THE CHEMICAL NATURE OF THE AMPHIDIAL AND " EXCRETORY " SYSTEM SECRETIONS OF *HETERODERA SCHACHTII* (NEMATODA : HETERODERIDAE) MALES

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Accepted for publication 11 September 1993.

Key-words : Chemoreceptors, chemosensilla, O-glycans, mucins, mucus, subunits. Nematode.

The amphids are supposed to be the main chemosensilla of the nematode head. The dendritic nerve extensions of the amphidial neurons are surrounded by secretions of the amphidial gland cells (Wright, 1983). The secretions may protect the nerve dendrites against microbial attack (Aumann & Wyss, 1989). In spite of a recent proposal (Bird *et al.*, 1988) the function of the so-called " excretory " system and of its gland cell secretions is yet unknown. The chemical characterization of the secretions may aid in the determination of their functions.

Previous studies showed that the amphidial secretions of the plant-parasitic nematode *Heterodera schachtii* are composed of glycoproteins with terminal galactose units (Aumann, 1989). Several lectins with different carbohydrate specificities bind to the amphidial and " excretory " system secretions of this (Aumann & Wyss, 1989) and other nematode species (Jansson, 1987). The carbohydrates may be bound to the protein backbone either N-glycosidically via N-acetylglucosamine and asparagine or O-glycosidically via N-acetylgalactosamine and serine or threonine. Fetuin, a blood glycoprotein, con-

Table 1. *The effects of glycoprotein-modifying reagents on lectin binding to the amphidial and " excretory " system secretions of* Heterodera schachtii *males.*

Treatment	n	No. (%) of males with lectin binding sites			
		Amphids		" Excretory " system	
		Con A	WGA	Con A	WGA
N-Glycosidase F	35	35 (100)	–	21 (60.0)	–
Sodium phosphate, pH 7.2	35	35 (100)	–	27 (77.1)	–
Trifluoromethanesulphonic acid	30	4 (13.3)	6 (20.0)	0	0
Water	30	30 (100)	30 (100)	14 (46.7)	2 (6.7)
Guanidine-HCl plus dithiothreitol	40	40 (100)	–	35 (87.5)	–
Tris-HCl, pH 8.0	40	40 (100)	–	16 (40.0)	–

glucosamine residues should have remained unaffected. The experiments with N-glycosidase F and trifluoromethanesulphonic acid thus indicate that the amphidial and " excretory " system secretions of *H. schachtii* males are composed exclusively of O-glycans.

According to Aumann and Wyss (1989), Con A (glucose/mannose specificity group) and WGA (N-acetylglucosamine specificity group) and the lectins from *Helix pomatia* and *Arachis hypogaea* (galactose/N-acetylgalactosamine specificity group) specifically bind to the amphidial secretions of *H. schachtii* males. The lectin from *A. hypogaea* also specifically bound to the " excretory " system secretions. Table 1 shows that, in contrast to previous observations (Aumann & Wyss, 1989), Con A bound to the " excretory " products, which may have been caused by an increased accessibility of internal Con A binding sites after the pre-incubation of nematodes with ultrapure water (Aumann, 1989). The variability of Con A binding to the " excretory " system secretions (Table 1) may be explained by the relatively small size of the " excretory " pore and by its variable position in specimens that had been fixed on microscopic slides. In summary, these data suggest that mannose or glucose, N-acetylglucosamine, and galactose and/or N-acetylgalactosamine are components of the amphidial secretion oligosaccharide chains, whereas the oligosaccharides of the " excretory " system secretions may contain galactose and/or N-acetylgalactosamine residues. Furthermore, as N-glycans do not seem to occur in the amphidial and " excretory " system secretions (Table 1), these monosaccharide residues may be components of O-glycans. This points to an unusual composition of *H. schachtii* O-glycans, since, in contrast to N-glycans (Kornfeld & Kornfeld, 1985), O-glycans usually do not contain mannose residues (Schachter & Brockhausen, 1989).

Human gastric mucus glycoproteins appear to be composed of four subunits linked together via disulphide bridges (Slomiany *et al.*, 1989). Using the guanidine hydrochloride plus dithiothreitol method, subunits were obtained from several mucous glycoproteins (Carlstedt *et al.*, 1982; Meyer, 1983; Carlstedt & Sheehan, 1984). This method did not affect the amphidial and " excretory " system secretions of *H. schachtii* males (Table 1), indicating that they are not composed of disulphide-linked subunits.

Acknowledgments

I thank Dr. Karin Petersen for providing the nematodes and the Deutsche Forschungsgemeinschaft for financial support (Au 100/1-1).

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PLESIOROTYLENCHUS TRUNCATUS (SHER, 1964) N. COMB. (NEMATA : HOPLOLAIMIDAE)

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