

## Determination of Anthraquinone Residues

### 1a

#### *Aloe vera*-treated Tomato Plants

##### Background Information:

Eight tomato plants, divided into two groups of four each, were grown in bedding plots situated by a considerable distance. The initial four plants were tended in the usual fashion with periodic watering and usual agricultural care and served as control plants. The other four plants were treated with an *Aloe vera* preparation consisting of ground whole leaves passed through an exchanger to separate the rind particles from the liquid portions of the leaves. This fraction, in contrast to the usual processing of the leaves, contained the anthraquinone compounds. The prepared aloe preparation was diluted with water at a ratio of 1 part of original aloe juice and 9 parts of water. The liquid material was spread on the ground around the test plants on three occasions during the 4-5 month growth cycle.

##### Observations:

The effects which were observed are as follow:

1. Plants treated with aloe (containing the anthraquinones), in contrast to the control plants without aloe, were free from attacking insects.
2. One tomato plant, without anthraquinone treatment, was attacked by insect pests, and spraying with the 10% aloe liquid caused the attacking pests to completely abandon the leaves.
3. Aloe-treated plants displayed far more luxuriant form than the untreated control plants.
4. The aloe-treated plants produced a crop consisting of 130 tomatoes compared to a yield of 50 fruits in the control plants.
5. The fruit produce by the aloe-treated plants were significantly larger than the fruits produced by the control plants.

##### A Point of Concern:

A concern which surfaced was whether or not the aloe treatment of the plants would contain any significant quantity of anthraquinones; if so, would its presence alter the taste of the tomatoes, and would there be a sufficient quantity to cause laxation. Thus, tomatoes of both groups were obtained and taken to the laboratory. The tomatoes were processed separately. The fruit was placed in a blender and pureed. The resulting liquid was passed through gauze to remove the insoluble fragments. The remaining liquid was centrifuged for 30 minutes at 4,000 rpm to remove any small particulates which remained in the juice.

The supernatants from centrifugation were examined for the major anthraquinones – aloin-A (barbaloin), aloin-B (isobarbaloin), aloe-emodin, and emodin, in triplicate, using the following methodology:

ZONTA F, BOGONI P, MASOTTI P, MICALI G: High performance liquid chromatographic profiles of aloe constituents and determination of aloin in beverages,

with reference to the EEC regulation for flavouring substances. Journal of Chromatography A: 718:99-106, 1995. The permissible limit for aloin in the European Union is 0.10 ppm for all beverages with the exception of beer, where the limit is 50 ppm.

Experimental Data:

<u>Control Tomatoes</u>	<u>Parameters</u>	<u>Aloe-Treated Tomatoes</u>
< 0.10 ppm	Aloin A (barbaloin)	< 0.10 ppm
< 0.10 ppm	Aloin B (isobarbaloin)	< 0.10 ppm
< 0.20 ppm	Aloe-emodin	< 0.20 ppm
< 0.20 ppm	Emodin	< 0.20 ppm

Thus, the levels of the anthraquinones in the tomatoes are below the limit of detection for both the control and aloe-treated groups.

Conclusions:

Aloe-treated tomato plants are more luxuriant, produce greater than 250% more fruits, and fruits of greater size, than the control plants, while at the same time repelling attacking insects in a most salubrious manner.

Both the control and aloe-treated tomatoes are free of any detectible quantities of the four major anthraquinone moieties found in the aloe liquid.



Leaves with Aloe



Leaves without Aloe



Tomato crop yield w/no Aloe

50 small tomatoes

Tomatoe crop yield with Aloe

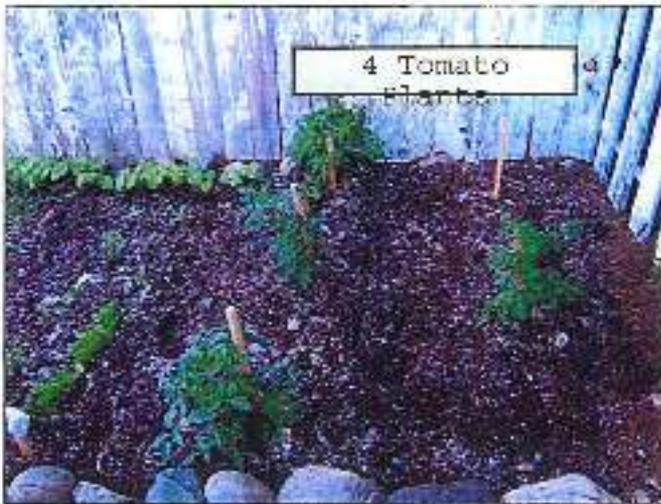
130 tomatoes twice as large in size

The tomato plant top left has been sprayed with Bugaloe and shows no stress from bug attack while the plant top right shows several areas being affected.

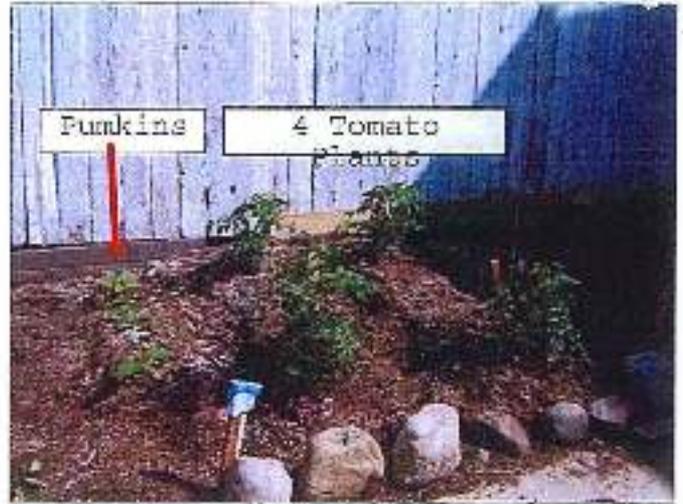
The tomatoes produced showed marked increase in growth when Bugaloe was used as you can see above. The tomato on the left is from the Aloe Tomato plant and the two on the right are typical of other plants without Bugaloe.

Canada uses 110 million pounds of pesticides a year which negatively impacts global environments and health, we don't need to with Bugaloe.

*"Bringing the Invisible to Light"*



Without Aloe June 3rd, 2006



With Aloe June 3rd, 2006



Without Aloe June 27th, 2006



With Aloe June 27th, 2006



Without Aloe August 4th, 2006



With Aloe August 4th, 2006



Without Aloe June 10, 2006



With Aloe June 10, 2006



Without Aloe June 10, 2006



With Aloe June 10, 2006

In the electronic format use the magnification features of the viewer to magnify up to 1600%.

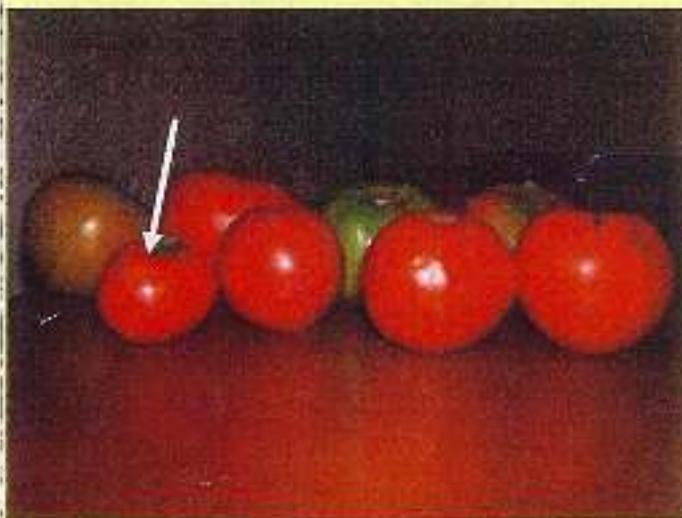
The set of pictures on the left side of the page are tomato plants being attacked by bugs where the right side shows a tomato plant with Coat's Aloe Liquid with Aloin left in it and no bug attack.

Once the tomato plant on the left was being attacked by bugs, the foliage on this one plant was sprayed with Coat's Aloe and the bugs left.

Note the pumpkins on the right side? I fed the pumpkins aloe as well without understanding distances pumpkins grow. In time the pumpkins overwhelmed the aloe fed tomatoes yet the yield for the aloe tomatoes was significantly higher.



The arrows are highlighting the tomatoes which did not have aloe applied. The aloe tomatoes were bigger as a rule and more of them.



The white arrow is highlighting the only tomato which was not fed aloe.



The white arrow is highlighting the only tomato not fed aloe.