ABOUT THE VALIDITY OF THE RATIO AIII/EP TO DISTINGUISH *PHLEBOTOMUS PERNICIOSUS* AND *PHLEBOTOMUS LONGICUSPIS* ♂♂ (DIPTERA, PSYCHODIDAE)

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Summary :

In Southeast of the Iberian Peninsula the ratio length of third antennal article over the length of the epipharynx (AIII/EP) is not useful in order to distinguish these two species. The distributions of frequencies coincide and both species have the same mean for this character.

KEY WORDS : *Larrousius*, *Phlebotomus perniciosus*, *Phlebotomus longicuspis*, phlebotomine sandflies, biometry.

Résumé : SUR LA VALIDITÉ DU RAPPORT AIII/EP POUR DISTINGUER *PHLEBOTOMUS PERNICIOSUS* ET *PHLEBOTOMUS LONGICUSPIS* (DIPTERA, PSYCHODIDAE)

Dans le sud-est de la Péninsule Ibérique, le rapport des longueurs du troisième article de l'antenne et de l'épipharynx (AIII/EP) n'est pas utile pour l'identification spécifique de *P. perniciosus* et *P. longicuspis*. Les distributions de fréquences coïncident et les moyennes de ce caractère, pour ces deux espèces, sont statistiquement égales.

MOTS CLÉS : *Larrousius*, *Phlebotomus perniciosus*, *Phlebotomus longicuspis*, phlébotomes, biométrie.

Parrot (1936) withdrew the variety *longicuspis* Nitzulescu, 1931, from *P. langeroni* Nitzulescu, 1930, and erected it as a valid species. He thought it was very close to *P. perniciosus* Newstead, 1911, and proposed the ratio between the length of the third antennal article and the length of the epipharynx (AIII/EP) as means of distinguishing both species. However there is an overlap in the range values which means that the taxonomic identity of some specimens can not be established.

The validity of these two species was not discussed until Morillas-Márquez *et al.* (1982) reported *P. longicuspis* for the first time in the Iberian Peninsula (Granada province). They found males with one valve like *P. perniciosus* and another like *P. longicuspis*. Similar specimens have been found within the populations of Alicante, Murcia and Almería provinces (Martínez-Ortega *et al.*, 1987; Morillas-Márquez *et al.*, 1991). Ever since, the inclusion of conflictive males in one of these two species has relied on the personal criteria of the authors.

For a long time this taxonomic character has been considered valid although it has not been widely used. Nevertheless in several doctoral theses or monographs, where it is possible to include an extensive description of the studied species (e.g. Theodor, 1948,

Morillas-Márquez, 1982, Martínez-Ortega, 1986, Marchais, 1992, Conesa-Gallego, 1994), explicit reference to this character is made.

The purpose of the present work is to study the effectiveness of this ratio to differentiate the populations of *P. perniciosus* and *P. longicuspis* in the Southeast of the Iberian Peninsula.

In order to check the validity of this taxonomic character we study whether or not the means for the two species are different in an attempt to ascertain the variation of this feature within a population. We also study the degree of overlapping in the range of values of both species.

A total of 462 male specimens belonging to *P. perniciosus* (n = 331) and *P. longicuspis* (n = 36) were studied. Also 197 males of *P. ariasi* Tonnoir, 1921 were used as a reference species in the multivariate analysis because it is a different and well defined species, and it too belongs to subgenus *Larrousius*. We also used 26 males of *P. longicuspis* collected in Morocco (Midelt, El Kbab, Oua-Oumana, Nimrou and Boulemane). Females were not used because we had no female which could be assigned to *P. longicuspis*.

The range of ratios (Table I) for *P. longicuspis* is within the range of ratios of *P. perniciosus* whereas the mean of *P. ariasi* is Higher than that of the other two. When we compare the means using a One-Way Analysis of Variance, the result is equality of means for *P. perniciosus* and *P. longicuspis* (p > 0.05), and significant differences with *P. ariasi* (p = 0). The mean of *P. longicuspis* of Morocco is significantly equal to the

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	$\bar{x} \pm \text{confidence}$ int. 95%	Min	Max
<i>P. perniciosus</i>	1.2506 $\pm$ 0.0094	0.9608	1.5801
<i>P. longicuspis</i>	1.2811 $\pm$ 0.0340	1.0638	1.4048
<i>P. longicuspis</i> (Morocco)	1.2273 $\pm$ 0.0201	1.1220	1.3077
<i>P. ariasi</i>	1.3645 $\pm$ 0.0143	1.0000	1.6111

Table I. — Ratio AIII/EP for *P. longicuspis*, *P. longicuspis* (Morocco), *P. perniciosus* and *P. ariasi*.

Arimethic mean $\pm$ confidence intervals to 95 % and maximum and minimum values.

mean of *P. perniciosus*. Therefore it became clear that the value of this ratio should not be employed as taxonomic character since there are no significant differences between both species. The populations of both species fully overlap. In fact, *P. longicuspis* (from both Spanish and Moroccan populations) has a frequency distribution included within the distribution of *P. perniciosus*, whereas *P. ariasi* has a small overlap with *P. perniciosus*. In most cases (working with a confidence level of 95 %) it is impossible to assign a specimen to a particular species by using AIII/EP ratio, since both species have the same mean.

On the basis of these results, it is obvious that in the sandfly populations of southeastern Spain, it is impossible to differentiate the specimens of *P. perniciosus* and *P. longicuspis* by using the AIII/EP ratio, since both populations have the same mean and the distributions of frequencies of both species coincide. New characters are needed to differentiate between species.

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Reçu le 27 mars 1996

Accepté le 8 août 1996