

**STUDIES ON IMMOBILIZATION TECHNIQUES FOR
DEXTRANASE ENZYME AND ITS APPLICATION IN
FOOD INDUSTRY**

By

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5. SUMMARY

The presence of *Leuconostoc mesenteroides* and *Leuconostoc* species in sugarcane juice in sugar factories causes loss of sucrose and formation of dextran (polysaccharide) which interferes in sugar manufacturing process in addition to the loss of sucrose. The problems caused, the loss of sucrose, increase in viscosity of process syrups, and poor recovery of sucrose due to inhibition of crystallization.

Many microorganisms produced dextranase such as yeast, bacterial, and fungal strains which are capable to remove the dextran. The present study was carried out to evaluate the production, extraction and purification of dextranase from some microbial strains and studying the characteristics of chosen enzyme. The immobilization techniques by different supports, the stability and characterization of the immobilized dextranase and its application in sugarcane along with its economic costs were also studied.

The obtained results are summarized as:

1. Microbial Production of Dextranase:

1. Six microbial strains *Penicillium funiculosum* NRRL-6014; *Penicillium aculeatum* NRRL-896; *Bacillus subtilis* M-15; *Leconostoc dextranicus* B-512 FM; *Saccharomyces cerevisiae* YSF-5 and *Lipomyces starky* ATCC-12659 were used to produce dextranase (α -I,6-glucan 6-glucano-hydrolase, EC 3.2.1.11) on basal medium contained dextran. The dextranase produced from fungal strain (*P. aculeatum*) showed the highest activity after 7 days incubation period (101250.00 units/100ml) compared to the other fungal strain (*P. funiculosum* NRRL-6014) or the five microbial strains i.e. *Bacillus subtilis* M-15; *Leconostoc dextranicus* B-512 FM; *Saccharomyces cerevisiae* YSF-5 and *Lipomyces starky* ATCC-12659 being 2985.03, 27591.49, 1078.18 and 744.61 units/100 ml, after 10, 7, 4 and 10 days, respectively.

Approval Sheet

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CONTENTS

LIST OF TABLES.....	viii
LIST OF FIGURES.....	x
LIST OF ABBREVIATIONS	xiii
1. INTRODUCTION.....	1
2. REVIEW OF LITERATURE	8
2.1. Microbial production of dextranase	8
2.1.1. From yeast	8
2.1.2. From fungi	8
2.1.3. From bacteria	11
2.2. Extraction and purification of dextranase	13
2.2.1. From yeast	13
2.2.2. From fungi	14
2.2.3. From bacteria.....	15
2.3. Characterization of purified dextranase.....	16
2.3.1. From yeast.....	16
2.3.2. From fungi.....	17
2.3.3. From bacteria.....	18
2.4. Immobilization of dextranase	20
2.4.1. The components of an immobilization enzyme system .	22
2.4.1.1. Immobilization carrier (support) materials.....	22
2.4.1.1.1. Organic carriers.....	22
2.4.1.1.1.1. Natural polymer.....	22
2.4.1.1.1.2. Synthetic polymers.....	25
2.4.1.1.2. Inorganic carriers.....	27
2.4.1.2. Activation of carriers used.....	29
2.4.1.3. Immobilization methods	33
2.4.2. Immobilization techniques	34
2.4.2.1. From yeast.....	34
2.4.2.1.1. Adsorption.....	34
2.4.2.1.2. Entrapment.....	35

2.4.2.1.3.	Covalent binding.....	35
2.4.2.1.4.	Cross-linking.....	36
2.4.2.2.	From fungi.....	36
2.4.2.2.1.	Adsorption.....	36
2.4.2.2.2.	Entrapment.....	37
2.4.2.2.3.	Covalent binding.....	38
2.4.2.2.4.	Cross-linking.....	38
2.4.2.3.	From bacteria.....	39
2.4.2.3.1.	Adsorption.....	39
2.4.2.3.2.	Entrapment.....	40
2.4.2.3.3.	Covalent binding.....	41
2.4.2.3.4.	Cross-linking.....	43
2.5.	Characterization of the immobilized enzyme.....	44
2.5.1.	From yeast.....	44
2.5.2.	From fungi.....	45
2.5.3.	From bacteria.....	48
2.6.	Applications.....	51
2.6.1.	Application of free dextranase in pharma-ceutical	51
2.6.1.1.	Clinical application	51
2.6.1.2.	Dental plaque applications	51
2.6.2.	Dextranase applications in sugarcane processing	52
2.6.3.	Immobilized dextranase applications in sugar-cane processing	59
3.	MATERIALS AND METHODS.....	62
3.1.	MATERIALS	62
3.1.1.	Microbial strains and media	62
3.1.2.	Chemicals.....	62
3.1.3.	Carriers.....	62
3.1.4.	Application Samples.....	63
3.2.	METHODS	63
3.2.1.	Production of crude dextranase from different microbial Strains.....	63

3.2.1.1.	From yeast strains.....	63
3.2.1.2.	From fungal strains.....	64
3.2.1.3.	From bacterial strains.....	66
3.2.2.	Effect of different carbon and nitrogen sources on the production of dextranase.....	67
3.2.2.1.	Carbon sources.....	67
3.2.2.2.	Nitrogen sources.....	67
3.2.3.	Dextranase activity.....	68
3.2.4.	Protein determination.....	69
3.2.5.	Determination of maltose.....	69
3.2.6.	Extraction and purification of dextranase.....	70
3.2.7.	Characteristics of the purified dextranase.....	71
3.2.7.1.	Amino acid analysis of the purified dextranase.....	71
3.2.7.2.	Electrophoresis and molecular weight of dextranase....	72
3.2.7.3.	Optimum pH & temperature of dextranase.....	72
3.2.7.4.	Thermostability of dextranase.....	72
3.2.7.5.	pH stability of dextranase.....	72
3.2.7.6.	Inhibitory effects of saccharides on dextranase.....	72
3.2.7.7.	Effect of stabilizing agents on dextranase.....	73
3.2.7.8.	Effect of different concentrations of dextran on dextranase activity.....	73
3.2.7.9.	Effect of different metals on dextranase activity	73
3.2.7.10.	K_m , V_{max} and activation energy of dextranase.....	74
3.2.8.	Immobilization techniques of <i>P. aculeatum</i> NRRL-896 dextranase.....	74
3.2.8.1.	Preparation of carriers via ultrasonicator.....	74
3.2.8.2.	Transmission Electron Microscopy.....	75
3.2.8.3.	Adsorption technique.....	75
3.2.8.3.1.	On Bentonite carrier.....	75
3.2.8.4.	Adsorption with cross-linking technique.....	76
3.2.8.4.1.	On silica gel carrier.....	76
3.2.8.5.	Entrapment technique.....	77

3.2.8.5.1.	On Polyacrylamide gel carrier.....	77
3.2.8.5.2.	On Alginate beads carrier.....	77
3.2.8.5.3.	On Hydroxyapatite carrier.....	78
3.2.8.5.3.1.	Untreated carrier with ultrasonicator.....	78
3.2.8.5.3.2.	Treated carrier with ultrasonicator.....	78
3.2.8.6.	Covalent binding technique.....	78
3.2.8.6.1.	On Chitosan.....	78
3.2.8.7.	Covalent binding with cross-linking technique.....	79
3.2.8.7.1.	On Activated charcoal carrier.....	79
3.2.8.8.	Cross-linking technique.....	79
3.2.8.8.1.	On Carboxy Methyl Cellulose (CMC) carrier.....	79
3.2.8.8.1.1.	Untreated carrier with ultrasonicator.....	79
3.2.8.8.1.2.	Treated carrier with ultrasonicator.....	80
3.2.8.9.	New immobilization technique for <i>P. aculeatum</i> NRRL-896 dextranase by using oyster mushroom stem (by-product) as a carrier	80
3.2.8.9.1.	Unmodified stem carrier.....	80
3.2.8.9.2.	Cross-linking technique.....	81
3.2.8.9.3.	Covalent binding technique by cyanogens bromide	81
3.2.8.9.4.	Covalent binding technique by carbodiimide.....	81
3.2.9.	Characteristics of immobilized dextranase.....	82
3.2.9.1.	Immobilized dextranase activity.....	82
3.2.9.2.	Optimum pH for immobilized dextranase.....	82
3.2.9.3.	Optimum temperature for immobilized dextranase.....	82
3.2.9.4.	Effect of different sugars on immobilized dextranase....	82
3.2.9.5.	Effect of different metals on immobilized dextranase...	83
3.2.9.6.	Operational and storage stabilities.....	83
3.2.9.7.	Determination the half-life ($t_{1/2}$) of dextranase	83
3.2.10.	Application of immobilized dextranase in sugarcane....	84
3.2.10.1.	°Brix measurement.....	84
3.2.10.2.	Determination of dextran in sugarcane (juice or syrups)	84
3.2.10.3.	Viscosity.....	85

3.2.10.4.	Effect of free and immobilized dextranase on the removal of dextran in juice and final evaporator sugarcane syrup.....	85
3.2.10.5.	Effect of free and immobilized dextranase on the reduction of viscosity in final evaporator sugarcane syrup	86
3.2.10.6.	Effect of biocide on reactivity of dextranase.....	86
3.2.10.7.	Storage Characteristics of free and immobilized dextranases	86
4.	RESULTS AND DISCUSSION.....	87
4.1.	Microbial production of dextranase	87
4.1.1.	Effect of different carbon sources on the production of enzyme	89
4.1.2.	Effect of different nitrogen sources on the production of dextranase.....	90
4.2.	Extraction and purification of dextranase from <i>Penicillium aculeatum</i> NRRL-896.....	91
4.2.1.	Extraction of crude enzyme.....	91
4.2.2.	Purification of dextranase.....	92
4.2.3.	Molecular-weight of purified dextranase by SDS-PAGE	94
4.3.	Characteristics of purified dextranase from <i>Penicillium aculeatum</i> NRRL-896.....	96
4.3.1.	Amino acid analysis.....	96
4.3.2.	Optimum temperature of dextranase	97
4.3.3.	Optimum pH of dextranase	98
4.3.4.	Thermostability of dextranase	99
4.3.5.	pH stability of dextranase.....	100
4.3.6.	Inhibitory effects of saccharides on dextranase activity.	101
4.3.7.	Effect of different concentrations of stabilizing agents on the dextranase activity.....	103
4.3.8.	Effect of different concentrations of dextran (M.W.	

	40,000 Da) on dextranase activity.....	105
4.3.9.	Effect of different metals on dextranase activity.....	106
4.3.10.	K_m , V_{max} and activation energy of dextranase	107
4.4.	Immobilization techniques of <i>P. aculeatum</i> NRRL-896 dextranase.....	108
4.4.1.	Adsorption technique.....	108
4.4.2.	Entrapment technique.....	112
4.4.3.	Covalent binding technique.....	115
4.4.4.	Cross-linking technique.....	119
4.4.5.	New immobilization technique for <i>P. aculeatum</i> NRRL- 896 dextranase by using oyster mushroom stem (by- product) as a carrier	122
4.4.5.1.	Adsorption technique.....	122
4.4.5.2.	Cross-linking technique.....	124
4.4.5.3.	Covalent binding techniques by cyanogens bromide and carbodiimide	125
4.4.6.	Comparative studies between immobilization techniques	128
4.5.	Characterization of immobilized dextranase.....	130
4.5.1.	Optimum pH and stability of immobilized dextranase...	130
4.5.2.	Optimum temperature and thermal stability of immobilized dextranase	132
4.5.3.	Effect of different sugars on immobilized dextranase....	135
4.5.4.	Effect of different metals on immobilized dextranase...	136
4.5.5.	K_m and V_{max} of immobilized dextranase	137
4.5.6.	The activation energy (E_a) for free and immobilized dextranase	139
4.5.7.	The half-life time ($t_{1/2}$) of immobilized dextranase	139
4.5.8.	Properties of oyster mushroom stem immobilized dextranase	140
4.6.	Applications of dextranases in laboratory	141
4.6.1.	Initial laboratory studies for optimized dextranases	

	factory application	141
4.6.2.	Effect of °Brix on free and immobilized dextranase activity	142
4.6.3.	Effect of free and immobilized dextranase on removal of dextran in final evaporator sugarcane syrup	143
4.6.4.	Effect of free and immobilized dextranase on reduction of viscosity in final evaporator sugarcane syrup	144
4.6.5.	Effect of free and immobilized dextranase on removal of dextran from sugarcane juice at 32 °C	145
4.6.6.	Effect of free and immobilized dextranase on removal of dextran from sugarcane juice at 55 °C.....	146
4.6.7.	Addition of free or immobilized dextranase to sugarcane juice in the presence of biocide (dithiocarbamate)	148
4.6.8.	Effect of storage of free and immobilized dextranase under simulated factory conditions.....	149
4.6.8.1.	Storage stability of dextranases at room temperature ...	150
4.6.8.2.	Storage stability of dextranases under refrigeration (4 °C)	151
4.6.9.	The reuse of immobilized dextranase by batch processing.....	151
4.6.10.	Economic costs of different dextranase applications	153
	5. SUMMARY.....	155
	6. REFERENCES.....	164
	7. ARABIC SUMMARY.....	---

LIST OF TABLES

No	Title	Page
1	Reactive residues of dextranase.....	31
2	Functionalized supports for dextranase immobilization.....	32
3	Dextranase activity (unit/100ml) of the culture filtrates of the microbial isolates at different incubation periods	88
4	Effect of different carbon sources on the production of <i>Penicillium aculeatum</i> NRRL-896 dextranase.....	90
5	Effect of different nitrogen sources on the production of <i>Penicillium aculeatum</i> NRRL-896 dextranase.....	91
6	Purification scheme for dextranase from <i>Penicillium aculeatum</i> NRRL-896.....	92
7	Amino acid analysis of purified dextranase from <i>Penicillium aculeatum</i> NRRL-896 per mg/g protein.....	97
8	Effect of different metals on dextranase activity.....	106
9	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase by adsorption techniques	110
10	The overall performance of the free and immobilized dextranase by adsorption techniques	110
11	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase by entrapment techniques	113
12	The overall performance of the free and immobilized dextranase by entrapment techniques	113
13	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase by covalent binding techniques	117
14	The overall performance of the free and immobilized dextranase by covalent binding techniques	117
15	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase on CMC by cross-linking technique	120
16	The overall performance of the free and immobilized dextranase on CMC by cross-linking technique	120

17	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase by adsorption on oyster mushroom stem	122
18	The overall performance of free and immobilized dextranase by adsorption technique on oyster mushroom stem	123
19	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase on oyster mushroom stem by cross-linking via amino groups, using glutaraldehyde	124
20	The overall performance of free and immobilized dextranase by cross-linking technique on modified stem mushroom via amino groups using glutaraldehyde	125
21	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase by covalent binding on oyster mushroom stem modified by cyanogen bromide (CNBr) or carbodiimide	127
22	The overall performance of the free and immobilized dextranase by covalent binding on oyster mushroom stem modified by cyanogen bromide (CNBr) or carbodiimide	127
23	Immobilization of <i>P. aculeatum</i> NRRL-896 dextranase on different carriers	129
24	Effect of different sugars on free and immobilized dextranase	135
25	Effect of different metals on dextranase activity.....	137
26	Properties of free and immobilized dextranase on stem carrier.....	140
27	Composition of juice and final evaporator sugarcane syrup from an Abu Kerkas factory.....	142
28	Cost-effective calculations for different dextranase applications ...	153

LIST OF FIGURES

No	Title	Page
1	Basic chemical structure of dextran (α -(1 \rightarrow 6)- α -D-glucan).....	2
2	The principle of dextranase action on high MW dextran	4
3	Structure of carboxy methyl cellulose	22
4	Structure of chitosan	23
5	Structure of sodium Alginate	24
6	Structure of charcoal	25
7	Structure of polyacrylamide	26
8	Structure of hydroxyapatite	27
9	Structure of bentonite	28
10	Scheme structure of silica gel support	29
11	Extraction of dextranase from both yeast strains	64
12	Extraction of dextranase from both fungal strains	65
13	Extraction of dextranase from both bacterial strains	67
14	Standard curve obtained with various dilution of maltose solution	70
15	Extraction and purification steps of dextranase from <i>Penicillium aculeatum</i> NRRL-896	71
16	A schematic diagram of the ultrasonic device	75
17	Standard curve of haze dextran (MW 40,000 Da)	85
18	Effect of incubation period on dextranase production by different microbial strains	89
19	Chromatogram of crude <i>Penicillium aculeatum</i> NRRL-896 dextranase on DEAE-sepharose fast flow	93
20	Elution profiles for protein and dextranase activity on Sephadex G-100.....	94
21	Electrophoresis analysis of purified dextranase from <i>Penicillium aculeatum</i> NRRL-896.....	95
22	Molecular-weight estimations by SDS-PAGE.....	96
23	Effect of temperature on dextranase activity.....	98