

Preliminary characterization studies on Sacha Inchi (*Plukenetia volubilis* L.) seeds and oils grown in San Martín, Peru

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OBJECTIVE:

To determine the physico-chemical composition of seeds and oils obtained from Sacha inchi (*Plukenetia volubilis* L.) grown in the villages of Lamas, Shanao, Pinto Recodo, the Huaico and the Bello Horizonte from the city of Tarapoto in San Martín Region of Peru. The samples belong to the native ecotypes: Pinto Recodo (EC1, EC2) and Ashaninka (EC3)

EXPERIMENTAL

RAW MATERIAL SELECTION & SEPARATION

SEEDS

DRY (40 °C)

HYDRAULIC PRESS

FILTRATION & CENTRIFUGATION

CRUDE OIL

Proximate composition

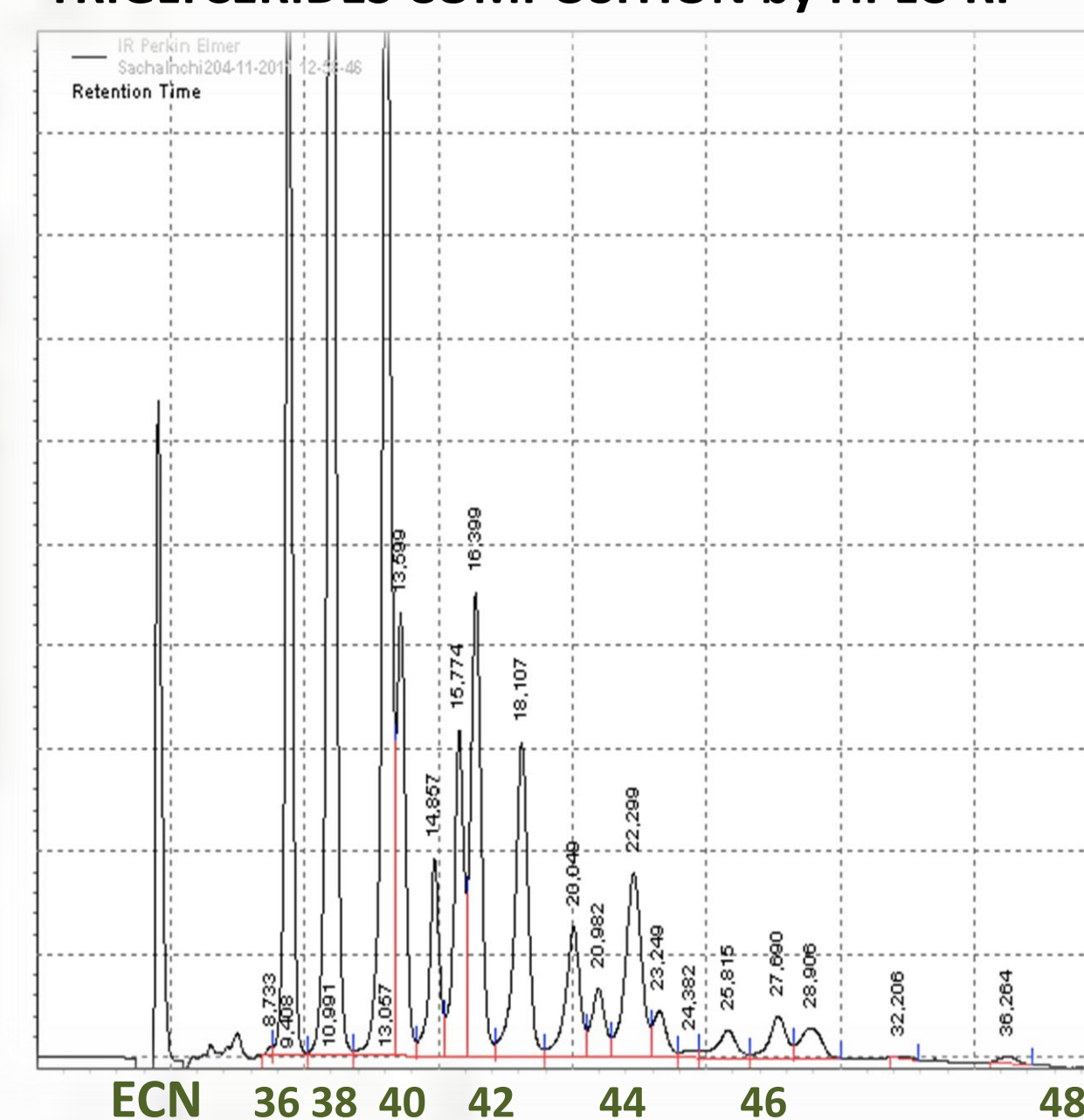


Parameter	Range for ecotypes EC1, EC2 & EC3
Humidity	11.1 - 11.5
Oil	37.3 - 42.3
Fiber	5.9 - 6.8
Ash	3.7 - 3.9
Proteins	25.8 - 26.9
Carbohydrates	10,3 - 14,5

Physico-Chemical Composition

Analytical Parameters	Range for EC1, EC2 & EC3
Iodine Value (g I ₂ /100 g)	161.41 - 165.74
Acidity (%)	0.03 - 0.06
Saponification Value (mg KOH/g)	181.9 - 193.5

TRIGLYCERIDES COMPOSITION by HPLC-RI

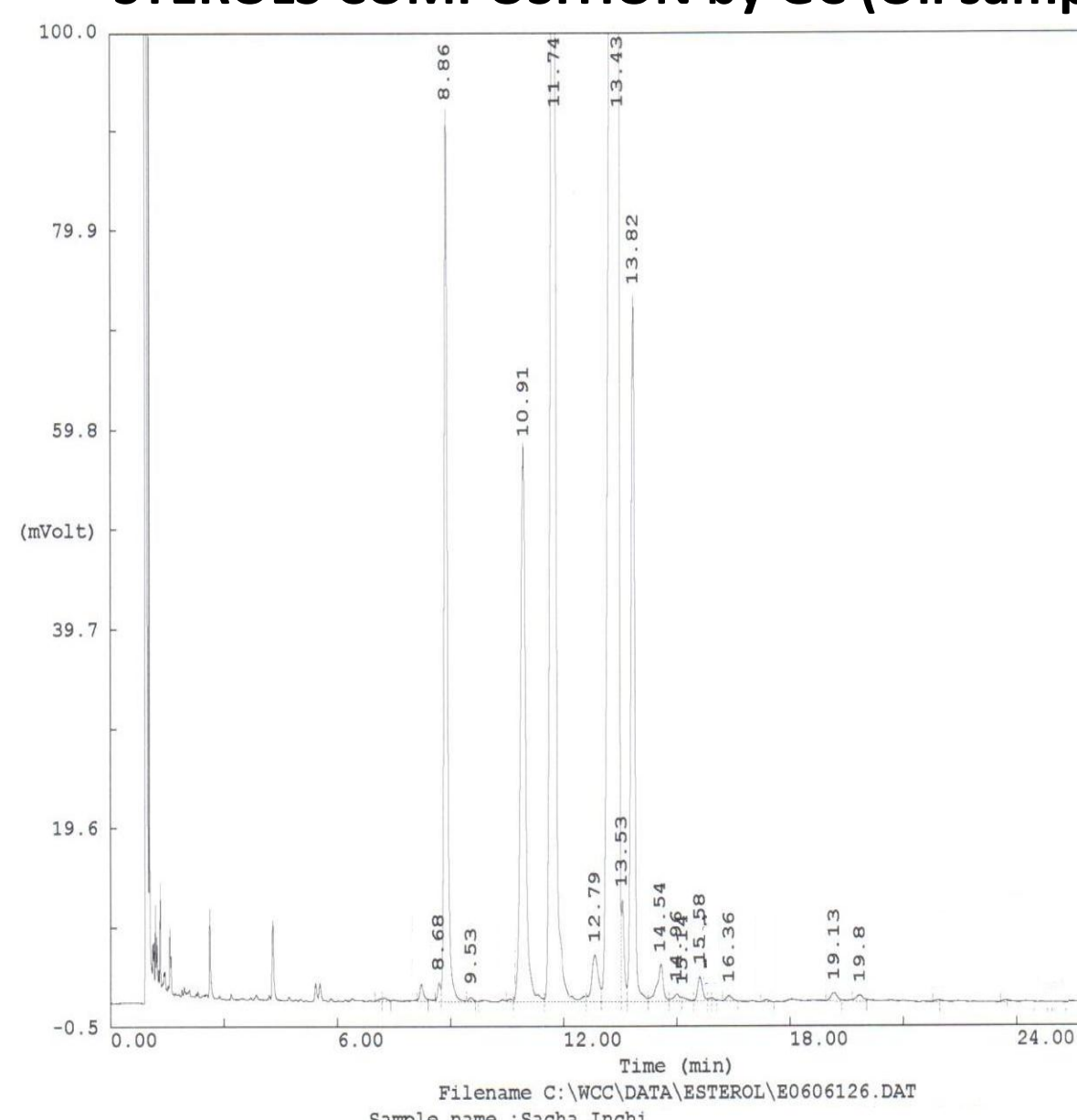


ECN	Range for EC1, EC2 & EC3 (%)
36 LnLnLn	12.9 - 13.1
38 LnLnL	23.7 - 24.8
40 LnLL+LnLnP LnLnO	17.4 - 19.7 6.3 - 6.9
42 LLL OLLn unknown PLLn	3.2 - 3.4 4.9 - 5.3 8.1 - 8.7 6.7 - 7.2
44 LLO OOLn LLP POLn	3.0 - 3.4 1.4 - 1.8 4.8 - 5.0 1.0
46 OOL LnPP PLO	1.1 1.2 1.0
48 OOO POO	- -

&

RESULTS

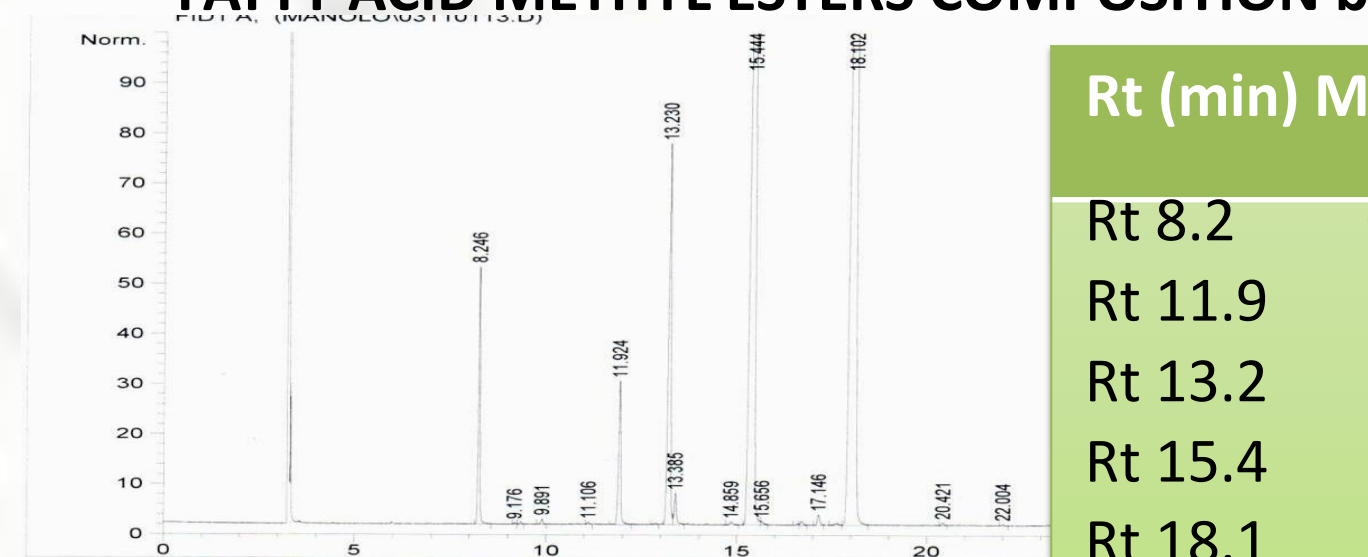
STEROLS COMPOSITION by GC (Oil sample saponified, isolated byTLC and silitated)



Rt (min)	STEROLS	Range for EC1, EC2 & EC3 (%)
8.7	Cholesterol	0.1
8.8	I.S. α -Cholestanol	
10.9	Campesterol	8.1 - 8.5
11.7	Stigmasterol	21.9 - 22.8
12.8	Clerosterol	0.9 - 1.3
13.4	β -Sitosterol	58.6 - 59.0
13.5	Sitostanol	0.8 - 0.9
13.8	Δ 5-Avenasterol	7.4 - 7.5
14.5	Δ 5,24 Stigmastadienol	0.5
15.1	Δ 7- Stigmastanol	0.3
16.3	Δ 7-Avenasterol	0.1
TOTAL (mg/kg)		2270-2500

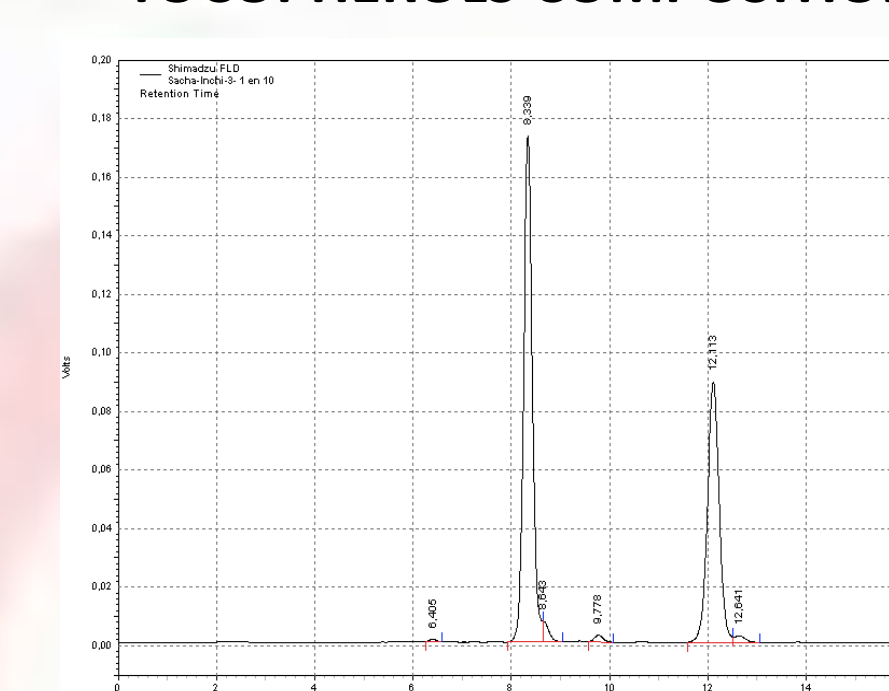
Rt (min)	TRITERPENIC DIALCOHOLS	Ranges for EC1, EC2 & EC3 (%)
19.1	Erithrodiol	0.1
19.8	Uvaol	0.1

FATTY ACID METHYL ESTERS COMPOSITION by GC



Rt (min)	Main FAMES	Range for EC1, EC2 & EC3 (%)
Rt 8.2	C16:0	3.5
Rt 11.9	C18:0	2.7-2.8
Rt 13.2	C18:1 n-9	8.1-8.3
Rt 15.4	C18:2	34.3-35.1
Rt 18.1	C18:3	48.8-49.6

TOCOPHEROLS COMPOSITION by HPLC-FID



TOCOPHEROLS	Range for EC1, EC2 & EC3 (mg/kg)
α	n.d.
β	n.d.
γ	2755-3878
δ	1803-2650
TOTAL	4559-6528

CONCLUSIONS

In spite of their high unsaturation level (LnLnLn > 10%) the oils are stable due to the total tocopherol content mainly Due to the positional isomers γ and δ .

Remarcable is the sterols content, formed mainly by the Δ 5- serie

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