

**PHILIPPINE SPECIES OF *ILLEIS* MULSANT
(COLEOPTERA: COCCINELLIDAE: COCCINELLINAE:
PSYLLOBORINI)¹**

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ABSTRACT

The genus *Illeis* is represented by two species in the Philippines. This includes the endemic *I. luzonica* Timberlake and the introduced *I. koebelei* Timberlake. On the other hand, *I. koebelei* is represented by 2 subspecies, namely, *I. k. koebelei* Timberlake and *I. k. amamiana* Miyatake. Descriptions and key to the species and subspecies are provided.

Key words: Coccinellidae, Psylloborini, *Illeis* spp., *I. luzonica* Timberlake, *I. koebelei koebelei* Timberlake, *I. koebelei amamiana* Miyatake, mycetophagous

INTRODUCTION

Ladybird beetles have remained very conspicuous to both taxonomists and non-taxonomists due to their size and colorful elytra. They represent one of the most important predaceous groups proven to be gregarious and effective in relation to pest management. They are not host-specific but feed on a wide range of hosts like aphids, coccids, scale insects, thrips, mites, immature forms of other insect groups and even fungi. The fungal feeders or mycetophagous forms belong to the tribe Psylloborini. These mycetophagous beetles are known to feed on powdery mildew, *Phyllactinia* sp on false cucumber (*Coccinea grandis* L.) and *P. corylea* on mulberry (*Morus alba* L.) (Reddy *et al.*, 1989). In some instances, they feed on mites found underneath the leaves of *C. grandis* and aphids on other host plants.

The taxonomy of the Psylloborini group has been studied in other countries like Japan (Sasaji, 1971), New Guinea (Jadwiszczak, 1987), Australia (Pope, 1988) and China (Jing, 1986). In the Philippines, it has not been given much emphasis, even if numerous specimens are collected and seen in the field. So far, only the genus *Illeis* Mulsant is represented, with only one endemic species, *luzonica* Timberlake, whose male holotype was collected in Los Baños, Laguna by F. X. Williams (Timberlake, 1943). Another species is added to the Philippine fauna as new record, with its nominate subspecies *koebelei* and subspecies *amamiana*.

This paper aims to provide and update taxonomic information regarding the existence of *Illeis* in the Philippines.

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TAXONOMIC DESCRIPTIONS

Tribe Psylloborini Casey

Psylloborini Casey, 1899, 7: 93, 100.

Halyziini Capra, 1927, 60: 158.

Type genus: *Psyllobora* Chevrolat, 1849

Body small to medium; dorsum glabrous but slightly convex. Head narrow in front of antennal insertions. Mandible apically multi-denticulate, rarely bifid (Fig. 1a). Galea of maxilla extremely broad. Antennal insertions distant from eyes. Antenna 11-segmented. Ant VI and Ant VIII relatively shorter than other segments (Fig. 1b). Lateral sides of anterior margin of clypeus not distinctly prominent anteriorly. Prosternum carinate. Elytra usually short oval or slightly hemispherical; dorsum slightly glabrous. Femoral line of 1st abdominal sternite incomplete (Fig. 1c). Tibial spurs absent. Claws with simple basal tooth. Usually mycetophagous forms.

Remarks

The tribe is most closely related to Coccinellini which differs from the latter in a number of characters (Korschefsky 1931, 1932) as in Table 1. In the Philippines, there exists only one genus which is *Illeis* with 2 species.

Table 1. Distinction of the tribe Psylloborini from tribe Coccinellini.

CHARACTERS	COCCINELLINI	PSYLLOBORINI
Head	rarely narrowed in front of antennal insertions	narrowed in front of antennal insertions
Mandible	apically bifid with basal tooth	apically multidenticulate
Antennal segments VI and VIII	equal in length with the other segments	relatively shorter than the other segments
Tibial spurs	distinct or indistinct	absent
Basal tooth of claws	simple, appendiculate or bifid	simple

Genus *Illeis* Mulsant

Psyllobora (*Illeis*) Mulsant 1850:166, 1026; 1853:153; 1856:127. Type species: *Illeis cincta* Fabricius, by subsequent designation, Korschefsky, 1932:558.

Illeis Mulsant: Crotch, 1871:4; Korschefsky, 1932:558; Timberlake, 1943:42; Iablokoff-Khnzorian, 1979:63; 1982:282.

Leptothea Weise, 1898:227; Korschefsky, 1932:570; Bielawski, 1961:354. Type species: *Psyllobora galbula* Mulsant, by original designation. Synonymized by Timberlake, 1943:42.

Illeis (*Leptothea*) Weise: Iablokoff-Khnzorian, 1979:63; 1982:282.

Outlines and dorsal patterns yellow and black. Antennae at least 2x as long as minimum frontal width, club segments loosely articulated, Ant VIII much smaller and narrower than Ant IX; each of Ant IX and Ant X strongly wide apically and entirely longer than wide.

Anterior clypeal margin rarely arcuate without projections. Frons narrow, about 1/3 as wide as head. Terminal segment of maxillary palpi strongly transverse triangular, expanded laterally while apical margin arcuated (Fig. 1d). Prosternal process with parallel carinae (Fig. 1e). Elytral epipleura at most 1/4 as broad as metathorax; longitudinally without foveae and not reaching elytral apex. Abdomen with postcoxal plates of 1st sternite with boundaries more or less obliterated for external half; (male) with apices of 5th and 6th abdominal sternites shallowly emarginate medially; (female) with apex of 5th sternite not emarginate, of 6th with a deep, V-shaped median notch. Tibiae narrow and simple without spurs. Tarsal claw with a quadrate tooth basally.

Distribution

Australia, China, Taiwan (Formosa), India, Japan, New Guinea, Southeast Asia including the Philippines.

Remarks

According to Pope (1988), the genus is very distinct from other halysiine genera in the structure of the antennae and maxillary palpi. Mulsant (1850) placed the species of *Illeis* under *Psyllobora* as a subgenus. He indicated that his key line should have preceded *P. galbula*, instead of *P. cincta* and substituted *Illeis* for *Egleis*. In the body of his work, he included *P. cincta* (Fabr.) and *P. bistigmata* Mulsant under *Egleis*, and in the appendix added *P. galbula* Mulsant, under the substitute name, *Illeis*. He then designated *Psyllobora galbula* Mulsant as type species of *Illeis*.

Weise, overlooking *Illeis*, proposed *Leptothea* (1898 Arch. Naturges. 64:227), with *Psyllobora galbula* as type.

Mulsant's subgenus *Illeis*, raised to generic status by Crotch in 1871 but apparently forgotten by him in 1874 and synonymized with *Halyzia* in the Gemminger and Harold catalogue of 1876, was resurrected by Korschefsky (1932). The most recent publications on *Illeis* (Iablokoff-Khnzorian, 1979, 1982) continue to recognize its generic rank, but with *Leptothea* as an included subgenus rather than a synonym. According to Iablokoff-Khnzorian, *Leptothea* may be distinguished from the nominate subgenus by its relatively wide frons, smaller and more finely faceted eyes and by genitalic differences. The head characters of *Illeis* (*Leptothea*) *galbula* alone are also possessed by a new species described in his 1982 paper. This additional evidence, coupled with geographical isolation of the two species, lends support to Khnzorian's contention and his rankings are adopted here.

Key to Philippine Species of *Illeis*

- 1 Pronotum entirely pale without any markings *luzonica* Timberlake
- Pronotum with black basal markings 2
- 2(1) Basal marks of pronotum small; median lobe of tegmen very slender, acicular, compressed at base, almost perfectly straight; paramere strongly curved; siphon slender, cylindrical, gradually tapering from base.....
..... *koebelei koebelei* Timberlake
- Basal marks of pronotum large; median lobe not slender, not straight; nearly as long as lateral lobes; siphon not so slender, gradually curved
..... *koebelei amamiana* Miyatake

1. *Illeis koebelei amamiana* Miyatake

(Fig. 2)

Illeis koebelei amamiana Miyatake, 1959: 158.

Pronotum with two large basal black markings usually quadrate; 1/3 antero-lateral sides translucent (Fig. 2a). Elytra yellow to yellowish brown. Thorax, abdomen and legs yellowish-brown or tawny.

Labium and labial palpi much shorter than *koebelei koebelei*. Antenna more slender and long; apex longer than broad relatively quadrate apically; apically larger than that of *koebelei koebelei*; Ant VI and VIII about half length of other segments; Ant X transverse (Fig. 2b). Pronotum with anterior margin arcuate; lateral angles orbicled or rounded; lateral and basal margins subangulate. Elytra broader than long. Female genitalia as in Fig. 2c & 2d. In male, lateral lobes of tegmen nearly as long as median piece of tegmen, as in Fig. 2e & 2f.

Size

Length 3.3-4.8 mm; width 2.5-3.7 mm.

Specimens Examined

LUZON. 1, Mt. Makiling, Laguna, on *C. grandis* preying on mites and feeding on powdery mildew, 9-X-1992, J.D. Recuenco (UPLB); 1, Mt. Makiling, Laguna, on *Citrus* sp. preying on *Toxoptera citricidus* (Kirkaldy), 14-X-1992, J.D. Recuenco (UPLB); 1, Umali Subd., Los Baños, Laguna, on *Vigna* sp. preying on *Aphis craccivora* Koch, 21-XII-1994, J.D. Recuenco; 1, Mt. Makiling, Laguna, on *Vigna* sp. preying on *Empoasca terminalis* Dworakowska and Pawar, 24-IX-1994, J.D. Recuenco (NAC); 1, Odell Plt., 20-IX-1955, G.B. Viado; 1, Abbag, Maddela, Quirino, 24-III-1977, L.A.C. Raros. MINDANAO. 11, Tra'ansafe, T'boli, South Cotabato, 22-IV-1993, J.D. Recuenco.

Remarks

Illeis koebelei amamiana differs from *koebelei koebelei* Timberlake in having a largely quadrate pronotal marking and a relatively narrow distance between spots. Moreover, the process of the siphon is relatively reduced, as in Fig 2f.

2. *Illeis koebeli koebeli* Timberlake

(Fig. 3)

Illeis koebeli Timberlake, 1943: 44, 61; Nakane, 1963: 212.

Illeis koebeli Miyatake, 1959: 155.

Illeis cinta Lewis, 1873: (nec Fabricius, 1798): 135.

Thea cinta Crotch, 1874: (nec Fabricius, 1798), p. 135.

Verania discolor Yokoyama, 1931 (nec Fabricius, 1798): p. 2.

Head opaque white with antennae and mouthparts pale tawny. Pronotum opaque white with a pair of black spots at base; black spot nearly orbicled, about 1/5 as wide as pronotum and touching basal margin of pronotum (Fig. 3a). Elytra totally pale yellow without any markings. Venter and legs tawny.

Ocular border thin. Antenna long and thin; scape longer than broad; Ant VI and VIII shorter than other segments except for Ant II which is broader. Ant X longer than broad; apex slightly rounded or arcuate (Fig. 3b). Elytral lateral margins slightly explanate; longer than broad. Female genitalia as in Fig. 3c & 3d. Male genitalia as in Fig. 3e & 3f.

Size

Length 3.5-5.1 mm; Width 2.7-4.0 mm

Specimens Examined

LUZON. 11, Mt. Makiling, Laguna on *Citrofortunella microcarpa* (Bunge) Wijmand preying on *Toxoptera odinae* (van der Goot), 11-IX-1994, J.D. Recueno (NAC); 9 6, Mt. Makiling, Laguna, on *C. grandis* preying on mites and feeding on powdery mildew (*Ptylactinia* sp.), 29-I-1995, J.D. Recueno (UPLB); 1, Tabaco, Albay, on *C. microcarpa* preying on *T. odinae*, 14-I-1993, J.D. Recueno (BPI); 5 2, Umali Subd., Los Baños, Laguna, on *C. grandis* preying on mites and feeding on powdery mildew, 21-XII-1994, J.D. Recueno; 1, Mt. Makiling, Laguna, 24-IX-1994, J.D. Recueno (NAC); 1, Floridablanca, Pampanga, on *Arachis hypogaea* L. preying on *Aphis craccivora* Koch., 2-I-1995, J.D. Recueno; 1, Los Baños, Laguna, 11-XII-1945, F.B. Calora; 1, Nasugbu, Batangas, 17-IV-1956, S.M. Cendaña; 1, Gonzaga, Cagayan, 19-IV-1971, L.A.C. Raros; 3, Baua, Gonzaga, Cagayan, 19-IV-1971, L.A.C. Raros. MINDANAO. 2, Tra'ankine, T'boli, South Cotabato, 21-IV-1993, J.D. Recueno.

Remarks

Originally, the species was designated only as *I. koebeli*. However, Miyatake (1959) retrieved another form from the same collection series which he designated as another subspecies, *I. koebeli amamiana*. The latter has large dark markings on the pronotum while these markings are small in the nominal subspecies, *I. koebeli koebeli* Timberlake. Sasaji (1971) also noted the same distinction from *I. cincta* (Lewis) which was subsequently found to be synonymous with the nominal subspecies.

I.k. koebeli was observed during collections to be dominantly associated with *I.k. amamiana* and both were found to be feeding on mites and powdery mildew on *Coccinea grandis* L. However, *I.k. koebeli* was observed to be feeding on the powdery mildew, *Sphaerotheca* sp., on leaves of niger (*Guizotia abyssinica*) in India (Dhapur et al., 1990).

3. *Illeis luzonica* Timberlake

(Fig. 4)

Illeis luzonica Timberlake, 1943: 44.

Adult medium sized, short oval; pronotum pale yellow without any markings (Fig. 4a). Elytra entirely light yellow without any markings.

Labrum not strongly angulate. Antennae shorter compared with *koebelei* and not strongly truncate apically (Fig. 4b). Galea of maxilla not as elongately broad as in *koebelei*. Prosternal process quadrate and carinate. Hemisternite broad and simple (Fig. 4c). Receptaculum siminis relatively shorter and narrower than in *koebelei* (Fig. 4d).

According to Timberlake (1943), the parameres are slender, straight, inserted very closely together and cirrate at apex. Siphon slightly more slender than in *amboinensis*.

Size

Length 3.8 mm; width 3 mm.

Specimens Examined

LUZON, 1, Guinobatan, Albay, 1-V-1989, M. Zipagan; 1, Mt. Makiling, Laguna, on *C. grandis* preying on mites and powdery mildew, 21-VIII-1994, J.L. Adorada (UPLB).

Remarks

The holotype was collected from Los Baños, Laguna, Philippines, July, 1916 (F. X. Williams) and 1 paratype was taken from the same locality, March-June, 1925.

The species was collected with the rest of *Illeis* species on *Coccinea grandis* (L.). However, a male specimen was not retrieved.

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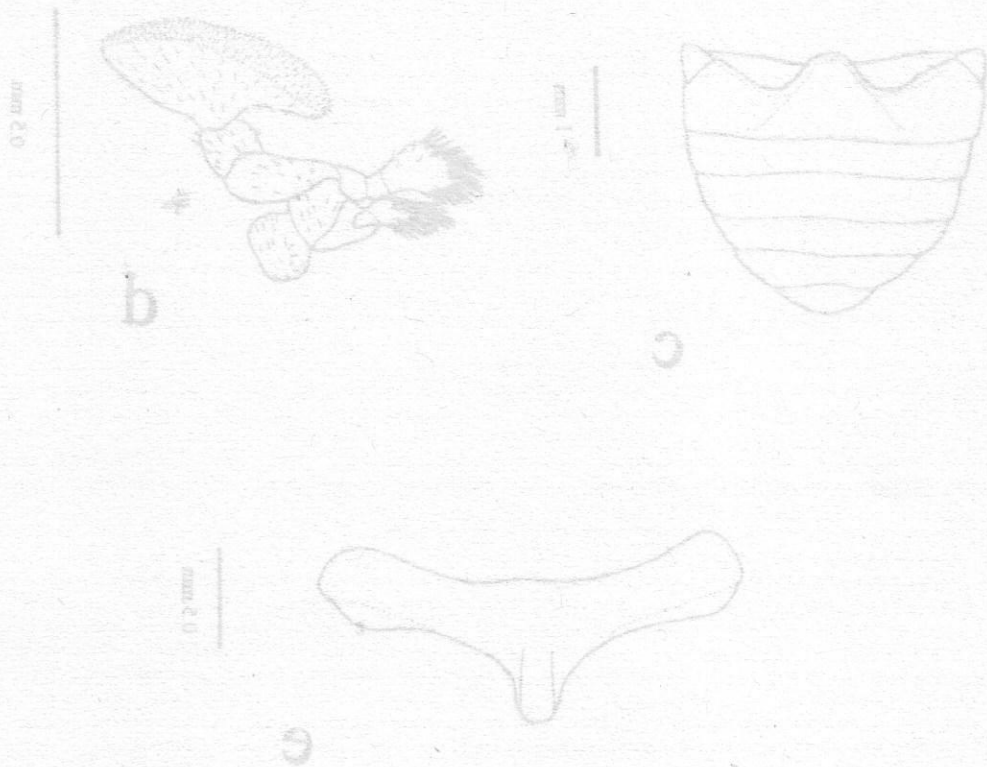


Figure 1. Tribe Psyllorini: a, mandible; b, antenna; c, abdomen; d, maxilla; and e, proctodum.

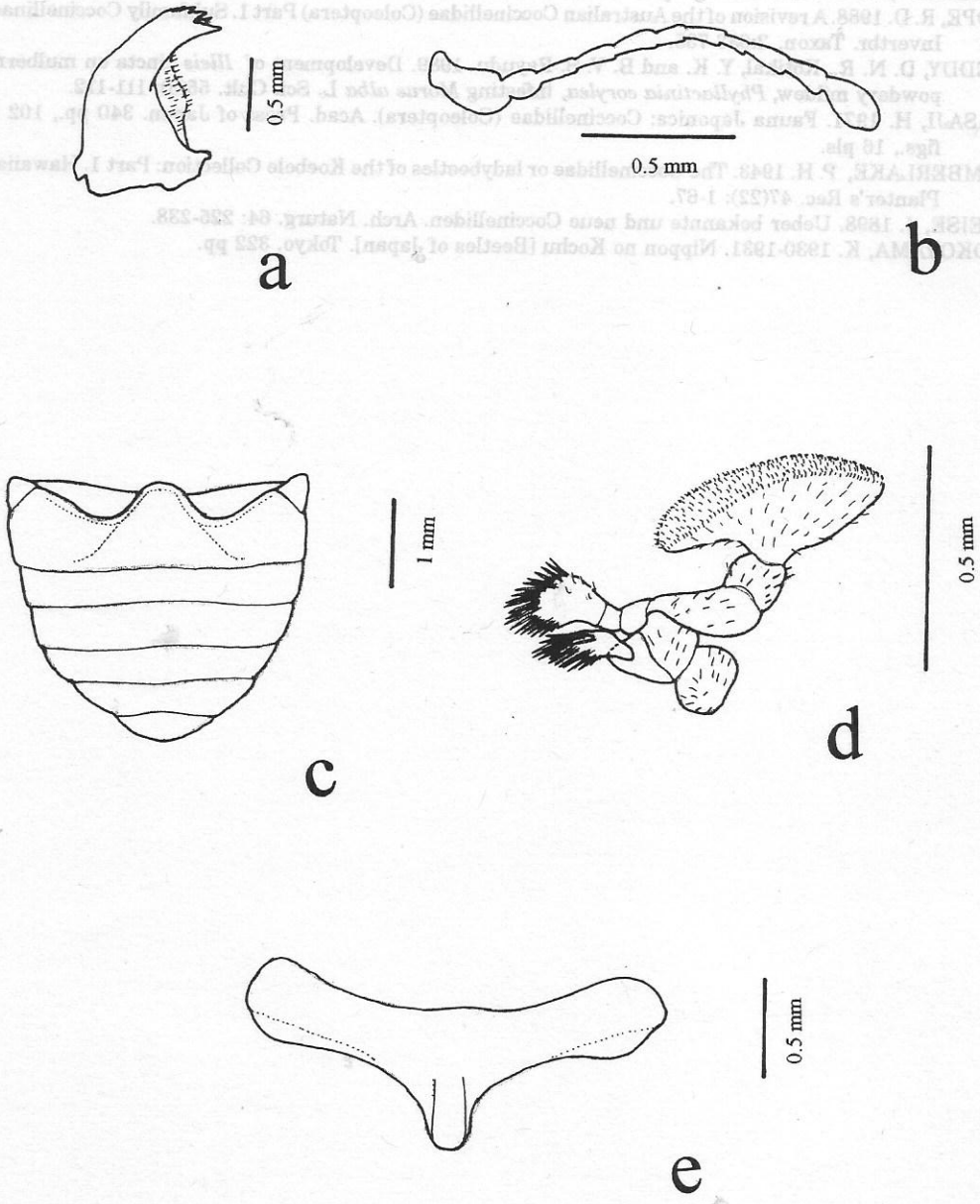


Figure 1. Tribe Psylloborini. a, mandible; b, antenna; c, abdomen; d, maxilla; and e, prosternum.

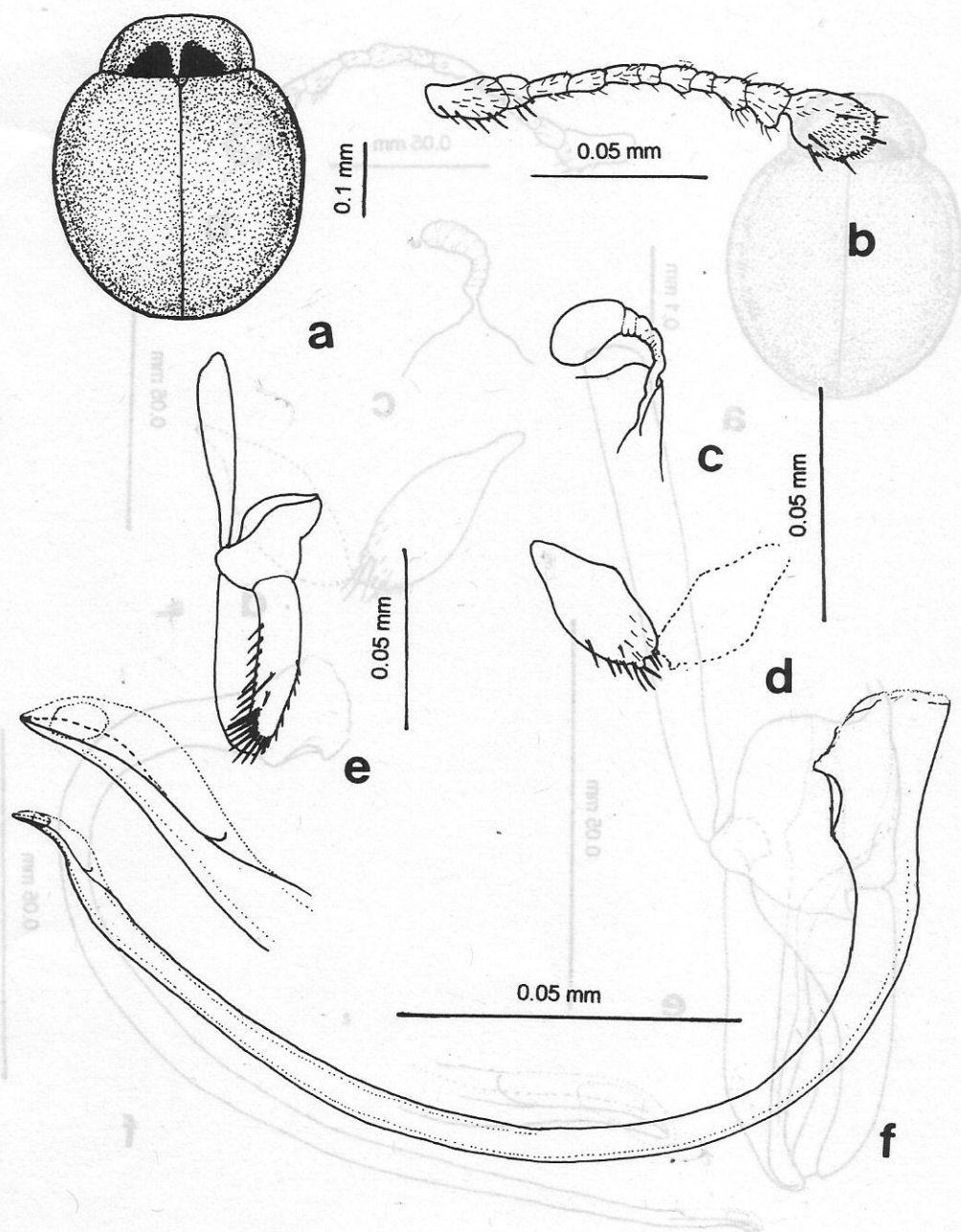


Figure 2. *Illeis koebelei amamiana* Miyatake: a, habitus; b, antenna; c, receptaculum seminis; d, hemisternite; e, tegmen; and f, siphon.

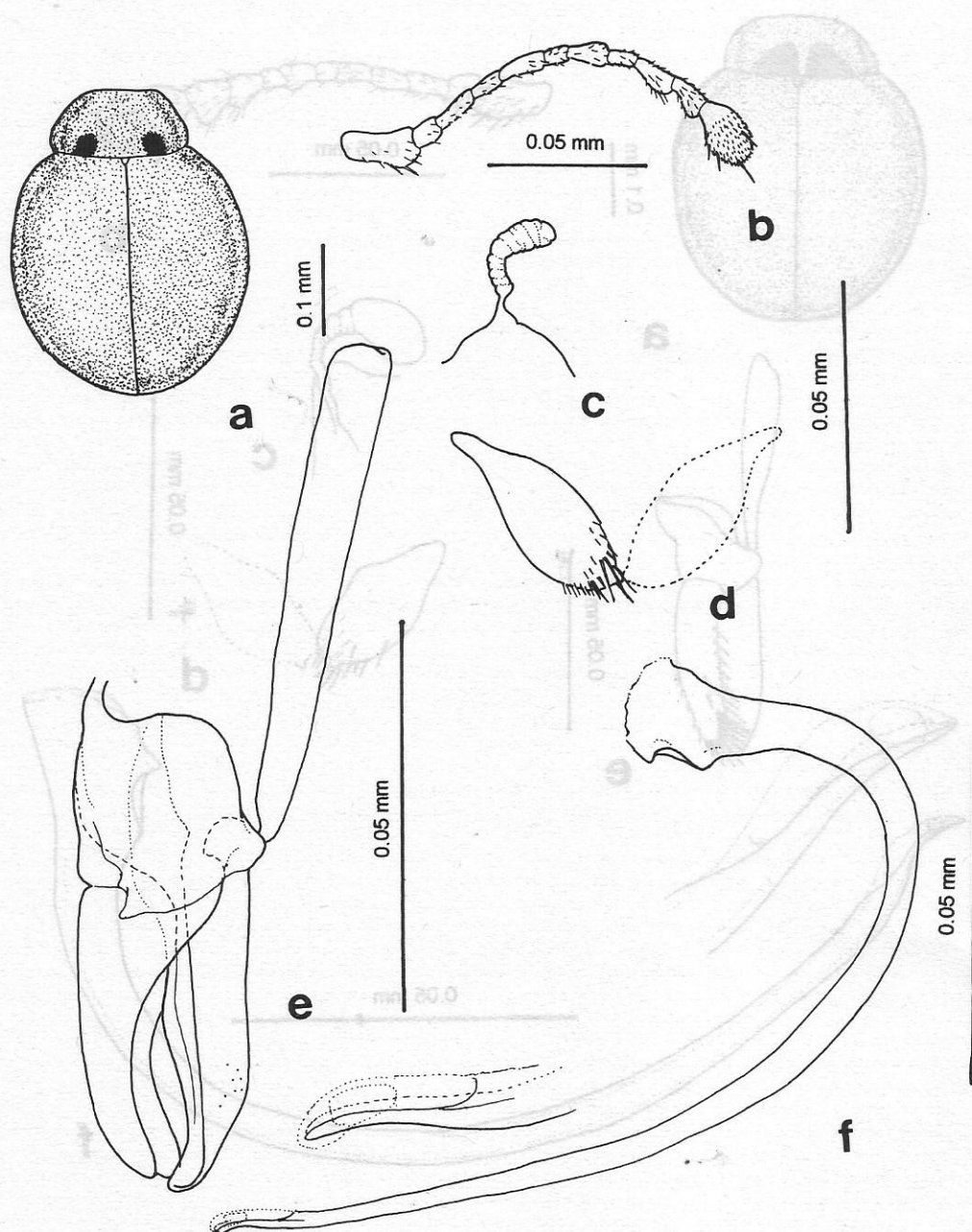


Figure 3. *Illeis koebelei koebelei* Timberlake; a, habitus; b, antenna; c, receptaculum seminis; d, hemisternite; e, tegmen; and f, siphus.

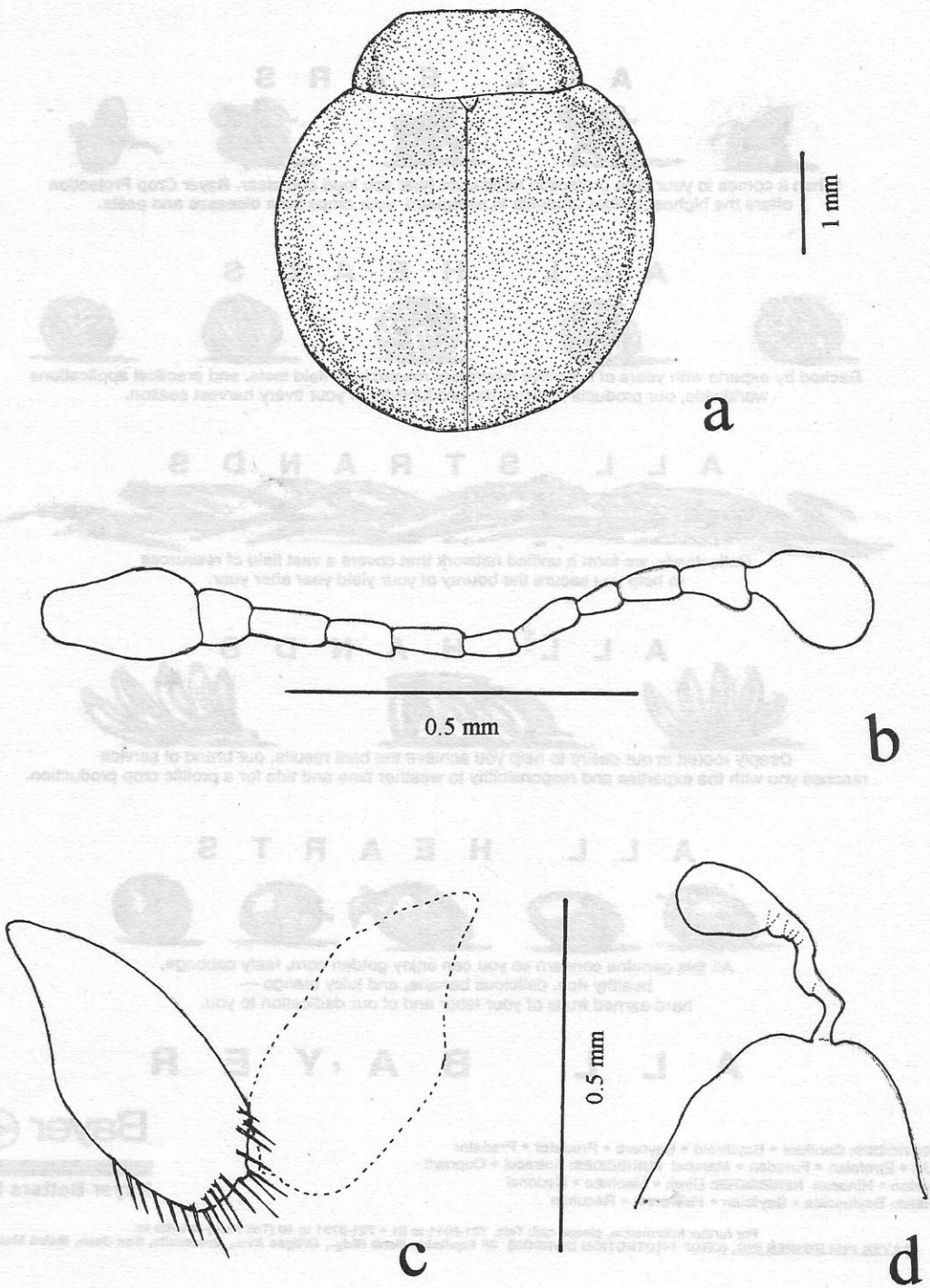


Figure 4. *Illeis luzonica* Timberlake. a, habitus; b, antenna; c, receptaculum seminis; and d, hemisternite.