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Abstract

Within the framework of a contribution to the valorization of the Moroccan natural heritage, we think through our research to contribute to a better knowledge of the primary and secondary metabolites of carob fruit pulp of the Moroccan wild and domesticated trees. For this purpose, several analytical techniques (spectrophotometry, ion and gas chromatography, HPLC-DAD, etc) were used to valorize the pulps of the pods of 12 wild and 8 domesticated carob trees collected from 15 localities spread over four regions of origin (Western and Eastern Rif, Western and Eastern Middle Atlas). Overall, the pulps of domesticated carob pods are richer in primary and secondary metabolites than those of a wild carob.

Methodology

Preparation of the pod pulp powder: The carob pods are dried for 2 weeks in an oven at 70°C. After removing the seeds, the dried pulps are chopped and ground to obtain the pulp powder (diameter < 0.2 mm).

Analysis: Several analytical techniques have been used to valorize the pod pulps:

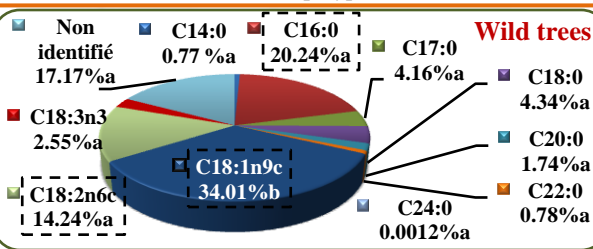
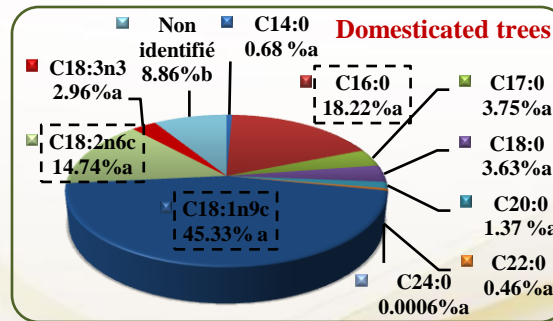
- Total fiber content (soluble and insoluble) (**Modified Southgate method**);
- Protein determination (**Kjeldahl method**);
- Identification and quantification of sugars (**Ion Chromatography**);
- Identification and quantification of fatty acids and lipids (**GC-MS**);
- Determination of total polyphenols (**Folin-Ciocalteu colorimetric method**), flavonoids (**Aluminum trichloride colorimetric method**), condensed tannins (**Butanol-HCl method**) and identification of polyphenols (**HPLC-DAD**).

Results

The results obtained are represented by the global average values for all the parameters measured for the wild and domesticated carob trees.

	Wild trees	Domesticated trees
g/kg de DM		
Total fiber content	500.6 ^a	492.3 ^a
Proteins	101.2 ^a	104.8 ^a
Total sugar	166.12 ^a	174.55 ^a
Lipids	1.58 ^a	1.57 ^a
Total polyphenols (GAE)	14.65 ^a	11.45 ^b

	Wild trees	Domesticated trees
Soluble fiber (%)	9.44 ^a	8.89 ^a
Insoluble fiber (%)	90.56 ^a	91.11 ^a
Glucose (%)	7.63 ^a	6.23 ^a
Fructose (%)	13.62 ^a	12.15 ^a
Sucrose (%)	78.75 ^a	81.62 ^a
Saturated fatty acids (%)	32.04 ^a	28.11 ^a
Unsaturated fatty acids (%)	50.8 ^b	63.03 ^a
Unidentified fatty acids (%)	17.16 ^a	8.86 ^b
Total flavonoids (%)	2.98 ^b	3.73 ^a
Condensed tannins (%)	4.88 ^a	4.08 ^a
Other polyphenols (%)	92.14 ^a	92.18 ^a



Three phenolic acids (**gallic, syringic and trans-cinnamic acids**, a flavanol (**catechin**), three flavonols (**myricetin, quercetin and kaempferol**) and a flavonone (**naringenin**) were detected by HPLC-DAD.