

*Dedicated to My Lovely Family...*

*and*

*To My Supervisor*

### Declaration by the candidate

The thesis entitled “Valorisation of oilseed meals for development of biopolymeric films and biodegradable plates using natural gums and plant fibres” is being submitted to School of Engineering, Tezpur University in partial fulfilment for the award of the degree of Doctor of Philosophy in the Department of Food Engineering and Technology is a record of bonafide research work accomplished by me under the supervision of Prof. Laxmikant Shivnath Badwaik.

All helps from various sources have been duly acknowledged.

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

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Certificate of the Supervisor

This is to certify that the thesis entitled “Valorisation of oilseed meals for development of biopolymeric films and biodegradable plates using natural gums and plant fibres” submitted to School of Engineering, Tezpur University in partial fulfilment for the award of the degree of Doctor of Philosophy in the Department of Food Engineering and Technology is a record of research work carried out by Ms. Ruchi Rani (Roll No. FEP18102) under my supervision and guidance.

All helps received by her from various sources have been duly acknowledged.

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

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## List of Abbreviations

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SEM	Scanning electron microscopy
FTIR	Fourier Transform Infrared Spectroscopy
XRD	X-Ray diffraction analysis
AOAC	Association of Official Agricultural Chemists
ANOVA	Analysis of Variance
WAC	Water absorption capacity
OAC	Oil absorption capacity
FC	Foam capacity
FS	Foam stability
EC	Emulsion capacity
ES	Emulsion stability
DSC	Differential Scanning Calorimetry
TGA	Thermogravimetric Analysis
AG	Acacia gum
XG	Xanthan gum
GL	Glycerol
FFD	Full factorial design
CAF	Citric acid incorporated biopolymeric film
GLF	Glutaraldehyde incorporated biopolymeric film
TSM	Total soluble matter
WVTR	Water vapour transmission rate
WVP	Water vapour permeability
SPSS	Statistical Package for the Social Sciences
IBM	International Business Machines
MPa	Mega Pascal
G	Gram
S	Second
M	Metre
PRESS	Sum of square
R <sup>2</sup>	Coefficient of variance
Pa	Pascal

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| OG | Oilseed meal-gums biopolymeric film |

CA	Citric acid
mm	Millimetre
cm	Centimetre
CMC	Carboxymethyl cellulose
J/g	Joule per gram
° C	Degree celsius
%	Percentage
T <sub>g</sub>	Glass transition temperature
T <sub>O</sub>	Onset temperature
T <sub>e</sub>	End temperature
T <sub>m</sub>	Melting temperature
ΔH	Enthalpy
rpm	Revolutions per minute
min	Minute
w/w	Weight by weight
h	Hour
LDPE	Low density polyethylene
OGCF	Oilseed meals- gum crosslinked biopolymeric film
BET	Brunauer-Emmett-Teller
BJH	Barrett-Joyner-Halenda
BSF	Banana pseudostem
CC	Coconut coir
SBF	Sugarcane bagasse fibre
DLS	Dynamic light scattering
a*	Redness
b*	Blueness
L*	Lightness
P <sub>sx</sub>	Pseudo-component of each component
C <sub>x</sub>	Real concentration
a <sub>y</sub>	Lower limit of real component
Σa <sub>y</sub>	Sum of lower limit of components
Y	Responses of the method
β <sub>s</sub>	Parameters of linear product of model

$\gamma_s$	Parameters of crosslinked product of model
DTG	Derivative thermogravimetry
K	Kelvin
ADF	Acid detergent fibre
NDF	Neutral detergent fibre
nm	Nanometre
WI	Whiteness index
BPBS	Biodegradable plates added with banana pseudo-stem fibres
BPCS	Biodegradable plates added with coconut coir fibres
BPSB	Biodegradable plates added with sugarcane bagasse fibres
N	Newton

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