

**ASSESSMENT OF EXTRACTION PROCESS, DEGRADATION KINETICS OF ANTHOCYANIN FROM EGGPLANT (*SOLANUM MELONGENA*) PEEL AND ITS USE FOR MAKING OF GUAVA JELLY**

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**degree of Master of Science in Food processing and Engineering**

**Department of Food Processing and Engineering**

**Faculty of Food Science and Technology**

**Chittagong Veterinary and Animal Sciences University**

**Chittagong-4225, Bangladesh**

**June 2018**

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**Md. Jamshed Alam**

**June 2018**

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**This is to certify that we have examined the above Master’s thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made.**

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***The Author***

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**LIST OF ABBREVIATION**

|  |  |
| --- | --- |
| **WORDS** | **ABBREVIATION** |
|  |  |
| DNA | Deoxyribo Nucleic Acid |
| FAO | Food and Agriculture Organization |
| USDA | United States Department of Agriculture |
| SPE | Solid Phase extraction |
| LLE | Liquid Liquid Extraction |
| MPLC | Medium Pressure Liquid Chromatography |
| BARI | Bangladesh Agricultural Research Organization |
| KPa | Kilo Pascal |
| PRTC | Poultry research and Training Center |
| RPM | Revolutions Per Minute |
| nm | Nano Metre |
| MW | Molecular Weight |
| DF | Dilution Factor |
| KMS | Potassium-meta-sulfate |
| TSS | Total Soluble Solid |
| AOAC | Association of Analytical Chemists |
| ⸰C | Degree Centigrade |
| % | Percentage |
| Kg | Kilo gram |
| mg | Mili gram |
| ppm | Parts per million |
| µg | Microgram |
| m | Meter |
| ha | Hectare |
| BC | Before Christ |
| Kcal | Kilo Calorie |
| mcg | Microgram |
| IU | International Unit |
| L | Liter |
| MAE | Microwave-Assisted Extraction  |
| UAE | Ultrasound-Assisted Extraction  |
| PFE | Pressurized Fluid Extraction  |
| SWE | Subcritical water extraction  |
| SPE | Supercritical Fluid Extraction  |
| PLE | pressurized Liquid Extraction  |
| EAE | Enzyme-Assisted Extraction  |
| SPME | Solid Phase Microextraction  |
| ME | Membrane Extraction  |
| HHP | High Hydrostatic Pressure  |
| EF | Electric Fields  |
| CC | Column Chromatography  |
| CCC | Countercurrent Chromatography  |
| GC | Gas Chromatography  |
| LC |  Liquid Chromatography Techniques  |
| MS |  Mass Spectrometry  |
| NMR |  Nuclear Magnetic Resonance  |
| CE |  Capillary Electrophoresis  |
| TLC | Thin layer Chromatography  |
| v | Volume |
| HPLC | High Pressure Liquid Chomatography |
| PDA | Photodiode Array  |
| UV | Ulta Violet |
| cm | Centimeter |
| BAU | Bangladesh Agricultural University |
| DMRT | Duncan Multiple Range Tests  |
| PPO | Polyphenol Oxidase |
| POD | Peroxides |
| SD | Standard Deviation |
| AAS | Atomic Absorbance Spectroscopy  |
| NIRS | Near-infrared Spectroscopy  |
| GC-MS | Gas Chromatography-mass spectroscopy  |
| GC-MS | Gas Chromatography-mass spectroscopy  |

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**ABSTRACT**

There is a growing attention in natural colorants as an alternative of synthetic colorants which have many biological activities and antioxidant potential on consumer health. The present study deals with the assessment of extraction process and the effects of pH (1.0, 3.0, and 5.0), extraction media (water and 50% ethanol) and storage condition (ambient and refrigeration) on anthocyanin content and degradation kinetics of total anthocyanin in the peel of eggplant. Maximum amount of anthocyanin content was obtained in water and 50% ethanol (247.02 ± 2.98)and (190.51 ± 3.40)mg/100g respectively at pH 3.0 followed by pH 1.0 and pH 5.0. Better results for kinetic parameters (t1/2, %R) were noticed at lower pH for water followed by 50% ethanol at refrigeration temperature. Anthocyanin degradation was accelerated at ambient atmospheric temperature (30 ± 2)° C than in refrigeration storage condition. PH, storage time and temperature affected the stability of anthocyanin. Experience of this research work suggests that anthocyanin from the peel of eggplant may be an excellent source to meet up the increasing need of natural colorants. The extracted anthocyanin from the peel of eggplant was also used to prepare guava jelly and investigate the changes in moisture content, ash content, acidity, reducing sugar, non-reducing sugar, total sugar and total soluble solids (TSS). The result showed that no significant changes in moisture content (28.72 ± 1.64)%, ash content (0.67 ± 0.01)%, acidity (0.35 ± 0.01)%, reducing sugar (27.08 ± 1.98)%, non-reducing sugar (35.81 ± 1.15)%, total sugar (62.89 ± 3.10)% and total soluble solids (66.00 ± 1.00) °brix of guava jelly due to addition of anthocyanin.