

PANAMANIAN FOREST MAMMALS AS CARRIERS OF *SALMONELLA**

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Abstract. Enteric bacteria pathogenic to man were sought in a total of 974 forest mammals collected from a variety of sites in rural and jungle areas of Panamá. The highest incidence of infection among the mammals was observed during the Panamanian dry season, which normally extends from January through April. A minimum of 10 *Salmonella* serotypes including, three of the *Arizona* group and *Edwardsiella tarda*, was isolated. Opossums of the genera *Philander*, 11 of 54 (20.1%), and *Didelphis*, 12 of 102 (11.8%) demonstrated high infection rates. One sloth of the genus *Choloepus* and specimens of two genera of rodents also were infected to varying degrees: 1 (11.1%) of 9 *Choloepus*, 8 (1.1%) of 704 *Proechimys* and 1 (16.7%) of 6 *Diplomys*.

Due to its topographic and climatic diversity, and despite its small geographic area (30,000 sq. miles), Panamá has a large mammalian fauna. As many as 214 mammals are known to occur on the Isthmus of Panamá.¹ Studies elsewhere have shown that a large number of species of mammals in many parts of the world are naturally infected by *Salmonella*.²⁻⁴ Previous surveys for enterobacterial pathogens among the wild animal populations in Panamá have recently been carried out to determine what role they might play as reservoirs for enteric pathogens. Those surveys were limited to nonhuman primates,⁵ various reptile and amphibian species,⁶ and elements of the rodent and marsupial fauna collected along a proposed site for a sea-level canal in eastern Panamá.⁷

The above studies revealed a variety of diarrhea-producing agents such as *Salmonella* and *Arizona* in a number of the more common species of animals found in this country. Such animals were without symptoms of disease, and perhaps may be the principle reservoir for human infections with *Salmonella* in remote rural and jungle communities.

Since rodents, opossums, and other mammals

occur throughout Panamá in high population densities, and a number of them proved to be harboring *Salmonella*, it was believed necessary to extend our studies to other geographic areas in this country. Thus, additional species would be included if we were to learn more about the variety and relative frequency of pathogenic enteric bacteria in wild mammals that find their best ecologic conditions in the vicinity of man.

The present investigation was initiated in March 1969, incidental to other studies, and continued through November 1971.

MATERIALS AND METHODS

Field Methods

Mammals were collected over a period of almost 3 years in all seasons and in a variety of habitats in different areas of the Republic of Panamá (Fig. 1 and Table 1). Most were trapped in the Pacific and Atlantic lowlands, and a few were collected along the Panama Canal. Small animals, such as rodents, were captured by setting Sherman traps. Larger animals such as opossums were caught in wire traps of various sizes (National Live Trap Corporation, P. O. Box 302, Tomahawk, Wisconsin 54487). The traps were baited with banana, corn, or toasted coconut. Sloths were captured by hand; bats were netted in free flight. All animals were taken to base camps in the field and kept in 25 × 25 × 35 cm stainless steel cages. Rodents were fed Lab-Blox (Allied Mills, 2205 Lamar Avenue, Memphis, Tenn. 38114). Opossums and other mammals were offered bananas, oranges, and yucca. The length of time they were

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