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Composition of the *Phlebotominae* Fauna (Diptera, Psychodidae) in Balochistan, Pakistan

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Abstract: An entomological study was conducted in the whole of the Balochistan Province to identify the species of sandflies. In the considered areas of cutaneous leishmaniasis endemicity, the composition results of sandflies of suburban, rural and field biotopes are given in the present paper.

Key words: Sandflies, *Phlebotomus*, *Sergentomyia*, *Grassomyia*

INTRODUCTION

Sandflies are considered as important vector of Leishmaniasis. Cutaneous form of the disease has been known in the Balochistan Province since a long time. The adjoining countries like Afghanistan and Iran both have a stable and long history of leishmaniasis over there. Since, 1980s, with the continuous arrival of refugees from Afghanistan as well as from Iran into the Province, researchers warned about the occurrence of the disease in this region. In order to contribute to a better knowledge of the phlebotominae fauna, which was poorly documented until then, the author conducted surveys during 1996-2001 in the whole of the Province. The aim of the present work was to determine the sandfly composition in the Province.

MATERIALS AND METHODS

Sandflies were collected from in-doors as well as from out doors using suction tubes, sticky paper and light traps. Flies were processed, preserved, dissected and mounted according to the conventional methods especially those adopted by Johnson *et al.*^[1], Lewis^[2], Killick-Kendrick^[3] and Killick-Kendrick *et al.*^[4]. For species identification, keys furnished by Lewis^[5-7] and Artemiev^[8] were consulted. Specimens are housed with the Author's Collection of Sandflies, Department of Zoology, University of Balochistan, Quetta.

RESULTS AND DISCUSSION

The preliminary results indicated 23 different sandfly species from various endemic foci of cutaneous

leishmaniasis (CL) and their composition results obtained in suburban, rural and field biotopes of the Province (Table 1). In addition, 5 undetermined species, four are of the genus *Phlebotomus*, subgenus *Phlebotomus* and 1 is of the genus *Sergentomyia*, subgenus *Parrotomyia* were also recorded (only females). These are not counted here in the total number of species of sandflies because more specimens are required for study. These five flies do not seem to belong other known species from Pakistan.

Phlebotomus papatasi is the predominant species in the total flies collected. Other predominant species are: *Ph. sergenti*, *Sergentomyia babu babu*, *S. t. pashtunica* and *S. baghdadis*. The ability of a vector to bite indoors is a very important component of the vectorial capacity. It is well known that *Phlebotomus papatasi*, *Ph. salehi* and *Ph. sergenti*, the highly potential vector in the neighboring countries, are essentially domestic insects. The dominance of these three species have role in the transmission of CL or they are the possible vectors of this disease and can be incriminated as the possible vector in the region. The present data on abundance of these insects in households located in semi urban and degraded environment of rural villages indicates their transmission capabilities. Resting sandflies were abundant inside houses especially in bedrooms and bathrooms. Infestation usually occurred in the places where the sanitary facilities were poor. The fauna diversity analyses among the different areas showed significant differences, probably due to extensive alterations in the environment especially in the suburban and rural areas which has modified the epidemiology of leishmaniasis, producing changes in the variability and behavior of the phlebotomine fauna. Thus some species have disappeared in the new man-made environment, while

Table 1: Composition of sandfly species in endemic areas of cutaneous leishmaniasis in Balochistan

Species		Suburban	Rural	Field
<i>Ph. papatasi</i>	(N=720, 35.76%)	290 (40.2%)	360 (50%)	70 (9.7%)
<i>Ph. bergeroti</i>	(N=30, 1.5%)	15 (50%)	12 (40%)	3 (30%)
<i>Ph. salehi</i>	(N= 70, 3.48%)	22 (31.42%)	28 (40%)	10 (14.28%)
<i>Ph. sergenti</i>	(N=140, 6.94%)	48 (34.28%)	74 (52.85%)	18 (12.85%)
<i>Ph. alexandri</i>	(N=82, 4.07%)	13 (15.85%)	61 (74.39%)	8 (9.75%)
<i>Ph. andrejevi</i>		---	a single male	---
<i>Ph. nuri</i>	(N=09, 0.45%)	6 (66.66%)	3 (33.33%)	---
<i>S. fallax</i>	(N=80, 3.97%)	6 (7.5%)	72 (90%)	2 (2.5%)
<i>S. punjabiensis</i>	(N=22, 1.09%)	10 (45.45%)	12 (54.55%)	---
<i>S. murghabiensis</i>	(N=17, 0.84%)	---	17 (100%)	---
<i>S. mervynae</i>	(N=19, 0.94%)	---	9 (100%)	---
<i>S. dentate arpaklensis</i>	(N=2, 0.1%)	--	02 (100 %)	---
<i>S. theodori pashtunica</i>	(N=158, 7.85%)	--	154 (97.6%)	4 (2.53%)
<i>S. babu babu</i>	(N=165, 8.2%)	40 (24.24%)	125 (75.76%)	--
<i>S. palestiniensis</i>	(N=10, 0.5%)	10 (100%)	---	--
<i>S. baghdadis</i>	(N=145, 7.2%)	55 (37.93%)	90 (62.07%)	--
<i>S. grekovi</i>	(N=1)	a single female	---	--
<i>S. freetownensis</i> var.	(N=110,5.46%)	47 (42.72%)	58 (52.73%)	5 (4.55%)
<i>S. clydei</i>	(N=75, 3.73%)	22 (29.33%)	53 (70.67%)	--
<i>S. tiberiadis pakistanica</i>	(N=25, 1.24%)	15 (60%)	10 (40%)	--
<i>S. hodgsoni hodgsoni</i>	(N=20, 1%)	4 (20%)	16 (80%)	--
<i>G. indica</i>	(N=54, 2.68%)	17 (31.48%)	37 (68.52)	--
<i>G. dreyfussi turkestanica</i>	(N=53,2.63%)	21 (39.62%)	32 (60.38%)	--

others have found highly favorable conditions for their development in these same locations. A higher abundance of female of *Ph. papatasi*, *Ph. salehi*, *Ph. sergenti*, *Ph. alexandri*, *Sergentomyia fallax*, *S. t. pashtunica*, *S. babu babu*, *S. baghdadis*, *S. freetownensis* var. *S. clydei*, *Grassomyia indica* and *G. dreyfussi turkestanica* were observed in indoors and near the human residences. This result suggests the population of these flies display a remarkable endophily. However, *Ph. papatasi*, *Ph. salehi*, *Ph. sergenti*, *Ph. alexandri*, *S. t. pashtunica* and *S. freetownensis* var. were captured from burrows in fields.

In conclusion, it can be suggested that after the present study, the number of sandfly species from Pakistan rises up to 37, though previously, Lewis^[5] reported 29 species from Pakistan.

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