

Dokha tobaccos – does their chemistry follow their growth in popularity?

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Dokha tobaccos

- Grown in the UAE and nearby countries
- An oriental tobacco that is grown in dry climates
- Minimally processed
 - Solid as ground tobacco not as leaf
 - Most of particles pass through 16 mesh screen
 - Typical descriptors are “cold”, “warm”, and “hot”
 - Some sources say it is mixed with herbs/spices
 - One US supplier is offering flavored dokha with flavors reportedly similar to shisha flavors

Uses of dokha tobaccos

- Smoking in a midwakh pipe
 - Holds between 0.5 to 1 gm tobacco
 - Reportedly gives 2 to 3 puffs
- Nicotine booster for shisha tobacco; flavored dokha also used to boost shisha flavor
- Potential for use in ultraslim cigarettes
 - US Patent 4,893,638 for the fabrication of an ultraslim cigarette using ground tobacco
 - MYO with Ramback Ultra Slim filter tubes
 - Gives very smooth smoke even for “hot” dokha

Chemical comparison of dokha tobaccos

- Dokha tobaccos
 - Nirvana hot dokha
 - Nirvana warm dokha
 - Nirvana cold dokha
 - Enjoy Dokha hot
 - Enjoy Dokha Ayub hot
 - Enjoy Dokha Haar hot
- Reference tobaccos
 - KY RT2 ground flue-cured
 - KY RT3 ground oriental
 - KY RT4 ground burley

Routine analytical data

SAMPLE	NICOTINE DWB %	TOTAL SUGARS DWB %	REDUCING SUGARS DWB %	OVEN VOLATILES %
RT2 Ground Flue Cured	2.78	16.36	15.26	13.88
RT3 Ground Oriental	0.63	4.01	3.44	14.33
RT4 Ground Burley	3.82	1.46	1.20	11.72
NIRVANA COLD DOKHA	3.76	6.92	6.09	12.97
NIRVANA WARM DOKHA	7.06	4.70	4.37	10.46
NIRVANA DOKHA	8.12	4.51	3.96	10.21

The analytical problem

- When dokha tobaccos are smoked in ultraslim filter tubes, there is not the harshness that one would expect for tobaccos with $> 4\%$ nicotine
 - Were there more volatile organic acids present than would be expected for an oriental tobacco?
 - Were the sugar levels (precursors to smoke acids) higher than would be expected for an oriental tobacco?
 - Were there other chemical species that were not measured by the analytical techniques used?
- Thus, analytical techniques focused first on organic acids and then on sugars

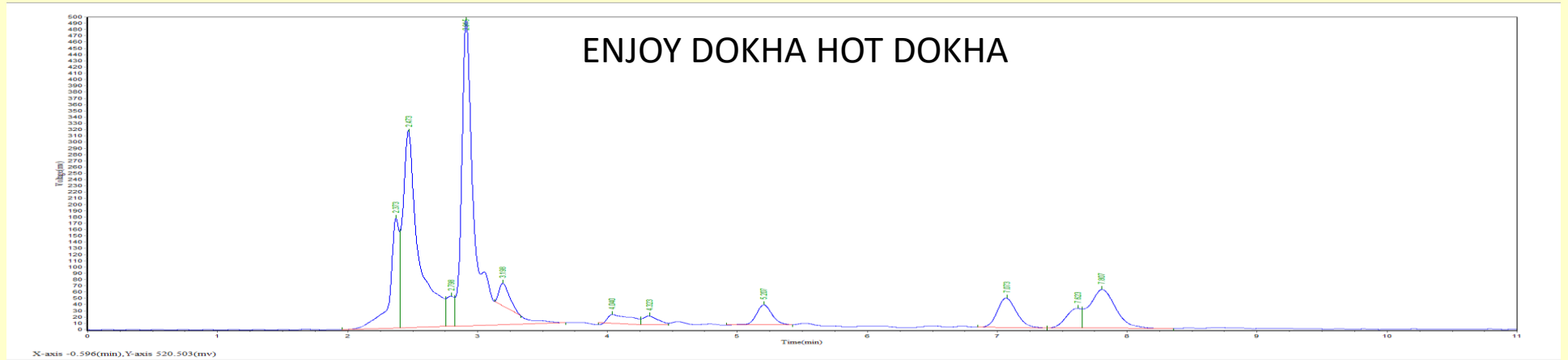
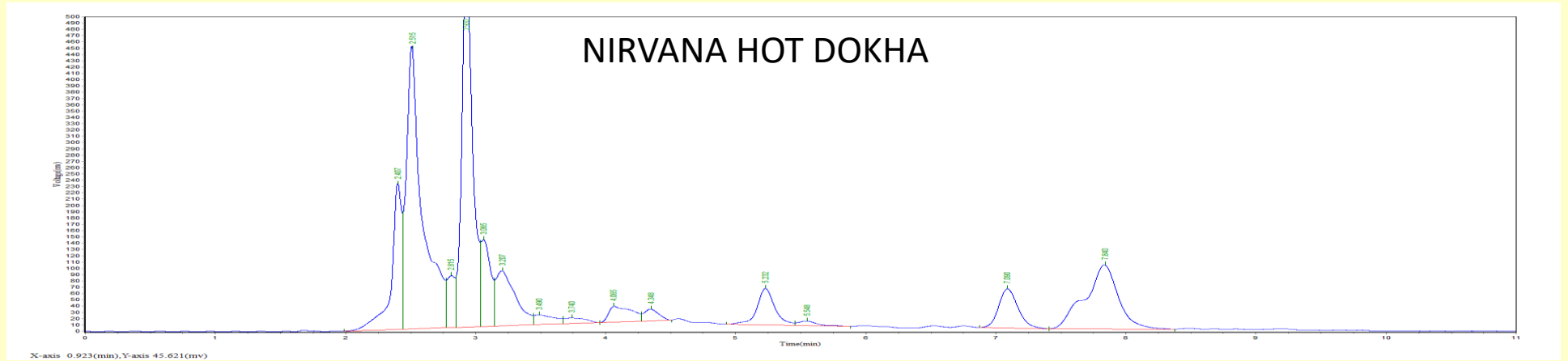
LC characterization of dokha tobaccos

- Extraction of tobaccos with 0.01 M sulfuric acid, then
 - Organic acids UV at 220 nm
 - Polyphenols UV at 345 nm
 - YMC Triart C18 column, 250 x 4.6 mm
 - 83/17 0.01 M H₂SO₄/ACN at 1 mL/min
- Estimation of levels of sugars in extracts
 - Extracts were cleaned-up with Oasis HLB SPME cartridges
 - Extracts were analyzed using a Cogent Amide Hydride column, 250 x 4.6 mm, 83/17 ACN/H₂O, 1 mL/min
 - UV detection at 195 nm

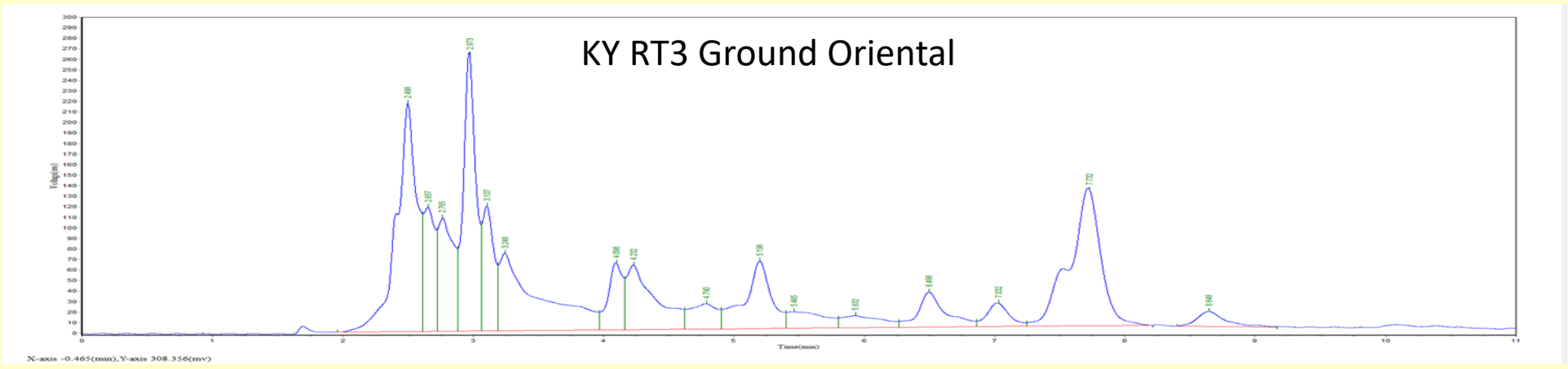
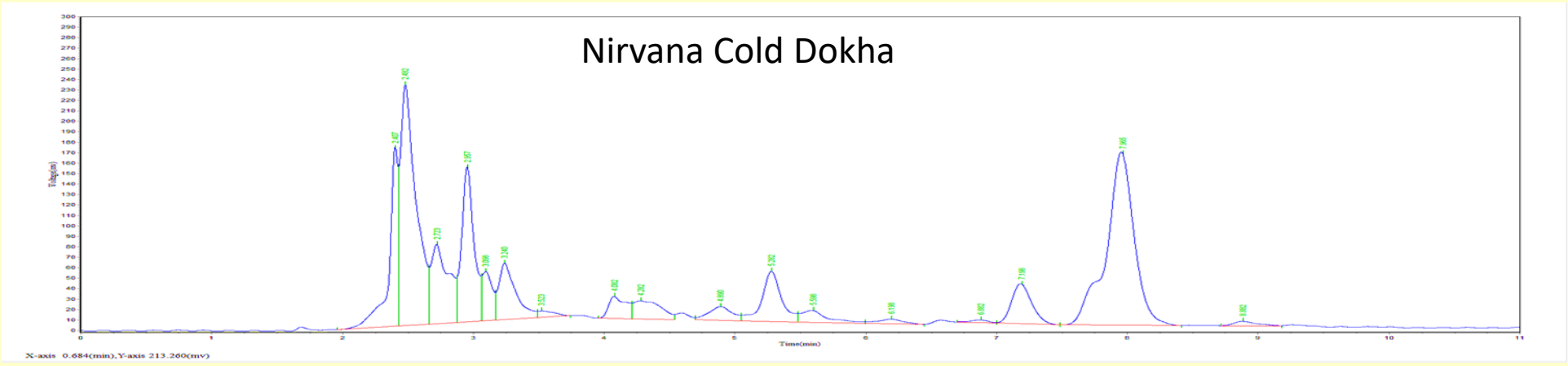
Results of analyses

- Organic acids
 - Procedure taken from column manufacturer with mobile phase modified to include 17% ACN
 - Procedure calls for UV detection at 220 nm, but also picked up nicotine as well as the tobacco polyphenols
 - As nicotine content of tobacco increased relative amount of organic acids decreased (see Slides 9 and 10)
- Sugars did not show a significant change
- The ratio of rutin to chlorogenic acid reportedly can be used to estimate “oriental character” of a blend
 - Based on peak height, dokhas were in range of 3 ± 1
 - It was > 13 for the KY RT3 oriental tobacco

Chromatograms of two hot dokhas



Nirvana cold dokha and KY RT3 Oriental



Dokhas as cigarette tobacco

- US Patent 4,893,638
 - Teaches the use of ground tobacco to make a 100-mm ultraslim filtered cigarette
 - It has not been practical for consumers to use ground tobacco such as manufacturing fines
- Dokha tobaccos solve this problem
 - Readily available
 - Easy to pack in ultraslim filter tubes



Conclusions

- We have provided a preliminary characterization of dokha tobaccos
- More work with better instrumentation needs to be done
 - Analysis of organic acids
 - Analysis of sugars and polysaccharides
 - Understanding of physical properties of tobacco particles, especially during pyrolysis and combustion
- Sensory studies with different grades of dokhas and flavorings would be useful