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Chemical Identification of Agar Acacia Tragacanth and Honey

Experiment 1 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To compare the physical and chemical responses of four carbohydrate-rich natural materials.

Principle

Polysaccharides differ in hydration, swelling and gel formation. General carbohydrate and reducing-sugar tests support constituent classes, but identity and purity require several observations together.

Requirements

- Authenticated agar, acacia, tragacanth and honey; water and labelled prepared test reagents.
- Water bath, test tubes, pipettes, iodine and instructor-prepared Molisch, ruthenium-red and Benedict reagents.

Procedure

1. Prepare portions

Label separate portions for hydration and each chemical test. Record the quantities and reagent strengths prescribed by the laboratory.

2. Agar

Warm the aqueous dispersion until properly hydrated, then allow it to cool. Observe gel formation. An iodine check for blue-black starch contamination is a separate screening observation.

3. Acacia

Observe dissolution or dispersion in water to form a mucilage. Perform the prescribed general carbohydrate reaction with a known control.

4. Tragacanth

Observe the swollen insoluble fraction and the soluble mucilage fraction. Record the ruthenium-red response of acidic mucilage; this stain is not unique to tragacanth.

5. Honey

Prepare the assigned aqueous dilution. Heat a separate portion with Benedict reagent in a water bath and record reducing-sugar response against controls.

6. Compare

Combine hydration, gel behaviour and chemical reactions. Honey containing reducing sugars is not automatically authentic honey; official adulteration/quality testing remains separate.

Observations and Record

Material	Supporting response	Actual observation
Agar	Hot hydration; gel on cooling	_____
Acacia	Water-compatible gum/mucilage; carbohydrate response	_____
Tragacanth	Swelling fraction; mucilage staining	_____
Honey	Reducing-sugar reaction	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- If all four give a carbohydrate response, that result alone cannot distinguish the four materials. Gel formation and swelling supply additional class evidence.

Result

State the material supported by the combined observations and any unresolved purity question.

Precautions

- Use authenticated, labelled teaching material and instructor-prepared reagents. Wear the protection specified for the chemical method.
- Compare with a known control and record actual observations. A single colour, precipitate or odour description cannot authenticate a crude drug.
- Do not taste botanical material or directly inhale vapours; dispose of solvents and staining reagents in their assigned waste containers.

Viva Questions and Answers

1. Why is Molisch not an identity test?

It detects a broad carbohydrate class.

2. What causes tragacanth swelling?

Its water-swelling insoluble fraction contributes strongly to hydration behaviour.

3. Does a positive Benedict test prove pure honey?

No. Other sugar mixtures can also be positive.

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