



0093 – SELECTION OF TOMATO GENOTYPES WITH HIGH LEVELS OF ACYLGLUCOSES AND RESISTANCE TO *TUTA ABSOLUTA*

LUANA DE SOUZA MARINKE¹; FERNANDO T HATA²; GABRIELLA C GOMES¹; HEDER ASDRUBAL M VALENCIA¹; TATIANA DE C CARRASCO¹; JULIANO TADEU V DE RESENDE¹

¹ UEL - UNIVERSIDADE ESTADUAL DE LONDRINA- DEPARTAMENTO DE AGRONOMIA, PR

² UEM - UNIVERSIDADE ESTADUAL DE MARINGÁ- DEPARTAMENTO DE AGRONOMIA, PR

INTRODUCTION

Several pests, such as tomato leafminer, can reduce tomato (*Solanum lycopersicum* L.) fruit production.

Since the lack of control and continuous increase in these insects' populations is an alarming problem for the tomato crop, It is necessary to seek alternatives, both to control insecticide-resistant pest populations and to reduce their use, reducing production costs and making this production chain more sustainable. Therefore, genetic improvement programs seek effective measures for this purpose, through the introgression of resistance genes from wild tomato species into commercial genotypes.

Studies carried out with the wild access *Solanum pennellii* LA-716 showed that the glandular trichomes present on its leaflets, especially type IV, exude the allelochemical acylglucose, being capable of activating antixenosis and antibiosis resistance mechanisms against the main arthropod pests of tomato plants.

Thus, the objective of the present study is to evaluate the relationship between the levels of acylglucoses and types of leaf trichomes in tomato genotypes from two segregating populations; and to associate them with resistance to tomato leafminer (*Tuta absoluta*).

MATERIALS AND METHODS

In this research, the F₂BC₄ genotypes developed and selected by the UEL/UNICENTRO tomato breeding program were used. The treatments were genotypes F₂BC₄ and F₂ [(M08 × F₂BC₃) *S. pennellii* × *S. lycopersicum*] with contrasting levels of acylglucoses, *Solanum pennellii* – LA-716 (resistance pattern) and *Solanum lycopersicum* lineage UEL M08 and *S. lycopersicum* cv. Redenção (susceptibility pattern). In order to quantify and identify glandular and non-glandular trichomes, leaf characterization of tomato plants from different treatments (genotypes with different levels of acylglucose) was carried out using scanning electron microscopy. The severity of damage caused by the tomato leafminer was evaluated 15 and 31 days after the infestation using a rating scale, as follows: A) Damage intensity (DI) [0 = no damage; 1 = minor injuries (0.1 to 5% damage); 2 = small, non-coalescing lesions (5.1 to 20% damage); 3 = medium to large injuries (20.1 to 50% damage); 4 = large and coalescing lesions (50.1 to 80% damage); and 5 = plants destroyed above 80% damage]. B) Types of leaflet lesions (LT) (0 = no lesions; 1 = few and small lesions; 2 = small and medium lesions; 3 = medium-sized lesions, without coalescence; 4 = large and coalescent lesions, deformed leaflets; and 5 = destroyed leaflets). C) Percentage of leaflets attacked (%) (AL) (0 = no leaflets attacked; 1 = 0.1 to 5% leaflets attacked; 2 = 5.1 to 20% of leaflets attacked; 3 = 20.1 to 50% of leaflets attacked; 4 = 50.1 to 80% of leaflets attacked; and 5 = more than 80% of leaflets attacked). The data were subjected to the F test using analysis of variance (p≤0.05), after checking the assumptions of normality and homoscedasticity, the means were compared using the Scott-Knott test with 5% significance. Pearson correlations were performed.

RESULTS AND DISCUSSION

In the evaluation of trichomes on the leaflets of tomato genotypes, the highest densities of glandular trichomes were found in the wild species and the genotypes with high levels of acylglucoses (Fig. 1).

In the bioassay to analyze the severity of damage caused by *T. absoluta* in tomato leaflets, it was possible to observe differences between treatments.

The genotype RVTA-42R (H), approached the result of the resistant parent, differing from the other genotypes (Fig. 2).

Fig. 1 Image showing leaf trichomes on the leaf surface of advanced tomato genotypes under a scanning electron microscope. LA-716 – A. RVTA-427M (H) – B. RVTA-42R (H) – C. ‘Redenção’ – D.

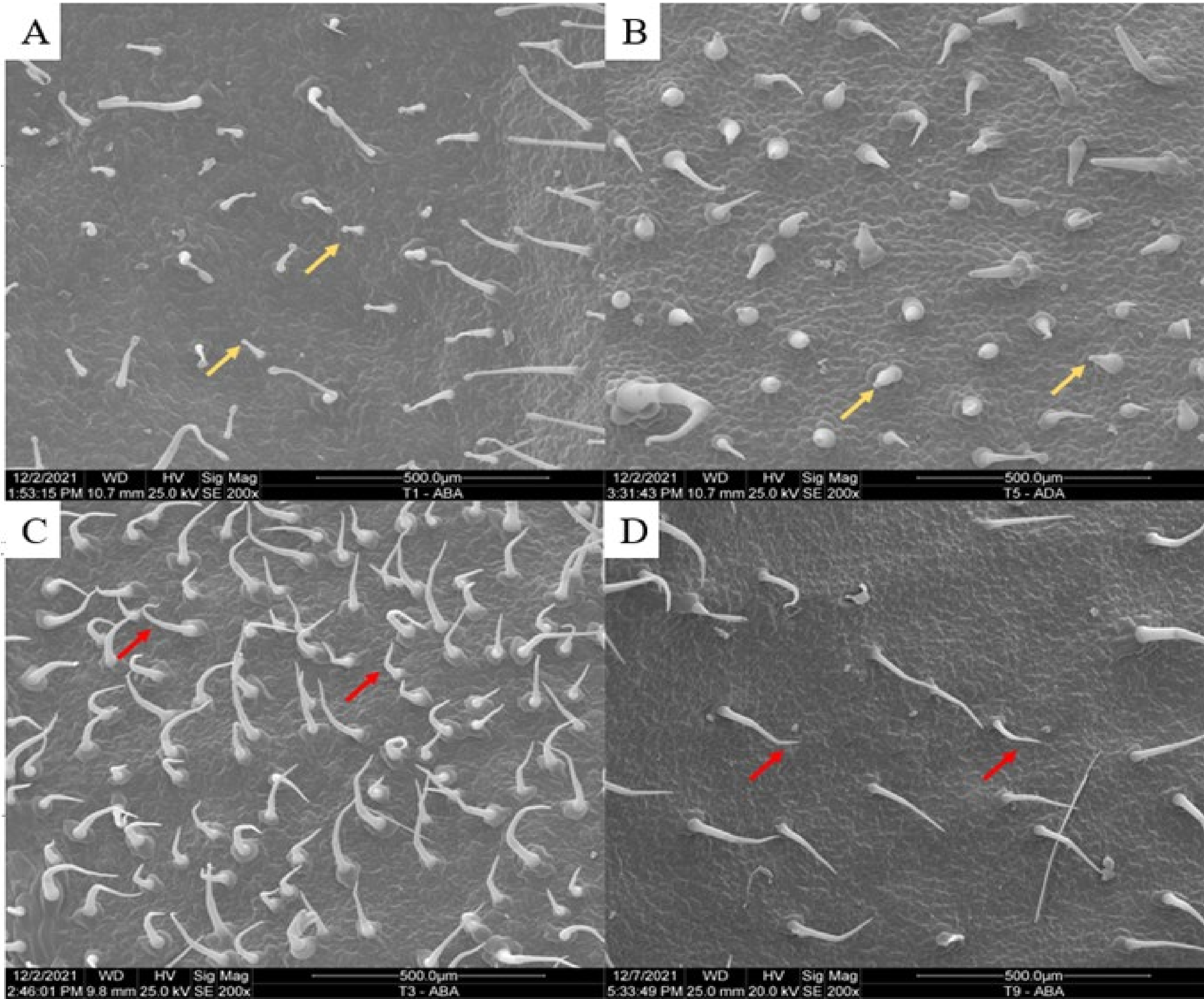
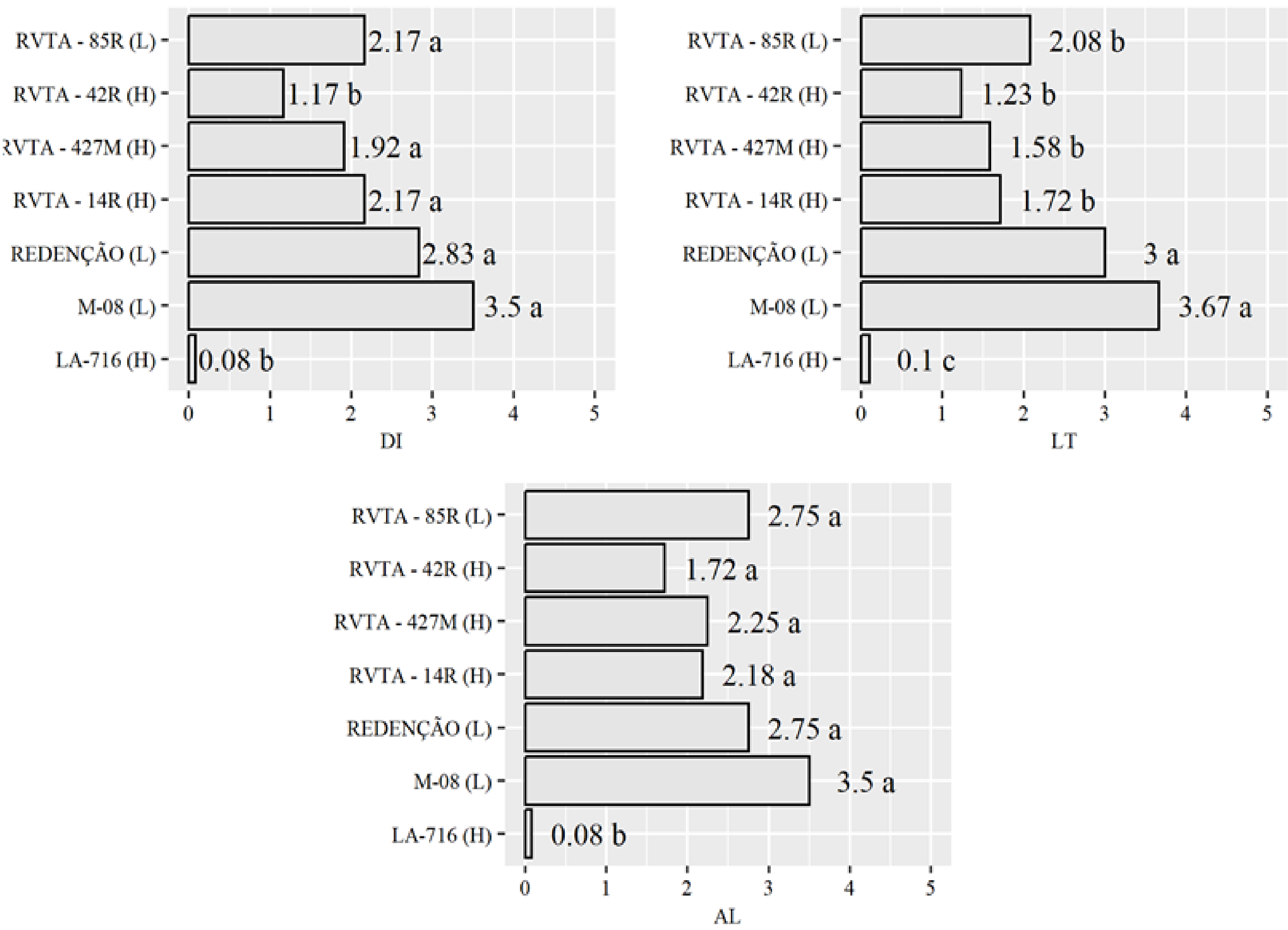
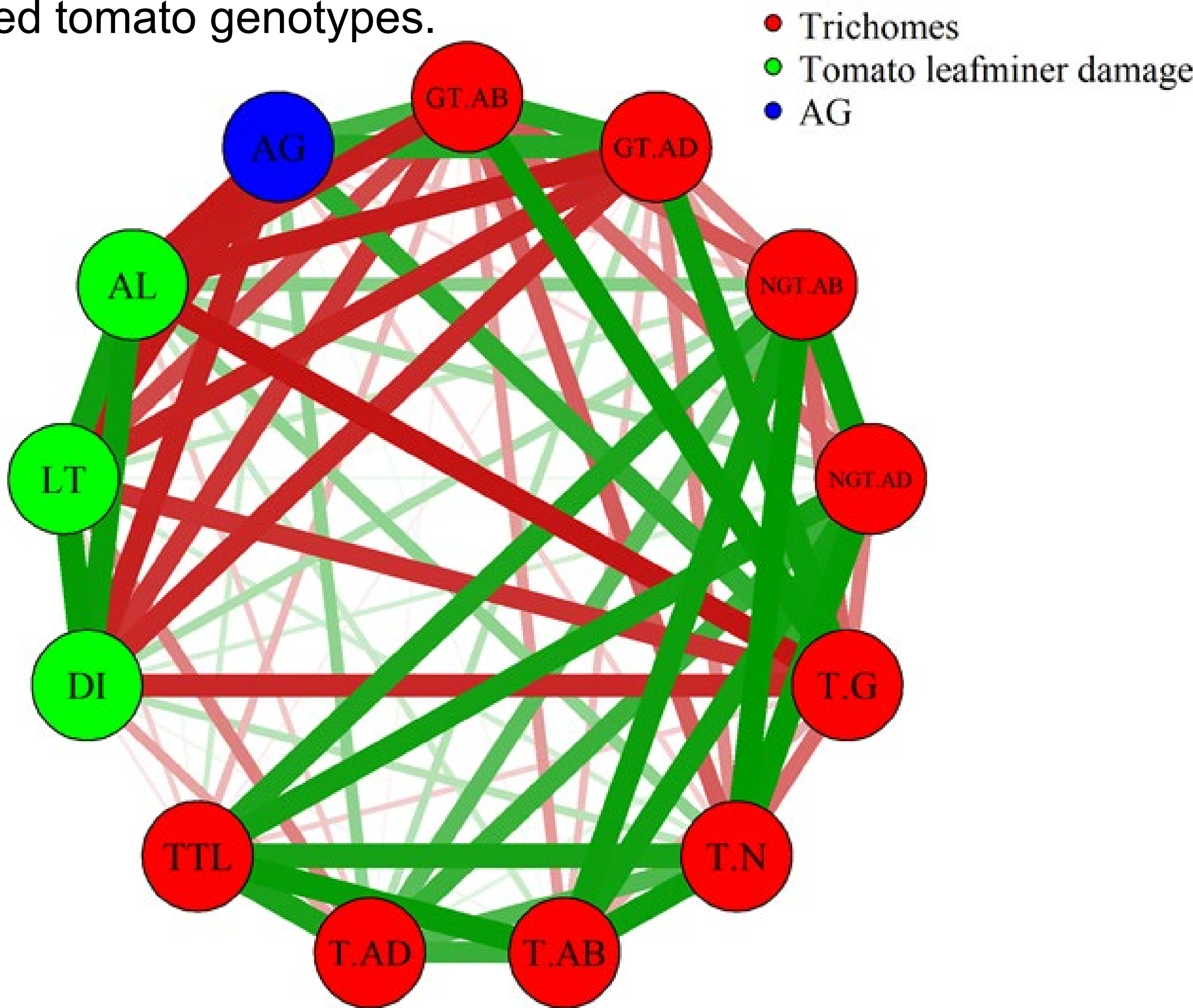


Fig. 2 Average damage caused by *Tuta absoluta* after 15 and 31 days of infestation in different tomato genotypes. H: High acylglucose content; L: Low acylglucose content.



Densities of glandular trichomes are positively correlated to levels of acylglucoses (Fig. 3).

Fig. 3 Pearson correlation network between traits evaluated in advanced tomato genotypes.



The advanced genotypes with high levels of the allelochemical reduced the severity of *T. absoluta* damage, compared to commercial material. The groups of genotypes with low levels of the allelochemical obtained greater similarity with the susceptibility parents. The genotypes RVTA-2010-31-319-214-238-pl#427M and RVTA-2010-31-177-177-325-pl#42R indicated potential to advance the tomato breeding program to obtain pest-tolerant cultivars.

ACKNOWLEDGMENT

