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Abba and Maa

## DECLARATION BY THE CANDIDATE

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I hereby declare that the thesis entitled “**Atmospheric Cold Plasma Assisted Processing of Orange Juice**” is being submitted to the **School of Engineering, Tezpur University, Tezpur, Assam** in partial fulfilment of the requirements for the award of the degree of **Doctor of Philosophy** in the **Department of Food Engineering and Technology** is a record of research work accomplished by me under the supervision of **Prof. Brijesh Srivastava**.

All helps from various sources haven been duly acknowledged.

No part of the thesis has been submitted elsewhere for the award of any degree.

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Date: 09/04/2025

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### **CERTIFICATE OF THE SUPERVISOR**

This is to certify that the thesis entitled “**Atmospheric Cold Plasma Assisted Processing of Orange Juice**” submitted to the **School of Engineering, Tezpur University** in partial fulfilment of the requirements for the award of the degree of **Doctor of Philosophy** in the **Department of Food Engineering and Technology** is a record of original research work carried out by **Mr. Sahijul Islam** under my supervision and guidance.

All help received by him from various sources have been duly acknowledged.

No part of this thesis has been submitted elsewhere for award of any degree.

Date: 09/04/2025

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*Sahijul Islam*  
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Date: 09/04/2025

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## LIST OF ABBREVIATIONS

Abbreviations	Full form
CP	Cold plasma
ACP	Atmospheric cold plasma
NE	Northeast
GI	Geographical indication
RF	Radio frequency
GAD	Gliding arc discharge
DBD	Dielectric barrier discharge
UV	Ultraviolet
ROS	Reactive oxygen species
RONS	Reactive oxygen-nitrogen species
DNA	Deoxyribonucleic acid
RSM	Response surface methodology
DPPH	2,2-diphenyl-1-picrylhydrazyl
FCR	Folin-Cocteau reagent
PME	Pectin methylesterase
RA	Residual activity
AA	Ascorbic acid
TSS	Total soluble solids
TA	Titrateable acidity
TPC	Total phenolic content
CCRD	Central composite rotatable design
BI	Bioaccessibility index
CV	Coefficient of variations
SD	Standard deviation
LBA	Luria-Bertani broth agar
PDA	Potato dextrose agar
NA	Nutrient agar
TVC	Total viable counts
YMC	Yeast and mold counts

BAM	Bacteriological Analytical Manual
FDA	Food and drug administration
CFU	Colony forming unit
RMSE	Root means square error
AIC	Akaike information criterion
MA	Modified atmosphere
GAE	Gallic acid equivalent
EC	Electrical conductivity
SPSS	Statistical Package for Social Sciences
DoE	Design of experiments
ANOVA	Analysis of variance

## LIST OF SYMBOLS

Symbols	Full form
mg	Milligram
g	Gram
kV	Kilovolt
mm	Millimeter
mL	Milliliter
%	Percentage
°C	Degree Celsius
$\sigma^2$	Variance
$\mu\text{m}$	Micrometer
$\beta$	Shape factor
$\delta$	Scale factor
cv	Cultivar
h	Hour
min	Minute
s	Second
U	Unit
$\Delta_i$	Akaike Increment
$A_f$	Actual factor
$B_f$	Bias factor
°B	Degree brix
$\Delta E$	Total colour difference
$R^2$	Coefficient of determination
ppm	Parts per million
cm	Centimeter
Q	Flowrate