

EXPERIMENTAL WORK GUIDELINE

PHYTOCHEMICAL ANALYSIS

(KIM 438 3(2-1))

by:

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Description and Learning Outcome

Description

This experimental work practices students' knowledge in the phytochemical analysis. Students explained how to design the experimental work plan which included sample preparation, extraction, purification, qualitative and quantitative analysis of phytochemical compounds, bioassays and or metabolite fingerprint determination and do the experiment as well as make the reports on their group.

Learning Outcome

Able to design and do the experimental work about phytochemical analysis including how to take and prepare samples, extraction, purification, qualitative and quantitative analysis of phytochemical compounds, simple bioassays, and metabolite fingerprint determination including make reports for the results.

2.

Overall Guideline

The following is the overall guideline to do the experimental work

- The experimental work will be done in a group of students
- Students are divided into 6 groups with each group of 5-6 students
- Each group must choose plant or part of plant for their experimental samples
- The experimental work must include sample preparation, extraction, purification, qualitative and quantitative analysis of phytochemical compounds, bioassays and or metabolite fingerprint determination
- The samples taken must be analyzed to LIPI Cibinong to find out the Latin name
- Please consider about the experimental budget
- Week 1 and 2 students make a experimental work proposal and must consult with their supervisor
- During work, students must consult with the supervisor, fill in the absence, and write all experimental work and results on the experimental log book
- The final report must also be consulted to the supervisor
- Important date: 3rd week there will be a proposal presentation, 14th week there will be a final presentation

Guideline of Experimental Log Book

- Every group have to make log book, that include:
 - a. Date and time.
 - b. Prosedure.
 - c. Results, data, and calculation of data.
- The score for log book is between 0-100.
- The log book score will contribute 15% of the experimental work

3.

Experimental Work Proposal

Guideline to prepare the experimental work proposal

- Experimental work proposal consists of introduction, aims, materials and methods, references, schedule, and budget.
- Proposal with the correct way of thinking and fulfil all the requirement will get maximum score of 100
- Proposal that still need modification will get maximum score of 70
- The proposal score will contribute 30% of the experimental work
- Only 1 week is time for proposal preparation
- During preparation of proposal, students have to discuss with the supervisor

Assessment criteria for experimental proposal

- Date of submission for proposal
- Presentation
- The communication and collaboration in the group
- Accuracy in answering the question during discussion
- Compliance with the scope of experimental work

4.

Collection and Sample Preparation

The collection and sample preparation work must include

- Sample collection
- Voucher specimen preparation
- Drying the samples
- Moisture content determination
- Ash content determination

Students should do this experiment for maximum 2 weeks

5.

Extracts Concentrated Process and Qualitative Analysis

The extract concentrated process and qualitative analysis work must include

- Extraction or distillation
- Drying the extract/concentrated extract
- Extraction or distillation yield determination
- Qualitative phytochemical analysis

Students should do this experiment for maximum 2 weeks

6.

Separation, Purification, and Quantitative Analysis

The separation, purification and quantitative analysis work must include

- Extract separation process
- Component purification process
- Fraction or compound yield determination
- Quantitative phytochemical analysis

Students should do this experiment for maximum 3 weeks

7.

Bioassay Technique

The bioassay work must include

- Sample preparation for bioassay
- Test organism preparation
- Detection
- Calculation of the activity

Students should do this experiment for maximum 2 weeks

8.

Metabolomic Analysis

The metabolomic analysis or fingerprint profiling work must include

- Sample preparation
- Instrument preparation
- Analysis
- Detection
- Data interpretation

Students should do this experiment for maximum 2 weeks

9.

Report

Reports of experimental work including:

- name of all group members and the title of experimental work
- Abstract.
- Introduction.

Please write the principal/theory for the experiment and instrument used. This part maximum 2-4 paragraph with maximum each paragraph 5-15 lines of sentences).

- Materials and methods.

Write all the materials and methods used and also its modification if any.

- Result and Discussion.

Include results in table and figure, discussion of the results including precision, accuracy, validity, is there any systematic error (physics or chemistry) that will influence the results and how to minimize the error. Maximum 4-5 paragraph with maximum each paragraph 5-15 lines of sentences).

- Conclusion.

This part maximum only 1 paragraph.

- References.
- Appendix for the calculation.

Only one of calculation in each determination should be included. If quantitative analysis done more than 2 repetitions please determine the average, deviation

standard, precision, and accuracy. If you make comparison between 2 results please determined the t and F value.

- The score between 0-100 and the distribution as follows:

Abstract - 15

Introduction - 15

Materials and Methods - 10

Results and Discussion - 30

Conclusion - 5

References – 5

Appendix – 20

- This score contributes about 30% of the experimental works

Assessment for presentation of results

- Date of submission of reports
- Reports
- The communication and collaboration within groups
- Accuracy in answering the question during discussion
- Compliance with the scope of experimental work
- The presentation score contributes 10% of the experimental work