Retour sur le Symposium de LJUBJANA

HPTLC'20-22

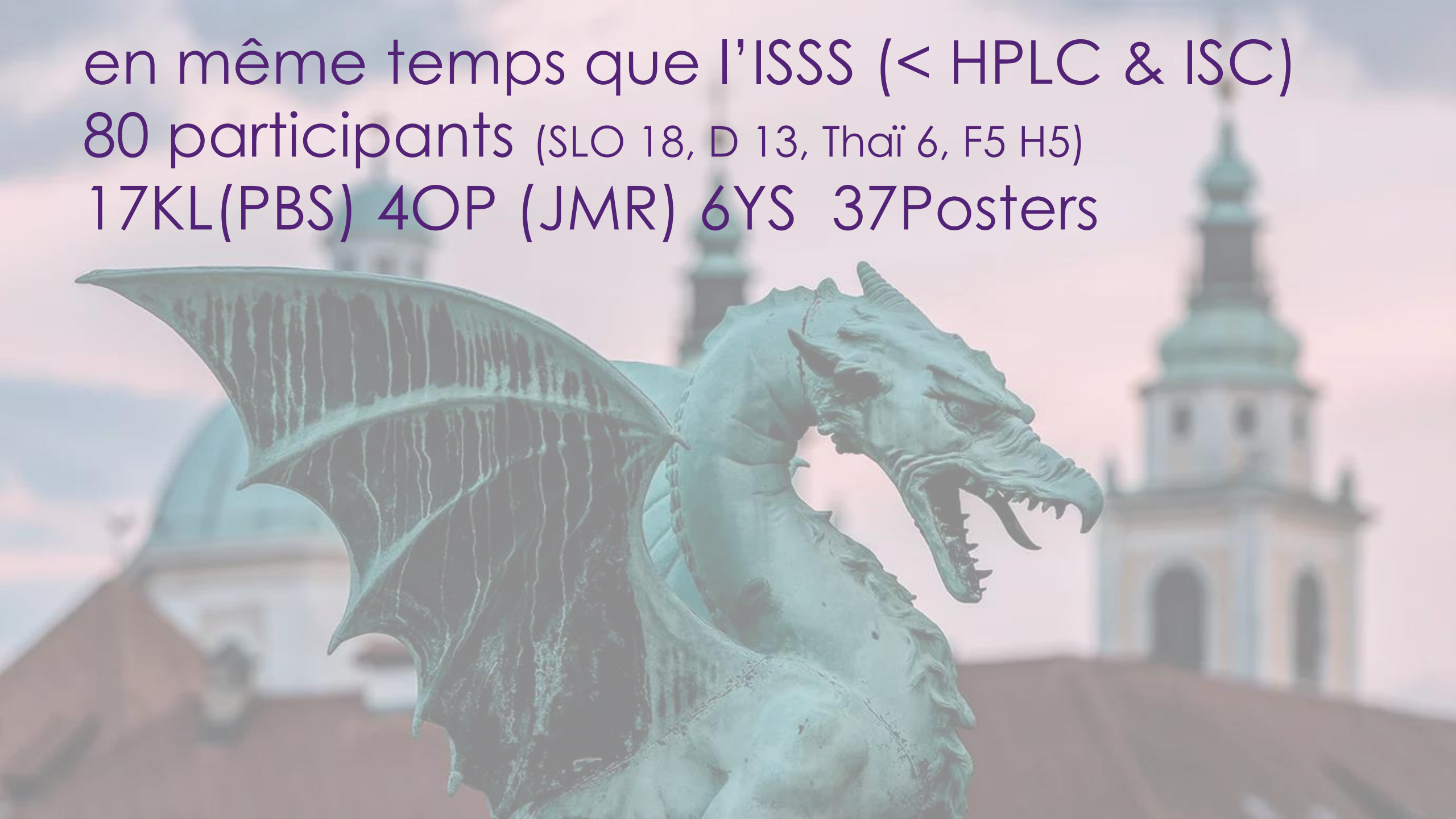
OUR MEETINGS

(Interlaken 1997 _ 70)
Lyon 2003 _ 120
Berlin 2006 _ 140
Helsinki 2008 _ 130
Basel 2011 _ 300 (incl Camag invited distributors)
Lyon 2014 _ 210
Berlin 2017 _ 200
Bangkok 2018_ 160
Boulder 2019 (> Princeton _ 20 ? + course)
Ljubjana 2022 _ 80

en même temps que l'ISSS (< HPLC & ISC)

80 participants (SLO 18, D 13, Thaï 6, F5 H5)

17KL(PBS) 4OP (JMR) 6YS 37Posters



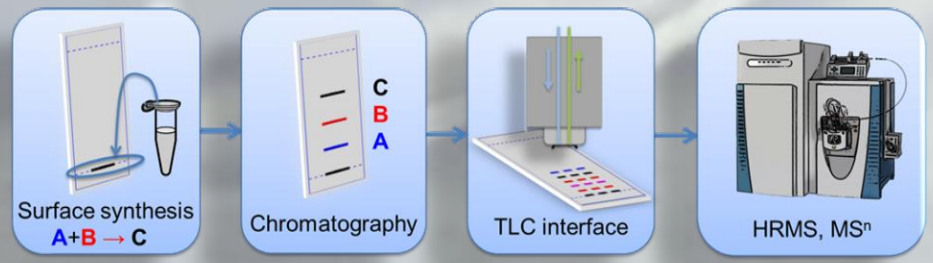
HPTLC & what else?

SCIENCE & FRIENDSHIP

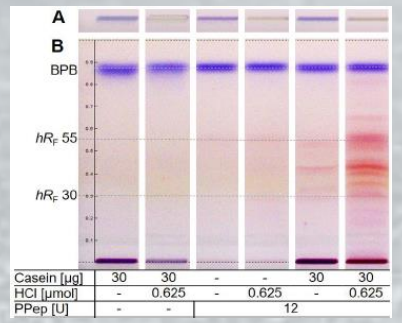
WITH US ALL

For the future of a wonderful chromatographic technique.

trends: US & THEM

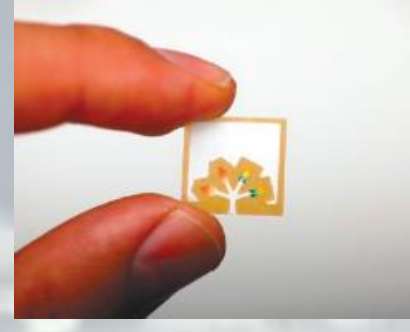


Symposium HPTLC'17 O7-Yüce, Morlock : Targeted combinatorial on-plate synthesis as new tool for structure elucidation

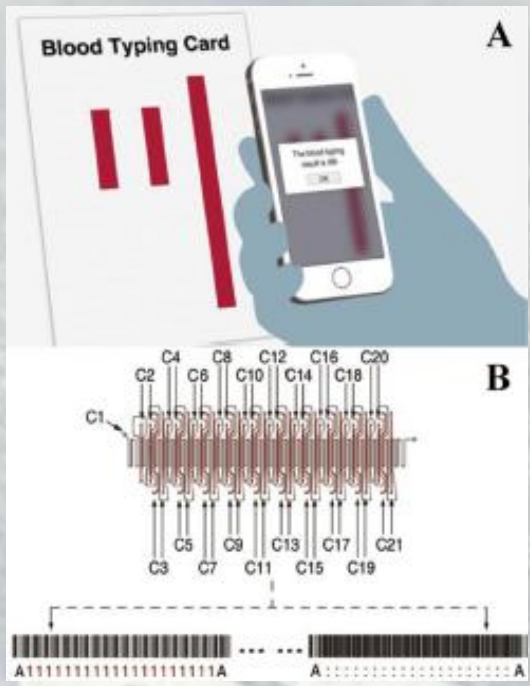


more green
more fun

2D-LC
techno MS
NEW apps
smartphones



Anal. Chem. 2010, 82, 3–10



M. Rezazadeh et al. / Trends in Analytical Chemistry 118 (2019) 548e555

Analytical chemistry goes closer to the final users

Manufacturers investments is a real issue/ there is a gap

Some unforgettable memories

BAYER Klaus BURGER
(PBS invitations to our French HPTLC CLUB and HPTLC until 2003)

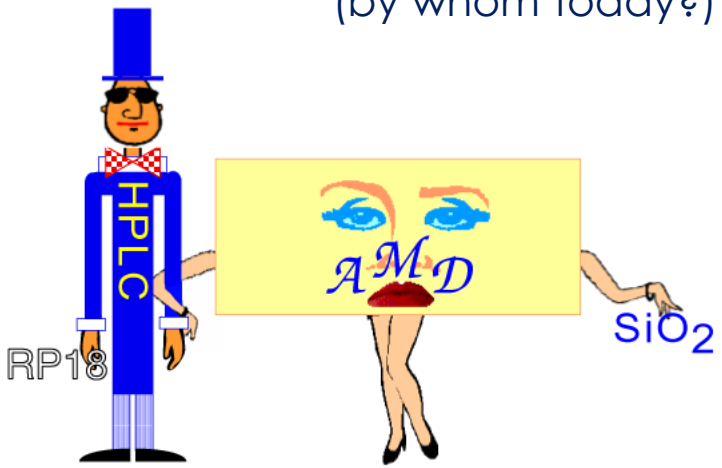
A lot of humor

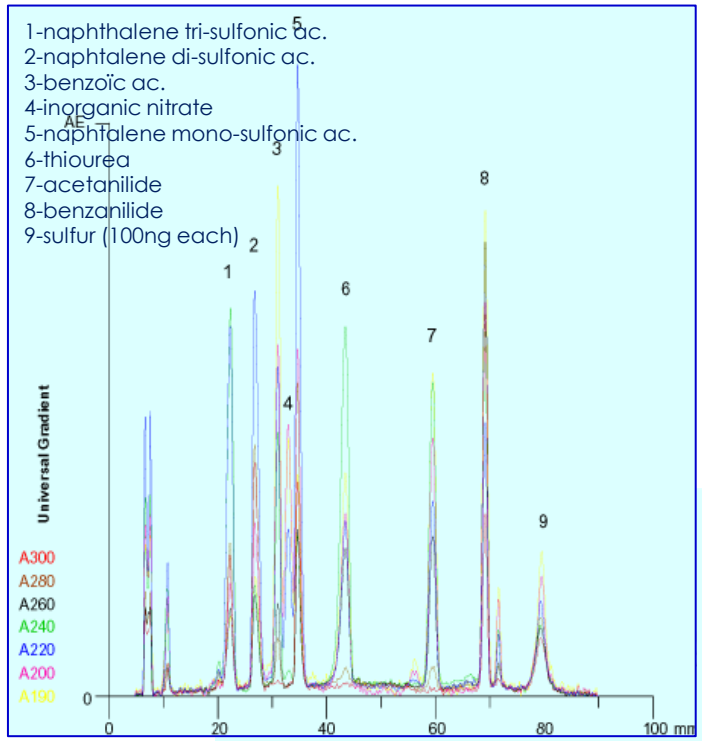
Working clean is a must

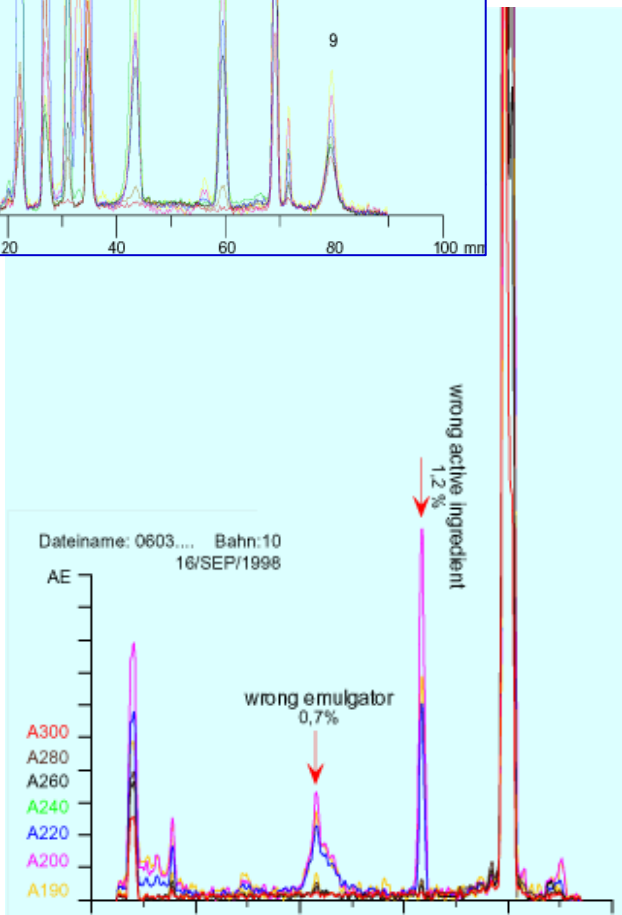
Column > Plate

High class baseline separations

(by whom today?)







25th HPTLC 2022
LJUBLJANA

25th International Symposium for High-Performance Thin-Layer Chromatography
June 28 - July 1, 2022, Ljubljana, Slovenia

HPTLC and DNA Profiling of Thai *Cannabis* Strains and Hybrids

Wanchai De-Eknamkul, Ph.D.
Department of Pharmacognosy and Pharmaceutical Botany
Faculty of Pharmaceutical Sciences, Chulalongkorn University
Bangkok, Thailand

Ljubljana, Slovenia
June 29, 2022

This study

Sample preparation:

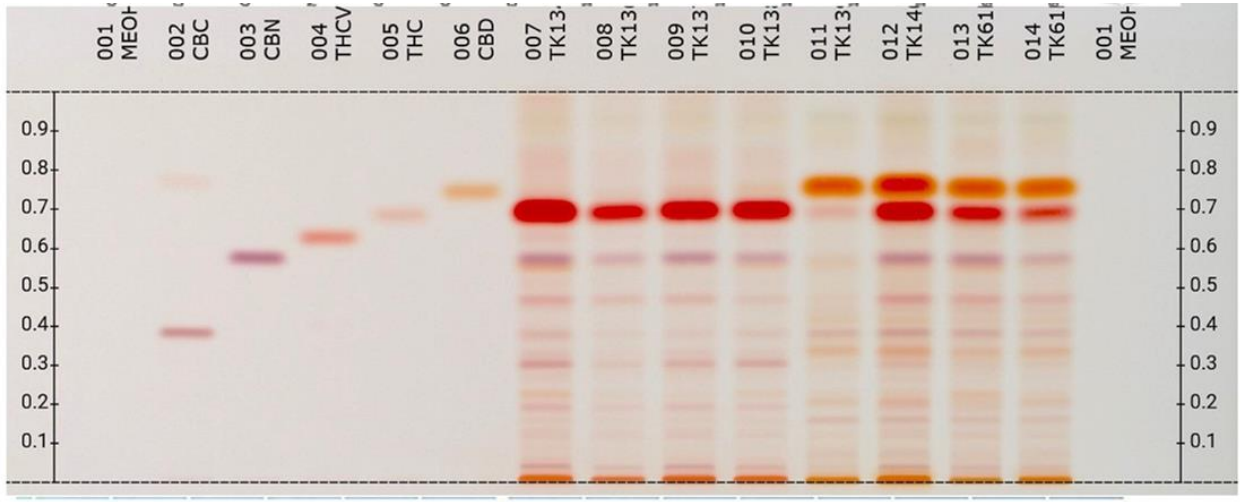
- 20 mg of powered sample extracted in 1 ml dichloromethane with 30-min sonication

HPTLC system:

- 5 µl application/sample
- Silica gel 60 F_{254} 20 × 10 cm plate
- Mobile phase : diethylamine-toluene

Derivatization:

- Spraying with 0.2 % Fast Blue Salt B



CAMAG Application Note A-108.1 (2017)

Sample preparation:

- 500 mg of powered sample extracted with 5 ml methanol-hexane 9:1 (v/v) with 15-min sonication

HPTLC system:

- 2 µl application/sample
- Silica gel 60 F_{254} 20× 10 cm plate
- Mobile phase : *n*-heptane-diethyl ether-formic acid 75:25:0.3

Derivatization:

- Spraying with 0.5 % Fast Blue Salt B solution

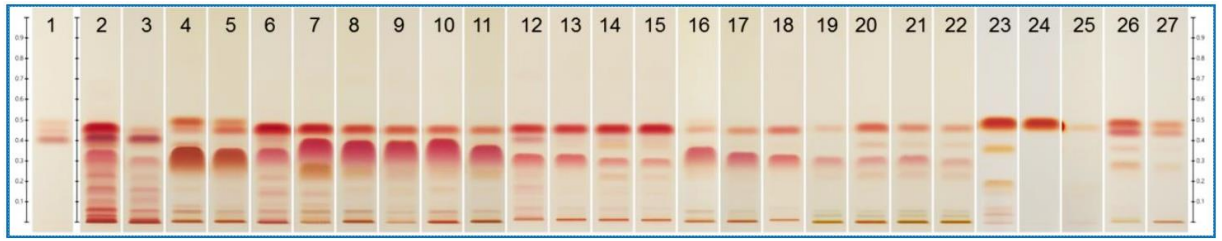
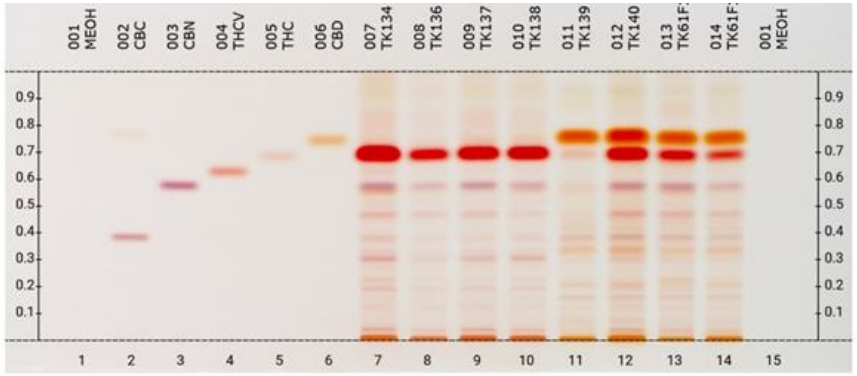
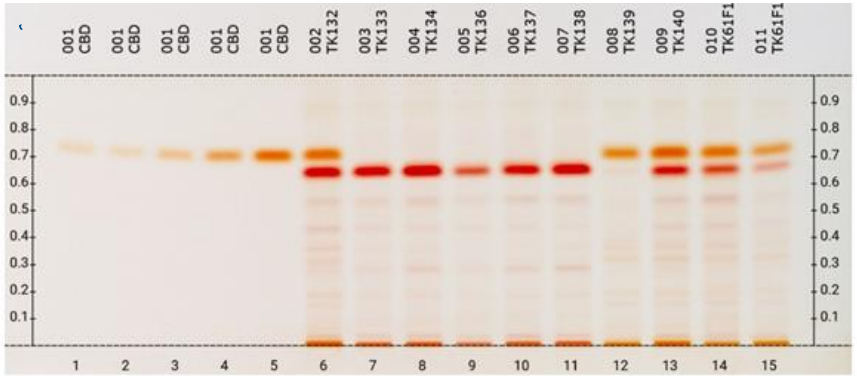
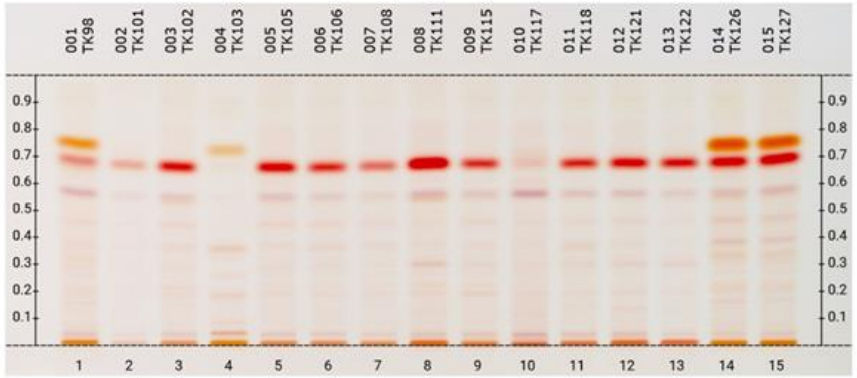


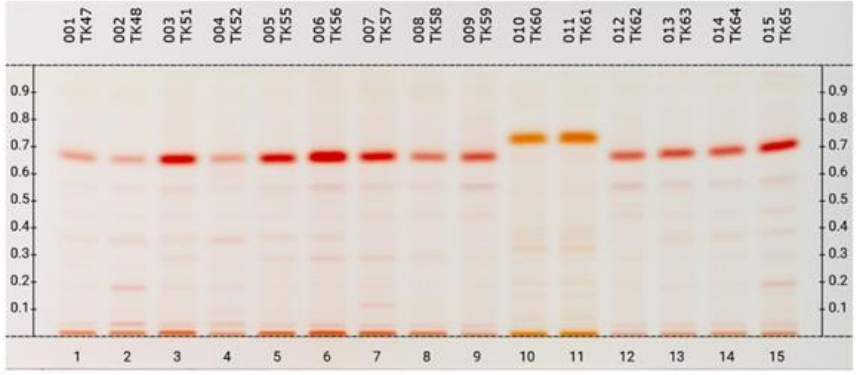
Fig. 1 Comparison of HPTLC fingerprints (chromatograms) under white light after derivatization with FBS reagent (method 1); track 1: SST (CBN, THC, and CBD with increasing RF), track 2: hashish sample, tracks 3-18: C. sativa samples, tracks 19-22: C. sativa samples (young plants), track 23: intermediate from CBD extraction (mother liquor, 1:10 diluted), track 24: CO2-extracted CBD (1:10 diluted), track 25: CBD cream, track 26: Cannabis oil (1:20 diluted), track 27: Cannabis tincture (1:10 diluted);

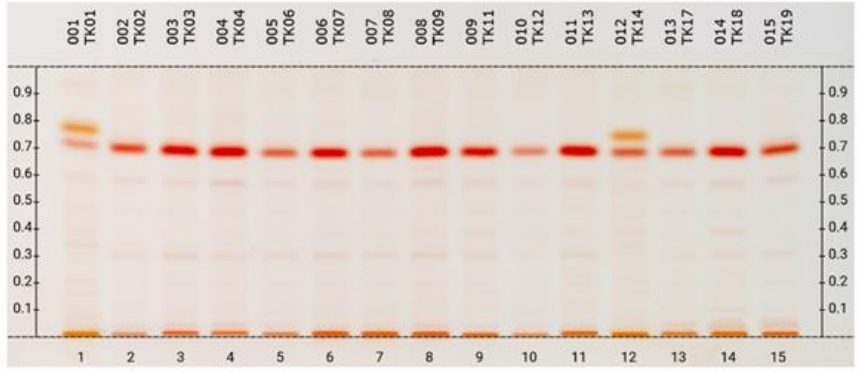
Results: HPTLC of 80 Thai Cannabis strains and hybrids

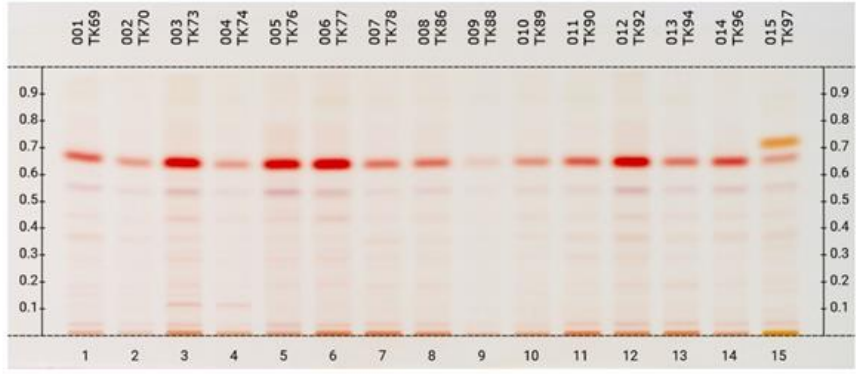












No.	Code	% CBD (Avg)	% THC (Avg)	Log (%THC/%CBD)
41	TK61	2.960	0.07	-1.61
40	TK60	2.382	0.07	-1.56
83	TK139	2.776	0.14	-1.29
65	TK103	0.861	0.07	-1.09
1	TK01	2.823	0.74	-0.58
85	TK61F1-C0-5P	1.658	0.51	-0.51
29	TK45	1.341	0.54	-0.40
62	TK98	1.332	0.54	-0.40
42	TK61F1-C0-2G	3.388	1.38	-0.39
84	TK140	6.495	2.68	-0.39
61	TK97	1.309	0.54	-0.38
12	TK14	3.053	1.34	-0.36
75	TK126	3.371	1.52	-0.35
76	TK127	3.039	1.69	-0.25
77	TK132	4.598	3.68	-0.10
71	TK117	0.018	0.11	0.76
9	TK11	0.141	1.05	0.87
14	TK18	0.140	1.47	1.02
3	TK03	0.155	1.66	1.03
7	TK08	0.077	0.95	1.09
18	TK28	0.097	1.21	1.10
11	TK13	0.120	1.55	1.11
6	TK07	0.138	1.80	1.11
4	TK04	0.144	2.08	1.16
10	TK12	0.034	0.50	1.17
2	TK02	0.062	0.93	1.17
23	TK37	0.106	1.69	1.20
69	TK111	0.132	2.14	1.21
64	TK102	0.056	0.91	1.21
24	TK40	0.048	0.85	1.25
13	TK17	0.035	0.61	1.25
17	TK25	0.116	2.05	1.25
16	TK20	0.120	2.17	1.26
54	TK86	0.042	0.82	1.29
82	TK138	0.143	2.80	1.29
43	TK62	0.039	0.78	1.31
45	TK64	0.041	0.84	1.31
19	TK29	0.080	1.66	1.31
63	TK101	0.015	0.31	1.32
74	TK122	0.055	1.18	1.33
8	TK09	0.077	1.97	1.41
81	TK137	0.078	2.03	1.41
39	TK59	0.035	0.91	1.42
80	TK136	0.043	1.18	1.44
5	TK06	0.030	0.83	1.44
60	TK96	0.032	0.87	1.44
57	TK90	0.033	0.98	1.47
30	TK46	0.062	1.88	1.48
21	TK34	0.043	1.32	1.49
79	TK134	0.100	3.12	1.49
78	TK133	0.068	2.24	1.52
32	TK48	0.011	0.37	1.55
27	TK43	0.048	1.72	1.55
70	TK115	0.025	0.88	1.55
66	TK105	0.023	0.85	1.56
33	TK51	0.051	1.91	1.57
20	TK33	0.030	1.14	1.57
52	TK77	0.052	2.04	1.59
22	TK36	0.053	2.18	1.62
58	TK92	0.069	2.86	1.62
38	TK58	0.018	0.78	1.63
28	TK44	0.044	1.88	1.63
51	TK76	0.038	1.66	1.64
49	TK73	0.029	1.25	1.64
37	TK57	0.034	1.52	1.65
36	TK56	0.056	2.48	1.65
35	TK55	0.037	1.64	1.65
15	TK19	0.024	1.21	1.71
67	TK106	0.017	0.88	1.72
25	TK41	0.023	1.19	1.72
31	TK47	0.008	0.45	1.72
72	TK118	0.015	0.92	1.79
73	TK121	0.016	1.11	1.83
26	TK42	0.014	1.02	1.85
44	TK63	0.010	0.85	1.92
34	TK52	0.002	0.49	2.30
68	TK108	0.002	0.50	2.31

Log (%THC/%CBD)

< -1.0
Hemp-type

> -1.0 - < 1.0
Intermediate

> 1.0 - < 1.5
Drug-type

> 1.5
Drug-type

À Côté Quantification of the Non-Eluting Biopolymer Lignin by Densitometry and Multivariate Calibration

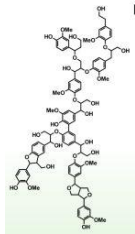
Christian Schuster, Hajar Khaliliyan, Ivan Sumerskii, Matthias Guggenberger, Josua T. Oberlerchner, Thomas Rosenau, Antje Potthast, Stefan Böhmdorfer

University of Natural Resources and Life Sciences (BOKU), Vienna, Austria
Institute of Chemistry of Renewable Resources

Biorefineries produce chemical feedstocks from plant biomass.

Liquors, the intermediary products, are demanding mixtures of carbohydrates, oils, extractives, salts and lignin.

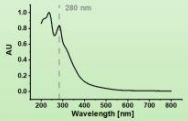
A biobased economy must make use of all **biomass components**.

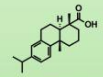


Lignin is

- a substantial plant component,
- a polymer
- from several phenolic monomers
- with several possible linkages and thus
- with an indeterminate structure.

Traditionally, lignin is **quantified** by precipitation or photometry at the local maximum of **280 nm**.

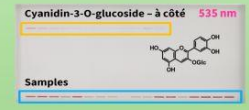




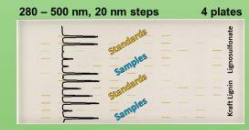
Dehydroabietic acid

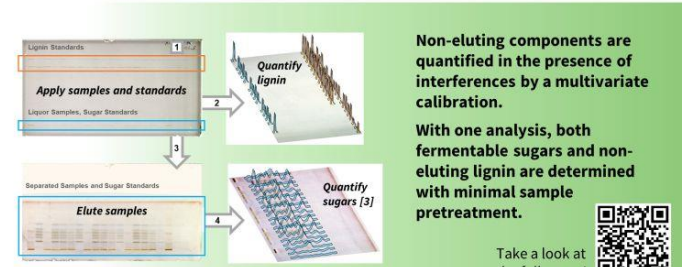
Extractives **interfere** at this wavelength.

À côté calibration – densitometry before development – allows quantitation of non-eluting compounds, as demonstrated with anthocyanins. [1]



A **multivariate (Partial Least Squares) calibration** was necessary to quantify lignin in the presence of interfering liquor components.





Non-eluting components are quantified in the presence of interferences by a multivariate calibration.

With one analysis, both fermentable sugars and non-eluting lignin are determined with minimal sample pretreatment.

Take a look at the full paper!

Perfect accuracy and good precision!

During kraft pulping, lignin is depolymerized and condensed.

Pure standards are prepared by precipitation and sequential extraction.

Good accuracy and good precision!

Overestimation and better precision

Erratic and unprecise

Validation performed according to Société Française des Sciences et Techniques Pharmaceutiques.

Acceptable accuracy and precision

During sulfite pulping, permanently charged sulfonic acid groups are added to lignin.

Pure standards are prepared by adsorption to a resin.[2]

Good accuracy and serviceable precision

Overestimation and better precision

Too high results and low precision

References

[1] Oberlerchner, J. T.; Fuchs, C.; Grausgruber, H.; Potthast, A.; Böhmdorfer, S. À Côté Calibration – Making Optimal Use of Time and Space in Quantitative High Performance Thin Layer Chromatography. *Journal of Chromatography A* **2018**, *1533*, 193–198.
[2] Sumerskii, I.; Korntner, P.; Zinovyev, G.; Rosenau, T.; Potthast, A. Fast Track for Quantitative Isolation of Lignosulfonates from Spent Sulfite Liquors. *RSC Advances* **2015**, *5* (112), 92732–92742.
[3] Oberlerchner, J. T.; Böhmdorfer, S.; Rosenau, T.; Potthast, A. A Matrix-Resistant HPTLC Method to Quantify Monosaccharides in Wood-Based Lignocellulose Biorefinery Streams. *Holzforschung* **2018**, *72* (8), 645–652.

Exploring HPTLC Data with Self-Organizing Maps

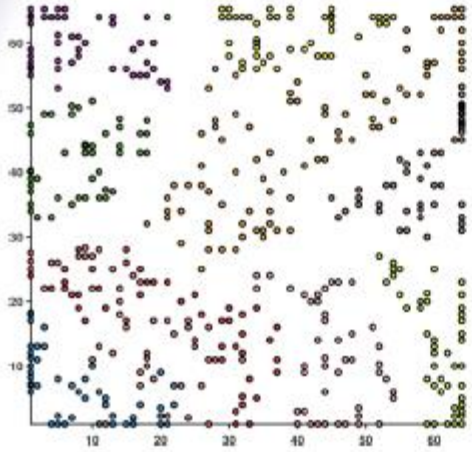
Matthias Guggenberger, Josua T. Oberlerchner,
Heinrich Grausgruber, Thomas Rosenau, Stefan Böhmdorfer

Institute of Chemistry of Renewable Resources, Institute of Plant Breeding

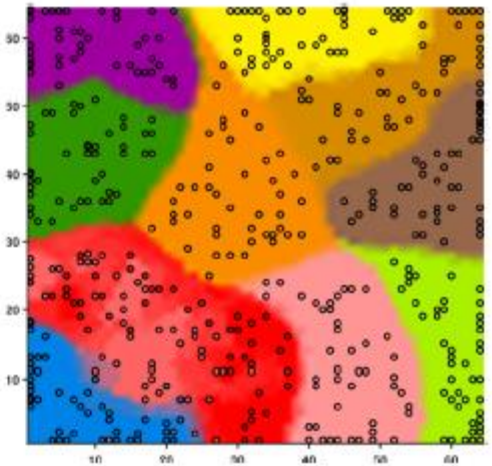
University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

Guggenberger, M.; Oberlerchner, J. T.; Grausgruber, H.; Rosenau, T.; Böhmdorfer, S.
Self-Organising Maps for the Exploration and Classification of Thin-Layer Chromatograms.
Talanta 2021, *233*, 122460. https://doi.org/10.1016/j.talanta.2021.122460

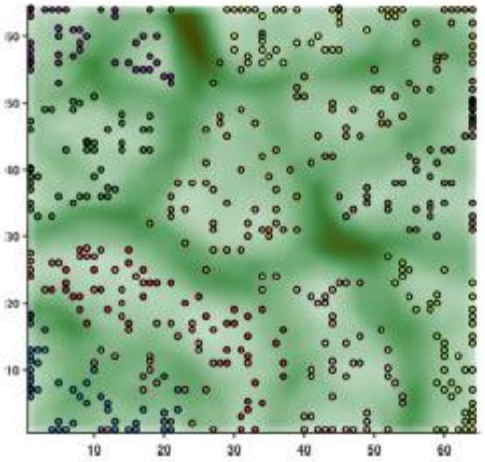
Sample position
(Best Matching Unit)



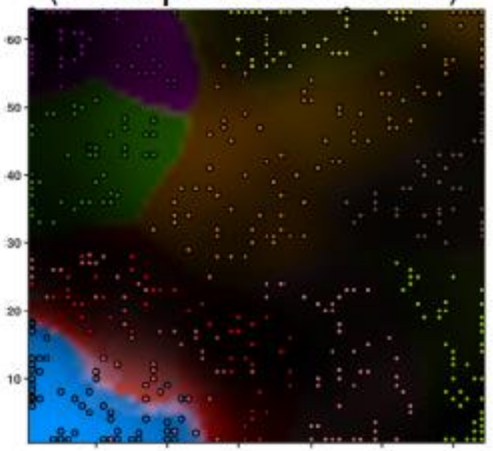
Classes



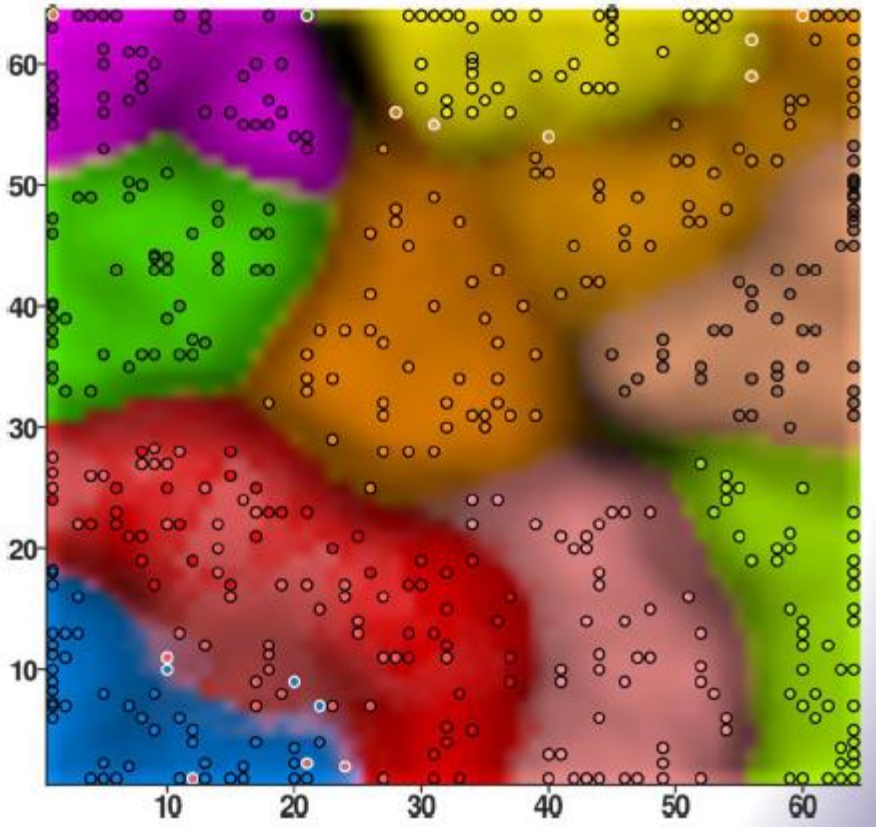
Difference
(U-Matrix)



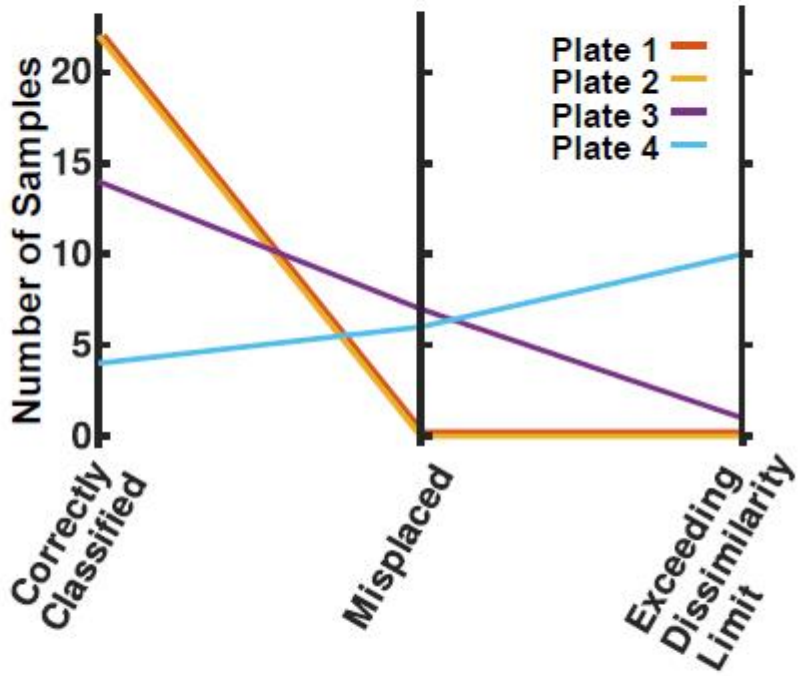
Signals
(Component Plane)

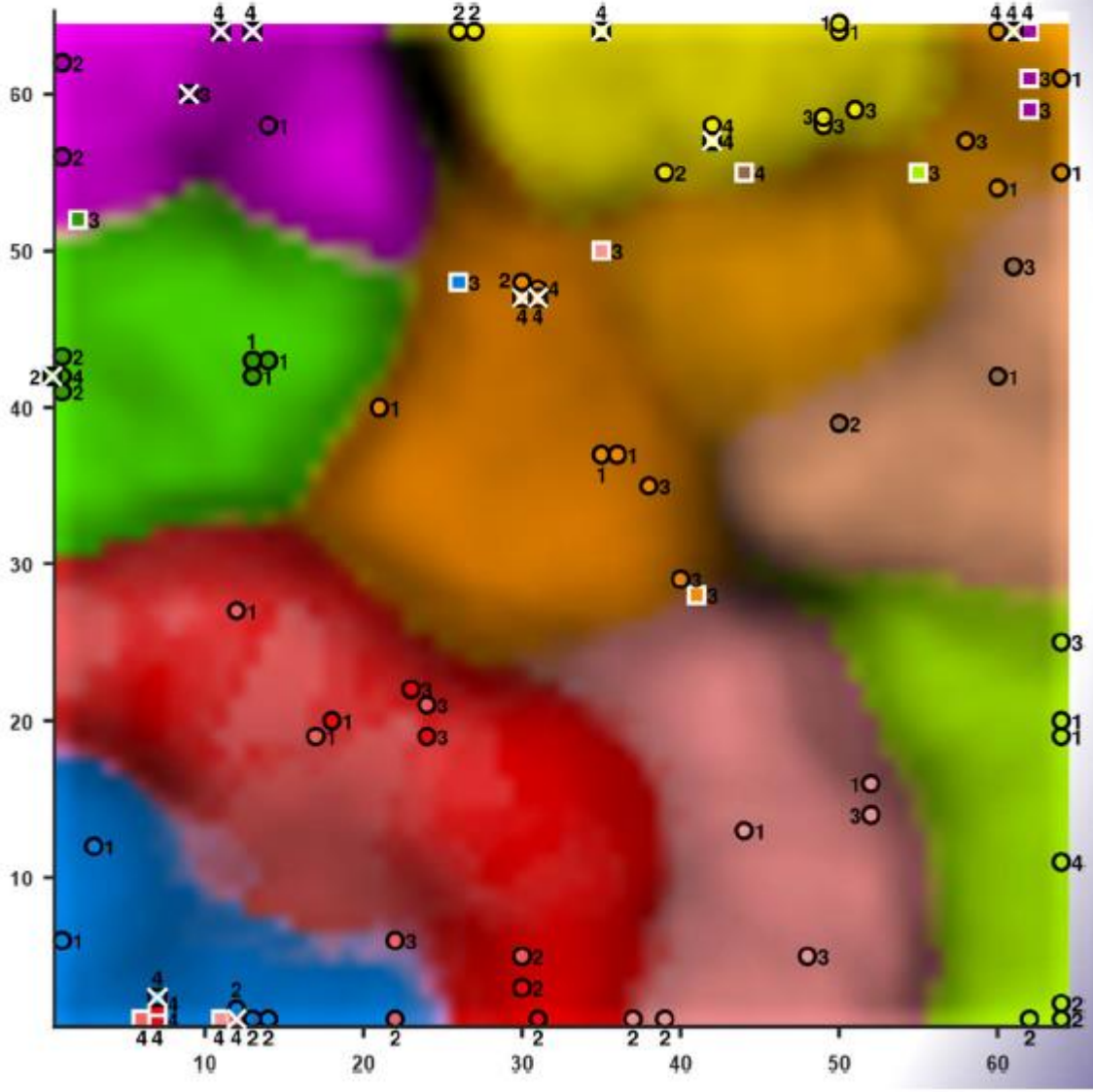


Self-Organizing Map of HPTLC Videodensitometry



Identification of Sample Class





100% correct identification for correctly prepared plates.

Flaws cause misclassifications.

PRIX de POSTER

HPTLC IS A POWERFUL TOOL FOR IDENTIFICATION OF PROPOLIS BOTANICAL SOURCE

Etil Guzelmeric[1], Nisa Beril Sen[1], Ecesu Sezen[2], Erdem Yesilada[1]

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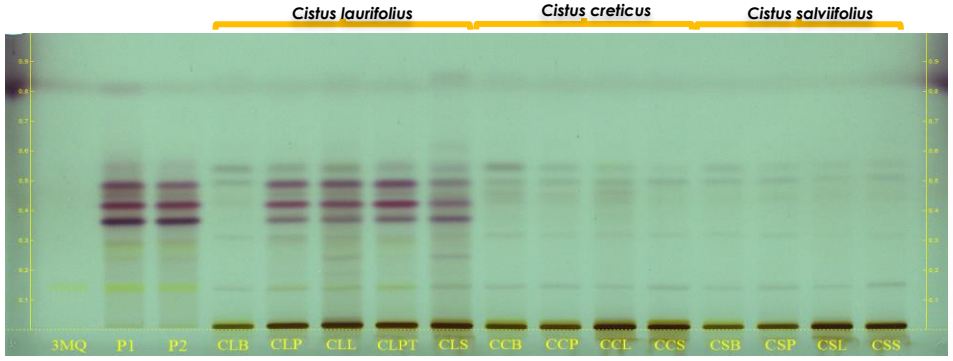
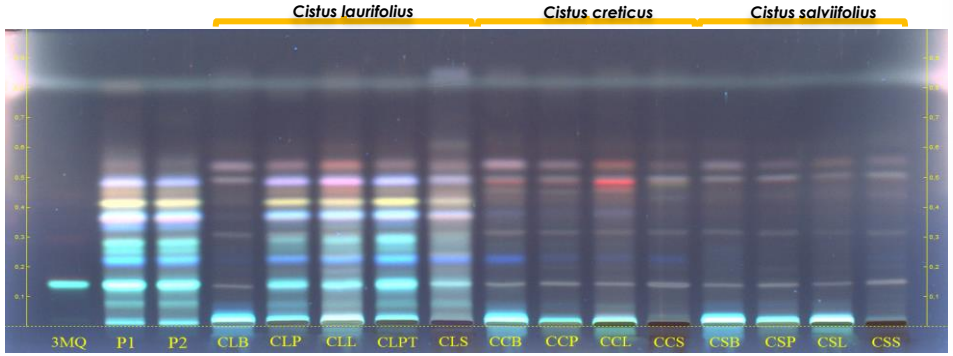
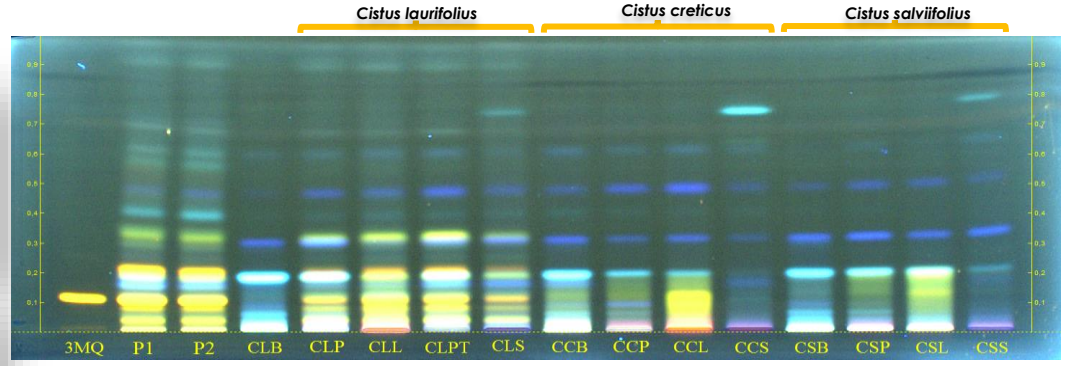
[2]Yeditepe University, Faculty of Pharmacy, Kayisdagi Cad., Atasehir, 34755, Istanbul, Turkey

ecesusezenn@gmail.com

Results







Result

Determination of the botanical source is highly important for the prediction of propolis' health benefits.

Chemical composition → Pharmacological activity

Consequently, HPTLC fingerprints of hydroalcoholic extracts of 3MQ-rich propolis were found to be similar to fingerprints of some plant parts of *C. laurifolius* extract.

The botanical origin of propolis from *Cistus laurifolius* was confirmed for the first time by HPTLC analysis in this study.

CONCLUSIONS

an increasing number of papers in JCA
shows that our user community is seriously growing
(plants, lipids, sugars, API & EDA)

knowledge/training average situation is the issue

necessity to make good real science to be considered
by the scientific analytical community

The power of the HPTLC technique is also our power !

WHAT'S NEXT

…difficult to see: always in motion is the future

Remember plans voted in BERLIN:
COVER ALL WORLD

1 to enable all fans scientists to contribute at least every three years
2 to bring on board new industries when the topic comes into question
3 to help manufacturers to grow the users number and then their business

but our two main sponsors made another choice

"the question mark is to the wise what the exclamation point is to the fool"

Many of the truth that we cling to depend on our point of view