

**LIFE CYCLE AND DESCRIPTION OF A NEW SPECIES OF  
*AMNESTUS* DALLAS (HEMIPTERA-HETEROPTERA:  
CYDNIIDAE) ASSOCIATED WITH THE FRUIT OF SEVERAL  
SPECIES OF *FICUS* (MORACEAE) IN MEXICO**

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*Abstract.*—A new species of *Amnestus* Dallas, *A. ficus*, is described. Its life cycle, and immature stages are also included and illustrated. The association of Cydnidae with the fruits of various species of *Ficus* is reported for first time. The study is based mainly on two-year sampling in a small patch of medium rain forest on the coast of Veracruz, combined with records from Chiapas, Guerrero, and San Luis Potosi, Mexico.

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Little is known about the biology of most species of Cydnidae. Many species are fossorial, some feeding on roots of plants and living as much as 20 cm below the soil surface (Schuh and Slater, 1995). *Sehirus cinctus* (P. de B.) (Torre-Bueno, 1935; McDonald, 1968; Sites and McPherson, 1982) and *S. bicolor* (L.) (Southwood and Hine, 1950) feed on seeds of several species of nettle and prefer species of Lamiaceae and Boraginaceae. Descriptions of the immature stages of cydnids are scant. Froeschner (1960) mentioned that the nymphs of the genus *Amnestus* Dallas have characteristic spines on the margin of the head, although no proper description or illustrations are known for any species. Nymphs are known only for *S. bicolor* (Southwood, 1949) and *S. cinctus* (Sites and McPherson, 1982). Apparently some species of Amnestinae are not strongly fossorial because there are several records of specimens taken by sweeping or found under debris and stones. Nymphs of all instars and adults of *A. subferrugineus* (Westwood) can be abundant in guano in bat caves in Panama, suggesting they may be seed feeders (Caudell, 1924). Many species are attracted to light.

The genus *Amnestus* is represented by 20 species distributed from western Canada, through the United States, Mexico, Central America, Antilles and South America to Argentina. In Mexico only five species have been reported: *A. brunneus* Signoret from Chiapas, Oaxaca and San Luis Potosi; *A. forreri* Distant, from Durango; *A. pusillus* Uhler from Nuevo Leon; *A. pusio* (Stål) for Chiapas, Morelos, Sinaloa and Veracruz; and *A. uhleri* Distant from the State of Mexico, and Veracruz (Froeschner, 1960; Mayorga, 2000). *Amnestus cribratus* (Stål), a species that can be mistaken for the one described here, has been recorded only from Brazil.

Here, we describe a new species of *Amnestus* associated with several species of *Ficus*: *F. cotinifolia* H.B.K., *F. insipida* Willd. and *F. trigonata* L.f., in a medium tropical rain forest at Estacion Biologica La Mancha, and associated with *F. colubrinae* Standley in a high tropical rain forest at Estacion Biologica Los Tuxtlas. Both areas are near the coast of central Veracruz, Mexico. The study is based mainly on

observations and individuals from the first area. All immature stages and adults are described and illustrated. During this study other species of Cydnidae have been found associated with these and other species of *Ficus*, so we conclude that this habitat, in which numerous species of Lygaeidae occur (Slater, 1972), could also be a place to find Cydnidae in the tropics.

#### MATERIAL AND METHODS

The study site is situated on the coast of Veracruz Mexico, 30 km NE of Ciudad Cardel, at 96°22'40"W longitude and 19°36'00"N latitude. The mean annual temperature is 25°C and the annual precipitation varies from 1,200 to 1,500 mm. The drier months occur mainly from November to May. The rainy season starts in June, with peak precipitation in July (Moreno et al., 1994). Although the area is a small site (about 40 ha) surrounded by agriculture and cattle ranches, it contains several types of vegetation, including coastal dunes, medium semi-evergreen rain forest, low deciduous forest, mangrove, and low wetland forest (Novelo, 1978). Four species of *Ficus* are found in the study area: *F. cotinifolia* with at least 28 reproductive individuals; and *F. trigonata* with six individuals, with both species occurring mainly inside the rain forest; *F. obtusifolia* with four trees; and *F. insipida* with 11 individuals, mainly established around lagoons. There are also several young individuals, especially some of *F. insipida*. The first three species belong to the subgenus *Urostigama*, which are characterized by the ability to form extensive systems of aerial roots that result in the habit of a strangler fig. The last species belongs to the subgenus *Pharmacosycea*, which are usually terrestrial free-standing trees. All species can produce fruit from January to December because of their asynchronous flowering. The fruit of *F. cotinifolia* is the smallest, not reaching more than 1 cm in diameter, and the fruit of the other tree species are greater than 2 cm when ripe. Usually the entire tree produces fruit at the same time, resulting in very large crops that last only a few weeks.

During a two year sampling (1999–2000) with visits every two months during the first year, monthly visits during the second, and occasional visits during the first half of 2001, the new species *Amnestus ficus*, was found almost all year around feeding on freshly fallen fruits and seeds of *F. cotinifolia*, *F. insipida*, and *F. trigonata*. In each visit every individual of *Ficus* spp. in the area was checked. Nymphs of all instars and adults were found inside the fallen fruits, feeding on seeds and on the endosperm of the fruit. Nymphs and adults were also found below ground, between three and 10 cm below the soil surface. Every time a tree produced fruit the area below the crown was sampled. First, we searched above ground inside the fallen fruits and under leaf litter of the same tree and collected individuals by hand or with the use of an aspirator. We then searched below ground, digging with a small spade and collecting the bugs with an aspirator or a spoon. Tree trunks up to a height of 10 m were also checked. All individuals were put in plastic containers (5 × 5 × 5 cm) covered with muslin to avoid condensation; in each container a layer of soil (sand) 2 cm deep was set and fresh fruits were offered as food. Containers were kept under laboratory conditions at around 20°C and 70% RH; they were checked every two days and new fruits were added. Several individuals of each instar were

fixed in 70% alcohol for illustration and descriptive purposes. All measurements are given in mm.

The types were deposited in Coleccion Nacional de Insectos, Universidad Nacional Autonoma de Mexico (CNIN); Coleccion Instituto de Ecologia, A.C. Xalapa, Veracruz, Mexico (IEXA); American Museum of Natural History, New York (AMNH); National Museum of Natural History, Washington, D.C. (USNM); Natural History Museum, London (BMNH); California Academy of Sciences (CAS); and University of California Berkeley (UCB).

#### ***Amnestus ficus* new species**

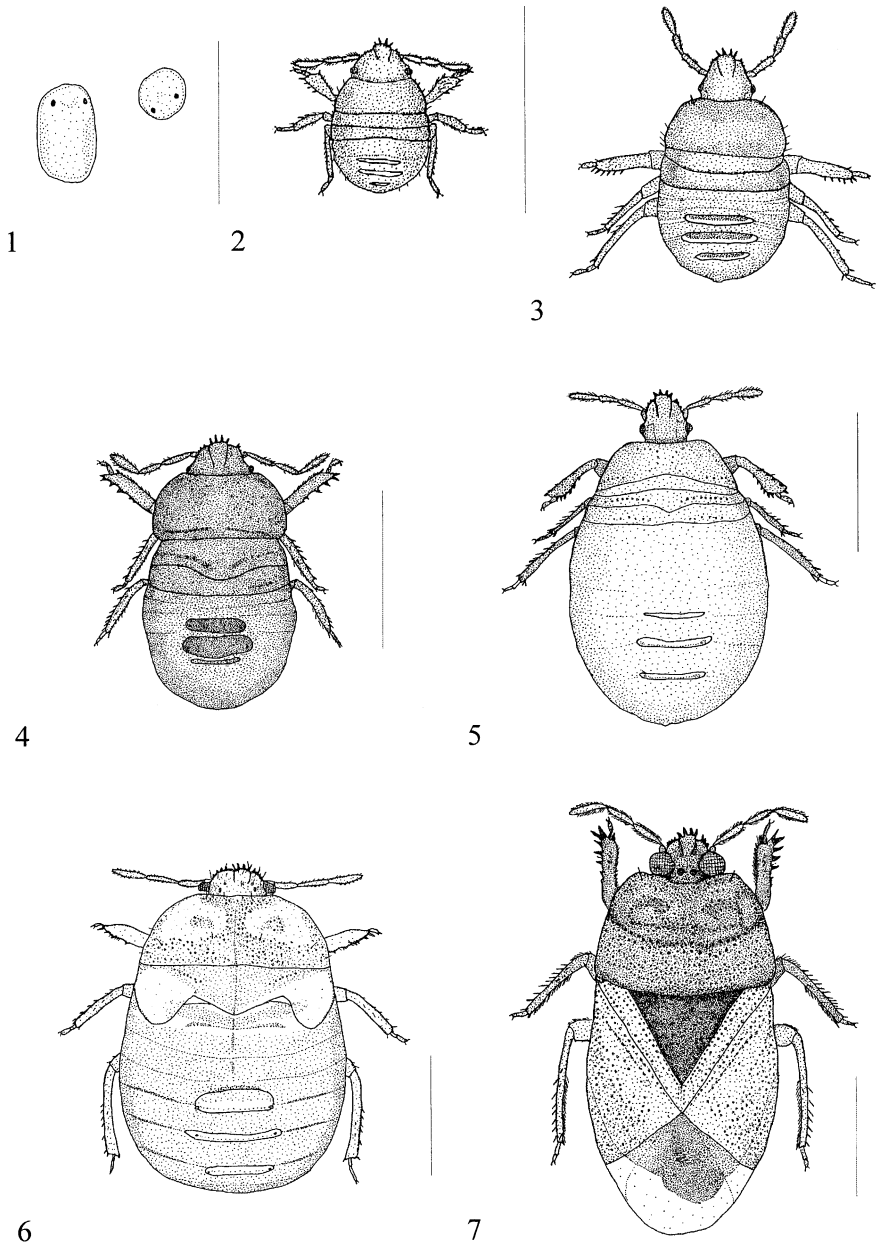
**Adult** (Figs. 7, 8–11). *Diagnosis.* Jugum with five spines, posterior part of pronotum slightly elevated; ventral margin of prosternal carina straight. Head, pronotum, scutellum and prosternal carina dark brown; marginal carina of pronotum, clavus, corium and abdominal venter light brown; antenna, rostrum and legs pale yellow.

*Head.* Posterior part with numerous punctures; tylus longer than jugum with four robust spines on apex; rostrum reaching metasternum. *Pronotum.* With an elevated and punctured area in the middle part; anterior and posterior border concave, anterolateral borders carinated, rounded slightly constricted at posterior margin. *Legs.* Fore tibia slightly flattened with seven spines on its external margin, and three spines on its internal margin; fore femur with a bifid spine on the middle of ventral surface (Fig. 8); internal margin of hind femur serrated and with a small, bifid spine near the apex (Fig. 9). *Scutellum.* With randomly distributed punctures. *Hemelytra.* Punctures uniformly distributed; clavus with three rows of punctures; distal margin sinuated; hemelytral membrane translucent extending beyond the apex of last abdominal segment. Prosternal carina with the internal margin straight.

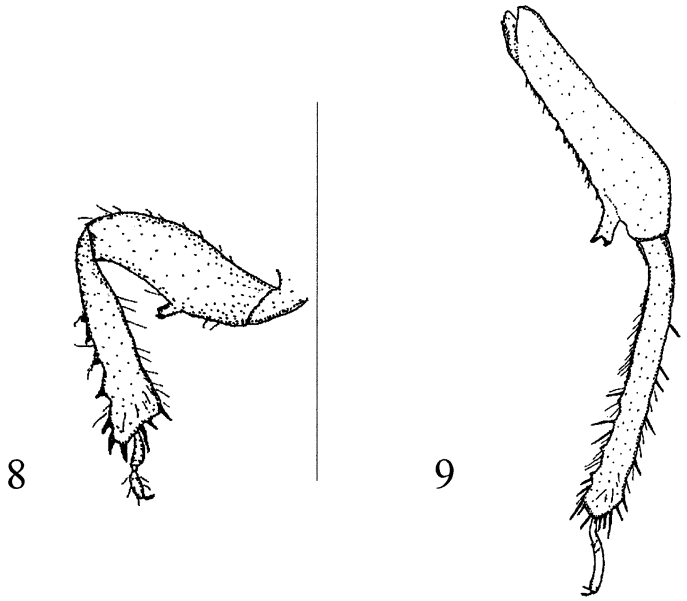
*Male genitalia.* Parameres very small, slightly clavated with a spine on one side, resembling a chicken head in lateral view; numerous hairs on the round end (Figs. 10–11).

*Male measurements* (n = 10). Body length  $2.98 \pm 0.02$ ; body width  $1.58 \pm 0.008$ ; head length  $0.34 \pm 0.01$ ; head width  $0.71 \pm 0.008$ ; interocular distance  $0.36 \pm 0.008$ ; eye-ocellus distance  $0.02 \pm 0$ ; antennal segments: I  $0.14 \pm 0$ , II  $0.04 \pm 0$ , III  $0.27 \pm 0.006$ , IV  $0.26 \pm 0.004$ , V  $0.29 \pm 0.006$ ; rostral segments: I  $0.23 \pm 0.006$ , II  $0.29 \pm 0.006$ , III  $0.23 \pm 0.004$ , IV  $0.28 \pm 0.006$ ; pronotum length  $1.06 \pm 0.01$ ; humeral width  $1.58 \pm 0.008$ ; frontal width  $0.79 \pm 0.01$ ; scutellar length  $0.72 \pm 0.008$ ; scutellar width  $0.92 \pm 0.008$ ; fore femur  $0.52 \pm 0.006$ ; fore tibia  $0.71 \pm 0.006$ ; hind femur  $0.86 \pm 0.008$ ; hind tibia  $0.99 \pm 0.008$ ; hind tarsi: I  $0.06 \pm 0$ , II  $0.04 \pm 0$ , III  $0.15 \pm 0.004$ .

*Female measurements* (n = 10). Body length  $2.82 \pm 0.01$ ; body width  $1.54 \pm 0.01$ ; head length  $0.37 \pm 0.01$ ; head width  $0.7 \pm 0.006$ ; interocular distance  $0.36 \pm 0.006$ ; eye-ocellus distance  $0.02 \pm 0$ ; antennal segments: I  $0.15 \pm 0.004$ , II  $0.04 \pm 0.004$ , III  $0.27 \pm 0.006$ , IV  $0.24 \pm 0.006$ , V  $0.28 \pm 0.006$ ; rostral segments: I  $0.22 \pm 0.006$ , II  $0.29 \pm 0.008$ , III  $0.23 \pm 0.006$ , IV  $0.27 \pm 0.008$ ; pronotum length  $0.9 \pm 0.01$ ; humeral width  $1.49 \pm 0.01$ ; frontal width  $0.76 \pm 0.008$ ; scutellar length  $0.72 \pm 0.01$ ; scutellar width  $0.93 \pm 0.01$ ; fore femur  $0.48 \pm 0.006$ ; fore tibia  $0.65 \pm 0.01$ ; hind femur  $0.81 \pm 0.01$ ; hind tibia  $0.98 \pm 0.01$ ; hind tarsi: I  $0.06 \pm 0$ , II  $0.05 \pm 0.004$ , III  $0.13 \pm 0.004$ .

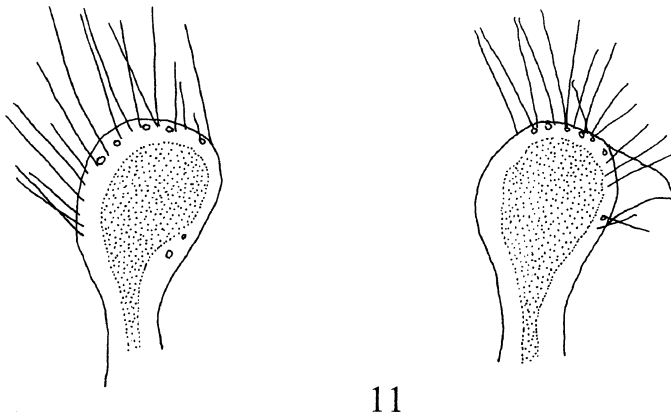


Figs. 1–7. *Amnestus ficus* 1. Egg, dorsal and top view. 2. First instar. 3. Second instar. 4. Third instar. 5. Fourth instar. 6. Fifth instar. 7. Adult.



Figs. 8-9. 8. Fore leg. 9. Hind leg.

**Types.** Holotype, male, MEXICO, **Veracruz**, Actopan, Estacion Biologica La Mancha, 17.XI.2000; on *Ficus cotinifolia*, L. Cervantes. (CNIN). Paratypes. MEXICO: **Veracruz**: Actopan, Estacion Biologica La Mancha, 17.XI.2000; on *Ficus cotinifolia*, L. Cervantes 16 males and 15 females. One male and one female in, CNIN, USNM, AMNH, NHML, CAS, UCB, each; the remainder in IEXA. **Guerrero**: Acapulco, 29.VI.1981, W. Lopez-Forment, four males and two females. **Chiapas**: Bonampak, 20.V.1980, H. Brailovsky, one male; Presa Peñitas, 5.III.1988, R. Barba, E.



Figs. 10-11. Back and lateral views of parameres.

Barrera, A. Cadena. **San Luis Potosi:** Chapulhuacanito, 10.VI.1980, E. Barrera, one male. **Veracruz:** San Andres Tuxtla, Estacion Biologica Los Tuxtlas, 30.VII.1989, S. Zaragoza, one male (CNIN); 28.III.1999, L. Cervantes, associated with *Ficus colubrinae*, two males, one female; Actopan, Estacion Biologica La Mancha, 26.XI.1998, L. Cervantes, under *F. cotinifolia*, 4 males, 8 females; 22.X.1999, L. Cervantes, C. Mayorga, under *F. cotinifolia*, 2 males, 5 females; 23.X.1999, C. Mayorga, under *F. cotinifolia*, 4 males and 2 females; 12.V.2000, L. Cervantes, under *F. triginata*, 1 female, 3 nymphs of instar IV, 2 of III, 3 of II and 13 of I; 13.IX.2000, L. Cervantes, under *F. triginata*, 5 females, and 9 nymphs of IV, 7 of III, 28 of II, 26 of I and 12 eggs; 6.X.2000, L. Cervantes, under *F. triginata*, 317 nymphs of IV instar; 6.X.2000, L. Cervantes, under *F. insipida*, 5 nymphs of IV instar; 17.XI.2000, L. Cervantes, under *F. cotinifolia*, 19 males, 27 females and 13 nymphs of V instar; 17.XI.2000, L. Cervantes, N. Peñaloza, under *F. cotinifolia*, 2 nymphs of IV instar been predated by two ant species, *Labidus caecus* and *Solenopsis geminata*; 13.VI.2000, L. Cervantes, under *F. cotinifolia*, 76 nymphs of V instar, 36 of IV, 14 of III, 6 of II, and 3 of I (IEXA).

**Distribution.** Mexico: Veracruz, Guerrero, Chiapas, San Luis Potosi.

**Discussion.** This new species of *Amnestus* is one of the largest in the genus. Its pronotum is divided into two lobes and the scutellum is characterized by its dark coloration. The spine of the fore femur in males has two teeth of different size; the hind femoral spine has two teeth of equal size, although one has a curved apex. This species can be separated from *A. cribratus* (Stål) by the presence of a slightly rounded paramere and by allometric differences, mainly in the total body length, *A. ficus* bring distinctly longer than that of *A. cribratus*; also, there are differences on antennal segments IV and V, and on pronotum and scutellum, which are also bigger in *A. ficus*. They can also be separated by their disjunct geographic distribution; *A. cribratus* has been reported only from Brazil and *A. ficus* only from Mexico.

**Etymology.** Referring to its association with several species of *Ficus*.

**Egg.** (Fig. 1). Barrel-shaped, white when laid, becoming pale yellow with some red marks that correspond to the abdominal segments of the first instar. In three days the eyes can be distinguished as two red spots. Females under laboratory conditions laid individual eggs inside the *Ficus* fruit or in the soil. *Measurements* ( $n = 10$ ). Egg length  $0.58 \pm 0.009$ ; egg width  $0.38 \pm 0.009$ .

**First instar.** (Fig. 2). Oval, convex dorsally, maximum width across abdominal segments I and II. Head, pronotum, mesonotum, metanotum, middle plates of abdominal segments III–IV, IV–V, V–VI, and legs light brown; pronotum, mesonotum and metanotum with an orange-red longitudinal middle line; part of dorsal abdominal segments and anterior and posterior margins of connexivum orange-red; eyes red; spines of tylus, juga and fore tibia dark brown. *Head.* Triangular; longer than width; eyes sessile and very small; ocelli absent; tylus with four robust spines longer than the spines on the juga; margin of juga with four minute spines; antenna with four segments, the fourth longest; rostrum reaching the IV abdominal segment. *Thorax.* Pronotum, mesonotum, and metanotum slightly sclerotized, wider than long, with anterior margin concave; anterolateral margins straight and posterior margin convex. *Abdomen.* Divisions of abdominal segments visible; lateral plates cover almost all the connexivum and with apex straight; middle plate of segments III–IV not very apparent and long; middle plates of segments IV–V and V–VI rectangular; spiracles

absent. *Measurements* (n = 10). Body length  $1.01 \pm 0.02$ ; body width  $0.45 \pm 0.01$ ; head length  $0.25 \pm 0.01$ ; head width  $0.31 \pm 0.01$ ; interocular distance  $0.21 \pm 0.006$ ; antennal segments: I  $0.08 \pm 0.004$ , II  $0.1 \pm 0.04$ , III  $0.1 \pm 0.004$ , IV  $0.19 \pm 0.006$ ; rostral segments: I  $0.1 \pm 0.004$ , II  $0.12 \pm 0.006$ , III  $0.14 \pm 0.008$ , IV  $0.18 \pm 0.006$ ; pronotum length  $0.18 \pm 0.01$ ; humeral width  $0.46 \pm 0.01$ ; frontal width  $0.31 \pm 0.008$ ; fore femur  $0.18 \pm 0.008$ ; fore tibia  $0.22 \pm 0.006$ ; hind femur  $0.22 \pm 0.008$ ; hind tibia  $0.28 \pm 0.006$ ; hind tarsi: I  $0.04 \pm 0$ , II  $0.06 \pm 0.004$ .

**Second instar.** (Fig. 3). Oval, convex dorsally, maximum width between abdominal segments III and IV; punctures absent. Head, pronotum, mesonotum, metanotum pale brown with red-orange spots; antenna and legs pale yellow; abdominal segments II to VII red-orange. *Head.* Similar to first instar. *Thorax.* Equal to first instar, but mesonotum and metanotum sclerotized and with widely scattered punctures. *Abdomen.* Sutures between segments visible, middle and lateral plates as in first instar. *Measurements* (n = 10). Body length  $1.32 \pm 0.01$ ; body width  $0.69 \pm 0.01$ ; head length  $0.27 \pm 0.01$ ; head width  $0.35 \pm 0.006$ ; interocular distance  $0.27 \pm 0.006$ ; antennal segments: I  $0.1 \pm 0.006$ , II  $0.14 \pm 0.004$ , III  $0.14 \pm 0.008$ , IV  $0.2 \pm 0.004$ ; rostral segments: I  $0.12 \pm 0.008$ , II  $0.17 \pm 0.008$ , III  $0.18 \pm 0.006$ , IV  $0.19 \pm 0.006$ ; pronotum length  $0.24 \pm 0.006$ ; humeral width  $0.65 \pm 0.01$ ; frontal width  $0.39 \pm 0.01$ ; fore femur  $0.22 \pm 0.006$ ; fore tibia  $0.3 \pm 0.004$ ; hind femur  $0.29 \pm 0.008$ ; hind tibia  $0.39 \pm 0.01$ ; hind tarsi: I  $0.06 \pm 0$ , II  $0.1 \pm 0$ .

**Third instar.** (Fig. 4). Oval, with dorsum convex; maximum width between segments I and II; scattered punctures on pronotum. Head, pronotum, mesonotum, metanotum, and middle plate of abdominal segment III-IV red-orange with pale brown spots. *Head.* Wider than long, sometimes with a narrow neck exposed; rostrum reaching base of abdominal sternum II. *Thorax.* Anterior margin of pronotum concave; lateral margins carinate; posterior margin convex. *Abdomen.* Middle plates long; spiracles and trichobothria evident. *Measurements* (n = 10). Body length  $1.56 \pm 0.01$ ; body width  $0.86 \pm 0.01$ ; head length  $0.31 \pm 0.01$ ; head width  $0.41 \pm 0.008$ ; interocular distance  $0.3 \pm 0.008$ ; antennal segments: I  $0.11 \pm 0.006$ , II  $0.18 \pm 0.006$ , III  $0.18 \pm 0.006$ , IV  $0.21 \pm 0.006$ ; rostral segments: I  $0.14 \pm 0.006$ , II  $0.22 \pm 0.008$ , III  $0.21 \pm 0.008$ , IV  $0.21 \pm 0.006$ ; pronotum length  $0.32 \pm 0.01$ ; humeral width  $0.82 \pm 0.01$ ; frontal width  $0.44 \pm 0.008$ ; fore femur  $0.29 \pm 0.006$ ; fore tibia  $0.38 \pm 0.008$ ; hind femur  $0.38 \pm 0.008$ ; hind tibia  $0.5 \pm 0.01$ ; hind tarsi: I  $0.06 \pm 0.004$ , II  $0.1 \pm 0$ .

**Fourth instar.** (Fig. 5). Oval, convex dorsally; maximum width between segments II and III; head and pronotum with scattered punctures and fine hairs. Head, pronotum, mesonotum, metanotum, and abdominal dorsal segments red-orange with pale yellow marks; abdominal venter and legs pale yellow; eyes red. Punctures on tylus, juga, and external margin of fore tibia pale brown. *Head.* Wider than long, rostrum reaching middle part of mesonotum; tylus longer than juga; fourth antennal segment longer than others; eyes slightly elongated; ocellus absent. *Thorax.* Anterior border of pronotum concave; lateral margins with carina; posterior border convex; wing pads evident but very small; scutellum not longer than metanotum. *Abdomen.* Similar to third instar. *Measurements* (n = 10). Body length  $2.15 \pm 0.02$ ; body width  $1.29 \pm 0.02$ ; head length  $0.36 \pm 0.01$ ; head width  $0.47 \pm 0.008$ ; interocular distance  $0.32 \pm 0.006$ ; antennal segments: I  $0.13 \pm 0.004$ , II  $0.2 \pm 0.006$ , III  $0.19 \pm 0.004$ , IV  $0.24 \pm 0.006$ ; rostral segments: I  $0.18 \pm 0.006$ , II  $0.24 \pm 0.008$ , III  $0.23 \pm 0.006$ ,

IV  $0.24 \pm 0.008$ ; pronotum length  $0.42 \pm 0.01$ ; humeral width  $1.07 \pm 0.01$ ; frontal width  $0.53 \pm 0.01$ ; fore femur  $0.35 \pm 0.008$ ; fore tibia  $0.46 \pm 0.008$ ; hind femur  $0.46 \pm 0.01$ ; hind tibia  $0.62 \pm 0.008$ ; hind leg tarsi: I  $0.07 \pm 0.004$ , II  $0.11 \pm 0.006$ . **Fifth instar.** (Fig. 6). Oval, convex dorsally; maximum width through abdominal segments II and III; scattered punctures on pronotum and scutellum. Head and pronotum pale yellow with red-orange punctures; scutellum red-orange. *Head.* Wider than long; rostrum reaching base of metanotum; tylus and juga each with four robust spines; lateral margin of juga also with a series of punctures with hairs; ocellus evident. *Thorax.* Anterior margin of pronotum concave, with a series of punctures on the anterior margin; humeral margins slightly elevated; pronotum with two visible lobes; scutellum wider than long and reaching base of abdominal segment II; wing pads well developed and reaching middle of segment II. *Abdomen.* Spiracles well developed; other characteristics similar to fourth instar. *Measurements* ( $n = 10$ ). Body length  $2.6 \pm 0.02$ ; body width  $1.57 \pm 0.02$ ; head length  $0.27 \pm 0.01$ ; head width  $0.64 \pm 0.01$ ; interocular distance  $0.36 \pm 0.006$ ; eye-ocellus distance  $0.06 \pm 0.004$ ; antennal segments: I  $0.15 \pm 0.006$ , II  $0.26 \pm 0.006$ , III  $0.23 \pm 0.006$ , IV  $0.25 \pm 0.008$ ; rostral segments: I  $0.21 \pm 0.006$ , II  $0.25 \pm 0.008$ , III  $0.26 \pm 0.008$ , IV  $0.28 \pm 0.008$ ; pronotum length  $0.62 \pm 0.01$ ; humeral width  $1.44 \pm 0.01$ ; frontal width  $0.66 \pm 0.01$ ; scutellar length  $0.53 \pm 0.02$ ; scutellar width  $0.99 \pm 0.01$ ; fore femur  $0.46 \pm 0.008$ ; fore tibia  $0.63 \pm 0.01$ ; hind femur  $0.66 \pm 0.01$ ; hind tibia  $0.84 \pm 0.01$ ; hind tarsi: I  $0.07 \pm 0.006$ , II  $0.14 \pm 0.004$ .

#### BIOLOGICAL OBSERVATIONS

*Amnestus ficus* was found almost year around but was more abundant from November to May. Although this period corresponds to the lower temperatures of the year, it also corresponds to the driest period. Because some of the study areas get flooded during the rainy season (May to October), it is probable that survival of *A. ficus* is greater during the dry season.

Nymphs and adults were found inside the fallen fruits feeding on seeds and on the endosperm of the fruit of *F. cotinifolia* and *F. trigonata*. Only adults were found on *F. insipida*. Some of the fruits were partially opened. Nymphs and adults that were found below ground fed on seeds of *Ficus* spp. that had moved down by the rain or other organisms (e.g., ants, earthworms, or land crabs). *Amnestus ficus* became established just above ground when *Ficus* fruit was numerous, but they also were found below ground to depths up to 10 cm. Nymphs and adults also were found on tree trunks of the different species of *Ficus*, where seeds had accumulated between leaf litter, or under the excrement of raccoons (*Procyon lotor* (L.)) that contain *Ficus* seeds, even at heights of 10 m.

*Amnestus ficus* was found when a fig tree started to drop fruit, until the last fruit disappeared from under the tree. This period varied from two to four weeks depending on the size of the crop and the rain. Many fruits are quickly removed by ants. Nymphs were more abundant one week after the first fruit had fallen. During large fruit crops, it was common to find hundreds of nymphs crawling on the soil surface between the fruits. Up to 200 nymphs were found on each fruit of *F. trigonata*. Some nymphs and adults crawl on the trunk and branches of the fig tree



and sometimes to nearby neighbors which catch some of the fruits fallen from the fig tree.

The life cycle takes fewer than 25 days to be completed, and even when no more than one generation takes place under the same tree, the bugs probably move from tree to tree, searching for fruits and producing the next generation under a different tree. Within the area at least one individual of the different species of *Ficus* was fruiting each month of the year. Bugs might be attracted by chemicals produced by the fresh fruits. In the laboratory nymphs and adults moved to the fresh fruits that were added every two days. Nymphs and adults were active all day. In areas of high abundance, where light trapping took place, only a few adults were attracted.

Within the same trees, it was common to find other species of Cydnidae feeding on the fruits of *Ficus*, including *Pangaesus aethiops* (Fab.) and a species of *Cyrtomenus*. Some individuals of *A. pusio* were collected during light trapping; this species was never found feeding on *Ficus*. Also, other Hemiptera of Lygaeidae were found feeding on *Ficus*. These species are to be treated in a different paper.

The ants, *Solenopsis geminata* (Fab.) and *Labidus cuecus* (Latreille), preyed on nymphs of different instars under the crown of *F. cotinifolia*.

In Estacion Biologica Los Tuxtlas, *A. ficus* was found feeding on the fruit and seeds of *F. colubrinae* and its is probable that feed on under species of *Ficus* found in the area.

#### DISCUSSION

This study brings to light new habits for the family Cydnidae. Apart from the new species described in this paper, several other species of Cydnidae have been found associated with *Ficus* spp. in the study area and other tropical zones in Mexico. This is the first of a series of studies of Cydnidae associated with *Ficus* spp. in Mexico.

Only five species of *Amnestus* have been reported previously for Mexico, and only *A. pusio* and *A. uhleri* have been cited for Veracruz. *Amnestus ficus* n.sp., one of the largest of the genus, is easily distinguished from the others by its dark scutellum, the presence of two well-developed lobes on the pronotum, the spines on the fore and hind femora of males, and by the shape of the male parameres.

It has been mentioned that another species of *Amnestus*, *A. subferrugineus* (Westwood), was found in guano in bat caves in Panama (Caudell, 1924), which suggests that this species was feeding on seeds of *Ficus* spp. contained in the excrement. *Pangaesus piceatus* Stål was found on foliage of *Ficus retusa* L. in Venezuela (database from Basset, Novotny and Weiblen, 1997), which could easily be explained because we have found *P. aethiops* feeding on the fruit of several species of *Ficus*.

The great abundance of *A. ficus* in the study area can be explained by a) the asynchronous fruiting of the *Ficus* species present, b) the abundance of tree individuals and c) the fact that *A. ficus* can feed on several species of *Ficus*. *Amnestus ficus* might move from one tree to another without discriminating among the species by detecting a chemical present in the ripe fruit, as the wasp pollinators do (van Noort and Compton, 1996). The low frequency of *A. ficus* under *F. insipida* is probably due to the association of this *Ficus* species with frequently flooded environments.

*Amnestus ficus* has a short life cycle because the individuals need to move to a different tree before the fruit and seeds disappear due to the action of the rain and

other organisms, such as crabs and ants (Laman, 1996). In profusely fruiting trees, the fruit can be present for about five weeks, although small crops usually disappear in three to four weeks.

Important observations were also made by Slater (1972) about the large and varied lygaeid fauna that feed on seeds of various species of *Ficus*. This paper further emphasizes the significance of Hemiptera as seed predators of figs.

Due to the great diversity and abundance of *Amnestus*, it is probable that additional new species will be found. A review of this group is suggested.

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