Hunting for Finnish Hops:
Are They Indeed Growing in That North
And How Do They Look Like?

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HOP CASE FINLAND

61.9241° N

25.7482° E

STONE AGE year 7100 BC/AD

Remains of hop pollen were found in the Mesolithic layers in Southern part of Finland

Alenius et al. (2013) Early farming in the Northern Boreal Zone: Reassessing the History of Land Use in Southeatern finland through High-resolution Pollen Analysis. Geoarcheology: An International Journal 28:1-24

MIDDLE AGES 11th century - CULTIVATION

Findings of hop macrofossil seeds date to the Middle Ages and most probably cultivation of hop in Finland started then

Lempiäinen Terttu (2007) Archaeobotanical evidence of plants from the medieval period to early modern times in Finland. In: Medieval food traditions in Northern Europe Edited by: Sabine Karg

REMARKABLE COMMERCIAL VALUE

When Finland was part of Swedish Empire, during the 17th and early 18th centuries, hop inflorescences were used for paying taxes, and there were even legal obligations to cultivate hops until 1915

CRAZE for CRAFT BEERS

Having only a few microbreweries not more than a decade ago, the number of them raised up to over 100 in 2017 in Finland

LUKE - BLOG about HOPS

Finnish hops are a big surprise to the rest of the world

https://www.luke.fi/blogi/hunting-finnish-hops-2/

RESULTS - CHEMICAL ANALYSIS

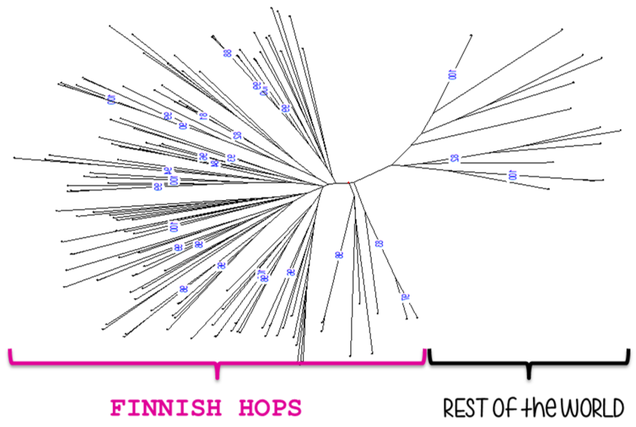
	Desmethyl-xanthohumol g/100 g dw	Xanthohumol g/100 g dw	Sum α-acids g/100 g dw	Sum β-acids g/100 g kdw	Ratio α *vs* β
Samples 2016 (n=22)					
Average	**0,18**	**0,46**	**2,4**	**3,0**	**0,8**
maximum	0,33	0,86	5,9	4,7	1,8
minimum	0,06	0,11	1,0	1,5	0,3

Analysis of prenylflavonoids and α- and β-acids (g/100 g dw) by HPLC-DAD in methanolic extracts.

	myrcene peak area %	β-caryophyllene peak area %	humulene peak area %
Samples 2016 (n=22)			
Average	**54,3**	**5,6**	**20,7**
maximum	74,2	9,2	34,2
minimum	34,3	1,8	5,7

Analysis of the main volatile compounds (peak area %) by GC-MS in hexane extracts. In addition to these some samples contained up to 15.4 % α-bergamontene, and up to 12.5 % β-seline.

RESULTS - GENETIC ANALYSIS



«PS FINNISH HOPS ARE QUITE UNIQUE»

We aim overall to collect 1000 hops in 2017 from all over Finland, with the goal of giving image to the «polar hop aroma» & establish solid base for IMPROVEMENT OF LOCAL HOPS

CALL FOR HOPS

1st June – 31st July 2017

criteria

- Older than 50 years
- Healthy plants
- Use (e.g. brewing)
- Bearing cones regularly
- Male plants

The call was published in number of media from Finland.

The call was implemented trough electronic system for plant genetic resources already existing in Luke.

15th July 2017 > 900 hops notified

COLLECTING HOPS

1st August – 31st December 2017

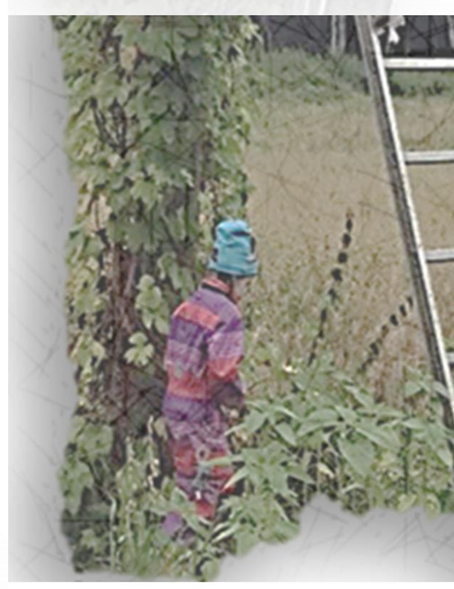
1 6 LEAVES

2 100 CONES

3 Knowledge

[a] Notifiers of hops from all over the Finland were asked to send leaf materials and cones to Luke.

[b] Traditional knowledge and important information on each plant was registered into Luke database.



CHEMICAL ANALYSIS

n = 22

- alpha- and beta-acids
- prenylated flavonoids
- terpenoids
- volatile oils

GENETIC ANALYSIS

n = 60*

- 20 microsatellite markers
- Identity analysis
- Relationships
- Genetic structuring
- Diversity analysis

**including landraces and bred cultivars from Europe and world wide(18) for inter-comparative assessment*

Photo: Jussi Kangas (Finland – 2016)