

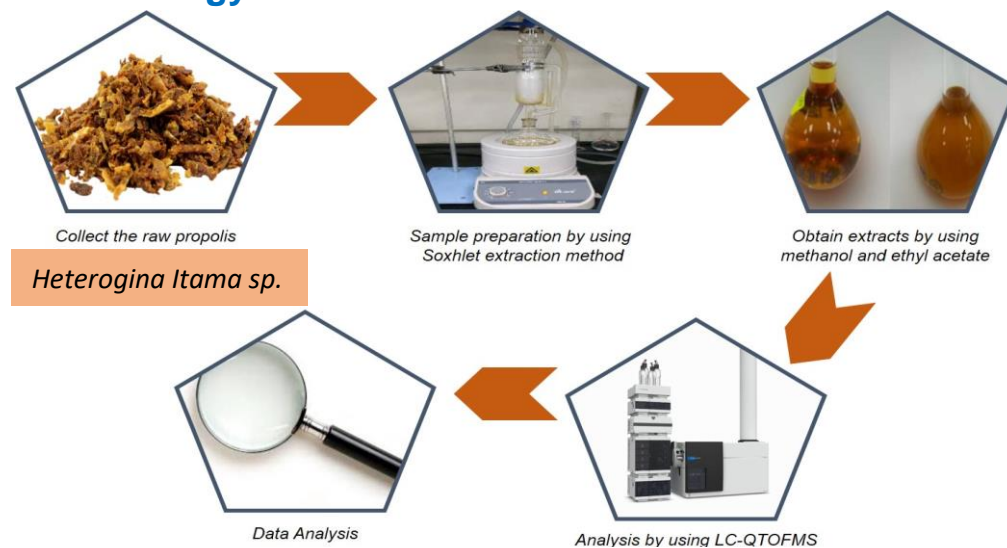
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Background of Study

- Propolis is a natural bee product which is resinous sticky wax (bee glue) that synthesized by the stingless bees from the mixtures of exudates of plants and bee enzymes.
- The chemical compounds of propolis mainly consists of phenolic acids and flavonoids. Since propolis has been consumed for ages as a traditional medicine and research on the Malaysia propolis is still lacking, this study was conducted.
- Therefore, propolis was ¹extracted by Soxhlet Extraction (using two different solvents) and ²determined their chemical profiling by using LC-QTOFMS which ³focusing on potential API that can be used in pharmaceutical product.

Methodology

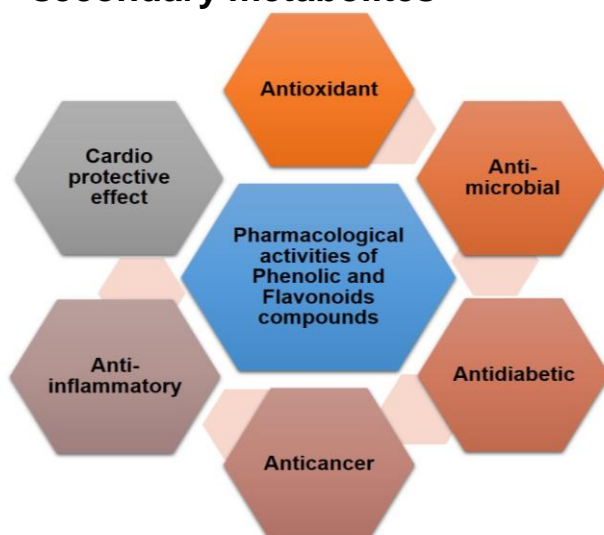


Novelty

- Due to its popularity in the treatment of various disease and its medicinal properties since the ancient times, propolis has been exposed to intense pharmacological studies in the last few decades.
- However, not much research has been done on extensively study the active compounds in Malaysia propolis.
- Several factors that influenced the composition of propolis: (1) The origin of plants sources (2) time of collection or seasons (3) type of extraction solvents used.
- New LC-Q-TOFMS has been applied to quickly identify compounds in propolis because it is not possible to rapidly identify all components by using conventional techniques.

Applicability of bioactive compounds in propolis extract

- Natural bioactive compounds as secondary metabolites



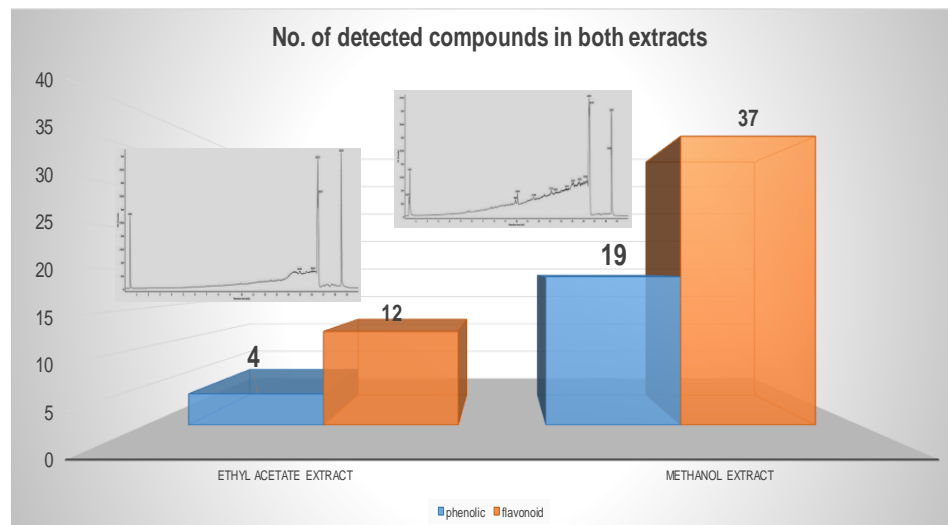
Status of Innovation

Research & Development phase

Single compound extracted only from Malaysia propolis

Pharmaceutical/ personal care / cosmetic product invention

Results & Discussion



*Methanol extracted more compounds compared to ethyl acetate

List of compounds detected in both ethyl acetate and methanol propolis extracts by LC-QTOFMS

Name of compounds	Retention time (min)	Observed neutral mass	Observed mass	Mass error (ppm)	Adducts
Phenolic					
3-Hydroxy-2,4,5-trimethoxydalbergiquinol	16.57	316.1317	317.1390	2	+H
Isoarundinin II	16.33	350.1533	351.1596	1.5	+H
Octahydrocurcumin	11.38	376.1885	399.1777	-0.2	+Na
Nobilin C	16.58	334.1422	335.1494	1.6	+H
Flavonoids					
Hinokiflavone	15.24	538.0903	539.0976	0.6	+H
Kurarinone	16.55	438.2054	439.2127	2.6	+H
Mahuannin J	12.37	556.1009	557.1082	0.6	+H
Bowdichione	16.46	298.0482	299.0554	1.4	+H
Licoricone	16.55	382.1419	393.1492	0.7	+H
Kushenol S	14.12	340.1313	363.1205	0.6	+Na
Methyl ophiopogonanone A	16.55	342.1099	343.1172	-1.2	+H
8-C-Prenylkaempferol	16.58	354.1105	355.1178	0.4	+H
Flavenochromane C	16.56	368.1263	369.1335	0.7	+H
Sophoranodichromane A	16.55	424.1888	425.1960	0.4	+H
Sanggenon H	16.47	354.1108	355.1181	1.3	+H

*The identification is based on accurate mass data with high resolution mass spectrometry (HRMS)

*Each compound has its biological activities.

HRMS with accurate mass data

Marketability & Commercialisation

- Potential of Malaysia Propolis as medicinal plant.
- Study of the composition leads to detection of bioactive compounds that unique to Malaysia propolis.
- Personal care/ pharmaceutical/ cosmetic products can be invented from the Malaysia propolis.

Environmental Impact

- Environmental factors (Temperature, humidity, light intensity) influenced the flying activity of stingless bee yet leads to different composition of propolis.



Industrial Partner



Publication

Comparison of total phenolic and flavonoids contents in Malaysian propolis extract with two different extraction solvents, *International Journal of Engineering Technology and Sciences* 6:2 (2019) 1 – 11 (Non-index Journal)