FCS14 - SOP for Identification of Marijuana

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1. Scope

2. This validation is intended to demonstrate if the microscopic identification of marijuana meets the laboratory and customer specifications (performance specifications) by examination and review of objective evidence. This validation is based off SWGDRUG Supplemental Document SD-2 and compliant to *FCU Quality Assurance Manual*.

3. Background

3.1. To establish a procedure for the identification of marijuana plant, including seeds and leaf, in support of casework results.

4. Safety

4.1. Protective Equipment: Personnel should wear personal protective equipment (PPE) including: lab coat, gloves, and safety goggles when carrying out standard operating procedures.

4.1.1. Wear vinyl or nitrile gloves when handling marijuana plant material.

4.2. Training: Formal training visual inspection of marijuana identification is necessary.

4.3. Personal Hygiene: Universal Precautions must be followed. Care should be taken when handling instrument, chemicals or any biological specimen. Routine use of gloves and proper hand washing should be practiced. Refer to DOM13 – DFS Health and Safety Manual.

4.4. Disposal of Waste: Waste materials must be disposed of in compliance with laboratory, Federal, state, and local regulations. Consult DFS Safety Officer for proper procedures.

5. Materials Required

5.1. N/A

6. Standards and Controls

6.1. Marijuana standards may be received from other agencies, *e.g.,* the Drug Enforcement Agency, or previously identified material from exhibits that have been identified for destruction and do not have further legal obligations.

7. Calibration

7.1. Not applicable

8. Procedures

8.1. General Maintenance

8.1.1. Preventative Maintenance Schedule

8.1.1.1. Microscopes shall be visually examined for operability prior to using.

8.1.1.2. Best practice includes use of a dust cover after use.

8.1.1.3. As needed, the analyst shall clean the stage, clean the eye piece and replace light bulb.

8.1.2. Quality Control Procedures

8.1.2.1. This is a qualitative assessment for detecting properties of a test item.

8.2. Macroscopic Characteristics

8.2.1. Upright stalk attains a height of 3-16 feet, average 4-6 feet.

8.2.2. Stalk varies in diameter up to two inches, averages less than one half inch.

8.2.3. Plant has compound palmate leaves with 5-11 leaflets (usually seven), and odd in number.

8.2.4. Leaf is similar in shape to a hand.

8.2.5. Leaflets are pointed at both ends and vary up to about six inches length and to about 1.5 inches in width.

8.2.6. Distinction between male and female plants is difficult except at maturity.

- Male: flowers are very prominent; mature ones shed pollen profusely.
- Female: flowers are inconspicuous and are found hidden among the small leaves at the ends of the stalk and branches.

8.2.7. The plant branches at the nodes – a branch appearing immediately above each leaf. The branches occur at opposite points on the stalk with alternate pairs situated at right angles.

8.2.8. Plant has a characteristic odor.

8.2.9. Seeds have a lacy, mottled appearance like a melon or turtle's back.

8.2.10. Seeds are ovoid in shape, mottled in color and are greenish-yellow to brown.

8.2.11. One main tap root up to eight inches long. Smaller branches from the main root.

8.3. Microscopic Characteristics

8.3.1. Leaves

- Green, brown-spotted, or brown in color.
- Characteristically serrated.
- Veins end at sharp point of each serration or notch, best seen from the underside.
- Cystolithic hairs on upper side.
- Longer, sharper pointed hairs on underside.
- Effervescence with dilute hydrochloric acid

8.3.2. Stems

- Fluted.
- Branches appear immediately above each leaf.

8.3.3. Seeds (fruit)

- Greenish-yellow to brown in color.
- Lacy, mottled appearance like a melon or a turtle's back.
- Ovoid in shape.
- Ridge around the greatest circumference.
- Inside similar to coconut meat.

8.3.4. Hairs

- Cystolithic Hairs
  - Characteristic "warty" appearance; look like bear claws.
  - Sphere of calcium carbonate at the base of the hair which effervesces in dilute hydrochloric acid.
  - No plant which fails to show them can be marijuana.
- Glandular Hairs
  - Wooly Appearance; look like clubs with flattened, spherical heads.

8.3.5. Hulls (pods) - found on outside of seeds

- Green, brown or brown-spotted in color.
- Characteristically shaped.
- Cystolithic and glandular hairs on outer surface.

8.4. Procedure

8.4.1. Plant material shall be viewed macroscopically and microscopically to verify the presence of visually recognizable morphological characteristics

8.4.2. Macroscopic and microscopic characteristics present in the exhibit shall be documented on the FA worksheet by checking the box beside the characteristics.

8.5. Performance Characteristics

8.5.1. Minimum acceptance criteria for the identification of Marijuana shall include:

8.5.1.1. A positive Duquenois-Levine color test.

AND

8.5.2. A combination of at least the following microscopic characteristics:

- Leaf/leaf fragment(s) and hairs **OR**
- Stem(s) and hairs **OR**
- Seed(s) and hairs

8.5.3. For material that does not meet the criteria for 8.5.1, the following shall be required:

8.5.3.1. Gas Chromatography Mass Spectrometry (GC-MS) test for THC,

8.5.3.2. Gas Chromatography Flame Ionization Detector (GC-FID) test for THC

9. Sampling

9.1. Weight determination for Marijuana

9.1.1. The weight shall, in general, be taken as per guidance from §7.7 of *FCS02 - SOP for General Laboratory Procedures for FCU*.

9.1.2. Marijuana has two exceptions, in support of *DC Code §48-904.01*, specifically for the cut-off value for a misdemeanor of net weight 1 ounce (1 oz, or 28 grams), or for a felony of net weight of ½ pound (1/2 lb, or 226 grams).

9.1.3. Note: A composite is made from multiple items that are determined by the analyst as being equivalent in nature, and are thoroughly mixed to ensure homogeneity prior to testing.

9.1.3.1. Sample Size One Ounce or More:

9.1.3.1.1. When the gross weight of an exemplar or of a series of items within an exemplar is less than one ounce (1 oz) or 28 grams, then only the net weight of one representative sample shall be taken.

9.1.3.1.2. If the gross weight is at or above one ounce (1 oz, or 28 grams), then all not analyzed units shall be combined and a composite made, with the combined net weight determined. The analysis shall be of the original unit not added to the composite. The weight of the not analyzed unit composite will be reported.

9.1.3.2. Sample Size One-Half Pound or More:

9.1.3.2.1. If the gross weight is at or above one-half pound (1/2 lb) or 226 grams, then all not analyzed units shall be combined and a composite made, with the combined net weight determine. The analysis shall be of the original unit not added to the composite. The weight of the not analyzed unit composite will be reported.

9.1.4. In situations where the number of items is exceptionally large, a statistical, representative sampling of items will be taken (as covered under §8.6.3.3 of *FCS02 - SOP for General Laboratory Procedures for FCU*, “Hypergeometric Sample”), a single composite made, and tested.

9.1.4.1. The total weight shall be estimated from a statistical estimate based off at least five (5) representative samples, applied over the entire number of test items. All mathematical calculations shall be recorded in the case notes and reviewed by the technical reviewer for accuracy.

10. Calculations

10.1. Not applicable

11. Uncertainty of Measurement

11.1. Not applicable

12. Limitations

12.1. Not applicable

13. Documentation

13.1. N/A

14. References

14.1. DFS Departmental Operations Manuals (current revisions).

14.2. Forensic Chemistry Unit SOPs (current revisions).

14.3. Controlled Substances Standard Operating Procedures; Comparative and Analytical Division, Houston Forensic Science Center (Document ID 2923, July 3, 2017)

14.4. *DC Code §48-904.01. Prohibited acts A; penalties* under Chapter 9 of the Controlled Substances Act of DC Code.