

## SCIENTIFIC NOTE

### NEW RECORD OF *PHLEBOTOMUS SERGENTI*, THE VECTOR OF *LEISHMANIA TROPICA*, IN THE SOUTHERN NILE VALLEY OF EGYPT

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**ABSTRACT.** We report the 1st collection of *Phlebotomus sergenti*, a vector of the cutaneous and visceralizing forms of *Leishmania tropica*, from southern Egypt. Four female and 1 male *P. sergenti* were collected from unlit Centers for Disease Control light traps placed in a village on the Nile River, 6 km north of Aswan, Egypt, during studies conducted from 1998 to 1999. This extends the known distribution of this species farther south in Egypt than previously recorded.

**KEY WORDS** *Phlebotomus sergenti*, distribution, Phlebotominae, Egypt

*Phlebotomus sergenti* (Parrot) is a widely distributed sand fly species that feeds readily on humans and is a known vector of *Leishmania tropica* (Ashford and Bettini 1987, Al-Zahrani et al. 1988). *Phlebotomus sergenti* occurs throughout the coastal region of the Mediterranean Basin and continues east from Israel to northern India and south throughout the Arabian and Indian Peninsula (Lewis 1982). In Egypt, *P. sergenti* has been reported from Cairo north through the Nile River Delta region, and eastward through the Sinai Peninsula (El Sawaf et al. 1987, Morsy et al. 1990) (Fig. 1). This species has never been reported south of Cairo.

*Leishmania tropica* is the causative agent of anthroponotic, or urban, cutaneous leishmaniasis (CL), which usually causes a dry lesion. This form of CL is found primarily in densely populated areas where human-sand fly-human transmission is maintained by *P. sergenti* (WHO 1990). However, *L. tropica* is also reported to cause visceral infection (Magill et al. 1992, 1993; Hyams et al. 1995), as well as classic kala-azar (Sacks et al. 1995). As part of a study to determine the effects of octenol on sand fly and mosquito capture rates in Egypt, sand flies were collected from June 7 to 15, 1999, in the governorate of Aswan. Aswan is the southernmost governorate of Egypt, bordering Sudan at its southern boundary, and encompasses all of Lake Nasser south of the Aswan High Dam. North of Aswan City and the dam, numerous villages and agricultural areas occupy the narrow Nile River valley. Bahrif, the village where we collected *P. ser-*

*genti*, is located on the Nile River 6 km north of Aswan City and has historically had high populations of several sand fly species compared to other villages in that region (Hanafi, unpublished data).

Sand flies were collected with battery-operated, unlighted Centers for Disease Control-style traps baited with either dry ice or a combination of dry ice and low or high concentrations of octenol. Traps were set out during the late afternoon in and around animal sheds and houses and were retrieved early the next day. During this same trip, specimens of *Phlebotomus papatasi* (Scopoli), *Sergentomyia palestiniensis* (Adler & Theodor) and *S. schwetzi* (Adler & Theodor & Parrot) also were collected.

Specimens were stored in vials containing 75% ethanol until mounted for identification. Sand flies were individually mounted on microslides in Puri's medium (Kirk and Lewis 1951) and identified to species level with the key developed by Lane (1986). Four female and 1 male *P. sergenti* were collected on 4 different nights over a period of 6 consecutive calendar days. Species confirmation was made at Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD. Voucher specimens have been deposited in the collection at the Naval Medical Research Unit No. 3, Cairo, Egypt.

This is the 1st evidence that *P. sergenti* is present in the southern Nile River valley of Egypt. Aswan is located approximately 960 km south of Cairo and is separated from the rest of Southwest Asia by the Red Sea and the Eastern Desert of Egypt. The climate of southern Egypt is much hotter and drier than that found along the Mediterranean Coast and in the Cairo area (El Said et al. 1985, Lane 1986). The presence of *P. sergenti* in this region is significant. A tremendous number of foreign tourists visit southern Egypt, as well as Egyptians who work in countries in the Arabian Peninsula and travel between Egypt and these countries where *L. tropica* is endemic. These travelers increase the risk of introducing *L. tropica*, including its visceralizing form, into Egypt. An example of this potential occurred when an Egyptian laborer, recently returned

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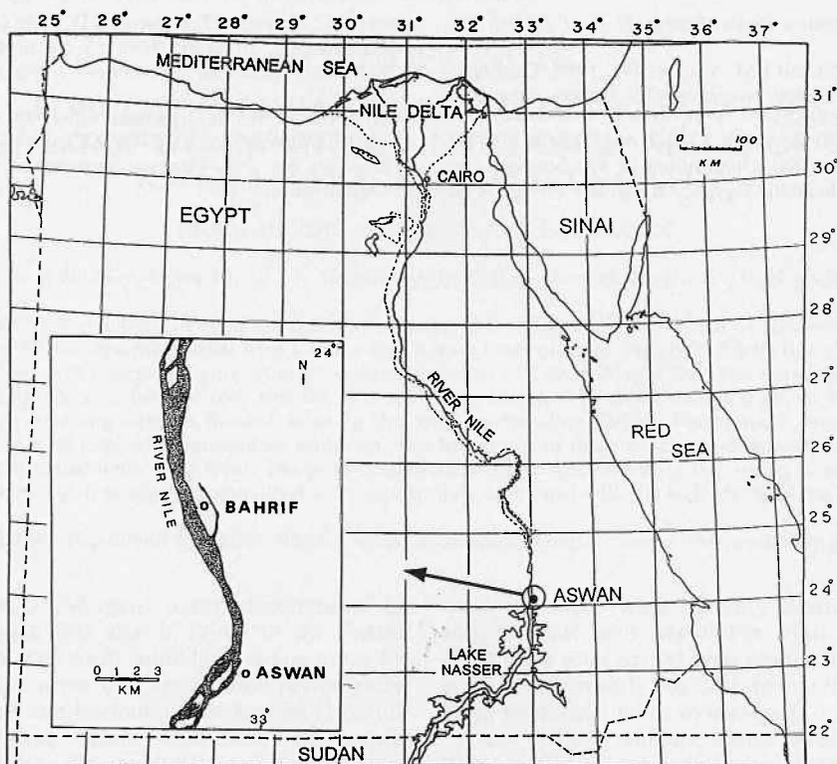


Fig. 1. Map of Egypt showing the location of Aswan and inset showing where specimens of *Phlebotomus sergenti* were collected in June 1999.

to Egypt, was hospitalized for viscerotropic *L. tropica* acquired while working in Saudi Arabia (Mohareb et al. 1996). The presence of *P. sergenti* in southern Egypt enhances the risk of transmission of both CL and viscerotropic leishmaniasis in that region. The presence of *P. sergenti* in southern Egypt also suggests that *P. sergenti* may be present throughout the Nile River valley.

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#### REFERENCES CITED

- Al-Zahrani MA, Peters W, Evans DA, Chin C, Smith V, Lane RP. 1988. *Phlebotomus sergenti*, a vector of *Leishmania tropica* in Saudi Arabia. *Trans R Soc Trop Med Hyg* 82:416.
- Ashford RW, Bettini S. 1987. Ecology and epidemiology: Old World. In: Peters W, Killick-Kendrick R, eds. *The leishmaniasis in biology and medicine* Volume 1. London: Academic Press. p 365-424.
- El Said SM, Kenawy MA, El Sawaf BM, Beir JC, El Sawy FM. 1985. Seasonal abundance and distribution of *Phlebotomus papatasi* (Diptera: Psychodidae) inside houses in Aswan Governorate, Egypt. *J Egypt Soc Parasitol* 15:371-380.
- El Sawaf BM, Shoukry A, El Said S, Lane RP, Kenawy MA, Beier JC, Abdel Sattar S. 1987. Sand fly species composition along an altitudinal transect in southern Sinai, Egypt. *Ann Parasitol Hum Comp* 62:467-473.
- Hyams KC, Hanson K, Wignall FS, Escamilla J, Oldfield EC III. 1995. The impact of infectious diseases on the health of U.S. troops deployed to the Persian Gulf during Operations Desert Shield and Desert Storm. *Clin Infect Dis* 20:1497-1504.
- Kirk R, Lewis DJ. 1951. The phlebotominae of the Ethiopian Region. *Trans R Entomol Soc Lond* 102 (8):383-510.
- Lane RP. 1986. The sand flies of Egypt (Diptera: Phlebotominae). *Bull Br Mus (Nat Hist) Entomol* 52:1-35.
- Lewis DJ. 1982. A taxonomic review of the genus *Phlebotomus* (Diptera: Psychodidae). *Bull Br Mus (Nat Hist) Entomol* 45:21-209.
- Magill AJ, Gasser RA, Oster CN, Grogl M, Sun W. 1992. Viscerotropic leishmaniasis in persons returning from Operation Desert Storm—1990-1991. *Mor Mortal Wkly Rep* 41:131-134.
- Magill AJ, Grogl M, Gasser RA, Sun W, Oster CN. 1993. Visceral infection caused by *Leishmania tropica* in vet-

- erans of Operation Desert Storm. *N Engl J Med* 328: 1383-1387.
- Mohareb EW, Mikhail EM, Youssef FG. 1996. *Leishmania tropica* in Egypt: an undesirable import. *Trop Med Int Health* 1:251-254.
- Morsy TA, El-Missiry AG, Kamel AM, Fayad ME, El-Sharkawy IM. 1990. Distribution of *Phlebotomus* species in the Nile Delta; Egypt. *J Egypt Soc Parasitol* 20: 589-597.
- Sacks DL, Kenney RT, Kreutzer RD, Jaffe CL, Gupta AK, Sharma MC, Sinha SP, Neva FA, Saran R. 1995. Indian kala-azar caused by *Leishmania tropica*. *Lancet* 345: 959-961.
- WHO [World Health Organization]. 1990. *Control of the leishmaniasis: report of WHO Expert Committee Tech Rep Ser No. 793*. Geneva, Switzerland: World Health Organization.