value of crosslinker concentration, aggregation of MCs occur. This decreases the EE. It was found that the number density of the capsules increases and the thickness of the wall of capsules decreases with increasing oil load due to the low efficiency of the dispersion force. This increases the release rate. The thickness of the wall of capsules increases with increasing polymer concentration as excess of polymer is present to cover the oil vesicles thus decreasing release rate of the oil from MCs. The release rate also decreased with increasing crosslinker concentration as the microcapsule wall become more compact.

FTIR spectra of oil encapsulated MC and empty MC were more or less the same hence proving successful encapsulation of lemongrass oil in chitosan. The highest EE and release rate was observed at polymer (1 g), oil (3 g) and cross linker (0.5 g) thus concluding the optimum formulation for lemongrass oil loaded MCs.

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Reference

1. T. K. M. N. Devi, 2009, *Journal of Applied Polymer Science*, **113**, 1576–1583.
2. D. Hou, R. Gui, S. Hu, Y. Huang, Z. Feng, and Q. Ping, 2015, *Advances in Nanoparticles*, **4**(3), 70–84.

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Potential of *Barringtonia asiatica* seed kernel extracts as antifungal agents

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Candida species are leading opportunistic fungal pathogens causing infections in humans. Development of resistance to existent anti mycotic drugs cause the need for development of new agents against *candida*. Antimicrobial activity has been reported in methanolic extracts of bark and leaves of *Barringtonia asiatica*. Our previous work indicated the presence of phenolic compounds and cytotoxic potential in the methanolic extract of *B. asiatica* seeds. This study aims to assess the potential of antifungal activity of the crude methanolic extract (CME, 15 g powder / 40 ml MeOH; 24 hrs; dried at 45 ^{0}C) and a fraction obtained from CME run through the Medium pressure liquid chromatography (MPLC) using different solvent gradients. CME and a fraction obtained from MPLC were tested for antifungal activity against standard type strains of *Candida albicans* (10231), *Candida tropicalis* (32113), *Candida parapsilosis* (7330), *Candida glabrata* (90030) and their clinical isolates. The antifungal assays were done with CME (1500 ppm) or MPLC fraction (1000 ppm), flucanozol [positive control, 50000 ppm (50 mg / mL)] and dimethyl sulfoxide DMSO (negative control, 5%)) using Mueller Hinton Agar (MHA) medium and the zone of inhibition was measured after incubation at 37 oC for 24 hours. Table 1 shows antifungal activity against selected *Candida* (ATCC) and their clinical isolates. Both CME and MPLC fraction inhibited the growth of ATCC strains except for *C. tropicalis* showed inhibition of growth at lower concentration than flucanozol. All clinical isolates of *C. albicans* and *C. glabrata* were inhibited by CME and MPLC fraction. Expect for one clinical isolate, CME inhibited the growth of C. tropicalis even though CME did not inhibit the ATCC strain. Both CME and MPLC were not active against most of the clinical isolates of *C. parapsilosis* at the given concentration. The isolates MPLC fraction (1000 ppm) indicated significantly high inhibition zones compared with CME in most of the strains and clinical isolates ($p \leq 0.05$) at these concentrations. Seed of *B. asiatica* CME and the MPLC fraction inhibited the growth of tested Candida ATCC strains except for *C. parapsilosis* and clinical isolates of all four Candida strains at a lower concentration when compared with the positive control flucanozol. Therefore, CME and MPLC fraction of *B. asiatica* have a high potential to be developed as an anti fungal agent.
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Table 1: Results of antifungal activity against selected *Candida* (ATCC) and their clinical isolates.

Candida	Crude methanolic extract		Fraction from MPLC	
	Crude (mm, 1500 ppm)	**Flucanozol (mm, 50000ppm)**	**MPLC fraction (mm, 1000 ppm)**	**Flucanozol (mm, 50000 ppm)**
Candida albicans	13 ± 0.58a	28 ± 2.89	15 ± 0.00b	20 ± 0.00
Clinical isolated *C. albicans*				
37HA	13 ± 0.58a	48 ± 5.86	14 ± 1.15b	48 ± 2.52
41HA	10 ± 0.58a	43 ± 1.53	14 ± 0.58b	42 ± 3.50
36H	10 ±0.58a	40 ± 0.0	9 ± 0.58a	42± 1.53
17H	11 ± 1.15a	40 ± 0.58	14± 0.58b	45 ± 0.00
13H	12 ± 0.00a	42 ± 2.89	14 ± 0.58b	45 ± 1.00
Candida tropicalis	0 ±0.00c	48 ± 0.58	10 ± 0.00d	46 ± 1.00
Clinical isolated *C. tropicalis*				
162A	0 ± 0.00c	11 ± 1.53	12 ± 1.53d	22 ± 2.31
166	12 ± 1.00c	16 ± 0.58	13 ± 0.58c	15 ± 0.58
161A	12 ± 2.08c	41 ± 2.65	14 ± 1.00c	44 ± 0.58
167	11 ± 0.58c	18 ± 1.53	13 ± 1.16c	19 ± 1.15
165B	12 ± 0.58c	19 ± 1.00	13 ± 1.53c	21 ± 0.58
Candida glabrata	15 ± 0.00e	23 ± 2.89	19 ± 0.00f	16 ± 0.58
Clinical isolated *C. glabrata*				
23B	10 ± 0.00e	50 ± 0.00	12 ± 0.58f	50 ± 2.00
32	15 ± 0.58e	41 ± 1.15	16 ± 0.00f	40 ± 0.00
193A	15 ± 0.58e	39 ± 1.15	18 ± 0.00f	41 ± 1.00
145B	14 ± 1.00e	41 ±1.15	17 ± 1.15f	37 ± 4.16
100B	16 ± 0.58e	39 ± 3.61	17 ± 0.58e	40 ± 0.00
Candida parapsilosis	10 ± 0.00g	42 ± 0.58	11 ± 0.58h	43 ±1.73
Clinical isolated *C.parapsilosis*				
14B	0 ± 0.00g	50 ± 0.58	14 ± 1.00h	48 ± 1.00
20	10 ± 0.00g	57 ± 2.89	11 ± 1.00g	62 ± 2.89
26A	0 ± 0.00	47 ± 3.46	0 ± 0.00	47 ± 0.58
109A	0 ± 0.00	51 ± 4.04	0 ± 0.00	47 ± 2.89
16C	0 ± 0.00	54 ± 3.21	0 ± 0.00	58 ± 1.53

Values are expressed as inhibition zone (mm) and an average ±SD. Same superscript along a row indicate no significant difference ($p \leq 0.05$)

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References

1. Bondaryk, M., W. Kurzątkowski, and M. Staniszewska, 2013, *Advances in Dermatology and Allergology*, **30**(5): p. 293-301.
2. Coleman, J.J., et al., 2010, *ACS chemical biology*, **5**(3): p. 321-332.
3. Khan, M. and A. Omoloso, 2002, *Fitoterapia*, **73**(3): p. 255-260.
4. Ragutharan, P. & Ekanayake, S., Scientific Session 2017, Faculty of Medical Sciences, University of Sri Jayewardenepura: PP 70-71.
5. Magaldi, S., et al., 2004, *International Journal of Infectious Diseases*, **8**(1): p. 39-45.