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### Modulation of early plant defenses by herbivores and their oral secretions

**Hala Samaha**

Lebanese University, Lebanon

Phloemophagous insects feed on sieve tubes due to their high content of nutrients. To reach phloem, aphids use their piercing mouthparts (stylets) inflicting sequential mechanical wounds on the plant cells and a periodic injection of oral secretions (OS). The presence of enzymes in the OS is suggested to prevent early plant responses in order to access the underlying cell membrane. With the aim to characterize salivary elicitors we characterized local potato responses against *Macrosiphum euphorbiae* at macroscopic, microscopic and physiological levels. Using a cytological approach, we identified three induced responses on local and distal leaves with an evident demonstration of their cross-linking. In addition to callose, brown phenolic deposits (lignin and suberin) appeared on infested leaf veins forming a physical barrier through cell-wall thickening and constitute an early wound-induced response. To overcome this physical obstruction, aphids inhibit callose in the mesophyll but could not hinder the irreversible polyphenols deposit. At a late stage of infestation, a localized HR-like cell death was induced. Puncturing inflicted on the tissues by aphid stylets are responsible for callose/polyphenol deposits unlike HR, which can be induced on foliar discs after applying aphid oral secretions. Aphid saliva seems to be able both to induce and inhibit plant defense responses. To test this hypothesis, we used cultivated potato cells. Ion flux detection and generation of reactive oxygen species were induced after aphid saliva application to cells. The findings provide a better insight into the molecular mechanisms mediating herbivore-induced plant defense. A possible influence of these early induced responses on viruses transmission by aphids is discussed.

### Biography

I currently working as an assistant professor in the Department of Life and Earth science, Lebanese University of Beyrouth, Fanar. I received my PhD in cellular and molecular plant physiology from the University of Picardie Jules Verne. I had a master degree in cellular and molecular biology from the University of Louis Pasteur, France and B.A in plant biology at the Lebanese University.

Halsam@ul.edu.lb

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