

# 11

reasons  
why

# MOZZIES

bite you



Words by Jess Fogarty.

**S**itting under an African night sky, hearing the cackle of a distant hyena and the crackling of the fire, and enjoying some quiet chatter with your mates, is a distinct pleasure. But once it's time to hit the sleeping bag, you might find yourself cursing the night as you swat at pterodactyl-size mosquitoes intent on sucking you dry. It's enough to ruin anyone's camping experience!

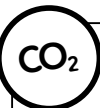
And a mosquito bite can result in more than an itchy bump, as some might have a more adverse reaction; and there are quite a few mosquito-transmitted illnesses to be leery of. Things like West Nile virus, dengue fever, elephantiasis, chikungunya virus, Rift Valley fever, and the more-commonly feared yellow fever and malaria.

The good news is that scientists are beginning to understand why some of us get bitten more than others. An estimated 20 percent of people are especially delicious to mosquitoes, and are bitten more often on a consistent basis. And while scientists don't yet have the complete picture, they do have a number of ideas about why some of us attract mozzies more than others.



## GENETICS

It has been found that human genetic factors account for about 85 percent of the reasons that mosquitoes find some of us more appetising than others.



## CARBON DIOXIDE

One of the key ways mosquitoes locate their targets is by homing in via the carbon dioxide (CO<sub>2</sub>) in your breath. They use an organ called a *maxillary palp* to do this, which can detect CO<sub>2</sub> from as far as 50 metres away. The scent and the amount of CO<sub>2</sub> you exhale is unique to you and your genetic makeup.

People who exhale more of the gas over time are bitten more often. On average, larger people exhale more CO<sub>2</sub>, which is why adults are more likely to be bitten than children.

There are many sources of CO<sub>2</sub> in nature, so it isn't just the carbon dioxide that attracts mosquitoes. Every time we exhale, we release chemicals such as lactic acid, octenol, uric acid and fatty acids which combine with the CO<sub>2</sub> to form our own unique carbon dioxide cocktail. This combination of scents is what tells mosquitoes that there's a human target nearby. And some of these particular combinations are more attractive to mosquitoes than others.



## BLOOD TYPE

A recent study found that mosquitoes landed nearly twice as often on people with Type O blood as those with Type A. People with Type B blood fell somewhere in the middle of this itchy spectrum.

Looking at other genes, they note that about 85 percent of people secrete a chemical signal that indicates which blood type they have – which is like a 'free dinner' advertisement. Mosquitoes also appear to be more attracted to these *secretors* more than *non-secretors* regardless of which type they are – and unfortunately there isn't much you can do to change your attractiveness other than mask your scent. (Sigh)



## EXERCISE AND METABOLISM

In addition to carbon dioxide, mosquitoes find victims at closer range by smelling the lactic acid, uric acid, ammonia and other substances expelled in their sweat, and are also attracted to people with higher body temperatures.

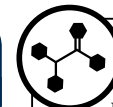
Because strenuous exercise increases the build-up of lactic acid and heat in your body, it makes you stand out. Meanwhile, genetic factors influence the amount of uric acid and other substances naturally emitted by each person, making some people more easily found by mosquitoes than others.



## SKIN BACTERIA

Having skin bacteria doesn't mean that you are unclean. Research has suggested that the particular types and volume of bacteria that occur naturally on human skin affect our attractiveness to mosquitoes. In a 2011 study, scientists found that having a large quantity of only a few types of bacteria made skin more appealing to mosquitoes. This could explain why mosquitoes are especially prone to biting our ankles and feet, as they naturally have more robust bacteria colonies.

Surprisingly, it seems that having large quantities of bacteria of a greater diversity of species seemed to make skin less attractive.



## LACTIC ACID

Lactic acid is emitted through your skin when you're active or eat certain foods. Mosquitoes are more attracted to people with a greater build-up of lactic acid on their skin. You can reduce lactic acid by washing with soap and thoroughly drying after exercising.



## PREGNANCY

In multiple studies, pregnant women have been found to attract approximately twice the number of mosquito bites that non-pregnant women do. This is probably because pregnant women exhale about 21 percent more carbon dioxide, and also because their body temperature is higher, on average, by 0.7°.



## HEALTH

Mosquitoes seem to be attracted to *unhealthy* people more than to a healthy target. A smoker is seen to have *sick blood* – basically meaning that it's easier for the mosquito to thin, and suck up, a smoker's blood. Similarly, people with high or low blood pressure, or a disease or illness requiring them to take medication, tend to attract more mosquitoes as it's easier for the mosquitoes to digest their blood.



## BODY ODOUR

What we call body odour – the combination of natural bacterial colonies on our skin and the sweat we generate – creates an irresistible scent for mosquitoes. Unfortunately, particularly so for the malaria-carrying *Anopheles gambiae*.

Washing regularly will reduce body odour, which is a better solution than trying to mask your body odour with smelly lotions, as beauty products such as hairspray, perfume and suntan lotion can also attract mosquitoes.



### CLOTHING COLOUR

Mosquitoes also use sight to locate prey, so wearing colours which stand out in your surroundings could make you easier to find. According to James Day, a medical entomologist at the University of Florida, colours such as black, dark blue or red are not the best colours to wear if you want to avoid being bitten. This was discovered when it was found that mosquitoes are much more attracted to darker foliage in nature.



### BEER

This may break your heart, but apparently a single 350 ml bottle of beer can make you more attractive to these blood-suckers. Previous research led scientists to suspect that this was because drinking increases the amount of ethanol excreted in our sweat, or because it increases the body's temperature. However, neither of these factors was found to correlate with mosquito preference, thus leaving their affinity for drinkers something of a mystery.



### HOPES FOR THE FUTURE

#### CONCLUSION

Scientific experiments show that mosquitoes do not react when there is only one of the mentioned sources present; it is a combination of several things (such as carbon dioxide, lactic acid and octenol) that most attracts mosquitoes.

The Smithsonian National Museum of Natural History in Washington D.C summed up other research recently with this suggestion: Don't have type O blood, don't be a large person, don't exhale, don't exercise, don't get hot, don't be pregnant, don't drink even one beer, don't have parents who were bitten a lot by mosquitoes when they were your age, and don't wear bright clothing or otherwise call attention to yourself. Slightly impossible, yes, but The American Mosquito Control Association says that you should avoid Limburger cheese and perfume – a slightly more achievable goal. ■

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