kaeo, 3, IX, 1975, Kano and Kurahashi; 14 ♂♂, 4 ♀♀, Fang Experiment Station, 500 m, Fang, 25, IX, 1975, Kano and Kurahashi; 6 ♂♂, 1 ♀, nr. Burma border, 1200 m, Fang, 26, IX, 1975, Kano, Kurahashi and Tumrasvin; 1 ♂, 1 ♀, Doi Huai Hwer, 1231 m, Fang, 27, IX, 1975, Kano and Kurahashi; 21 ♂♂, 27 ♀♀, Ban Yang, 1400 m, Doi Inthanon, 17, 19 and 23, IX, 1975, Kano, Kurahashi and Tumrasvin; 1 ♂, 4 ♀♀, Top, 2667 m, Doi Inthanon, 23, IX, 1975, Kano and Kurahashi; 3 ♂♂, 2 ♀♀, Nam Tok Mae Klang, Doi Inthanon, 18, IX, 1975, Kano; 3 ♂♂, 1 ♀, Doi Pui, 1685 m, Chiang Mai, 16, IX, 1975, Kano, Kurahashi and Tumrasvin; 1 ♂,

Chiang Mai University, 22, IX, 1975, Kurahashi; 1 ♀, Ban Pong Din, 10 km N.E. Doi Saket, 20, IX, 1975, Kurahashi; 1 ♂, 6 ♀ ♀, Khao Yai, 30 km S. Pak Chong, 6, IX, and 25–26, XII, 1975, Kano, Kurahashi, Tumrasvin and Shinonaga; 1 ♀, nr. Ban Sap Bon, 30 km E. Sara Buri, 4, X, 1975, Kurahashi; 6 ♂ ♂, 1 ♀, Erawan Waterfall, 500 m, Kanchana Buri, 5, 7 and 10, IX, 1975, Kano and Kurahashi; 24 ♂ ♂, 23 ♀ ♀, nr. Sai Yok, 500 m, Kanchana Buri, 7, 8, 9 and 11, IX and 9–13, XII, 1975, Kano, Kurahashi, Tumrasvin and Shinonaga.

Distribution: India, Sri Lanka, Malaysia, Thailand, Indonesia, New Guinea, China, Philippines, Japan, Australia and Melanesia.

Bionomics: The adults were highly abundant in the summer and frequently gathered on earthworms. Breeding media are unknown.

Lucilia sinensis Aubertin

Lucilia sinensis Aubertin, 1933, J. Linn. Soc. Lond., 38: 407.

This species is closely related to *L. papuensis* in the external characters of both sexes except for the following characters:

Body length: 9.0 to 12.0 mm; large species. Head: Male holoptic, frons much narrower than that of *L. papuensis*. Thorax: Anterior part of upper squama creamy white, usually with a tuft of yellowish white hairs at the inner lower margin, lower squama brown. Female sternites and ovipositor are shown in Plate 2.

Specimens examined: THAILAND: 4 ♂ ♂, 3 ♀ ♀, Sai Yok, 500 m, Kanchana Buri, 9–13, XII, 1975, Shinonaga; 3 ♂ ♂, Erawan Waterfall, Kanchana Buri, 10, XII, 1975, Shinonaga; 5 ♂ ♂, 1 ♂, Khao Yai, 30 km S. Pak Chong, 24–26, XII, 1975, Shinonaga and Shima; 2 ♀ ♀, Doi Pui, 1685 m, Chiang Mai, 16, IX, 1975, Kurahashi.

Distribution: China, Nepal and Thailand.

Bionomics: This species is a mountainous species and seems to be commonly found in the winter. The life history of this species is unknown.

Lucilia cuprina (Wiedemann)

Musca cuprina Wiedemann, 1830, Auss., Zweifl. Ins., 2: 654.

Body length: 4.0 to 6.0 mm. Head: Eyes dichoptic; frons about a half width of one eye in the male, but a little wider than one eye in the female; parafrontalia dark brown with silvery sheen; gena and metacephalon dark brown to black, upper part of metacephalon with light brown hairs; antennae dark brown, 3rd antennal segment two times as long as the 2nd; arista plumose and dark brown. Thorax: Scutum metallic copper with whitish pollen entirely; *ac* 2+3, *dc* 3+3, *ia* 1+3, *prs* 1, *h*, 3, *ph* 3, *n* 2, *sa* 3, *pa* 2, *asc* 1, *dcs* 1, *lsc* 3; upper part of proleuron hairy; suprasquamal ridge with numerous black hairs; spiracles dark brown. Wings: Hyaline, slightly infuscated anteriorly and basally; basicosta light brown; subcostal sclerite pubescent; upper squama creamy white, lower squama light brown and bare; halteres dark brown. Legs: Brownish black; 1 *ad* on mid tibia. Abdomen: Tergites metallic copper with numerous black hairs.

Specimens examined: THAILAND: 6 ♂ ♂, 3 ♀ ♀, Muan Ngai, 20, X, 1961, Imadate; 4 ♂ ♂, 4 ♀ ♀, Kaper, 2, I, 1962, Imadate; 2 ♀ ♀, Sara Buri, 3, X, 1961, Imadate; 1 ♀, Kok Kloi, 3, I, 1962, Imadate; 1 ♂, Kra Buri, 1, I, 1962, Imadate; 6 ♂ ♂, 4 ♀ ♀, Beach, 30 km S. Chon Buri, 30, VIII, 1975, Kano and Kurahashi; 2 ♂ ♂, 2 ♀ ♀, Doi Inthanon, Chiang Mai, 22 and 23, IX, and 19, XII, 1975, Kano, Shinonaga and Tumrasvin; 2 ♀ ♀, Doi Huai Hwer, 1231 m, Fang, 27, IX, 1975, Kurahashi; 1 ♂, Chiang Mai University, 22, IX, 1975, Tumrasvin; 1 ♂, 1 ♀, Nam Tok Mae Klang, Doi Inthanon, 18, IX, 1975,

Tumrasvin; 4 ♀♀, Hill, 30 m, S.E. 30 km Sa Kaeo, 3, IX, 1975, Kurahashi; 1 ♂, 1 ♀, Erawan Waterfall, 500 m, Kanchana Buri, 5, IX, 1975, Kano and Kurahashi; 2 ♀♀, nr. Sai Yok, 500 m, Kanchana Buri, 6, IX, 1975, Kurahashi; 1 ♀, Town, Sara Buri, 2, X, 1975, Kano; 1 ♂, Mahidol University, Bangkok, 26, VIII, 1975, Kano; 1 ♀, Bangkok, 23, VII, 1964, Kano; 3 ♀♀, Bangna Nai, Bangkok, 28, VIII, 1975, Kano and Kurahashi.

Distribution: Japan, Taiwan and China and widely distributed in South Asia, Hawaii, Australia, Africa and North and South America.

Bionomics: This species is very common in Thailand, highly abundant on garbage pile, animal feces, carrion, seashore, around houses, in market places, etc. The larvae feed on dead animals and animal feces.

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EXPLANATION OF FIGURES

Plate 1. *Lucilia papuensis* Macquart

- Fig. 1. Sixth to 9th sternites of female
 Fig. 2. Sixth to 9th tergites of female
 Fig. 3. First to 5th sternites of female

Plate 2. *Lucilia sinensis* Aubertin

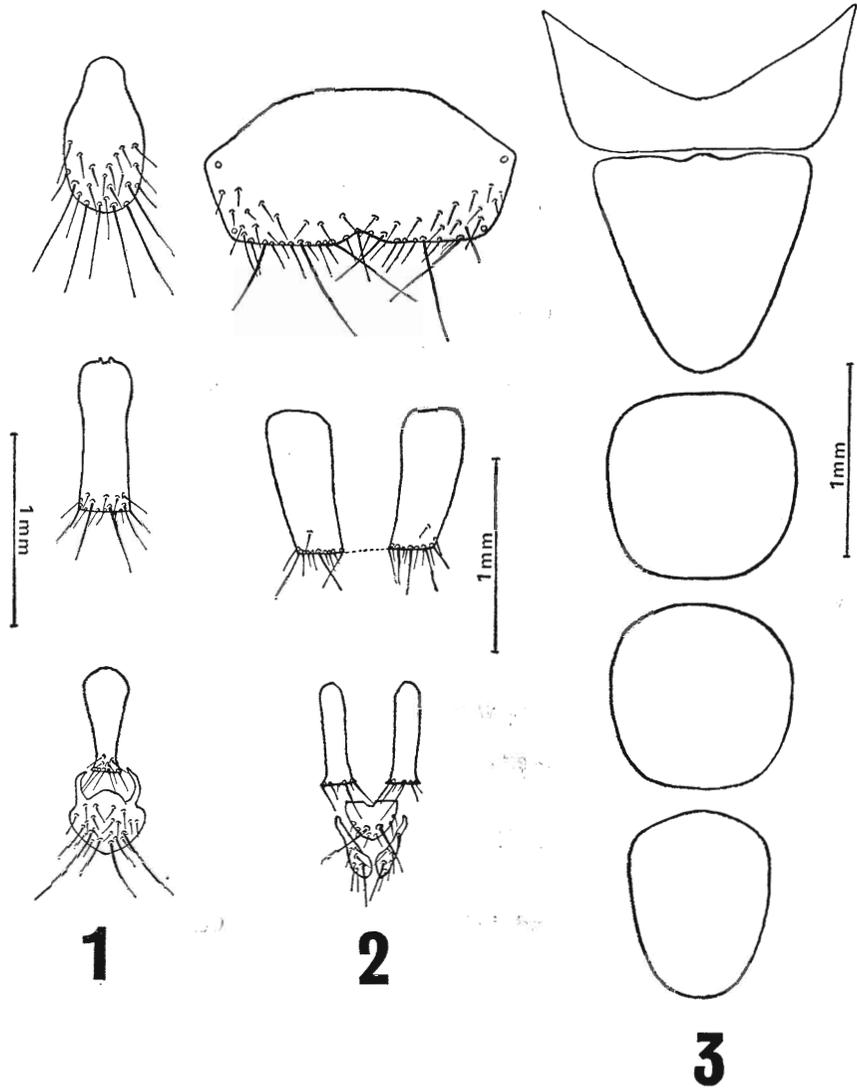
- Fig. 4. Sixth to 9th sternites of female
 Fig. 5. Sixth to 9th tergites of female
 Fig. 6. First to 5th sternites of female

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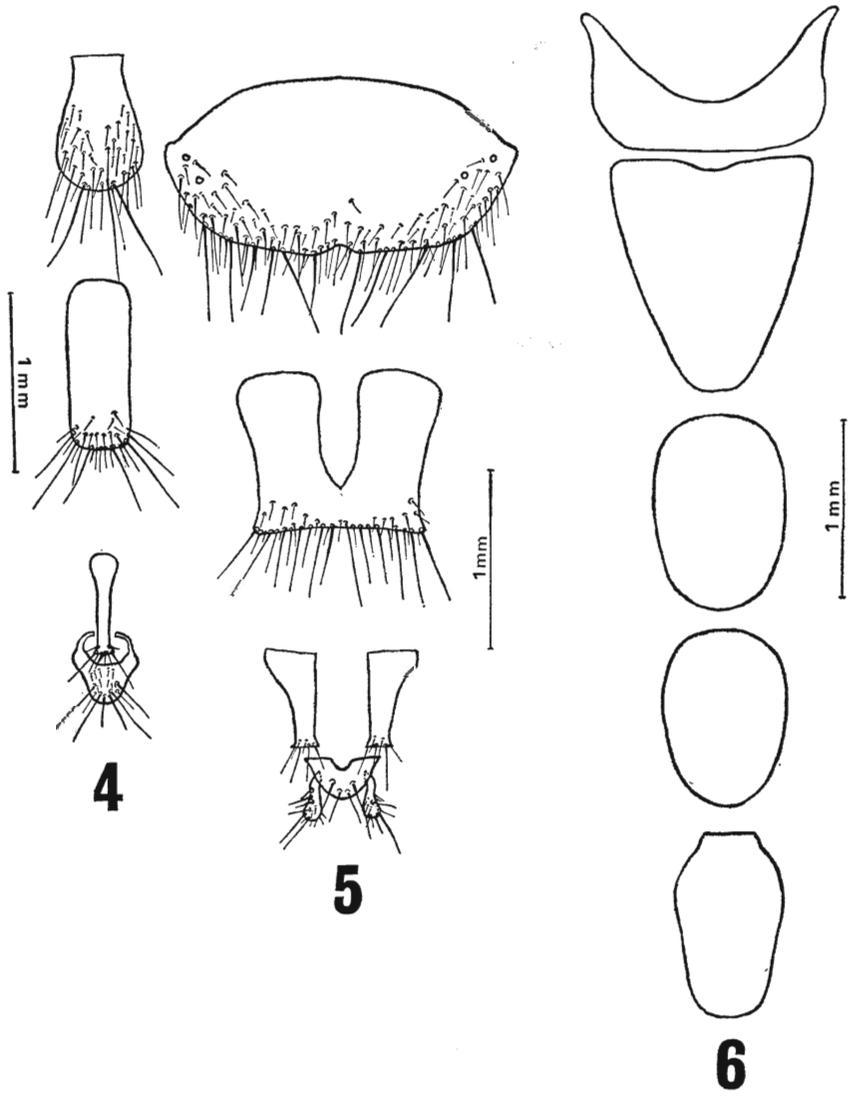
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Plate 3. Male genitalia of *L. papuensis* and *L. sinensis*

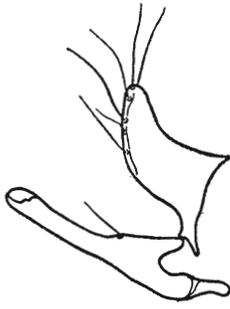
- Fig. 7. Anterior and posterior parameres of *L. papuensis*
 Fig. 8. Phallosome of *L. papuensis*
 Fig. 9. Inner and outer forceps of *L. papuensis*
 Fig. 10. Anterior and posterior parameres of *L. sinensis*
 Fig. 11. Phallosome of *L. sinensis*
 Fig. 12. Inner and outer forceps of *L. sinensis*



Lucilia papuensis Macquart

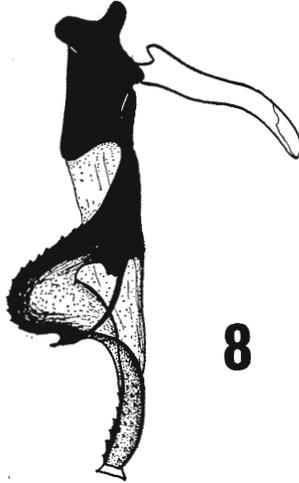


Lucilia sinensis Aubertin

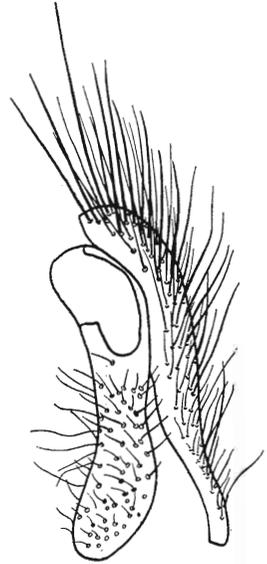


0.3 mm

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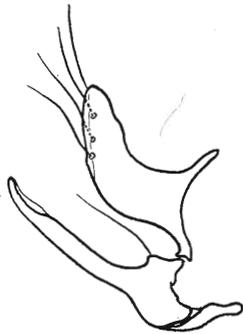


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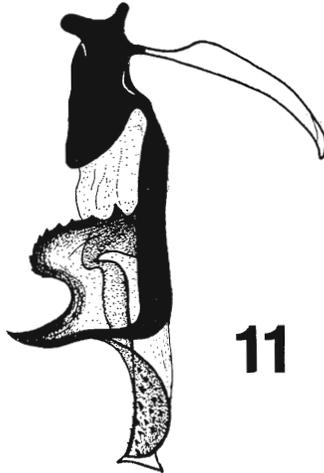
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Lucilia papuensis Macquart

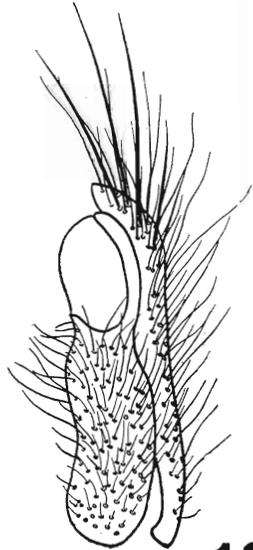


0.3 mm

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11



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Lucilia sinensis Aubertin