



Fig. 1. Top and side views of a linear pitfall trap for mole crickets and other soil arthropods.

The PVC pipe was placed in a trench with the open slot up, at or very slightly below the soil level. The plastic pail was imbedded in the ground (Fig. 1) with the collection jug inserted over the open end of the PVC pipe. About 1 cm of soil was placed both inside the PVC pipe and the plastic jug to keep the captured mole crickets separated since they are cannibalistic. Insects that fell into the PVC pipe eventually moved to the open end of the pipe and fell into the jug.

The trap works equally well in sod or bare ground, capturing considerable numbers of mole crickets of all stages. First and second stage mole cricket nymphs were initially captured by this technique 28 April 1981 at Boynton Beach, FL. In the succeeding 30 days, 2 of these linear pitfall traps captured 749 immature mole crickets, both *Scapteriscus acletus* and *S. vicinus*, for an average of 12.5/day/trap. The highest capture for one trap in one day was 41.

Many soil inhabiting arthropods were captured in addition to mole crickets: spiders; earwigs; *Euborellia* sp.; ground beetles (Carabidae); and billbugs, *Sphenophorus* sp.. Larger spiders, especially wolf or ground spiders (*Lycosa* sp.) which are predacious on the mole crickets, were largely excluded from the collection jug by cutting a 0.635 cm mesh hardware cloth screen to fit the inside of the PVC near the pail.—K. O. LAWRENCE, RPE, Chemlawn Corporation, Rt. 1 Box 1125, Boynton Beach, FL 33437 USA.

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MATING WOUNDS IN MALACOSOMA: AN INSIGHT INTO BED BUG MATING BEHAVIOR—Male bed bugs (Hemiptera: Cimicidae) inject sperm into females through the body wall. In addition, in *Xylocoris*, males inject sperm into mounting males which indirectly deposit some of the attacking males' sperm into their mates (Lloyd 1979. Florida Ent. 62: 17-23). The mating behavior of *Malacosoma* (Lepidoptera: Lasiocampidae)

may provide some clues to the evolutionary origin of this bizarre behavior. The operational sex ratio in *Malacosoma* frequently is male-biased (Stehr and Cook 1968. United States Nat. Mus. Bull. 876.). This results in males finding females which are already mating. In a laboratory enclosure, a male *M. americanum*, the eastern tent caterpillar, attempted to copulate with an already mating female. It appeared that he succeeded although he did not dislodge her first mate or penetrate her bursula copulatrix. Instead he punctured her abdomen probably with his tusk-shaped penis. An accessory gland and ovary spilled out. In the field in 32 out of 68 matings of *M. americanum* and *M. disstria*, the forest tent caterpillar, males attempted to copulate with already mating females. These interfering males probed with their abdomens just as they would with solitary females. None of the interfering males succeeded in mating the paired females, but 4 mating *M. disstria* (3 males and 1 female) sustained abdominal punctures. Most likely these were not "intentional" woundings like the ones bed bugs inflict. The wounds were probably the result of interfering males finding the bursula copulatrixes occupied and stabbing one of the mating participants while probing. We speculate that bed bug mating behavior evolved under conditions where the operational sex ratio was male-biased and males frequently encountered mating pairs.

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OCCURRENCE OF *PTOMAPHAGUS CAVERNICOLA* IN FORESTS IN FLORIDA AND GEORGIA (COLEOPTERA; LEIODIDAE; CHOLEVINAE)—There are 19 species of *Ptomaphagus* beetles in the southeastern United States which are highly cave-evolved (troglobitic) and with very limited geographic distributions. They are probably descendants from early Pleistocene ancestors that became specialized and restricted to caves (Peck, 1981. Proc. 8th Int. Cong. Speleology, Bowling Green, KY: 503-5.). In contrast, the evolutionary meaning of the distribution of *Ptomaphagus cavernicola* Schwarz has been a puzzle. It belongs to a species group that is mostly Mexican in distribution, and is known as a scavenger. Hundreds of specimens have been collected from 96 caves in a broad arc from Mexico through Texas to Oklahoma, Arkansas, Missouri and Iowa, and down to Alabama, Georgia, and Florida. It shows cave "specializations" in its comparatively reduced pigmentation and longer antennae and legs, but has very well-developed eyes and functional flight wings. In spite of extensive collecting in litter and with baited traps, the only non-cave record was one specimen taken in January in litter in South Carolina (Peck, 1970. Fla. Ent. 53: 203-7; Peck, 1973. Bull. Mus. Comp. Zool. Harvard Univ. 145: 29-162; Peck, 1977. Pages 185-213 In Reddell, J. R., ed. Studies on the caves and cave faunas of the Yucatan Peninsula. Assoc. Mex. Cave Studies Bull. 6.; and unpubl. data.) From these data and through comparison with the distantly related troglobitic species of *Ptomaphagus*, it was concluded that (1) the species is physiologically and behaviorly suited for life in caves but