

CHARACTERIZATION OF EFFECTOR GENES FROM *GLOBODERA PALLIDA* IN RESISTANT AND SUSCEPTIBLE POTATO PLANTS

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Potato cyst nematodes (PCN) are some of the most economically important pests of potato. *Globodera pallida* was first detected in the United States in Idaho in April 2006. Nematode secretions (effector genes) are the first signals perceived by the plant, and affect the host defense response, facilitates the second-stage (J2) penetration and development in the host plant.

- Objectives:**
- To study the expression of putative effector genes (*Gp-crt-1*, *Gp-far-1*, *Gp-rbp-1* and *Gp-mnsod*) in different developments stages of *G. pallida*
 - To investigate whether resistant and susceptible potato and *Solanum sisymbriifolium* (SS) root exudates regulate the expression of putative effector genes.

Methods:

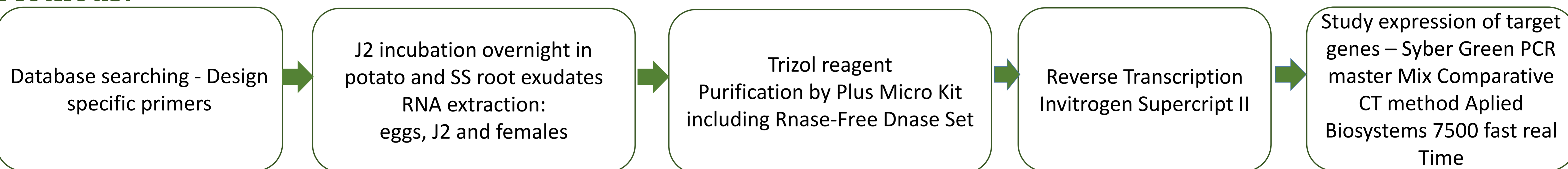


Figure 1 A) Susceptible potato plant Desiree cv and B) Immune *S. sisymbriifolium* plant.

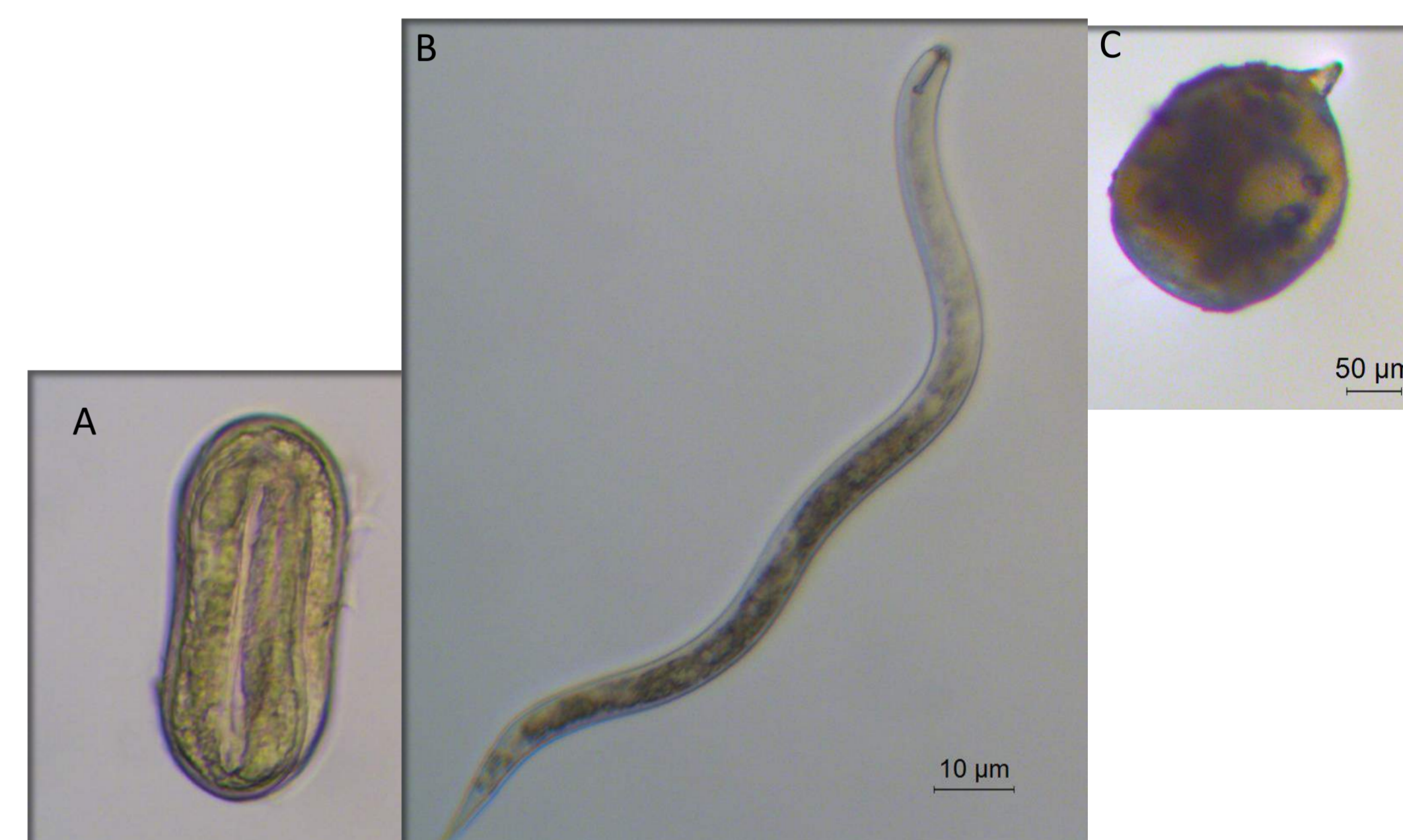


Figure 2 Developmental stages from *Globodera pallida*: A) eggs, B) second stage Juveniles (J2) and C) females

Results:

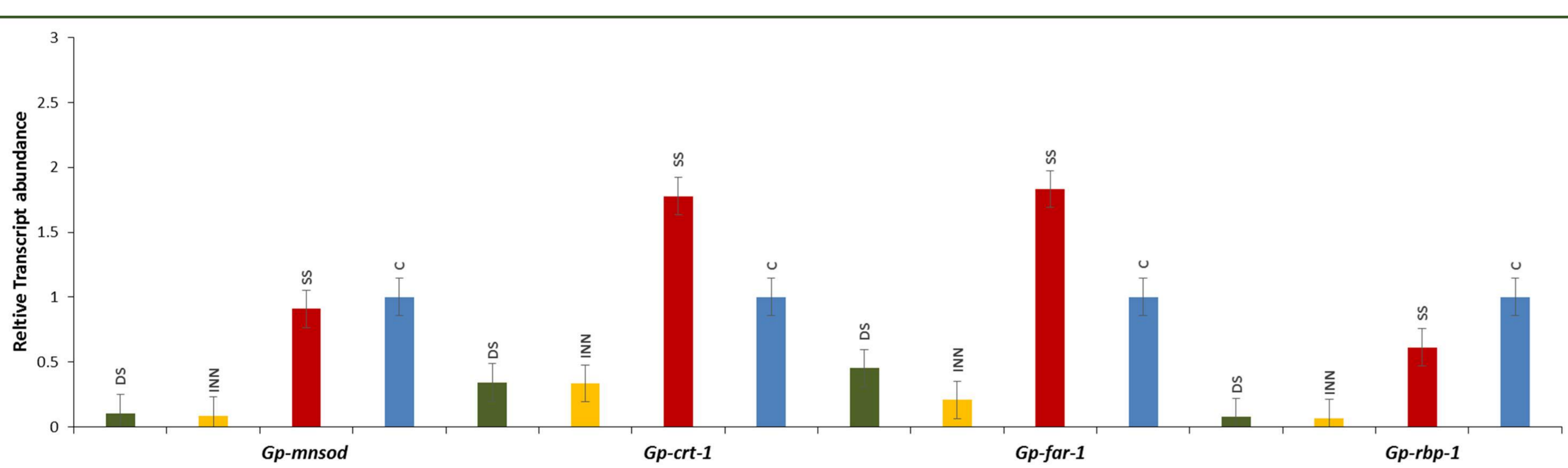


Figure 3 Evaluation of transcript abundance of the J2 putative effector genes after incubation in immune and resistant root plant exudates

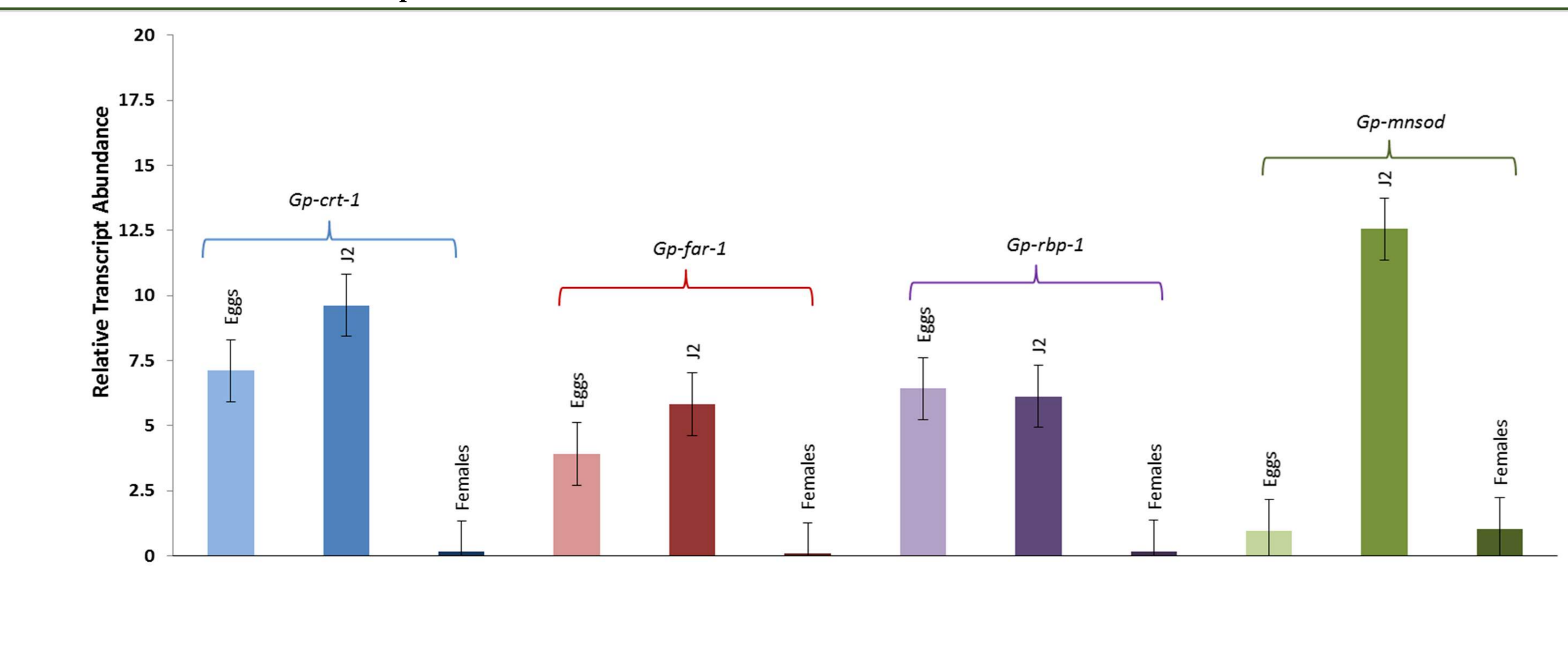


Figure 4 Evaluation of transcript abundance of putative effector genes in different development stages

Conclusions:

- G. pallida* J2 recognizes signal molecules in susceptible (potato) and immune *S. sisymbriifolium* plant root exudates
- Potato and *S. sisymbriifolium* root exudates induces changes in putative effector genes expression
- Genes potentially involved in parasitism are up-regulated prior to nematode infection
- Plant signal molecules in root exudates can lead to the development of new novel approaches for management of *G. pallida*
- Gp-crt-1*, *Gp-far-1*, *Gp-rbp-1* and *Gp-mnsod* genes were transcribed in eggs, J2, and females suggesting a potential role as parasitism genes
- Genes up-regulated:
 - Eggs- embryonic development and hatching process
 - J2- root invasion/migration
 - Females - later events of infections (eggs deposition)

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