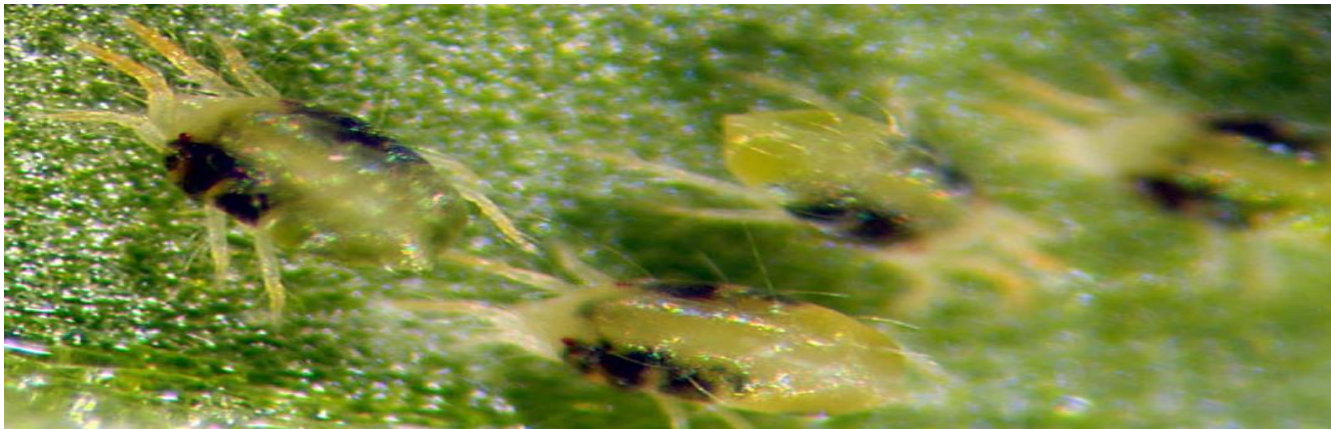


LITHUANIAN
RESEARCH CENTRE
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AND FORESTRY

Insecticide Resistance in *Tetranychus urticae* (Acari: *Tetranychidae*) Populations From Field Vegetables in Kaunas region

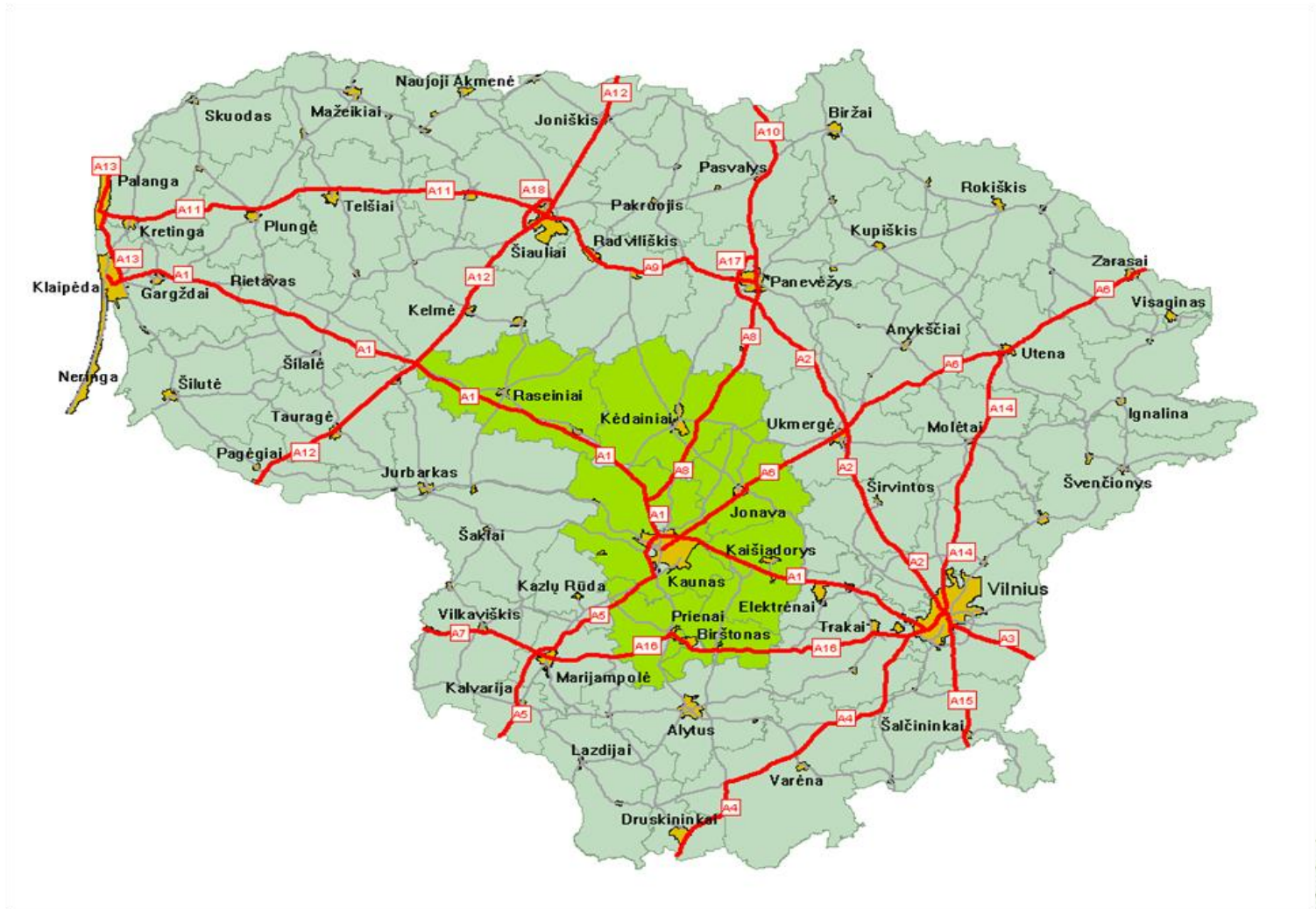


Dr. Laisvūnė Duchovskienė

Nordic Baltic Pesticide Resistance Action Group
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Kaunas region



Methods

- Rapid resistance detection is necessary for adaptive management of acaricide – resistant populations of *Tetranychus urticae*. Detection of genotypic resistance was conducted by quantitative sequencing (QS). QS was effective for determining the frequencies of resistance alleles on a population basis, which corresponded to 12 nonsynonymous point mutations associated with target site resistance to five types of acaricides (organophosphates (monocrotophos, pirimiphos- methyl, dimethoate and chlorpyrifos), pyrethroids (fenpropathrin and bifenthrin), abamectin, bifenazate and etoxazole.

- It was delayed for handling many other samples. Was conducted allele frequency determination using QS methods. Total 12 point mutations were chosen as target mutations. Organophosphate/Carbamate responsible mutations were G228S, G228A, F439W and F439Y. Pyrethroid responsible mutations were L1022V, A1376D and F1704I. Abamectin responsible mutations were G323D and G326E. Etoxazole responsible mutation is I1017F. Bifenazate responsible mutations are G126S and P262T.

Results

- As you see in the table, several mutations were found at only organophosphate and pyrethroid acaricides. No mutations were not found associating abamectin, etoxazole and bifenazate. The sensitivity of mutation allele frequency to actual phenotypic resistance levels were different due to the existence other multiple resistance factors such as detoxification enzymes. In other countries, some abamectin-resistant strains were found possessing no point mutation of G323D and G326E. Instead it possess high level of enhanced-CYP450 activity. It means other factors could be associated with it. Currently, it was under development for over expressed genes.

Table. Allele frequency of point mutations associating insecticide resistance (2015)

Strain	Host	Organophosphates/ Carbamates				Pyrethroids			Abamectin		Etoxazole	Bifenazate	
		G22 8S	G228A	F439W	F439Y	L1022 V	A1376 D	F170 4I	G323D	G326 E	I1017F	G126 S	P262 T
LT_15B F1	Soy-bean	0.0	0.0	6.0	24.3	0.0	30.8	0.0	0.0	0.0	0.0	0.0	0.0
LT_15C K1	Pumpkin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LT_15P V1	Parsnip	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LT_15C K2	Pumpkin	0.0	0.0	0.0	0.0	0.0	34.2	0.0	0.0	0.0	0.0	0.0	0.0
LT_15C uR1	Cucumber	39.4	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LT_15C uS2	Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	ND	0.0	0.0	0.0	0.0	0.0
LT_15B FG2	Soy-bean	32.6	0.0	24.7	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LT_15C g2	Pumpkin	15.8	0.0	0.0	39.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- May be the acaricide resistance problem would be not serious in Lithuania?
- Usage of different-types of acaricide would be helpful to manage the resistant population with the retardation of resistance development.
- Analyses was made in Seoul National University, Lab. Insect Molecular Biology & Toxicology .

Thank you for attention