

# Finnish hops who are you?©™

Some findings from genetic markers analyses

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*Erikoistutkija; FINN HOP PI*

*Kasvigenetiikka*

*Jokioinen*

1000  
hops

**FOR**

CULTIVATION

AROMA

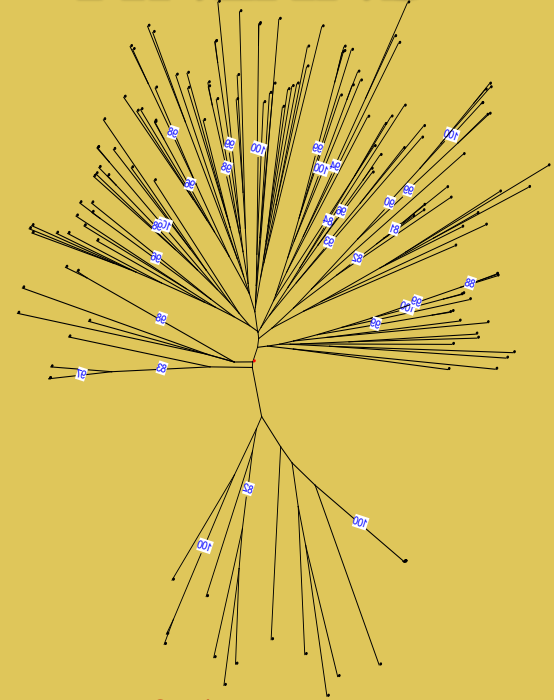
FOOD

FIBRE

WELL BEING

MEDICINE

**FINLAND**



**REST of the WORLD**

PS FINNISH HOPS ARE

QUITE UNIQUE !!!

# Toward the selection of best hops – genetic analysis:

How did we obtain hops for this study?

- **From Finnish citizens – THANK YOU ALL**
- **From the rest of the World:** Australia, Arizona, Austria, Bosnia and Herzegovina, China, Colorado, Czech Republic, Denmark, ex-Yugoslavia, France, Georgia, Germany, Iowa, Italy, Japan, Kazakhstan, Macedonia, Manitoba, Missouri, Montana, New Mexico, New Zealand, North Dakota, Russia, Saskatchewan, Slovenia, South Africa, Spain, Serbia, United Kingdom, USA, Utah and Wisconsin.



**KASVIEN GEENIVARAT**

**KASVIKUULUTUS**

**Missä kasvaa arvokkaita vanhoja humalia?**

Luonnonvarakeskus (Luke) kerää tietoja Suomessa pitkään viljellyistä tai luonnosta kasvavista vanhoista humalista.

...ta meille vähintään 50 vuotta vanhasta tai sitä aiemmin Suomessa viljellystä humalasta, joka:

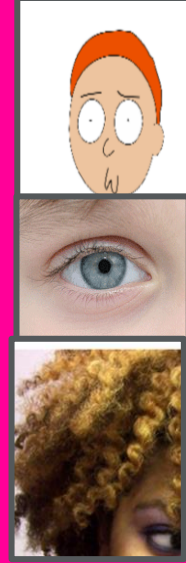
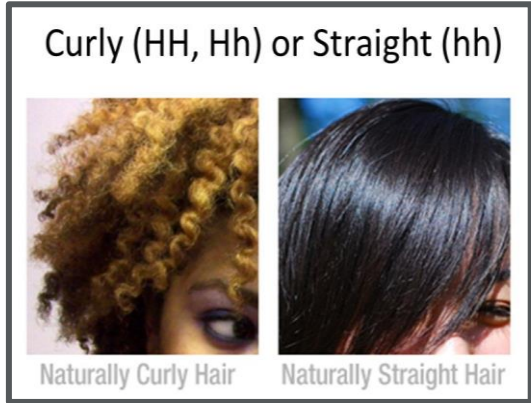
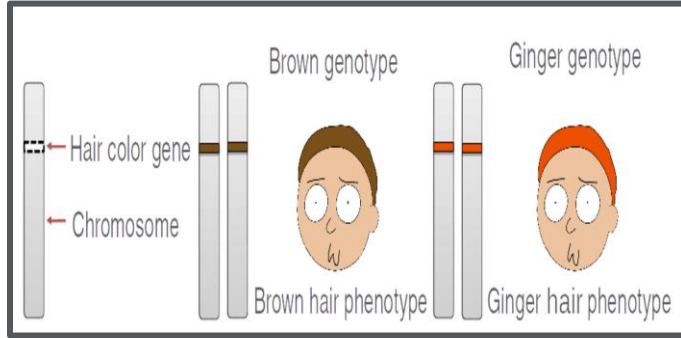
- tuottaa hyvän tuoton vuosittain
- on terve ja hyvin kasvava
- sopii valmistukseen ja sitä voi hyödyntää muulla tavoin
- tuottaa aromiltaan, maultaan tai muuten erittäin mielenkiintoisia käpyjä

Ilmoittamisesta 31.7.2017 lähtien: [www.luke.fi/ilmoitukset](http://www.luke.fi/ilmoitukset)

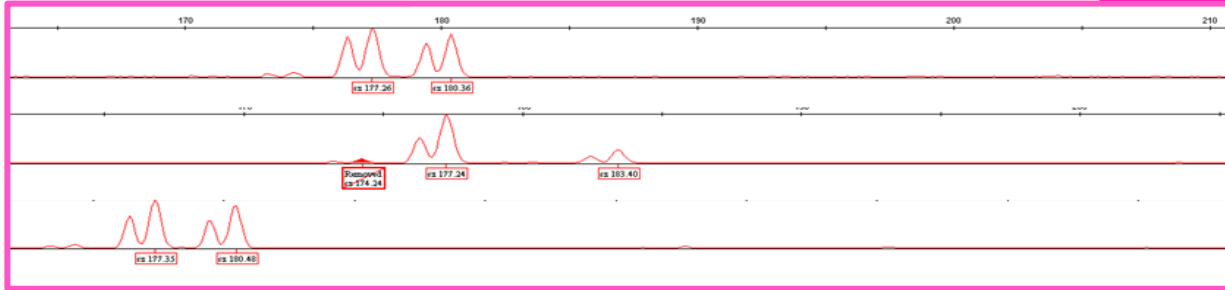
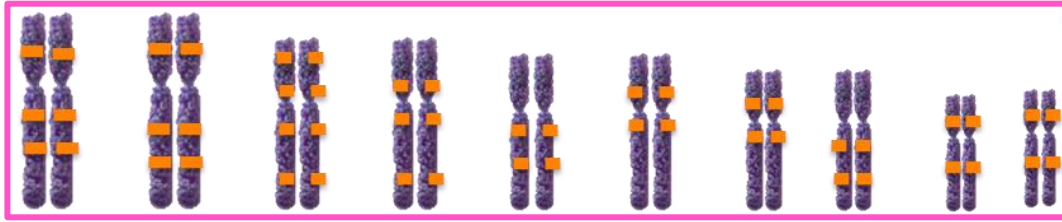
Kuva: Jussi Kangas 2016

**Keräämme tietoja myös hedekasveista.**

# How do we perform genetic analyses? GENES → MARKERS

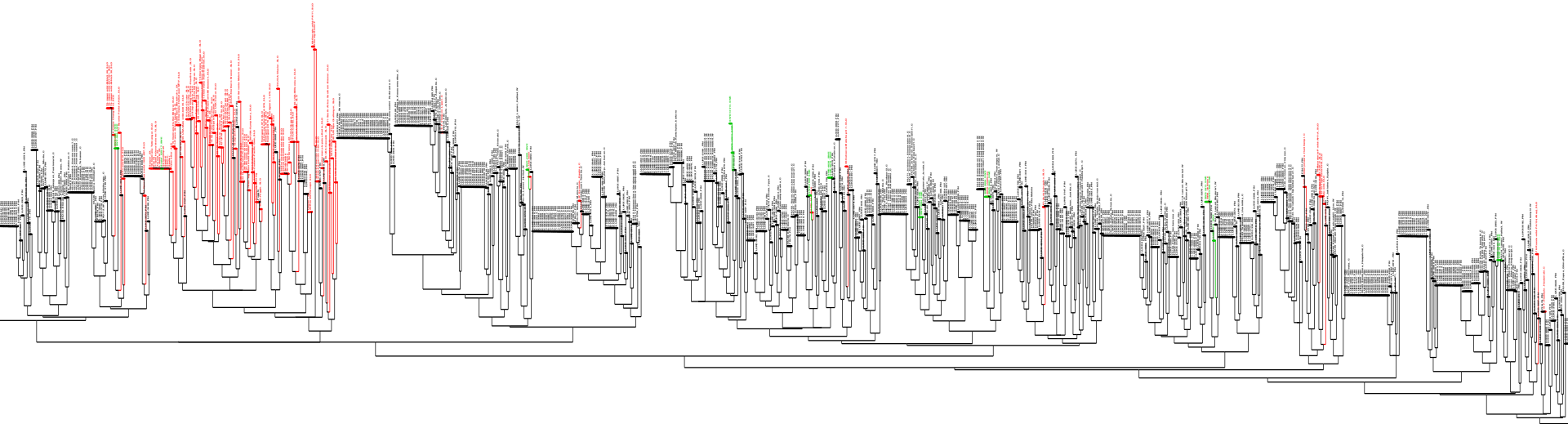


# MARKERS = 25



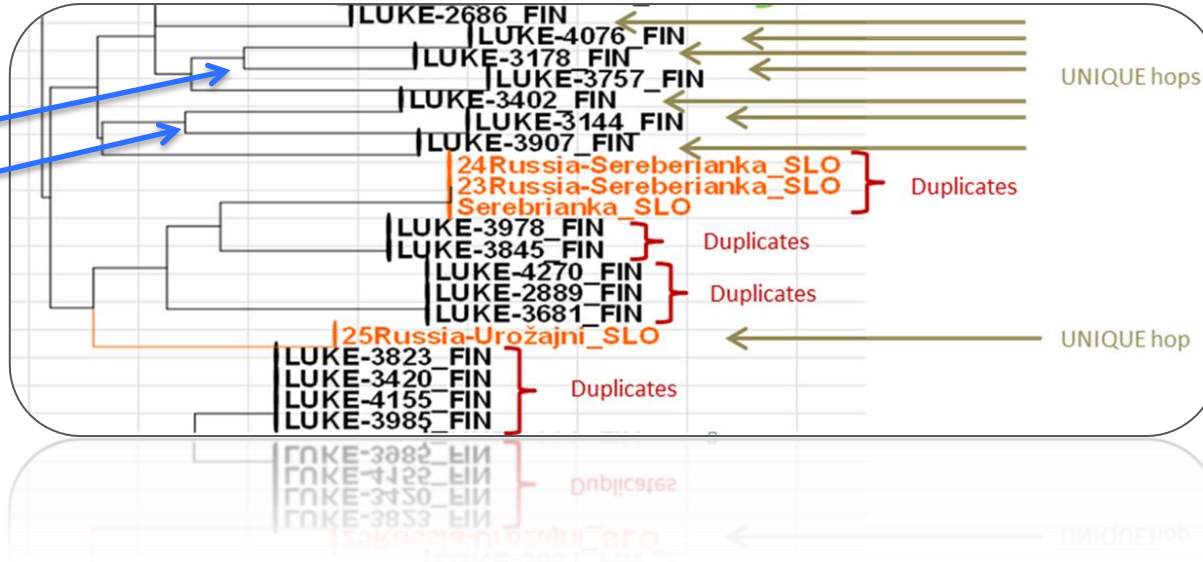
OA Name	GA4-P11-9	GA4-P11-9	GA5-G3-10I	GA5-G3-10I	GA5-G3-10II	GA5-G3-10II	GA7-16-16	GA7-16-16	GA8-K15-4	GA8-K15-4	GT1-K1-4	GT1-K1-4	HI-ACA3	HI-ACA3	HI-AGA1	HI-AGA1	HI-AGA6	HI-AGA6	HI-AGA7	HI-AGA7	HI-GA27	HI-GA27
<b>LUKE-1997</b>	204	206	76	76	115	133	214	218	226	232	158	158	204	223	254	254	153	187	156	181	197	197
<b>LUKE-2588</b>	198	206	76	86	115	139	206	218	240	240	158	177	207	223	272	275	190	190	181	184	199	199
<b>LUKE-2590</b>	204	206	76	86	125	154	210	216	226	240	158	158	204	204	254	254	186	189	178	178	195	219
<b>LUKE-2591</b>	204	204	76	86	141	154	210	214	232	242	158	175	204	204	269	278	176	190	178	181	195	195
<b>LUKE-2592</b>	204	204	76	86	141	154	210	214	232	242	158	175	204	204	269	278	176	190	178	181	195	195

# FINNISH HOP DENDROGRAM 2012 - 2017



# IDENTIFICATION

SISTERS?



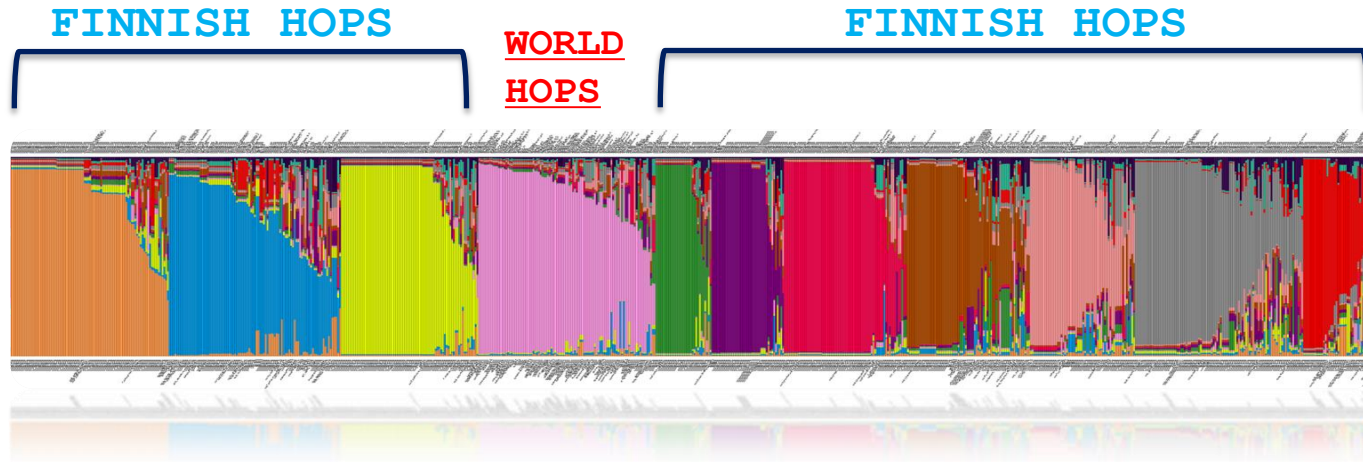
RARE UNIQUE HOPS

DUPLICATES

260 UNIQUE FINNISH HOPS

>30%

# COMPARISONS



- FINNISH hops are authentic to the World.
- FINNISH hops are native to the Finland.





# FINNISH HOP CHAMPIONS

1  
DNA  
analysis

Only  
UNIQUE  
HOPS



From  
DIFFERENT  
GROUPS

2  
CHEMICAL  
evaluations



# FINNISH HOP CHAMPIONS – WE HAVE THEM – THEY ARE GOOD 😊



Thank you!



NATURAL RESOURCES  
INSTITUTE FINLAND