Potential of Asian Herbaceous Plants as Source of Micronutrients

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PROBLEM STATEMENT

DEFICIENCY OF MICRONUTRIENTS

Diets are based on crops rich in macronutrients.

Modern Lifestyle causes oxidative stress.

- → Radiation (UV)
- → Pollution
- → Eating habits > Stress

CONSEQUENCES

- → Reduced immune and non-immune defenses
- → Imbalance between oxygen reactive species and antioxidant defensive system can cause increasing rates of several illnesses (including cancer, cardiovascular and neurological diseases)

IMPLICATIONS

Higher uptake of micronutrients to avoid deficiencies and imbalances:

- → Improvement of eating habits
- → Complementing nutrition with wider range of plants known for their high nutriceutical value
- → Increase of micronutrient content due optimization of cultivation

AIM OF RESEARCH

***Perilla frutescens* and *Persicaria odorata* were cultivated in a greenhouse under natural light and in mitscherlich pots.**

- → Is cultivation in temperate climate zones posible?
- → What is the nutritional value of the plants? Considering intake recommendation and contents of other plants.

PLANTS & MICRONUTRIENTS

PERILLA FRUTESCENS

(syn. Shiso, fam. Lamiaceae)

- → herbaceous plant native to mountainous areas of India and China.
- → used in Asian cuisine
- → well-known for its high contents of polyphenols and anthocyanin with corresponding antioxidative capacity
- → health benefits include potential to ease problems relating to tumors, diabetes, infections and intestinal disorders

PERSICARIA ODORATA

(syn. Vietnamese coriander, fam. Polygonaceae)

- → herbaceous sub-tropical plant, native to Southeast Asia
- → used as basic ingredient and food additive in Asian cuisine
- → well-known for its high content of flavonoids
- → traditional medicine: to alleviate digestive problems, dermatitis and inflammation

Nutrition Facts

Serving Size	(100g)
Calcium	31%*
Iron	23%*
Potassium	13%*
Vitamin A	58%*
Vitamin C	171%*
Phosphorus	20%*
Magnesium	27%*
Polyphenols	110%**

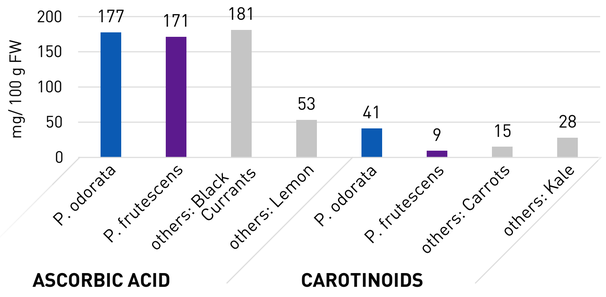
* Referred to dietary intake recommendation by D-A-CH organisation for man, 25–50 years.
** Referred to dietary polyphenol intake by following '5-a-day'-compaign.

Nutrition Facts

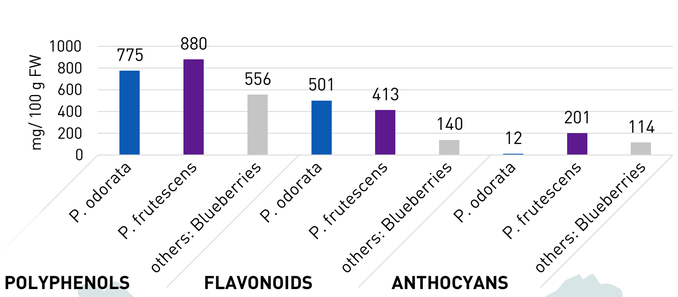
Serving Size	(100g)
Calcium	39%*
Iron	18%*
Potassium	14%*
Vitamin A	178%*
Vitamin C	177%*
Phosphorus	17%*
Magnesium	32%*
Polyphenols	97%**

* Referred to dietary intake recommendation by D-A-CH organisation for man, 25–50 years.
** Referred to dietary polyphenol intake by following '5-a-day'-compaign.

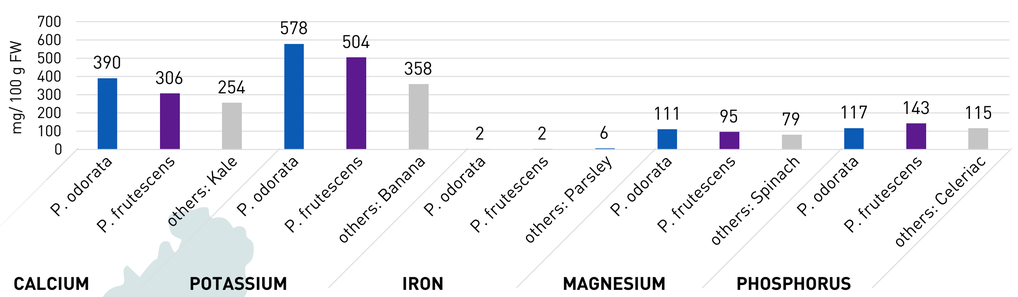
VITAMINS



POLYPHENOLS

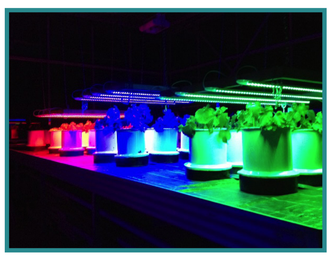


MINERALS



RESEARCH

COMPLETED RESEARCH



Experiments completed in a research greenhouse in Berlin and during the summer proved that both Asian plants can be cultivated in a temperate climate zone with reproducible quantity and quality.

Modified light conditions can improve micronutrient content and yield.

Increased blue light ration buffers yield losses experienced in october when light intensity decreases.

FURTHER RESEARCH

To provide constant yield and quality during winter month under limited light conditions, research will focus on optimizing growth conditions from October to April.

To improve yield and efficiency, different cultivation techniques will be tested.

Costs and profitability will also be examined and calculated.