GUIDELINES ON FORMING A POLICY ON CONSUMPTIVE SAMPLING OF MACROMOLECULES FROM MUSEUM MATERIALS

Approved by the American Society of Mammalogists, Board of Directors, 8 June 1998, at Annual Meeting held at Virginia Tech, Blacksburg, VA

Policy on Consumptive Sampling

The curator, perhaps in consultation with his/her staff, will decide on a case-by-case basis if a request for consumptive sampling will be approved. Consumptive sampling refers to the destruction of a sample of material from a scientific specimen. A scientific specimen can be a mammalian voucher skin, a cryovial of tissue extracted from a whole animal, a digit or limb, a portion of a skull such as an auditory bulla, etc. The curator must consider the following:

1. All requests for materials to be consumed during macromolecule (e.g., nucleic acids, stable isotopes) extraction and analysis should satisfy the following requirements:
    1. All requests for consumable loans must be made in writing. Requests from students must be approved and countersigned by their research advisors.
    2. Researchers must outline the proposed research. This outline must contain sufficient detail that the scientific merit of the proposal can be evaluated (relative to the cost of consumption).
    3. Researchers must present a case justifying why a consumable loan is warranted. Museum specimens are samples from a previous point in time (i.e., they represent historical populations) and cannot be replaced. An explanation is needed to justify the use of such archived materials.
    4. The number and kind(s) of specimens requested must be justified. This justification must consider the overall rarity of the requested specimens in nature as well as in collections.
    5. Researchers should make an effort to request the minimum amount of tissue needed from each specimen.
    6. Traditional specimens (skin, skull, teeth, etc.) are those that were not collected with the intent of consumptive sampling, but with the intent of providing vouchers and comparative morphological materials. A request to sample traditional specimens should identify *how* the specimen will be sampled without destroying morphological or anatomical characters of systematic value or ecological significance. Additionally, traditional specimens are often more problematic to evaluate biochemically, and curators may require direct evidence of success with similar materials. Frozen tissues or tissues preserved in fluid, if available, should be requested first.

Expertise in the molecular approaches to be employed must be demonstrated. This could take either of two forms:

1. Researchers must provide assurance that the system (e.g., genetic locus) to be evaluated will supply the resolution and confidence required for the investigation. Empirical evidence will be most persuasive.
2. Researchers must demonstrate that they are competent with the methods to be employed. Positive results from pilot research using similar museum preparations or tissue samples will be required from first time users, and may be required from anyone if a taxon is particularly rare. In lieu of pilot results, a curator may agree to provide a portion of the material with the remainder of the loan to follow, pending positive results. Negative results should also be discussed as they help to identify the potential for success and may be used to justify sample sizes. Museum collections will rarely (if ever) be loaned for the explicit purpose of practicing a technique.

   Offers to provide financial or other assistance in obtaining the loan are encouraged. Curators may decide that specimen or tissue sampling should be conducted or supervised by museum personnel. Reimbursements for museum time and shipping costs should be offered. Collections may charge for processing of loans or request that the samples be given as part of an exchange of tissues. However, as is traditional with museum collections, loans are often provided at no charge anticipating reciprocations at some future time.

7. Researchers need to identify the extraction method they will use. Extraction methods must be standardized and generally accepted as the most likely to ensure long-term stability and utility of extracts.
8. It is recommended that the borrower may not loan the material to a third party without the knowledge and consent (preferably in writing) of the original lending institution. The agreement between the researcher and the curator of the research collection should include the following:
    i. Researchers must agree that the original voucher numbers (assigned to the specimen when catalogued into the museum's collection) will be used to identify the samples and extracts throughout (bench work through publication). A museum's acronym is considered part of the voucher number. This is critical to future scientific research involving specimens because it allows investigators to track from the source the use of all materials.

ii. Researchers must agree to deposit DNA sequence results (with voucher numbers) in an appropriate international data base (such as GenBank). If no data bases exist for the types of data collected (i.e., allozyme frequencies, DNA hybridizations), then provisions should be made for the complete and permanent documentation of research results.
iii. Reprints of publications resulting from consumptive loans must be provided to the loaning institution. An acknowledgment of the consumptive loan should appear in each publication. Reference numbers for accessing specimen data from the international data bases should accompany the reprints.
iv. Researchers must agree that all DNA, other macromolecule extractions, of other materials that are derived from loans but not entirely consumed will be returned to the loaning institution. The guidelines below are intended to safeguard the value of returned materials.
    1. Prior to the loan, an agreement should be made with the loaning institution to have remaining materials returned to that institution or to the surrogate collection approved by the curator. Every effort must be made to return to the loaning institution a sample of the extract from each specimen. In the case of DNA, returned samples may be concentrated and dried rather than frozen. The extraction method and DNA concentration (if known) should be identified for portions of samples that are returned.
    2. The researcher must provide assurance that the returned extracts are properly identified and uncontaminated. Any possible exceptions must be brought to the attention of the curator.

2. Collection accredited by the American Society of Mammalogists may request that the ASM's Systematic Collections Committee review specific requests for consumable loans. This service will be provided on an ad hoc basis to institutions that feel they would benefit from outside review of potentially contentious requests.
3. Collections that use these guidelines are not restricted only to this policy, but may modify it as necessary.
4. Disregard for or violation of this policy (once an agreement has been entered into by a researcher and a curator) may jeopardize an individual's or an institution's further access to a museum's research collection. For this reason, advisors need to approve of a student's loan so that the advisor is aware of and in agreement with the conditions of the loan.

5. Adequate, long-term storage of tissues and their extracts is strongly encouraged. Contact the ASM's Systematic Collections committee for suggestions of collection facilities equipped as biological materials repositories that follow minimal collection standards.