OSAC 2021-N-0001 Wildlife Forensics Method-Collection of Known DNA Samples from Domestic Mammals

Wildlife Forensic Biology
Biology Scientific Area Committee
Organization of Scientific Area Committees (OSAC) for Forensic Science

OSAC Proposed Standard

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Prepared by
Wildlife Forensics Biology Subcommittee
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Wildlife Forensics Method-Collection of Known DNA Samples from Domestic Mammals

Foreword

This standard presents protocols for collecting DNA samples for use in genetic analysis of domestic mammals. It is based on a draft from the Wildlife Forensic Biology of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

Keywords: *DNA sample collection, domestic mammal, dog, cat, horse, cattle, pig, sheep*

1 Scope

This standard provides the protocol for obtaining genetic known evidence samples (buccal swabs and pulled hair) for the purpose of genetic analysis of domestic mammals. This standard does not address sampling of wild animals.

2 Normative Reference

There are no normative reference documents. Annex A, Bibliography, contains informative references.

3 Terms and Definitions

3.1
Buccal swab
A cotton swab or similar collection substrate; used in a relatively non-invasive sample collection technique for scraping the inside of a mouth to collect cells from the inner cheek lining; this is a common method for collecting and preserving samples for DNA testing from known individuals.

3.2
chain of custody
Chronological record of the handling and storage of an item from its point of collection to its final return or disposal.

3.3
known sample
Biological material for which the identity of the donor is established and used for comparison purposes.

3.5
nuclear DNA
The DNA inside a cell's nucleus, existing in the form of chromosomes.

4 Requirements

4.1 General

4.1.1 All known evidence samples submitted shall have a unique name or number.

4.1.2 All required paperwork (e.g. submission forms, chain of custody forms) shall be completed.

4.1.3 Pertinent information, such as sample collector, collection date and site, sample type (e.g., buccal swab, hairs), swab type, sample storage conditions, etc., should be recorded.

4.2 Buccal swabs

4.2.1 Buccal swabbing using cotton, nylon, or other swab types is the preferred method for collecting DNA from domestic cats and dogs. Buccal swabs should be sterile.

NOTE: While many swab types are acceptable for buccal swabbing, cotton swabs can sometimes be problematic for buccal collection from dogs.

4.2.2 Preparing to collect buccal swabs

a) Isolate any animal(s) to be tested from other individuals (including nursing animals) and remove food and water at least 30 minutes prior to sample collection.

b) If buccal swabs from more than one animal will be collected, complete the process for one animal and change gloves or clean hands before collecting from the next.

c) Use at least 2 buccal swabs per animal to obtain replicate samples.

d) Prepare a paper envelope or other container for each animal. Label it so as to uniquely identify the animal from which the sample is collected.

NOTE: Other packaging options may be appropriate as long as buccal swabs are stored in a way that minimizes mold, bacterial growth, and sample degradation.

4.2.3 Collecting the sample

a) Open the swab packaging and remove the swab by its handle.

b) Place the head of the swab against the inside of the cheek and gums, and swirl/wipe vigorously 8–10 times.

c) Allow the swab to dry in a clean environment, unless cells/swabs are directly transferred to a different storage medium (e.g. preservative liquid, preservative paper).

d) Place the dry swabs in the labeled envelope (or equivalent). Seal the envelope and sign and date the seal.

NOTE: Dry swabs may be stable at room temperature, however refrigeration is recommended for short term storage (days to weeks) while freezing is recommended for longer term storage.

4.3 Pulled hair

4.3.1 Pulled hairs with roots are the preferred DNA source for domestic mammals other than cats and dogs. Because nuclear DNA is only present in high quantities in the root of the hair, cut hairs are not acceptable.

4.3.2 Preparing to collect hairs

a) If hairs from more than one animal will be collected, complete the process for one animal and change gloves or clean hands (and pliers or similar if used) before collecting hairs from the next.

b) Prepare a paper envelope or other container for each animal. Label it so as to uniquely identify the animal from which the sample is collected.

NOTE: Other packaging options may be appropriate as long as hairs are stored in a way that minimizes mold, bacterial growth, and sample degradation.

4.3.3 Collecting the sample

a) Collect thick hairs such as those from the mane, tail, or fetlock (base of leg just above the hoof). The area on the animal from which hairs are collected should be dry. If dirt or debris is present, brush the area to remove it.

b) Use fingers or pliers (or similar) to grasp hair close to the skin and pull approximately 10 hairs at once (do not cut hairs). Repeat this until 20–30 hairs with roots have been obtained.

NOTE: For pigs, which have very thick hairs, 5–10 hairs with roots are sufficient.

c) Place the hairs in the labeled envelope (or equivalent). Seal the envelope and sign and date the seal.

NOTE: Hairs may be stable at room temperature if kept dry and free from pests (e.g. dermestid beetles), however refrigerated or frozen are also acceptable storage conditions.

Annex A
(informative)

Bibliography

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