

Comunicação Científica**Identification by Gas Chromatography - Mass Spectrometry (GC - MS) of the Compound Responsible for the Rancid Odor of Female Cysts of *Eurhizococcus brasiliensis* (Hempel)**John P.G. Wilkins¹ and Saulo de J. Soria^{2,3}¹Ministry of Agriculture, Fisheries and Food, Central Science Laboratory, Harpenden, Hertfordshire, AL5 2 BD, UK.²Laboratório de Entomologia, EMBRAPA, Centro Nacional de Pesquisa de Uva e Vinho, Rua Livramento 515, 95700-000, Bento Gonçalves, RS.³Corresponding author.

An. Soc. Entomol. Brasil 25(1): 169-170 (1996)**Identificação Química do Composto Odorífico dos Cistos-Fêmea de *Eurhizococcus brasiliensis* (Hempel)**

RESUMO - A pérola-da-terra *Eurhizococcus brasiliensis* (Hempel) é praga importante que prejudica o sistema radicular das videiras no Brasil. A utilização de feromônios sexuais no controle de insetos está se tornando um método amplamente utilizado para reduzir o tamanho das populações. Este método foi proposto como conseqüência de observações de campo com relação aos hábitos de agregação e cortejo dos machos tentando copular com as fêmeas. O objetivo deste trabalho foi determinar a natureza química do odor forte exalado pelas fêmeas nos cistos, sugerindo atividade feromonal sexual intensa. A substância odorífera foi extraída com 10 ml de etanol, a partir de 20 fêmeas, no estágio de ciste. A determinação analítica foi realizada através da cromatografia gasosa utilizando-se um aparelho (GC) Hewlett-Packard, equipado com coluna capilar de 25 m x 0,2 mm de diâmetro interno. Os resultados mostraram que o composto odorífero é o ácido n-pentanóico (ácido valérico). A presença de n-pentanal foi também evidenciada. Suspeita-se que este composto possa ser o feromônio sexual utilizado para atrair os machos alados.

PALAVRAS-CHAVE: Insecta, Coccoidea, Margarodidae, semioquímicos.

The ground pearl *Eurhizococcus brasiliensis* is a serious pest that damages the root system of grape vines in Brazil. The use of pheromones in insect control is being proposed as an alternative method to reduce populations. This method of control is proposed as a result of field observations of assemblage and courtship of several males attempting to copulate with that same female at the same time. The objective of this work

is to determine the chemical nature of the strong goaty odor of virgin females within the cysts, suggesting strong sex pheromonal activity of virgin female to attract males.

Analytical work was carried out at Central Science Laboratory, Harpenden, Hertfordshire, England. Twenty female cysts were extracted with 10 ml ethanol. Analysis was made with Hewlett-Packard Carbowax 20M capillary GC column, 25 m x 0,2 mm, film

thickness 0.1 micron (HP19091W-102). On-column injection into a Supelco deactivated mega-bore retention gap, 1 m x 0.53 mm, coupled to the analytical column with a push-fit connector. Injection volume one microliter. Injector temperature 230 C. GC oven temperature programme: 40 C (1 min), and 10 C/min to 220 C (held at 220 C for 10 min). Capillary GC column coupled directly to JEOL DX-300 Mass Spectrometer, operated in electron impact ionisation (EI) mode, with 70eV ionisation energy, ion source temperature 200 C, scanning m/z 20-500 once per second.

Results of GC-MS analysis of the ethanolic extract indicated the presence of several volatile organic compounds. The two major components detected were identified as 1,1-diethoxypentane (GC-retention time 384 s, main ions m/z 57 (100%), 103 (90), 115 (70), 85 (60), 69 (60) and 47 (60) and n-pentanoic acid (retention time 719 s, main ions m/z 60 (100%), 73 (45), 102 (1) molecular ion). The identity of the n-pentanoic acid was confirmed by comparison with standard material. (The retention times of n-propanoic, n-butanoic, n-pentanoic and n-hexanoic acid reference materials under these GC conditions were 565, 636, 718 and 795 s respectively). The concentration of the n-pentanoic acid was estimated to be 2.5 g/l. Smaller amounts of ethyl stearate and ethyl linoleate were also detected. According to Jacobson

et al. (1968), n-pentanoic acid, also known as valeric acid, has been reported as an insect sex attractant of the sugar beet wireworm, *Limonius californicus* (Mannerheim).

The goaty smell of the extract of the virgin female cysts is very evident, even in the presence of the solvent (ethanol). This rancid smell is due to the presence of n-pentanoic acid ($C_5H_{10}O_2$, molecular weight 102) which is also known as valeric acid. There were several other components in the extract, but the most abundant was 1,1-diethoxypentane. This is the diethyl acetal of n-pentanal (also known as valeraldehyde) which may have been produced from pentanal by reaction with ethanol. The presence of pentanal would not be unexpected. It is closely related to n-pentanoic acid, to which it is readily converted by oxidation. The pentanal could also be a significant component in contributing to the odour of the insects.

Literature Cited

- Jacobson, M., C.E. Lilly & C. Harding. 1968. Sex attractant of sugar beet wireworm. Identification and biological activity. *Science* 159: 208-210.

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