

Influence of glycoalkaloids in leaf extract of different *Solanum* plants on the growth of *Dickeya solani* and *Pectobacterium brasiliense*

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INTRODUCTION

Soft rot of potato tubers is caused by bacteria that belong to many species of two genera: *Dickeya* and *Pectobacterium*. Chemical protection against bacterial diseases is not carried out in practice. Pectinolytic bacteria infect a wide range of plant species and result in direct and indirect losses in plant production.

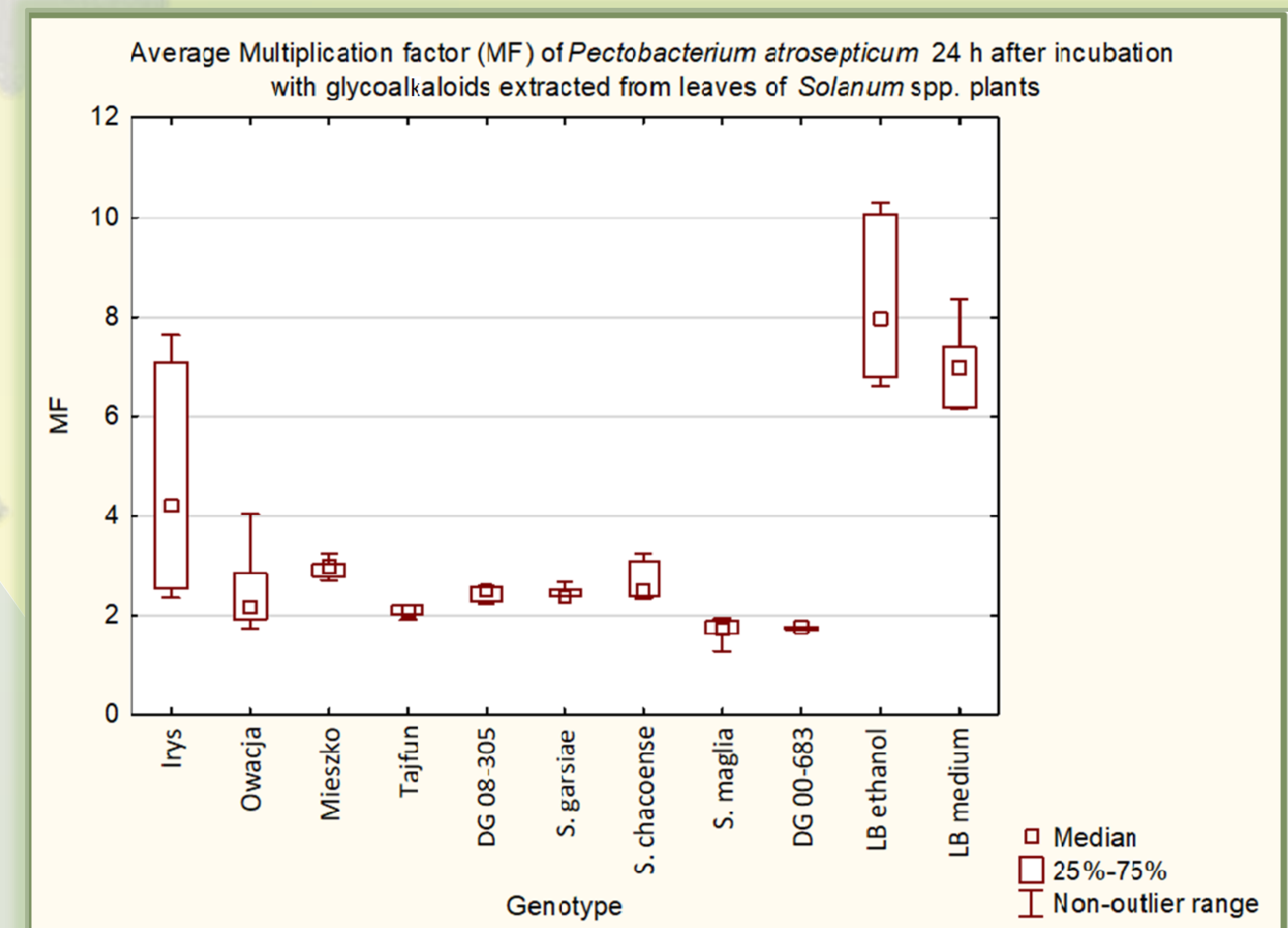
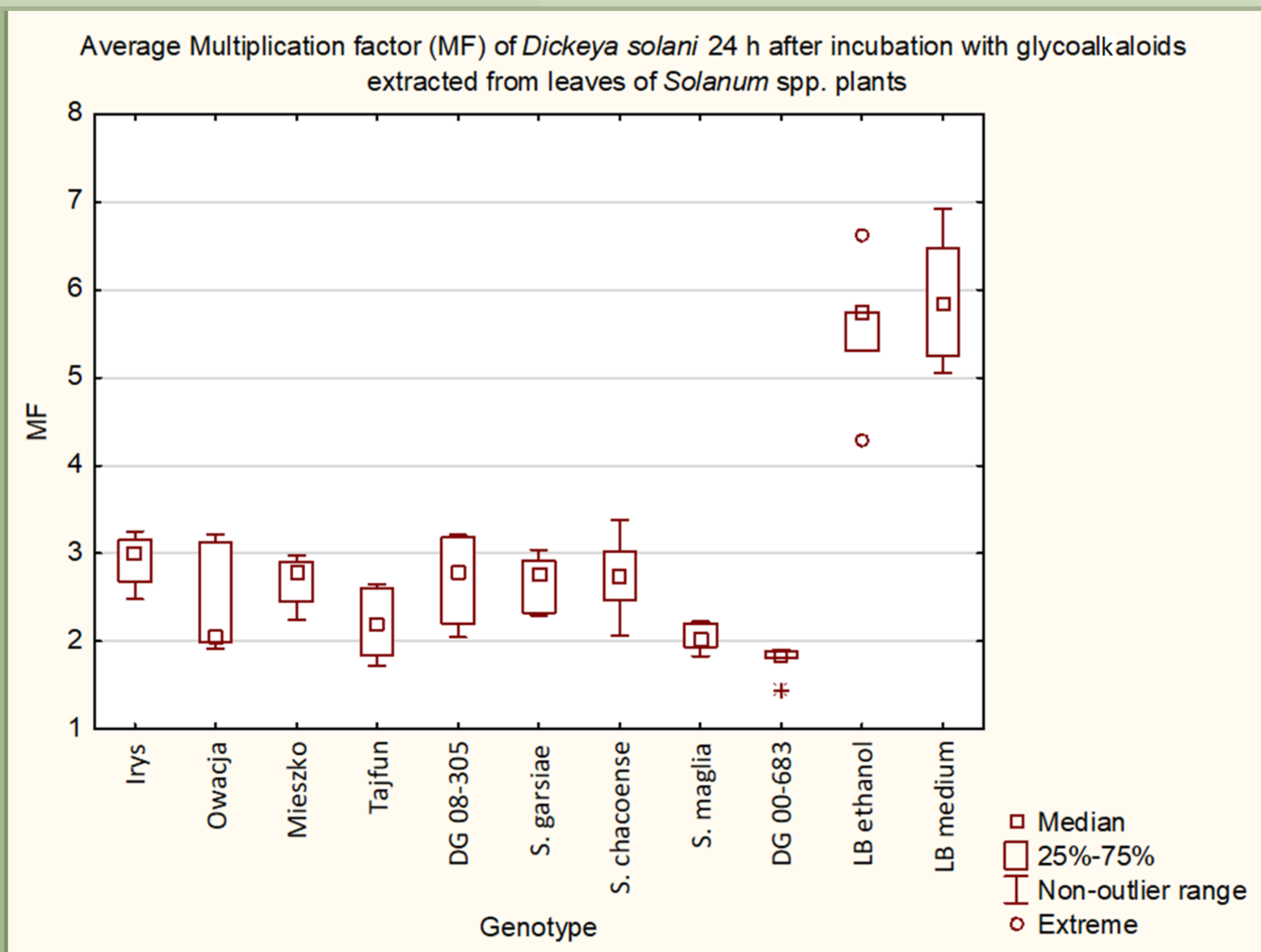
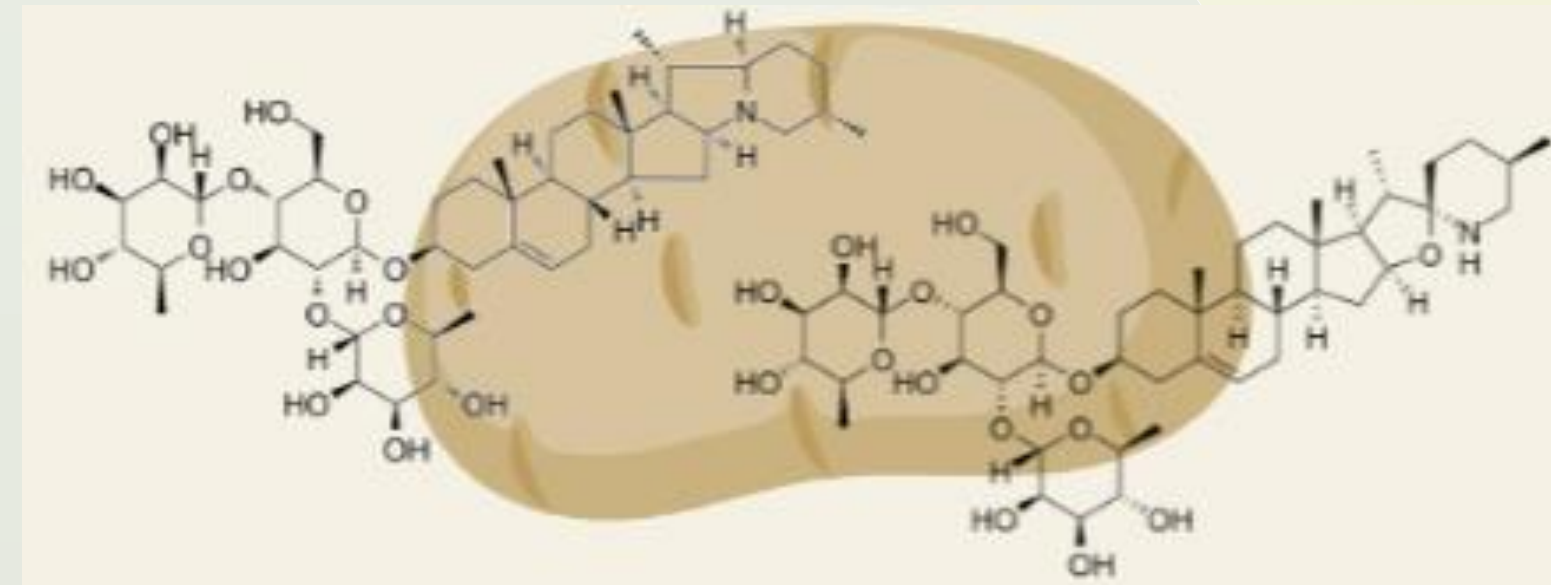
Plants of *Solanaceae* produce glycoalkaloids (GLA), secondary metabolites that contribute to plant pest and pathogen resistance.

The growth of bacteria was **inhibited by all tested GLA** extracts. The highest inhibition of both tested bacteria was observed for GLA obtained from *S. maglia*, DG 00-683 and cultivar Tajfun. *S. maglia* and cultivar Tajfun were characterized by a high content of α -chaconine and α -solanine in equal proportions. The composition of GLA in DG 00-683 was more complexed, and the content was as follows: α -chaconine = α -solanine > Leptinine I. The inhibitory effect of GLA isolated from all tested potato genotypes was similar for *D. solani* and *P. brasiliense* (correlation coefficient $r = 0.98$, $P < 0.05$).

RESULTS

CONCLUSIONS

S. garsiae was characterized by the highest content and the most complex composition of GLA (α -chaconine, α -solanine, α -solamargine, α -solasonine, Leptinine I, Leptinine II). The simplest composition in the leaves, limited to α -solanine and α -chaconine, was observed in cultivars Tajfun and Owacja, and wild species *S. chacoense* and *S. maglia*. Among six identified GLA α -solanine and α -chaconine predominated, their content was from 64 % (*S. garsiae*) to 100 % (Tajfun, Owacja, *S. maglia*). The proportion of α -solanine and α -chaconine in cv. Tajfun and *S. maglia* was 4 : 4 (in relatively high content), while in the diploid hybrid DG 00-683 – 1 : 1, but there was also Leptinine I in this extract. Not only composition but also proportion of different GLA may affect the biological activity against pectinolytic bacteria.



MATERIALS & METHODS

GLA were obtained from leaves of nine potato genotypes: four cultivars, three wild species, and two interspecific *Solanum* spp. hybrids. The composition and quantity of isolated GLA were analyzed using HPLC-MS. The influence of GLA on the growth of two highly aggressive for potato tubers strains of *Dickeya solani* and *Pectobacterium brasiliense* was tested in this study. Bacteria were adjusted to $OD_{600} = 1$, equivalent to 10^9 CFU/ml, and diluted 10 times in Luria Bertani Broth. GLA was added to the bacterial suspension to a final concentration 0.8 mg ml^{-1} . The bacterial growth was measured after 0 and 24 h of incubation at a temperature 25°C and shaking at 150 rpm/min.

