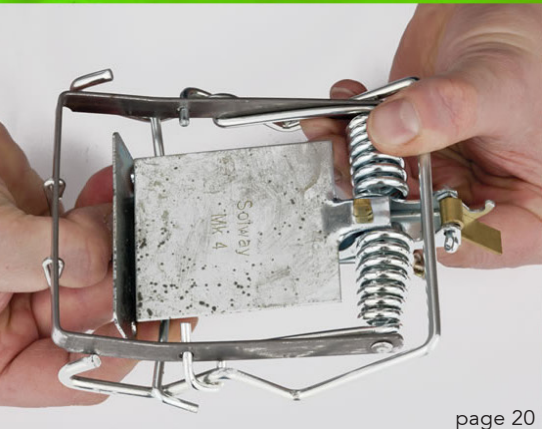


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The newsletter of the Society for Wildlife Forensic Science

Vol. 3, No. 2 | July 2018

SWFS NEWS

Inside this edition: Seeing Touch DNA / Building capacity in Africa & S.E. Asia / Welcome Belarus

Do sweat the small stuff...it may save time and funds!

Silvana Tridico – Forensic Science and WildLife Matters Pty Ltd

There is no doubt in the power of DNA profiling mammalian remains in the identification of animal (non-human) remains recovered in illegal trade or slaughter of endangered or vulnerable mammals. However, there is merit in the preliminary microscopical examinations of hairs prior to costly and time consuming molecular methods.

This article demonstrates, through presentation of two wildlife cases, the value of microscopy in saving time and money which may be better spent on identifications that cannot be effected using microscopy.

CASE 1: Alleged Killing of a protected marine mammal

Members of the public contacted police after gunfire was heard coming from a fishing boat in Spencer Gulf, South Australia (SA), whose occupants were killing Australian Fur seals (*Arctocephalus pusillus*). Fur seals are protected nationally by the Environment Protection and Biodiversity Conservation Act (1999). Fisheries SA officers boarded the boat and found the remains of an unrecognisable dismembered mammal. The two fishermen stated that the meat was the remains of a butchered cow (*Bos Taurus*). Samples of hair were taken from the carcass for forensic examination.

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Welcome from the SWFS President

Dear SWFS Members

Welcome to the July edition of SWFS News.

As ever it's been a busy six months for the wildlife forensics community so there's lots to catch up on. Please have a good read and share the news widely.

The lack of major international meetings since January has meant a little less talk and a bit more action for many of us. That said, SWFS had very strong representation at the American Academy of Forensic Sciences meeting this year and other meetings this year (see pages 25 and 30).

As you will remember the SWFS board had a vacancy to fill at the start of the year. The appointment process was concluded in April and it gives me great pleasure to welcome Prof Daniel Xu, from China's Northeast Forestry University in Harbin, to join the team. Daniel has a long history of national and international wildlife forensics involvement and his broad experience and enthusiasm will be of great benefit to the Society as we continue to grow. You can read more about Daniel in his interview on page 21.

Global efforts to combat illegal wildlife trade are increasingly turning towards the forensic science community to play a role in supporting law enforcement, particularly in Africa and Southeast Asia. Significant funding from the US, UK and EU has seen projects starting in 2018 that are set to spread the development of wildlife forensic capacity and directly support investigations over the coming years (see articles on pages 5, 17 and 19).

As part of these international efforts, the Society is continuing to develop strategic links with inter-governmental community, in our role as the lead advisory body for wildlife forensic science.

With less than a year to Denver 2019, we're also starting to gear up for another great SWFS meeting. If you haven't done so already, make sure you get it into your travel budgets and look out for announcements on the website.

Enjoy your northern summer or southern winter!

Regards

Rob Ogden



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Letter from the Director of Communications

I do hope you enjoy the current edition of our newsletter. It contains a snapshot of what's going on in the world of Wildlife Forensics from the perspective of our members. There is a tremendous volume of information coming at us every day. You can find it on the news, in journals, on web sites, from blogs, and from tweets. No one can possibly keep up with it all. We produce this newsletter to share the news that matters to us most. That which we are involved in by becoming defenders of wildlife from unscrupulous profiteers that exploit the world's wildlife to its extinction. I want to thank those who have contributed to this newsletter and encourage all of you reading this to share your stories with us by submitting articles, pictures, and information highlighting the good works that you do.

The stories that you will read here highlight the fact that what we do does matter and makes a difference. It is hard work and often dangerous, but we come to work every day chipping away at the sometimes piles of evidence to build cases for the prosecution of wildlife traffickers around the world. You can also support the Society for Wildlife Forensic Science (www.wildlifeformenscience.org) through your donations or by becoming a member. Enjoy this newsletter and we hope to see you at one of the several international wildlife forensic science meetings coming up in the future.

And as always – Keep It Wild.
Brandt Cassidy, Ph.D. ♦

Articles can be submitted for consideration to:
bcassidy@dnasolutionsusa.com or
sherryn.ciavaglia@wildlifeformenscience.org

'Seeing' Touch DNA: applications in wildlife forensic science

*Piyamas Kanokwongnuwut, Jessica Champion, Adrian Linacre
Flinders University, Australia*

Anyone who touches an item will pass on their DNA. This can be so important in forensic science and this includes criminal investigations where wildlife is central. On-going research at Flinders University, initiated by Dr Alicia Haines and now progressed by Piyamas Kanokwongnuwut and Jessica Champion, has been using a dye that binds to human DNA (any eukaryotic DNA), but does not effectively bind to bacterial DNA. This was a serendipitous observation, like so many in science, but has turned out to be an amazing means to 'see' otherwise latent DNA.

An example of a fingerprint on touched items; glass slide (left) and tooth (right), is shown in the figure below. This item was 'touched' for only a few seconds. Yet, in this brief contact there is enough DNA passed on that it can be observed.

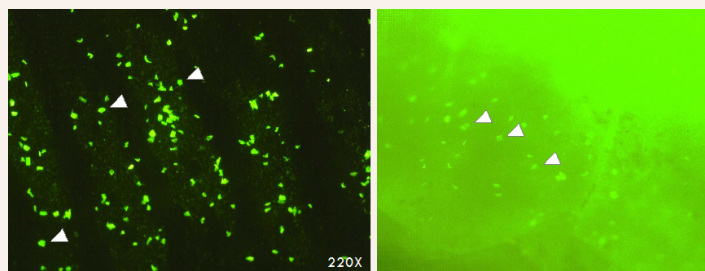


Figure 1 is a fingerprint showing the ridge details after staining with Diamond Dye. Left is under dark light and right in white light. The 'green dots' (a few of which have arrows) are stained DNA/dye as a clump of cellular material. These can be counted and collected. The amount of cellular material correlates with the resulting DNA profile.

'Seeing' Touch DNA: applications in wildlife forensic science

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The process of staining the DNA takes only about 20 seconds and a mini-microscope is used to visualise the deposited DNA. For those interested please read 'Shedding Light on Shedders' published in *Forensic Science International: Genetics* (2018, 36: 20-25).

The implications for wildlife forensic science are that human DNA can be targeted on items of forensic relevance. Consider the recent paper by McLeish et al. (also in *FSI:G* 2018, 35:65-69) entitled 'DNA Profiling in Wildlife Crime: Recovery of Human DNA Deposited Outside' where STR DNA profiles were generated from traps and baits. The sampling was performed on best assumption. Skilled examiners will target areas of a substrate most likely to have been in contact with a perpetrator of the crime. However, the methods we have been developing allow this contact to be visualised.

There are sufficient cells transferred in only a brief contact. Before our study, there were conflicting reports on 'shedders' but our recent study has shown that some people are indeed heavy shedders, others poor shedders, but most people fall somewhere in the middle. By chance the authors represent examples of all three.

Figure 2 showing touch DNA on a tooth. The cellular material shows as green flakes and these were deposited by the person who touched this item. A tooth is shown here as mimicking ivory, for instance.

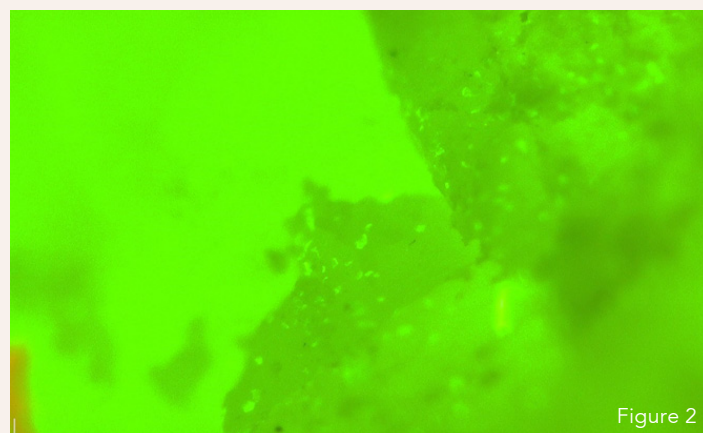


Figure 2

We can envisage our method being applied to a wide range of items encountered in wildlife forensic investigations. Current research is looking at the use of our dye on porous samples, demonstrating its applicability to many more items of forensic significance. The same process actually stains all eukaryotic DNA and so can be applied if searching for the DNA of a species relevant to a wildlife crime. We have also applied this method to stain swabs collected from items remote from a lab and shown that DNA is present and therefore worth subsequent DNA processing. With on-going investigations we hope and expect that our methods will assist in a wide range of applications, including wildlife forensic science. If anyone is interested and wants information further to that found in our recent paper, then please email adrian.linacre@flinders.edu.au. ♦

African Wildlife Forensics Network news

Stephanie Pietsch - TRACE Southern Africa Programme Coordinator

The African Wildlife Forensics Network (AWFN) was launched in Gaborone, Botswana in May 2016 as part of a two-year initiative led by UNODC and TRACE and supported by the UK Illegal Wildlife Trade (IWT) Challenge Fund (2015-2017). The aim of the AWFN is to bring together wildlife forensic scientists and law enforcement stakeholders from across the continent. From an initial meeting of participants from six African nations, the network has slowly developed and attracted more support. The second AWFN meeting was held during the SWFS conference in Edinburgh in June 2017. The harmonisation meeting held in the Hague in November 2017 (reported in SWFS News January 2018) was the next opportunity to get together with numbers and national representation increasing.

Since then, a lot of work has gone on in the background to maintain momentum and expand the number of countries linked together through the Network. New wildlife forensic projects led by TRACE have started in Gabon, Kenya, Tanzania, Malawi, Zambia and Zimbabwe this year and the Netherlands Forensic Institute has funding for further project activities in East and Southern Africa. The US Fish and Wildlife Service also continues to deliver crime scene training and laboratory support to the region. All of these activities benefit from cross border scientific exchange which in turn helps strengthen regional links.

So, we are very happy to announce that the next African Wildlife Forensics Network meeting will take place at the National Zoological Gardens in Pretoria, South Africa at the end

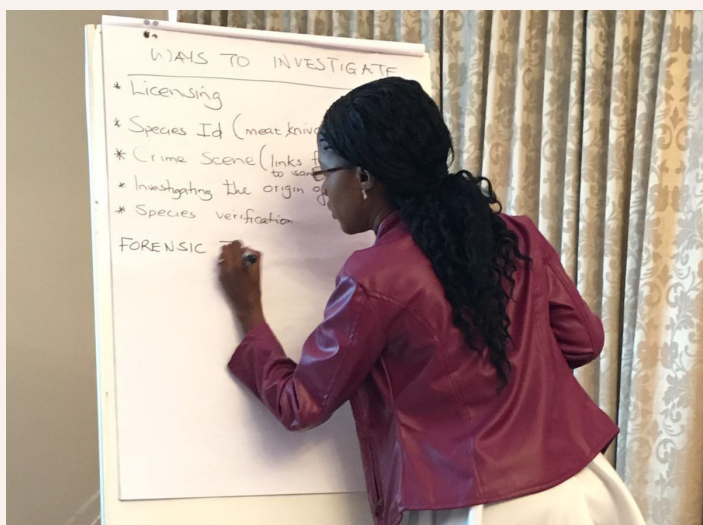
of November 2018. We hope this will be the largest meeting yet, with representatives from all active African wildlife forensic labs in attendance.

The initiative received initial support from the UK IWT Challenge Fund and subsequent funding from the European Commission's Forensic Alliance against Wildlife Crime programme and USAID's Wildlife TRAPS program. In addition, the African Wildlife Forensics Network is now supported by the UK People's Postcode Lottery and USAID's VukaNow programme. This diversity of funding streams has allowed us to plan for the future, with an event being arranged for SWFS 2019 in Denver, as well as tentative plans for the next full AWFN meeting to be held in Zambia in November 2019. The African Wildlife Forensics Network is picking up the pace!



African Wildlife Forensics Network news

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Do sweat the small stuff...it may save time and funds!

All mammalian hair exhibits species specific characteristics that enable identification to a particular taxonomic level.

If the hairs taken from the carcass were that of a cow, the morphological features would assist in effecting an identification of the mammal of origin and doing so might corroborate the identification as stated by the fishermen.

Hairs taken from a cow and from an Australian fur seal (*Arctocephalus pusillus doriferus*) were microscopically examined. The hairs from each sample were guard hairs (which commonly bear species specific morphological features).

Results

If the hairs taken from the carcass originated from a cow (*Bos Taurus*), as alleged by the fishermen, the scale pattern should have looked like those in figure 1.



Figure 1

However, the scale pattern from the hairs taken from, the carcass was scalloped, as seen in figure 2, which is typical for fur seals

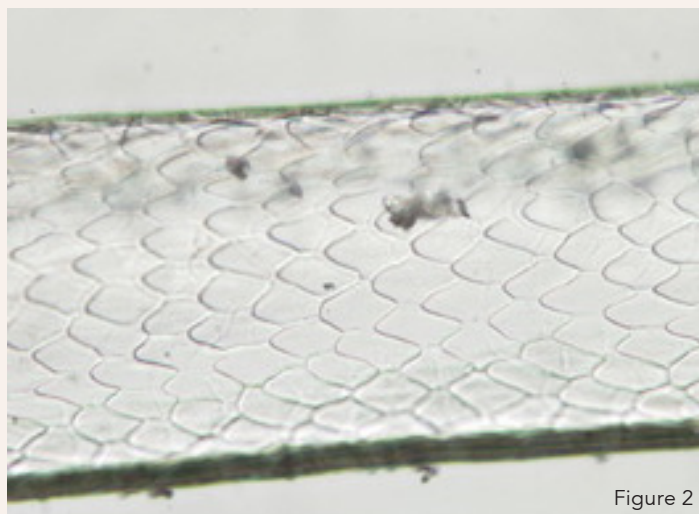


Figure 2

Furthermore, fur seals have very distinctive cross-sectional morphology as shown in figure 3



Figure 3

which differs to the cross-section of cow hairs as illustrated in figure 4.

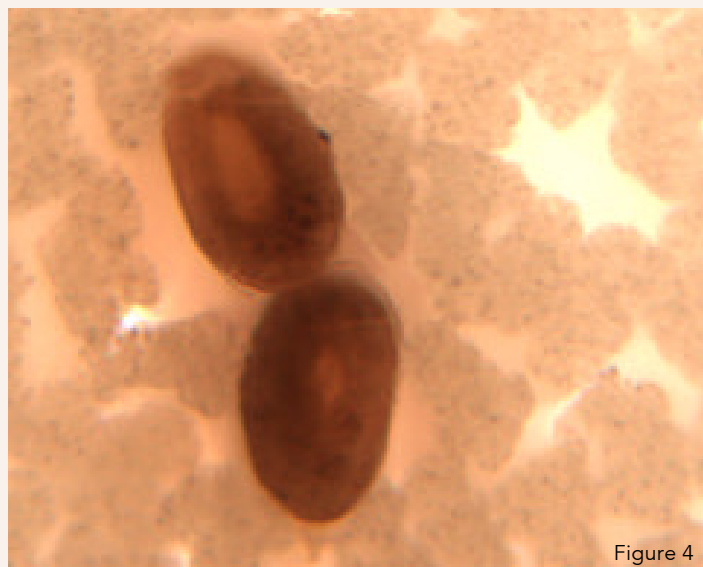


Figure 4

On the basis of this evidence the fishermen confessed to killing protected marine mammals, which incurred a substantial fine. The examination and identification of the hairs was effected within less than half an hour.

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Do sweat the small stuff...it may save time and funds!

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CASE 2: Alleged Illegal Importation of a CITES listed species

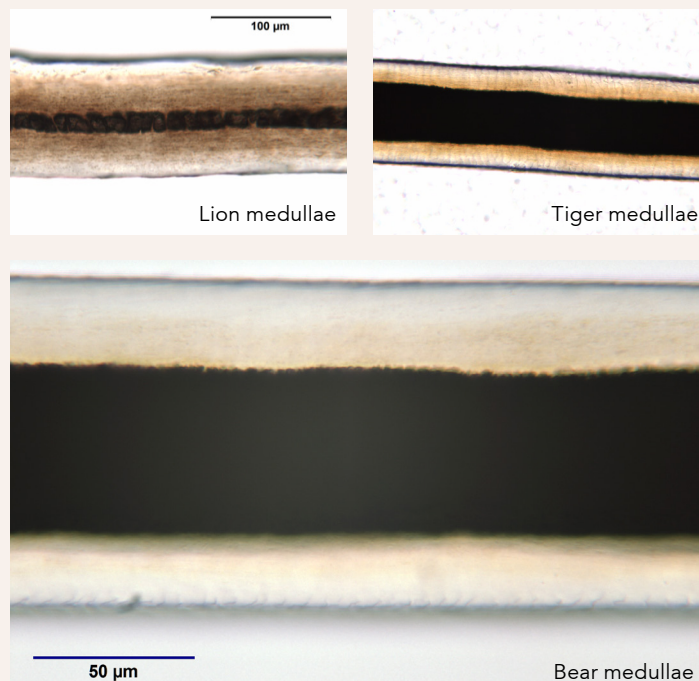
A person entering Australia was caught with what appeared to be a claw allegedly from a member of the cat family (Felidae) or bear family (Ursidae) (Figure 5). Attempts to identify the species using the DNA extracted from the hair were unsuccessful. However, examination by microscopy of the hairs' microscopic morphological features revealed that hair did not originate from a felid or ursid, but from goat hairs and bone fashioned into a claw.



Figure 7. Medulla exhibited by the hairs taken from the 'claw'

If the claw hair originated from a lion or brown bear figure 6 shows what the medulla may have looked like.

Figure 6. Upper images showing medullae from Lion and tiger guard hair (a, b) whilst the lower image shows medulla exhibited by bears.



The medulla in the hairs taken from the 'claw' (figure 7) was clearly distinct from the medulla shown by the big cats and bears. The wide scalloped medulla, which filled the vast majority of the shaft, identified the source of the hair as originating from a goat and not from a big cat. This finding explained the failure of felid DNA primers. The claw was fashioned from cow bone and the hair on the claw was goat in origin; the importer was not charged with bringing an illegal import of a CITES listed species into Australia. ♦

New SWFS members from Belarus: Introducing the Scientific and Practical Center of the State Committee of forensic examinations, Republic of Belarus

*Tsybovsky I.S. (scientific secretary), Grebenchuk A.E. (junior researcher), tsybovsky@yahoo.com
Molecular Biology Research Laboratory, Scientific and Practical Center of the State Committee of
Forensic Examination, Republic of Belarus*

The Scientific and Practical Center was established on 16th August, 1929. This is a scientific organization, accredited by the National Academy of Sciences of Belarus. As of 2013, forensic expertise is concentrated within the State Committee of Forensic Examination of the Republic of Belarus, to which the Scientific and Practical Center belongs.

The Centre's activities are both scientific and practical, carrying out examinations in the field of forensic science, forensic expertise, and scientific research. The Centre also engages in the development of modern methods, techniques and technical means for conducting expert studies.

The Molecular Biological Research laboratory (MBRlab) conducts DNA analysis of wild animals on investigative materials submitted for cases dealing with allegations of illegal hunting. Forests cover 40 percent of the territory of Belarus. Previously, molecular genetic studies of wild flora and fauna of Belarus were not conducted. To solve this issue, the MBRlab has developed scientific pilot studies of DNA-marker polymorphism and the genetic structure of wild species, in order to develop methodological approaches for expert application.



From left to right: Verchuk Alexei (trainee of junior researcher of the MBRlab), Nedzveckaya Diana (junior researcher of the MBRlab), Zabavskaya Tatyana (researcher of the MBRlab), Grebenchuk Alexandra (junior researcher of the MBRlab), Lukashkova Olga (junior researcher of the MBRlab), Kotova Svetlana (Head of Laboratory of molecular biological research, PhD of biological science)

Wild boar, moose, roe deer and red deer are the main native species hunted in our country. The introduced fallow deer is also hunted. Mouflons and spotted deer live in open-air cages. The Republic of Belarus has one species that is listed in the Red Book of Belarus (a listing of protected species), the European bison. Populations live in designated national parks. However, illegal hunting outside the reserves is known to occur. The bison belongs to the order of even-toed ungulates, which also include domestic pig, sheep, goat, domestic bull; meat products of these species are a common household item.

Any expert examination of biological samples should first determine the species of a sample, in order to identify whether a wild or domestic animal is being examined. Only after this is it necessary to identify to individual. MBRlab has a strategy, which dictates that the traditional STR-technologies of the investigating laboratory are applied to expert studies of animal DNA. So, the laboratory has worked to establish the limits of marker cross-amplification for even-toed ungulate species. MBRlab studied STR locus cross-amplification on specimens of elk, roe deer, red deer and wild boar. We used four groups of STR-markers to study cross-

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New SWFS members from Belarus: Introducing the Scientific and Practical Center of the State Committee of forensic examinations, Republic of Belarus

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amplification in species wild to Belarus: twelve bovine loci, six pig loci, 13 deer markers (species origin – American deer) and five caribou markers. Please refer to the web version of this article for details of the study, found [here](#).

Quantitative differences were seen in the spectrum of the detected alleles between species and differences in the molecular size ranges of alleles in the group of amplified loci. The level of kinship between species allowed us to create a DNA marker panel that successfully differentiates wild and domestic animals. A patent was filed for consideration in the Eurasian patent office in the city of Moscow, based on this work.

Pork is the national cuisine in Belarus, so a second scientific study examined genetic polymorphism of wild boar. Samples of wild boar (719 samples) and domestic pigs (304 samples including 6 breeds) were studied in parallel using 18 STR loci and SNP polymorphisms of the melanocortin 1 receptor gene (MCR1, 2 sites of single nucleotide substitutions) and the nuclear receptor NR6A1 (1 site). See the web article for details of this study. To summarize, gene introgression is present between wild boar and domestic breeds, but allele frequencies don't differ markedly between hybrids and non-hybrids, suggesting hybridization

to have occurred long ago. STR analysis reveals significant regional differentiation of wild boar populations and populations coincide with administrative regions. STR polymorphisms of wild boars are significantly different from those of domestic pigs. Allele frequencies are also statistically significantly different between individual breeds of domestic pigs, potentially allowing domestic pig breed to be identified. Further evaluation of the 20 STR loci in wild boar and domestic pigs is found in the web article. A minimum of 12 loci is required to assign a sample to wild boar or domestic pigs.

The MBRLab also investigates the genetic polymorphism of red deer, roe

deer and moose. 143 samples of the reintroduced red deer were investigated by 16 tetra-nucleotide STR loci. Like wild boar, the results show red deer to have statistically significant regional differentiation. A high number of loci are suitable for forensic tasks. The laboratory has genotyped samples around 400 European moose and 380 Roe deer at present, using 18 STR di-nucleotide and tetra-nucleotide loci and 13 STR loci, respectively.

The legalization of methodological tools is a separate area of our forensic work and methods must be officially approved and included on the Register of the State Committee of Forensic Examinations of the Republic of Belarus. Our laboratory



Head of Laboratory of molecular biological research (MBRLab), PhD of biological science, Kotova Svetlana

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New SWFS members from Belarus: Introducing the Scientific and Practical Center of the State Committee of forensic examinations, Republic of Belarus

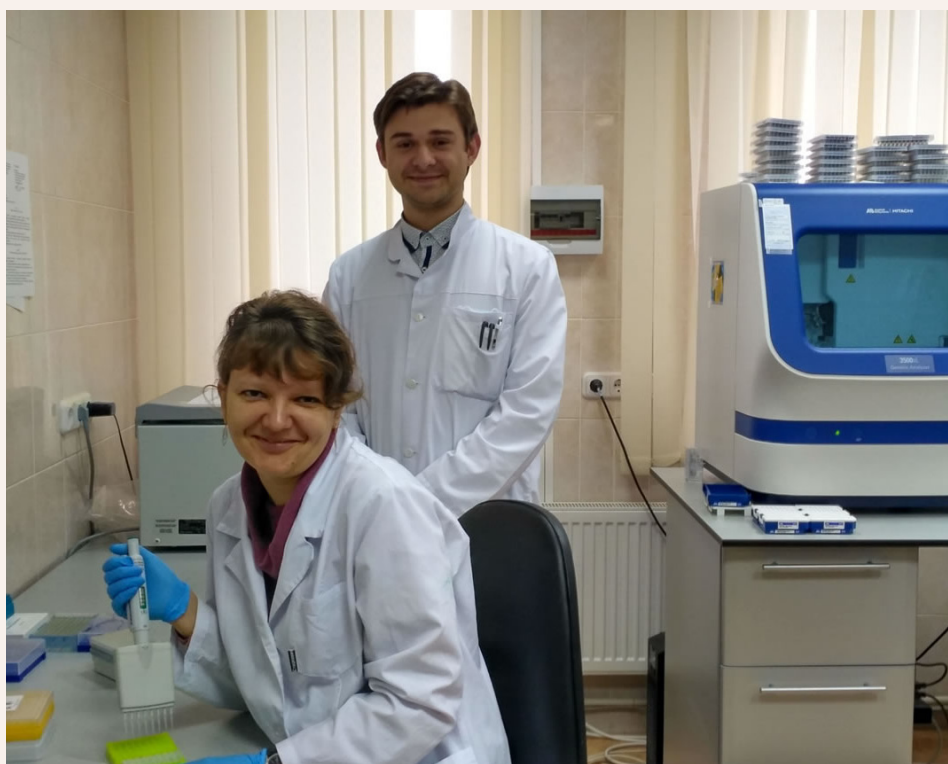
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has developed methodological resources, three of which are included in the Register of Forensic Expert Techniques at present (see web article for full references):

1. Specific PCR identification of wild animals of the Cervidae family and their differentiation from Bovid and Suids families,

2. DNA-identification of biological specimens of animals of the European boar (wild and domestic), and

3. Identification of biological specimens to wild and domestic representatives of the European boar by the method PCR-RFLP.



In the background: trainee of junior researcher of the MBRlab, Verchuk Alexei
in the foreground: junior researcher of the MBRlab, Lukashkova Olga



Researcher of the MBRlab, Zabavskaya Tatyana

In 2018, further methods will be developed for red deer, moose and roe deer and applied to expert examinations involving illegal hunting of these species. The number of these examinations exceeds 200 per year.

Animal abuse and dog theft is also of interest to MBRlab, although it is still quite small compared to western Europe. In 2018, four examinations involving animal abuse were conducted, and five in 2017. There is a completely unexpected problem caused by global warming. Reports began

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New SWFS members from Belarus: Introducing the Scientific and Practical Center of the State Committee of forensic examinations, Republic of Belarus

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to appear on the appearance of a new species on the territory of the Republic of Belarus – for example appearance of the golden jackal. MBRLab has been asked to conduct a mitochondrial DNA study of the golden jackal and further details of this are found in the web article. An unknown sample aligned most closely with the mitochondrial DNA of the golden jackal from an Israeli population.

In 2017, MBRLab signed an agreement on scientific co-operation with the State Organization Minsk Zoo. Employees of Minsk zoo are interested in the sex of birds that don't show sexual dimorphism and paternity testing of lion-tailed macaque. Our lab has also examined maternity in the African wild dog, as well as the relationship of sibs from different litters, one of whom was abducted from the zoo.

Small numbers of expert studies have been required for fox, bear, beaver, badger, and bison. Due

to the number of investigations in which dogs appear, it is most likely that the laboratory will be engaged in a more detailed study of genetic polymorphism in Canidae family including are wolf, fox, raccoon dog and domestic dog

In the nearest future, a separate area will be assigned to the laboratory that will deal with problems of forensic identification of plant samples. First this sector will be engaged in research of molecular biological polymorphism of plants involved in logging (pine and spruce) and illegal circulation (hemp).

We thank you for your attention. ♦

Note from the editors: If you would like your laboratory featured in a future SWFS newsletter, please let us know at bcassidy@dnasolutionsusa.com or sherryn.ciavaglia@wildlifeforensicscience.org



In the background: junior researcher of the MBRLab, Grebenchuk Alexandra
in the foreground: junior researcher of the MBRLab, Nedzveckaya Diana

Belarus joins SWFS after knowledge exchange visit to Edinburgh

Lucy Webster, SASA

In January 2018, a team of three forensic scientists from the Scientific and Practical Centre of the State Forensic Examination Committee of the Republic of Belarus visited the University of Edinburgh and the Scottish Government Wildlife DNA Forensic Unit at SASA to discuss wildlife forensics and SWFS. Their visit was funded by an EU program (MOST) to promote knowledge sharing and best-practice between Belarus and EU countries.

It was a very useful visit on all sides. Poaching was the key area where interests overlapped; DNA profiling techniques have the potential to be shared between

Belarus and the United Kingdom for various species include wild boar, red deer and roe deer. We discussed methods of analysis, quality assurance, and how we can collaborate in the future. For more information on the work of the Belarus lab, see the article by Iosif and Alexandra on page 9. Further funding has been obtained to support two internships which will take place at the University of Edinburgh later this year. The benefits of joining SWFS – with an ever increasing international membership – were well received and we can now count the Republic of Belarus as a member country! ♦



Front row: Iosif Tsybovski (Scientific secretary, Belarus), Svetlana Kotava (Head of the laboratory, Belarus), Alexandra Hrebianchuk (junior researcher, Belarus) from Scientific and Practical Centre of the State Forensic Examination Committee of the Republic of Belarus, Sherryn Ciavaglia (SASA).

Back row: John Kerr (SASA), Lucy Webster (SASA), Rob Ogden (University of Edinburgh) and David Kenyon (SASA).

Who made this?

Sleuthing the cultural identity of ethnographic objects using avian forensic morphology techniques

*Ildiko Szabo – Assistant Curator of the Cowan Tetrapod Collection
University of British Columbia Beaty Biodiversity Museum
ildiko@zoology.ubc.ca*

Museums and people's attics are chock-a-block with ethnographic objects that have little or no provenance. Not knowing where, when, and why an object was made turns these objects into cultural orphans. Without provenance, an item that could be a significant ethnographic object becomes a tourist trophy, at best a proudly displayed curio. This investigation showcases two aspects of forensic morphology: the importance of having a broad spectrum reference collection of your taxa, plus the benefits of collaborations between anthropology museum staff members and other professions with forensic scientists.

Before asking for avian forensic assistance, Dr. Nuno Porto (University of British Columbia Museum of Anthropology (MOA) Africa & South American Curator) researched the beadwork pattern of artifact H2.64, but he was unable to find a cultural match. This was a needle in a haystack problem. Within Amazonia there are 385 identified indigenous people belonging to 270+ indigenous languages. A colleague suggested he reach out to the 'feather person' at the sister museum on campus, the Beaty Biodiversity Museum. The resulting avian forensic investigation resulted in the reattribution of several cultural orphans to their rightful cultural heritage. Only one case is highlighted in this article.

Upon arrival to the back rooms of the MOA to see the ethnographic objects, I was asked: Can you confirm that these objects are from South America? Answering this on a continental wide basis was easy, narrowing it down to a region or drainage system is a much more difficult problem. The locality note attached to object H2.64 was: ? Ecuador.

MOA protocols forbid subsampling of any cultural object. This wide sweeping ruling is not limited to wildlife; even the removal of paint from the underside of an artifact to determine if it is lead-based is not allowed. This eliminated all DNA techniques and even



University of British Columbia Museum of Anthropology
H2.64 cultural object

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Who made this?

Sleuthing the cultural identity of ethnographic objects using avian forensic morphology techniques

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Each of the four subspecies of Paradise Tanagers (*Tangara chilensis*) has a unique lower-back upper-tail pattern. In most of the subspecies, the scarlet red either gradually or abruptly changes to orange. Only in *T. c. chilensis* is this pattern 100% scarlet with zero orange feathers. “

ruled out microscopic feather down analysis. Another MOA protocol is that only collections staff are allowed to hold or touch cultural objects. This meant that in the event that I needed a measurement that requires touching a bird, needed to look at the bird from a different angle or wanted to utilize feather-to-feather comparison techniques, all had to be done by MOA collections staff while I watched. By necessity, all the work was done at the MOA research lab with my transporting reference materials (books and birds) to their lab. I never touched a cultural object, nor collected a sample.

This left only two methods: comparing the birds attached to H2.64 to drawings and taxonomic descriptions in South American

bird field guides and other reference books, plus examining the avian study skin reference collection held at my home institution. Not all the birds present could be identified for a variety of reasons; sometimes only a wing was present or the head was absent. After identifying the majority of the birds to the species level, the next step was to determine the sub-species of polytypic species. After this was completed, comparison of the range maps of all the identified birds (monotypic species or subspecies) narrowed down the localities where they occur. During the first site visit, I had cautioned the MOA staff that we could not rule out the possibility of trade causing one or all of the bird to



This distinctive black manakin with a red head, and yellow thighs (not visible) narrowing the possibilities to two monotypic species. As its name suggests, this Round-tailed Manakin (*Ceratopira chloromeros*), has a tail atypical for its genus. The lack of yellow underwing covert feathers, tertial feathers with black inter vanes, plus a black rather than pale upper chin all confirm this identification and rule out the extremely similar Red-capped Manikin (*P. mentalis*).

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Who made this?

Sleuthing the cultural identity of ethnographic objects using avian forensic morphology techniques

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have originated from an ecological area different to where the birds were incorporated into this cultural object. There was also the possibility of some birds being outliers, that is, originating from different parts of the continent than the majority of the birds, which would muddy the waters considerably. Superimposing the range maps showed that all the identifiable birds attached to H2.64 do co-exist in the wild.

The two largest and extremely charismatic orange-and-black Andean Cock-of-the-rock (*Rupicola peruvianus*) turned out, forensically speaking, to be useless. Plumage is used to differentiate between the females of the four subspecies. These birds are males which are best identified to subspecies by their vocalizations. Male eye pigmentation is also a useful taxonomic character - but only when the birds are alive!

On this bandoleer, the relatively small Round-tailed Manikin, *Ceratopipra chloromeros*, turned out to be the crucial bird. Manikins typically inhabit very small geographic ranges. This species lives in an ecological zone that encompasses parts of Peru, Bolivia and Brazil.

After receiving the Birdlife International species range map of the Round-tailed Manikin, Porto speculated that H2.64 might be

of Ashaninka origin. Using a cell phone, he send a photo of H2.64 to a colleague at the Universidade de Brasília who quite by chance was at that moment in the field, working in an Ashaninka village. The cell phone image was shown to the local residents. Within an hour, it was texted back that the Ashaninkans recognized it. It was a Txoshiki. It was of an older style, the style formerly used by their grandfathers to fabricate a child's Txoshiki.

Going forward, this beautiful ethnographic object is no longer a museum curio stored with other cultural orphans. H2.64 is now reunited with other Ashaninka pieces at its home museum, but more importantly its existence is shared globally through the Revolving Research Database (RRN) and the MOA's fully imaged catalogue, making it available for future generations of researchers. This database record now includes the local indigenous knowledge obtained during this investigation.

This forensic case illustrates many things. The availability of reference material, actual physical specimens, plus an extensive library, is extremely important. This is especially true when DNA techniques cannot be implemented. It highlights the importance of not being influenced by undocumented written notes associated with a case; H2.64 is not from Ecuador or a



Due to the condition of the material, this bird could not be identified.

culture associated with that country. This investigation also underscores the benefits of interdisciplinary museum collaborations and one of the many ways that forensic science can contribute to such endeavors. ♦



BirdLife International range map for Round-tailed Manikin. Map data @2017 Google, INEGI.

An update from the ForCyt Project

Greta Frankham, Australian Centre for Wildlife Genomics, Australian Museum Research Institute.

If you were at the Edinburgh SWFS meeting or you are a keen reader of SWFS newsletters, you may be familiar with the ForCyt project. The aim of this project is to develop the first fully-regulated database of mitochondrial DNA sequences for use by the wider wildlife forensic community, in the similar way that databases such as EMPOP are used by the Human forensic community.

The ForCyt database will provide any lab across the globe undertaking analysis for evidential requirements access to mtDNA sequences generated from vouchered reference material, a basic resource still lacking in the wildlife forensic community. For those labs that do not have access to large natural history collections and vouchered

reference material, this will reduce the reliance on invalidated and non-quality controlled public access DNA databases such as GenBank or BOLD and ultimately lead to improvements in wildlife forensic standards and quality control across the community.

Originally the ForCyt database was going to focus on Cytochrome b. However, through discussions at the SWFS meeting last year, the project team decided to embrace mass parallel sequencing technology and new bioinformatics pipelines to generate whole mitochondrial genomes for target species, increasing versatility and useability of the database.

In February 2018, the first ForCyt workshop was held

in Kuala Lumpur, Malaysia. The workshop was hosted by Dr Jeffrine J Rovie-Ryan and Frankie Sitam of the National Wildlife Forensic Laboratory of Malaysia (NWFL). Attendees were Dr Ross McEwing and Kyle Ewart, both from TRACE Wildlife Forensics Network, Dr Monica Mwale of the National Zoological Gardens, South Africa (NZG), Assistant Professor James Creecy from the University of Central Oklahoma, and myself, Dr Greta Frankham (Australian Centre for Wildlife Genomics, Australian Museum Research Institute, AMRI). This project team brought together expertise in academic and practitioner lab work, bioinformatics, sample collection, acquisition and database curation. ♦



The ForCyt Project Team in the lab at the National Wildlife Forensic Laboratory in Kuala Lumpur Malaysia

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An update from the ForCyt Project

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We spent five days in Malaysia, piloting lab procedures, troubleshooting the inevitable problems that arise, even with the best laid plans. We also worked on creating the framework for the database and benchmarking standards that will need to be met in regards to taxonomic identification and associated metadata before samples are eligible for the database, and began the initial development of Standard Operating Procedures to capture all aspects of this work.

With samples from the NWFL, NZG, and AMRI

collections now all in Malaysia, initial sequencing is underway on 23 species, including some of the world's most highly trafficked species: elephants, rhinos, pangolins, large cats and bears. The results from this sequencing will inform how the project proceeds into the future.

The ForCyt project should not only provide a resource that is very much needed in the wildlife forensics community, but it also serves as a great model for cross laboratory collaboration and information sharing, which will lead to improvements in investigative

outcomes for this truly global problem.

ForCyt is supported under the Wildlife TRAPS project of TRAFFIC and IUCN funded by USAID. Additional ForCyt funding has just been announced over the next two years to develop reference DNA sequences for wildmeat (bushmeat) species and heavily traded bird species. ♦

For more information, contact ross.mcewing@tracenetwork.org.



The ForCyt Project Team at the National Wildlife Forensic Laboratory in Kuala Lumpur, Malaysia
L to R (back) Ross McEwing, James Creecy, L to R (front) Kyle Ewart, Greta Frankham, Monica Mwale and Frankie Sitam

Strengthening wildlife forensic capacity in SE Asia: increasing testing for rhino horn, ivory and pangolin seizures

Kyle Ewart – TRACE Wildlife Forensics Network

Jeffrine Rovie-Ryan – National Wildlife Forensic Laboratory, Department of Wildlife and National Parks (PERHILITAN), Malaysia

Frankie Thomas Sitam – National Wildlife Forensic Laboratory, Department of Wildlife and National Parks (PERHILITAN), Malaysia

South-East Asia remains a major hotspot for wildlife trafficking, one of the largest transnational criminal activities. Thousands of wildlife products are seized in the region every year, many of which require wildlife forensic testing to determine their legality.

We can generate a wealth of information from a wildlife seizure, thanks largely to the hard work of many SWFS members. Many DNA-based tests have been developed by the wildlife forensics community, which are often divided into two broad categories: 1) validated forensic tests used to produce evidence for prosecution, and 2) tests to generate information for intelligence and/or to deter wildlife trafficking. The benefits of performing both types of test on a wildlife seizure are obvious; however, the frequency and scale of wildlife seizures in SE Asia can overwhelm the time and monetary resources of wildlife forensic labs, hence testing is often limited.

A project funded by the Bureau for International Narcotics and Law Enforcement Affairs (INL), headed by TRACE Wildlife Forensics Network in partnership with TRAFFIC, is supporting DNA-based testing in the South East Asia region for rhino horn, elephant ivory and pangolin seizures. It is well known that these charismatic taxa are heavily trafficked and are often seized in large quantities. For example, pangolins alone contributed up to US\$200 million of the estimated US\$2.5 billion illegal wildlife trade industry in East Asia and the Pacific (UNODC, 2013). The National Wildlife Forensic Laboratory (NWFL) in Kuala Lumpur, Malaysia, is working in partnership with TRACE to implement the project, and is currently hosting a TRACE technical advisor (first author) to ensure effective collaboration and a swift response to any seizures in the region involving these species. Since its commencement in 2017, the project has supported the testing of multiple seizures in Thailand,

Vietnam and Malaysia. A notable example was a large ivory (3 tonnes) and pangolin scale (5 tonnes) seizure in Sabah, Malaysia. NWFL coordinated a week-long operation with representatives from PERHILITAN, Sabah Wildlife Department, Sabah Customs and TRACE, to process the seizure. An intense week of measuring, labelling, sorting, sawing and packaging resulted in >150 ivory samples and >200 pangolin scales, which are now being tested at NWFL. The subsequent species identification results can be used as forensic evidence in prosecutions related to the seizure, while the geographical origin information will assist relevant authorities to uncover trade routes and monitor trends.

One key aspect of this INL project is to collate a set of available tests and guidelines to streamline and standardize testing for these species, from sampling to reporting results, and then present this guide as an interactive webpage (coming soon...). TRACE and NWFL will be hosting a workshop in Malaysia this coming September, with participants from Thailand, Hong Kong, Indonesia, Vietnam, China, Japan, Korea and Malaysia, to discuss wildlife forensics in the region, potential collaborations, and to undergo expert witness training. ♦



Ivory from the Sabah seizure

Applying standard human forensic techniques in the wild

Lucy Webster – Science and Advice for Scottish Agriculture (SASA)

There is surprisingly little published literature on the success of human DNA profiling from evidence that is seized from the outdoor environment. In remote areas, crime scenes may not be located for a significant period of time, and so rain and UV exposure could affect the persistence of human touch-DNA. For wildlife crimes, traps and snares will be handled by the people who set them, illegally killed animals and carcasses that will be used as poisoned bait may also be handled- transferring human DNA in the process - but how long will the DNA persist?

Kayleigh McLeish, an MSc student in Forensic Science at the University of Strathclyde in Scotland, took an experimental approach to assess the persistence of human touch-DNA from evidence that could be recovered out in the wild in June 2017. Her project was carried out in collaboration with the wildlife forensic lab at SASA and the Scottish Police Authority Forensic Services. The results of her work have recently been published in *Forensic Science International: Genetics* (McLeish et al., 2018).

Traps were set and animal carcasses (rabbits and corvids) were handled by a volunteer and then placed outside for 0, 1, 4, 7 or 10 days (or left inside as a control). Items were then sampled by tape-lift and profiled for human DNA using the standard methods employed at the Scottish Police Authority Forensic Services (Globalfiler™ PCR kit). A smaller experiment involving four bird of prey carcasses was performed, leaving the handled birds outside for only 24 hours.



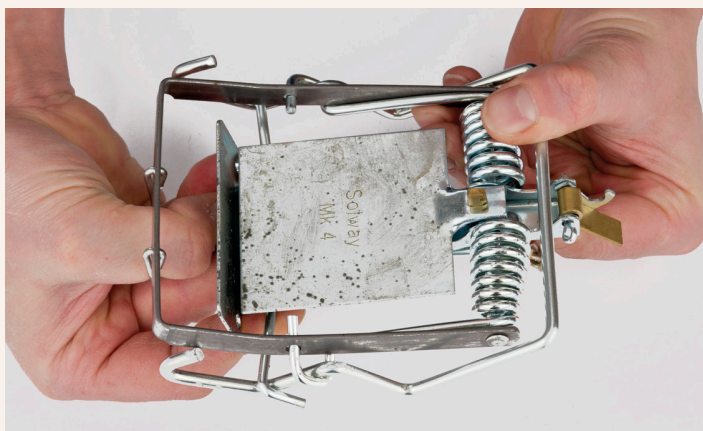
Kayleigh McLeish

In summary, her experiments demonstrated firstly that it is possible to obtain complete human DNA profiles from spring traps that had been left outside for at least 10 days -the longest time period in her experiment. This was in spite of some torrential rain that fell over the experiment (over 100mm of rain in one replicate). Secondly, her results showed that you can recover a useful human DNA profile from a handled carcass (rabbit, corvid or bird of prey) after at least 1 day outside, but the drop off in success is much faster, probably due to decomposition of the animal.

The time since a crime occurred may not be known when a scene is located in the wild. However, Kayleigh's results suggest it might always be worth taking samples from an illegally-set trap for human DNA profiling and also from a carcass if there are no significant signs of decomposition.

In wildlife forensic science we are often thinking of how we can use animal DNA to assist with an investigation, but this work has highlighted that human touch-DNA can be another useful tool, even during a wet Scottish summer.

McLeish, K., Ferguson, S., Gannicliffe, C., Campbell, S., Thomson, P. I. T., & Webster, L. M. I. (2018). Profiling in wildlife crime: recovery of human DNA deposited outside. *Forensic Science International: Genetics*, 35, 65–69. <https://doi.org/10.1016/j.fsigen.2018.04.002> ♦



A spring trap, of the type used in these experiments, being set and showing the areas of contact for transfer of human touch-DNA.

New CITES lab survey 2018

Rob Ogden

Many of you will have contributed to the survey conducted by the UNODC with the support of SWFS in 2015, which looked to identify labs around the world involved in supporting CITES enforcement. This led to a report submitted to the 2016 CITES Conference of the Parties (CoP) in Johannesburg, where the subject of wildlife forensic capacity was discussed. The decision was taken to continue to build up a database of labs in different countries, and separately, to provide a public directory of those labs able to offer wildlife forensic services at an international level.

To this end, CITES has once again requested the UNODC to undertake a survey of international wildlife forensic capacity, with two main aims. The first is to update the existing confidential database concerning national wildlife forensic research and casework capacity, giving existing labs the opportunity to update their data and inviting new labs to submit information on their activities. The second aim is to invite labs to consider offering international casework services, evaluate their capabilities in this regard and, subject to approval, list these labs on a CITES directory of wildlife forensic facilities able to provide specific services.

The entire process is likely to run on into 2019 with a report submitted to the CITES CoP in Sri Lanka next May, however many SWFS members should receive a 2018 online survey in the near future. Please take ten minutes to respond, the data remains confidential but really helps the International Consortium on Combatting Wildlife Crime to develop a picture of wildlife forensic capabilities worldwide. If you don't receive a survey invitation and would like one, please contact unodc-wlfc@un.org ♦

New Board Member: Daniel Xu

What's your current position? How long have you been in this position? Can you give me a brief overview of what it is you do in your work?

I am a professor at College of Wildlife Resources, Northeast Forestry University. This position started from 2008.

My responsibilities at this position include teaching of Advanced Molecular Biology for Masters students, Conservation Genetics for PHD students, as well as Guiding Principles of Scientific Research for undergraduate students.

I also do research, most of which is regarding conservation genetics, particularly in wildlife

forensics and population genetic management technologies. Topics of my research include DNA species identification, individualization, paternity testing, sexing, and origin assignment. Presently, I am engaged in developing statistical methods for DNA-based species identification, to more effectively extract evolutionary speciation signals from routine genetic markers such as cyt b and COI to improve the power of species discrimination. This new method is also effective to support database development for automated species assignment.

Another important topic I am working on is origin determination of farmed or wild animals using different approaches such as morphometrics and density of bone, and methylation pattern

of energy-metabolic related genes in skeletal muscle etc. This is useful because there are a large number of endangered species being commercially farmed, while commercial utilization of wild conspecific animals is banned.

Tell me how you first got involved in Wildlife Forensics?

I studied conservation genetics when I was a PHD student from 1997-2000. I validated a set of microsatellite loci for paternity testing and population genetic management of captive tigers. This work was done with support from the Forensic Laboratory of the Public Security Department of Heilongjiang Province and the Institute of Forensic Science of China. I became interested

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New Board Member: Daniel Xu

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in forensics and recognized the importance of forensics in combating wildlife crimes. The microsatellites I validated were then applied to forensic individualization of tigers.

What was your first impression of Wildlife Forensics?

My first impression of Wildlife Forensics is its mystery, its uses of knowledge and technologies to help investigations of wildlife crimes and prosecution. Because wildlife crime cases are very often victimless, that victims could not speak and co-operate with police, information could only be mined through special technologies. Such challenges attracted my attention and interests.

What has surprised you most about working with Wildlife Forensics?

My lab has a lot of ivory cases requesting species identification. Surprisingly, we sometimes encounter conflicting conclusions between DNA and morphological methods for mammoth ivory, a small number of which the Schreger's angles were great enough to make a conclusion of exclusion. Therefore, we often use two methods when the Schreger's angle result is confusing. This tells us there are indeed exceptions, although methods are validated using large sample size. Alternative methods should always be considered.

What do you find most challenging about Wildlife Forensics?

There are many challenges about Wildlife Forensics. A typical

challenge comes from emerging problems, for which technologies are not available, for instance, the discrimination of origin between farmed and wild animals and their parts and products. China is fairly successful in wildlife commercial farming and has built up industries independent of wild populations. We do not understand well the differential outcomes in animal physiology. It's quite difficult to locate boundaries to set up theoretical predictions and testing systems. But investigators are waiting outside your laboratory.

What would you say most motivates you to do what you do?

What most motivates me is the interest and the second should be responsibility. China is a big country with a long history of wildlife culture, utilization, captive breeding, and large number of endangered species. Law enforcement would not be effective without the support of forensics. It was my luck that I became one of the first groups of people to establish wildlife forensic systems in China.

What were you doing before you began your current position?

I was a faculty member of my college, teaching and research.

Tell me about some of the people you've met while working in Wildlife Forensics?

The first two forensic scientists I met were Mr. Xiao Ping Li of

the Forensic Laboratory of the Public Security Department of Heilongjiang Province and Dr. Wan Shui Li of the Institute of Forensic Science of China. They showed me how forensic genetic analysis was done for humans, and started my interests. The second two important scientists I met and learned from were Dr. Edgard Espinoza and Dr. Jim LeMay of the National Fish and Wildlife Forensics Laboratory in the USA. They visited my university in 1998 when my forensic lab, the State Forestry & Grassland Administration Detecting Center of Wildlife of China (SFGA-DCW) was just established. They gave us a lot of instructions. I visited their lab the next year and learned more. That was the start of my forensic career.

Tell me about someone who has influenced your decision to work in Wildlife Forensics?

My supervisor for Masters and PhD degree, Prof. Song Yan Jing, is the person who lead me to wildlife forensics. She was the first scholar to recognize the demand for wildlife forensics in wildlife conservation. She made a great deal of effort to talk to government and university administrators and achieved collaboration between central government and my university to set up the first forensic lab, SFGA-DCW.

Where did you grow up?

I grew up in the countryside of Heilongjiang Province

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New Board Member: Daniel Xu

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What was it like to grow up in countryside?

In my childhood, I lived with many kinds of wildlife. Hares, weasels, ring-necked pheasants, hawks and many birds were seen in my village, taking from our crops. Villagers often trapped wildlife for fun and for sumptuous food. However, I experienced a dramatic change of landscape, from grassland, wetland to farmland with rapid growth of human populations. Wildlife gradually disappeared.

Did you go to college?

Yes, I did.

Where did you go, and what was that like?

My university is located in Harbin, the capital of Heilongjiang Province and famous for ice and snow art. The city was deeply influenced culturally by Russia and the Russian style of life, building and traditions of which last to present day.

What might someone be surprised to know about you?

My team is the only research team of wildlife forensics, so I appear on TV or in newspapers sometimes to talk about stories of either research or cases. Some are surprised when they meet and recognize me.

The interest in Wildlife Forensics seems to be growing. Why do you think that is?

Yes, I agree, because wildlife crime has been globalized. Poaching somewhere may link to trafficking in another region or continent far away. Therefore, law enforcement should also be globalized, as well as forensics. There are two major difficulties preventing globalization. One is the disequilibrium of ability in economy and infrastructure, the other is the disequilibrium of expertise from region to region. These difficulties lead to vulnerable spots in forensics.

What would you tell someone who is thinking about starting in Wildlife Forensics?

I often say to my students and colleagues that forensics is different from other applied science in that wrong identification might either condone crime or hurt innocent people.

What do you think will change about Wildlife Forensics over the next five years?

I think there will be two changes. One is further integration of global wildlife forensic resources to improve international collaborations, including expertise, reference data and sample sharing, as well as standardization. The other change would be the amelioration of disequilibrium ability from region to region by efforts of integration and collaboration.

How would you describe yourself?

I think I am a modest, optimistic, and co-operative man.

What do you do when you aren't working?

I like to walk in the wild, enjoy all things in nature, which is better with friends.

What's next for you in your work? What are you looking forward to?

I am making efforts to develop techniques to separate farmed from wild animals for different kinds of wildlife parts or products. I hope to establish and validate a series of technologies to cover the most farmed species, such as birds and snakes. ♦

SWFS Board Update

Tasha Bauman

There has been a lot happening behind the scenes within the Society for Wildlife Forensic Science. Over the last six months the SWFS board has been working on the auction of the Wyoming Game and Fish Commissioner's license, writing a scheme and application process for the Society for Wildlife Forensic Science: Small Research Award system, adding a new board member and updating portions of the website.

As you will remember, we announced the auction of the Wyoming Game and Fish Commissioner's license. The Board is excited to announce that the profits made from the license auction reached US\$16,000, which will go to support the Technical Working Group.

Currently, several board members are in the process of developing an application system for small research awards. The purpose of the SWFS Small Research Award is to provide financial support to SWFS members for development and validation of methods for use in wildlife forensic casework. The Award will provide funding for specific projects that are not typically supported by research grants, i.e. validation studies, ring-trials and the development of new proficiency tests. It may also be used to support the exchange of techniques between SWFS member labs, particularly at the international level. Subject to available funding, the Society seeks to provide Awards to support one or more projects up to a total of US\$5,000 per year. This application

system is still being developed and further details will be shared in the very near future.

Professor Daniel Xu of the College of Wildlife Resources, Northeast Forestry University in Harbin, China is the newest member of the SWFS Board. Professor Xu is currently teaching and conducting research in wildlife forensics at the University. He has a close link with Chinese police and Customs and has been involved in many of the international conservation activities. Please join me in welcoming Daniel to his new board position. See his interview on page 21 to learn more about Daniel.

Lastly, many of you may have noticed that the SWFS website is currently going through some changes. Several board members have been working with web designer John Clark of Artificial Art to improve many of our online services. Firstly, the SWFS member web portal is now live! Members can sign in to renew their membership and update their details online. The web portal sends automated prompts when memberships are nearing expiry and provides access to contact details of other SWFS members to facilitate networking. Please log on and make sure that your details are up to date. You should have received a personal username and password from Sherryn Ciavaglia. If you have not received this and believe you should have, contact Sherryn at sherryn.ciavaglia@wildlifeformscience.org. The online membership application process is also quicker

and easier than the previous email trail.

The second improvement will be the Certification process. The application process is currently going through a face lift to become more streamlined. Applications for certification are not being accepted during this time, but we will resume taking applications in August once the online system has been revamped. Lastly, in the very near future the purchase of proficiency tests will be made through the SWFS website.

These are a few of the exciting items that the SWFS board has been working on. If you have further questions about what the board is doing for you, please contact us. ♦

11th Annual IFVSA conference in Portland, Oregon

Susan Underkoffler

The International Veterinary Forensic Sciences Association (IVFSA) held its 11th annual three-day conference this past May in Portland, Oregon. Approximately 100 participants from multiple countries attended presentations by professionals in the fields of veterinary and wildlife forensics, humane law enforcement, animal law and animal welfare, along with an additional half-day workshop on courtroom testimony and a moot-court exercise.



Dr. Servio Reis and Mariel Everson present on veterinary forensics in Brazil

Amid the surprisingly sunny, warm weather in Oregon, we were treated to impressive presentations from talented colleagues. Topics included case studies, forensic necropsy techniques, equine racing fatalities, DNA use in animal cruelty crimes, patterned injuries, regulatory medicine investigations, and canine hypo/hyperthermia characterizations, among others.

We were also privileged to welcome the Honorable Thomas A. Balmer, Chief Justice of the Oregon Supreme Court, who presented a Keynote on animal cruelty in the context of the larger mission of the justice system, and Dr. Nici Vance, Senior Forensic Scientist and Forensic Anthropologist in the Medical Examiner Division of the Portland Metro Laboratory, who

spoke about forensic anthropology.

Our annual soiree, which is always a fun time to reunite with colleagues and meet new members, was held at the Oregon Zoo this year, thanks to their generous sponsorship. The bartenders graciously continued our tradition of a signature drink by creating a pink and green concoction called the "Hair Follicle". The Bring Your Own Slides event was as great a success as ever, and Oregon Humane Society graciously gave attendees a tour of their facility. Plans for the organization throughout the remainder of 2018 and into 2019 were discussed at the business meeting, and we were happy to announce that 2017-2018 saw the largest increase in new membership that IVFSA has experienced. Following the conference, the National Fish and Wildlife Forensics Laboratory in Ashland, Oregon opened its doors to those of our group who wished to tour the facility – an opportunity of a lifetime for many.



Social dinner attendees

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11th Annual IFVSA conference in Portland, Oregon

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Feeling, in many cases, more like a family reunion than an educational event, our conference is a chance for us to remind each other that we are not alone – that those of us on the front lines of some of the most horrific cases of animal cruelty and abuse have support and can rely on each other for professional advice and help.

With gratitude the IVFSA Board of Directors and conference planning committee thanks everyone in attendance and hopes that you can all join us in St. Pete Beach, Florida, from May 8th-10th in 2019! ♦



Keynote Speaker Judge Balmer

DNA results show mysterious canine is a wolf

Greg Lemon, reproduced with permission from Montana Fish, Wildlife and Parks

Original article: http://fwp.mt.gov/news/newsReleases/fishAndWildlife/nr_1108.html

The canine creature shot in Montana a month ago that captured the curiosity of the nation is actually a gray wolf.

DNA from the animal, which was shot legally by a rancher near Denton on May 16, was tested at the U.S. Fish and Wildlife Service forensic laboratory in Ashland, Ore. The lab compared the animal's DNA with thousands of other DNA samples from wolves, coyotes and dogs. The conclusion was clear – this animal is a gray wolf from the northern Rocky Mountains.

Confusion about the animal might be due to the condition of the animal and the photos, which seemed to show short legs and big ears. Inspection of the animal at the Montana Fish, Wildlife and Parks wildlife health lab in Bozeman revealed a relatively normal looking, dark brown wolf.

Physical variations aren't unusual for animals, said Mary Curtis, geneticist for the U.S. Fish and Wildlife Service.

"Within species there can be variability that's not surprising at all," Curtis said.



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DNA results show mysterious canine is a wolf

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The wolf was a non-lactating female, which means she didn't have a litter of pups. However, any unique physical features she has might also appear in her siblings or parents and may continue to be passed along by others in her family. The wolf measured 45 inches from the tip of the nose to the rump and weighed 84.5 pounds. It's estimated that the wolf was between 2 and 3 years old.

Wolves are fairly common in Montana. According to the 2017 Montana Gray Wolf Program Annual Report, population estimates suggest there are approximately 900

wolves in Montana. This marks the 13th consecutive year that Montana has far exceeded wolf recovery goals.

Property owners in Montana have broad legal authority to shoot wolves they feel might be a threat to their livestock, as was the case with this wolf near Denton. ♦



Wildlife poisoning forum roundup

The following are recent highlights from an online collaborative wildlife poisoning forum with a membership of over 150 researchers, conservationists, ecologists, toxicologists, policy-makers and scientists from around the world whose expertise spans the fieldwork, laboratory, and law-enforcement sectors. Casework is routinely consulted upon and recent developments shared through an extensive reference library. Date of posting is highlighted in bold.

For more information about the forum, or to become a member, contact moderator:

Ngaio Richards: ngaio@wd4c.org

Submissions are sought for the inaugural issue of the Journal of Veterinary Forensic Science (JVFS), an initiative of the Maples Center for Forensic Medicine (University of Florida - Gainesville). Online and open access, JVFS focuses on the application of forensic science and medicine to the investigation of animal crime. Manuscript submissions in the areas of original research, case analysis, investigations, industry standards and guidelines, technical notes, short communications,

book reviews, and opinion articles can be submitted to the Editor for peer review. For more information, contact Susan Underkoffler: sunderkoffler@ufl.edu

Snapshot of recent wildlife poisonings around the world

Loss of even a single individual from a rare and long-lived species, which often require years to reach reproductive age and produce a relatively small number of young thereafter, can have significant and lasting repercussions to the population and its status. And, as was demonstrated by the Asian Vulture Crisis, wherein millions of Gyps vultures perished within less than a decade following exposure to residues of a nonsteroidal anti-inflammatory veterinary drug, the demise of abundant animals should be no less concerning.

June, 2018:

Carcasses and carcass parts of hundreds of Wedge-tailed Eagles were recovered under suspicious circumstances from a farm property in Australia. Two ravens and a kookaburra (genus *Dacelo*), among others, were also

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Wildlife poisoning forum roundup

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found. It appears that the eagles were deliberately targeted over a period of several years via sheep carcasses laced with the organophosphorus pesticide fenthion (Product name: Lucijet). Mortality may be on the order of 400 individuals. Authorities continue to gather evidence and investigate.

More here: <http://www.abc.net.au/news/2018-06-12/wedge-tailed-eagles-killed-east-gippsland/9859880> and here: <https://www.news.com.au/national/victoria/why-more-than-400-wedgetailed-eagles-could-have-died-in-east-gippsland-baiting/news-story/2fe7d6d3ed787b3179d1d15febf5fe2>

February 2018:

Fitted with a radio-collar and released to the wild July 2017, a young male captive-bred Bearded Vulture named Durzon was found dead on his stomach, some 400 meters from a power line in France. Post-mortem evaluation and toxicological analyses confirmed cause of death to be carbofuran. A poison detection K9 patrol team came from Spain to assist with the investigation, however no suspect has been identified or detained. The poisoning of a single bird represents a setback to Bearded Vulture reintroduction efforts in the region.

See: <https://www.4vultures.org/dead-bearded-vulture-grands-causses-life-gypconnect/> and, for an update: <https://www.4vultures.org/poisoning-in-the-grands-causses/>

January, 2018:

34 Andean Condors were found dead alongside the remains of a puma, and livestock including sheep and goats, near the town of Los Molles, in the Andes mountains of Argentina. This incident brings the number of poisoned condors to 60 in Argentina in the past year, including 19 individuals found dead in Jujuy Province in March 2017, in another mass fatality. In Argentina, many ranchers target puma, eagles and foxes amongst others with poisoned bait to prevent livestock predation. Lab analyses have confirmed exposure to the carbamate insecticide carbofuran as the cause of death in all 66 of the latest condor casualties. The Andean

Condor is globally classified as Near Threatened but as Threatened in Argentina, where 2500 of the world's estimated 6700 are thought to occur.

See: <https://www.birdlife.org/worldwide/news/34-andean-condors-found-dead-argentina-poisoning-needs-stop>

June 2018 UPDATE:

In 2016, the carcasses of 13 Bald Eagles were found on a farm in the US (Maryland), many with clenched talons and splayed wings. Carbofuran was linked with at least 6 of the birds. No potential perpetrators have been identified as yet.

Other discussed incidents from recent years include:

- a Montana farmer being fined US\$1000 for the death of a Bald Eagle that fed on a calf carcass he had injected with carbofuran in order to kill coyotes, which also killed a hawk and three coyotes
- a man in Pennsylvania was fined US\$3500 after sending carbofuran (Furadan) to workers at his farm in New York with instructions that they lace sheep carcasses with it to kill hawks that had preyed on his lambs - two Red-tailed Hawks, a Rough-legged Hawk and two Bald Eagles died.
- Wisconsin father and son each had to pay more than US\$100,000 after more than 70 wild animals, including Bald Eagles, died as part of their bid to kill wolves and coyotes, again with carbofuran.

More here, including other incidents of deliberate wildlife poisoning in the United States: https://www.washingtonpost.com/news/animalia/wp/2018/06/20/thirteen-bald-eagles-were-found-dead-in-a-field-this-is-what-killed-them/?noredirect=on&utm_term=.9608b6178111

And finally for some great news:

CONGRATULATIONS to Munir Virani, Head of The Peregrine Fund's Africa program, and recipient of

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Wildlife poisoning forum roundup

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a 2018 Whitley Award, also referred to as the 'Green Oscars'.

Munir, his team and an alliance of NGOs have been closely engaged with pastoralist communities in Kenya's Maasai Mara to reduce predation on livestock and associated retaliatory poisoning, e.g., using predator deterrents and fortified livestock enclosures. With an aim of mitigating vulture poisoning, cases had dropped by nearly 50% in 2016. The project will serve as a model for other African countries and continues along a number of lines, including the training of numerous conservation leaders within the community, to promote a lasting impact.

More about the project here: <https://youtu.be/IzBRn7Q4Wrk>

You can view Munir's acceptance speech here: <https://youtu.be/jgsmPYSXmLk>

For additional inspiration, please take a moment to read about the excellent work being done by other award winners: <https://whitleyaward.org/winners-hub/>

Online courses being offered

Interested in learning how veterinary products, including pesticides, can harm wildlife, various sources of inputs and points of entry into the environment - and how they can be more quickly detected and intercepted? Two online classes are being offered within the University of Florida's Veterinary Forensics Program. The first course, which launches August 22, is called Critical Thinking and Environmental Monitoring of Veterinary Agents. You can find out more here: <https://www.forensicscience.ufl.edu/veterinary/programs/courses/vme-6616-critical-thinking-and-environmental-monitoring-of-veterinary-agents/>. The second course, titled Risk Assessment and Mitigation for the Use and Management of Veterinary Agents will be given in January. Here, students will have an opportunity to develop interactive risk assessments tailored to specific species and exposure/poisoning contexts, and to reflect scenarios most relevant to their professional interests and needs. For more information contact Instructor Ngaio Richards: ngaio@wd4c.org ♦



Munir Virani

7th ENFSI APST Working Group meeting in Cergy-Pontoise, France

Sherryn Ciavaglia – Science and Advice for Scottish Agriculture (SASA)

One of the seventeen Expert Working Groups of the European Network of Forensic Science Institutes (ENFSI) deals with Animal, Plant and Soil Traces (APST). The APST Working Group meets annually to facilitate networking between forensic specialists dealing with non-human biological remains and provide a forum to discuss casework, research and quality assurance. I was fortunate to represent Science and Advice for Scottish Agriculture (SASA) at the 7th meeting of the Working Group in April, hosted by the French Gendarmerie (national police force) at their headquarters in Cergy-Pontoise, a suburban region roughly one hour north-west of Paris.

The meeting brought together specialists from government organisations, academia and a small number of representatives from private industry, primarily focused on the examination of animal, plant or soil remains in the context of forensic casework, or the development of associated techniques. This included scientists in biology/DNA, botany and diatom analysis, chemistry, entomology, geology and microbiology, among other disciplines. While the attendance list numbered fifty-one delegates, the unfortunate and relatively common incidence of French transport strikes precluded two delegates from attending. Fifteen countries were represented; I make honourable mention of a guest delegate from the Australian Federal Police (AFP) who had



Group photo of conference delegates

circumnavigated half the globe specifically to attend the meeting and arguably spent not a great deal fewer hours in the air than at the destination!

Proceedings ran from lunchtime Wednesday through to lunchtime Friday and the format followed a single session of presentations, with concurrent workshops running on the afternoon of the full day. The first day's focus was on quality assurance. Discussions within the group aimed to promote a higher standard of quality assurance in non-human forensic science throughout Europe and raise awareness of accreditation to ISO17025 for those not already working to this standard. The Working Group is conducting three collaborative exercises/proficiency tests in forensic botany, soil analysis and animal species identification by DNA analysis. An evaluation of each exercise run in 2017 was provided. As these tests are still under development, feedback from participating labs was encouraged. All exercises will be run again in 2019.

Thursday morning involved presentations from members and guests on techniques, software/databases and case reports. The afternoon session split delegates into two workshops on soil/diatom analysis and Mass Parallel Sequencing (MPS) prospects for non-human DNA analysis. I attended the MPS workshop, which commenced with a review of current MPS platforms by Bruno Huettel (Max Planck Institute). Member presentations were followed by discussions around approaches to validation of MPS for use in forensic casework and a healthy debate about a centralised MPS facility for Europe. Whether or not forensic specialists in non-human DNA should be following behind progress made by the human DNA forensic field or actively pushing to introduce MPS applications into the justice system was also discussed; forensic scientists working with non-human DNA potentially have much more to gain through the use of MPS in casework than forensic colleagues working with human DNA, due to the breadth of applications using non-human

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7th ENFSI APST Working Group meeting in Cergy-Pontoise, France

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DNA. Friday morning involved member presentations focused on soil analysis, forensic taphonomy and forensic microbiology, concluding with discussions about APST board matters.

The social side of the meeting was well-planned and jam-packed, allowing much time for networking and soaking in French history, culture and cuisine. The highlight was an evening outing into Paris, which involved a guided tour (hop-on, hop-off style bus) of Paris with a stop at the Eiffel Tower for snaps, a three course French meal in the stately setting of the inner-city Gendarmerie training facility and concluding Seine river cruise, all preceded by a police escorted bus ride from Cergy-Pontoise into Paris that I don't think any delegate in attendance will ever forget!



Conference Dinner in Paris

All in all, I found this a really interesting and worthwhile meeting to attend. It provided insight into the ways that different non-human disciplines contribute to forensic investigations and allowed me to mix with many forensic practitioners I had not previously met. It is important to be aware of the ways that our colleagues

working in areas some might regard as non-wildlife contribute to forensic investigations. Discussions of techniques and diffusion of ideas can benefit all in the non-human forensic community.

While membership of the APST working group is open to ENFSI representatives, associate membership is open to non-ENFSI European labs actively conducting forensic casework. Non-European guests are also able to participate in meetings. Details of the Working Group are found at: <http://enfsi.eu/about-enfsi/structure/working-groups/animal-plant-and-soil-traces/>. Please contact the working group using the contact form on this page if you are interested to attend a future meeting. A small number of APST Working Group members attended the SWFS2017 in Edinburgh, but there were also many faces that were new to me in France. I hope that the future holds increased collaboration between SWFS and the ENFSI APST Working Group. ♦



Social evening tour of Pontoise underground history

Recent publications:

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Yang, F., Ding, F., Chen, H., He, M., Zhu, S., Ma, X., ... Li, H. (2018). DNA Barcoding for the Identification and Authentication of Animal Species in Traditional Medicine. *EVIDENCE-BASED COMPLEMENTARY AND ALTERNATIVE MEDICINE*.

Recent publications:

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Fish Forensics:

Almeron-Souza, F., Sperb, C., Castilho, C. L., Figueiredo, P. I. C. C., Goncalves, L. T., Machado, R., ... Fagundes, N. J. R. (2018). Molecular Identification of Shark Meat From Local Markets in Southern Brazil Based on DNA Barcoding: Evidence for Mislabeling and Trade of Endangered Species. *FRONTIERS IN GENETICS*, 9.

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Recent publications:

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Timber Forensics continued:

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