Analysis of the Labial Gland Secretions of the Male Bumblebee *Bombus griseocollis* (Hymenoptera: Apidae)

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   The labial gland secretions from males of the bumblebee *Bombus (Separatobombus) griseocollis* De Geer, a bumblebee exhibiting perching behaviour, were analysed by gas chromatography/mass spectrometry (GC/MS) in the electron impact and positive ion chemical ionization mode. The major compound of the complex mixture of alkenols, acetates, hydrocarbons, wax type esters and steroids is tetradecyl acetate, considerable amounts of hexadecyl, geranyllinaloyl, geranylgeranyl, docosyl, tetracosenyl and hexacosenyl acetate were also found. 1,3-Tetradecanediol diacetate, detected as a minor component, has not yet been identified in male bumblebee labial gland secretions. Besides small amounts of primary alcohols (tetradecanol and hexadecanol) the tertiary alcohol geranyllinalool (3,7,11,15-tetramethyl-hexadeca-1,6,10,14-traene-3-ol) was also present. The primary alcohols were also present as esters of butanoic, dodecanoic, tetradecanoic, and hexadecanoic acid. Besides the usual mixture of un- and mono-unsaturated straight chain hydrocarbons, the labial gland contains the isoprenoid hydrocarbons β-springene [(6*E*,10*E*)-7,11,15-trimethyl-3-methylene-hexadeca-1,6,10,14-tetraene] and two isomers of α-springene [(3*Z*,6*E*,10*E*)- and (3*E*,6*E*,10*E*)-3,7,11,15-tetramethyl-hexadeca-1,3,6,10,14-pentaene]. The close relationship in chemical composition in male bumblebees with perching and flight pass behaviour is discussed.

Key words: Bombus griseocollis, Geranyllinalool, Springene, 1,3-Tetradecanediol Diacetate