The kinetoplasts are a group of protozoan parasites characteristic by the presence of a unique organelle, called the kinetoplast, that is located inside a single mitochondrion and contains a large amount of DNA called kinetoplast DNA (kDNA). Kinetoplasts of medical and veterinary significance include Trypanosoma spp. (the etiological agents of human and animal African Trypanosomiasis, surra, and Chagas disease), and leishmanias (the causative agents of the various forms of leishmaniasis). Millions of people, and their domesticated animals living in endemic regions across the globe are at risk of these Neglected Tropical Diseases. All of the human and veterinary conditions can be disabling or fatal if not adequately treated, and no vaccines are available. However, drug treatment is hampered by the challenge of drug resistance and toxicity to the mostly very old drugs. We have been investigating propolis (a natural product made by bees from tree resins), and compounds isolated from it, as novel agents against Trypanosomae and Leishmaniem species. Our results show that high levels of activity were obtained for all the samples with the levels of activity varying across the sample set. The highest levels of activity were found against L. mexicana. Propolis have no in vitro growth inhibition against mammalian cells (result not shown), but displayed low EC50 against Trypanosoma and Leishmania species, without a loss of activity against diamidine- and arsenical-resistant or phenanthridine-resistant T. brucei strains, or a miteleobiont-resistant T. mexican strain. These results provide sufficient scope for further investigations of propolis-derived natural compounds toward the rational development of sustainable drugs against these kinetoplastids.

**Results**

**Discussion & Conclusion**

- It was previously found that a parasite challenge encouraged bees to collect more propolis and that the propolis enveloped improved the immunity of colonies against infection.
- In the current study, regional variations in the antimicrobial properties of propolis have been found to exist.
- Propolis would appear to have broad spectrum activity with individual components in the mixture having activity against different organisms.
- Propolis-enveloped colonies showed a broad array of different organisms. Especially against T. b. rhodesiense and T. congolense the correlation is very close, which is important as African animal trypanosomiasis is caused by multiple Trypanosoma species including T. congolense, T. b. rhodesiense, and T. b. brucei, and the disease has now spread far beyond Africa for T. vivax and T. evansi. Even more important is that the correlation between the drug-resistant and the sensitive strains was very good, with activity against the resistant strains on average better than against the parental strains. These results give ample scope for further investigations.

**Reference**
