

**Folio No:** 3486-2024  
**Purchase Order:** 2582  
**Contact:** ENFYS Ecology  
**Issue Date:** 23.09.2024  
**Received Date:** 17.09.2024

# Biological Report

Technical Report



SureScreen Scientifics

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# Biological Sample Analysis

## Summary

Most biological materials (tissue, feces, hair, blood, etc.) contain small amounts of DNA from the organism of which it originated. Using molecular methods such as PCR (polymerase chain reaction) and DNA sequencing, SureScreen Scientifics are able to analyze an unknown sample to determine which species the sample originates from our methods are optimized for the detection of species including bats (over 92% of bat species worldwide can be identified including all 18 UK bat species), mammals; bees, wasps & hornets; birds; fish; plants (from roots, leaves, stem and even dried wood) and many more species.

## Results

Lab ID	Site Name	OS Reference	Sample Type	Species Name	Match(%)
B3995	TA Centre	SJ0638 8329	Bat Dropping	Common pipistrelle (Pipistrellus pipistrellus )	98.84

### Genetic Sequence

```
TTTGGACTGACTAGTTCCACTAATAATTGGAGCCCCTGACATGGCATTTCCTCGTATAAATAATATAAGTTTCTGAC  
TCCTACCTCCTTCTTTTCTACTACTACTAGCCTCGTCTATAGTAGAAGCGGGAGCGGGTACAGGCTGAACAGTCTA  
CCCCCTCTAGCAGGAAATCT
```

Matters affecting result: none  
Reported by: Vanessa Hind

Approved by: Lauryn Jewkes

# Methodology

Once samples have arrived in the laboratory, the DNA is isolated using a commercial DNA extraction kit. Using PCR, DNA (if present within the sample) is amplified using universal molecular markers designed to amplify a short fragment of the DNA of the target species group (i.e. mammal, fish, arthropod, reptile, plant etc.). If amplification is successful, the resulting DNA sequence is revealed using a process known as Sanger Sequencing in order to obtain the genetic sequence of the mitochondrial gene within the sample. The sequence results are aligned against a library of known reference sequences using bioinformatics software, which enables us to determine which species the DNA sequence from the sample matches with, informing the species identity and sequence similarity (match %). If the initial analysis is unsuccessful, the entire process is repeated up to two additional times with a fresh reserve sample (if available) in order to obtain a species identification. If no DNA is detected after three attempts, then we can be confident that any further analysis of the sample will likely also fail to result in species identification.

# Interpretation of Results

- Sample Type:** The sample you send to us can come from a variety of sources. Fecal, dropping, urine, hair, blood, carcass (skin, flesh, bone), gamete, plant matter or unknown biological material all contain DNA that we can test for in order to identify the species of origin.
- Genetic Sequence:** The unique DNA sequence obtained from the sample.
- Match (%):** How closely matched the DNA sequence from your sample is to the sequences within our reference database. This can be interpreted as a score of result accuracy, with the maximum score of 100% indicating an exact match of the sample to the indicated species' reference sequence. Lower scores (80-99%) indicate some variation between the sample and reference sequence, likely due to natural variation between individual genetic sequences and/or systematic variations generated through the sequencing process. Scores below 80% similarity should be interpreted with care and can indicate part degraded or part contaminated samples.
- Inconclusive Result:**
- Degraded sample:**  
DNA is degraded and we are unable to determine species identification due to degradation of sample DNA. This can happen either before sample collection (old samples, exposure to UV etc.) or after sample collection if stored for long periods before analysis or not handled correctly.
- Inhibited/contaminated sample:**  
We are unable to determine species identity due to contamination or the suspected presence of large quantities of PCR inhibitors. Contamination sources can originate from other species which could have come into contact with the samples, or human contamination during sample collection.
- Alternative Result:**  
Sometimes, for targets such as bat dropping analysis, other mammalian species such as rodents are detected. We find this to be a common occurrence as some bat droppings can be similar in appearance to rodent droppings. Although sometimes unexpected, repeat analyses in these cases would likely return the same results.

