

# Are Electromagnetic Waves the Culprit?

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In two communities in Nagano Prefecture an increasing number of citizens are complaining of swollen lymph glands and muscle pain, and at the same time deformities are appearing in plants. The causes have not been clarified, but some people suspect that the electromagnetic waves from mobile phone base stations may be a factor.

Ms. A (40) of Ina City began suffering from headaches, fatigue and eye pain in 2002. Her condition gradually worsened, and when she was at home, while studying for a skills qualification exam, she found herself unable to concentrate, had a hard time remembering, and had attacks of dizziness.

Last year unusual changes she had never seen before in the plants in her garden began to appear.



Captions: Left to right

Shirotsumekusa with a fasciated stem extending from the center of a flower. Another flower blooms at the tip of the extended stem.

Five or six cosmos flowers appeared with the disk flower (the yellow center part) turning petal-like. Photographed in October 2004.

A tulip with one leaf aggrandized. Photographed approximately 300 meters from the DoCoMo Base Station. From left to right, bottom:



Captions: Left to right

Narcissuses with a mixture of split and not split corolla. Approximately 300 meters from the DoCoMo Base Station.

Dandelion with abnormally fat stems and more than one flower on each stem. The B family first observed four years ago, and it has reappeared every year since.

Near the B family, a mutation was observed this spring on butterbur flowers. The stems, fasciated, are stuck together half way down.

At the same time, at the home of Mr. B (44), who lives in the town of Takaou, some 25 kilometers from Ina, the health of family members deteriorated. They experienced unusual symptoms for the first time, things like chronic exhaustion, itching hands and feet, and

a sudden rise in blood pressure to double their normal levels. And many of the dandelions in his garden developed fasciation, an abnormal thickening of the stem.

Besides the strange phenomena seen in plants and the deterioration in peoples' health, these two communities have something else in common. Mobile phone base stations were built in both communities a year before the oddities occurred. A Vodafone base station is located about 200 meters from A's house, and an NTT base station is about 250 meters from B's house.

### *Eyesight deterioration, swelling of lymph glands*

Electromagnetic waves from mobile phones are thought to damage cells and cause diseases like leukemia and brain tumor, but they also seem to cause more commonplace health problems.

According to a survey by the Applied National Science Laboratory in France, more people living near mobile phone base stations have health problems than people not exposed to mobile phone electromagnetic waves. And women suffer particularly from headaches, nausea and poor appetite.

Research by the Dutch Economic Ministry points out that electromagnetic waves from third generation mobile phones (3G) may cause headaches and nausea. When irradiated with electromagnetic waves of the same strength as those of 3G, the number of people who complained of headaches and nausea was considerably greater than those exposed to electromagnetic waves from previous types of mobile phones.

Ms. A, suspecting that the electromagnetic waves from mobile phones might be the cause of the deformed plants and her health problems, conducted a survey of 30 people living within 300 meters of the Vodafone base

station.

The findings revealed that 20 per cent of residents suffered deteriorating eyesight after the mobile phone base station was built. As many as 16 per cent complained of swollen lymph glands in the neck and underarms, and muscle pain. And 13 per cent experienced declines in their ability to think, concentrate and remember. Furthermore, 13 percent reported having noticed unusual phenomena in the flowers and vegetables growing nearby.

1. The high frequency electromagnetic waves in Ms. A and Mr. B's homes measure maximums of between 0.1375 and 0.717 microwatts per square centimeter (a unit that shows the quantity of heat passing through 1 square centimeter). Is this a safe level for an everyday life environment?

Permissible levels for mobile phone electromagnetic waves are set very high in Japan, at 600 and 1000 microwatts per square centimeter (differing with the frequency band).

But the city of Salzburg in Austria has much tougher standards (0.1 microwatts per square centimeter), and in Paris, France a stiff standard has been set of an average over 24 hours of 1.06 microwatts per square centimeter. The prevalence of stone houses in Europe, moreover, means that levels are probably lower indoors there. Some researchers think that levels should be set even lower, such as at 0.00002 microwatts per square centimeter. (Note 1)

Aware of the possibility of damage to health from exposure to even low doses over long periods of time, Ms. A and others put up shield cloth over the windows and wall of their houses on the side of the mobile phone base station to block the electromagnetic waves. She found that her symptoms were clearly lessened in the room with shield cloth and her fatigue and palpitations alleviated. Using a high frequency

measurement instrument, she found the level decreased more than 94 per cent (Note 2)

### *Deformed plants nationwide?*

A TV Asahi program, "Super Morning", reported that fasciation in dandelions was on the rise throughout the country, and that it was thought that seeds might be being produced that were sensitive to chemical substances as a result of increased crossbreeding between Western dandelions and Japanese dandelions. But in Ina and Takaou irregularities are occurring in plants other than dandelions, and there are more species with irregularities every year.



In an organic farm 180 meters from the mobile phonestation, a cucumber was found with a leaf growing out of the fruit.

According to Professor Yamamoto Kotaro, who is studying plant morphology function at Hokkaido University, "there is a gene that suppresses the area of the growth point at the apex of the stem that makes the stem, but when that gene is destroyed the fasciation that thickens the stem occurs." He adds that "a flower is basically a leaf that has evolved, so

that when the gene that transforms a leaf into a flower is destroyed the flower reverts to a leaf. Unusual phenomena like the mutation of a stamen into a petal or of a petal into a calyx can also easily occur."

The influence of agricultural chemicals and other chemical substances and of electromagnetic waves are usually thought to be behind such genetic irregularities. But at the homes in Nagano where the strange modifications in plants and humans are occurring, agricultural chemicals have not been used for nearly ten years, and one family has been raising vegetables the traditional, chemical-free way for fifty-five years.

In nature, sudden abnormalities in plants can occur due to cosmic rays, but in the case of seed-bearing plants such abnormalities are believed to occur at a rate of only 1 in 100,000.

Fasciation and stamens becoming petals are occurring in many of the plants around Ms. A's house, plants like cosmos, daffodils, Dutch clover, bergamots, poppy anemones. Without surveying the whole area, it is not possible to give an accurate estimate of the rate of occurrence of these abnormalities, but they would seem to be occurring at a rate higher than 1 in 100,000.

Also, for example, a maple in Ms. A's yard grew a whole meter last summer. An umbrella pine, a species that normally grows 10 centimeters a year, grew 25 centimeters last year, and as of June this year, had already grown 10 centimeters. And a castor aralia grew 95 centimeters this spring alone.

There is not much research on the relationship between electromagnetic waves and plants, but a study by the University of Michigan of trees located between 50 and 150 meters of a Navy communications antenna that emits ultralow frequency electromagnetic waves revealed that the growth of maples increased by 74 per cent.

One theory is that radiation may cause an increase in the absorption rate of carbon dioxide. Another is that electromagnetic waves hasten plant growth.

The environment in which we live has changed enormously in the last fifty years. Man-made electromagnetic waves have drastically increased as has pollution from chemicals. A combination of these factors may be giving rise to changes in plants and animals, humans included.

#### Notes

1. Ogino Koya. Puroburemu Q&A, abunai keitai denwa [Problem Q&A: dangerous

electromagnetic waves], Ryokufu Shuppan.

2. The high frequency instrument used measures not only mobile phone electromagnetic waves but also electromagnetic waves from TV and radio high frequency bands. It measures the electrical field and converts it into power density

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