

Rootstock Affects Apple Fruit Biochemical Content: Preliminary Results

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MATERIALS AND METHODS

Trial was conducted in productive orchard (planted in spring 2005) at the Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry in 2011-2012. Apple rootstock (M.26, M.9, P 22, P 59, P 61, P 62, P 66, P 67, B.9, B.396, PB.4 (Belarusian selection) and Pure 1 (Latvian selection)) effect on fruit biochemical content was tested with cv. 'Auksis' (Lithuanian selection). Trees were planted at 4 × 1.5 m.

25 randomly selected fruits from each replication were taken for biochemical analysis.

Total phenolic content, expressed as gallic acid was determined by Folin-Ciocalteu method, soluble solids content by refractometer, titratable acidity expressed as citric acid by titration with 0.1 N NaOH solution, ascorbic acid (vitamin C) content by titration with 2,6-dichlorophenolindophenol sodium salt solution. The antiradical activity of the extracts against stable DPPH* was determined by a slightly modified spectrophotometric method of Brand-Williams et al. (1995).

RESULTS

Rootstock effect on fruit quality characters (average 2011-2012)

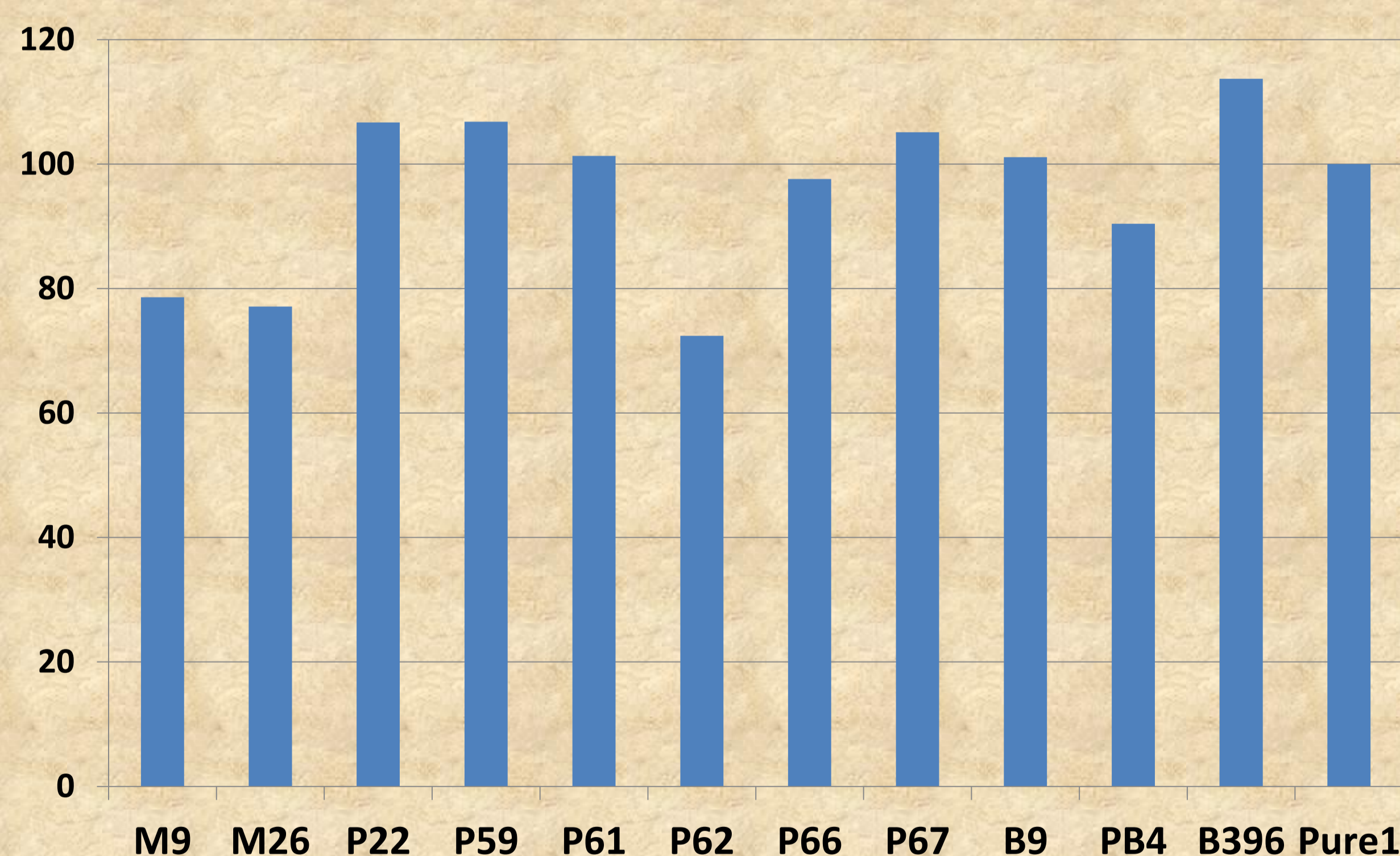
Rootstock	Titratable acidity, %	Ascorbic acid, mg/100 g	Soluble solid content, %	Dry matter content, %
M.9	0.35 d	8.80 ab	12.5 de	13.4 cd
M.26	0.45 ab	8.80 ab	12.0 e	13.1 d
P 22	0.38 cd	8.40 bc	13.1 bc	13.9 b
P 59	0.40 bc	8.70 ab	13.5 ab	14.0 ab
P 61	0.45 ab	8.40 bc	13.1 bc	14.1 a
P 62	0.39 bc	8.20 c	12.4 de	13.9 b
P 66	0.41 bc	8.85 ab	12.9 bc	13.2 d
P 67	0.42 bc	8.80 ab	12.7 cd	13.5 cd
B.9	0.45 ab	9.00 ab	12.8 cd	14.3 a
PB.4	0.34 d	8.75 ab	13.8 a	14.2 a
B.396	0.47 a	8.40 bc	12.7 cd	14.3 a
Pure 1	0.40 bc	9.20 a	12.9 bc	13.7 bc

Titratable acidity varied between years and rootstock. Higher variability of titratable acidity was recorded in fruits from trees on M.9, M.26, B.9 and B.396. More stable results were with P series and PB.4 rootstocks. On the average lower acidity was detected in fruits on PB.4 and M.9, higher acidity on B.396, B.9, M.26 and P 61.

On the average P 62 rootstock determined the lowest fruit **ascorbic acid** though there were no significant differences with B.396 and P 61.

Significant rootstock effect on **soluble solid content** was recorded every year. Stable the lowest SSC was in fruits from trees on M.26, significantly the highest SSC on PB.4. On the average tendencies of lower fruit SSC were recorded with M.26, M.9 and P 62 rootstocks.

Dry matter content content was more stable in fruits on the most dwarfing rootstocks P 59 and PB.4. Lower DM content was recorded on M.26, M.9 and P 66.

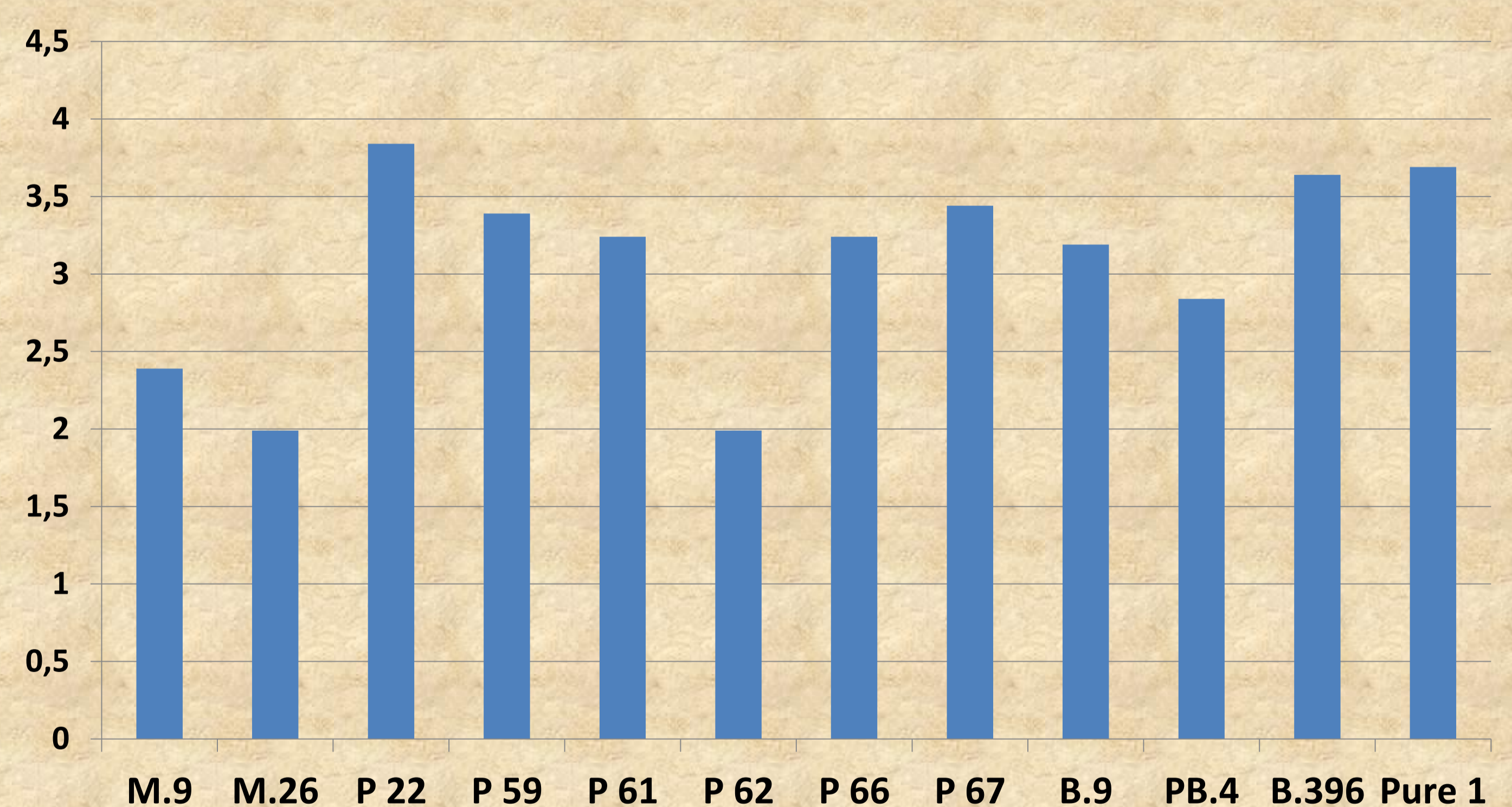


Rootstock effect on fruit total phenolic content, 2012

Fruit total phenolic content was significantly affected by rootstock.

The highest phenolic content was found in fruits from trees on B.396, very high in P series rootstocks with the exception on P 62.

Rootstocks M.26 and M.9 determined low fruit total phenolic content.



Rootstock effect on antiradical activity, 2012

Antiradical activity is closely related with total phenolic content.

The lowest antiradical activity was detected in apples from trees on M.26 and P 62 rootstocks, and almost double on P 22, Pure 1 and B.396 rootstocks.

ACKNOWLEDGEMENTS. This work was supported by a grant from the Research Council of Lithuania, No. SVE-02/2011.