BioS Reports

Glimpse into the activities of the
Master's course "Biology in Society"

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ANIMALS AND MONEY

This part of BioS Reports unravels relationships between animals and the economy.

A Medicinal Goldmine: The Exploitation of Seahorses for Traditional Chinese Medicine

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Seahorses are the Viagra of the ocean. At least according to Traditional Chinese Medicine, where seahorse powder is used to treat erectile dysfunction. Due to their perceived medical properties, seahorses have become increasingly popular in various health products and diet therapies [1,2]. Yet, the high demand for seahorses comes at a high cost to the animals themselves.

Traditional Chinese Medicine has relied on animal derivatives for over 5000 years, with seahorses used medicinally for at least 600 years [3,4]. The production merely requires a simple process of grinding whole dried seahorses into powder. Seahorse-derived powder is not only used to boost the male libido, but also to treat other complaints, including fatigue, inflammations or asthma [5]. The scientific evidence behind this practice, however, remains thin: while seahorse extracts have been tested in cultured cells and in rats, clinical trials in humans are still missing to fully prove its health benefits [6,7].

An estimated 37 million seahorses are caught as bycatch every year [8]. Some end up in aquariums or as souvenirs, while the majority (98%) is sold dried [9,10]. This business is highly profitable, especially for Thai fishers, contributing up to 10% of commercial fishers' annual income and up to 20% for small-scale fishers [11,12]. In Thai waters, seahorses are usually classified as "trash fish", accounting for 30 – 40% of total catch [13]. However, their market value in Traditional Chinese Medicine prevents them from being discarded and rather promotes their trade. Accordingly, Thailand has grown to be the world`s top seahorse supplier, accounting for 75% of global exports until 2016 [10]. From 2004 to 2011, Thailand exported between 9,598 kg and 20,980 kg of dried seahorses annually, while domestic consumption remained low at 520 kg per year [11, 14]. Seahorse prices varied based on size and processing method, ranging from $528/kg to $684/kg [14]. According to these numbers, Thailand's exports would have generated $5.8 – 12.7 million annually. By contrast, studies report values of up to $26.5 million [11]. Such discrepancies suggest underreporting of the actual trade volume.

Three seahorse species dominate the export lists: *Hippocampus kuda*, *H. kelloggi*, and *H. spinosissimus*, all classified as endangered on the IUCN Red List of Threatened Species [11,14]. Beyond the pressure from the fishing industry, seahorses' biological traits already make them vulnerable: monogamy, low fertility, and long parental care slow population growth [2]. To support animal conservation, all *Hippocampus* species were listed by CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) in 2004. This advance also aimed to tackle overexploitation and regulate the export of seahorses internationally [14,15,16]. Yet, such restrictions can diminish economic opportunities and create space for a black market. In 2016, Thailand introduced an official ban of seahorse trafficking, cutting off all exports and trade [10,17]. Still, the demand for Traditional Chinese Medicine remained high, fueling illegal networks. After 2016, dried seahorse prices rose, while bycatch levels stayed unchanged [11,18]. A recent survey found seahorses still being sourced from export-banned countries, including Thailand [11]. This raises the question: How large is the black market today?

The full impact of Thailand´s export ban remains unclear, with no comprehensive research conducted in over 25 years [14]. However, the ecological damage is evident: declining seahorse populations, habitat degradation, and a rising black market. Weak enforcement and unregulated bycatch further complicate conservation efforts. True sustainability will require stricter monitoring, better fishing practices, and large-scale aquaculture to reduce pressure on wild seahorse populations. Without these measures the trade will persist, legal or not.

EXCURSIONS AND OTHER NEWS

Off The Walls or In Study Hall: Coping with Exam Stress

Patience Blossfeld Dodgson

At the end of every semester is the dreaded exam period, where students fight for their grades against time, difficult material, and procrastination. To learn how BioS students approach the exam period, we reached out and asked Alyssa Wagner how she copes.

What study methods do you use?

Alyssa: It depends on what the exam is. I do a lot of reviewing slides and my notes. I prefer to do things analog instead of digital. If there are things to memorize, I'll write them out many times. I usually have gaps in my knowledge, so I'll watch videos and read to catch up…and then I usually go down a rabbit hole doing that, but I enjoy it.

How much of your day do you study to prepare?

Sometimes I study all day long, minus the early morning. I usually study all evening and night. I study biology enough that it is hard to find time to study German.

What do you do to relax during exam time?

I don't do enough. I just stack on stress and keep going. I do go for walks and relax with my cat. If I don't look at stupid videos online at least once a day, my brain will explode. I sometimes play fast songs on the accordion to activate my brain.

Do you have any special rituals?

I like to work in general with yerba mate. It feels kind of like a ritual. I have to be in silence to study, so I go to the only quiet section in the SLUB. I try to reward myself after an exam or assignment by crashing out with a no alarm nap and also some treats, which is often pho or something from Go Asia.

For every student out there working hard for good grades, we wish you the best of luck and post exam relaxation!

SCIENCE UNPACKED - THE BIOS PODCAST

Philine Lea Hampe

In this episode, Ecren Arıöz, Mariia Voloshyna and I explore a fascinating question: Can the contraceptive pill influence who you're attracted to, down to who you choose as a partner? Listen as we unpack how hormonal contraception may shape attraction, partner preferences and relationship dynamics, and what this has to do with sweaty T-shirts.

EXCURSIONS AND OTHER NEWS

Small insights in BioS points of view, field trips, and other stuff we do.

Lab Rotation at the Leibniz-HKI: Robots, Antibiotics and Science Communication

Jenny Kurth

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During my lab rotation, I made an unexpected discovery: my bachelor's thesis could have been done overnight. How, you ask? Using the automated robotics platform JenXplor (see below) at the Leibniz Institute for Natural Product Research and Infection Biology Hans Knöll in Jena.

I spent six weeks at the institute, but instead of working in the lab, I focused on science communication. My tasks included writing website content, conducting interviews with researchers for press releases and, most importantly, establishing the concept and structure of the JenXplor website and that of the Robotic Assisted Discovery of Antiinfectives research group.

The group's research focuses on identifying bioactive compounds from which new antibiotics can be developed. With the growing problem of multi-resistant germs, current antibiotics are becoming less effective, while the development of new compounds has slowed due to limited profit for the pharma industry. In academia, compound discovery remains largely manual and time-intensive. The Antiinfectives team's high-throughput robotics platform addresses this gap by enabling the parallel testing of thousands of substances in significantly less time – with greater precision and improved data quality.

My job was to translate this complex research into clear, accessible and engaging online content. This involved creating a concept and structure for the website, collaborating closely with the group leader and the website programmer, text writing, and working on visualizations. Along the way, I picked up a new skill: illustrating in Adobe, probably one of my favorite tasks in the project. I really enjoyed diving into a new topic and figuring out how to communicate science in a creative and appealing way.

The experience strengthened my science communication skills while giving me insight into cutting-edge antibiotic research. Beyond the work itself, I appreciated the nice facilities, the welcoming team, and the height-adjustable desk.

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