



KEMENTERIAN AIR, TANAH DAN SUMBER ASLI

TECHNICAL SERVICES

PHYTOCHEMISTRY PROGRAMME, NATURAL PRODUCTS DIVISION
FOREST RESEARCH INSTITUTE MALAYSIA (FRIM)

52109 KEPONG, SELANGOR, MALAYSIA

T: 603-62797330 F: 603-62729805

www.frim.gov.my

NO	TECHNICAL SERVICES	DESCRIPTION
1.	Quality Tests	<ul style="list-style-type: none">Colour test (H₂SO₄, HCl, NaOH, KOH, NH₄OH, FeCl₃).Ash content (total ash, acid-insoluble ash).Extractive value (water-soluble - hot/cold method, ethanol-soluble - hot/cold method).
2.	Phytochemical Screening Tests	<ul style="list-style-type: none">Detection of some important phytochemical constituents such as alkaloids, saponins, flavonoids, tannins, triterpenes and steroids that usually exhibit biological activities.
3.	Ultraviolet-Visible (UV-Vis) Spectroscopic Analysis	<ul style="list-style-type: none">Spectroscopic analysis for flavonoids, sugar, polysaccharide and saponin content in the raw material or extract.
4.	Infrared (IR) Spectroscopic Analysis	<ul style="list-style-type: none">Spectroscopic analysis for the structural elucidation and quality control of herbal materials and products.
5.	Nuclear Magnetic Resonance (NMR) Spectroscopic Analysis	<ul style="list-style-type: none">Spectroscopic analysis for the elucidation of chemical structures in combination with other spectroscopic techniques.Type of spectrum available includes ¹H, ¹³C and DEPT.
6.	High Performance Liquid Chromatographic (HPLC) Analysis	<ul style="list-style-type: none">General profiling with UV spectra of the major peaks in the chromatogram.Qualitative and quantitative detection of marker/reference/bioactive compounds which are important in the quality control of herbal products.
7.	Eurycomanone Analysis Using Ultra Pressure Liquid Chromatography (UPLC)	<ul style="list-style-type: none">Eurycomanone is one of the major quassinoids present in the roots of <i>Eurycoma longifolia</i> (Tongkat Ali) which has been used as a reference compound in the quality control of its derived products.Qualitative and quantitative analysis for various product forms such as the processed raw material, extract, beverage and pre-mixed coffee.
8.	High Performance Thin Layer Chromatographic (HPTLC) Analysis	<ul style="list-style-type: none">General profiling with UV spectra of the major peaks in the chromatogram.Qualitative and quantitative detection of marker/reference/bioactive compounds which are important in the quality control of herbal products.
9.	Orbitrap Liquid Chromatography – Mass Spectrometric Analysis (LC-MS)	<ul style="list-style-type: none">Accurate mass determination of isolated compound for structural confirmation.Identification and quantification of compound.Identification and quantification of compound from a mixture.Identification and quantification of trace levels of compounds in complex herbal mixtures.Analysis and characterisation of unknown samples.

Application & Payment Procedure:

1. Applicant should fill in the technical service application & sample receipt form.
2. Payment for the service should be made prior to the commencement of analysis/test.
3. Payment can be made by Local Order/Bank Draft/Bank Transfer/Postal Order/Cheque, payable to the **DIRECTOR GENERAL FRIM.**
4. Payment by Cash should be made by the applicant at the Payment Counter, Financial Branch, FRIM.

TYPE OF TECHNICAL SERVICE	COST (RM)	DURATION (WORKING DAY)	SAMPLE REQUIREMENT *	PERSON-IN-CHARGE
1. Quality Tests 1.1 Colour test (H ₂ SO ₄ , HCl, NaOH, KOH, NH ₄ OH, FeCl ₃) 1.2 Ash content (total ash, acid-insoluble ash) 1.3 Extractive value (water-soluble - hot/cold method, ethanol-soluble - hot/cold method)	40 /sample 100 /sample 200 /sample	7 21 21	DRM - 2 g DRM - 20 g DRM - 100 g	Dr. Zunoliza Abdullah T: 03-62797339 E: zunoliza@frim.gov.my
2. Phytochemical Screening Tests (Steroids, Flavonoids, Tannins, Triterpenes, Alkaloids, Saponins)	150 /sample	21	FRM - 200 g DRM - 25 g E - 2 g	Fauziah Abdullah T: 03-62797361 E: fauziahabdullah@frim.gov.my
3. UV-Vis Spectroscopic Analysis 3.1 Flavonoids content 3.2 Sugar content 3.3 Polysaccharide content 3.4 Saponin content	150 /sample 150 /sample 150 /sample 150 /sample	21	DRM - 25 g E - 2 g	Abdul Rashid Li T: 03-62797337 E: abdrashid@frim.gov.my
4. IR Spectroscopic Analysis (4000 – 450 cm ⁻¹)	70 /sample	21	DRM - 50 mg E - 10 mg (powder) C - 10 mg (powder)	Adiana Mohamed Adib T: 03-62797366 E: adiana@frim.gov.my
5. NMR Spectroscopic Analysis 5.1 Proton (¹ H) 5.2 Carbon (¹³ C) 5.3 DEPT	100 /sample 150 /sample 150 /sample	21	C - 10 mg	Adiana Mohamed Adib / Salbiah Man T: 03-62797366 / 62797361 E: adiana@frim.gov.my / salbiah@frim.gov.my
6. HPLC Analysis 6.1 General profiling 6.2 Qualitative analysis 6.3 Quantitative analysis	250 /sample 250 /sample + 50 /compound 250 /sample + 100 /compound	30	FRM - 100 g DRM - 10 g E - 100 mg C - 2 mg	Dr. Ling Sui Kiong / Dr. Zunoliza Abdullah / Mohd. Radzi Ahmad T: 03-62797356 / 62797339 / 62797335 E: lingsk@frim.gov.my / zunoliza@frim.gov.my / radzi@frim.gov.my
7. Eurycomanone Analysis (By UPLC)	350 /sample	21	FRM - 100 g DRM - 10 g E - 100 mg C - 2 mg	Abdul Rashid Li / Mohd. Radzi Ahmad T: 03-62797337 / 62797335 E: abdrashid@frim.gov.my / radzi@frim.gov.my
8. HPTLC Analysis 8.1 General profiling 8.2 Qualitative analysis (Detection by H ₂ SO ₄)	250 /sample 250 /sample + 50 /compound	30	FRM - 100 g DRM - 10 g E - 100 mg C - 2 mg	Dr. Zunoliza Abdullah T: 03-62797339 E: zunoliza@frim.gov.my
9. LC-MS Analysis # (compound/semi-pure fraction) 9.1 LC-MS ion trap MS full scan 9.2 LC-MS Orbitrap MS full scan 9.3 Direct Infusion Ion trap MS full scan 9.4 Direct Infusion Orbitrap MS full scan 9.5 MS ⁿ 9.6 Data Analysis (Mass Frontier)	300 /sample 500 /sample 150 /sample 200 /sample 25 /peak 80 /structure	30	E - 100 mg C - 2 mg	Fauziah Abdullah T: 03-62797361 E: fauziahabdullah@frim.gov.my

* FRM - Fresh raw material; DRM - Dried and ground raw material; E - Dry extract; C - Compound

Please state: Type of column to be used (C18/C8) for LC-MS; n value for MSⁿ; Provide chemical structure in .cdx file (positive ionisation) for the Mass Frontier Data Analysis