THE BRAZILIAN PEPPERTREE: AN OLD CURE FOR NEW WOUNDS

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The Brazilian Peppertree (*Schinus terebinthifolia* Raddi) is a large shrub or small dioecious tree, native to Brazil, Paraguay and Argentina *(1)*. It can also be found in over 20 subtropical countries and is considered to be an invasive species in the southeastern United States, particularly in Florida where it has colonized most of the state *(2)*.

Peppertree is included in the Brazilian Pharmacopoeia and has served as a staple in Brazilian traditional medicine *(3)*. Almost all parts of the plant, including leaves, bark, fruit, seeds and resin have been used to treat a variety of ailments *(4)*. In particular, it has been used traditionally for its antiseptic and anti-inflammatory qualities in the treatment of wounds and ulcers, bruises, hemoptysis, diarrhoea, chills, tumours and arthritis, as well as urinary and respiratory infections *(3, 5)*.

Although the bright red fruits have a long history of use as an ingredient in a balm to treat wounds and ulcers, little was reported in the literature concerning the activity of the fruits. Thus, we endeavoured to investigate the efficacy and safety of *S. terebinthifolia* fruits for treating *S. aureus* infections, which are frequently implicated as a major pathogen found in infected wounds and ulcers.

Interestingly, we found that fruit extracts did not inhibit bacterial growth, but rather interfered with the capacity of the bacteria to communicate with one another using a chemical signaling system known as quorum sensing *(6)*. Through blocking communication, these plant compounds "tricked" the bacteria into behaving like they were alone even when surrounded by millions of their peers. This is important because bacteria behave differently when they are in a group setting; as a group, *S. aureus* cells coordinate production of large amounts of toxins that are secreted into the host. In turn, these toxins act to destroy host tissues, attack the immune system and aid the bacteria in spreading to other parts of the body. By blocking bacterial communication, these peppertree compounds effectively disarm the bacteria, rendering them harmless and more vulnerable to clearance by the host immune system. The full text of the article reporting these findings is available via open access at Scientific Reports. ■

Figure 1: **Peppertree**

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References

1. Panetta F, McKee J. Recruitment of the invasive ornamental, Schinus terebinthifolius, is dependent upon frugivores. *Australian Journal of Ecology* 22, 1997: 432-438.
2. Geiger J, Pratt P, Wheeler G, Williams D. Hybrid Vigor for the Invasive Exotic Brazilian Peppertree (Schinus terebinthifolius Raddi., Anacardiaceae) in Florida. *International Journal of Plant Sciences*, 2011: 172, 655-663.
3. Fedel-Miyasato LE et al. Antigenotoxic and antimutagenic effects of Schinus terebinthifolius Raddi in Allium cepa and Swiss mice: a comparative study. *Genetics and molecular research: GMR* 13, 3411-3425, doi:10.4238/2014.April.30.2 (2014).
4. Gundidza M, Gweru N, Magwa M, Mmbengwa V, Samie A. The chemical composition and biological activities of essential oil from the fresh leaves of Schinus terebinthifolius from Zimbabwe. *African Journal of Biotechnology 8*, 2009 ;7164-7169.
5. Morton JF. Brazilian Pepper - Its Impact on People, Animals and the Environment. *Economic Botany* 32, 353-359, doi:Doi 10.1007/Bf02907927 (1978).
6. Muhs A. et al. Virulence inhibitors from Brazilian Peppertree block quorum sensing and abate dermonecrosis in skin infection models. Scientific Reports 7, 42275, doi:10.1038/srep42275 http://www.nature.com/articles/srep42275#supplementary-information (2017).