

Synthesis of Systematic Resources
SYNTHESYS

Molecular Collections in Natural History Museums and Herbaria

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196 - 2002 - Infraestructuras - 1

Tissues and DNA collections of MNCN

The Tissue and DNA Collection of the Museo Nacional Ciencias Naturales began its activity in 2002

Tissues and DNA collections of MNCN

MOLECULAR SAMPLES: PRESERVATION METHODS

Dried material	Dry, Whatman FTA Card	Tissues / DNA
	Silica	Tissues
	Freeze dried	Tissues / DNA
Liquid preserved (Spirit)	Alcohol 96-70%	Tissues
	DMSO buffer, EDTA buffer	Tissues
Frozen	Freezers -80 to -20°C	Tissues / DNA

Tissues and DNA collections of MNCN

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DIMETHYL SULFOXIDE
DMSO: SALT BUFFER

SEUTIN G., WHITE B.N., BOAG P.T. Preservation of avian blood and tissue samples for DNA analyses. Canadian Journal of Zoology (1991) 69:82-90

ALCOHOL
Humason, Gretchen L. 1997 *Humason's Animal Tissue Techniques*

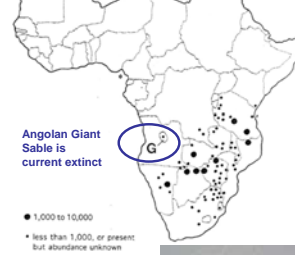
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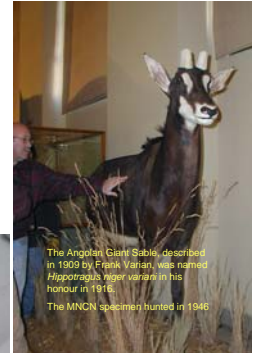
Tissues and DNA collections of MNCN



Angolan Giant Sable is current extinct

- 1,000 to 10,000
- less than 1,000, or present but abundance unknown

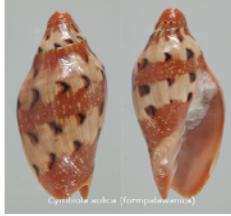
DNA from classical collections



The Angolan Giant Sable, described in 1909 by Frank Vanlan, was named *Phaenoceros major vanlan* in his honour in 1916. The MNCN specimen hunted in 1946

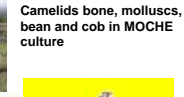
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DNA from classical collections: POPULATIONS

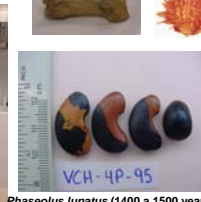
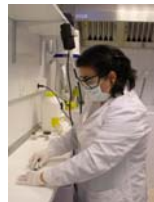


Tissues and DNA collections of MNCN

DNA from archeological places: bioarchaeological specimens



Camelids bone, molluscs, bean and cob in MOCHE culture



Phaseolus lunatus (1400 a 1500 years AD) archaeological place "El Brujo"

Zea mays (1400 a 1500 years AD) archaeological place "Puerto Pobre"

NHM:Liquid Nitrogen



LN2 Samples



NHM:Sequencing Facility



NHM:Robotics



What we offer Users

- Sequences and samples linked to accurately identified specimens (vouchers)
- High quality tissues/nucleic acids/proteins
- Visiting researchers have access to adjacent Sequencing Facility NHM

Future Proofing Molecular Collections

- Loans: QC nucleic acids/proteins extracted and purified on-site
- Collection types and range of specimens
 - Expression/protein data
 - Time frame series for environmental monitoring (not just DNA), geo-referenced records.
 - Samples for archaeology, wildlife forensics, customs, pests, pathogens
 - New technologies to reduce problems with transportation (Dangerous Goods) e.g. FTA
 - Population genetics and conservation (numbers of individuals per species?)

Staff and resources! Cost-benefit analysis.

Standardisation of Procedures

- EU Commonality of approach
 - Promotion/marketing of collections, shared database access: specimens, protocols, sampling and loans policy. Updates.
- SYNTHESYS Program
 - JRAs 1 to 5: optimisation of DNA extraction methods to encourage access to precious specimens

SYNTHESYS FVII JRAs

- **JRA1:** PrediCtoR software to forecast PCR success from samples (bone initially)
Sample normalisation from environmental data to provide 'thermal age' directly proportional to PCR success
- **JRA2:** statistical evaluation of DNA preservation/degradation factors (bone)
Non/minimally-destructive tools (inc UV- IR- spectroscopy) to predict PCR success (linked to JRA1)
- **JRA3:** MORDOR Method for Optimal Recovery of DNA from Osteological Remains
Optimised DNA extraction by minimal destructive microsampling (bone)

SYNTHESYS FPVII JRAs

- **JRA4:** Optimising DNA extraction protocols for herbarium tissue (inc old preserved plants and fungi)
- **JRA5:** Development of high throughput methods for DNA isolation from museum specimens with mucopolysaccharide rich tissue (inc molluscs, seaweeds)

PCR inhibitors: plant chemicals, insecticides, mucopolysaccharides, toxic chemicals in extraction methods. New methods include use of magnetic bead capture of DNA, amylases , CTAB etc.