



# HPLC analysis of ascorbic acid

## in pretreated and dried red pepper (*Capsicum annuum* L.)

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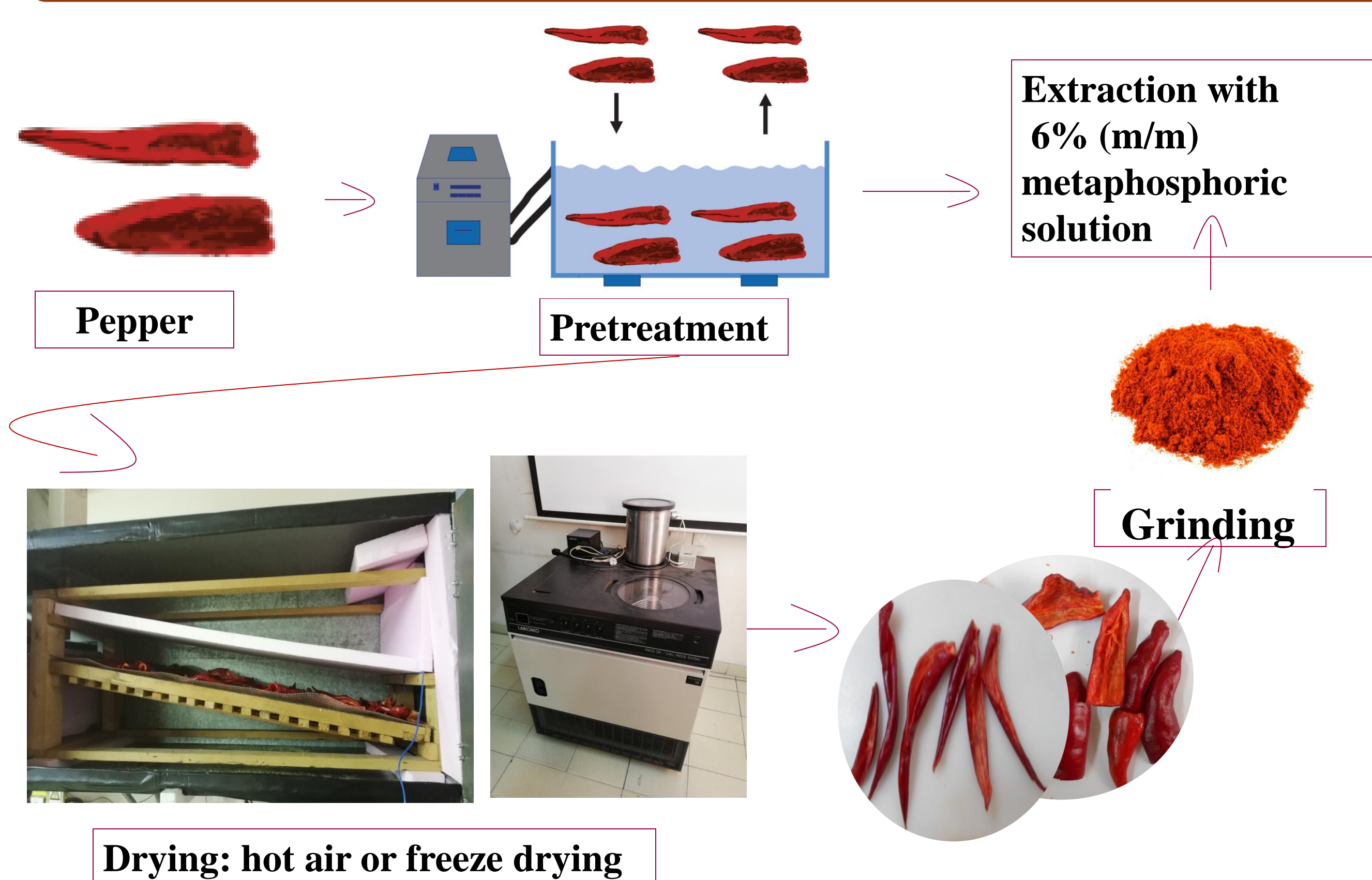
### INTRODUCTION AND AIM

Red pepper (*Capsicum annuum*) fruits contain a considerable amount of **vitamin C**, more than other types of vegetables and fruits that are commonly recognized as a source of this vitamin<sup>1</sup>. Dehydration is a common way used to extend the shelf life of easily perishable food<sup>2</sup>. Dried peppers are popular products in vegetarian diets, healthy mixtures, and as ingredients in many types of dishes<sup>3</sup>. Before drying, fruits and vegetables can be subject to different pretreatment (chemical, physical) with the main purpose to reduce drying time and improve color characteristic of dried product<sup>2</sup>.

**AIM:** This study investigated how various pretreatments (applied additive citric acid (CA) and/or potassium metabisulfite (KMS), pH value, temperature, ultrasound) and drying methods (hot air drying and freeze drying) affect the preservation of L-ascorbic acid in dried peppers.



### SAMPLE PREPARATION



### HPLC ANALYSIS

The concentrations of **L-ascorbic acid** were determined by HPLC analysis

**Equipment:** Thermo Surveyor HPLC System

**Detector:** UV-Vis

**Column:** Kinetex (phase: EVO C18; 250x4.5 mm I.D; particle size: 5 µm; pore size: 100 Å)

**Injection volume:** 20 µL

**Flow rate:** 1.2 mL/min

**Run time:** 8 min

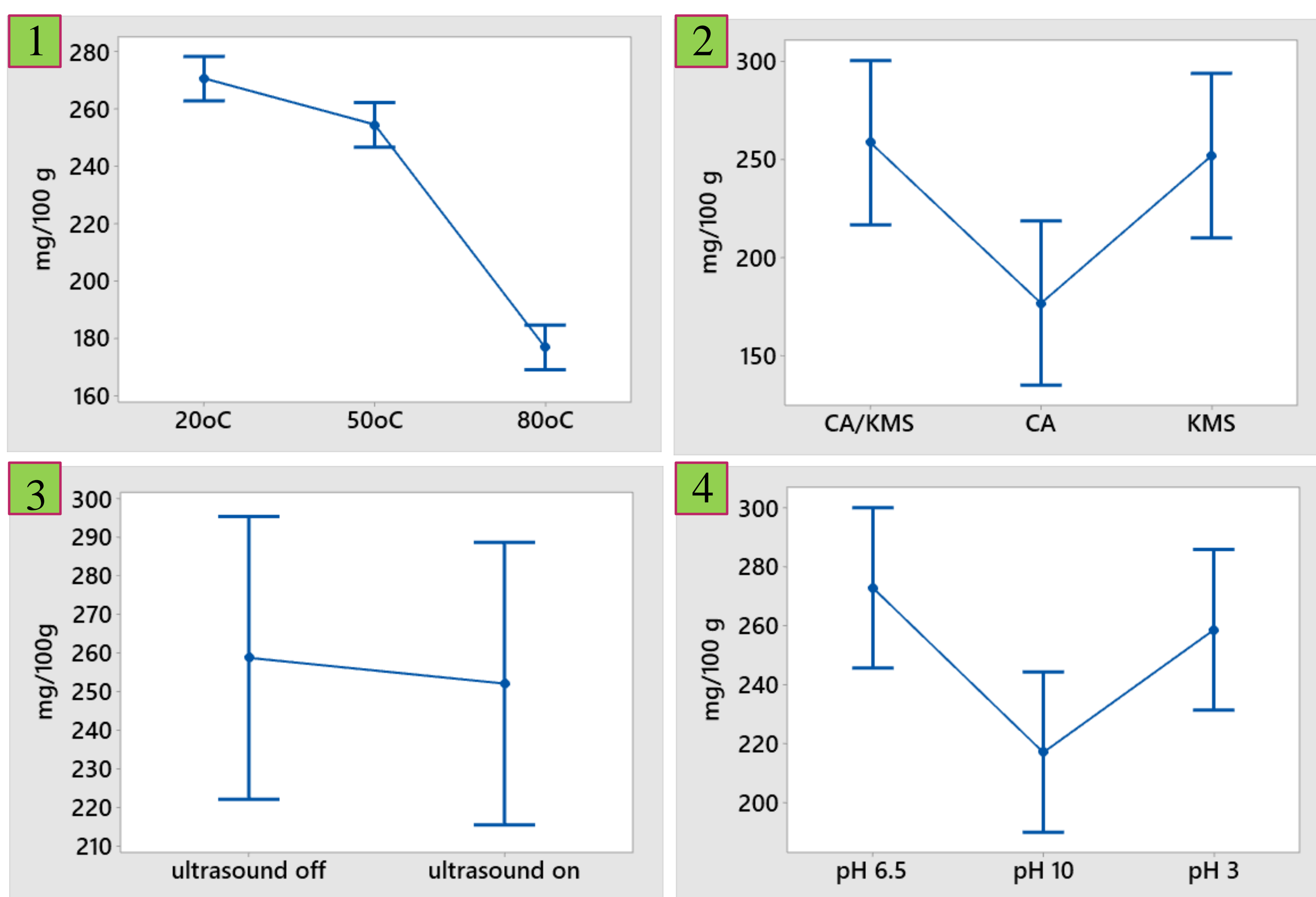
**Detection:** 269 nm

**Mobile phase:** 0.03 mol/L CH<sub>3</sub>COOH/NaCH<sub>3</sub>COO buffer, 5% metanol i 1 mM EDTA (pH=5.8)

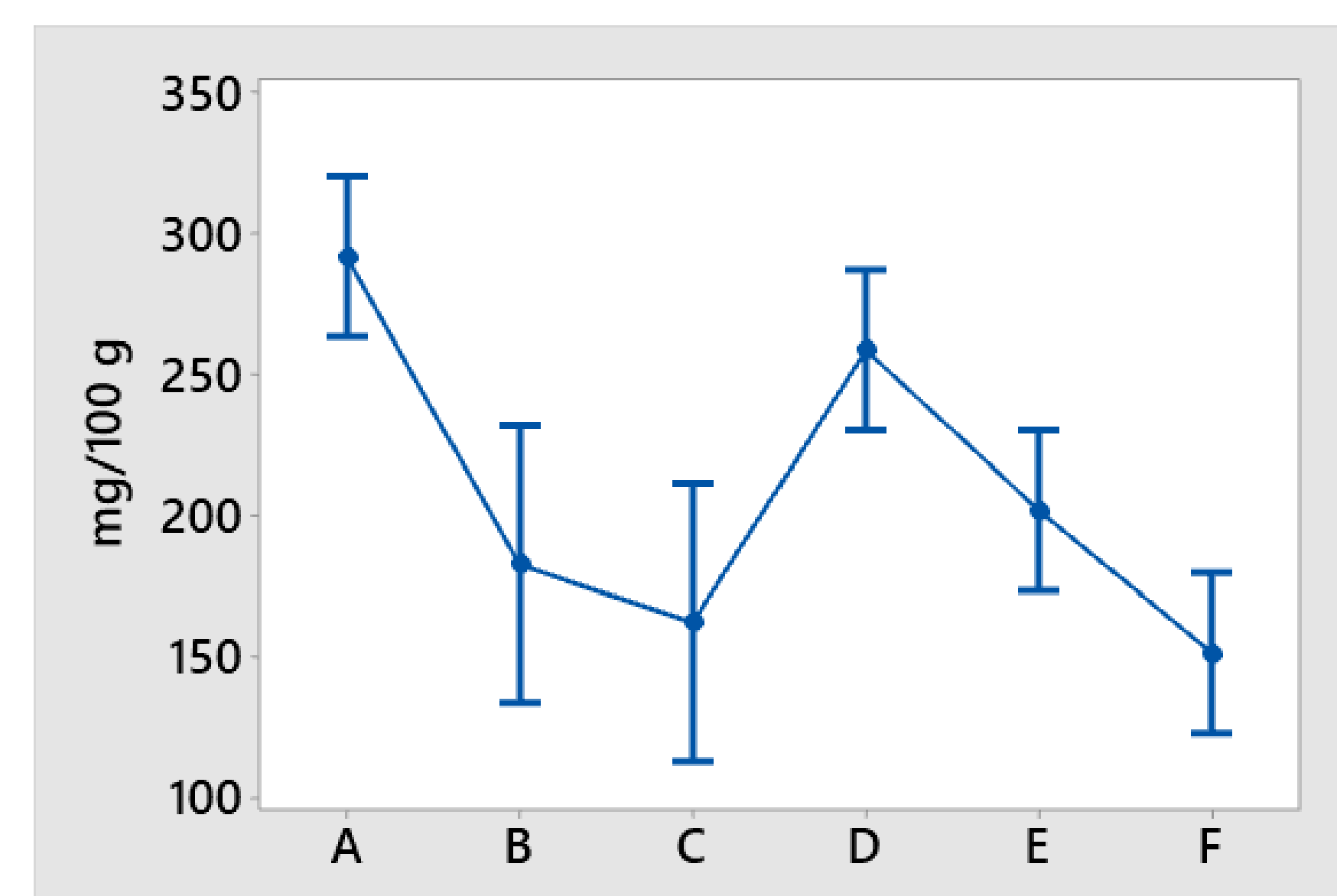


Results were expressed as mean ± standard deviation (SD). The significance of differences between mean values was determined by an analysis of variance using MINITAB software package. Differences were considered significant at  $p < 0.05$ .

### RESULTS AND DISCUSSION



**Fig. 1. L-ascorbic acid content in peppers after pretreatments: 1) influence of temperature, 2) influence of applied additive, 3) influence of ultrasound pretreatment, 4) influence of pH value**



**Fig. 2. L-ascorbic acid in fresh pepper (A), freeze-dried pepper (B), hot air dried pepper (C), pretreated pepper – 20°C, pH=6.5, CA/KMS (D), pretreated freeze-dried pepper (E), pretreated hot air dried pepper (F)**

The initial content of ascorbic acid in fresh pepper (292 mg/100 g d.b.) was reduced after all pretreatment and after drying of pretreated samples. Nevertheless, most of the pre-treatments contributed to better preservation of ascorbic acid in dried peppers compared to dried controls made from fresh peppers. At Fig. 1. is given influence of pretreatment parameters on ascorbic acid content while Fig 2. shows reduction that occurred after pretreatment and drying.

### CONCLUSION

The temperature and drying method were parameters that significantly influenced ascorbic acid content in dried peppers. The highest retention of L-ascorbic acid in dried peppers was obtained with following pretreatment: temperature 20 °C, pH 6.5, CA/KMS, without applying ultrasound and freeze drying method.

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