Blackcurrant breeding tendencies in Lithuania

LIETUVOS AGRARINIŲ IR MIŠKŲ MOKSLŲ CENTRAS

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Summary

- Main facts about Lithuania,
- Main research topics,
- Most important parameters,
- Breeding achievements (research with gall mite, cultivars),
- Collaboration with farmers, associations, joint-stock companies.

Main facts about Lithuania

- **Population:** ~3 000 000
- **Area:** 65 300 sq. M
- **Bordering countries:** Russia (Southwest), Poland (South), Belarus (East), Latvia (North), Baltic Sea (West).
- **Ethnicities:** Lithuanians 85,08%, Poles 6,65%, Russians 5,88%, Others 2,39%
- **Native languages:** Lithuanian [official] 85%
- **Langauges spoken:** Lithuanian[official] 96%
- **Climate:** average winter temperature: –5°C (lowest –27°C), average summer temperature: +17°C (highest +35 °C).
- **The agricultural** sector now employs only some 12 percent of the population.

Main research topics

The main research topics for blackcurrant

- Breeding, variety testing,
- Genetic resources,
- Management systems,
- Growing and plant protection technologies.

Most important parameters

- winter hardiness,
- resistant to spring frost,
- late flowering,
- resistance to main important fungal diseases and pest,
- high fruit quality.

Breeding achievements

'Ritmo'

'Domino'

'Viktor'

'Karina'

Molecular markers linked to resistance to the gall mite (1)

- Ce and P genes provide resistance of blackcurrant to gall mite.
- A linkage map around the resistance locus controlled by predicted *P* gene was constructed.
- 43 amplified fragment length polymorphism (AFLP) and 19 microsatellite polymorphic markers obtained from analysis of the progeny obtained in cross with *P* gene donor ‘Dainiai‘ were mapped.

I. MAZEIKIENE, V. BENDOKAS, V. STANYS, T. SIKSNIANAS, Plant Breeding 131, 762—766 (2012)

Molecular markers linked to resistance to the gall mite (2)

- The obtained consensus map covers 691.196 cM, with an average marker spacing of 14.706 cM. AFLP fragment CTA-ACC-107 was closely linked to resistance to blackcurrant gall mite and was detected in the sixth linkage group.

- Screening of cultivars and hybrids with known resistance to gall mite confirmed that this dominant 107-bp AFLP marker is linked to gall mite resistance in a comprehensive range of available *Ribes* germplasm with different genetic background and it may be used for early diagnosis of resistant to gall mite hybrids.

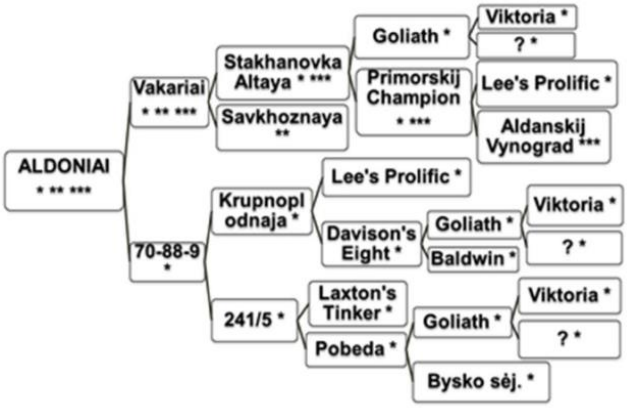
I. MAZEIKIENE, V. BENDOKAS, V. STANYS, T. SIKSNIANAS, Plant Breeding 131, 762—766 (2012)

Genetic background of resistance to gall mite in *Ribes* species

- Resistance in *R. americanum* is determined by P gene and *R. sanquineum* by Ce gene.
- Both molecular markers were absent in *R. dikuscha* genome.
- Molecular markers related to P and Ce genes were identified in the genome of *R. aureum*.
- Resistance to gall mite in the field conditions in *R. nigrum x R. americanum, R. nigrum x R. aureum, R. nigrum x R. sanquineum F3* hybrids fitted an expected Mendelian segregation ratio of 1:1, 3:1, 1:1.
- 75% of hybrids with a pyramidal resistance to gall mite carrying markers related to Ce and P genes were obtained in the cross combination *R. nigrum x R. aureum* and will be included in the future breeding programs.

Breeding achievements (in DUS testing) ‘Aldoniai‘

- Middle season cultivar.
- Pedigree: ‘Vakariai’ × Nr. 70-88-9.
- Berries are with good taste and big size.
- Bushes are high, resistant to cold, blossom resistant to spring frosts.
- Enough resistance to fungal diseases, resistant to gall mite.
- Distinguished by a high level of self-pollinating (77 %).
- Suitable for organic horticulture.



Black currant varieties ‘Aldoniai’ and ‘Didikai’. I.Mažeikienė, V. Stanys, A. D. Juškytė, A. Sasnauskas, T. Šikšnianas. SODININKYSTĖ IR DARŽININKYSTĖ. SCIENTIFIC ARTICLES. 2017. 36(1-2).

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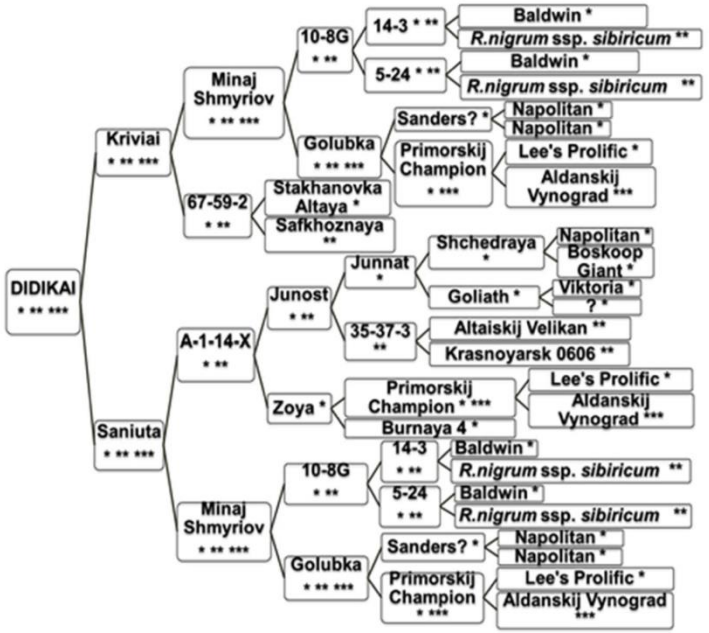
Breeding achievements (in DUS testing)

‘Didikai‘

- Early season cultivar.
- Pedigree: ‘Kriviai’ × ‘Saniuta’.
- Berries are with very good taste and big size.
- Bushes are medium high, resistant to cold.
- Enough resistance to fungal diseases, resistant to gall mite.
- Distinguished by a high level of self-pollinating (77 %).
- Suitable for organic horticulture.



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Collaboration with farmers, associations, joint-stock companies

- JSC „RŪTA“
- JSC „Mėlynė“
- IC „Morkūnas“
- JSC „Kėdainių konservų fabrikas“
- JSC „Visos sultys“
- JSC „Kvalitetas“
- JSC „EKOSULA“
- JSC „Dehidra“
- JSC „Eco Extractum“
- JSC „Biohumusas“
- Farmers T. Skaizgirys, P. Tiknevičius, et. all.

Agreements with associations „Medsėdžių bendruomenė“, ”Vaisiai ir uogos” and ”Pramoninių uogynų augintojų asociacija” **Total:** 123400 € (2017)

Collaboration with farmers, associations, joint-stock companies

- A close relationship with growers, individual farmers and companies exists to transfer science knowledge at consultations, open days, seminars, meetings, conferences.

- The main topics for all soft fruits are: *variety testing*, genetic control of plant traits and creation of *new breeding methods, development of berry plant growing technologies for fresh market and processing, efficacy trials of the new plant protection products* according to GEP (Good Experimental Practice) standards.

- These cooperation created a new advanced research-based products, conducted an experimental research, various measurements or construct a prototypes, created new or improved the existing technologies.

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