

# The Effect of the Herbicide Glufosinate (BASTA) on Astaxanthin Accumulation in the Green Alga *Haematococcus pluvialis*

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The addition of 2.5 mM glufosinate ammonium (BASTA), a well known plant killer, to *Haematococcus pluvialis* culture efficiently inhibits cell growth, blocks the activity of glutamine synthetase (GS) and induces astaxanthin accumulation. Conversely, methionine-S-sulfoximine (MSX), a well known GS inhibitor, had no effect on neither these parameters. When GS activity was tested *in vitro*, MSX inhibited the activity at high concentrations (mM), while glufosinate was effective in the  $\mu\text{M}$  range. We have found that in the presence of glufosinate, ammonia is excreted from the cells. Therefore, we suggest that this process enables *Haematococcus* cells to escape the potentially harmful effect of glufosinate. As a consequence of the inability to assimilate nitrogen, astaxanthin is accumulated. This situation resembles the response of *Haematococcus* cells to nitrogen starvation.

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