

VITATOX 2021

ZDRAVÉ A NEZDRAVÉ VITAMINY

Aleš HORNA

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RADANAL Ltd.

Pardubice



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EVROPSKÁ UNIE
EVROPSKÝ FOND PRO REGIONÁLNÍ ROZVOJ
INVESTICE DO VAŠÍ BUDOUCNOSTI



DOBA jedová byla , JE a BUDE.

Chemie rostlin versus Chemie lidského chování.

These are the hundreds of thousands of small molecules (also called **secondary metabolites**) that plants use as chemical ammunition to protect themselves from predation.

Biologically active compounds, which are the source of many of the drugs that people use and **abuse** daily.

NUTRIČNÍTERAPIE – PRINCIP –DOBRÉHO A MOC.

**ŠKŮDCE SE NEJLÉPE ZBAVÍTE, KDYŽ JEJ OTRÁVÍTE, ALE MUSÍTE TO UMĚT,
NEBO BUDETE ZABITI VY**

KILL OR BE KILLED.

HOSTINEC
F. HORNY.

PROJEKTOVÁ SMISENĚ
ZBOŽÍ A POTRAVIN



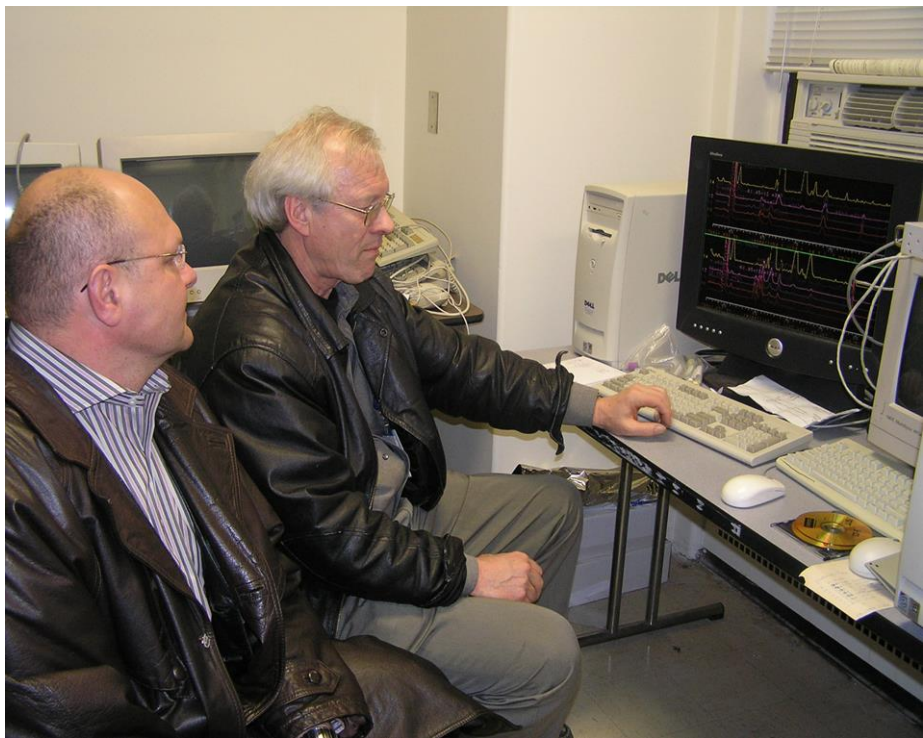
Amelia Schwingenegger
"I'll be back"

To Sid
With a big Skaa
Lauritz Melbik
11-11-41

Keaton



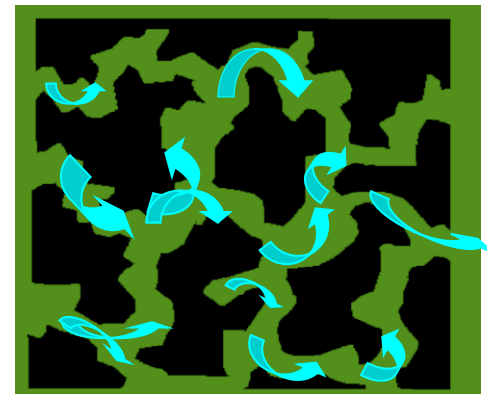
Electrochemical detection in HPLC



Wayne Matson

Exposure to excessive levels of lead in the environment, the home and food..... adults and children suffering adverse health effect and impaired intellectual development

ESA, Chelmsford, MA, USA



Porous Graphite Electrode



RADANAL s.r.o.



Institut Nutrice
a Diagnostiky
Pardubice



(HPLC-ECD)
(HPLC-MS/MS)
(HPLC-EC-MS)



Coulochem



CoulArray



MS – trojitý kvadrupól



MS – iontová past

Přehled řešených projektů

označení	Název projektu	noskytvoatel	Hlavní příjemce
FD09003	Využití tukových odpadů při výrobě bionafty	MSM - Ministerstvo školství, mládeže a tělovýchovy	RADANAL s.r.o.
EA-4-3P103/126	VIK RADANAL	MPO - Ministerstvo průmyslu a obchodu	RADANAL s.r.o.
FE1M076	Výzkum separace bioaktivních peptidů laktoferinu a laktoperoxidázy	Ministerstvo průmyslu a obchodu	Výzkumný ústav organických syntéz a.s.
CE1M2028	Vývoj nerezového/keramického filtru s mikrovrstvou stříbra jako antibakteriální prostředek pro vodní systémy	MPO - Ministerstvo průmyslu a obchodu	FAVEA a.s
FR-T11/227	Výzkum přírodních stimulantů pro zvýšení užitečných vlastností a výnosů vybraných plodin	MPO - Ministerstvo průmyslu a obchodu	Výzkumný ústav organických syntéz a.s.
FR-T11/238	Výzkum izolačních technik vedlejších složek z chemických produktů a přírodních surovin za účelem přípravy jejich standardů	MPO - Ministerstvo průmyslu a obchodu	Výzkumný ústav organických syntéz a.s.
FR-T14/331	Vývoj kítu pro stanovení plazmatických metanefrinů	MPO - Ministerstvo průmyslu a obchodu	Výzkumný ústav organických syntéz a.s.
FR-T14/353	*Intenzifikace a optimalizace zplyňovacích jednotek a dopalovacích komor pro velmi vlhkou odpadní biomasu	MPO - Ministerstvo průmyslu a obchodu	GEMOS CZ, spol. s r.o.,
FI-1A2/014	Výzkum bioaktivních látek z chmelového odpadu a jejich využití ve formě doplňků stravy	MPO - Ministerstvo průmyslu a obchodu	FAVEA a.s
FI-1A3/008	Význam bioaktivních látek obsažených v oddencích křídlatky a jejich využití ve formě doplňků stravy	MPO - Ministerstvo průmyslu a obchodu	FAVEA a.s
KAN308130801	Nové konstrukce a využití nanobiosenzorů a nanosenzorů v medicíně (NANOSEMED)	AV0 - Akademie věd České republiky	Vysoké učení technické v Brně / Středoevropský technologický institut
LE15006	Introdukce nových odrůd třešní s vysokou kvalitou plodů na evropský trh	MSM - Ministerstvo školství, mládeže a tělovýchovy	Výzkumný a šlechtitelský ústav ovocnářský Holovousy s.r.o
LV15-27580A	Vnímání chuti, oxidativní poškození a mikroprostředí střeva v kolorektální karcinogeneze: důsledky na riziko nemoci, jeho prognózu a prevenci	MZO - Ministerstvo zdravotnictví	Ústav experimentální medicíny AV ČR
QJ1510353	Tvorba a selekce odrůd jablek s vysokým obsahem zdraví prospěšných látek a prodlouženou skladovatelností plodů	MZO - Ministerstvo zdravotnictví	Výzkumný a šlechtitelský ústav ovocnářský Holovousy s.r.o.,
OK1310296	Efektivita nových postupů regulace škodlivých činitelů v ovocnářství	MZO - Ministerstvo zdravotnictví	Výzkumný a šlechtitelský ústav ovocnářský Holovousy s.r.o.,
TA01010737	Vývoj technologického zpracování ve světě nově zaváděných vysoce nutričně hodnotných luštěnin pro využití k přípravě běžných potravin i dietních a výživových výrobků	MZO - Ministerstvo zdravotnictví	EXTRUDO Bečice s.r.o.
TA0-0010762	Zlepšení kvality bezlepkového pečiva novými zdroji proteinů	TA0 - Technologická agentura České republiky	PERNÍK s.r.o
TE02060177	Centrum pro inovativní využití a posílení konkurenceschopnosti českých pivovarských surovin a výrobků	TA0 - Technologická agentura České republiky	Mendelova univerzita v Brně / Agronomická fakulta
TH01030787	Zavedení vhodných postupů snižujících negativní vlivy na hmyzi opylovače a další užitečné organismy do technologie produkce ovoce a vypracování postupů zvyšujících efektivitu opylení	TA0 - Technologická agentura České republiky	Výzkumný a šlechtitelský ústav ovocnářský Holovousy s.r.o.
TH03010019	Vývoj bezlepkového pečiva s vysokou nutriční hodnotou využitím nových technologických postupů a netradičních potravinářských surovin a posouzení zdravotních rizik	TA0 - Technologická agentura České republiky	PERNÍK s.r.o
TH03030336	Kolorimetrický senzor pro diagnostiku otrav pesticidy	TA0 - Technologická agentura České republiky	RADANAL s.r.o.,
TJ02060196	Výzkum využití odpadů z ovocných stromů jako zdroje cenných bioaktivních látek	TA0 - Technologická agentura České republiky	Univerzita Karlova / Farmaceutická fakulta v Hradci Králové

Erasmus Students August 2021





Czech experts in talks over Semtex

By Michael Evans, Defence Correspondent

Four Czech plastic explosives technicians who had five hours of talks with Ministry of Defence scientists at the Foreign Office yesterday provided valuable information for those investigating the Lockerbie air disaster.

But they could not help to prove whether the explosive used to destroy the Pan Am jet was Semtex, which is made in Czechoslovakia.

The residues of explosive found by the investigators were too small, according to Whitehall sources yesterday. Mr Paul Channon, Secretary of State for Transport, told the Commons earlier this week that it was probably Semtex.

The Czech experts were shown photographs of the Pan Am wreckage and they discussed the disaster in detail with four scientists from the Ministry of Defence's Royal Armaments Research and Development Establishment based at Fort Halstead in Kent. They are expected to return to Prague today.

They were asked about the possibility of marking Semtex

exported Semtex for years. British intelligence believes it was last exported in 1982.

So, although it would be too late to mark the Semtex that has already been sold abroad, huge quantities of which have landed up in Libya and then been given to the IRA and other terrorist groups, a "fingerprinting" system could be vital if the Prague government decided to start exporting the explosive in the future.

● The Prince of Wales is going to visit Lockerbie on January 24 to see the aftermath of the air disaster. Buckingham Palace announced yesterday.

His appearance in the Scottish border town more than a month after the tragedy follows criticism that no member of the Royal Family attended the memorial service for the victims last week.

The Duke of York visited the scene the morning after the crash, and said at the time that while he felt sorry for everyone concerned, he felt particularly sorry for the Americans involved.

The Prince will visit the

Mock disaster

By Tony Dawe

Britain's biggest switchboard failed to cope yesterday with thousands of calls from "anxious relatives" after a mock disaster resembling the M1 jet crash.

More than 2,500 volunteers flooded British Telecom's Bristol centre, often used for large share flotations, with inquiries about victims. Most calls went unanswered. Only one in four got through to the centre and most callers had to dial several times.

Telecom and the emergency services had hoped the Bristol switchboard might serve as a permanent information number, reducing the delays that have distressed relatives of genuine disaster victims. But after yesterday's exercise, conducted by the Association of Chief Police Officers, one emergency planner said: "The authorities will have to look for

Surgeons give

By a Staff Reporter

Surgeons treating victims of the M1 jet crash were given financial backing yesterday to help them to research the cause and nature of the injuries suffered and whether rear-facing seats and other changes in aircraft design could have reduced the casualties.

Nottingham Health Authority announced a £20,000 grant to provide

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THE UNIVERSITY OF NEW SOUTH WALES

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PLEASE QUOTE

SCHOOL OF CHEMICAL ENGINEERING AND INDUSTRIAL CHEMISTRY

11th May, 1988.

Dr. A. Horna,
Research Institute of Industrial Chemistry,
East Bohemia Chemical Works Synthesia,
532 17 Pardubice - Semtin,
CZECHOSLOVAKIA.

Dear Dr. Horna,

I imagine that you are aware that The Journal of Chromatography is becoming more and more administered by Klaas Bij as Executive Officer Amsterdam as a lead up to the retirement of the foundation editor Dr. Michael Lederer in early 1989.

It would be of interest to know if you would be prepared to referee occasional manuscript and if so in what areas could you act.

I will eventually handle most papers on GC at least some if not all MS, most on polymers by all techniques some, a minority on HPLC. The arrangement fits in with the interests of the other people to be edited.

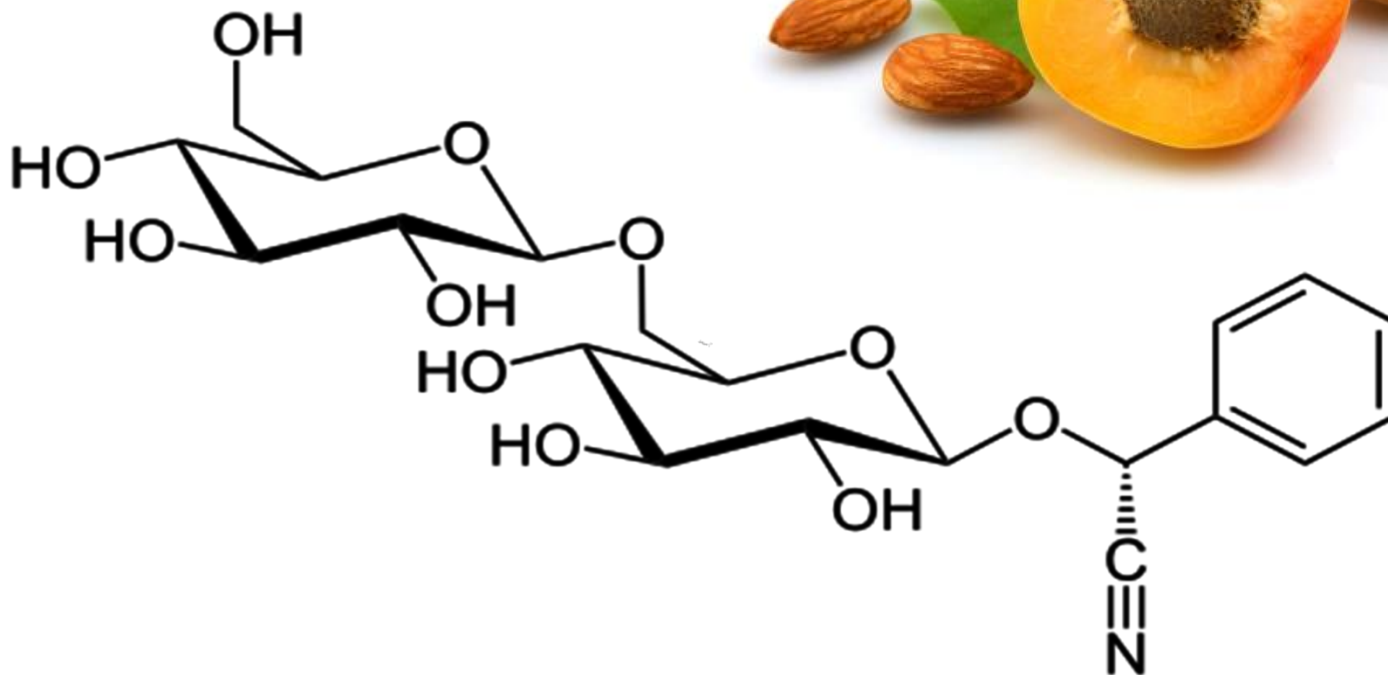
Kind regards,

J.K. Haken,
Associate Editor.

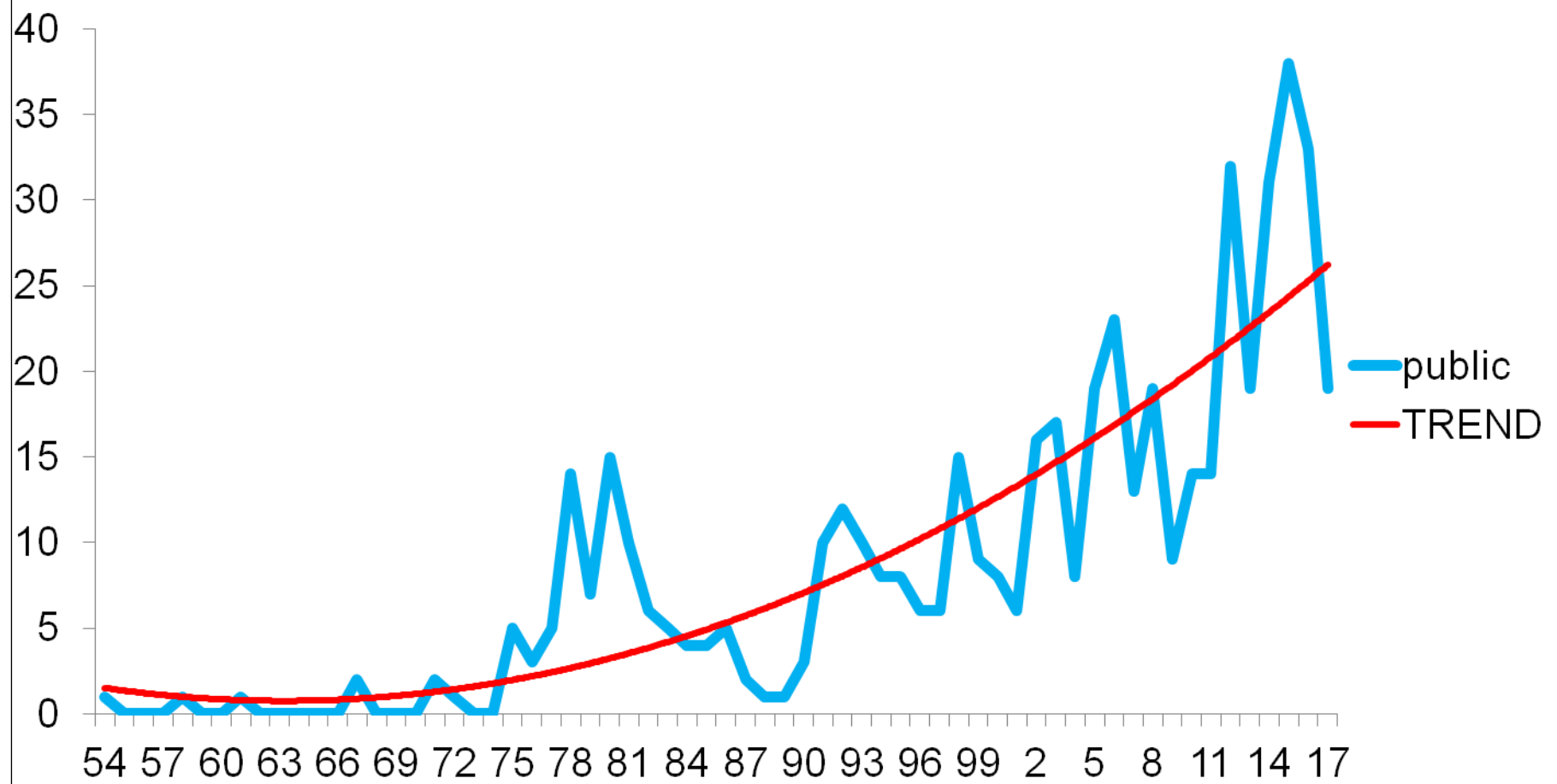
TEMPORARY ADDRESS JUNE-DEC. 1988

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Amygdalin is the cyanogenic diglucoside, D-mandelonitrile- β -D-gentiobioside, MW 457.431



Amygdalin topic on the WOS page from 1954 to 2017



VITATOX – Vitamin A toxicity

- Vitamin A toxicity is known to be an ancient phenomenon; fossilized skeletal remains of early humans suggest bone abnormalities may have been caused by hypervitaminosis A.
- Vitamin A toxicity has long been known to the Inuit and has been known by Europeans since at least 1597 when Gerrit de Veer wrote in his diary that, while taking refuge in the winter in Nova Zemlya, he and his men became **severely ill after eating polar bear liver**.
- In 1913, Antarctic explorers Douglas Mawson and Xavier Mertz were both poisoned (and Mertz died) from eating the livers of their sled dogs during the Far Eastern Party. Another study suggests, however, that exhaustion and diet change are more likely to have caused the tragedy.
- **Nejezte játra ledního medvěda a ani psů**

VITATOX – Vitamin E toxicity

- Hi Ales,
-
- The safety of large doses of vitamin E went virtually unquestioned until the early 2000s, when several studies were published **showing that consumption of vitamin E from dietary supplements increased mortality, as well as the risk of gastrointestinal cancer and heart failure**. These studies prompted numerous letters to the editors of medical journals and widespread coverage in the media. Both the medical community and the general public became confused and concerned about the use of vitamin E supplements. The purpose of this article is to review the medical literature and to explain these unusual findings. First we provide an overview of the earlier literature on vitamin E. Second, we provide a critical assessment of three meta-analyses that were neutral or negative toward vitamin E supplementation. Third, we review the limitations of meta-analyses in general. Fourth, we assess the individual studies that comprised one of the three meta-analyses. Since all three meta-analyses used many of the same studies, the individual critique should further the understanding of the limitations of these meta-analyses, and the meta-analysis approach in general. Lastly, we offer some guidance for healthcare professionals to give to the general, healthy public and those with chronic conditions who are no doubt left puzzled as to what to do regarding vitamin E supplementation.
-
- Regards
- Brian

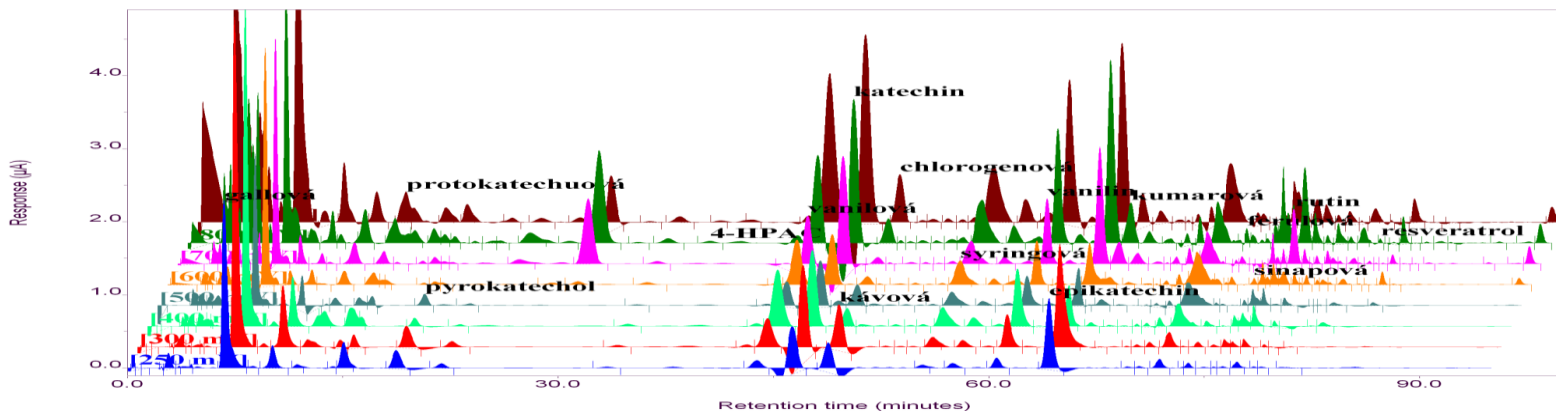
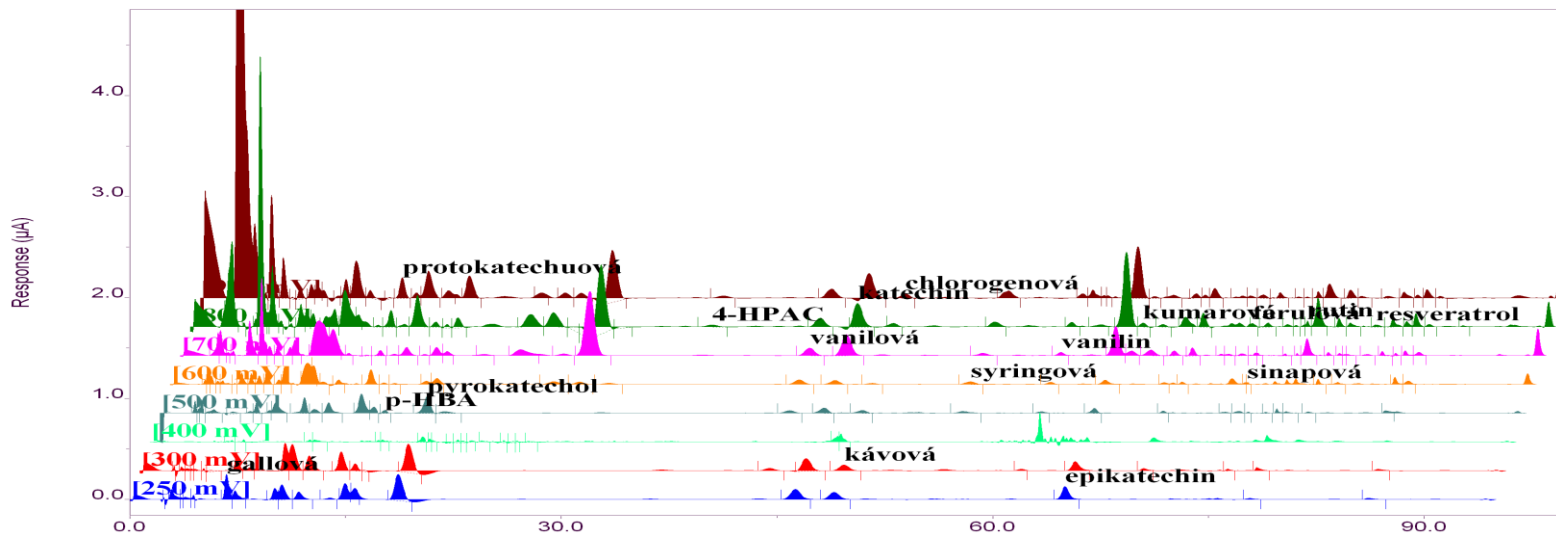
VITATOX – Vitamin B

- **Homocystein** (systematický název **2-amino-4-sulfanylbutanová kyselina**) je aminokyselina, která vzniká při normálním metabolismu u lidí a jiných savců z aminokyseliny methioninu. Odbourává se na cystein za pomoci vitamínů B (zvláště B₆, B₁₂, kyseliny listové). Nedostatek těchto vitamínů, například ve stravě vegetariánů, anebo vzácná dědičná choroba (homozygotní homocystinurie) mohou vést ke zvýšené hladině homocysteinu v krvi. Americký **lékař McCully** vytvořil v roce 1960 hypotézu, že i mírné zvýšení hladiny homocysteinu může přispívat k nemocem krevního oběhu. Tu popsal v knize *The Homocysteine Revolution*.^[3]
- Homocystein není nijak škodlivý **????** V poválečné době strachu z A-bomby se používal jako radioprotektivum.
- V České republice se v minulých letech stali propagátorem snižování hladiny homocysteinu **MUDr. Karel Erben** a jím řízený Svaz pacientů. Erben možnost vyšetření hladiny homocysteinu nabízí komerčně. Za „prosazování neověřené metody léčby nádorů snížením hladiny homocysteinu“ mu Český klub Sisyfos udělil Bronzový Bludný balvan za rok 2007.
- Čest jeho památce

YouTube Oldschoolers

Tomáš Nezmeškal

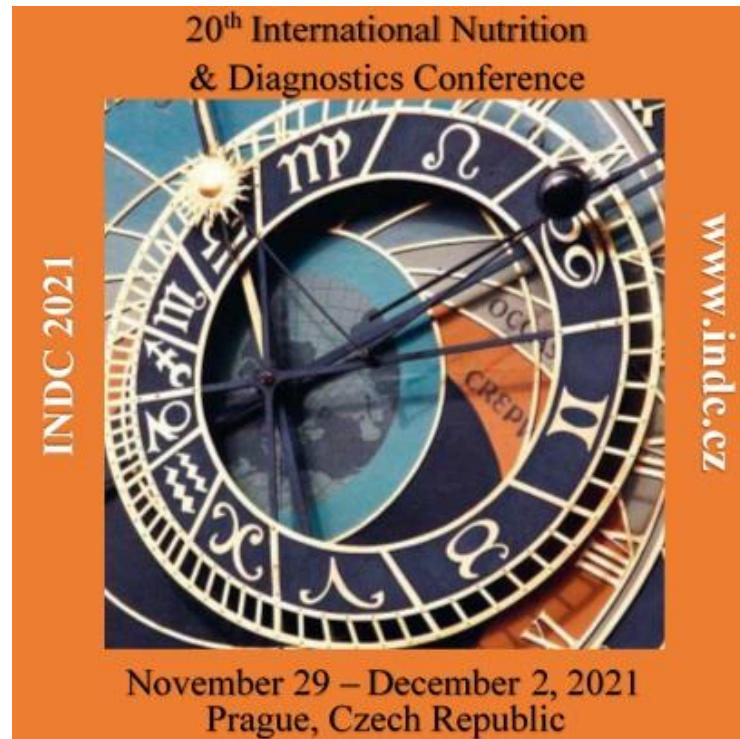
Doporučuji se propít ke zdraví ! Alena Semrádová a Aleš Horna







pozvánka

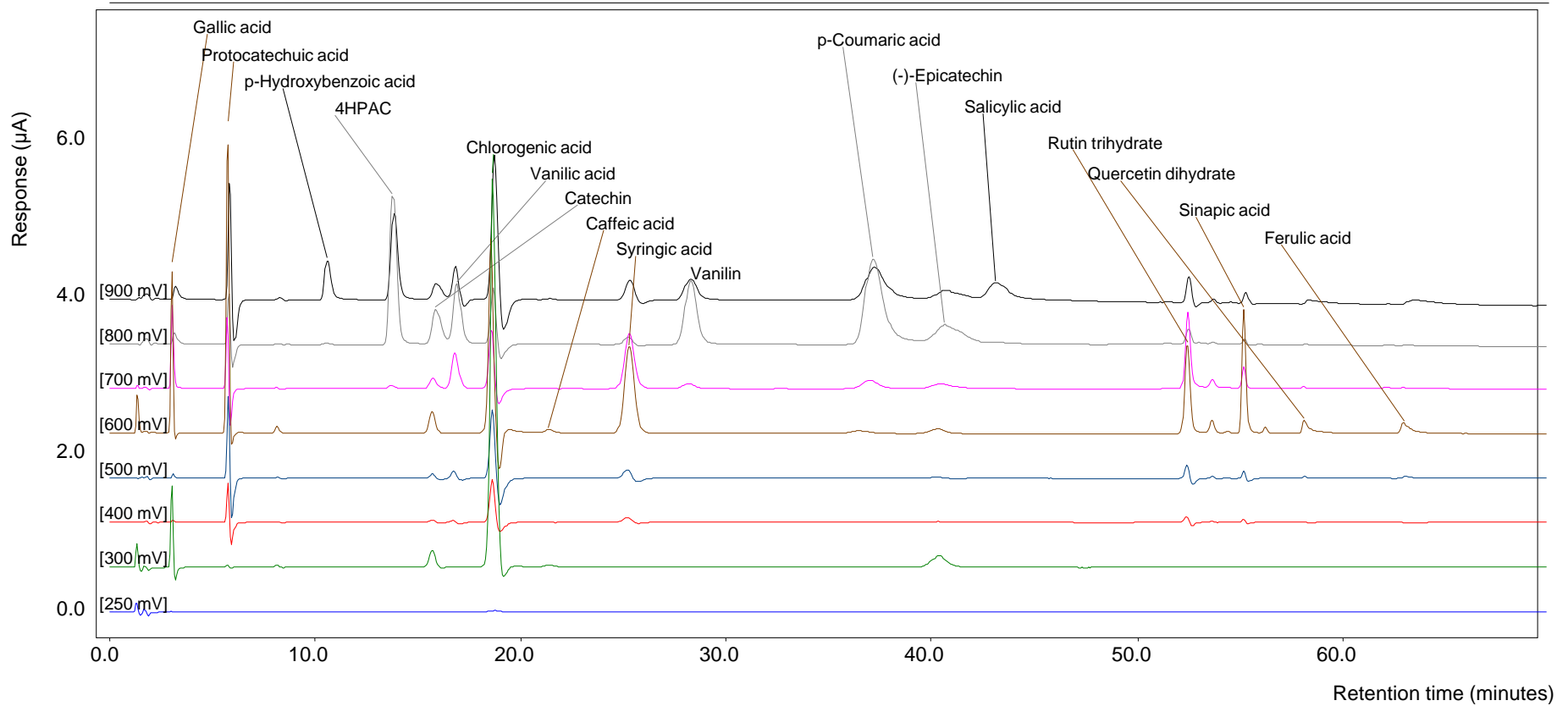


Electrochemical detection in HPLC

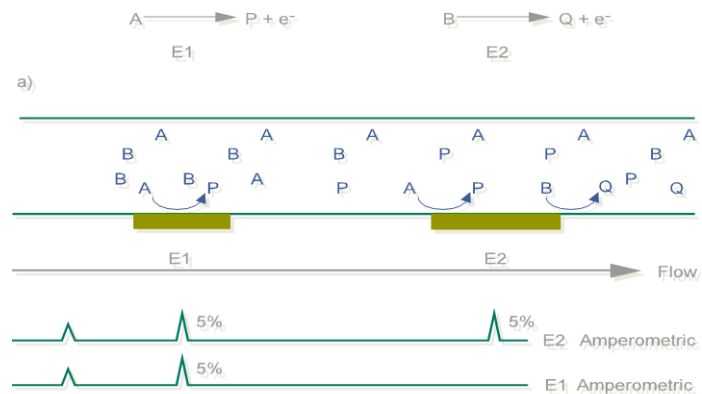
Prof. Pavel Jandera and CouloChem II in 1997

- Coulochem - 1 to 2 channel amperometric or coulometric electrochemical cell
- CoulArray- up to 4 series connected electrochemical cells (ESA, Inc., Chelmsford, USA)
- The CoulArray detector is compatible with HPLC gradient elution
- The sample does not need to be specially treated before analysis, for example, when determining the antioxidant activity of electroactive substances in wine, beer, or other beverages, the sample is diluted with MF only and filtered prior to injection
- Jandera P., Škeříková V., Řehová L., Hájek T., Baldriánová L., Škopová G., Kellner V., Horna A.:
- **RP-HPLC analysis of phenolic compounds and flavonoids in beverages and plant extracts using a CoulArray detector. Journal of Separation Science. 2005, 28(9-10), 1005-1022.**

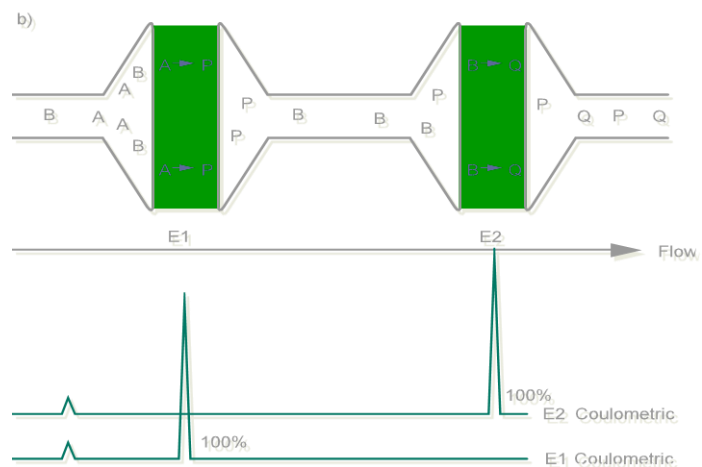
Chromatogram – standard compounds



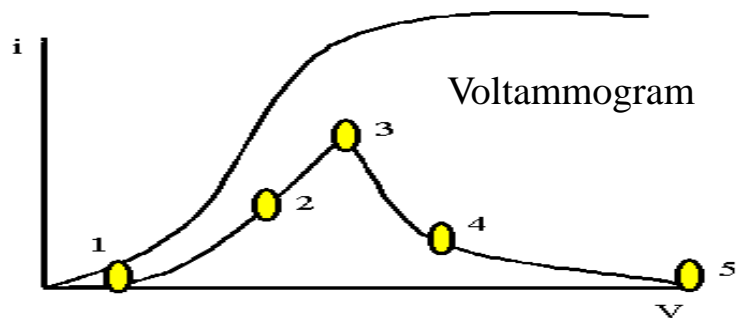
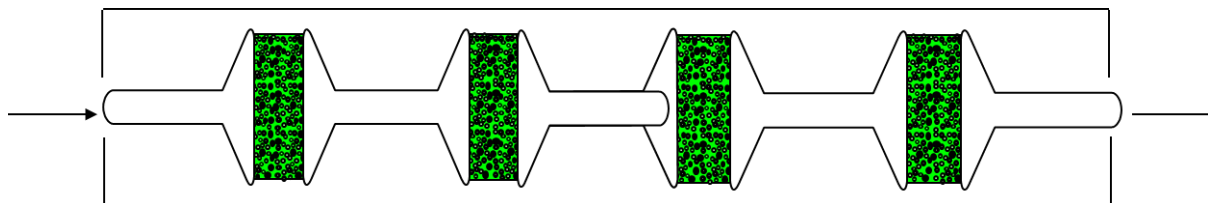
a) Lack Of Selectivity And Sensitivity With Dual Amperometric Electrodes



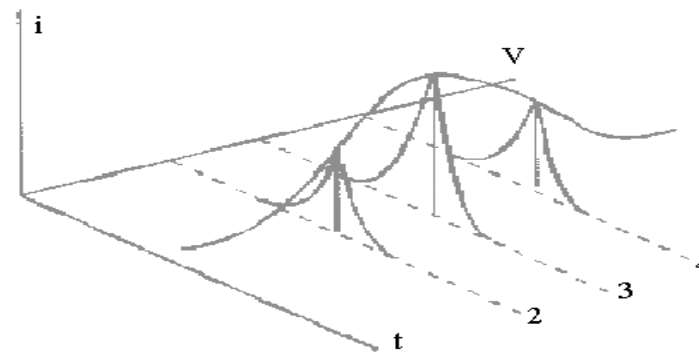
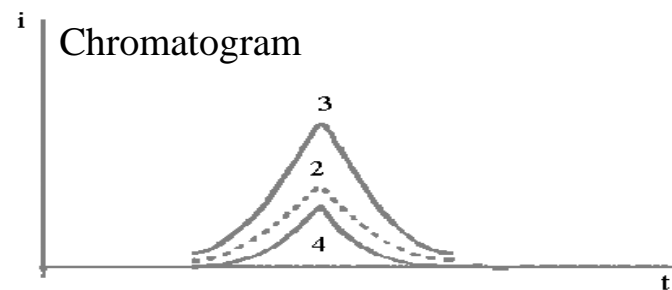
b) Dual Coulometric Electrodes Are Selective And Sensitive



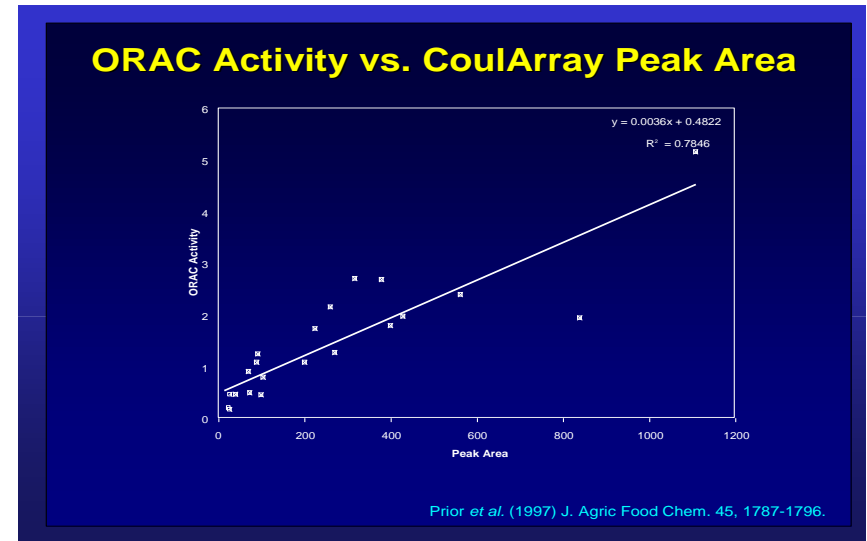
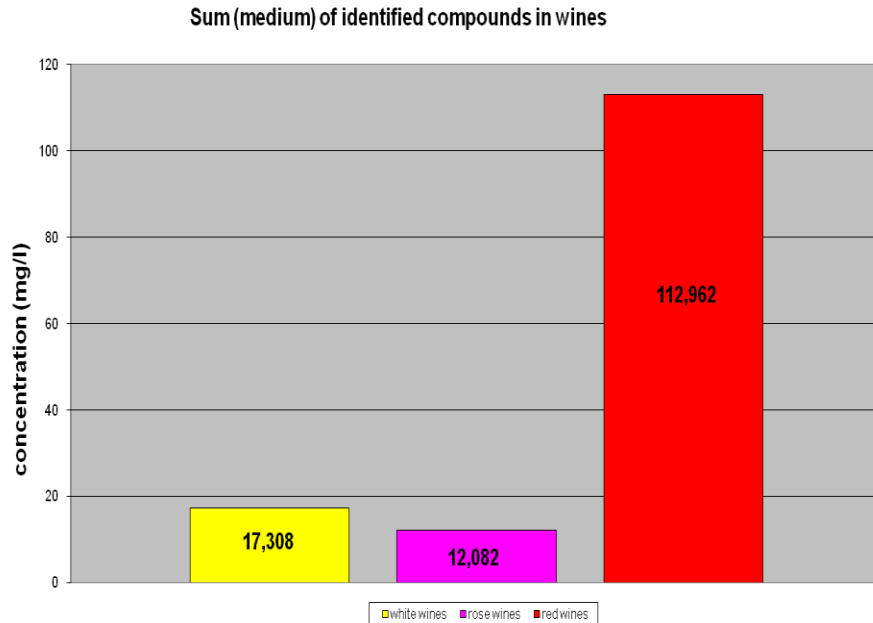
Electrode array



- 2: Pre-dominant
- 3: Dominant
- 4: Post-dominant peaks



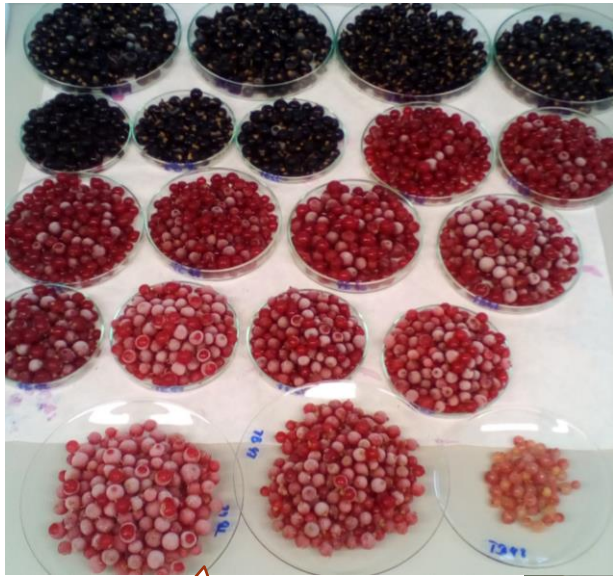
Estimation of the Overall Antioxidant Capacity



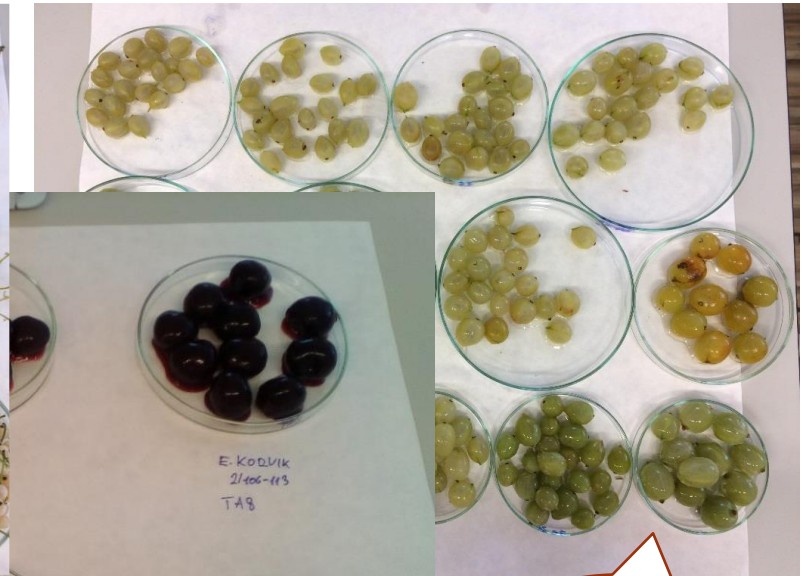
Guo *et al.*, J. Agric. Food Chem., 1997,45, 1787

A relationship between the sum of peak areas of a chromatogram of a plant and the antioxidant capacity of this extract

Samples



Currants

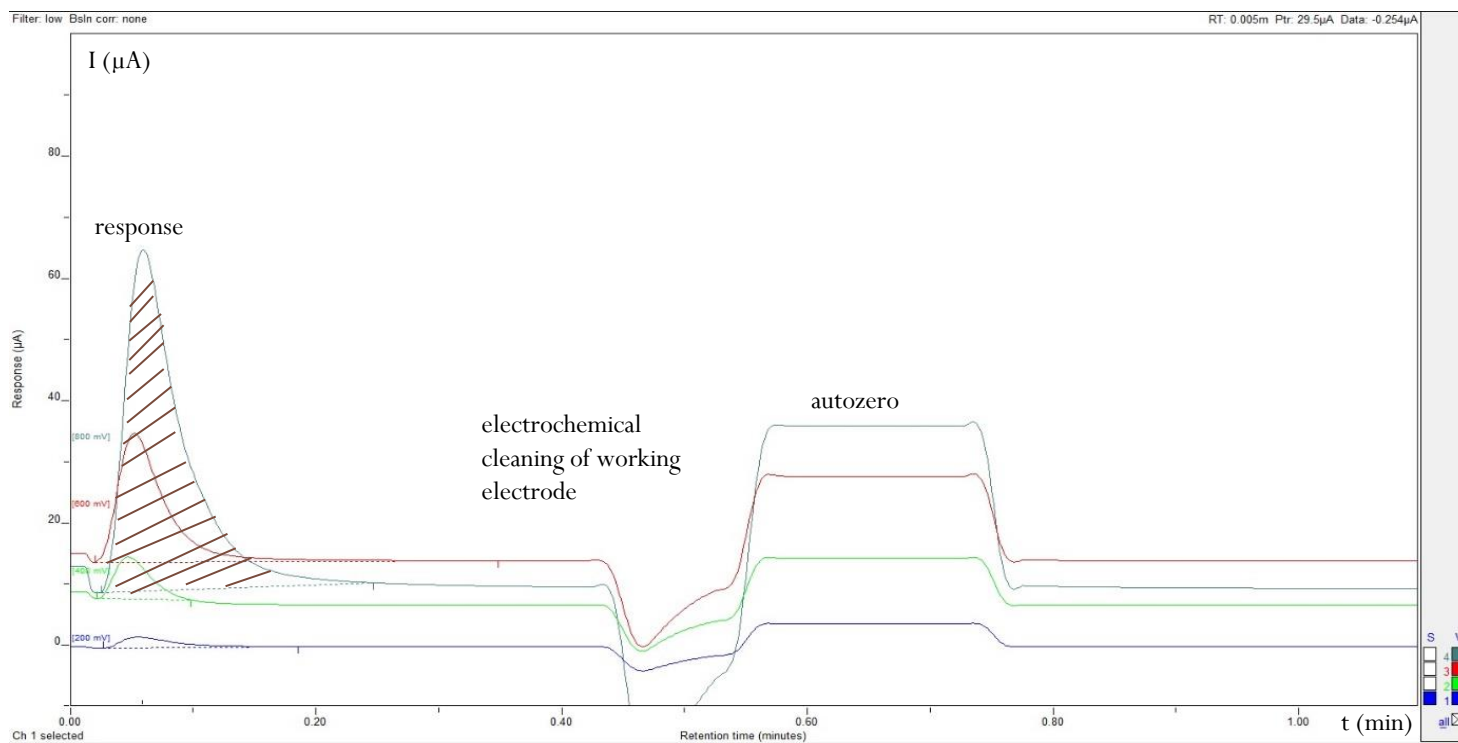


Gooseberries



Cherries

- Automatic peak integration, electrochemical cleaning, autozero
- Total charge as a sum of charges at 200,400,600, 800 mV



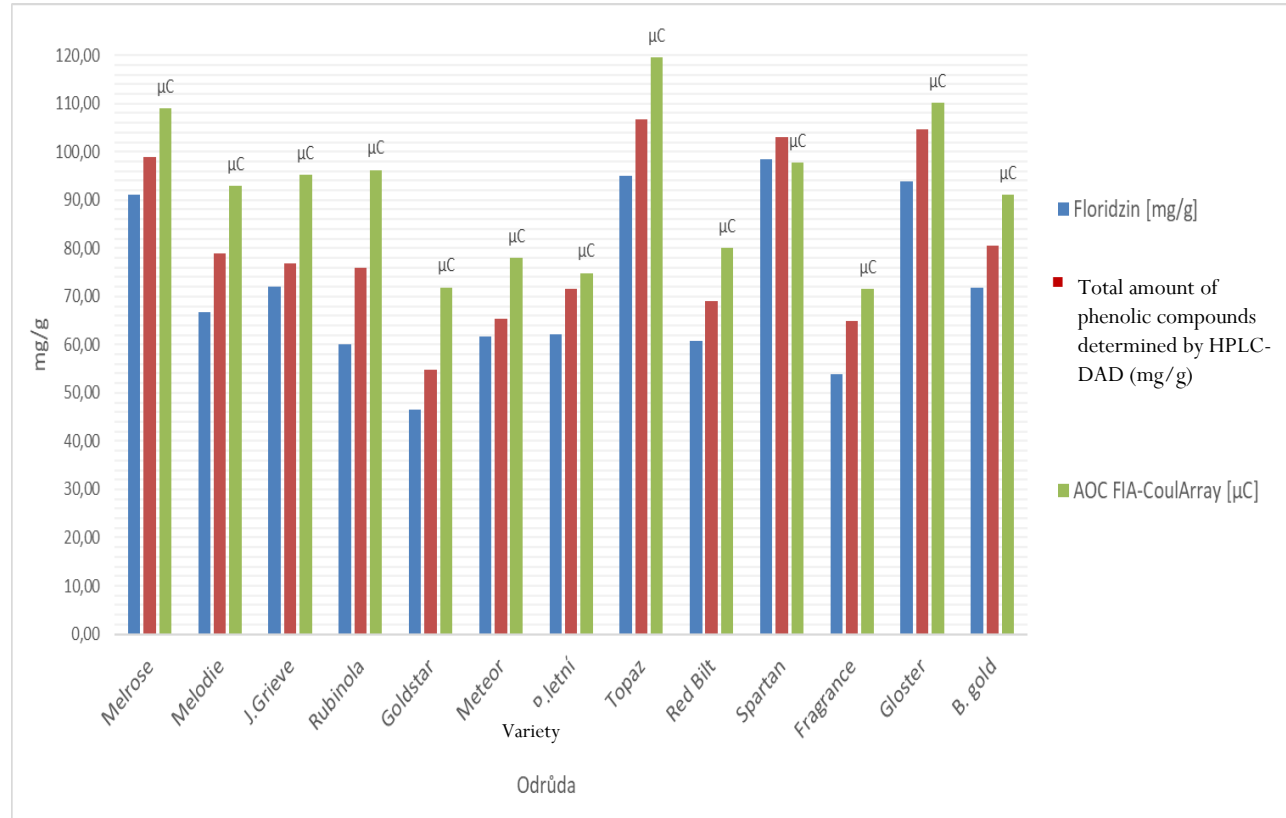
FIA/ECD and HPLC/DAD correlation

Total mg of phenolic compounds determined by HPLC/DAD and FIA-CoulArray

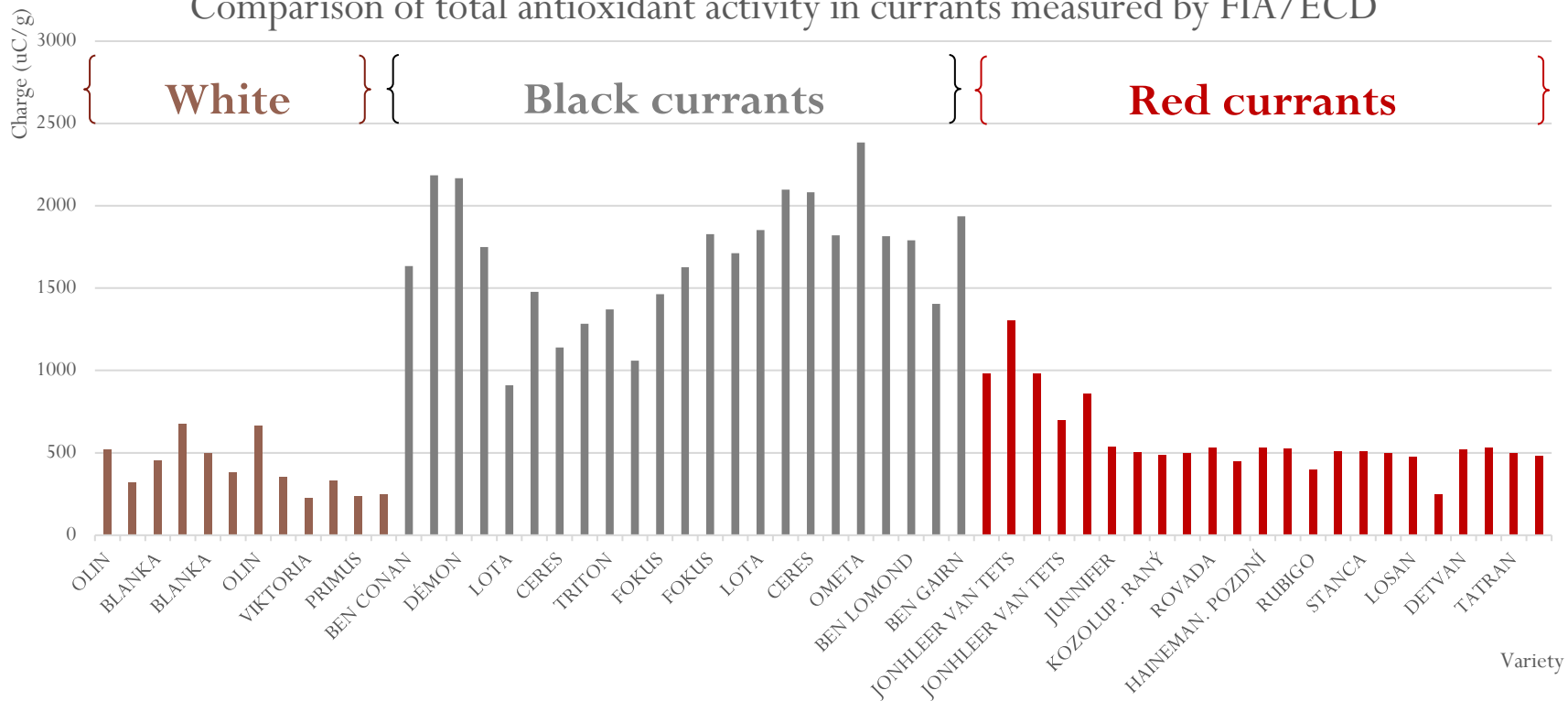
(confirmed by 12/13 varieties)

The FIA seems to be suitable as a rapid screening method for cross-species comparison.

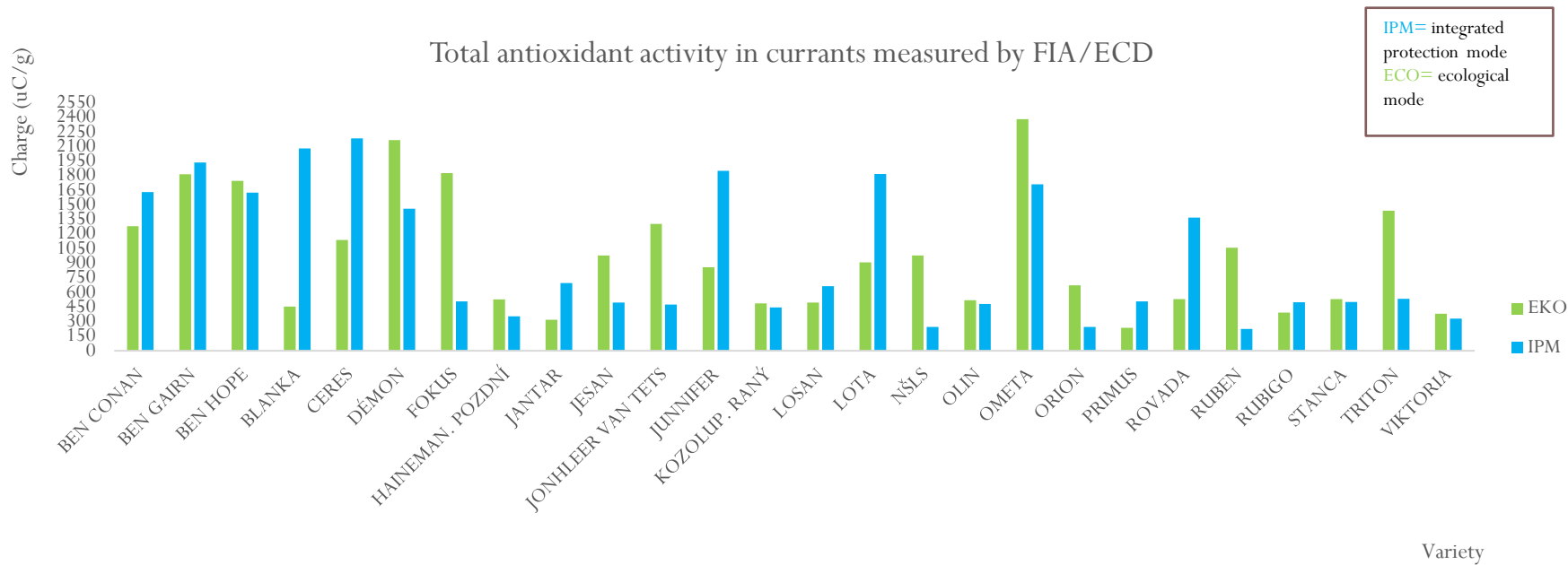
This is followed by separation and quantification by HPLC-DAD.



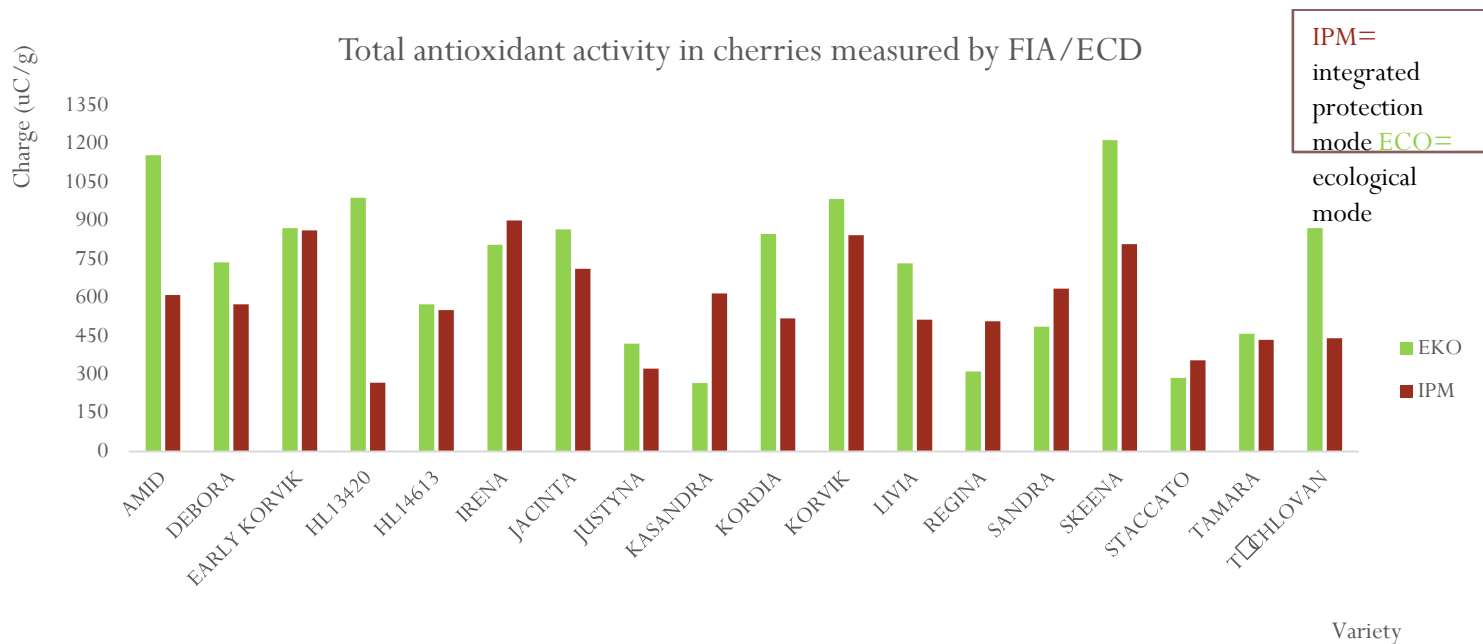
Comparison of total antioxidant activity in currants measured by FIA/ECD



Total antioxidant activity in currants measured by FIA/ECD

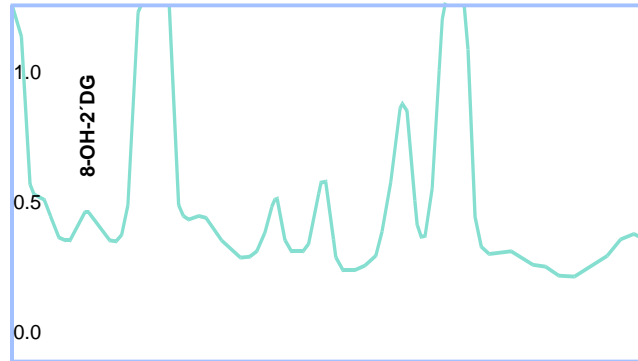


Total antioxidant activity in cherries measured by FIA/ECD

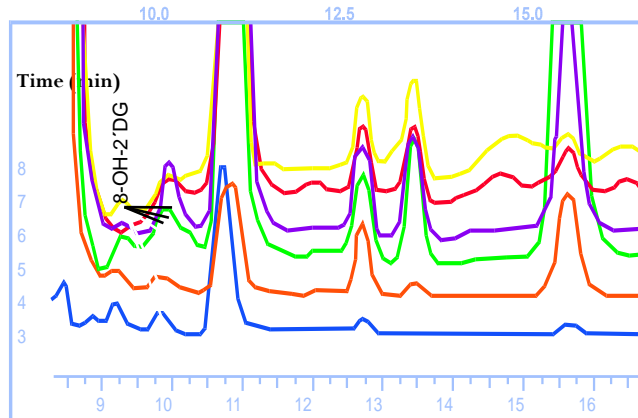


8-OH2'dG In Urine

What appears to be a single 8OH2'dG peak by conventional HPLC-ECD is actually found to be a co-elution of several metabolites by CoulArray detection!

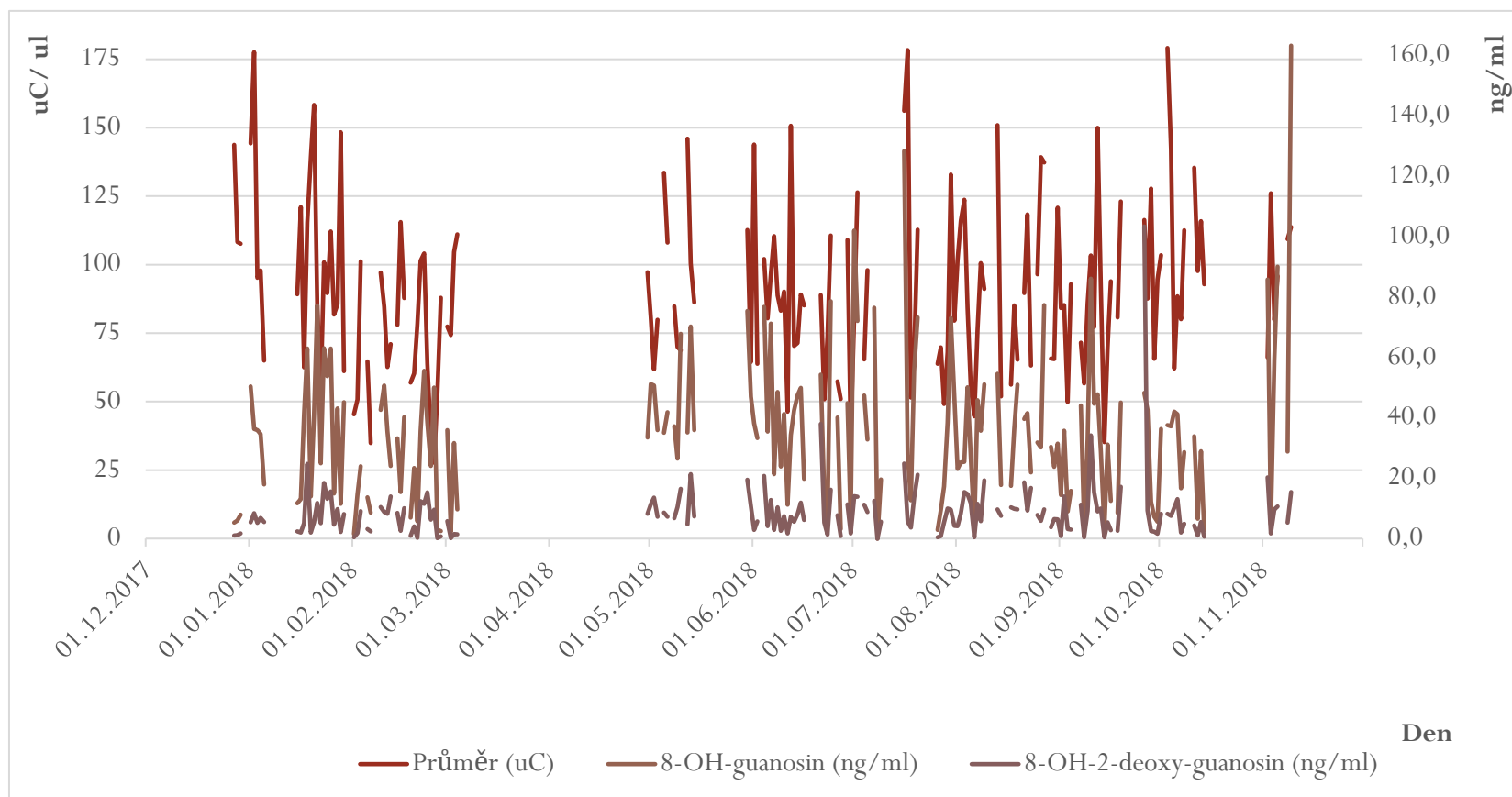


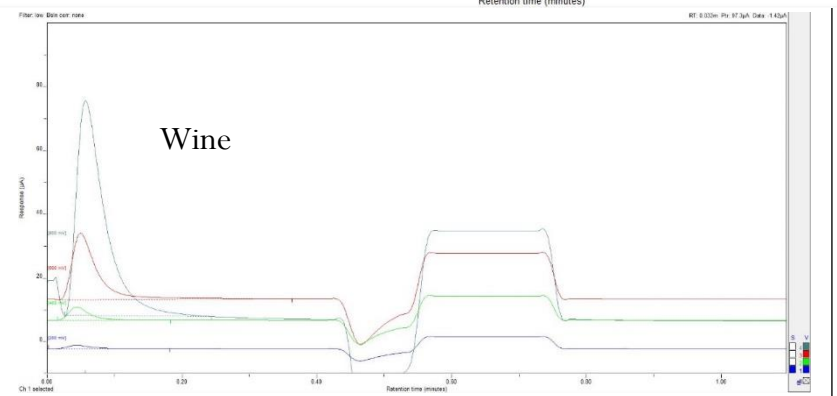
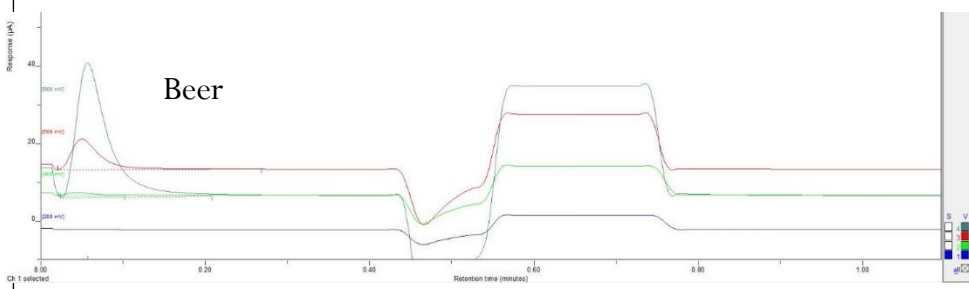
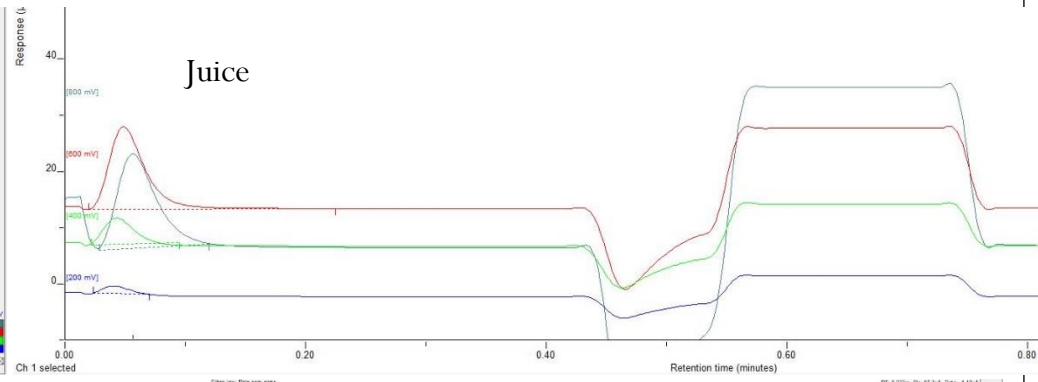
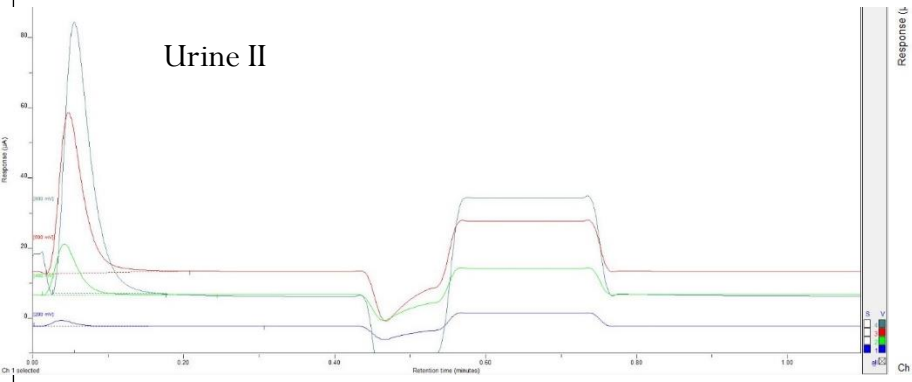
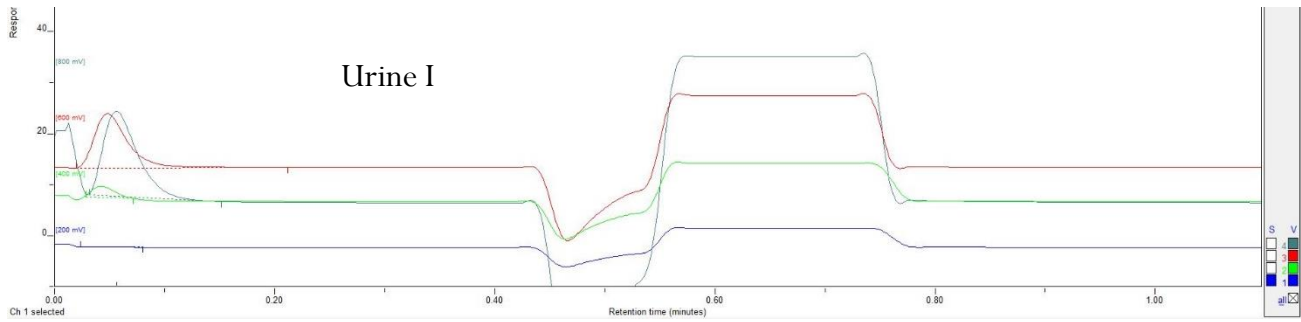
Conventional



CoulArray

BIOMARKERS – CORRELATION FIA/ECD AND UPLC-MS/MS





Thank you for your attention

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Effectiveness of new techniques for regulating harmful factors in fruit growing*