

# Artemisinin: fighting coronavirus with this antimalarial drug is risky

July 14 2020, by Tabitha Mwangi

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Since the beginning of the pandemic, much work has been done to test whether antimalarial drugs can treat COVID-19. Hydroxychloroquine, the most well known, has been found to be [ineffective](#). But in Africa, another drug has been attracting attention: artemisinin.

Obtained from the sweet wormwood plant, *Artemisia annua*, artemisinin was first discovered in the 1970s. It's now commonly used worldwide for

treating [malaria](#).

In response to the pandemic, Madagascar's Institute of Applied Research has produced an artemisia-containing tonic that supposedly prevents and treats COVID-19. It was [launched](#) by the country's president, Andry Rajoelina, in early May. The tonic is being provided free to schoolchildren and wider society in Madagascar. It's been reported that other African countries are also [buying up](#) thousands of doses.

So far, it's not clear whether the drug is effective in preventing or treating COVID-19, despite widespread use of the tonic. This is itself concerning, but there's also another fear: that widespread use of the drug could end up making malaria parasites more resistant to it.

## **Hunting for a treatment**

Both artemisinin and its derivative artesunate [have the potential](#) to stop viruses reproducing, including human cytomegalovirus, herpes simplex virus type 1 and hepatitis C. A [2005 study conducted in China](#) also found that compounds extracted from four herbs, including Artemesia annua, showed moderate antiviral activity in laboratory cells against the original SARS virus, which is [closely related](#) to the current coronavirus.

Therefore, it's not surprising that artemisinin might be considered for treating COVID-19. However, so far there is no evidence that it works.

When Madagascar's tonic was launched, the African Centres for Disease Control and the World Health Organization, not wanting to dismiss it, [were willing to discuss](#) putting the drug through [clinical trials](#) with the Malagasy authorities. To date, nothing has come from these discussions. Worryingly, the untested treatment hasn't stopped COVID-19 [overwhelming Madagascan hospitals](#).

However, [a small study of artesunate in Madagascar](#) has been logged on the Pan African Clinical Trials Registry. This study will test the use of injectable artesunate to treat patients with moderate COVID-19 symptoms. If it's found to work, it would be relatively easy to roll the drug out on the African continent, as artesunate is [already licensed](#) to treat severe malaria.

And at the Max Planck Institute of Colloids and Interfaces in Germany, extracts from *Artemisia annua* plants and artemisinin derivatives are also being tested against the coronavirus in [laboratory cell studies](#). These trials are still underway.

## Is drug resistance a threat?

The fact that there's no published trial data on using artemisinin to treat COVID-19 hasn't stopped [other countries](#) from purchasing the Madagascan tonic. Buyers include [countries](#) with some of the highest malaria burdens in the world. There are fears that increased use of the drug could [drive up](#) antimalarial resistance.

Even before the pandemic, the WHO [had discussed](#) how herbal tonics that include artemisia extracts might lead to drug-resistant malaria if they contained low doses of the active ingredient. It is well known that exposing malaria parasites to weak levels of [antimalarial drugs](#) is one factor that drives resistance.

However, there are other factors that seem to drive resistance too. One is the [genetics](#) of the parasites. Another is the widespread availability of treatments that only contain artemisinin—called "monotherapies"—as resistance is [less likely to occur](#) when different treatments are combined. A third issue is [people not completing courses of treatment](#). These issues are severest [in south-east Asia](#), where resistance to a number of malaria drugs has originated. In the case of artemisinin, resistance was first

reported in [western Cambodia](#), and is now [fully established in south-east Asia](#). But to date, no resistance to artemisinin has been reported in Africa.

Although the chief ingredient in the Madagascan tonic is said to be extracts from *Artemisia annua*, there's no data on how much artemisinin is in it. The use of a tonic containing unknown quantities of the drug, over a large population, certainly raises fears of malaria parasites in Africa developing resistance to it.

However, using injectable artesunate to treat patients with COVID-19 symptoms in a hospital setting—which may one day happen if the [Madagascan clinical trial](#) is successful—is unlikely to generate any issues with drug resistance.

Nevertheless, with malaria posing such a large problem in Africa—it killed over 380,000 people on the continent in 2018—everything should be done to prevent more deaths. This might mean controlling artemisinin more tightly by, for example, [imposing regulations](#) on the use of oral treatments that contain the [drug](#) as their only active ingredient.

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