

Polyphenols Applications

From the waste of must clarification to the production of a high polyphenols' rich buccal film: new insight to treat oral oxidative stress-related pathologies

BACKGROUND



There are several pathologies affecting the oral mucosae which are based on an oxidative imbalance. Among them oral mucositis (OM) and oral lichen planus (OLP) are the main ones. As the current therapeutic options could result ineffective while also suffering from several other disadvantages, polyphenols can be ideal supporting candidates due to their wide range of biological activities including the antioxidant and anti-inflammatory ones¹. A rich source of natural polyphenols can be the black bentonite (BB) waste coming from white grape must filtration which, through virtuous recovery, can be treated to obtain a liquid polyphenols' enriched excipient useful for pharmaceutical applications².



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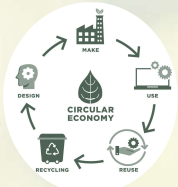
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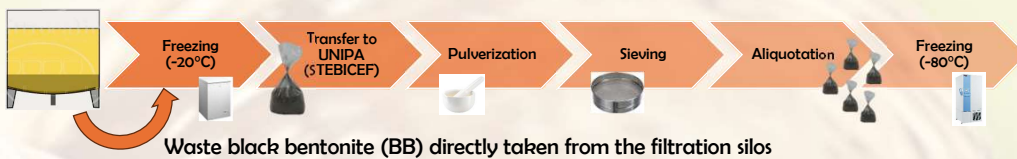
AIM

Obtaining a high polyphenols' rich novel raw material directly useful to be inserted into pharmaceutical formulations suitable for buccal administration and thus useful to treat the oral oxidative stress-related pathologies

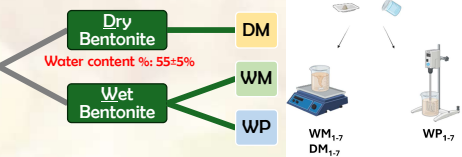
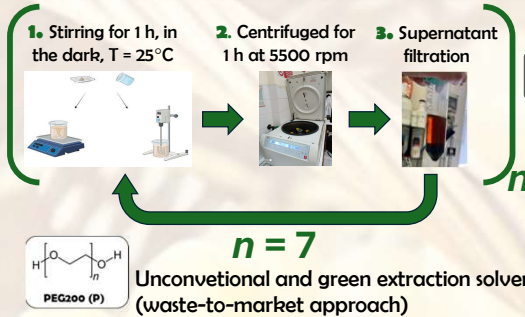


Waste recovery

Waste recovery



Multiple maceration

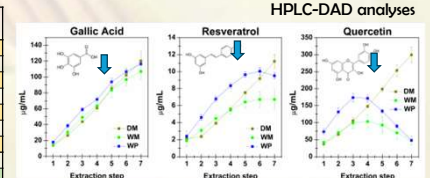


Formula code	Black bentonite (BB)	Solvent (S)	BB:S (w/w)	Mixing method
DM	Dry	PEG200	1:8	magnet
WM	Wet	PEG200	1:4	magnet
WP	Wet	PEG200	1:4	paddle

Best extract selection

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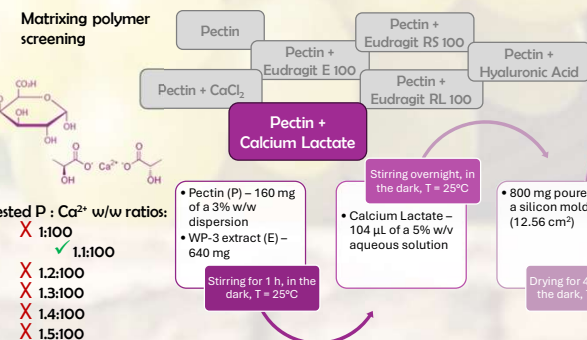
Sample	Solvent recovery %	Density (g/mL)	pH	TPC (mg/g)	TPC (mg/g)	GAE (mg/g)	
DM	DM-1	76.36±0.69	1.171±0.010	3.92±0.05	1.329±0.104	0.183±0.003	0.309±0.052
	DM-2	57.07±1.08	1.182±0.003	3.58±0.04	2.546±0.109	0.245±0.015	0.988±0.055
	DM-3	41.50±0.94	1.186±0.015	3.66±0.09	5.256±0.229	0.660±0.030	1.787±0.058
	DM-4	29.79±0.97	1.149±0.006	3.56±0.11	7.868±0.342	0.728±0.048	2.505±0.092
	DM-5	18.71±0.68	1.151±0.006	3.52±0.10	10.570±0.744	0.890±0.077	4.256±0.113
	DM-6	9.89±0.93	1.163±0.004	3.39±0.03	13.679±0.553	1.107±0.076	5.270±0.181
	DM-7	3.40±0.71	1.175±0.007	3.35±0.03	14.957±1.215	1.141±0.128	7.368±0.276
WM	WM-1	79.84±4.15	1.125±0.013	4.00±0.01	2.518±0.236	0.677±0.124	0.666±0.053
	WM-2	62.63±3.08	1.118±0.011	3.50±0.04	4.495±0.684	0.878±0.135	1.249±0.055
	WM-3	45.11±3.47	1.136±0.012	3.32±0.01	7.086±1.305	0.872±0.141	1.768±0.089
	WM-4	33.18±4.16	1.136±0.001	3.28±0.02	8.637±1.427	1.010±0.145	2.107±0.118
	WM-5	26.88±4.20	1.131±0.005	3.25±0.04	10.351±2.440	1.018±0.178	2.380±0.126
	WM-6	17.16±4.66	1.137±0.018	3.25±0.01	11.740±3.070	1.109±0.234	2.462±0.138
	WM-7	11.98±4.14	1.136±0.009	3.21±0.01	13.563±3.906	1.257±0.295	2.592±0.104
WP	WP-1	78.94±1.99	1.111±0.010	3.69±0.08	3.132±0.356	0.372±0.041	1.447±0.149
	WP-2	61.44±2.99	1.134±0.012	3.38±0.04	6.407±0.203	0.622±0.017	2.547±0.078
	WP-3	42.63±4.50	1.136±0.011	3.35±0.03	9.911±0.309	1.183±0.017	3.694±0.610
	WP-4	29.43±5.08	1.127±0.009	3.34±0.04	12.501±0.347	1.281±0.023	5.128±0.085
	WP-5	16.59±3.83	1.133±0.005	3.36±0.02	14.555±0.395	1.385±0.010	6.815±0.377
	WP-6	10.43±4.35	1.142±0.007	3.36±0.01	15.925±0.669	1.498±0.075	8.379±0.468
	WP-7	8.20±3.65	1.143±0.009	3.37±0.01	18.515±0.606	2.170±0.268	8.929±0.521



WP-3 is the best compromise between sufficient solvent recovery % and GAE

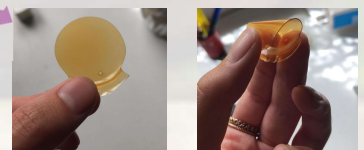
Buccal film formulation

Buccal film formulation



Buccal film characterization. Means (n = 6) ± standard error

Weight (mg)	[GA] (mg/cm ²)	[RSV] (mg/cm ²)	[QRC] (mg/cm ²)
663.4 ± 20.2	2.32 ± 0.26	0.27 ± 0.02	7.12 ± 0.35



Homogeneous & Deformable buccal film prototype!!

WORK IN PROGRESS

FUNDING

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REFERENCES

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