Tutkimuksesta tukea luonnontuotealalle

Rainer Peltola, Luonnonvarakeskus

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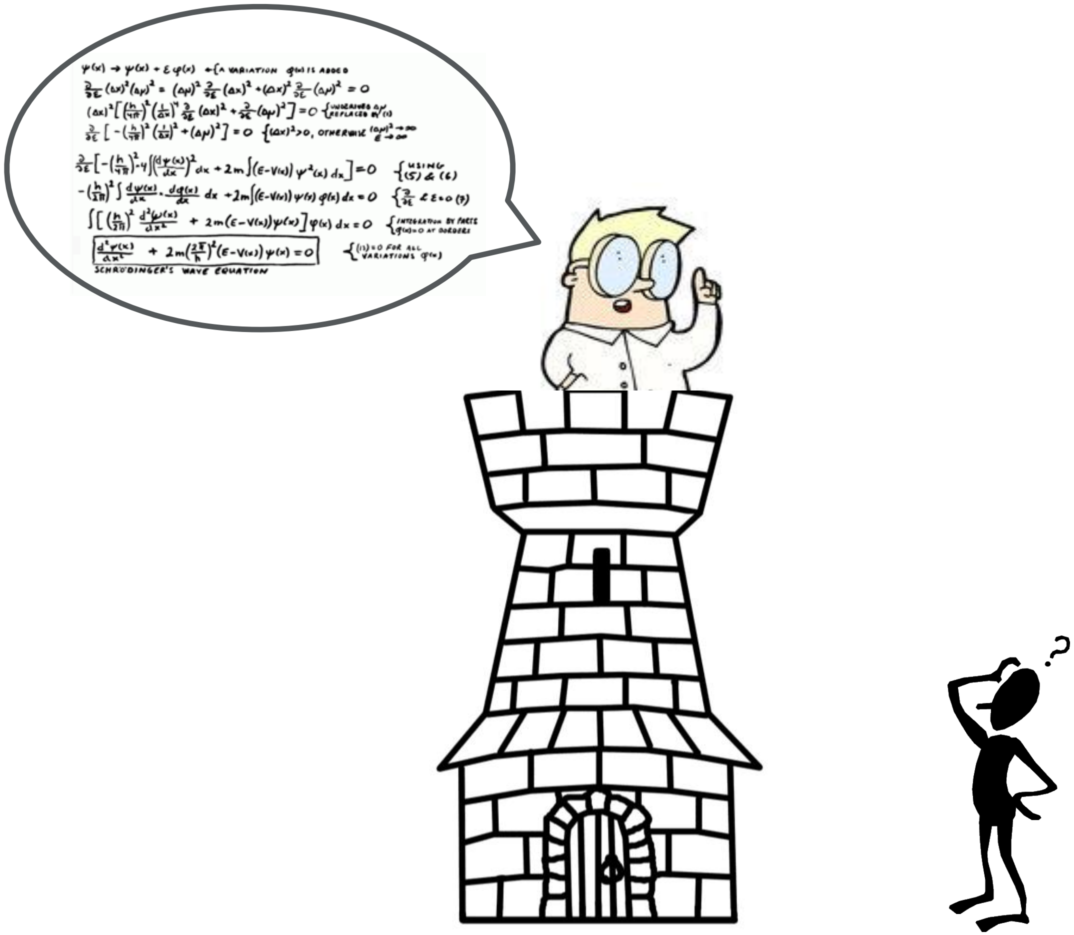
Tutkijat norsunluutorneissaan



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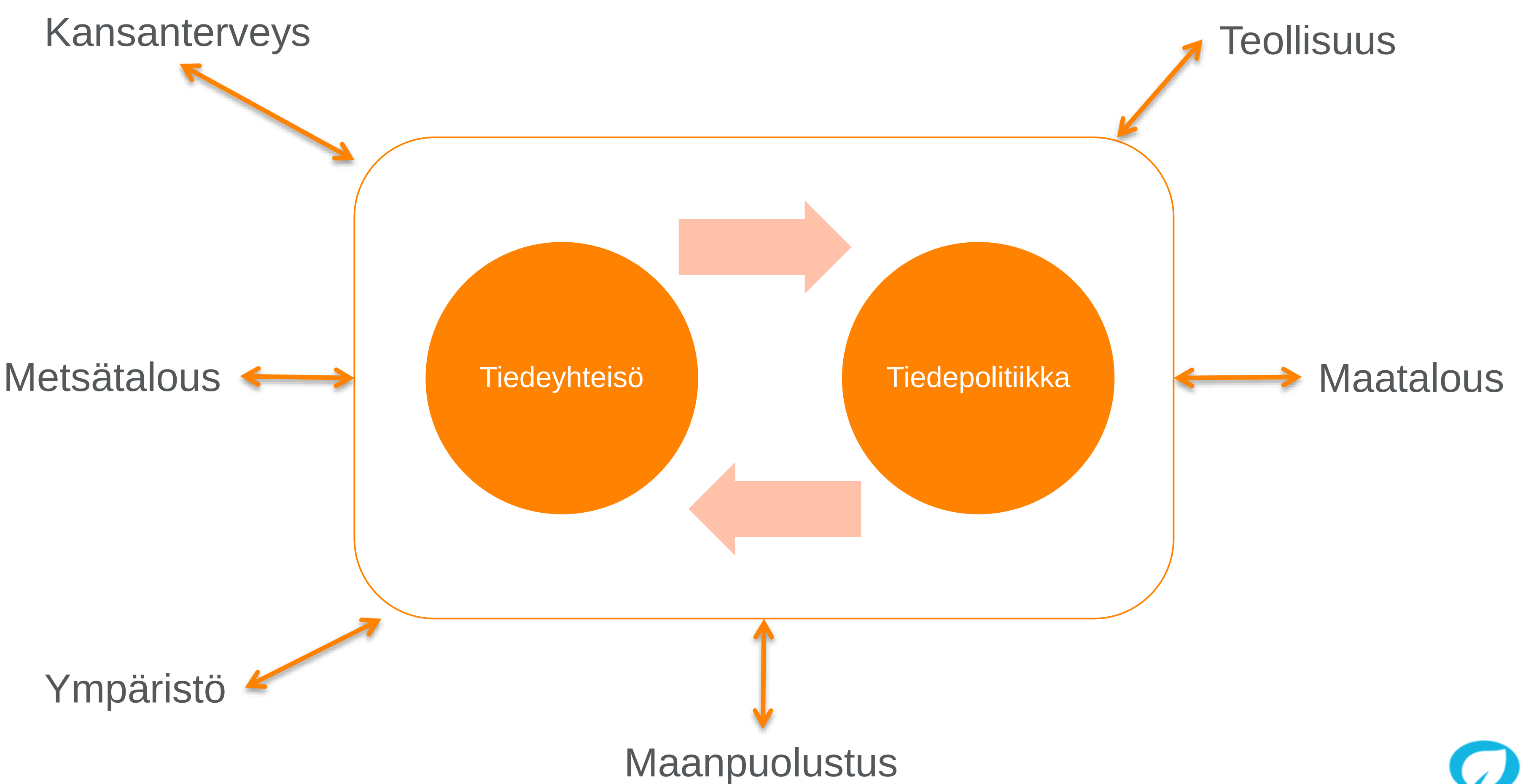
Tutkimuksen teko ei koskaan ole ollut tutkijan egotrippi!



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Tutkija tekee rahoitushakemuksia siinä missä yrittäjä tarjouksia

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Tutkimusorganisaatioiden rahoitusrakenne

- Kokonaisrahoitus pienenee
- Sidotut varat
  - Toimitilat
  - Kalusto
  - Tukihenkilöstön palkat
- Sitomattomat varat
  - Pienenevät jatkuvasti

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Muutoksessa on mahdollisuus

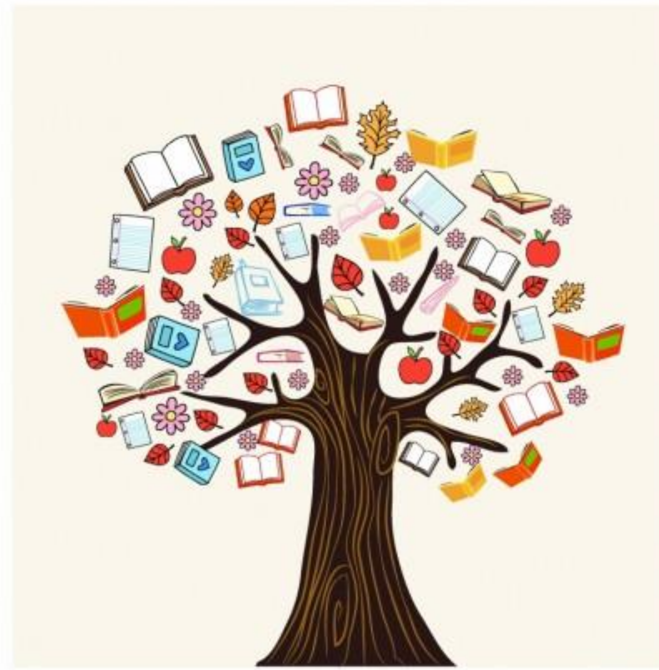
- Tutkimuksen elinkeinoille koituvat hyödyt korostuvat enemmän ja enemmän → soveltava tutkimus

Perustutkimus

Soveltava tutkimus

Tuotekehitys

Tuote



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Tuntuuko siltä että nyt tarvitaan tutkimusta?

- Kannattaa muistaa:

Maailma on täynnä tietoa!

- Ja toisaalta:

Myös tiedon hakuun on ammattilaisia!

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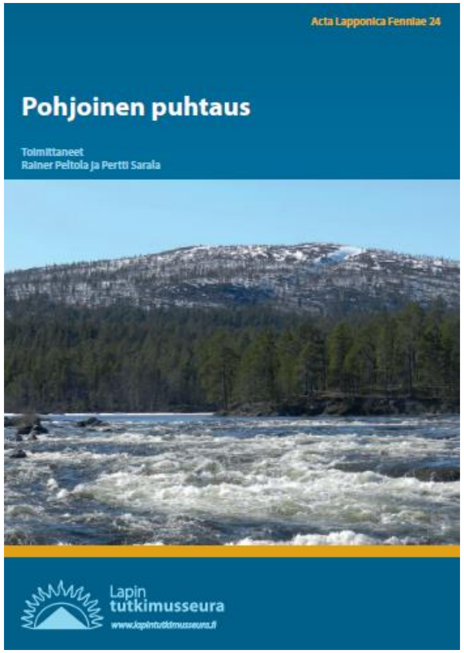
Tuntuuko siltä että nyt tarvitaan uutta tietoa?

- Koko toimialaa hyödyttävä tutkimus
  - Hyödyllisintä silloin kun tulokset ovat mahdollisimman laajan toimijajoukon saatavilla



- Yksittäisiä yrityksiä tai yritysryhmiä hyödyttävä tutkimus
  - Tuotekehitys

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…mutta sille, kuka lounaan maksaa on useita vaihtoehtoja

- LUMOA – hanke
  - Alan tutkimustiedon kokoaminen ja välittäminen
  - Raaka-ainetuotantoon liittyvät tutkimuskysymykset,
  - Brändinrakentamisen tutkimuksellinen tuki

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- LUTUNEN – hanke: Luonnonvara-alan tietoa eri kohderyhmien tarpeisiin
  - Popularisoituja (tarinallisia) esimerkkejä onnistuneista luonnontuotealan yrityksistä, niiden toimintatavoista ja tuotelanseerauksista
  - Yleistajuista tietoa luonnontuotteiden käyttömahdollisuuksista, mm.
    - käyttötavoista
    - merkityksestä
    - elinkeinomahdollisuuksista
    - markkinoista
    - hyvinvointihyödyistä
    - käyttöhistoriasta ja – kulttuurista
  - Videotallenteita seminaareista ja pientapahtumista
  - Painettua materiaalia
    - esitteitä
    - oppaita
    - opetusmateriaaleja

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Tiedonvälityksen uusille kanaville huutava tarve!

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Effects of Latitude-Related Factors and Geographical Origin on Anthocyanidin Concentrations in Fruits of *Vaccinium myrtillus* L. (Bilberries)

ANDREAS ÅKERSTRÖM,*,† LAURA JAAKOLA,§ ULLA BÅNG,† AND ANDERS JÄDERLUND‡

†Department of Agricultural Research for Northern Sweden, and ‡Department of Forest Ecology and Management, Swedish University of Agricultural Sciences, 90183, Umeå, Sweden, and §Department of Biology, University of Oulu, POB 3000, FIN-90014 Oulu, Finland

Two data sets are presented to identify the effect of growth location and origin of parental plant on anthocyanidin concentrations in *Vaccinium myrtillus* fruits. Bilberries were collected from wild populations growing at different latitudes and from cultivated plants originating from different geographical locations but grown in the same location for over 10 years. High-performance liquid chromatography analysis showed that anthocyanidin concentrations varied significantly with latitude and with geographical origin, with higher values form northern latitudes or from a more northerly origin of parent plants. The results show that anthocyanidin concentrations in bilberries are under strong genetic control but are also influenced by climatic factors. Furthermore, the proportions of specific anthocyanidins differed between latitudes and between plants with different parental origins. The diversity in anthocyanidin concentration and composition has important implications for plant breeders and for future development of varieties with high antioxidant capacity.

KEYWORDS: Anthocyanidin composition; breeding; genome; climate; cyanidin; delphinidin

INTRODUCTION

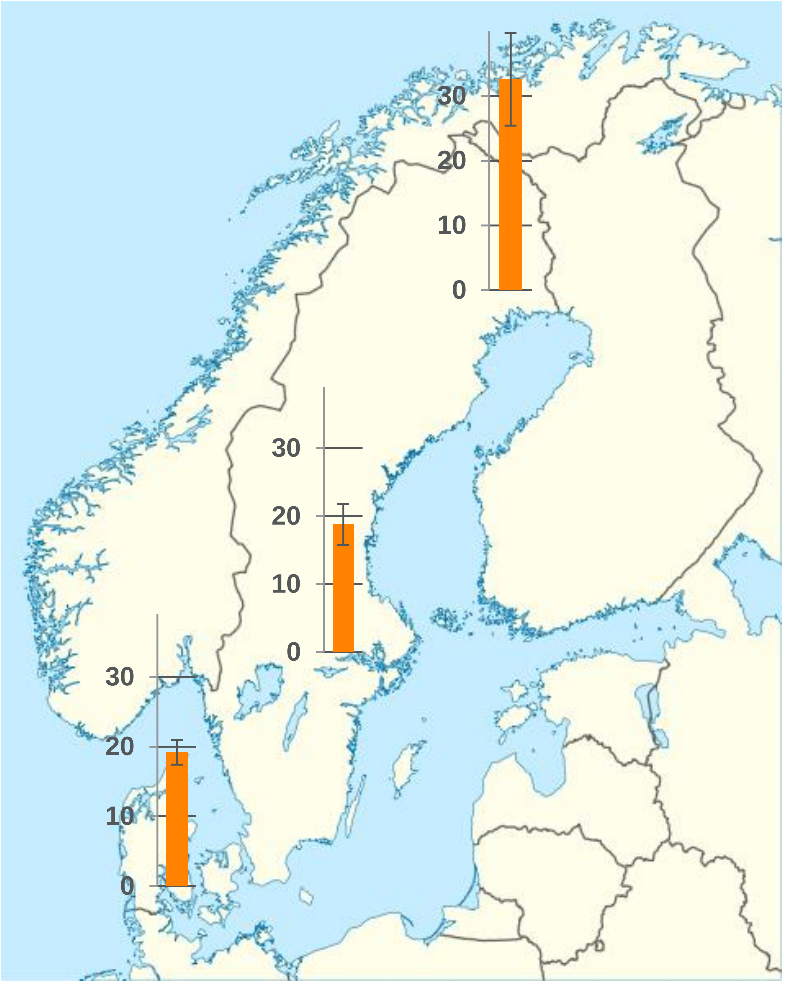
Because of their health-promoting effects, the anthocyanin content in fruits and berries is becoming an important quality factor for the industry and the general public. However, the variation of anthocyanin content within and between populations on both spatial and temporal scales can be very high. The concentration and composition of anthocyanins in small berries are influenced by both genetic factors, such as genotype (*1*), and environmental factors, such as temperature (*2–4*), light quality (*3*, *5–8*), nutrient availability (*9*, *10*), and the timing of harvest (*4*).

Climate can have a great effect on berry-producing plants. Krebs et al. (*11*) showed that in *Vaccinium vitis-idea* and other species, the following year's yield could be predicted from climate factors and previous yields with a certainty of 80–96%. They found no periodicity in berry yields in their study as previously reported by Selås (*12*) when looking at a 50 year time line of bilberry yields in Norway. In a 3 year study in northern Sweden, a periodicity was also suggested to explain observed variations of anthocyanidin concentrations in bilberries that could not otherwise be explained by climate parameters (*4*).

Differences in latitude were interpreted by Strong and Redburn (*13*) as a factor causing understory vegetation to respond to cooler and slightly drier conditions and PAR (photosynthetically active radiation) availability to understory species being reduced by 20%. Temperature effects on anthocyanidin concentrations in berries are apparently inconsistent. Low temperatures (10–15 °C) have been reported to increase the amounts of anthocyanidin in berries of various species (*2*, *3*, *14*), and high temperatures (> 30 °C) have been reported to limit their production (*15*, *16*). However, in strawberries, high temperatures (30 °C day, 22 °C night) have been found to be more favorable than low temperatures (18 °C day, 12 °C night) on anthocyanidin concentrations (*17*). In a 2 year study by Rieger et al. (*18*), the anthocyanin contents of *Vaccinium myrtillus* fruits were found to decrease with altitudes increasing from 800 to 1200 m and 1500 m above sea level. Large differences in day and night temperatures have been suggested to promote anthocyanin formation, and this is supported by the results of Mori et al. (*19*) who found that accumulation of red grape skin anthocyanins decreased if night temperatures were elevated from 15 to 30 °C for grapevines grown under 30 °C day temperature. However, in strawberry, the antioxidant capacity increased when night temperatures were increased from 15 to 22 °C with a constant day temperature of 25 °C (*17*).

Anthocyanin production is photoinduced by light in the UV, visible, and far-red wavelengths (*16*) and inhibited by darkness in, for example, apple (*20*). However, UV-B (280–315 nm) light has been proven to inhibit anthocyanidin synthesis in juvenile *Syzygium* leaves due to DNA damage (*21*). Elevated amounts of red light in the light spectra promote anthocyanidin biosynthesis (*22*). Long days and increased amounts of red light in the light spectrum are two factors that typify growing conditions in northern Scandinavia. Moreover, *V. myrtillus* plants from the same clone produced a better fruit set when grown in climate chambers under long day (24 h) than under short day (12 h) conditions (*8*).

*To whom correspondence should be addressed. Tel: +46-90-786 87 63. Fax: +46 90 786 87 49. E-mail: Andreas.Akerstrom@njv.slu.se.



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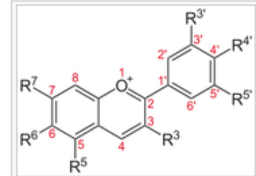
Anthocyanin

From Wikipedia, the free encyclopedia

Not to be confused with anthocyanidins, the sugar-free counterparts of anthocyanins.

Anthocyanins (also **anthocyans**; from Greek: ἄνθός *(anthos)* = flower + κυανός *(kyanos)* = blue) are water-soluble vacuolar pigments that may appear red, purple, or blue depending on the pH. They belong to a parent class of molecules called flavonoids synthesized via the phenylpropanoid pathway; they are odorless and nearly flavorless, contributing to taste as a moderately astringent sensation. Anthocyanins occur in all tissues of higher plants, including leaves, stems, roots, flowers, and fruits. Anthoxanthins are clear, white to yellow counterparts of anthocyanins occurring in plants. Anthocyanins are derived from anthocyanidins by adding sugars.[1]



Anthocyanins are glycosides of anthocyanidins, the basic chemical structure of which is shown here.

Anthocyanins give these pansies their dark purple pigmentation.

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Ollaan yhteydessä!

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