

Soil laboratory report on a crime scene

Objective

The purpose of this laboratory report is to examine soil samples obtained from a crime scene and from the shoes of crime suspect.

Introduction

Soil is a crucial property of the earth. It makes the greatest percentage of the land to which people dwell in today. Soil is a component that can be used in the analysis of crime. In many crime scenes, the area marked for investigations are often sealed and restricted. The public is restricted from using the marked place until all investigations are completed. The process includes taking samples from the crime scene for analysis in the laboratory. The aim of this paper is to discuss laboratory soil report. This forensic laboratory report will present test and procedures for the analysis of the soils from the crime scene. By the end, of the report, one should be able to conclude whether the suspect of the crime committed in this place is guilty or not (McGraw-Hill Editorial Staff 137).

Summary

There are different types of soils depending on the ground which one stands. The soil at point A is different from the soil at point B. In this regard, soils have been used often in studying crime. Soil has been used extensively to prove the innocence of an individual or otherwise. The soils have properties, which are specific to the point at which it is taken from. It is these properties that make the soil sample unique. For this reason, forensic scientist have used soil samples in

determining robbery suspects (Hess & Orthmann 327).

Forensic scientists have in turn used soil as one of the samples that can be relied to prove or disapprove a crime suspect. Soil that has been obtained from the crime scene is compare to samples from the suspect's shoes, clothes, or body (Hails 173). The properties, which are studied in this context, include minerals, rocks, paints, grass, and other vegetation. Often these properties differ from one place to another. This paper will discuss on the soil analysis done on a crime scene. The discussion will center on the samples taken from the crime scene. A conclusion will be made on the innocence of the accused, by comparing the properties of the samples provided. The paper will end with a page no works cited.

Background information

Thieves broke into Billy's house at night. They left one window broken. There was a heavy rainfall on the night of the incidence. No finger prints could be obtained for investigation purposes. Hence, crime investigators opted to use soil samples as a way to determine the criminal. Soils samples were collected from the compound and taken for analysis in the crime laboratory. The police managed to bring into custody four suspects. Soil samples were also taken from the shoes of the suspects. These were also taken to the laboratory for comparison with the sample from the compound.

Materials and equipment

- 5 petri dishes
- 5 soil samples, labeled
- 5 beakers and 5 funnels
- Stereomicroscope
- Measuring scale
- weighing paper
- Gauze
- Graduated cylinder
- pH hydronium paper

Test procedures

The samples obtained were labeled each according to its source. The sample taken from the crime scene was labeled CS; the samples from the suspects were labeled S1 to S4. A small portion of the sample was sprinkled evenly on a petridish. On each sample, several properties were observed, color, odor, texture, inorganic matter present, and plant or animal debris. This was followed by a microscopic study on the stereomicroscope.

A capillary action procedure was done on the samples. This test was to test on the ability of the soil type to hold water. This was done by analyzing the factors which facilitate the soil to hold water. The soil samples were put in funnels that were sealed with wet gauze. Five flasks were filled with a measured amount of water. Funnels were put into flasks with the neck inside the flask. This set up was left to stand for 20 minutes. After the 20 minutes, the funnels were removed, and the remaining water in the flasks was measured again.

The pH of the soils was determined by the use of a pH paper. Small pieces of the pH paper were labeled according to the samples and put on the white sheet. A drop of water was put on the pH paper, by using the gauze from the funnel. These results were well put into different tables then analyzed.

To determine the physical and chemical properties of the soil sample, and the percentage of clay and silt present, the samples were let to settle overnight and analyzed the following day. The samples from were taken and put into three separate jar with water. A little detergent was added to the water. The mixture was then shaken for 30 seconds and left to settle overnight. The following day, a piece of white paper was placed at the back of each jar. This was to note the layers that had formed by the soil in the jars. Each layer was then labeled by a china marker. In addition, the thickness of the layers was measured with a ruler. This measurement was used to calculate the size of the particle and the percentage of each layer in the soils.

Results

Table 1 – initial description

Sample	Color	Odor	Texture	Plant and animal debris	Inorganic debris present
CS	2.5 5/4	n/a	Sandy-clay loam	Twigs, bark and leaves	rocks
S1	2.51 4/2	n/a	Clay loam	Roots, twigs	rocks
S2	2.54 5/4	n/a	Sandy clay	Moss, twigs, leaves, seeds	rocks
S3	2.54 7/6	n/a	Loam sand	No visible debris	rocks
S4	2.54 6/4	n/a	Sandy clay loam	Bark, twigs	rocks

Table 2 – Observation with microscope

Sample	Color	Odor	Texture	Plant and animal debris	Inorganic debris present
CS	2.5 5/4	n/a	Sandy clay loam	Tree barks, leaves, twigs	Rocks
S1	2.5 4/2	n/a	Clay loam	Grass, roots, twigs	crystal structured
S2	2.5 5/4	n/a	Sandy clay	Moss, roots, seed, leaves	Sandy clay clumps
S3	2.5 7/6	n/a	Loam clay	No significant organic matter	Rocks sand clay
S4	2.5 6/4	n/a	Sandy clay loam	Tree barks, twigs, leaves	rocks

Table 3 – Water holding capacity and pH

sample	Amount of water held	pH
CS	122ml	6
S1	110ml	5
S2	45ml	5
S3	115ml	7
S4	122ml	6

Interpretation of results

All samples that were analyzed, S1, S2, S3, and S4 were compared to the crime scene sample.

Results in table 1 varied slightly. Most of the samples had common properties on color, texture, and components of organic and inorganic matter. In table 1, sample S3 differed the most from the crime scene sample. S4 was the sample that compared the most of the entire sample in table 1.

Table two was a microscopic observation of the samples. When observed under the microscope, the samples revealed other properties which were not seen in the first table. Sample S4 compared the most of all the other samples. While samples S1, S2, and S3 varied the most from the crime scene sample.

Table 3 reported on the analysis of water holding properties. This is the capacity

of the soil to hold water when exposed. For instance, clay soil holds more water compared to loam soil. The results revealed that sample S4 had similar water holding properties compared to the other samples. However, samples S1, and S3 had properties that were closely related, while sample S2 had the lowest water holding capacity.

Post lab questions

1. Did any of the suspects commit the crime? Explain

According to the results from the analysis above, the suspect who could have participated in the robbery is Suspect S4.

This is because he or she is the one whose sample compares the most to the crime scene sample. The analysis was done to compare the soil at the crime scene and that which was taken from the shoes of the suspect. Hence, the sample similar to the crime scene sample tells that the suspect must have been the one on that crime scene at the appointed time.

2. What is the significance of the capillary action test?

Capillary action test is used to test the ability of the soils to hold water. The ability of the soil differs from one soil type to another. For instance, clay soils can hold water for long compared to sandy soil, which maintains water for a short while.

3. What is soil?

Soil is the top component of the earth (Lindeen 5). It forms the first layer of the earth's crust on which trees and plants grow. The soil can be composed of both organic decomposing matter and inorganic matter. The soil can be particularly useful in determining the suspect of a crime.

4. Why were the soil samples dried before observations were made?

The soil in this test is dried at 100 degrees so that it can maintain its original color when dry. This is because soils have a different color when wet. Hence, if analyzed while wet, the results will not be true.

