

EXCURSIONS AND OTHER NEWS

Small insights in student's and professor's points of view, field trips, and other stuff we do.

Bird excursion

by Helen Rothfuß, Nele Kheim

Bird excursion with an expert in bird song recognition? In May 2022 we said yes and joined Klaus on a walk along Elbe river in Dresden, appreciating bird diversity. When Klaus gave us a signal we think we stopped the chatting and carefully listened. Most of the time he had to tell us what we were listening to, since most of us started out with very little knowledge. Eventually we walked to a beer garden and finished the evening chatting and having some drinks.



View from Lingner-Terrasse, where we heard some common sandpipers from the river bank and rested our feet.

If you are interested in what we heard, here are some from the list:

piep flycatcher - Trauerschnäpper	swift - Mauersegler
whitethroat - Dorngrasmücke	lesser whitethroat - Klappergrasmücke
common sandpiper - Uferläufer	wood pigeon - Ringeltaube
chaffinch - Buchfink	common redstart - Gartenrotschwanz

FACT CHECK

In this section students evaluate the scientific evidence behind a certain urban myth.

Let's talk about soy, baby! – soy and male fertility

by Emma Markwardt, Helen Rothfuß, Nele Kheim

Soy boy - an insult towards young men who are not living up to the traditional idea of masculinity. Their lifestyle is often associated with reduced meat consumption and the stereotype of increased soy intake. Soy boy is meant to imply softness and effeminacy, as a consequence of soy consumption. This term is one of the favourites in the tool box of right wing conservatives, to deplore people with different lifestyles than their own.

Soy, an increasingly important crop in everyone's diet, is consumed by humans either indirectly through animal products, since the vast majority of cultivated soy is fed to livestock, or directly through soy products such as tofu, soy milk or soy beans. But why do people assume soy intake could be linked to masculinity? Does soy consumption really have an effect on masculinity or more specifically on male fertility?

Some theory behind the urban myth: Soy contains molecules, so called phytoestrogens, that have a similar structure to the human hormone estrogen. Since estrogen levels in men are generally lower than in women, the intake of phytoestrogens is suggested to have a feminizing effect on men. Phytoestrogens can interact with the hormone binding site in the cell, but figuratively, the soy puzzle piece does not fit as well as the original piece and therefore does not trigger the same reactions as the human hormone. However, the exact mode of function is still being researched.

Fertility is not sufficiently represented by just one meaningful indicator but reduced chances of pregnancy can be linked to some sperm parameters. Sperm number, morphology or motility are often assessed in case of male inability to conceive children. The idea that soy affects male fertility mainly comes from animal studies. However, these concern rodents, which are not exactly like humans. Also, even most of the animal studies did not find an indication for decreased fertility. And even within rodents, the results in mice and rats were different. So it seems animal studies in this case have a low relevance to humans. In humans, the majority of studies did not find that more soy consumption reduces reproductive health, even though a few individual studies did report weak effects on one of several sperm parameters. To summarise, scientific studies on the effect of soy in animals may poorly apply to humans and studies in humans hardly show any effect. Currently, therefore, a solid conclusion would be that soy - an important part of a healthy and balanced diet and one that is needed to respect our planet's limit - can be consumed without fearing effects for one's masculinity or indeed male fertility. Fragile masculinity, based on the contempt for dietary choices surrounding different lifestyles, needs to be questioned rather than the effects of soy. Newspaper and online articles should be read with caution in regard to their conclusions on scientific studies.

Literature

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ANIMALS AND MONEY

This part of BioSReports unravels interesting relations between animals and the economy.

A single mussel can save Polish Waterworks up to 83.7 million€

by Klaudia Ostatek

The exposure of humans and all other species to contamination by hazardous substances expands from air to land to water. Mussels quickly detect water contamination and are sensitive to small changes in water composition, including heavy metal content^{1,2}. Water quality control is cheaper using biomonitoring than traditional laboratory analysis. These results may help water utilities decide to use a less expensive and a more environmentally friendly method of controlling water quality.

An EU directive from 2020 orders that monitoring programmes for water intended for human consumption shall include measurements recorded by a continuous monitoring process, collection and analysis of discrete water samples³. Clams can, therefore, be used to create a warning system for sudden contamination. The mussel valve movements can be monitored using remote sensing technologies and serve as a tool for early warning alarms for aquatic pollution⁴. The company PROTE (Poznań, Poland) designed the SYMBIO Biomonitoring System, which records the movement of the shells of eight bivalve *Unio tumidus* molluscs in a flow tank⁴. The cost for the purchase of the SYMBIO system is 40,000 Euros and maintenance costs are approximately 17 Euros net per day for a water treatment station, amounting to 6,205 Euros annually. Service and quarterly replacement of the biological material add 550 Euros net per month to 6,600 Euros net annually (numbers based on personal correspondence with company). Purchase of the system, daily maintenance and costs of service and replacement of the molluscs over a period of 10 years, amount to costs of around 168,050 Euros.

For comparison, a one-time water quality analysis in Poland costs a few dozen to a few hundred PLN (which equals a few up to 150 Euros), and it considers only a few basic pollutants⁵. The price for the physico-chemical and microbiological analysis of water is about 85 Euros^{6,7}. If the number of samples in one-time water analysis is the same as in biomonitoring, the costs of traditional analysis would have reached a level of 26.78 billion Euros over a period of 10 years.

To establish the value of one individual mussel, all costs for the purchase, maintenance, and conservation of the SYMBIO system were deducted from the cost of a one-time water sample over a period of 10 years, meaning the benefit of SYMBIO system is 26.77 billion Euros. The system consists of eight bivalve molluscs, which are replaced every three months to assure proper sensitivity of indicator organisms³. Therefore, the benefit of 26.77 billion Euros must be divided by 8 and 40. As a result, a single mollusc can save up to 83.7 million Euros.

The SYMBIO system is unable to determine which substance caused the clam to close and trigger the alarm⁴. However, early recognition of possible health risks posed by contaminated water means that it can be cut off from Waterworks immediately. Traditional water testing relies on testing of samples, the results of which can be delayed up to 48h⁸. In this case, reaction time is more important than analyzing the contaminating agent. Sudden water contamination will be detected without delay which ensures safe and clean drinking water.

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Was it really chicken?

by Klaus Reinhardt

"How is your döner, Oliver?" – the opening sentence of our [advertisement video](#) placed quite some focus on the course *Genetical Forensics*. Taught by Drs Melitta Vamberger and Heiko Stuckas from the Dresden Zoology Museum, it is fair to say that not many courses like this exist in the world. It comes in two parts, wildlife forensics and food barcoding. I had the pleasure to attend the exam talks of the food barcoding - and was blown away by the breadth of topics. Luckily, DNA genotyping confirmed that the döners indeed contained turkey or veal/beef as advertised by the shop. Another group of students bought seafood in the supermarket. After DNA extraction, primer design etc., all seafood samples contained what it said on the package – Chilean mussel, Pacific salmon, Whiteleg shrimps or Argentine shortfin squid. Although this was very reassuring, I have to admit that a sensationalist part in me hoped that students would detect DNA from something that was not stated on the package. Well, maybe next year...