

Introduction:

The legume by-products of broad beans, artichokes and peas seem to be of little nutritional value. However, further analysis shows the presence of phenolic compounds, pigments; proteins, lipids and polysaccharides. The present study extended on the one hand to follow the classic drying kinetics in a ventilated oven of the powder of the Bean peel, the Pea and the leaves of Artichokes, on the other hand on the influence of this drying process on color, and chemical composition (polyphenols, Brix, pH, conductivity and antioxidant activity) depending on the size of the powders.

I. Materials and Methods :

1. Harvesting of plant material:



The Pea (*Pisum sativum*), the Bean (*aquadulce*), and the leaves of the Artichoke (*Cynara scolymus*)

2. Pretreatment and Drying :

In the laboratory, a preliminary sorting was carried out, elimination of the perforated, broken, damaged pods, carrying spots, rotten or presenting damage caused by harmful insects.

The samples are placed in the oven at different temperatures, 30, 35, 40, 50, 60, 70, 80, 90 ° C and the loss by mass is monitored periodically until a constant mass is obtained.

3. Grinding and sieving:

After obtaining a constant mass by drying in the temperature-controlled oven, the samples were ground using an electric mill.

The powders obtained were sieved using an electromagnetic sieve until there were four particle size fractions greater than 125 µm, between 125 µm and 50 µm, between 50 µm and 25 µm and less than 25 µm.

The liquid-solid extraction was carried out by maceration, the solvent used is pure methanol. The solution obtained is then filtered on Wattman filter paper under vacuum, the filtrate is collected in a glass bottle is labeled and then stored in a refrigerator for analysis.

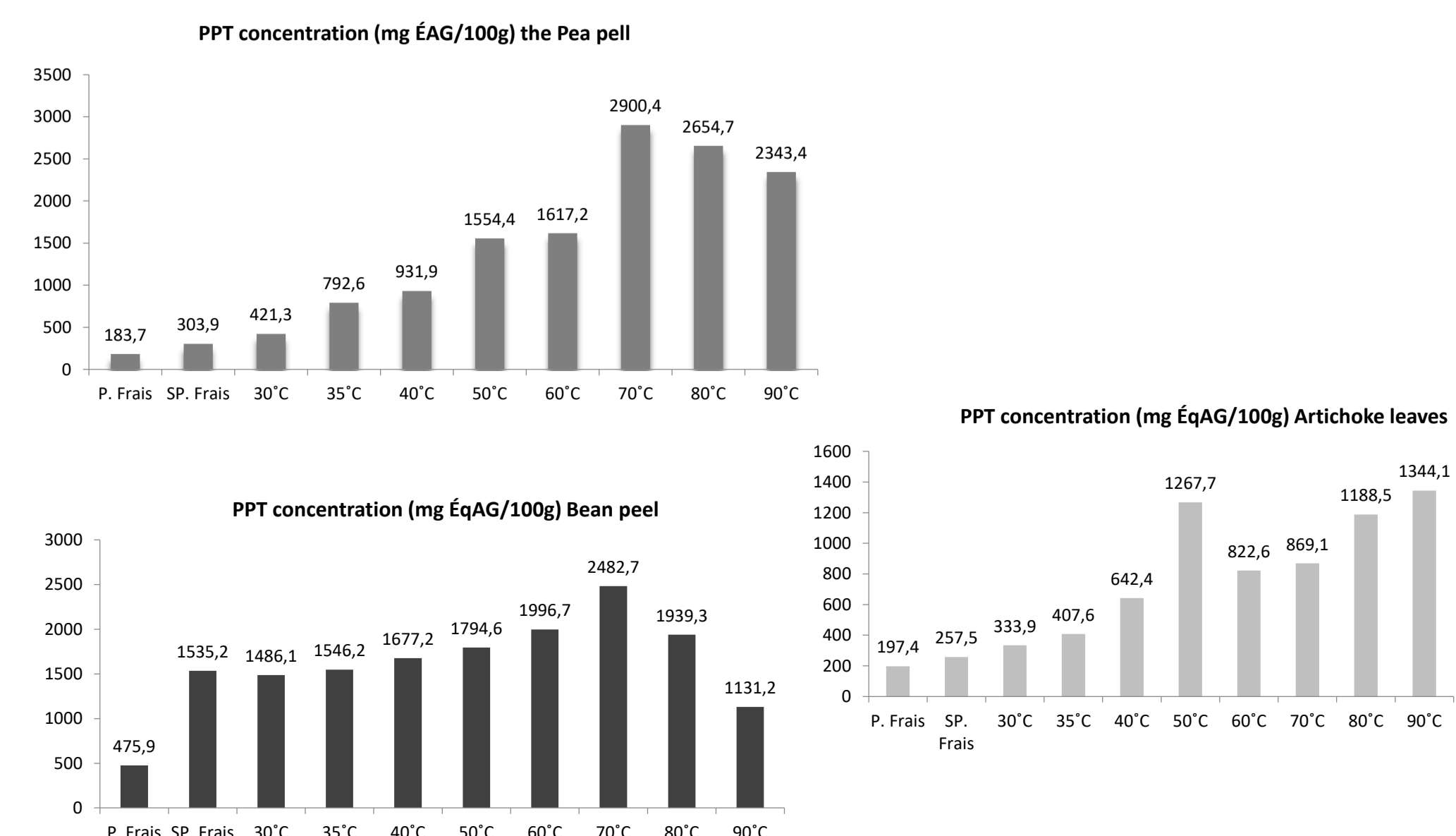


4. Physico-chemical analyzes of Bean (*aquadulce*), Pea (*Pisum sativum*), and Artichoke (*Cynara scolymus*) by-products:

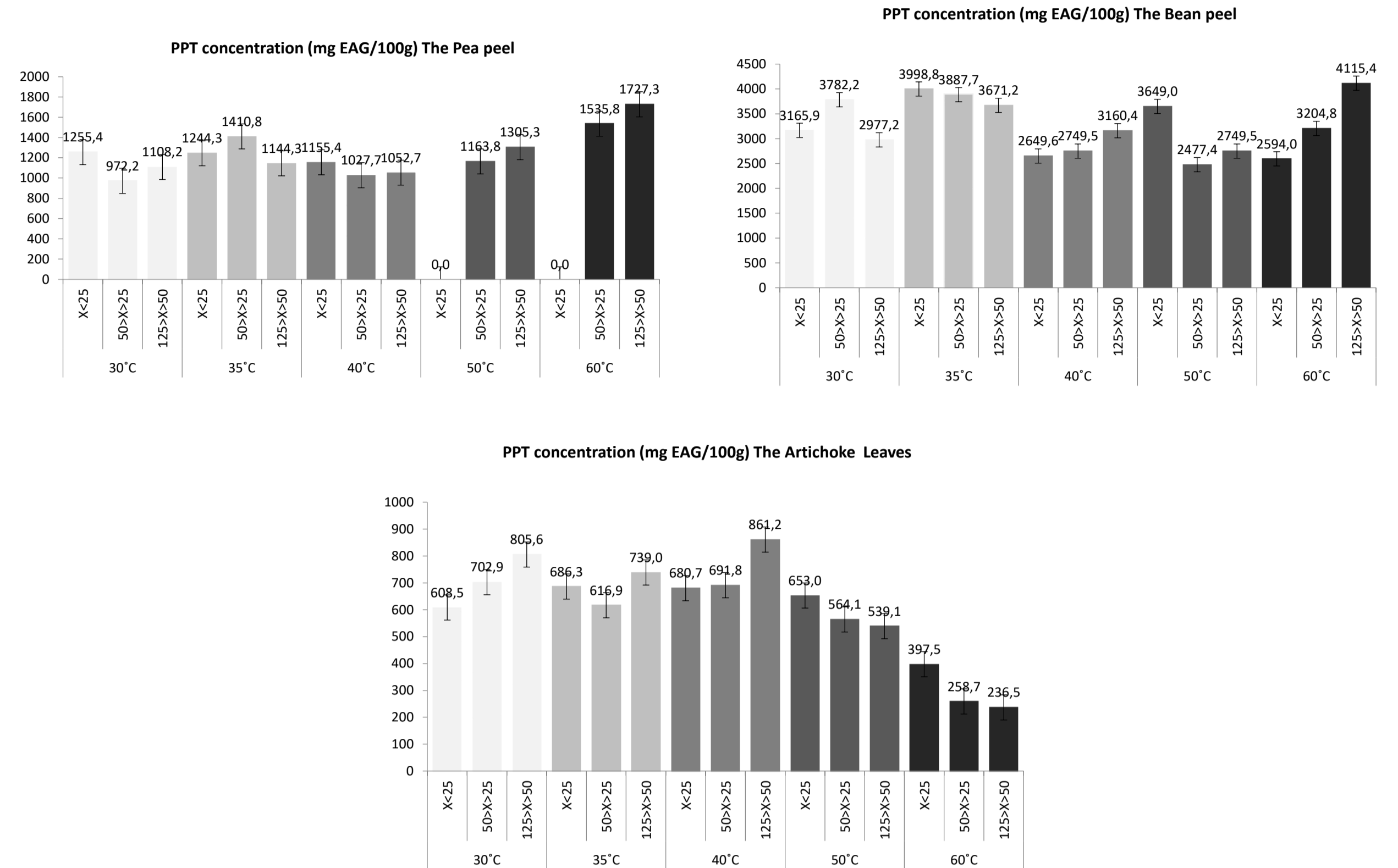
	The Pea (<i>Pisum sativum</i>) peel	The Bean (<i>aquadulce</i>) peel	The Artichoke (<i>Cynara scolymus</i>) Leaves
pH (±0,02)	5,3	4,5	6
Conductivity (mS±0,05)	0,895	1,938	2,33
The Brix degree	1	3	1
The water content %	87,58	89,32	85
The ashes %	5,3	8,5	6,8
The total phenolics content of by-products (mg ÉqAG/100g)	303,9	1535,2	257,2
Cd	<0.001	<0.001	<0.001
Cu	<0.001	<0.001	<0.001
Fe	<0.001	0.007	0.002
Mn	<0.001	<0.001	<0.001
Ni	<0.001	<0.001	<0.001
Zn	<0.001	<0.001	<0.001

5. Total phenolic compounds:

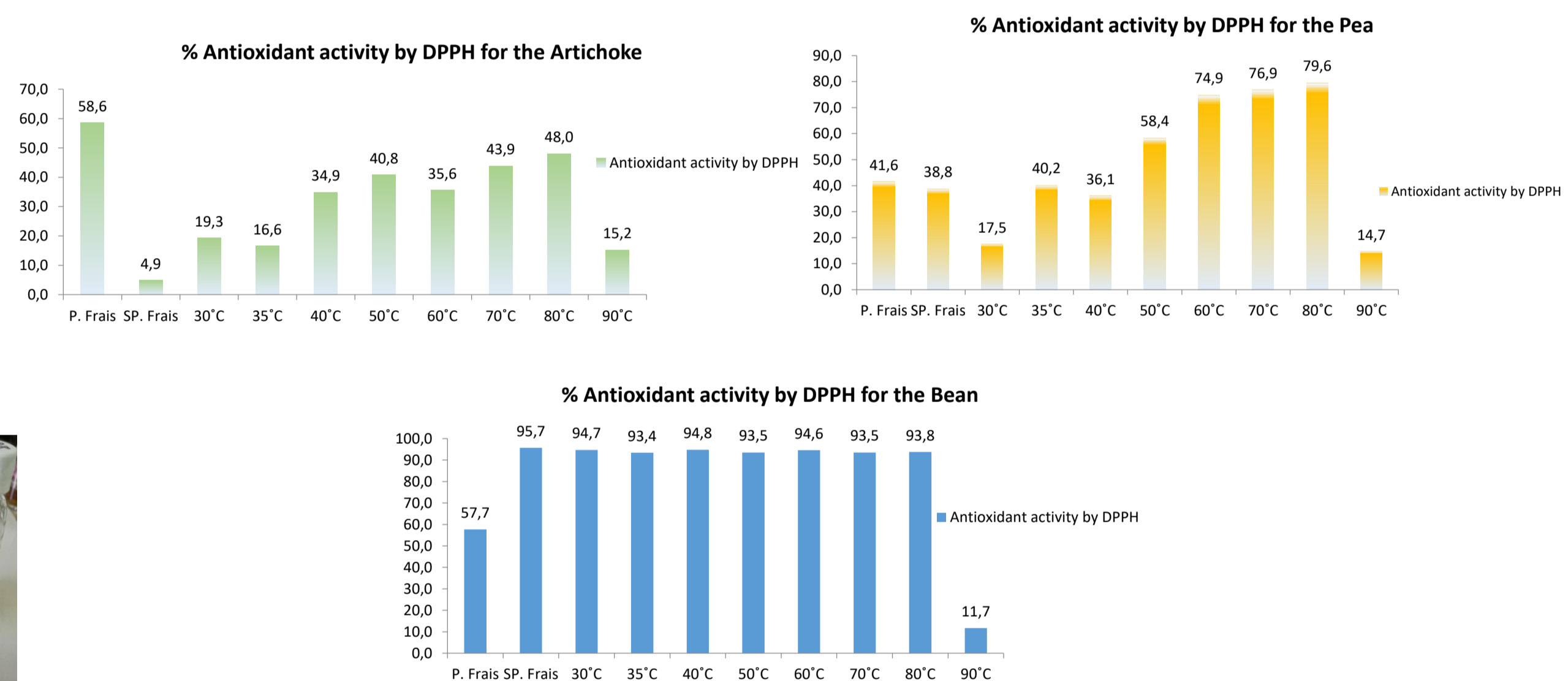
a. Effect of the drying temperature on the dosage of total polyphenols:



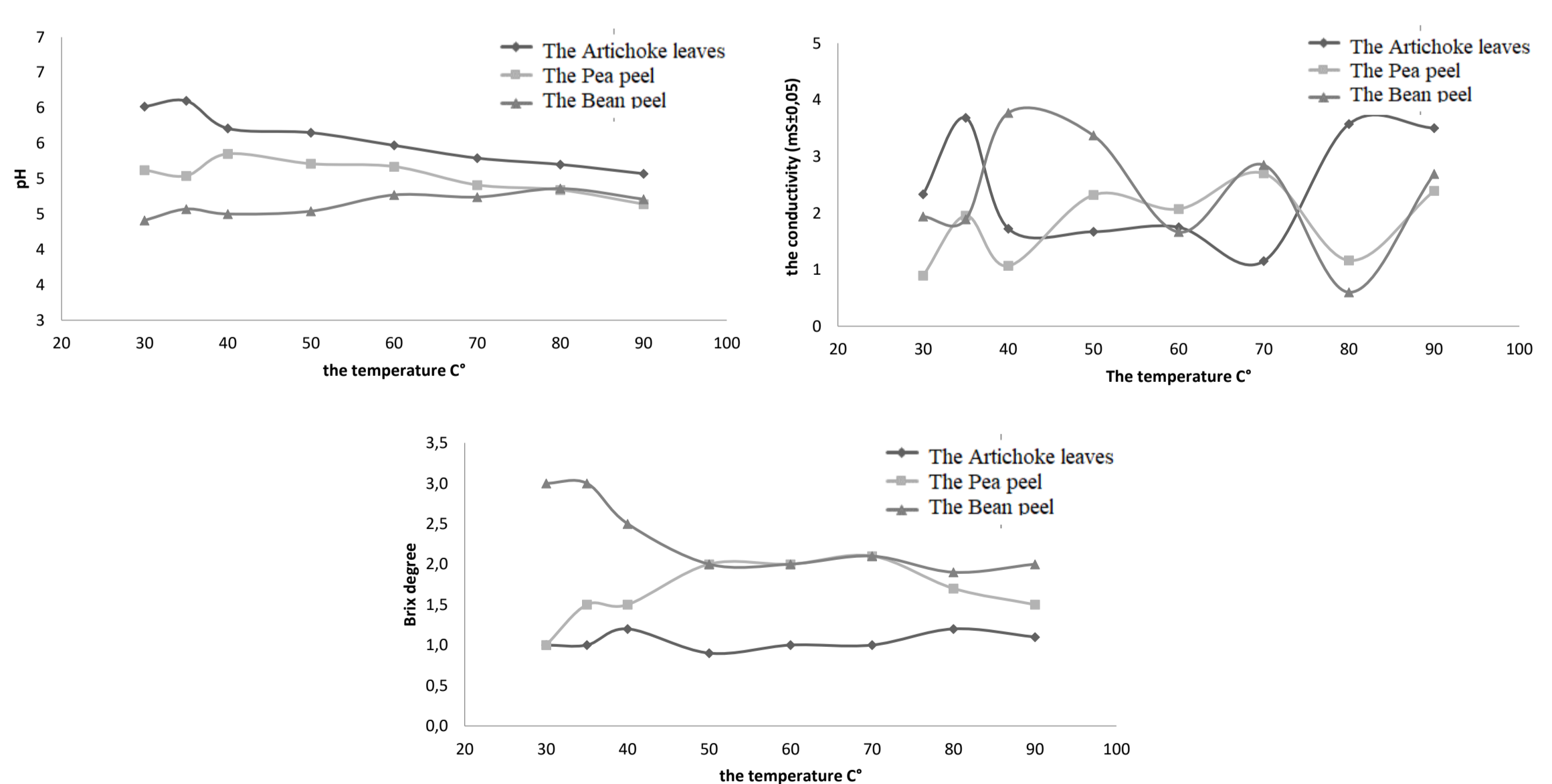
b. Effect of granulometry of powders on the dosage of polyphenols (Sieving) :



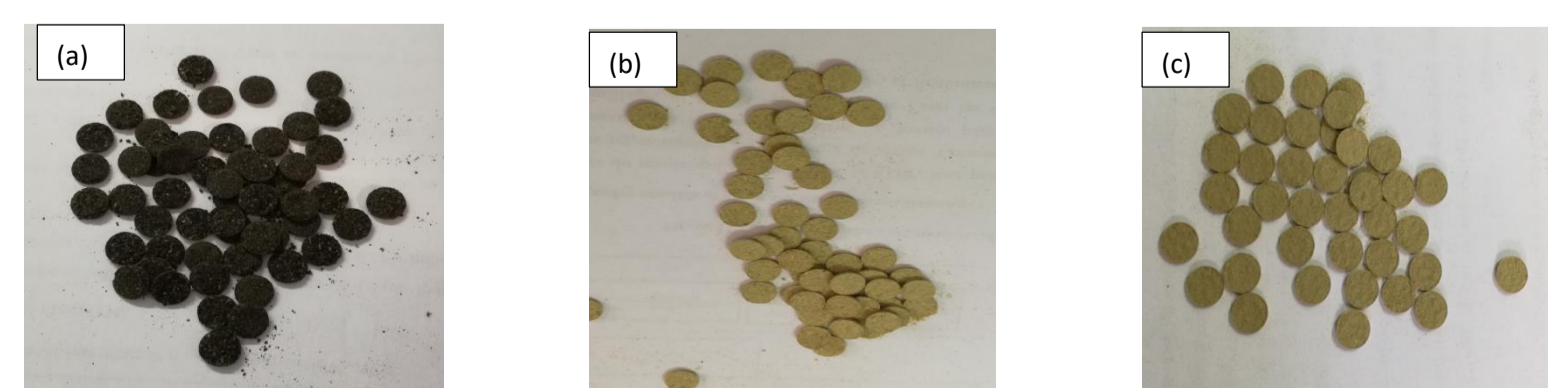
c. Antioxidant activity :



d. Drying effect on pH, conductivity and Brix degree:



6. manufacture of tablets as a food : (Artichoke (a), bean (b) and pea (c) by-product tablets



Conclusion :

According to the results, the samples dried at 60 ° and 70 ° C have a value of polyphenols important at other drying temperatures, with a very fine particle size. the study then focuses on the analysis of the different types of polyphenols by liquid chromatography and the other chemical compounds by Flasch chromatography and spectral analyzes.