

# The Aerial Spraying of MALATHION: How Safe is it?

Interview with Jorge R. Mancillas, Ph.D.

*Jorge R. Mancillas, Ph.D. Neurobiologist at the University of California, Los Angeles (formerly affiliated with MRC's Laboratory of Molecular Biology, Cambridge, England, and the Salt Institute) as interviewed by Betsy Russell-Manning, in her publication "Malathion: Toxic Time Bomb"*

**BRM: How does malathion affect the living organism?**

**DR. MANCILLAS:** All cells in the body are in constant communication with one another. This allows all the tissues to act in a coordinated fashion (this is the key point). One of the chemicals most commonly used for cellular communication, especially in the nervous system, is acetylcholine. Some nerve cells release acetylcholine and this leads to excitation of the cells they contact. The cells that respond to acetylcholine, have an enzyme called cholinesterase, which destroys the acetylcholine (to limit the period of excitation). Malathion inhibits cholinesterase, and as a result, the cells that are exposed to acetylcholine, go into a frenzy of activity, (or a period of activity that does not end) leading to damage or leading to abnormal responses or abnormal activity in the nervous system. It affects humans, flies, insects, dogs, rats or any other animals the same way by binding and inactivation cholinesterase. A short way of saying all of this is to say, malathion interferes with cell communication by inhibiting cholinesterase.

**BRM: In other words, malathion affects the entire nervous system.**

**DR. MANCILLAS:** Exactly. Any part of the system where you find acetylcholine, and therefore cholinesterase, that communication will be disrupted by malathion.

In the nervous system of flies, it acts by disrupting the control of their muscles, and kills them. In our bodies, acetylcholine and cholinesterase are found most commonly in nerve cells that control muscles. They are found in the visual system in nerve cells and muscles that control pupil and lens contraction and eye movements; in the nerves and muscles that control respiration; in nerves and muscles that control the digestive system. They are also involved in the control of blood vessel contraction, release of tears and mucous secretion.

So, not surprisingly, when you examine the many well-documented cases in the clinical literature of people that have been accidentally exposed to malathion in the pesticide manufacturing industry or in agriculture, when it is clear that malathion was the causative agent, all of the symptoms documented involve those areas of the body I just mentioned.

The textbook description of the symptoms of malathion poisoning include increased lacrimation, irritated eyes, blurred vision, breathing difficulties, muscle paralysis, vomiting, diarrhea, increased mucous discharge and flu-like symptoms.

It can also affect the central nervous system, leading to headaches, dizziness, weakness, blurry vision, etc. Which of these symptoms will be displayed depend on the amounts of malathion and the mode of exposure. If the dose of malathion is really large, patients can display generalized convulsion, psychological disturbances, coma and death from respiratory or cardiac failure.

**BRM: For example, if I am in El Monte one night (where they are spraying) and then Pasadena the next night (where they are spraying) will the malathion be cumulative — even if it is a low dose?**

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**DR. MANCILLAS:** Yes... let me interject a point before I go into that ... if you are exposed to malathion, the question is how much of it do you get exposed to? Obviously a very small amount can kill a fly, but because our bodies are larger, the relative dose per kilogram of body weight, is much lower. Can malathion harm you? Well, if you are under a barrel and you don't touch it, you don't get exposed to it, and you don't breathe it, it won't harm you.

The critical question is how much malathion are you exposed to? State officials repeatedly bring out the importance of the concept of dosage and claim that the doses applied are very low, too low to cause any harm. The first flaw with their argument is that they are not monitoring what doses people are being exposed to, but at best what amounts are being applied to the ground. But let us examine this question using their own figures. The Environmental Protection Agency (EPA) has established that the No Observable Effect Level, that is, the amount below which no effects are observed, is 0.2 mg per Kg of body weight. Based on that they have established a Provisional Acceptable Daily Intake level of 0.02 mg per Kg of body weight, to account for some uncertainties in the data. Now, if you look at the California Department of Food and Agriculture claims that the amount of malathion sprayed would be at a rate of the position, **which means that it is not spread evenly.** The average coverage per square foot was 1.9 milligrams and the maximum found was 4.9 milligrams. Exposure to 1/3 sq. ft. exceeds the EPA's acceptable intake level and the amount of malathion in 3 1/2 square feet would have observable effects. If you have a child playing in the grass, a sand box, or on a slide, in a park or at his home, or drinking from a public fountain, he can easily be exposed to that amount.

We have also recently learned from scientists working for the California Department of Health Services that the amounts of malathion are closer to 1.9 mg per square foot and that the distribution is not homogeneous, having found areas where the concentration was around 5 mg per square foot. Is it therefore surprising that so many people in the sprayed areas are reporting adverse health effects?

There are a number of independent physicians in Los Angeles who have documented cases of people displaying classical symptoms of malathion poisoning. I am told by Dr. Thrasher that he has documented thousands of calls made to one of the non-governmental malathion hotlines and found that close to 15,000 people reported classical symptoms of malathion poisoning. That is not unreasonable if you consider that over a million people are being exposed, and 15,000 represents between 1-2% of that population.

**BRM: Are there different symptoms for the different ways in which malathion gets into the body?**

**DR. MANCILLAS:** Exactly. It depends on what part of the

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body it goes through, and what amounts the child/adult were exposed to. We get a lot of different symptoms reported. It just depends how much malathion they got on themselves, or if the pets were playing outside and went into the house and jumped up on the table and then you ate something or you got it on your hands because you played around with your pet. It is difficult to know where in the body people got it, but their most commonly reported symptoms have been allergic skin reactions, which is also one of the clinical symptoms, as well as vomiting and diarrhea, nausea, headaches, and blisters on their skin. All of these are clinically documented as a symptom of malathion exposure.

Many people are reporting fever or high temperature. That in the clinical literature is considered less typical. But for some reason we are receiving many reports of these symptoms. I am not sure that this is due to malathion, but

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