

MARKING PHEROMONES OF BUMBLEBEES: COMPOSITION OF THE LABIAL GLAND SECRETION OF MALES OF *BOMBUS MAGNUS*.

Irena Valterová¹, Klára Urbanová¹, Pierre Rasmont² and Michaël Terzo^{2*}

¹Institute of Organic Chemistry and Biochemistry, Academy of Sciences of the Czech Republic, 166 10 Prague, Czech Republic

²University of Mons-Hainaut, Laboratory of Zoology, Avenue du Champs de Mars 6, B-7000 Mons, Belgium; *FNRS Scientific Research Worker
email: irena@uochb.cas.cz, michael.terzo@umh.ac.be

Bombus magnus is a bumblebee species belonging to the subgenus *Bombus sensu stricto* and closely related to *B. cryptarum* and *B. patagiatus*. It is abundant in Atlantic heaths from Portugal to Norway [1,2]. Characters given by Rasmont to separate *B. magnus*, *B. cryptarum*, *B. terrestris* and *B. lucorum* show a great variability in coloration and a great homogeneity of genitalia which make them difficult to identify [2]. Because of this variability Williams [3] does not recognise *B. magnus* as a good species. As application of the Paterson species recognition concept [4], the composition of the labial gland secretion, used by males for scent-marking their patrolling nuptial behaviour, seems to be the most reliable trait for recognising the validity of the bumblebees species [5].

Main component of the labial gland secretion of *B. magnus* is ethyl dodecanoate (23 %) as it is the case also for *B. patagiatus* [5] and *B. cryptarum* [6]. This is also a major or minor characteristic component in all known sexual pheromones of other species of the subgenus *Bombus* [5-7]. Unsaturated C₁₈ alcohols and ethyl esters of the corresponding acids are found in *B. magnus* and *B. lucorum* [7], but they are not reported in *B. cryptarum* [6]. Beside the main component, many other lower-abundant components are in common for *B. magnus* and *B. cryptarum*. However, their proportions are different. Another characteristic of *B. magnus* sexual pheromone is that it contains small amount (0.4 %) of geranylcitronellol and other terpene derivatives. The same is true for *B. lucorum* (0.3 % of isoprenoids). However, *B. terrestris* is the only other species of the subgenus *Bombus* which contains large amounts of isoprenoids (2,3-dihydrofarnesal 5 %, 2,3-dihydrofarnesol 18 %, 2,3-dihydrofarnesyl acetate 2 %, geranylcitronellal 4 %, geranylcitronellol 8 %, and 2,3-dihydrofarnesyl dodecanoate 6 %).

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