

Table 1. Effect of humidity on the rate of insemination of *Aedes vexans* by manual copulation.

Age of females copulated (days)	Number dissected	Percentage of females inseminated based on number of spermathecae (Sp) filled									
		Humidity of holding cages: males 100%, female 100%					Humidity of holding cages: optional male, 100% female				
		Anesthetic: dry					Anesthetic: humid				
		Sp 1	Sp 2	Sp 3	Total	Total	Sp 1	Sp 2	Sp 3	Total	Total
1	10	..	..	..	..	20	70	10	100	100	
2	10	30	0	60	..	10	40	50	100	100	
3-5	30	20	70-80	90-100	0	10-20	40-70	30-50	100	100	
6-8	30	0	90	90	0	10-30	20-70	20-50	100	100	

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#### NOTES ON THE HOST RANGES OF SOME PHLEBOTOMINE SAND FLIES IN PANAMA

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Young and Fairchild (1974) have compiled a key to nearly 60 species of New World sand flies (Diptera, Psychodidae) known to bite man. The 7 species *Lutzomyia gomezi* (Nitzulescu), *L. olmeca* (Vargas and Diaz-Najera), *L. panamensis* (Shannon), *L. pessoana* (Barretto), *L. sanguinaria* (Fairchild and Hertig), *L. trapidoi* (Fairchild and Hertig) and *L. ylephiletrix* (Fairchild and Hertig) are major man-biting species in Panama (Chaniotis et al. 1971). The reports of Thatcher and Hertig (1966), Tesh et al. (1971), 1972), Christensen et al. (1972) and Christensen and Herrer (1973) indicate that such species feed on a wide range of vertebrate hosts. The host ranges of many of the more strictly zoophilic species are not well known. Since sand flies transmit American leishmaniasis among animals and from animals to man, the following notes on the host ranges of several species are submitted for the record.

**ANTHROPOPHAGY IN *L. camposi* (RODRIGUEZ).**  
On 22 January 1971 a specimen of *L. camposi* was taken in a biting collection on Farfan Hill at the Pacific Terminus of the Panama Canal. The area is open and grassy with a few scattered trees. The collection was made on a hot, sunny afternoon in the partial shade of a small tree. This species has not been previously reported as biting man. The only other known host is the horse (Christensen and Herrer 1973).

**SAND FLIES ATTRACTED TO HORSE-BAITED TRAPS.** Christensen and Herrer (1973) listed 12 species of sand flies collected from horses in Panama. The following additional species have been taken from horse-baited mosquito traps operated in the Canal Zone by the Office of the Chief

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Surgeon, U. S. Army Forces, Southern Command: *L. cruciata* (Coquillett), *L. dysponeta* (Fairchild and Hertig) and *L. trinidadensis* (Newstead). In Panama, *L. cruciata* and *L. dysponeta* were previously known to feed on man and on rodents, respectively (Chaniotis et al. 1971; Christensen and Herrer 1973). *L. trinidadensis* was known to have a wider host range, including geckos, anteaters, rodents, dogs and man (Thatcher and Hertig 1966; Christensen and Herrer 1973).

**DISCUSSION.** A few of the Panamanian sand fly species are thought to be narrowly restrictive in host preference. For example, *L. vespertilionis* (Fairchild and Hertig) and *L. isovespertilionis* (Fairchild and Hertig) apparently feed preferentially on bats (Thatcher and Hertig 1966; Tesh et al. 1971, 1972). The majority of species, however, appear to have much wider host ranges. Certain species in this category, such as *L. panamensis*, feed freely on humans, while others, such as *L. trinidadensis*, do not. The precise role that a given species plays in the transmission of leishmaniasis among animals and from animals to man undoubtedly depends to a large extent on its particular spectrum of host preferences. The authors believe that detailed studies of sand fly host preferences would contribute greatly to the intelligent control of leishmaniasis in Panama.

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#### USES OF THE RING-TAB OF CANS IN THE ENTOMOLOGY LABORATORY

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A number of uses have been found in the entomology laboratory for the aluminum ring-tab which is pulled away in order to open the top of a can or tin of beer, or other beverage. The tab, which is invariably thrown away, has a rounded strip of aluminum attached to it. The ring is usually a rounded oval. The metal strip usually curls when the ring is pulled away. The following uses have been found for them:

1. *Mounting cell.* The metal strip is removed by bending it at the riveted end several times. The metal portion bearing the rivet is trimmed away so that the ring has an even edge all around. The ring is then gently tapped with a hammer so as to remove any irregularity. It is then cemented permanently to a clean slide with any waterproof cement, such as Duco, contact cement, or cyanoacrylate Super-Glue. It may be mounted right side up or upside down. When the cement is dry, any insect specimen of suitable height is mounted in the center of the ring, using a mounting medium of choice. A round or square cover glass may be applied. To cut a square or rectangular cover glass to any size, place it on a hard surface, and holding it firmly with a slide or thin metal rule, make a fine scratch in the cover glass with a tungsten-tipped metal scribe. The cover glass can then be broken without shattering. The glued-on cell can also be used to hold water containing mosquito larvae or pupae.

2. *Specimen-holder.* The entire unit of ring plus strip is used for this purpose, the curled strip being used as a handle. The ring is cemented to a white piece of cardboard cut to the same dimensions as the ring; this is used for holding adult insects. If the floor is, instead, made from rigid, clear plastic or a piece of microscope slide, the resulting holder can be used to transmit light when examining aquatic specimens, such as mosquito larvae and pupae, under the microscope. If two rings are cemented one over the other, so that the incurled strips diametrically oppose each other, a more stable unit results, and either handle can be used to lift up the specimen-holder.

3. *Spatula.* The flat metal strip can be used