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Report of the Intersessional Working Group on Communication, Bat Conservation and Public Health

Weird bat scam in Iran with conservation and public health implications

Hossein Zohoori

Based on reports from the Persia bat team¹ and the cavers' network² during February and March 2018 bat "nests" containing mercury have been advertised for sale claiming that bat saliva contains mercury. It is also claimed that bats make the nests with their saliva and clay so it is possible to find drops of pure mercury in the "nests" which can be used to cure some diseases. A fake video and photos of the bat "nests" have been circulated via social networks and cell phone apps. The bat "nests" have been offered for sale to naïve people at high prices. Some people have entered caves for bat "nests" and also caught bats during hibernation.

After receiving these reports, the Persia Bat Team and the cavers network with local DOE³ guards in the area (some cities in Azarbayejan-gharbi province such as: Khoy, Salmas, Bookan and Takab) have started to find the best ways to prevent harm to bats and local people.

Activities:

Public awareness with correct information about bats and toxicity of mercury:

- Bat information on DOE web page
- Azarbayejan-gharbi DOE`s news meeting

¹ Persia bat team is the first Iranian bat study team

² Caver network is volunteer team from Iranian cavers for bat conservation

³ Department of Environment

- Life Café radio show⁴
- Interview with ISNA⁵ press
- Awareness in social network by Persian Speleological Society⁶ and Young Life Café

Monitoring and control:

- Alerting the public health authorities about the dangers of exposure to mercury
- Cave protection
- Arrest of offenders
- Collect bats from catchers

Concerns:

- Numbers of bats killed
- Changing peoples' minds is difficult
- How the fake "nests" containing mercury are made
- Geographical extent of the problem in Iran

Seven bat bodies found by DOE's guard in the city of Khoy which were caught by local people (for obtaining mercury from their saliva when they were alive but when they failed to do so, they let the bats die).



"Bird nest" and tools for digging (selling "bird nests" as "bat nests").



⁴ Weekly radio show about bats, wildlife and environmental education

⁵ Iranian Student National Agency press

⁶ Iranian cavers team

Handmade containers with mercury inside (clay containers with mercury inside are broken in front of the camera to reveal the mercury).



The Soimuş cave incident (2017)

Szilárd-Lehel Bücs

Romania is notorious for building highways at a very slow rate, and in a very expensive way. In several cases and after delays, Nature gets the blame, including large carnivores. In 2017 it was the turn of bats to be blamed. On the A1 highway (planned from Bucharest towards Hungary) there is a section near Deva city, where a small cave, the Şoimuş cave (around 50 meters long) was discovered after construction had begun.

Initial surveys (also done by myself) established that the Şoimuş cave is not of national importance, and in the best case scenario it is a transient roost during migration for a few tens of *Rhinolophus ferrumequinum* (which also has several other roosting options in the vicinity). Hence, its importance in comparison to Romania's huge bat roosts is nearly insignificant. However, at one point in time and by unknown players, a mitigation proposal was born, to create an artificial cave and to place 50 bat boxes in the area, to replace the cave that needed to be demolished. However, *R. ferrumequinum* would not have used these boxes, so the measure was not well thought out. Also, bat boxes would have increased bat mortality after the completion of the highway (due to collisions), since no other "green" measures were included in overall highway planning.

The amount of money needed to carry out this mitigation work (artificial cave + 50 bat boxes) would have been 500,000 EUR, an enormous amount in comparison to other artificial roosts (e.g. in Belgium ca. 20,000-50,000 EUR/roost). We think that some "clever" guys wanted to profit from bat conservation, and charge the Romanian state / highway company for this money. These measures were nevertheless officially accepted, and an environmental permit issued. During this whole process (almost 2

years), several articles and video reports were published by the Romanian national and local media, talking about a few bats blocking the building of the highway. The subject was treated negatively by media outlets, branding it “Three bats block the highway for 2 years”, etc. A small selection of these articles and clips is below:

- http://adevarul.ro/locale/hunedoara/grota-lilieci-blocat-constructia-autostrazii-lugoj-deva-fost-astupata-vietuitoare-fost-salvate-1_59aabea65ab6550cb893789e/index.html
- http://adevarul.ro/locale/hunedoara/unde-liliecii-blocat-lucrarile-autostrada-angajatii-ministerului-i-au-cautat-pesteră-avut-surprize-1_598c364c5ab6550cb8e42dd6/index.html
- <https://a1.ro/news/social/nu-firma-de-constructii-nu-lipsa-fondurilor-ci-liliecii-lucrarile-pe-autostrada-deva-lugoj-blocate-dintr-un-motiv-uimitor-id564628.html>
- <https://observator.tv/social/urii-i-liliecii-au-interrupt-lucrarile-autostrazii-de-la-deva-la-lugoj-160998.html>

Faced with lots of delays, the authorities realized that the single most important blockage for this whole highway is the low-importance cave and its few bats. In parallel, they probably also realized that they don't want to pay 500,000 EUR for those obviously overpriced compensation measures. Hence, they tried to withdraw / review the officially accepted environmental permit, which is illegal under Romanian (and probably European) law, if there is no new study that determines that the mitigation measure is no longer needed. So, the authorities approached members of the Romanian bat research community to commit this illegality for them: to say that without any new study, that the measures are not needed. However, after consultation, we agreed that this illegality cannot be condoned or carried out by us.

The situation culminated when a high representative of the Ministry of Environment descended upon the site (in full office gear, see the YouTube video below), and after a two-minute visit inside the cave, triumphantly declared in front of numerous reporters, that there are no bats in the cave. Meanwhile, the bat expert group of the Ministry of Environment (formed in 2016 and tasked exactly to advise in such matters) was not involved in making decisions or recommendations regarding this site. From that moment on, media outlets started joking about the bats that were not there in the first place.

- <https://www.youtube.com/watch?v=LhdhxxEkhG0>

Finally, the site was demolished, following a mist-netting event that captured a few bats and moved them to a natural roost in the region. Immediately after this mist-netting, it was declared that there are no bats at the moment inside the roost, and it can be demolished.

Conclusion:

We fear that this situation has damaged the image of bats in Romania, and created a precedent, in the sense that official agreements can be put aside / ignored if some higher cause requires it. This was a “fortunate” case, as relatively few bats were using the roost. The situation would have been very different had it been a nationally or continentally important roost, where the damage would have been huge. Unfortunately, all this was aided and inflated by local and national media. We also feel that the big evolution and positive results that Romanian bat conservation organizations made in the last years in educating the public, suffered from this episode.

SARS outbreak linked to Chinese bat cave

P A Racey

On 7th December 2017, David Cyranowski, a journalist based in Asia, wrote an article in Nature entitled ‘SARS outbreak linked to Chinese bat cave’. He was reporting on the findings of a PLOS Pathogens paper published a couple of months earlier by Ben Hu and sixteen colleagues which identified the genetic building blocks of SARS-CoV in horseshoe bats in a cave in Yunnan, south western China. Cyranowski asserted that the Chinese study had identified the “smoking gun” for the SARS outbreak that infected thousands of people in 2003. However no such claim was made in the PLOS pathogens paper and so five bat biologists wrote to Nature’s Editorial Director and complained of sensationalist publishing. She suggested we write a letter to Nature’s Correspondence section which was published in January 2018, as follows:

Don’t misrepresent link between bats and SARS

Paul A. Racey, Brock Fenton, Samira Mubareka, Nancy Simmons & Merlin Tuttle

We find your report on bats and severe acute respiratory syndrome (SARS) sensationalist and misleading (Nature 552, 15–16, 2017). The important work it discusses does not claim to pinpoint conclusively the source of the SARS outbreak (B. Hu et al. PLoS Pathog. 13, e1006698; 2017), as implied by your “smoking gun” metaphor. The rapid rate of evolution of RNA viruses means that SARS could have

arisen in one of many areas. Thus, your inference that the strain “could easily” have originated in this bat population is, in our view, unjustified.

Inflammatory statements about bats and disease have led to culling and roost destruction, compromising conservation efforts (K. J. Olival EcoHealth 13, 6–8; 2016). Accurate reporting of information on SARS, Middle East respiratory syndrome, Ebola and other emerging diseases is crucial for controlling outbreaks and for preventing unnecessary deaths of wild animals.

Viral spillover occurs when humans and domestic animals come into direct contact with wild animals and their pathogens. Public education, comprehensive surveillance and considered interventions can all help to protect public health. The closure of markets selling live birds has already reduced the activity of avian influenza viruses, and could likewise curtail the spillover of mammalian viruses.

Nature 553, 281 (2018) doi: 10.1038/d41586-018-00603-7

Zeit on line published the following piece (<http://www.zeit.de/wissen/umwelt/2018-02/fledermaeuse-viren-krankheit-keime-ebola-sars-biologie>) which is translated:

Ebola or Marburg viruses: No animal distributes more nasty, dangerous to humans pathogens than the bat. Only, why do the animals themselves survive these infections?

By Dagny Ludemann

It was a flying fox that triggered the largest ever Ebola epidemic in human history in 2014 . A boy was infected with the virus with the virus against which there was no vaccine or therapy at that time. Nearly 30,000 people in several African states then became infected within two years - more than 11,000 died from internal bleeding and extreme fever.

Hardly any other order in the animal kingdom is contaminated with so many dangerous germs for humans as the bats, which are divided into fruit bats (Megachiroptera) and bats (Microchiroptera). In the current issue of the magazine Cell Host & Microbe , a team from China and Singapore (Jiazheng Xie, et al., 2018) reported how the flying mammals manage not to become mortally ill themselves from the germs in their bodies.

Ebola, Marburg viruses or the mainly Hendra viruses and not least the pathogens of the life-threatening respiratory disease SARS. All of these pathogens infect bats. And they can infect other mammals - whether dog, horse, pig or human - with their faeces. The fact that they live long and are able to fly makes distribution even easier. The amazing

thing: The bats themselves develop despite their own infection little or no disease symptoms.

So, what is the difference between the bats? Presumably the secret lies in their genes that control their immune defense, report the virologists of the Chinese Academy of Sciences and a college in Singapore. They suspect that the bats can keep their body's defences at bay due to a mutation in a particular gene that plays a role in their immune system. In this way your body fights the viruses, but it prevents the physical reaction from ending in life-threatening fever, bleeding and circulatory collapse. Because: In diseases such as Ebola or the Marburg fever, it is basically the out-of-control overreaction of the immune system, which can be life-threatening.

When viruses enter an organism, they are first recognized by certain proteins in the body, the interferons. These then give a signal to receptors, which in turn give the order to the defence reaction: antibodies are formed, all power is directed to the fight against the invaders, the fever rises. Certain genes that are crucial are what scientists call STING (stimulator of interferon genes). And they are not as active in bats as in humans, as the team reports in their work in *Cell Host & Microbe*.

"We believe there is a balance between the bats and the pathogens they carry," said Peng Zhou, one of the authors. And in order to be able to hold these, it has apparently become established in the evolution of bats that certain ways of their immune defense are suppressed. So, bats are capable of fine-tuning their virus defence - something that other mammals cannot. Presumably the fact that bats could fly gives them this advantage: according to the research team, random gene mutations could spread so well in the gene pool of these animals.

All this explains why these animals survive so many infections. An ability that unfortunately has made them unprecedented disease transmitters in the animal kingdom. They are trumped in it probably only by mosquitoes.

Merlin Tuttle responded as follows and Zeit on line published his response:

I am deeply concerned about how various sensationalistic reports on bats carrying viruses have recently triggered the fear of these mammals. Especially given that bats are worth billions of dollars to human economies ([Sciencemag: Boyles et al., 2011](#)) and are essential to the health of entire ecosystems upon which we depend. Yet bats are among our planet's most endangered wildlife. Scary speculation aside, they also have an extraordinary record of not transmitting diseases to humans. Instead of fearing bats, we should fear their loss.

Bats can indeed transmit deadly diseases like rabies and the Nipah virus to humans, though transmission is exceedingly rare and easily avoided. Risks have been greatly exaggerated because fear is lucrative in grant-getting publicity. There is still no documentation of bat origins for either SARS ([Nature: Racey et al., 2018](#)) or Ebola ([Viruses: Leendertz, 2016](#)), though this has been repeatedly reported as fact. It's time to put such misplaced fear in perspective.

Even if we were to assume that all human deaths from the major so-called "emerging diseases," – i.e. viruses like Hendra, Nipah, Ebola, Marburg, SARS and MERS – came from bats in the past four decades, we would still have fewer than 20,000 fatalities. These numbers are trivial compared to losses from far more [easily preventable health threats such as obesity](#).

Claims that bats are the world's most dangerous harbingers of deadly pathogens are deceptive ([Issues in Science and Technology:Tuttle, 2017](#)). New viruses can be found wherever we look ([Virology blog:Racaniello, 2013](#)). Recent reports of large numbers of coronaviruses found in colonial bats ([Virus evolution: Anthony et al., 2017](#)) are meaningless without far greater investigation. Most viruses are innocuous; indeed, some are likely essential to our very survival. However, when they are discovered in bats, they are too often prematurely publicized as dangerous. Historically, great pandemics have come from birds, rodents or primates, not bats ([MPH Online, 2018](#)).

Finally, the fact that bats can survive exposure to deadly pathogens like Ebola doesn't necessarily mean they are reservoirs for human outbreaks. When fruit bats were infected in lab experiments, they survived without becoming sick. But they also did not shed the virus, meaning they were unlikely to be infectious ([Viruses: Paweska et al., 2016](#)). Furthermore, there is no evidence of disease outbreaks among people who eat bats or live in cities co-occupied by huge bat colonies. For anyone who simply doesn't attempt to handle bats, the odds of contracting a disease from one are close to zero.

People seldom protect and often kill animals they fear, and colonial bats are among the most vulnerable. Our real concern should focus on how we may be harmed by the loss of bats given that so many bat species are already endangered.

A ‘fearsome’ flying fox.....

P A Racey

In December 2017, the London Times published this photo 14 x 16cm in the middle of a page above the one-line caption: ‘Claws for thought: An Indian Flying Fox, one of the biggest in the world, is a fearsome sight at Narspaur Lake, Hyderabad’. I wrote to the Editor of the Times to complain.



And a week later in a Feedback piece, the following was buried in a Comment article:

‘..... we managed to upset Professor Paul Racey, regius professor of natural history (emeritus) at the University of Aberdeen, and a world authority on bats: “I am writing to enquire why The Times published a photo of an Indian flying fox, and labelled it as ‘a fearsome sight’? This appears to be an attempt to encourage fear of such animals, with little regard for the facts — that they are vegetarians which eat fruit and leaves and do not attack humans or other animals. In my youth, I kept this species as a pet. We had no fear of each other.”

He’s right, of course, but for something that eats only fruit that bat was sporting quite a businesslike set of teeth and claws.’

Tentative novel lyssavirus in a bat in Finland

Nokireki T et al (2018). Tentative novel lyssavirus in a bat in Finland. *Transboundary and Emerging Diseases*, doi: 10.1111/tbed.12833 [Article \[Open access\]](#)

Abstract: “A tentative novel member of the genus Lyssavirus, designated as Kotalahti bat lyssavirus, was detected in a Brandt’s bat (*Myotis brandtii*) in Finland. Based on phylogenetic analysis, the virus differs from other known lyssaviruses, being closely

related to Khujand virus, Aravan virus, Bokeloh bat lyssavirus and European bat lyssavirus 2.”

Pseudogymnoascus destructans and White Nose Syndrome

Bats with White-nose Syndrome Detected In Kansas

White-nose syndrome (WNS), a fungal disease that affects hibernating bats, has recently been confirmed in Kansas - the 32nd state to confirm the presence of the disease. Several dead bats, collected during cave surveys in Cherokee County in southeast Kansas and Barber County in southcentral Kansas, tested positive for the disease. Surveys were conducted between February 14 and March 1, and samples were tested by the U.S. Geological Survey (USGS) National Wildlife Health Center in Madison, Wis.

White-Nose Syndrome Spreads into Central Texas

The fungus that causes white-nose syndrome (WNS) in bats, detected for the first time in Texas in early 2017 in the Panhandle, has now spread into Central Texas.

Though no bat deaths have been attributed to WNS in Texas, the syndrome has killed millions of bats in the eastern parts of the United States, raising national concern. A coalition of groups in Texas is continuing work to monitor the spread of the disease.

The fungus was detected at several sites in four new counties this year including: 2 sites in Blanco County, 1 site in Foard County, 2 sites in Kendall County, and 1 site in Wheeler County. This brings the total number of counties where the fungus has been detected in Texas to 10. The fungus was detected on cave bats, tri-colored bats, Townsend's big-eared bats, and on a single Mexican free-tailed bat. No signs of WNS were reported. Biologists say it usually takes a few years after detecting the fungus for the disease to manifest.

The detection on a Mexican free-tailed bat was at Old Tunnel State Park in Central Texas. This is first ever detection of the fungus on this species.

Pseudogymnoascus destructans (Pd) / White-nose syndrome (WNS) Research in the UK

Lisa Worledge, Head of Conservation Services at The UK’s Bat Conservation Trust: Volunteers from the National Bat Monitoring Programme have been undertaking surveys at a small number of sites in England to collect swab samples from bats and substrate (under licence from the Statutory Nature Conservation Body) alongside their

normal hibernation surveys over the last two hibernation seasons (2016/17 and 2018/19). This work has been undertaken to contribute to research by Joseph Hoyt, University of California Santa Cruz. Two years of samples have been collected. The project builds on work already undertaken by Joseph looking at the prevalence of *Pseudogymnoascus destructans* (Pd) in bats in the USA (where it causes WNS), China and other Asian countries (where WNS is not found). The preliminary results show some new sites positive for Pd in England but without any evidence of WNS. We believe this supports our theory that bats in the UK have the same immunity to WNS as bats throughout mainland Europe. Joseph is writing up his research for peer-reviewed publication and the data from the UK project will be included. Joseph will also be presenting his work (including the UK findings) at the UK National Bat Conference in September 2018.

The UK's Animal and Plant Health Agency (APHA) continue to offer a passive surveillance programme for Pd, whereby samples from suspect bats may be submitted for testing. However, the numbers of samples received has reduced dramatically in the last couple of years as we now focus on swab or tape samples from live bats with visible signs of a fungus on them. This is because we were finding people were submitting dead bats with white fungi that turned out to be saprophytic. Over fifty bats have been tested but the only two positive cases identified through the passive surveillance programme were from live bats.

Rabies Passive Surveillance Programme

BCT receives a small amount of funding from APHA to support the work it does to support its ongoing surveillance programme for EBLV in the UK, which includes the provision of dead bats packs and encouraging members of the public, bat groups and others to submit dead bats for testing by APHA. We have two speakers from APHA secured to present at the UK National Bat Conference in September about the passive surveillance work in the UK and about rabies in bats more widely. The latest EBLV2 case was in England in September 2017 (bringing the total number of positive EBLV2 cases in bats to 15, alongside one human case back in 2002).

Guidance

BCT maintains a set of Rabies Good Practice Guidelines aimed at bat groups in the UK. These are updated regularly and always after an EBLV2 positive bat is found. We have additional documents for bat workers, one aimed at bat rehabilitators and another about

the wearing of gloves. All of these documents are available from the Resources for Bat Groups pages of our website at: http://www.bats.org.uk/pages/resources_for_bat_groups.html. Good practice is continually promoted to bat groups and bat workers and any reports of poor practice, e.g. in relation to images of bats in bare hands are followed-up on.

BCT provides information and guidance on Pd/WNS for bat workers in the UK on its website at:http://www.bats.org.uk/pages/about_bats-white-nose_syndrome-586.html and the pages are updated regularly, including some summary information about the situation in North America from the whitenosesundrome.org website.

Communications

The BCT web pages on bats and diseases at:http://www.bats.org.uk/pages/bats_and_disease.html were updated following the EUROBATS statement (<http://www.eurobats.org/node/1323>) responding to the reporting of bats as sources of Ebola, despite lack of evidence, and the Bats and disease Frequently Asked Questions (see: http://www.bats.org.uk/pages/bats_and_disease_faqs.html) include a link to this statement. A page on Bats and viruses (see:http://www.bats.org.uk/pages/bats_and_viruses.html) has also now been added to the website, this is based on Prof. Paul Racey's article for Issue 109 (Spring 2016) of Bat News.

We continue to respond to media articles and other stories about bats and disease where there are particular causes for concern:

BCT co-signed a statement last year with Bat Conservation International following the publication of research which found that bats were the main reservoirs of coronaviruses (the paper, by Anthony et al, was published in Virus Evolution and can be read at: <https://academic.oup.com/ve/article-lookup/doi/10.1093/ve/ex012>). The press release was aimed at providing balance to the reporting of this research in relation to the conservation of bats. The full press statement can be read at:<http://www.batcon.org/resources/media-education/news-room/gen-news/80-latest-news/1094-bat-conservation-can-help-reduce-the-risk-of-disease>. There is also a statement related to the paper on the EcoHealth Alliance website at:<https://www.ecohealthalliance.org/2017/06/research-uncovers-huge-diversity-coronaviruses-worldwide>.

The issues of bats and diseases were also raised by some delegates at the Bats in Churches Conference back in May 2016. There were follow-up communications with those that raised issues. Additionally, the output from the event, which was shared with all delegates, included a link to the BCT pages on what to do when a grounded bat is found. This web page has been updated to improve the emphasis that bats should not be handled if possible and if they are gloves should be worn.

We have a talk on bats and infectious diseases that we offer to bat groups around the UK to help keep them up to date and well informed. We occasionally contribute articles about bats and disease, to industry magazines and in the last couple this has included an article on bats and rabies for the Official Vet Magazine, as well as an article on monitoring bats and disease risk management for In Practice (the magazine of the Chartered Institute for Ecology & Environmental Management).

Conferences

BCT was represented at the 2nd International Infectious Diseases of Bats Symposium last summer in Fort Collins, Colorado, USA. The event was attended by disease researchers from around the world. A small number of conservation NGOs were also represented, providing an important link between researchers and conservation organisations, who are often in the front line when dealing with the media and public perception in relation to bats and diseases. Details of the conference are available online at: <http://www.batid.org/> and the next conference will be taking place in 2020.

Bovine tuberculosis and bats

Two media reports appeared last year where bats were mentioned as reservoirs of bovine tuberculosis in a newspaper and as part of a Parliamentary review. Having successfully persuaded the newspaper to withdraw its statement from its website, Dr Carol Williams (BCT's Director of Conservation) followed up with the UK's Chief Veterinary Officer, who confirmed that "there are no recorded cases of Mycobacterium bovis (the bacteria which causes bovine TB) in bats in the UK and no evidence that they are capable of 'sustaining the disease'. Although like other mammals, bats may be susceptible to infection with M. bovis if exposed to a sufficiently large infectious dose, there is currently no evidence to suggest that bats are involved in the epidemiology of bovine TB infections in the UK." Carol then contacted Dr Paul Monaghan MP who had made the statement in Parliament referring to bats (and other animals).