Mosquitoes are literally wired for hunting. These predators are equipped with a special sense known as Electroreception which allows them to home in on their prey with precise accuracy. Other members of the Mosquito family also share this trait but the Common Mosquitoes Electroreception (Electroreceptive animals use this sense to locate objects around them) are the extremely finely tuned. Electroreception is used in electrolocation (detecting objects) and for electrocommunication.

Electroreception simply means the ability to detect Electrical or Magnetic currents. What does electricity have to do with Mosquitoes? Any muscular movement or twitches in living animals create a small electrical current. At hospitals, electrocardiogram machines track the electricity resulting from our heart beat. Bees for example, collect a positive static charge while flying through the air (see Atmospheric electricity). When a bee visits a flower, the charge deposited on the flower takes a while to leak away into the ground. Bees can detect both the presence and the pattern of electric fields on flowers, and use this information to know if a flower has been recently visited by another bee and is therefore likely to have a reduced concentration of pollen. The mechanism of electric field reception in animals living in the air like bees is based on mechno-reception, not electroreception. Bees receive the electric field changes via the Johnston's organs in their antennae and possibly other mechano-receptors. They distinguish different temporal patterns and learn them. During the waggle dance, Honeybees appear to use the electric field emanating from the dancing bee for distance communication.

The presence of the magnet elicited a distinct reaction from Mosquitoes -- they dart away from it. To determine the strength of this repugnant force, we examined the results with several other people who were 'covered' with Mosquitoes from Head to Toe. It appears that the only person in our experimental group that was not being 'Eaten Alive' was Michael Saxon (Field Researcher) who was the only person wearing magnets around his neck and wrist. This is a condition commonly known as 'Tonic Immobility' or a Temporary Paralysis that naturally occurs when Mosquitoes are disrupted before they bite. Sure enough, the magnets repelled the Mosquitoes with surprising results.

Why the intense reaction? The apparent interaction between Atmospheric Static Electricity and Magnetically Charged Magnemax 'Earths-Core' Magnets produces a weak but notable electromagnetic field. When a Mosquito comes close to that field, it seems to disrupt the Mosquitoes Sixth-Sense aka Electroreception. Many species of Mosquitoes have sensory receptors that detect minute changes of electricity in the air. These electrical impulses originate and are carried through Atmospheric Ions.

Open air does not conduct this electricity away from our bodies, but for Mosquitoes it does. Ions are particles that have an electrical charge because they have lost or gained an electron. Static Electricity is easily transported by Humidity. You can compare this to how batteries work. It's set up like an electrochemical cell that separates negative from positively charged ions. When connected by a wire, those
opposite charges attract, meaning the positive and negative particles flow toward each other to pick up or drop off electrons to become stable again.

A similar thing happens in the interaction of living cells. Because Mosquitoes carry a charge different from other insects, the contact creates a weak voltage in the same way as a common household battery. Mosquitoes can sense even the tiniest changes in this electrical current, down to one-billionth of a volt. Compare this with two AA batteries that are connected to each other and extended 1,000 miles (1,600 kilometers) apart. A Mosquito could effectively detect if any of these batteries were to expire.

How can Mosquitoes do that? Mosquitoes bodies regulate this unique internal homing device. The lateral line and electroreception along with Mosquitoes senses, make them incredibly keen hunters. Since two-thirds of a Mosquitoes brain is devoted to sensing heat, its senses can ignite Mosquitoes instinct towards its next meal even in total darkness. It's only when the Mosquito gets about 3 feet (1 meter) away from its target that electroreception kicks in to orient its senses for an accurate attack. During the last few feet before they attack, electroreception takes over their instinctive navigation towards its target.

In experiments testing Mosquitoes electroreception skills, we have confirmed that the Mosquito will indeed make its final feeding decision based on electrical and instinctive impulses. The power of electroreception also explains why Mosquitoes will continue attacking victims even while being rescued by another person or animal. Instead of going for the fresh meat of the rescuer, Mosquitoes will be repeatedly drawn to their previous victims because of the increase of ‘heat’ that is released from secreting blood. The higher the degree of temperature, the greater the intensity of this electrical field around the victim.

Since Mosquitoes can track electrical and heat changes so well, we are also investigating whether electroreception plays a role in their navigation skills. Some theorize that the Earth’s magnetic field may interact with Ionization or Atmospheric Static Electricity in order to form an electrical current that Mosquitoes may follow during its migration.

Research and Data Reference: Field Testing/Wikipedia

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