



FACT CHECK

In this section students evaluate the the scientific evidence behind certain biological topics



Brightening up winter: Using light therapy to beat the seasonal blues

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Do you miss the sun when it's winter and you just can't wait to feel the warmth on your skin again? If your answer is "yes," then don't worry - you are not the only one.

Some people feel depression-like symptoms from the start of early winter till the beginning of spring[1]. What is known to most people as 'winter blues' or 'seasonal depression' is actually called seasonal affective disorder (SAD). In 2023 alone, 280 million people[2] around the world suffered from depressive symptoms, making it the most common mental disorder. In the United States, SAD affects 11 million people, while 25 million have a milder form[1]. The cause of this disorder is not known, but there are two possible explanations. One contributes the symptoms to a delayed circadian rhythm, and the other to a change in serotonin uptake, the neurotransmitter regulating mood. For both of these hypotheses, treatment with light therapy (LT) seems to relieve the symptoms[3]. To prevent SAD, doctors recommend going outside, exercising, eating a balanced diet, and keeping up social contact[1].

Light therapy is a common and effective treatment for SAD and has been used for over 40 years. During LT sessions, patients are exposed to a light box with 10,000 lux of light for about 20 to 30 minutes, usually in the morning[4]. While the exact mechanism behind LT remains unclear, it is believed to simulate natural sunlight to help regulate internal circadian rhythms and neurotransmitter levels[5,6]. Reviews and meta-analyses have shown the efficacy of LT for SAD. A significant improvement for patients treated with LT compared to people not treated was found in a network meta-analysis in 2024: they analyzed 21 studies and 1037 patients, comparing pharmacological and non-pharmacological intervention treatments[7]. Another meta-analysis in 2020 found that LT

was superior to placebo[8], highlighting LT as a highly effective and preferred treatment option for individuals with SAD.

Light therapy has shown effective results in relieving symptoms of SAD. The key parameters for LT include intensity, wavelength, exposure duration, and timing of light exposure during the day. This study also showed that there was no significant difference in efficacy between morning, afternoon, and evening treatments[9]. However, there are also some studies suggesting that LT was more effective in the morning[10]. This difference may be related to the use of different light intensities and exposure times, but there is no accurate conclusion yet. As for the effect of wavelength on LT, although there was a hypothesis that blue light may be more effective, experiments have not supported this notion[11].

There are discrepancies in opinions in the field which are reflected in the published papers. While several studies confirmed that LT works to relieve depressive symptoms[12,13,14,15], there are other more critical voices[8,9,16,17,18]. The main critique points are the duration of the trials, the sample sizes, and the lack of standardization of the light therapy parameters[16,17]. Where one study shows an antidepressant effect beyond placebo after three weeks[13], a meta-analysis on adolescents revealed a better effect of LT than a placebo control group in only two studies[16]. Other studies use a control group to check for a placebo effect[17].

Whether light therapy is an effective treatment for patients with SAD or the relief of symptoms could be explained by other therapeutic variables unrelated to light (e.g. improvement in day-night structure, or recognition of complaints)[11], the psychological field seems to be in disagreement. But since LT is well-tolerated with patients[17] and ensures high safety[19], it still is a normal practice. What every researcher could agree on was that there is a need for "adequately controlled clinical trials of LT treatment protocols"[16] to establish efficient and accepted treatment strategies. For this moment one thing seems to be of importance - no harm is done!

EXCURSIONS AND OTHER NEWS

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

Lab Rotation: Decomposers, data, and delight

Charlotte Kricke

I had a vivid idea of what to expect at the Department of Forest Science in Tharandt: lots of khaki, deer antlers, hunting dogs, and sturdy footwear...and yes, they have that too! As I am very interested in insects and field research, I decided to do my second lab rotation in forest zoology at the university in Tharandt under the supervision of Prof. Sebastian Seibold. I was warmly welcomed and had the opportunity to assist Marit Hertlein with her research and work on a small project about larvae in decomposer communities. Thereby I realized how much fun I could have programming in R (no joke!) and how important it is not to let your statistical knowledge get rusty.

The internship provided me with the perfect opportunity to delve deeper into ecological research. One of Marit Hertlein's current projects deals with the effect of arthropods as decomposer communities on carrion and how an open or closed canopy affects them. For this project, I sorted insects caught with pitfall traps in the lab (so many dung beetles!) and was able to expand my species knowledge. The highlight of my lab rotation was a week of fieldwork in the Swabian Alb and Freising, where I quickly found out that the mosquitoes were a bit too enthusiastic about our arrival! Despite their relentless clinginess, I thoroughly enjoyed my time in the forest. There were four of us on-site, taking wood samples and collecting camera, pitfall, and window traps for various projects. This allowed me to gain direct insight into different trapping methods. The fieldwork days were long, but we had enough 'Spezi' and good music on hand, and honestly, what's better than trekking through the forest and spotting beetles like

the alpine longhorn beetle! Not only was I able to collect important data for current research, but I also had the pleasure of meeting wonderful people. Their enthusiasm was contagious, much like the mosquitoes, but in a good way!

After these exciting weeks, one or two khaki-colored items have found their way into my wardrobe... I won't deny it. Thanks to Marit and all the staff of forest zoology, I had a lot of fun and a great time!



EXCURSIONS AND OTHER NEWS

Time to say goodbye

Interview with Helen Rothfuß and Nele Kheim

Bios Reports is facing its first farewell: Helen and Nele have graduated! As they prepare to leave BioS Reports, they told us about their time working on the journal, challenges and hopes for the future.

You two are the founding students of Bios Reports. What was the intention behind this student journal?

H: The idea evolved together with our Professor, Klaus Reinhardt, who was really excited about the economically important animal essays, written during the Master's course Biology in Society. The idea was to somehow share this work. Nele and I both enjoy working with texts, so it was a cool way for us to practice science communication. We invented other categories to tell more about working in science and our master's program. In the end it became something quite special to us.

What are some challenges you faced during your time at BioS Reports?

N: I learned that I don't need to be an expert to get to know new programs and platforms. Also, I was reminded over and over that checking sources takes time but it is important! Even though the texts were researched by a master's student and read by a professor, we often identified weak sources, missing literature, mistakes in calculations etc when editing the texts for Bios Reports.

Out of all the articles published, what is your favorite biology topic that you've learned about?

H: My favourite article is the barnacles one, which deals with the costs they create for the shipping industry. It was cool to get invested in the topic and gain a new way of looking at these creatures.

N: The category "Animals and Money" was a reminder of what weird things people do to animals. Donkey skins for cosmetics, bull fighting for entertainment and endangering so many species such as the sturgeon out of purely selfish reasons. The whole world as a system is so fragile. Every text reminded me of that and how we treat it.

What are your hopes for the future of the magazine, and what advice would you give to students planning to work in science communication?

N: I hope we could build a platform that will evolve further and give many students the chance to realize their ideas and practice their text work. I would recommend being open about new ideas and don't hesitate to go for it. Nothing can go wrong, this is your place to try it out!

