BIZCOMMUNITY

The anti-inflammatory properties of Madagascar's Tsontso plant

By Tianarilalaina Tantely, Andriamampianina

21 Nov 2019

In rural areas of Madagascar, medicinal plants are widely used to treat illness. In remote areas, and with limited funds to pay for other health products and services, traditional medicine is essential.

Cladogelonium madagascariense, more commonly known as *tsontso* in Madagascar. Tianarilalaina Tantely, Andriamampianina

Madagascar has a wealth of flora, the source of a vast range of traditional medical treatments. These plants grow throughout the island, making them widely accessible.

However, while traditional medicine is relatively well established in rural areas, it is less so in urban centres. This is despite the numerous studies that show the efficacy of plants and the World Health Organisation's global strategy confirming that traditional medicine can enhance people's health and well-being.

As part of this effort to promote medicinal plants, we began research into a native Malagasy plant: *Cladogelonium madagascariense*, commonly known as "*tsontso*. We wanted to find out the therapeutic value of the plant and to establish whether it was safe and effective for people to use.

Madagascar's tsontso plant

Tsontso was first identified in a survey conducted in northern Madagascar in 1968. Villagers used it to treat fevers, pain and swelling. Given these traditional uses, it was hypothesised that the plant may have anti-inflammatory properties, and this became the starting premise for our study.

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We found and isolated a molecule called D:B-friedo-olean-5-en-3α-ol (DBFO).
After several laboratory tests, it appeared that DBFO was more effective than some drugs currently available on the market used to treat symptoms of inflammation, such as Phenylbutazone and Aspirin

We also made a major discovery about the plant: it is devoid of side effects on the stomach, as commonly seen in most anti-inflammatory drugs.

No side effects

All pharmacological studies have to include a toxicity assessment. So we carried out two series of tests on DBFO.

The first one is known as an acute toxicity test. DBFO was administered at 60 times a normal effective dose on mice. The results showed that it wasn't fatal.

The second one, called the chronic toxicity test, revealed that DBFO does not cause gastric ulcers, even at 15 times the normal dose on mice.

This was an important finding as a large number of anti-inflammatory drugs on the market cause gastric ulcers.

We then wanted to know exactly how DBFO works and relieves inflammation.

By definition, inflammation is an organism's defence mechanism against something that has harmed it. It is characterised by four symptoms: redness, heat, swelling and pain.

Redness and heat are caused when blood vessels dilate and there's an increased blood flow to the site of the inflamation. Because they dilate, blood vessels become more permeable and water and plasma can get into tissues. This collection of fluid in tissues cause the swelling (or edema) surrounding the infected area. The swelling in turn compresses nerves, leading to pain.

White blood cells, which are part of the body's immune system helping to fight infection and other diseases, get engaged around the infected area to combat pathogens – anything that might cause disease. They release substances, among them is TNF-α – tumour necrosis factor. Once released, TNF-α will "recruit" other defence cells in the organism. If the pathogen persists, more TNF-α are released, while continuing to bring in other defence components. This aggravates the inflammation.

Knowledge of the mechanisms of inflammation enables us to directly target the agents involved in the body's inflammatory response. Since TNF-α plays such an essential role, it is an ideal target for anti-inflammatory substances. The results of tests carried out on human white blood cells demonstrated that the DBFO found in *tsontso* reduces the concentration of TNF-α.

In other words, DBFO stops inflammation by inhibiting or stopping the production process of TNF-α.

While these results are very satisfying, our research on *Cladogelonium madagascariense* does not stop there. There is much left to discover, in particular the likely effect of DBFO on immune system substances other than TNF-α, the possible

presence of pure molecules other than DBFO in the plant and their respective mechanisms.

The fact remains that the journey from plant to drug is long. In the meantime, tsontso is available as a decoction called “tambavy” in Madagascar. It is often served in small, overflowing glasses. Here’s to your health!

Translated from the French by Alice Heathwood for Fast ForWord.

ABOUT THE AUTHOR

Tianarilalaina Tantely, Andriamampianina, Enseignant-chercheur en pharmacologie, *Université d'Antananarivo*