

DEDICATED TO MAA AND PAPA

DECLARATION

The thesis entitled “**Quality Profiling and Valorization of Tamarillo (*Solanum betaceum*) of North East India**” is being submitted to the Tezpur University in partial fulfilment for the award of the degree of Doctor of Philosophy in ***Food Engineering and Technology*** is a record of bonafide research work accomplished by me under the supervision of Prof. Charu Lata Mahanta.

All assistance received from various sources have been appropriately acknowledged. No part of this thesis has been submitted elsewhere for award of any other degree

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CERTIFICATE OF THE SUPERVISOR

This is to certify that the thesis entitled “*Quality Profiling and Valorization of Tamarillo (Solanum betaceum) of North East India*” submitted to the **School of Engineering, Tezpur University** in partial fulfilment for the award of the degree of **Doctor of Philosophy in Food Engineering and Technology**, is a record of research work carried out by **Shubham Rohilla** under my supervision and guidance.

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

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

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List of Abbreviation

ABTS	2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid)
Adj.	Adjusted
ALB-F	Egg albumin-Foam
ALB-P	Egg albumin-Powder
ANOVA	Analysis of variance
AV	Acid Value
BBD	Box Behnken Design
<i>BC</i>	<i>Bacillus cereus</i>
BHT	Butylated hydroxytoluene
C3G	Cyanindin-3-glucoside
DPPH	2,2-diphenyl-1-picrylhydrazyl
EC	<i>Escherichia coli</i>
EE	Encapsulation Efficiency
GAE	Gallic Acid Equivalent
GEL-F	Gelatin Foam
GEL-P	Gelatin Powder
HPH	High Pressure Homogenization
HPLC	High performance Liquid Chromatography
HSD	High Shear Dispenser
LDPE	Low Density Polyethylene
LM	<i>Listeria monocytogenes</i>
NE	Nanoemulsions
PDI	Polydispersity Index
PS	Particle size
PV	Peroxide Value

QE	Quercetin Equivalent
RCCD	Rotatable Central Composite Design
RMSE	Root Mean Square Error
ROS	Reactive oxygen species
RSM	Response Surface Methodology
SA	<i>Staphylococcus aureus</i>
SCFE	Supercritical Fluid Extraction
SEM	Scanning Electron Microscopy
SPC-F	Soy Protein Concentrate Foam
SPC-P	Soy Protein Concentrate Powder
SSE	Error sum of squares
TCC	Total Carotenoids Content
TE	Trolox Equivalent
TEM	Transmission Electron Microscopy
TFC	Total Flavonoids content
TMAC	Total Monomeric Anthocyanin Content
TMC	Total Microbial Count
TPC	Total Phenolic content
TSS	Total Soluble Solids
UAE	Ultrasound Assisted Extraction
US	Ultrasound
UV-Vis	Ultraviolet Visible
WPC-F	Whey Protein Concentrate Foam
WPC-P	Whey Protein Concentrate Powder
β-CE	Beta Carotene Equivalent

List of Symbols and Units

%	percentage
°C	degree Celsius
µl	micro litres
µm	micrometre
L*	Lightness
a*	redness
b*	yellowness
A _o	absorbance of blank
A _s	absorbance of sample
CFU/g	colony forming unit per gram
cm	centimetre
cm ⁻¹	per centimetre
dw	dry weight
eq	equation
fw	fresh weight
µg/g	microgram per gram
g	gram
g/g	gram per gram
g/mL	grams per millilitres
h	hour
kg	kilogram
M	molar
min	minutes
mL	millilitres
mm	millimetres

nm	nanometre
R^2	coefficient of determination
rpm	rotation per minute
s	seconds
U/mL	units per millilitre
v/v	volume by volume
w/v	weight per volume
w/w	weight by weight
ζ	Zeta potential
λ	wavelength
CO ₂	carbon di oxide
MPa	Mega Pascal
mV	millivolt
ΔE	Total colour difference