Council of the European Union

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NOTE

From:	General Secretariat of the Council
To:	Delegations
No. Cion doc.:	8624/23 + ADD 1- ADD 4
Subject:	Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Council Directives 2001/110/EC relating to honey, 2001/112/EC relating to fruit juices and certain similar products intended for human consumption, 2001/113/EC relating to fruit jams, jellies and marmalades and sweetened chestnut purée intended for human consumption, and 2001/114/EC relating to certain partly or wholly dehydrated preserved milk for human consumption - Comments from the Latvian delegation

DOCUMENT PARTIALLY ACCESSIBLE TO THE PUBLIC (07.06.2023)

Delegations will find in the Annex the comments from the Latvian delegation on the above-mentioned proposal.

ANNEX

Comments from the Latvian delegation

Latvia highly appreciates the work of the European Commission in the development of proposals for amendments to the Breakfast Directives, as well as the active work of the Presidency for advancing these amendments.

Latvia supports the aim of the amendments to the Directives like as to incorporate the latest innovations and to adapt products to consumer preferences, as well as to provide information to the consumer so that the consumer can make an informed choice.

Since the Breakfast Directives are currently being amended, Latvia invites to consider additional proposal for amendments to the Fruit juice Directive.

Latvia proposes to the COUNCIL DIRECTIVE 2001/112/EC of 20 December 2001 relating to fruit juices and certain similar products intended for human consumption in ANNEX IV SPECIAL PROVISIONS RELATING TO FRUIT NECTARS in Part 1 **after the word "Quinces**" to **add its Latin name,** as it is determined in the Annex IV for other fruits: **"Quinces (Cydonia oblonga)"**.

Such clarification would allow Latvian producers to produce nectars from other varieties of quinces grown in Latvia, such as Japanese quince (Chaenomeles japonica), because there are significant differences between Quince and Japanese quince. They are two different species with different chemical compositions (exactly the total acid content, which affects the taste characteristics of the product).

We would like to point out that the nectar, which according to the provisions of Fruit juice Directive must contain at least 50% quince juice, is not enjoyable because it has a sharp, unpleasant taste.

The above-mentioned amendment in Fruit juice Directive would promote the free circulation of products and unlimited opportunities for consumers to receive a healthy and tasty product.

Please find more detailed explanation about differences and chemical compositions in annexes. More information in the file with the presentation.

We really hope that our suggestion for amendment will be examined and included in Proposal for amendments to the Fruit juice Directive.

There are significant differences between quince and Japanese quince. They are two different species.

Quince ***(Cydonia oblonga)*** is an ancient crop that is widely grown in southern countries: Central Asia, Turkey, Romania, Moldova, Italy and elsewhere. Common quinces have been cultivated for over 4,000 years. Southeast Asia and the Caucasus are considered to be their place of origin. In Latvia, it is not winter-hardy enough. More durable forms have been created through breeding, but they are grown in hedges or used as a pear rootstock, **but not for fruit production.**

Quince is a small tree with a height of 5–8 and 4–5 m wide. The flowers are large, white or pale pink with 5 petals on short stems, placed one at a time at the ends of the shoots. They bloom late, in Latvia - in May, June. Fruits are similar in shape to apples or pears, lemon yellow, covered with small hairs, hard, with a strong, very pleasant aroma. The fruits of the cultivars grown in the south are large, their weight can reach 400 g, with a sweet and sour taste. The fruits of the locally separated seed pods growing in Latvian conditions are small, the size of a small apple, hard, sour, astringent because they contain a lot of tannins. Quince fruits ripen late - at the end of September, October. The fruits contain potassium, calcium, magnesium, vitamin C. The literature mentions that the average amount of vitamin C is 15 mg/%, while in Japanese quince fruits it reaches 100 mg% or more.

Japanese quince (***Chaenomeles japonica*****)** occurs in central and south Japan at elevations from 100–2100 m on hillsides, and on riverbanks and lakeshores. There are four natural species in the *Chaenomeles* genus. It is a dwarf shrub (0.6–1.2 m) with more or less thorny shoots. In the world they are well known and cultivated for their attractive flowers. More than 300 ornamental cultivars are known. The flower colour range of these ornamental cultivars varies from red, pink, orange shades to completely white. Flowers can also be bicolour and stuffed. However, people have been interested in quince fruits for a very long time. Japanese quinces were brought to Europe in the end of 18th century.

Breeding of Japanese quince as a fruit crop was initiated in Latvia in 1950s by Alberts Tīcs, and the first large plantations were established in the 1970s. The interest for cultivation of *Chaenomeles japonica* increased in Latvia in the 1990s. Than the breeding was continued in the Institute of Horticulture by Silvija Ruisa with the aim to obtain local cultivars adapted to the Latvian climate. For breeding, only one species - *Ch. japonica* was used, because the others are not winter hardy in Northern parts of Europe. In 2012 the first cultivars have officially registered in Latvia. Japanese quince areas have increased 4.5 times in the last 7 years, they are currently the 4th fruit crop in terms of area. Exports have started and are increasing every year.

Along with its processing technologies and cultivars now it has become a crop of high market potential in the Baltic Sea region.

Japanese quince (*Chaenomeles japonica*) – new promising fruit crop for Baltic Sea region countries

DĀRZ KOPĪBAS INSTITŪTS

[redacted]

KAUNAS, 10-13 September 2017

Introduction – difference between quince and Japanese quince

Quince is a small tree with a height of 5–8 and 4–5 m wide. It is the sole member of genus *Cydonia* (***Cydonia oblonga***). Its fruit has bright yellow coloration, astringent taste, characteristic aroma, and large numbers of plano-convex seeds arranged in two vertical rows (Gholgholab, 1961). It is native to Iran and Turkey, and is cultivated in India, South Africa, Middle East, and Europe.
In Latvia, it is grown in hedges or used as a pear rootstock, but not for fruit production.

Japanese quince (***Chaenomeles japonica***) is a dwarf shrub (0.6–1.2 m) with more or less thorny shoots, which occurs in central and south Japan at elevations from 100–2100 m on hillsides, and on riverbanks and lakeshores. There are four natural species in the *Chaenomeles* genus (Weber 1964). In the world they are well known and cultivated for their attractive flowers. More than 300 ornamental cultivars are known.

Introduction

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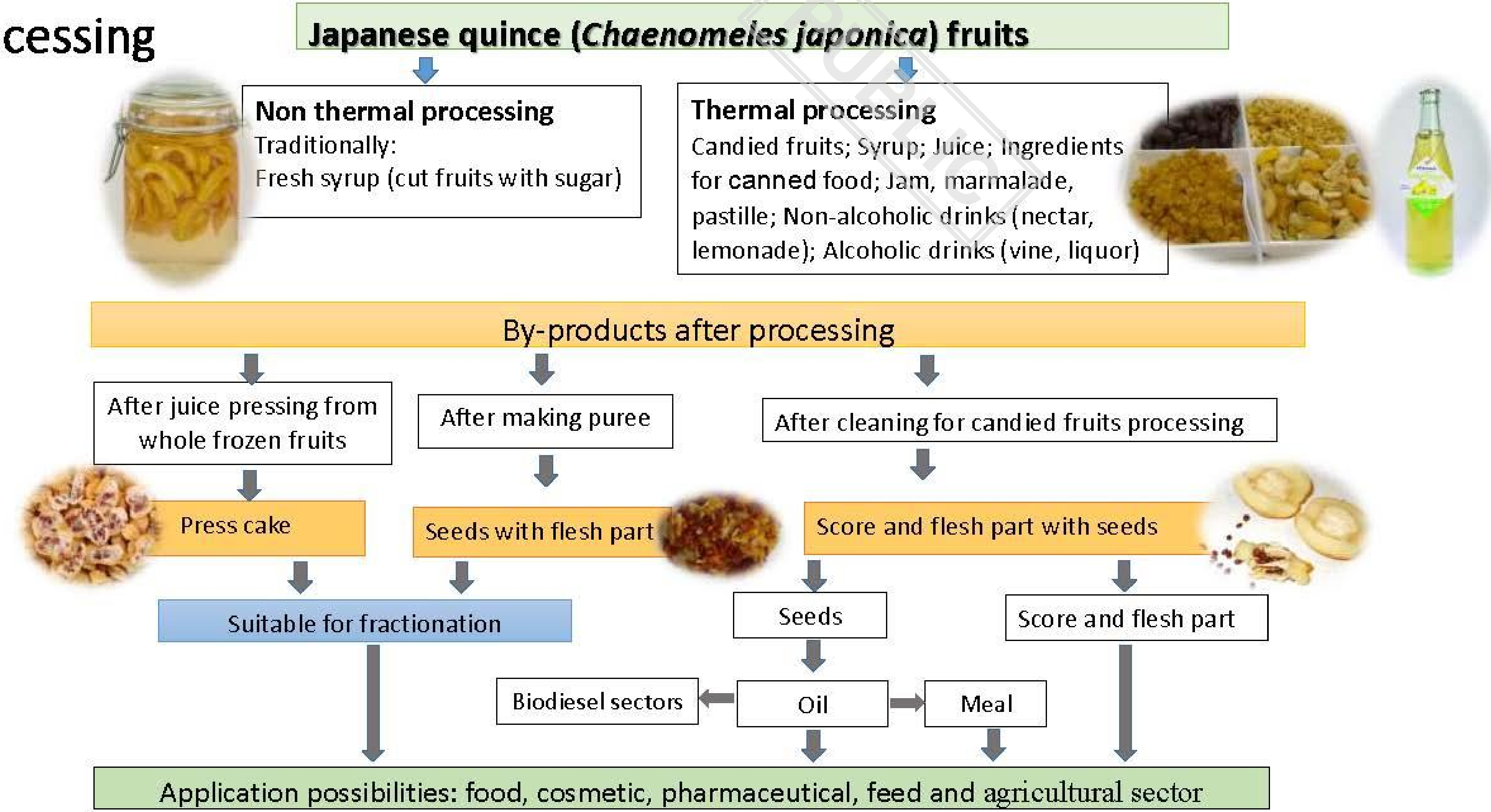
In Poland the studies on Japanese quince started in 1968: Doc. dr. Elżbieta Lesińska (1941-2013) http://www.pigwowka.pl/

Introduction

Important projects in Europe:

- Framework project FAIR-CT97-3894 «Japanese quince - a new European fruit crop for production of juice, flavour and fibre» (1998-2001, Sweeden)
- «Japanese quince growing and complex processing on the farm» (2007-2013, Lithuania)
- EUREKA project E! 3490 «Functional food ingredients from plant products» (2006-2008, Lithuania)
- *EUREKA project E*! *6240* «Development of new products from plant material for health improvement and cosmetics» (2010-2012, Latvia)
- ERDF project «Environment-friendly cultivation of emerging commercial fruit crop Japanese quince - *Chaenomeles japonica* and waste-free methods of its processing» (2017-2020, Latvia)

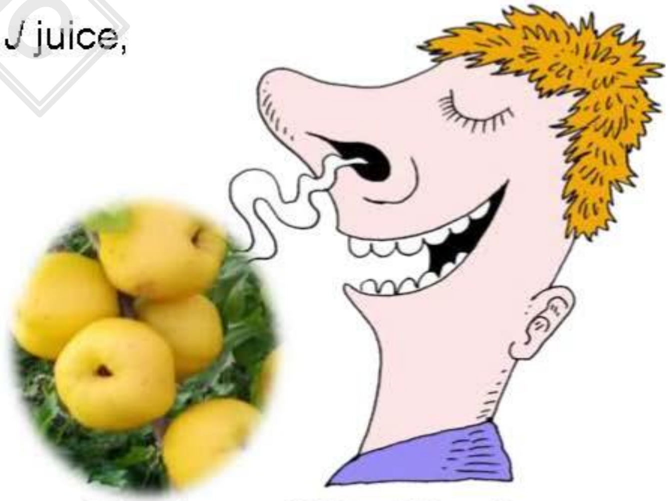
Processing


Japanese quince (*Chaenomeles japonica*) fruits
Non thermal processing
Traditionally:
Fresh syrup (cut fruits with sugar)
Thermal processing
Candied fruits; Syrup; Juice; Ingredients for canned food; Jam, marmalade, pastille; Non-alcoholic drinks (nectar, lemonade); Alcoholic drinks (vine, liquor)
By-products after processing
After juice pressing from whole frozen fruits
After making puree
After cleaning for candied fruits processing
Press cake
Seeds with flesh part
Score and flesh part with seeds
Suitable for fractionation
Seeds
Score and flesh part
Biodiesel sectors
Oil
Meal
Application possibilities: food, cosmetic, pharmaceutical, feed and agricultural sector

Flavor - volatile compounds

The volatile compounds (ppm) in samples of fresh *Chaenomeles J* juice, mg/L / Jordan et al., 2003

	C. japonica			
	NV (*n*=8)	RG (*n*=10)	D (*n*=6)	F (*n*=6)
Alcohols	16.73	8.13	7.37	21.96
Aldehydes	0.83	1.48	0.54	0.66
Ketones	5.21	5.75	10.12	1.93
Esters	1.43	1.20	1.08	5.35
Terpenic hydrocarbons	0.08	0.25	0.06	0.13
Total	24.28	16.81	19.17	30.03



God made noses AND beautiful smells

Lesinska, et al., 1988, J Food Science; Jordan et al., 2003, Report FAIR-CT97-3894; Tarko et.al., 2014, J Food Sci Technol

Acids

- ✓ The content of soluble solids in Japanese quince juice was 7–9 °Brix
- ✓ Japanese quince juice had a rather low pH of 2.5–2.6
- ✓ Total content of acids are within a wide range 3,2 – 9,4%
- ✓ The dominant organic acids: malic acid, quinic acid and succinic acid
- ✓ Vitamin C varied depending on growing place, harvesting time and genotype: 41-243 mg 100^{-1}ml

The composition of Japanese quince juice / Helin et.al, 2003

Site	Samples[a] (*n*)	Insoluble solids (*x* % ± SD)	Titratable acidity (*x* % ±SD)	Proteins (*x* mg/100 ml ± SD)	Vitamin C (*x* mg/100 ml ± SD)
C. japonica					
NV	19	8.3 ± 3.0	3.5 ± 0.7	32.6 ± 3.8	67.1 ± 26.0
RG	18	8.1 ± 5.2	4.0 ± 0.5	42.5 ± 4.9	78.5 ± 40.8
D	12	5.6 ± 3.3	3.8 ± 0.4	42.0 ± 2.0	63.9 ± 17.1
F	21	5.2 ± 2.5	4.0 ± 1.0	58.7 ± 10.0	45.3 ± 18.0
C	9	1.7 ± 0.9	3.2 ± 0.6		66.3 ± 23.3

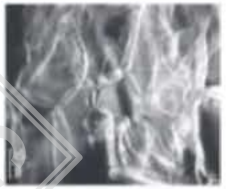
Lesinska, 1987, LWT; Ruisa, 1990; 1996, Verksamhetsberättelse; Rumpunen, 1995, Rpt. Balsgård, Sweeden; Lesinska et al., 1996, Verksamhetsberättelse; Mezhenskij, 1996, Verksamhetsberättelse; Ratomskyte, 1996, Verksamhetsberättelse; Vila et al., 2003, Rpt. Balsgård, Sweeden; Hellin et al., 2003, Report FAIR-CT97-3894; Krasnova et al., 2007, Cheminė technologija; Skrzyński and Bieniasz 2009, Zesz. Probl. Post. Nauk Roln.; Rubinskiene et al., 2014, Sodininkystė ir daržininkystė; Bienasz et al., 2017, Folia Hort; Baranowska-Bosiacka et al., 2017, Biol Trace Elem Res

Carbohydrates

- ✓ Fruits contain high amounts of dietary fibre and pectins.
- ✓ On average, it was possible to extract 11.0g pectins and 3.1 g hemicelluloses from 100 g dry fruit, and 22.2 g of cellulosic residues were obtained in two selected genotypes.

Dry matter of the entire fruit, g/100 g (Hellin, 2003)

Genotype	D694				
	Weight[a]	AIS[a]	TDF[ab]		
Zone			IDF	SDF	TDF
Skin	7	3.2	3.3	0.5	3.8
Flesh	71	19.3	14.4	10.9	25.3
Carpels	22	13.5	10.6	3.1	13.7
Entire fruit (calculated)	100	36.0	28.3	14.5	42.8
Entire fruit (determined)	100	35.9	29.4	6.5	35.9


flesh after preparation of the alcohol insoluble solids

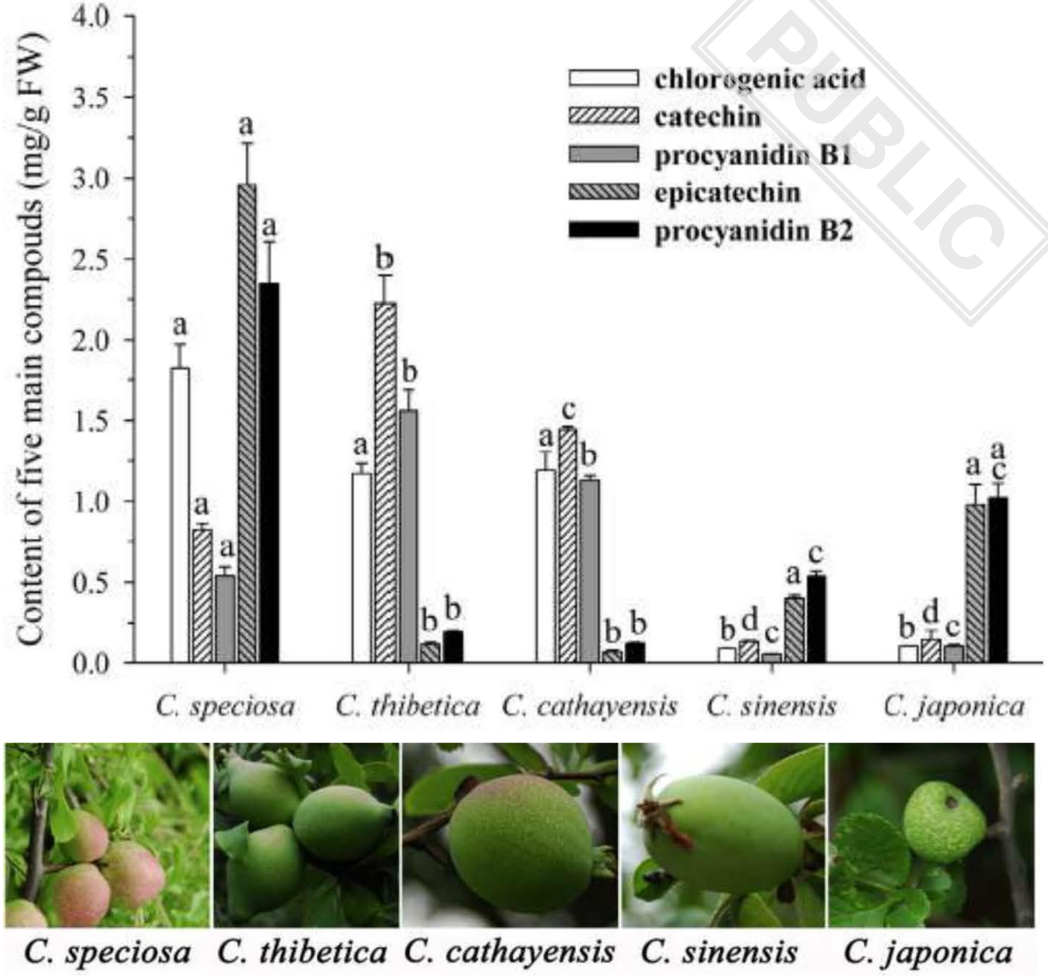

flesh cells after water extraction of the pectins


flesh cells after oxalate extraction of the pectins


flesh cells after acid extraction of the pectins

Thomas et al.2000, Lebensmittel-Wissenschaft Technologie; Thomas, 2001; Thomas & Thibault 2002, Carbohydrate Polymers; Thomas et al., 2003, Carbohydrate Polymers; Golubev et al., 1990, Khimiya Prirodnykh Soedinenii; Hellin et al., 2003, Report FAIR-CT97-3894; Rumpunen et al., 1998, Acta Horticulturae; Komych et al., 2016, Eastern-European Journal of Enterprise Technologies

Phenolic compounds



Du et al., 2013, Food Chemistry; Hellin et al., 2003, Report FAIR-CT97-3894; Krasnova et al., 2007, Cheminė technologija; Komych et al., 2016, Eastern-European Journal of Enterprise Technologies; Rubinskiene et al., 2014, Sodininkystė ir Daržininkystė

Japanese quince leaves as a valuable source of phenolic compounds

- Phenolic acids → Chlorogenic acid
- Flavonols → Quercetin-3-O-rutinoside, Quercetin-3-O-galactoside
- Flavan-3-ols → Procyanidin B3, (+) Catechin, Procyanidin B1, (−) Epicatechin, Procyanidin B2, Procyanidin C1

Teleszko et al., 2015, Journal of Functional Foods

Macroelements

The parameter studied	Mg [mg/100 g dry weight]	Ca	P	K	Na
Arithmetic mean ($\bar{x}$)	16.729	22.920	64.090	249.740	2.805
Standard deviation (±SD)	3.652	5.687	1.610	2.540	0.183
Maximum	22.835	32.318	65.801	246.090	2.980
Minimum	11.391	17.191	62.071	251.760	2.560

Microelements

The parameter studied	Fe [mg/100 g dry weight]	Cu	Zn	Mn	Mo
Arithmetic mean ($\bar{x}$)	0.516	0.146	0.546	0.25	0.020
Standard deviation (±SD)	0.165	0.076	0.493	0.013	0.002
Maximum	0.830	0.325	1.456	0.23	0.022
Minimum	0.330	0.093	0.211	0.26	0.018

The concentration of oxalate averaged 8.2 mg/100 g wet weight of the fruit

Baranowska-Bosiacka et al., 2017, Biol Trace Elem Res

Japanese quince seeds as a source of bioactive compounds

Hydrophilic compounds

Amygdalin

Phenolic compounds

Lipophilic compounds

Tocopherols

Phytosterols

Carotenoids

Fatty acids

Mierina et al., 2013, The Journal of Latvian Academy of Sciences; Górnaś et al., 2013, Industrial Crops and Products

Physicochemical properties of the cold-pressed Japanese quince seed oil

Physical and chemical properties	
Oil in dwb of seeds (%)	10.08 ± 0.07
Colour	Yellow
Physical state at 4 °C	Liquid
Index of refraction (20 °C)	1.4738 ± 0.01
Density at 20 °C (g/cm³)	0.900 ± 0.01
β-Carotene (mg/kg)	**10.69 ± 0.09**
Chlorophyll (mg/kg)	0.11 ± 0.01
Squalene (mg/g)	0.67 ± 0.01
Saponification value (mg KOH/g)	196.37 ± 0.79
Unsaponifiable matter (%)	3.15 ± 0.11
Iodine value (g/100 g)	96.6 ± 0.15
Peroxide value (mEq O_2/kg)	0.60 ± 0.05
Acid value (mg KOH/g)	0.88 ± 0.09
p-Anisidine value	1.86 ± 0.14
Total oxidation value	3.06 ± 0.24
Oxidative stability index (h)	7.35 ± 0.05

Fatty acids		%
Lauric acid	$C_{12:0}$	0.04 ± 0.01
Myristic acid	$C_{14:0}$	0.09 ± 0.02
Palmitic acid	$\mathbf{C_{16:0}}$	**9.46 ± 0.21**
Heptadecanoic acid	$C_{17:0}$	0.10 ± 0.03
Stearic acid	$C_{18:0}$	1.02 ± 0.08
Arachidic acid	$C_{20:0}$	0.70 ± 0.12
Heneicosanoic acid	$C_{21:0}$	0.08 ± 0.02
Behenic acid	$C_{22:0}$	0.16 ± 0.02
Tricosanoic acid	$C_{23:0}$	0.02 ± 0.01
Lignoceric acid	$C_{24:0}$	0.10 ± 0.03
Cis-10-Heptadecenoic Acid	$C_{17:1}$	0.05 ± 0.01
Oleic acid	$\mathbf{C_{18:1}}$	**33.80 ± 1.17**
Elaidic acid	$C_{18:1}$	0.56 ± 0.07
Cis-11-Eicosenoic acid	$C_{20:1}$	0.51 ± 0.05
Linoleic acid	$\mathbf{C_{18:2}}$	**52.36 ± 1.46**
Alpha-Linolenic acid	$C_{18:3}$	0.56 ± 0.06
cis-11.14-Eicosadienoic acid	$C_{20:2}$	0.06 ± 0.01
Cis-13.16-Docosadienoic acid	$C_{22:2}$	0.03 ± 0.01
Cis-4.7.10.13.16.19-docosahexaenoic acid	$C_{22:6}$	0.30 ± 0.04

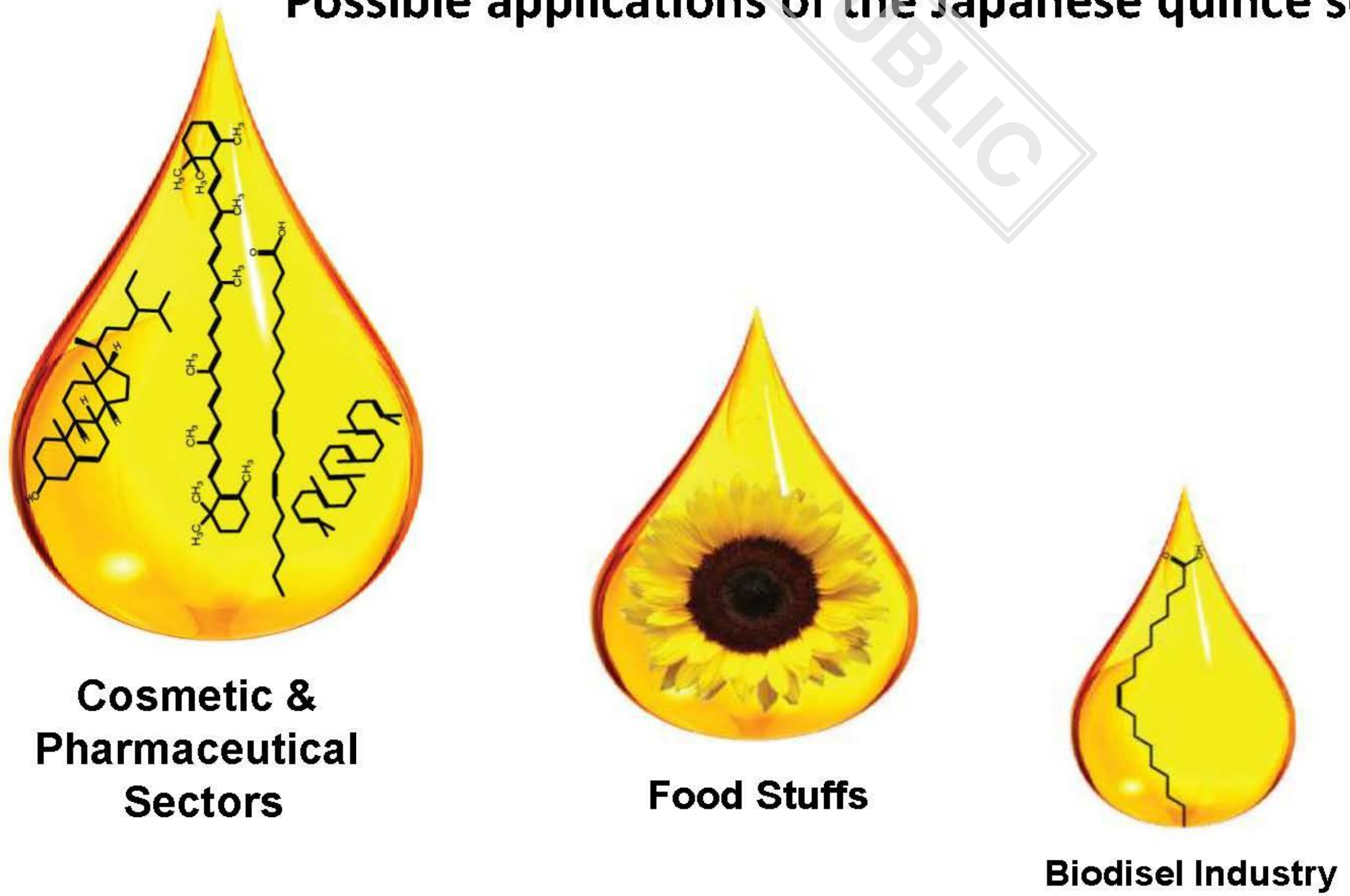
Tocochromanols	mg/100 g	%
α-Tocopherol	**69.61 ± 0.34**	**93.74**
β-Tocopherol	0.67 ± 0.03	0.90
γ-Tocopherol	1.82 ± 0.05	2.45
Plastochromanol-8	2.16 ± 0.08	2.91
Total	74.26 ± 0.50	100

Phytosterols	mg/g	%
Campesterol	0.45 ± 0.02	5.91
Stigmasterol	0.18 ± 0.01	2.37
β–Sitosterol	**6.31 ± 0.03**	**82.92**
Avenasterol	0.53 ± 0.02	6.96
Others	0.14 ± 0.01	1.84
Total	7.61 ± 0.02	100.00

Phenolic compounds	mg/kg	%
4-Hydroxybenzoic acid	0.08 ± 0.01	3.62
Vanillic acid	0.18 ± 0.01	8.15
Vanillin	**0.57 ± 0.01**	**25.79**
p-Coumaric acid	**0.65 ± 0.01**	**29.41**
Ferulic acid	**0.72 ± 0.02**	**32.58**
trans-Cinnamic acid	0.01 ± 0.01	0.45
Total	2.21 ± 0.07	100

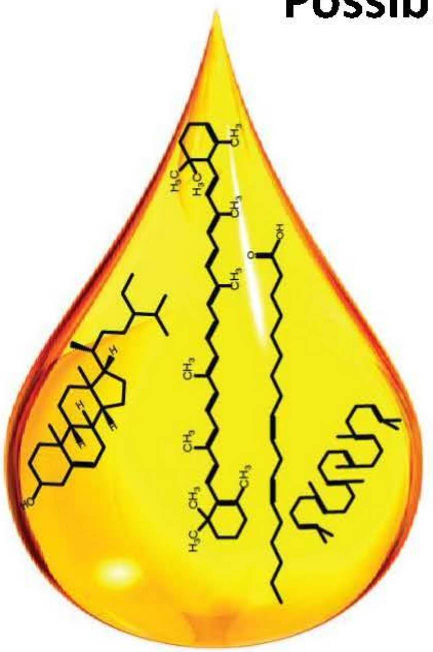
Górnaś et al., 2013, Industrial Crops and Products

Possible applications of the Japanese quince seed oil



Górnaś et al., 2016, Industrial Crops and Products; Górnaś et al., 2014, European Journal of Lipid Science and Technology

Possible applications of the Japanese quince seed oil



Cosmetic & Pharmaceutical Sectors

Since the Japanese quince seed oil is a rich source of carotenoids, phytosterols, tocochromanols, essential fatty acids, it become an excellent oil for cosmetic and pharmaceutical sectors

Górnaś et al., 2016, Industrial Crops and Products; Górnaś et al., 2014, European Journal of Lipid Science and Technology

Possible applications of the Japanese quince seed oil

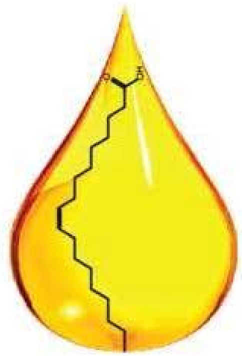
The Japanese quince seed oil, due to a very similar composition of both fatty acids and tocopherols as in sunflower oil, could be used as an alternative substitute of sunflower oil.

Food Stuffs

Górnaś et al., 2016, Industrial Crops and Products; Górnaś et al., 2014, European Journal of Lipid Science and Technology

Possible applications of the Japanese quince seed oil

The Japanese quince seed oil can be considered as potential biodiesel feedstock, since meets most of the European biodiesel standards for such characters as: cetane number, kinematic viscosity at 40 °C, oxidation stability, iodine value and density.



Biodisel Industry

Górnaś et al., 2016, Industrial Crops and Products; Górnaś et al., 2014, European Journal of Lipid Science and Technology

Conclusions

Japanese quince (*Chaenomeles japonica*) is new promising fruit crop for Baltic Sea region countries!

Future directions and opportunities

- ✓ Research on chemical compositions, harvesting time, shelf life and conditions, suitability for processing
- ✓ Breeding of new cultivars and and growing in other Baltic Sea region countries
- ✓ Few studies about Japanese quince leaves
- ✓ Development of a method for extraction of fruit flavour, looking for its industrial applications
- ✓ ....

66 YEARS
NOT OLD, BUT DISTINGUISHED

Thank you for the attention!

ERDF project «Environment-friendly cultivation of emerging commercial fruit crop Japanese quince - *Chaenomeles japonica* and waste - free methods of its processing» No 1.1.1.1/16/A/094