

Science & Society

Perceptions of parasites: reflections from a new parasitology outreach initiative

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Parasites often have a bad reputation, yet they play vital roles in ecosystems. The Global Parasitologist Coalition has created novel interactive outreach materials blending science and art, using them in diverse events to foster understanding. Here, we summarize these efforts and the lessons learnt to support future outreach initiatives.

A new parasitology outreach initiative

Conventional beliefs surrounding parasites among members of the public are overwhelmingly negative. Parasites are typically viewed as organisms causing disease in humans, pets, and livestock, making them the focus of eradication efforts. These views are not unwarranted given the substantial burdens that parasitic diseases impose on public health and global economies. However, a more nuanced view is needed given that most parasites have no impact on human wellbeing and many play key ecological roles that are underappreciated, even among scientists [1]. Given the concerns over the impact of biodiversity loss on ecosystem functions, public science outreach initiatives should also highlight the beneficial roles of parasites and why they should be

included in future conservation efforts. There have been educational and public outreach initiatives – including children's booksⁱ, podcastsⁱⁱ, blogsⁱⁱⁱ, and vibrant anime artwork such as Parasite MonMusu^{iv} – focusing on the ecological and beneficial roles of parasites.

The Global Parasitologist Coalition (GlobalPC)^v was founded in 2021 to enhance public appreciation of parasites and bring greater awareness of their beneficial contributions to ecosystem processes through educational outreach materials and public events. In the spirit of crossdisciplinary collaboration, we have been actively building a global community of parasite researchers and experts from the creative fields. Through our work over the years, we have explored different approaches for challenging the public's perceptions of parasites, with an emphasis on their roles in ecosystems. We are keen to share the findings from our public outreach (hereafter refer to as 'outreach') journey with members of the parasitology community who aspire to undertake similar initiatives.

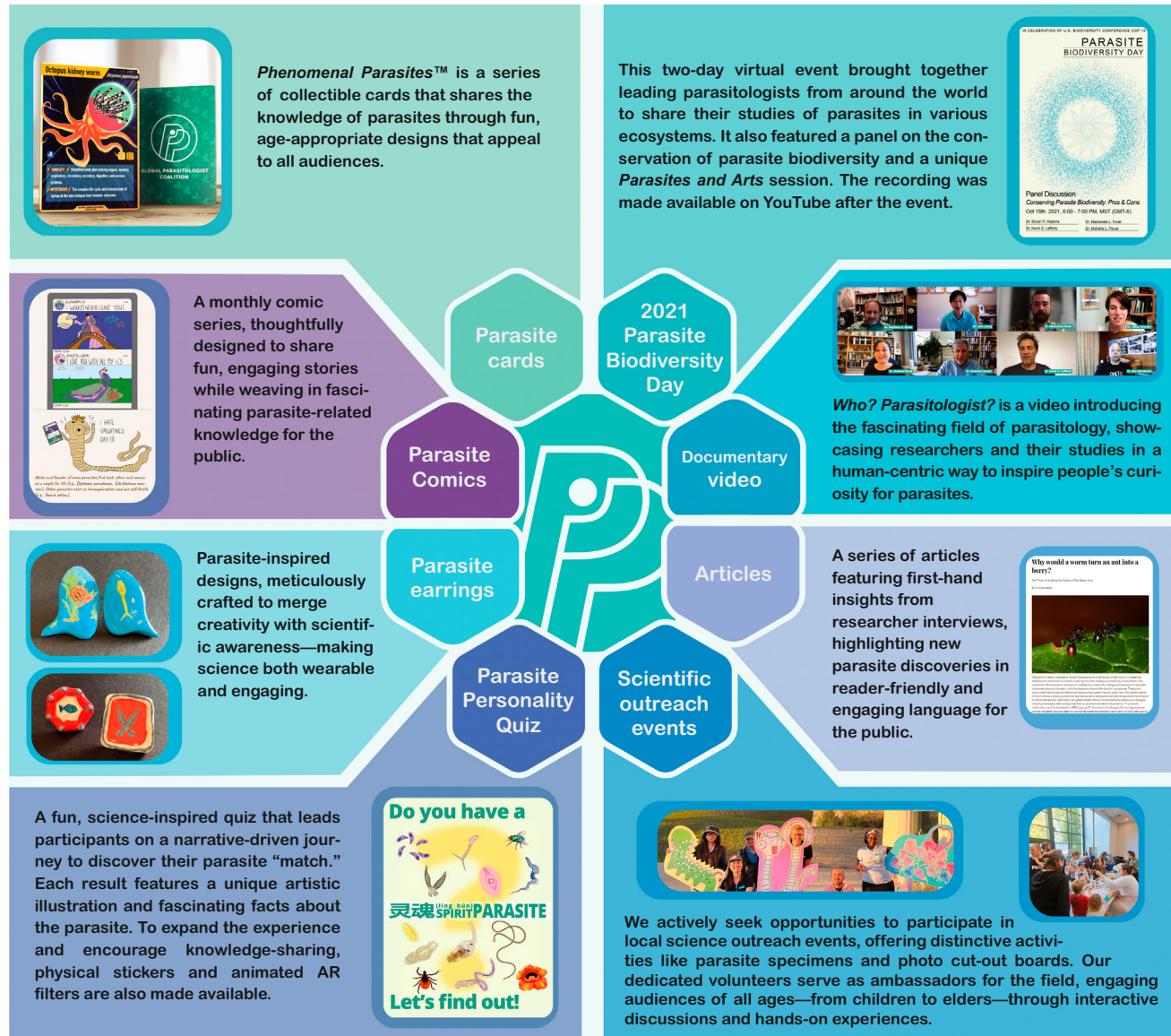
Our journey began with the 2021 *Parasite Biodiversity Day* event^{vi}, an online educational event promoted through online media posts and held in celebration of the United Nations Biodiversity Conference (COP15). This 2-day event had eight 1-h online sessions comprising five presentations on parasite biodiversity, a documentary video titled *Who? Parasitologist?* featuring eight leading parasitologists from different countries, a panel discussion that explored issues surrounding the inclusion of parasites in biodiversity conservation initiatives, and a *Parasites and Arts* session. One of the high points was our interview with Nobel Laureate, Dr William Campbell, which highlighted his creative endeavors that integrate art and science since his early years in the field. In our view, the success of this event does not stop with the size of the audience (>800 attended the

live event from 93 different countries) but more importantly, how diverse they were – 28% were members of the public, 15% were undergraduate students, 26% were graduate students, and 31% were university faculty members. Later we learned this event inspired an undergraduate student at Oklahoma State University to start a state-wide discussion on the possibility of offering parasitology as a high school elective course. The event replay is available on YouTube and continues to serve as a rich resource for anyone interested in parasites and the people studying them.

Following the 2021 *Parasite Biodiversity Day* event, we expanded our parasitology outreach work through the creation of more educational materials that are freely available online^v. We use crossdisciplinary approaches combining art and science to realize our goal of enhancing public engagement. Here, we describe these endeavors and the lessons learnt on how to best change public perceptions about parasites.

A sampler of GlobalPC materials

GlobalPC developed outreach materials for different channels and platforms (Figure 1) to engage audiences of all ages and promote awareness about parasites. The *Phenomenal Parasites*TM collectible cards^{vii} serve as a fun educational tool that conveys fascinating knowledge using trading cards, a format in the sport and game industry. The monthly *Parasite Comics*^{viii} creatively tell fictional stories of parasites, blending humor and education. Our documentary video, *Who? Parasitologist?*^{ix}, introduces the field of parasitology, giving mass audiences the opportunity to hear directly from parasitologists and gain insights through their first-person experience. Our innovations extend to graphical assets, such as the gallery-quality art posters created for the 2021 *Parasite Biodiversity Day* event, and parasite-themed memorabilia such as parasite-themed earrings. All these fun



Trends in Parasitology

Figure 1. A diverse range of outreach materials and activities developed by Global Parasitologist Coalition (GlobalPC). These efforts include virtual events, documentary videos, science articles, and interactive physical outreach activities, alongside creative educational materials such as *Parasite Personality Quiz*, *Parasite Comics*, *Phenomenal Parasites™* cards, and artistic designs. Abbreviation: AR, augmented reality.

experiments complement more traditional approaches. We recently started a series of parasitology articles featuring first-hand insights from our interviews with researchers worldwide. In keeping everything accessible, GlobalPC maintains a dedicated online presence through our website^v and social media channels.

One outstanding example that blurred the boundaries of geography, virtual and in-person experience, ages, cultures, and more is the *Parasite Personality Quiz - What's your Línghún (spirit) parasite?*^x, an outreach tool designed to connect participants with a parasite best representing their personality. This quiz highlights the

immense diversity of parasites while making learning an interactive experience. Participants answer six questions, each determined by their previous choice and drawn from a total set of 40 questions, to eventually reach one of 13 possible results. These results span ectoparasites, endoparasites, parasitic plants, and single-

celled organisms. The quiz is the result of a collaboration between scientists and artists, with a splash of artificial intelligence-generated images to enhance the narrative experience. Since its launch in December 2022, the quiz has had over 8400 participants, with over 30% being members of the public without formal science education and another 19% being undergraduates in different majors of different degrees in science, technology, engineering, and mathematics (STEM) or non-STEM. Feedback from participants has been very positive (from both the online survey and personal communication). The quiz has featured at various in-person and virtual events and has been integrated into other researchers' outreach work. To widen its impact at in-person events, GlobalPC created free stickers with dynamic Instagram augmented reality (AR) filters to give away to participants. The AR filters depict the movements of the parasites, enabling participants to visualize them in action and share the experience across social media. Through these innovative and creative efforts, GlobalPC continues to inspire curiosity and make parasitology accessible to everyone.

Interactive activities and real parasite specimens are the best

To evaluate the effectiveness of different materials and identify the most engaging approaches for the public, GlobalPC team participated in *Beakerhead*, a local science event held in Calgary, Canada, in September 2023 (Telus Spark Science Centre, Contemporary Calgary). A variety of activities were held, including the *Parasite Personality Quiz*, the *Who? Parasitologist?* video, displays of parasite specimens, a *Mini Shop* featuring parasite cards and comics, and a *Mini Mocktail Bar* serving parasite-themed beverages.

Over the 2-day event, 471 participants completed the *Parasite Personality Quiz*. According to survey responses, attendees identified the quiz (59%) and real parasite specimens (44%) as the top enjoyed

activities ($n = 70$, Figure 2A). The specimens, in particular, captivated the audience because they provided a rare opportunity to observe actual parasites. Seeing real parasites with a microscope or in a display container was a first for many attendees, leaving them with an

unforgettable memory. Furthermore, well-designed informational materials, including information sheets for each parasite specimen, and effective communication by volunteers significantly enhanced public engagement, making the event both educational and distinctive.

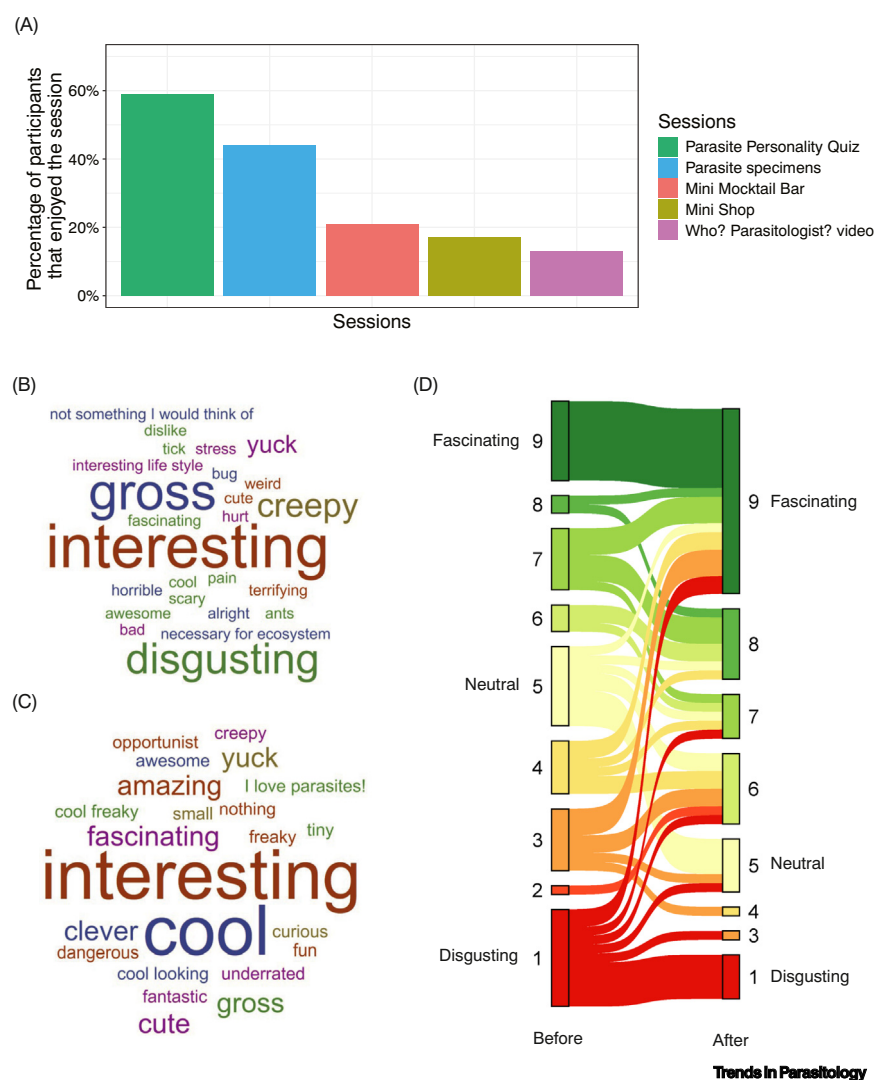


Figure 2. Public feedback from two in-person events in Canada and New Zealand. Activities that people enjoyed the most and the shift of people's views towards parasites before and after participating in Global Parasitologist Coalition activities in a public event. (A) Activities that people enjoyed in a public event ($n = 70$ respondents, September 2023, Contemporary Calgary, Calgary, Canada). (B–D) Word clouds and Sankey plot highlighting the shift of people's views towards parasites before and after participating in a public event (February 2025, Otago Museum, Dunedin, New Zealand). (B) Thoughts about parasites before participating in the activities. (C) Thoughts about parasites after participating in the activities. (D) Sankey plot of how people shifted their view towards parasites after participating in the activities ($n = 55$ respondents), where 1 represents 'disgusting', 9 represents 'fascinating', and 5 represents a neutral view of parasites.

Multi-media interactive approaches can change public perception

In February 2025, at an in-person event (*Bug Day*, Otago Museum) GlobalPC brought our most favorite activities to Dunedin, New Zealand: the *Parasite Personality Quiz* and real parasite specimens, alongside *Phenomenal Parasites™* cards, and *Parasite Comics*. We used a survey (see Figure S1 in the supplemental information online) to quantify how public perceptions of parasites can be effectively shifted through a combination of engaging multi-media materials and interactions with parasitologists. Across the 5-h event, 163 participants explored the *Parasite Personality Quiz*, 42% of them being high school students or younger, and an additional 28% belonging to non-academic members of the public. Results from the survey revealed notable changes in participants' attitudes towards parasites, reflecting increased positive perception and appreciation (Figure 2B–D).

Many participants shared that their perspectives shifted due to the new information gained at the event. They expressed intrigue over the diversity of parasite types, the fact that many parasites do not infect humans, and the unique survival strategies employed by these organisms. One participant, whose opinion of parasites improved significantly (from a negative score of 1 to a positive score of 9), stated, 'I feel much better knowing I'm safer than I thought'. For the four attendees who maintained a neutral stance before and after the event, comments indicated mixed feelings of disgust and fascination toward parasites. However, a small group (5 of 55) held firmly to their initial negative perceptions, describing parasites as gross and disgusting.

The *Parasite Personality Quiz* emerged as a standout component of the event and was highlighted by 35 of the 55 participants as their favorite activity. Attendees

appreciated the quiz's interactive nature, personalized outcomes, parasite stickers tailored to their quiz results, and its fun yet educational content. Many participants enjoyed taking the quiz with friends and noted that it resonated particularly well with children. Additionally, seven individuals expressed enthusiasm for the diverse parasite specimens in jars, six praised the overall format for being engaging, informative, and fun, and four commended the volunteers for their enthusiasm, friendliness, and knowledge. Lastly, two participants identified the collectible parasite cards as their favorite aspect.

This multi-format approach highlighted distinct advantages for each outreach component. The *Parasite Personality Quiz* excelled in personalization and fun, making it an engaging entry point to parasitology. The *Parasite Comics* added humor and relatable narratives, setting the ground for further learning. The real specimens provided a tangible, fascinating connection to the organisms under discussion, and the collectible cards served as an educational takeaway, reinforcing learning beyond the event. Together, these elements demonstrated how a combination of creative outreach tools can effectively inspire curiosity, transform public perceptions, and make complex scientific concepts accessible to all.

Lessons learnt

Our artistically crafted, interactive, and narrative-driven approaches have captured the attention of people of all ages, sparking curiosity and reshaping attitudes towards parasites. Portraying parasites as animals of their own and as diverse organisms with crucial roles in ecosystems, rather than mere threats, can challenge misconceptions about parasites. The volunteers' enthusiasm towards parasites, alongside thoughtfully created educational tools, has proven crucial in fostering a deeper understanding of parasites' ecological importance.

These initiatives also offer valuable lessons for future outreach programs. Interactive materials and the enthusiasm of the volunteers were instrumental in creating impactful and memorable experiences for participants. Nevertheless, challenges remain, such as improving accessibility, tailoring activities to specific event environments, and striking a balance between education and entertainment. Free gifts like parasite cards effectively boosted engagement, while participant feedback highlighted the need for optimized spatial planning and additional resources. By consistently measuring shifts in public attitudes and refining its methods, GlobalPC exemplifies how science communication can effectively strengthen the bridge between researchers and the public. Our outreach efforts do not rest only on fostering greater understanding but also on advocating for the inclusion of parasites in biodiversity conservation initiatives.

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Declaration of interests

The authors declare no competing interests.

Supplemental information

Supplemental information associated with this article can be found online at <https://doi.org/10.1016/j.pt.2025.05.006>.

Resources

ⁱwww.us.macmillan.com/books/9781250833983/power-to-the-parasites/

ⁱⁱwww.asm.org/podcasts/twip

ⁱⁱⁱwww.dailyparasite.blogspot.com/

^{iv}www.deviantart.com/the-episiarch/gallery/58399252/parasite-monmusu

^vwww.globalpc.org

^{vi}www.globalpc.org/events-2

vii www.globalpc.org/parasite-cards

viii www.globalpc.org/parasitecomics

ix www.youtube.com/watch?v=9o7EOftqizs&t=1s

x www.globalpc.org/parasite-personality-quiz

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