

Physico-Chemical Characterization of *Arbutus Unedo* L. From kabylian Region (Northern Algeria)

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Abstract

The fruits of the strawberry tree (*Arbutus unedo* L.) are consumed mainly as processed product, but may be a good source of antioxidants if consumed as fresh fruit. The presented work aims to evaluate some of its physicochemical parameters, including X-ray diffraction (XRD) properties, crude fiber, titrable acidity, etc.

Keywords: *Arbutus unedo* L.; Characterisation; Physicochemical

Abbreviations: FA: *Arbutus* fruit; XRD: X-Ray Diffraction

Introduction

Arbutus berries (*Arbutus unedo* L.) is a Mediterranean typical tree which fruit is generally not consumed in fresh form but after processing [1]. Like other plants which are fitted with wonderful defense system assured by various biopharmaceuticals [2], the berries are also known to be used in folk medicine as antiseptic, diuretic and laxative [3]. Moreover, Ruiz-Rodríguez et al. [4] having earlier supported that the higher antioxidant potential of the *arbutus* berries may be due to the activity of various bioactive components including vitamin C. So, considering dietary ingredient any herbal or botanical material containing vitamins and minerals, *arbutus* berries may be repertoires as a dietary supplement. *Arbutus unedo* (Ericaceae) part of the range of Algeria medicinal plants [5]. The *Arbutus* fruit (FA) is poorly exploited, not very well-known from point of view nutritional and industrial by the population Algerian and its consumption remains seasonal. In this context, the present work main purpose the physico-chemical study powder freeze-dried (PL) of Algerian FA (*Arbutus unedo* L.).

Materials and Methods

Ripe *Arbutus* berries were picked in Kabyle region (northern Algeria) in 2017. The fruit is submitted to freeze drying at 109 K (4.5 Pa) during 2 days. The dried product is then ground and sieved (sieve of type Euromatest-Sintoo, NFX11-501) to obtain homogeneous powder (LP) which is kept in closed glass flask at 277K. The general chemical parameters of LP *A. unedo* berries, namely; crude fiber [6], titrable acidity (with NaOH, 0.1 N), pectin

[7], ash and Acid-Insoluble Ash [8] were evaluated. The electrical conductivity of 20% LP solution in distilled water was measured at 20 °C (mScm^{-1}); the lipid was determined, using a Soxhlet apparatus. The X-ray diffraction (XRD) of LP was investigated using diffractometer (Panalytical Xpert Pro ®).

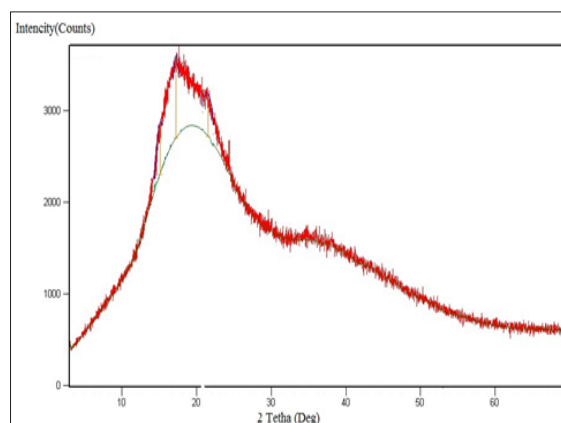


Figure 1: X-ray diffraction patterns of powders freeze-dried *arbutus* berries.

Results and Discussion

The different quality parameters of LP are summarized in Table 3. Crude fiber of LP is comparable to that reported by Ruiz-Rodríguez et al. [4] and is less than that reported by Özcan and Haciseferogulları, [9] for fresh strawberry tree fruits (6.4 g/100 g

of cellulose, 2.93 g/100 g soluble fibers respectively). The titratable acidity is close to that indicated in the literature 0.4% [10], On the other hand, it is less than that given by Celikel et al. [11] (0.48 - 1.24 and 0.8 - 1.59% respectively) for the Turkish variety electric conductivity is greater than that calculated by Ulloa et al. [12] (0.643 mS \cdot cm⁻¹) for strawberry tree (*Arbutus unedo* L.) honey. The XRD pattern of LP powder is presented in Figure 1. A broad band with very weak peaks, characteristic of amorphous forms, is observed in the pattern indicating the presence of amorphous sugar obtained by freeze-drying fruits berry. Furthermore, the amorphous characteristics are clearly reported on different dried mango powders [13] and fluidize-dried gum extracted from the fresh fruits of *Abelmoschus esculentus* [14] (Table 1) & (Figure 1).

Table 1: Physicochemical characterization of LP.

Parameter	Value
Crude fiber (%)	4.440 \pm 0.125
Titrable acidity (%)	0.210 \pm 0.010
Pectin(%)	2.456 \pm 0.034
Total ash	3.910 \pm 0.030
Acid-Insoluble Ash (%)	0.510
Lipid (%)	0.801 \pm 0.080
Electrical conductivity (mS.cm-1)	2.550 \pm 0.050

Conclusion

The results showed that all physicochemical parameters were comparable to those the literature.

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