

SEPARATION OF
PSYCHODOPYGUS CARRERAI
CARRERAI AND *P. YUCUMENSIS*
(DIPTERA : PSYCHODIDAE) BY
GAS CHROMATOGRAPHY OF
CUTICULAR HYDROCARBONS.

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SUMMARY

Specimens of two species of sandfly, *Psychodopygus carrerai carrerai* and *P. yucumensis*, vectors of *Leishmania braziliensis braziliensis* in the subandean lowlands of Bolivia were subjected to cuticular hydrocarbon analysis to ascertain if the technique could separate the isomorphic females. A high degree of separation (87%) was obtained based on

Introduction

Sandflies of the genus *Psychodopygus* are proven vectors of *Leishmania (Viannia)*

Results

Fifty three sandflies were analysed; 27 females of *P.c. carrerai* and 26 females of *P. yucumensis*. Examples of the hydrocarbon profiles obtained are shown in Figure 1 and these profiles have been chosen to highlight the five peaks which account for most of the separation. The classification table (table 1) shows a high degree of separation of the the two species and predicts that 87% of unknown flies would be correctly identified using the discriminant function derived from this data.

Discussion

The public health importance of these anthropophilic vectors in relation to their distribution and abundance in the area of settlement is clear from earlier studies on disease prevalence (DESJEUX *et al.*, 1987). Both *P. c. carrerai* and *P. yucumensis* have been identified as vectors of cutaneous leishmaniasis in the subandean lowlands of Bolivia - an area which has been selected for the settlement of people from the high altitude plateau. Currently, there is massive immigration of non-immune populations into this endemic region; with activities such as road building, forest exploitation for timber, housing construction close to primary forest and hunting, all resulting in high rates of transmission. The continuing geographical spread and the growing incidence of leishmaniasis in this region thus have important socio-economic consequences. For the future implementation of control measures it is important therefore, to identify the different elements of the transmission cycle in this area.

P. yucumensis and *P. c. carrerai* are sympatric only in the lowest altitudes of *P. c.*

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Fig.1 : Examples of the chromatograms obtained from the extracted cuticular wax of individual female *Psychodopygus carrerai carrerai* and *P. yucumensis*. The x-axis represents increasing time, temperature and molecular weight of compound, while the height and area under the peak represent the concentration. Compounds other than hydrocarbons are also extracted (e.g. fatty acids, esters etc.). The hydrocarbon peaks are indicated (as determined by gas chromatography/mass spectrometry) and those accounting for most of the separation (i.e. > 77%) are denoted by an asterisk (*).

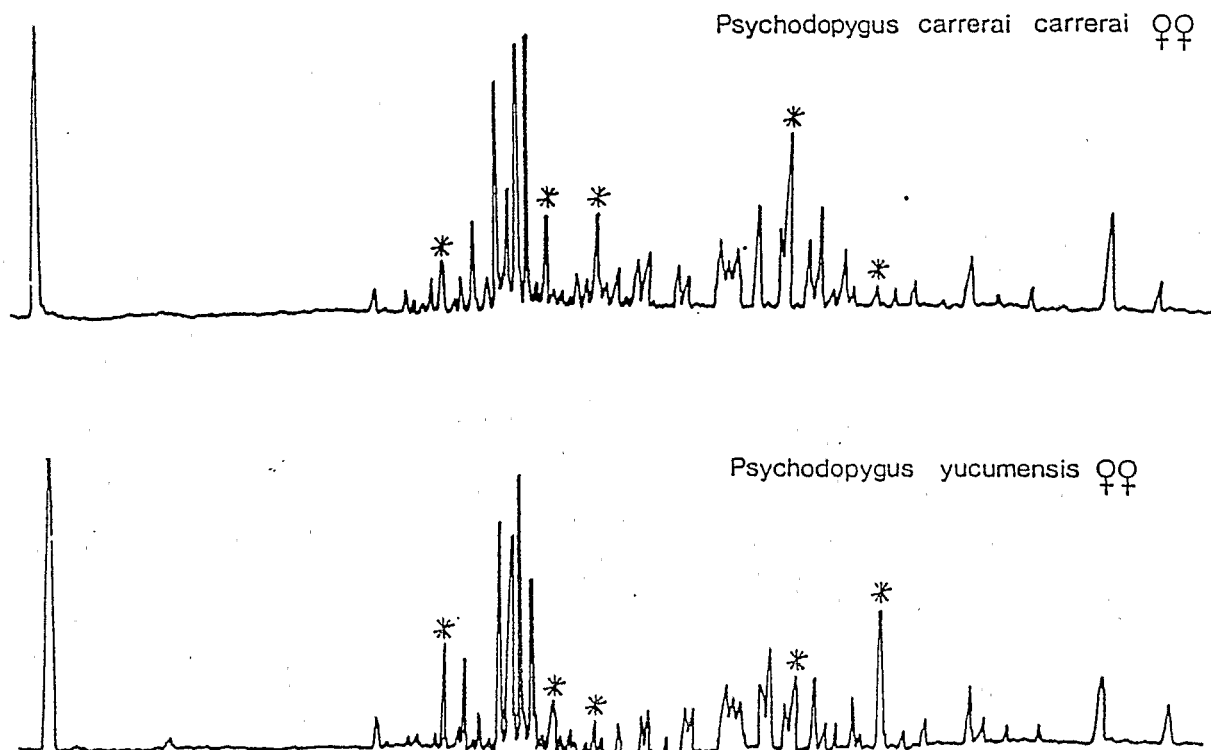


Table 1.

Table showing the predicted classification success using the discriminant function calculated from the data.

Actual group	Predicted group	
	<i>P.c. carrerai</i>	<i>P. yucumensis</i>
<i>Psychodopygus c. carrerai</i>	24	4
<i>Psychodopygus yucumensis</i>	3	22
TOTAL	27	26

Average correct classification rate = 87%