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# Extraction Methods for Medicinal Plants

Practical 6 - Practical study

## Aim

To compare extraction methods for an authenticated medicinal-plant material.

## Principle

Extraction depends on solvent selectivity, particle size, solid-to-solvent ratio, temperature, time and mass transfer. A high extract yield may reflect inactive or interfering matrix material rather than a higher marker recovery.

## Materials and Requirements

- Authenticated material, plant-part and voucher record
- Approved maceration, percolation or supervised hot-extraction method
- Solvent-quality, moisture, dry-extract and marker assays
- Approved method or teaching-data pack and a dated record sheet

## Procedure

1. Define the preparation or dataset, study question and method version. Record identities, units and the criteria to be used before examining the outcome.
2. Confirm botanical identity and plant part and determine the input moisture basis.
3. Compare selected methods on equal dry-material and solvent-accounting bases; record actual conditions and extraction repetitions.
4. Separate solids, recover extract through the authorised solvent-removal procedure and record dry residue.
5. Measure marker or fingerprint quality and reconcile extraction yield with marker recovery and solvent use.
6. Retain the original observations and calculations. State deviations, missing information and the limits of the conclusion; do not replace measured values with expected results.

## Observations and Record

Enter actual measurements or the supplied teaching data. Record the method, material identity, conditions and units.

| Method | Dry plant input | Dry extract / marker | Yield / recovery |
|---|---|---|---|
| Maceration | Record g | Record g / mg | Calculate |
| Percolation | Record g | Record g / mg | Calculate |
| Hot extraction | Record g | Record g / mg | Calculate |

## Calculations

- Extract yield (%) = dry extract mass / dry plant mass x 100
- Marker recovery (%) = recovered marker mass / independently established input marker mass x 100

### Worked Example

Illustrative 20 g dry plant gives 3 g dry extract: yield = 15%. If 100 mg input marker yields 70 mg recovered marker, marker recovery = 70%.

The two percentages measure different things.

## Result and Interpretation

• Compare extraction, marker evidence, solvent use and degradation risk on consistent bases.

## Precautions

• Use authenticated material and approved solvent handling.
• Avoid uncontrolled heating of thermolabile compounds.
• Do not equate dry residue with active-compound purity.

## Viva Questions and Answers

### Why correct moisture?

It makes dry-material comparisons meaningful.

### Does higher extract yield prove better extraction?

Selectivity and marker recovery must also be considered.

### Why keep a voucher?

It supports traceable botanical identity.

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