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SHORT COMMUNICATION

Winter activity of *Phlebotomus* (*Transphlebotomus*) *mascittii*, Grassi 1908 (Diptera: Psychodidae) on the island of Corsica

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Abstract In the first week of February 2008 on the island of Corsica, 55 *Phlebotomus* (*Transphlebotomus*) *mascittii*, 39 males and 16 females, were caught in a railway tunnel. This is the first proof of the winter activity of the adult *P. mascittii* in Europe.

One hundred years ago, Battista Grassi collected sandfly larvae in a cellar of the Via Panisperna in the center of Rome and described them first as *Phlebotomus papatasi* (Grassi 1907). After breeding them in the laboratory, he recognized the adult sandflies as a new species: *P.* (*Transphlebotomus*) *mascittii* (Grassi 1908).

Since this original description 100 years ago, little more than a thousand *P. mascittii* were collected in its known distribution area in Europe (Schmitt 2002). In 1912, *P. mascittii* was found in western Switzerland (Galli-Valerio 1912) and in 1931 in southern Switzerland (Vogel 1931). Further studies on *P. mascittii* in Switzerland were made by Knechtli and Jenni (1989) and Grimm et al. (1993). In 1950, a blood-feeding female could be collected from a child in Strasbourg near by the German border (Callot 1950). In southern France, *P. mascittii* is well-known in the French Cévennes (Guilvard et al. 1980). In Germany, the first sandflies were trapped in 1999 (Naucke and Pesson 2000), followed in Belgium in 2001 (Depaquit et al. 2005). In the southeast of the island of Corsica, an old railway tunnel is known since more than 50 years to harbor this species (Toumanoff and Chassignet 1954).

The location of this railway tunnel is nearby the road leading from Solenzara to Ste. Lucie de Porto Vecchio. The global positioning system data at the entrance of the tunnel are 41°43′14.8″ N and 9°23′58.3″ E (Fig. 1). The tunnel is 4.10 m wide and 4.63 m high. After 400 m, the tunnel is completely blocked. In the summer 2001, more than 200 specimens of *P. mascittii* were caught within 11 nights. It could be demonstrated that *P. mascittii* is a day and night active sandfly species. During summer, the temperature inside the tunnel was 19°C and was independent from the outside temperature (Schmitt 2002).

Temperature and humidity of the long (and blocked) tunnel can be compared with a cave where the seasonal temperature differences can be neglected and the outside annual average temperature is equivalent to it inside the cave. The relative humidity inside is usually high (Trimmel 1968). Therefore, it was probable that the sandflies might

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Fig. 1 The entrance of the former railway tunnel—winter activity of *P. mascittii*

be active also during wintertime inside the tunnel, especially for the species *P. mascittii*. For that reason, a winter activity of *P. mascittii* should be proven and is subject of this study in the first week of February 2008.

Centers for Disease Control (CDC) light-traps were placed at regular distances at the heights of 0.50 m up to 1.50 m for seven nights and three days. In addition, temperature and humidity were measured at every trap point and the average data were calculated. The winter temperature was about 16°C inside the tunnel. Thirty-nine male and 16 female sandflies were captured during the first week of February 2008 (Table 1). All the sandflies were identified as *P. mascittii* according to the identification key of Theodor (1958).

As *P. mascittii* is always found at a low density, little is known about its ethology. However, previous field surveys gave evidence of its anthropophilic nature (Grimm et al. 1993; Pesson et al. 1985). In Germany, *P. mascittii* was caught in several places situated close to the human dwellings (Schmitt 2002). *P. mascittii* has never been proven to be a vector of leishmaniasis, but it is noteworthy that when it occurs in *Leishmania infantum*-endemic regions it occurs in association with populations of the main local vector-species, such as *P. ariasi* and/or *P. perniciosus*. Data are not presently available on the natural and/or experimental infection of the females. Nevertheless, the affinity of *P. mascittii* belonging to the subgenera *Adlerius* and *Larroussius* (Rispail 1990), which includes all the potential vectors of Mediterranean kala-azar, suggests that the role of this species should no longer be overlooked. Since the mid-1990s, the reported geographical distribution of endemic leishmaniasis has expanded (WHO 2000). This spread is due to a combination of factors, among them are increased monitoring, more intensive research, demographic changes, land use/land cover changes that create new habitats and/or changes in microclimate, and the changes in seasonal climate (Lindgren and Naucke 2006). In countries such as Germany, *Leishmania* infection has become the most frequently imported arthropod-borne disease in dogs, which is conditional on the steadily increasing tourism and import of dogs from Mediterranean countries (Glaser and Gothe 1998). Currently, about 20,000 *Leishmania*-infected, imported Mediterranean dogs live in German households (Naucke 2007). Their number is steadily increasing.

However, the first evidence for the winter activity of *P. mascittii* in Europe could be demonstrated. Is *P. mascittii* a rare or caverniculous species in Europe? It is hoped that scientists might find more ecological niches to be checked for a winter activity of sandflies in the future.

Table 1 Sandflies collected from 01–08 February 2008 inside the tunnel

Tunnel distance in meter	Number of light traps	Number of *P. mascittii*	Average temperature in °C	Average humidity in %
25–100	6	9	16.5	62.3
125–200	11	22	16.1	63.1
225–300	9	17	16.6	61.9
325–400	7	7	16.2	66.9

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