



Issue 49

PARSA

Newsletter

I am pleased to present to you the 49th issue of the PARSA newsletter. A sincere thank you to everyone who contributed – your input is deeply appreciated and continues to shape the strength and direction of our society.

This edition is rich in research and highlights some of the important work being carried out across our member institutions, including the University of the Free State, Tshwane University of Technology, University of Pretoria, and the University of Limpopo. You'll find insightful features ranging from acaricide resistance to parasitic zoonoses. Among the stories, we explore the hidden hitchhiker—tapeworms in pets and their flea vectors, examine the growing concern of anthelmintic resistance in domestic ruminants with a focus on African-specific strategies, and review the potential of plant-based solutions in managing dog-associated ixodid ticks through a systematic literature review.

We also bring you a reflective piece on a research visit to Charles Sturt University in Australia by Dr Iva, reminding us that sometimes, research breakthroughs happen when the time is just right. And perhaps most importantly, this issue shines a spotlight on the life-changing Stem Cell Donor Drive – an initiative that exemplifies the power of science in service of humanity.



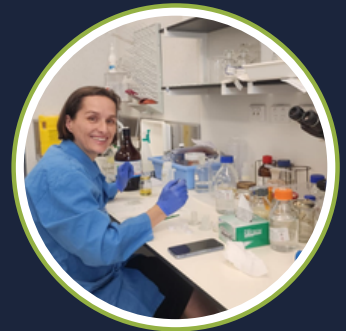
**SEMINAR
REGISTRATION!**



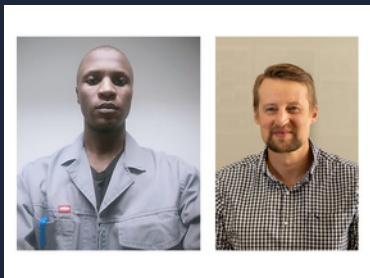
MS G MOLABA



DR C. BYARUHANGA



DR I PŘIKRYLOVÁ



**FRANS SELEPE
&
LUTHER VAN DER MESCHT**

CONTENT

- PARSA President.....pg 2
- Dr Sonja Matthee.....pg 3
- Seminar*pg 4
- The hitchhiker.....pg 5
- Anthelmintic resistance.....pg 7
- Furbabies.....pg 8
- A visit to Charles Sturt University.....pg 10
- Stem Cell Donor Drive.....pg 11

PRESIDENT

Dear PARSA Member,



PROF KERRY MALHERBE

We've already reached May, half the year has passed, and with it comes the reassurance that our efforts are paying off, milestones have been met, and the excitement of our annual conference is just around the corner.

Looking ahead, we are excited to co-host the upcoming ICPOW Webinars, a prelude to the much-anticipated ICPOW-PARSA joint conference. These events promise engaging discussions, fresh insights, and valuable networking opportunities. I encourage all members to register and participate, as your presence and input are what make these gatherings truly enriching. More information is included in this newsletter and on the SAVETCON website.

I would also like to extend the invitation to join us for the **5th International Congress on Parasites of Wildlife (ICPOW), taking place from 14-18 September 2025 in Skukuza, Kruger National Park.** This joint event with PARSA's 53rd annual meeting offers an exceptional opportunity to share research, connect with fellow parasitologists, and experience the beauty of the African bush. Whether your work focuses on taxonomy, epidemiology, evolutionary biology, or veterinary science, we look forward to welcoming you for a week of collaboration, discovery, and inspiration.

As we near the end of the current PARSA Council's term, I would like to extend heartfelt thanks to our council members for their hard work, dedication, and valuable service to the society. In the coming weeks, we will open nominations for select council positions, and I urge members to consider stepping forward or nominating peers who are passionate about the future of our society.

Lastly, we were delighted to receive numerous nominations for this year's PARSA annual medals. These awards celebrate excellence and dedication in parasitology, and the winners will be announced during the joint ICPOW-PARSA meeting. Thank you to all who took the time to recognise and nominate outstanding students.

I look forward to reconnecting with familiar and friendly faces this September. Until then, stay warm, stay inspired, and enjoy a productive and joyful winter season.



Warmest regards,
Prof Kerry Hadfield Malherbe
PARSA President

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PROF. SONJA MATTHEE

ICPOW2025 ORGANISING COMMITTEE CHAIRPERSON

Dear Fellow Parasitologists,

The Parasitological Society of Southern Africa (PARSA) is delighted to invite you to the 5th International Congress on Parasites of Wildlife (ICPOW), to be held at the Nombolo Mdluli Conference Centre in Skukuza, the main congress centre of the world-famous Kruger National Park, South Africa, during 14-18 September 2025.

Leading up to the **5th International Congress on Parasites of Wildlife (ICPOW 2025)**, you are invited to attend a series of monthly webinars focusing on key themes in parasitology. Below is an advert with all the information. Visit SAVETCON for registration.

Register on savetcon : <https://savetcon.co.za/icpow2025/>

hosted by the Parasitological Society of Southern Africa (PARSA) 53rd Annual Conference

ICPOW 2025 WEBINAR SERIES

JOIN FREE

In lead-up to the 5th International Congress on Parasites of Wildlife you are invited to attend

Webinars on Parasites & Pathogens
Hosted by
International Congress on Parasites of Wildlife and the Parasitological Society of Southern Africa

Webinars will be presented "live" once per month at midday (12:00 – 13:00 SAST (UTC+2))

<p>1</p> <p>13 MAY 2025 - 12h00-13h00 (UTC+2)</p> <p>A concept of zeta diversity in studies of compositional turnover in ectoparasite communities</p> <p><i>Prof. Boris Krasnov</i> Ben-Gurion University of the Negev, Israel</p> <p>REGISTER</p>	<p>2</p> <p>18 JUNE 2025 - 12h00-13h00 (UTC+2)</p> <p>Zoonoses control and the "One Health" moral dilemma</p> <p><i>Prof. Oriel Thekisoe</i> North-West University, South Africa</p> <p>REGISTER</p>	<p>3</p> <p>09 JULY 2025 - 12h00-13h00 (UTC+2)</p> <p>Parasites in a warming world</p> <p><i>Prof. Christian Selbach</i> The Arctic University of Norway, Norway</p> <p>REGISTER</p>	<p>4</p> <p>06 AUGUST 2025 - 12h00-13h00 (UTC+2)</p> <p>Parasite biodiversity and species discrimination</p> <p><i>Prof. Robert Poulin</i> University of Otago, New Zealand</p> <p>REGISTER</p>
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<https://savetcon.co.za/icpow2025/>

MEET THE SEMINAR PRESENTERS



Prof R Poulin

Originally from Canada, Robert obtained a PhD from Laval University before joining the University of Otago in 1992. He has since established a research programme in parasite ecology and evolution that focuses on broad questions. His research group has four main research directions. First, his lab investigates the forces shaping the evolution of parasites, in particular the evolution of life history traits such as host specificity, the ability to manipulate host behaviour, and the complexity of transmission pathways. Second, they are studying the role of parasites in aquatic ecosystems, i.e. how they affect community diversity and food web stability, and how parasitism may interact with climate change to influence ecosystems. Third, Robert has long been exploring large-scale patterns of parasite biodiversity and biogeography, searching for the processes behind the diversification and distribution of parasites and diseases. Finally, Robert and his team are now turning toward the role of parasite microbiomes in shaping the host-parasite interaction.



Prof O Thekiso

Prof. Oriel Thekiso obtained a PhD degree (Veterinary Science) at Gifu University, Japan. He served as a Postdoctoral Fellow of Japan Society for the Promotion of Science (JSPS) in 2007 to 2009 at Obihiro University of Agriculture and Veterinary Medicine, Japan. He then joined University of the Free State as a Senior Lecturer in 2009 until 2013, and Associate Professor in 2014. He later joined North-West University (NWU) in 2015 as an Associate Professor and is currently a Professor of Zoology. He is the Principal Investigator of the Veterinary Parasitology and Zoonosis Research Laboratory. Initially (2000 - 2015), his research focus was mainly on molecular diagnostics and epidemiology of vector-borne parasitic infections in livestock. However, since 2016 he has expanded his research niche to include zoonotic infections within the "One Health" paradigm.



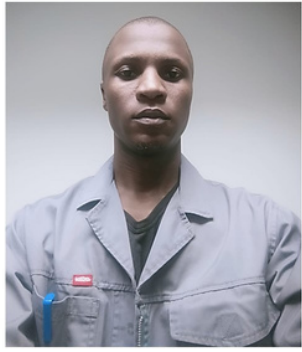
Prof B Krasnow

Prof. Boris Krasnov is an ecologist mostly dealing with ecological, evolutionary and biogeographic parasitology using arthropod ectoparasites (mostly fleas) and their mammalian hosts as model associations. Boris graduated from Moscow State University of the former Soviet Union and then (after the collapse of the communist regime) moved to Israel. There, he expanded his scientific interests to ecology of host-parasite interactions (he himself has no idea how and why this happened). Boris collaborates with many researchers from all continents (except Antarctica). At present, he is a Full Professor in the Ben-Gurion University of the Negev.



Prof C Selbach

Prof. Christian Selbach is an aquatic ecologist interested in the broad question of how parasites interact with their environment, and how they function as integral components of ecosystems. His work focuses on trematodes that parasitize a wide range of vertebrate and invertebrate hosts. Chris studies the role of these ecologically important parasites in marine and freshwater habitats to better understand their contribution to the systems' biodiversity, energetics and food webs, their impact on host behaviour, and their relevance as human and wildlife pathogens. Chris has conducted international research projects in South Africa, New Zealand, Denmark, the Czech Republic, Germany, and Norway, where he works as an Associate Professor in Ecological Parasitology at UiT in Tromsø.



THE HIDDEN HITCHHIKER: TACKLING TAPEWORMS IN PETS AND THEIR FLEAS

FRANS SELEPE^{1&2} AND LUTHER VAN DER MESCHT²

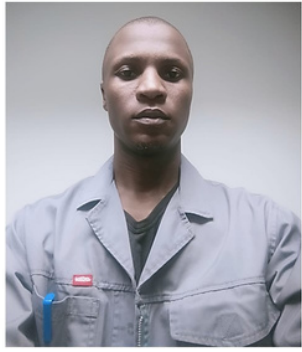
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²DEPARTMENT OF ZOOLOGY AND ENTOMOLOGY, UNIVERSITY OF THE FREE
STATE, BLOEMFONTEIN, SOUTH AFRICA

Tapeworms infect pets by hitching a ride within their fleas. Once your pet is infected, worms develop in the **small intestine** of your favourite pooch or kitty where adults can reach up to 50 cm long. Pets are often asymptomatic, but tapeworm infections can lead to **scotching** (sitting and dragging their bottom on the ground), mild digestive problems or you may even notice rice-like segments called proglottids shed in their faeces. Despite the peculiar life cycle of these worms and their impact on pet health, **few studies have been conducted to understand which factors affect how fleas get infected** or pinpoint those factors that influence infection in your dog or cat. This lack of research **hinders the development of new pharmaceutical products** to rid pets of these pesky parasites. Laboratory studies will not be successful without basic information relating to optimal conditions allowing both fleas and pets to become infected with these tenacious tapeworms. That's why I chose to investigate tapeworm infection dynamics for my MSc, under the supervision of Dr. Luther van der Mescht at the University of the Free State.

Larval cat fleas, as the first host in the tapeworm life cycle, become infected when they ingest tapeworm eggs disguised as food (i.e., organic matter) in their environment. Once these eggs are ingested, tapeworm development starts. Although some flea larvae do die after ingesting the eggs, the development of the tapeworm continues uninterrupted in the remaining fleas' life cycle. Interestingly, the experimental temperature at which fleas are reared has a significant influence on tapeworm development rates, where higher temperatures lead to worms developing faster and resulting in more adult fleas becoming infective. In other words, temperature determines how many adult fleas can transmit the tapeworm to a pet. Scientists have developed several ways to infect adult fleas with tapeworms in the lab, but the mystery remains as to which of these methods works best for rearing fleas with high levels of tapeworm infection.

Adult cat fleas infected with baby tapeworms emerge from their cocoons once they are fully developed, with emergence stimulated by vibrations, heat, or carbon dioxide generated by your posh pooch or fantabulous feline friend. At this point, the baby tapeworms inside the adult flea are not yet infective, but become infective within days once the flea jumps onto your dog or cat. Now, because tapeworms become more infective at temperatures higher than 30 °C, the fluffiness factor of your pet becomes important. Pets differ in how fluffy they are, and the fluffier they are the greater the temperature that a tapeworm-infected flea is exposed to and the faster these tapeworms become infective. In other words, if your pet is fluffy, they are potentially at greater risk of being infected by tapeworm, and not just of having hairballs. **However, very few studies have investigated the influence of pet traits on the likelihood of them being infected with tapeworm.**



THE HIDDEN HITCHHIKER: TACKLING TAPEWORMS IN PETS AND THEIR FLEAS

FRANS SELEPE^{1&2} AND LUTHER VAN DER MESCHT²

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When an adult flea carrying baby tapeworms' lands on your dog or cat, it might get swallowed during grooming – oops! Inside your pet's belly, the tiny hitchhiker develops into an adult tapeworm and sets up camp in the small intestine, where it grows and gets comfy. Once comfy enough, it starts shedding rice-like segments (proglottids) of its body that land up in your posh pet's posh poop. These tapeworm egg packets can remain in the external environment for long periods but eventually break down to release eggs that are consumed by baby fleas (larvae) to restart the cycle.

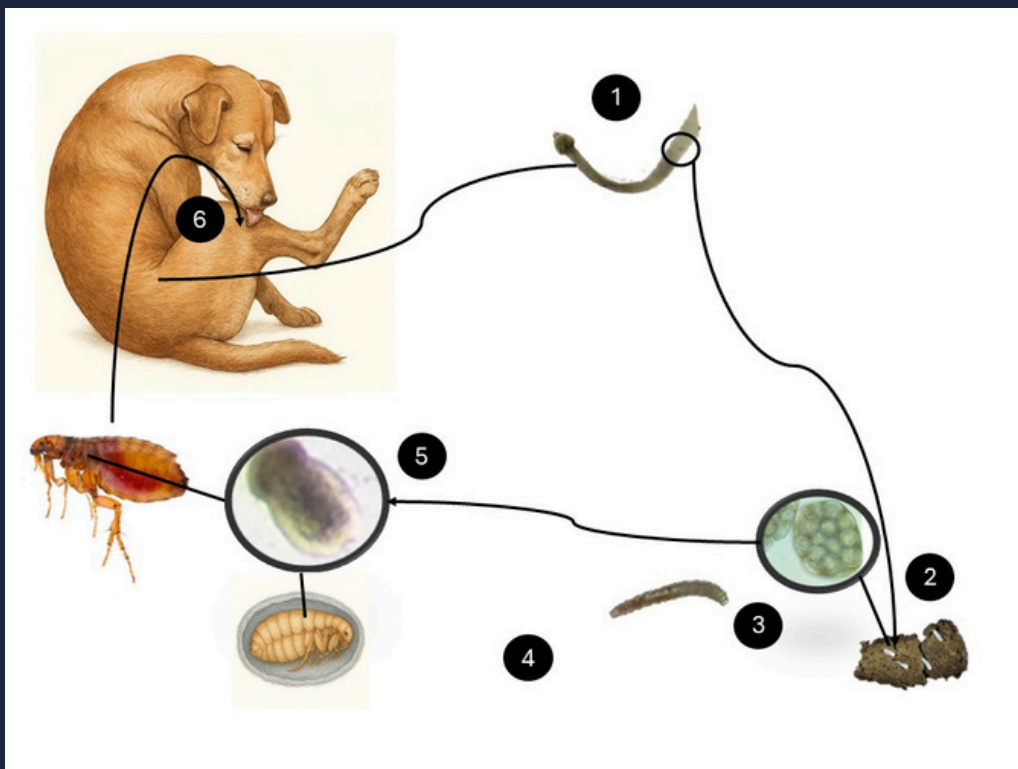


Figure 1: The life cycle of the tapeworm, *Dipylidium caninum*, in fleas and dogs.

There are two types of tapeworms – both can infect cats and dogs. However, the tape type matters! It can affect how quickly symptoms appear, how long the infection lasts, and how long the tapeworm's egg packets stay intact in the environment. But never fear, effective treatments are available, if you notice symptoms, speak to your friendly neighbourhood vet!



ANTHELMINTIC RESISTANCE IN GASTROINTESTINAL NEMATODES OF DOMESTIC RUMINANTS: MITIGATION, WITH AN AFRICAN CONTEXT

CHARLES BYARUHANGA¹

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Anthelmintic resistance (AR) is worsening in **gastrointestinal nematodes of ruminant livestock worldwide**. In Africa, 50% of household income and food requirements rely on livestock rearing, mostly ruminant stock, and therefore increasing prevalence of multi-drug resistance threatens livelihoods. Current practices based on intensive treatments increase the risk of AR. Maintenance of efficacy requires **routine monitoring of resistance**, utilization of **appropriate treatment schedules** (targeted treatment, targeted selective treatment, and selective nontreatment), **treatment with multiple drugs** from different classes, **quarantine** and treatment of new animals before introduction to the farm, and **correct dosing**.

Alternative methods such as **rotational grazing**, selection for **host resistance and resilience**, **multispecies grazing** and **good nutrition** can minimise conventional anthelmintic use. The use of **copper oxide wire particles**, **condensed tannin-rich plants** and **plants with secondary compounds**, and the **nematode-trapping fungus *Duddingtonia flagrans*** are also beneficial in integrated control strategies.

The African climate is mostly tropical and sub-tropical with a continuous helminth parasite annual pattern, and therefore, some standard control regimens developed in temperate regions are not easily communicable to or adaptable by most livestock keepers. Moreover, limited professional advice or resources and communal grazing are more prominent than in other continents, and these constrain the extent of implementation. Minimizing the spread of AR will require **information on farmers' perceptions, beliefs, behavior, and attitude** regarding the adoption of recommended strategies. It is important to deploy extension services that focus on human behavior, mindset change and social epidemiology to make sustainable approaches common practice in parasite control. **Veterinary training and professional development** that emphasise various aspects of AR and sustainable parasite control are essential to improve the quality of advisory services. Targeted community education and communication methods will help alleviate misconceptions and promote accurate information regarding management of animal health and AR. **Deployment of community-led monitoring systems**, wherein reliable local leaders are educated to oversee implementation of integrated control strategies could effectively overcome spread of rumors and misconceptions and ensure the accurate dissemination of correct information.

Integration of remote electronic systems has shown potential in managing animal health by reducing labour inputs that are associated with visual identification of individual animals with parasitic and infectious diseases.



INVESTIGATING AND EVALUATING THE PLANTS, PLANT EXTRACTS AND TICK ASSAYS THAT HAVE SHOWN EFFICACY AGAINST DOG-ASSOCIATED IXODID TICKS USING A SYSTEMATIC LITERATURE REVIEW APPROACH

MS G MOLABA

TSHWANE UNIVERSITY OF TECHNOLOGY

Dogs, affectionately called “**furbabies**”, are an integral part of many households and important companion animals to humans. In these households, dogs are seen as part of the family and have a close association with their human companions. They are primarily susceptible to tick infestations due to their inquisitive and explorative behavior to roam natural environments. As a result, the transfer of ticks from dog to humans and transmission of associated zoonotic pathogens is possible. **To control tick infestations and tackle the issue of acaricide resistance**, various plant species have been investigated and evaluated previously by other researchers for their efficacy against ticks.

The aim of this systematic review was to **consolidate the data that has been published about the efficacy of plant extracts used against ixodid ticks that parasitize dogs**. The review further evaluated the diversity of plant species tested for acaricidal activity, the types of extracts (e.g., essential oils, crude extracts), and the laboratory or field acaricidal assays employed in testing their efficacy.

A keyword-Boolean strategy was created by the author to evaluate more than 3500 article titles, from these, a total of $n = 103$ articles that met the study inclusion criteria were unearthed, evaluated and discussed in detail. From our extensive investigation, it was noted that the leading countries in terms of acaricidal plant investigation outputs, that is, published articles, were Turkey at 7%, India at 17% and the highest, Brazil at 23%. A total of $n = 13$ tick species that are associated with canines (particularly dogs) were reported as test subjects in the evaluated studies. At a frequency of 43% the brown dog tick, scientifically called *Rhipicephalus sanguineus* had the highest frequency of reports. A total of $n = 177$ plant species from $n = 60$ families were recorded and used to evaluate the acaricide potential of the plants. The plants from the Lamiaceae family was most preferred across the evaluated studies with an 18% frequency. In this family, plant genera such as *Lavandula* (commonly known as lavender), *Mentha* (mint), *Origanum* (oregano), *Thymus* (thyme), *Ocimum* (basil) were frequently reported. Other common plants that were reported in other plant families such as the Cupressaceae and Myrtaceae, included *Juniperus* (juniper), *Eucalyptus* (gum tree), *Citrus* (including, orange and lemon), *Nicotiana* (tobacco) and *Zingiber* (ginger). With regards to plant parts, it was noted that the leaves were the most preferred for utilization in crude plant metabolite extraction ($n = 42$) and evaluation of efficacy of the plants. Additionally, essential oils were the most frequently reported plant extracts ($n = 60$), meaning the majority of the plant parts were used to extract essential oils.



MS G MOLABA

TSHWANE UNIVERSITY OF
TECHNOLOGY

INVESTIGATING AND EVALUATING THE PLANTS, PLANT EXTRACTS AND TICK ASSAYS THAT HAVE SHOWN EFFICACY AGAINST DOG-ASSOCIATED IXODID TICKS USING A SYSTEMATIC LITERATURE REVIEW APPROACH

In terms of tick assays, **the adult immersion test (AIT) was predominantly used with n = 45 reports**; followed by the larval packet test (LPT) with n = 25 and larval immersion test (LIT) with n = 17 reports. These are quite commonly used tick assays and it is not surprising that their frequency was high across the reports. Interestingly, only n = 3 of these studies reported on the cytotoxicity of the plants using mammalian cell lines. This means of n = 103 articles that were evaluated and used, only 2.9 % investigated the toxicity or simply the safety of use of plants or their products on animal subjects. Therefore, whilst their efficacy has been determined, their safety is still unknown. Additionally, only n = 5 of these papers reported on *in vivo* results using dogs, rats and rabbits as test subjects for efficacy as well as allergy tests.

Whilst there have been several systematic reviews that have looked at plant efficacy against ticks, none (to our knowledge) were specific to important companion animals such as dogs. This study is unique in that it evaluates the efficacy of plants that can be used on dogs with promising anti-tick effects, often comparable to or exceeding synthetic acaricides. It further gives the current global status of effective acaricidal plants used against ixodid ticks parasitizing dogs, and also highlights the limitations and gaps of the evaluated studies, which adds knowledge for future research and possible commercialization.

The results are expounded in the published research article accessible online: Molaba, G.G., Thethe, P.K., Shai, L.J., Thekiso, O.M.M. and Mtshali, K., 2025. A systematic literature review of the efficacy of acaricidal plants, plant extracts, and tick assays used against dog-associated ticks. *Acta Tropica*, p.107608. <https://doi.org/10.1016/j.actatropica.2025.107608>



Acta Tropica
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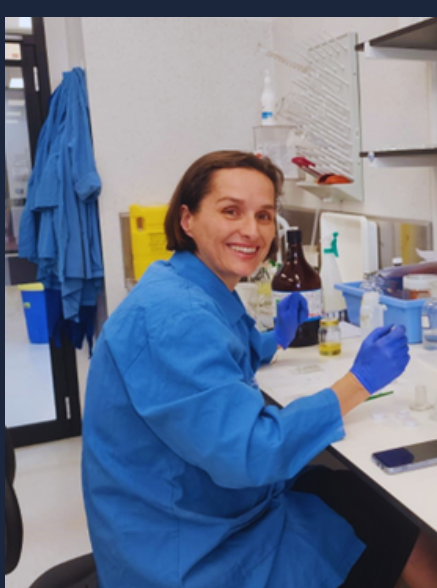
A systematic literature review of the efficacy of acaricidal plants, plant extracts, and tick assays used against dog-associated ticks

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ALL HAPPENS WHEN IT'S THE RIGHT TIME: RESEARCH VISIT AT CHARLES STURT UNIVERSITY, WAGGA WAGGA CAMPUS, AUSTRALIA



DR IVA PŘIKRYLOVÁ



Between 4 and 11 November 2024, I visited the lab of **Prof S. Shamsi at Wagga Wagga campus, Charles Sturt University, Australia**. Prof Shamsi is currently one of the very **few freshwater fish parasitologists in Australia**. The idea for collaboration arose a while back when I was still working at Masaryk University, Czech Republic, when I was invited to be part of a grant application to fund the study focusing on the parasites of Australian freshwater fish. In 2022, we met in person during the 15th International Congress of Parasitology in Copenhagen, Denmark, and discussed and planned my research visit.



During the visit, I assisted with the **identification of monopisthocotylan parasites** from the problematic invasive fish *Cyprinus carpio* as well as with the **molecular work** on *Microcotyle sebastis* of the US shore. I had an opportunity to meet and work with a PhD Candidate, **Bianca Leite, from the Federal University of Para, Brazil**, who was visiting the lab at the same time. While working in Prof. Shamsi's lab, I also organized a mentoring session with **Kym Grundy**, an Honours student in Veterinary Science at Charles Sturt University, during which I guided her through the principles of scientific drawing using a compound microscope.

During my stay in Wagga Wagga, there was time for a discussion about the possibilities of future collaborations, including the student training on monopisthocotylan parasites of Australian freshwater fishes. In addition, we discussed the topic of parasites of ornamental fish and what a serious problem it is in terms of biosecurity in both countries.

As Australia has become a multicultural country, apart from the scientific activity, the weekend time offered a space to attend the celebration of the Indian Feast of Light: **Diwali**, and to explore the city of Wagga Wagga.

I received a very warm welcome from Prof Shamsi and her family members, as well as the CSU students and colleagues in the department.

STEM CELL DONOR DRIVE

Faith Nkosi (Student Representative) & OP-Postgraduate Student Association



Every year, approximately 4,000 new cases of blood disorders are reported in South Africa. For each one that indicates a life forever changed. For many of these patients, a stem cell transplant is their only hope for survival. **On 26th March 2025**, hope walked onto the Onderstepoort Campus in the form of students, staff, and volunteers ready to make a difference.

Led by the **OP-Postgraduate Student Association (PGSA)** in partnership with **DKMS** and **Onderstepoort Veterinary & Para-Veterinary Committee (OPVSC)**, the Stem Cell Donor Drive brought the campus community together for something far greater than a single event. It sparked a movement of compassion. By the end of the day, **78 new donors** had joined the global stem cell registry.

'That's 78 chances, 78 lifelines for patients who are still waiting for their match'

The drive was more than just tables and sign-up sheets, it was filled with heartfelt conversations, information sessions, and encouragement from peers who've witnessed the impact of stem cell donation first-hand. For many who joined, it was their first time learning that donors of African and mixed-ethnic backgrounds are vastly underrepresented in global registries, making local drives like this even more critical.

It was so inspiring to see our fellow students and staff come together for something bigger than ourselves. Every signature we got registered could mean a second chance at life for someone out there. The atmosphere was buzzing with purpose.

The PGSA is committed to continuing with this life-changing initiative. This donor drive is just the beginning of a larger campaign to raise awareness and build a stronger, more representative donor base in South Africa.

To everyone who showed up to register, we thank you. A huge thank you also goes to DKMS for their effective service and support. Because of you, 78 more people now stand ready to be someone's miracle. And that's a reason to celebrate!



DKMS 
WE DELETE BLOOD CANCER

The DKMS busy registering University of Pretoria donors on their database

Photos courtesy of Faith Nkosi