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## Drying Kinetics and Quality Attributes of *Gardenia Erubescens* Fruits as Affected by Slice Thickness, Pretreatment and Drying Air Temperature

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### Abstract

The *Gardenia erubescens* (GE) fruit is a wild fruit common in the savannah zone including Ghana. It is rich in fiber, carbohydrates, minerals and health promoting bioactive compounds. However, due to its seasonality and perishability, the application of preservative methods such as drying is imperative to improve its shelf life. Unfortunately, there is currently limited information regarding the effect of drying conditions on quality retention of the dried fruit. As a response, systematic laboratory trials were undertaken to investigate the effect of slice thickness, pretreatment option and air temperature on the drying kinetics, colour, and bioactive compound (  $\beta$ -carotene, vitamin C, phenol, flavonoid and antioxidant activity) composition of GE fruits. Cleaned fresh GE fruits were sliced into 3 mm and 5 mm thicknesses, subjected to three different pretreatment options (steam blanching at 100°C for 3 min, dipping in 2% w/v ascorbic acid solution for 3 min and control) and dried at temperatures of 40, 50, 60 and 70°C. Results indicated that the drying time increased with pretreatments in the order control ascorbic acid steam blanching and increase in slice thickness, but decreased considerably with increase in air temperature. Furthermore, the greatest colour change ( $\Delta E = 36.82$ ) and chroma ( $C^* = 51.85$ ) were associated to 5 mm fruit slice thickness pretreated with ascorbic acid and steam blanching, respectively. However, the lowest  $\beta$ -carotene (42.70  $\mu\text{g}/100\text{ g}$ ), vitamin C (37.50 mg/100 g) and flavonoid (36.33 mg/100 g), phenol (97.33 mg/100 g) and antioxidant activity (21.04 mg/100 g) contents were obtained in fruits pretreated with ascorbic acid and steam blanching, respectively. GE fruits sliced to 3 mm thickness, without pretreatment and dried at 60°C was the best option considering most of the measured response variables. Findings of this study may therefore be useful to the food industry regarding selection of drying conditions for desired quality attributes of dried GE fruits.

**Keywords:** Drying conditions, drying kinetics, gardenia erubescens fruit, quality attributes