

## The application of random amplified polymorphic DNA for sandfly species identification in Saudi Arabia

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### ABSTRACT

Sandflies are of great medical and economic importance as vectors of disease agents such as viruses, bacteria and protozoan parasites. Because of the great importance of these insects in the Kingdom, The present work has been undertaken to collect and identify samples from different regions of the Kingdom of Saudi Arabia, which included the Central Province (Riyadh and Qassim), the East Province (El Ehsa), the West Province (AlMadinah AlMunawarh) and South Province (Abha and Assir). Samples were divided into two parts: the first included the head and terminalia, which were used for morphological taxonomy, and the second part included the rest of the body which was used for molecular taxonomy. Standard keys of morphological taxonomy were used for the identification and classification of the sandflies. The collected sandflies were found to belong to five species and two genera. Of these, three species belonged to the genus *Phlebotomus*, these were *Phlebotomus (P.) papatasi*, *P. bergeroti* and *P. sergenti*. The other species belong to genus *Sergentomyia*, these were *Sergentomyia (S.) antennata*, *S. clydei*. *P. papatasi* was the most common species in all of the collection areas (56.37%), *S. clydei* was the second common (23.58%) and *S. antennata* was the third common species (8.4%) followed by *P. sergenti* (7.86%), then *P. bergeroti* (2.71%). The second part of each fly, including the thorax, anterior part of the abdomen and wings, were used for DNA extraction. The DNA was amplified by the RAPD-PCR method using two different arbitrary primers, Opa-2 and Ap-16. Species-specific banding patterns were obtained by this method. Slight differences were observed in the banding pattern within the species which suggested that there were individual diversity or that these variations were owing to the presence of subspecies or sibling species in the same species.

**Keywords:** Sandflies- DNA- Saudi Arabia

### INTRODUCTION

Sandflies (Diptera, Psychodidae) are among the most medical important insects since they transmit several species of pathogenic bacteria (Beati *et al.*, 2004), viruses and protozoan parasites, the agents of both cutaneous leishmaniasis (CL) and visceral leishmaniasis (VL) (Robert & Janovy, 1996). CL is present in Bisha (Lewis and Buttiker, 1980); Al-Kharj, Al-Ahsa (killick-Kindrick *et al.*, 1985); Hail (Al-Zaharani *et al.*, 1988b); Makkah (Lane &

Fritz, 1986); Rfha, Najran, Taif, Asir and Jizan (killick-Kindrick *et al.*, 1985; Al-Zahrani *et al.*, 1988b); Riyadh (Al-Dawood *et al.*, 2004). *Leishmania major*, the causative agent of CL in Kingdom of Saudi Arabia (KSA) is transmitted by female of *Phlebotomous papatasi* (Abou El-Ela *et al.*, 1995; Al-Dawood *et al.*, 2004) while the other causative agent of CL, *Leishmania tropica*, is transmitted by the females of *Phlebotomus sergenti* (Al-Zaharani, 1988; El-Sibae and Eesa, 1993). VL, caused by *Leishmania*