

NATURAL PLANT VITALIZER **HB-101**

About HB-101.

HB-101 is a natural plant growth enhancer which increases plant productivity by promoting the plant cell proliferation, activating a mitochondrial enzyme of the plant and increases the number of useful microorganisms in the soil. HB-101 is not fertilizers, agricultural chemicals and hormone preparations. HB-101 is applied as both foliage and soil and is effective on all types of crops and trees, and in most soil conditions. HB-101 is completely non-toxic extract of natural plants and trees and will not harm animals or the environment.



Raw materials of HB-101.

Ceders, Cypressess, Pines and Plantains grass are the raw materials used in the manufacturing of HB-101. Extracts from these plants and trees are refined and blended to produce a highly concentrated formula beneficial to virtually all phases of plant propagation. Ceders, Cypressess and Pines are long-lived trees with powerful deodorizing and bacteria-suppressing power. The saps and secondary metabolites of these trees are responsible for maintain the health and longevity of these trees, repelling harmful invaders and protecting against disease. Plantains grass are known to have medical properties, and have long been used in various human medications.



Physical data of HB-101.

External appearance and so on; Colorless transparent liquid (according to the season of gathering materials, it often happens that a little pale-yellow transparent liquid is extracted.), Specific gravity; 1.000 ~ 1.050, pH; 3.0 ~ 4.5, EC; 0.1 ~ 0.5 ds / m, Solubility; High water solubility, Smell; Sweet smell

Typical analysis of HB-101.

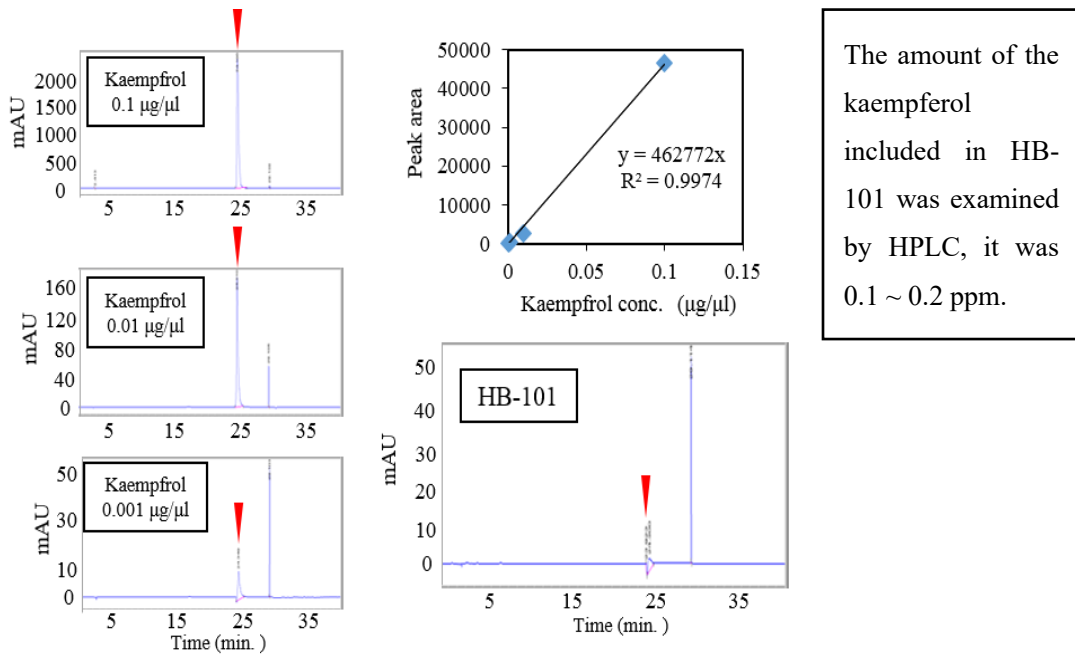
Kaempferol; 0.1 ~ 0.2 ppm

Water-Soluble Nitrogen (as N); 0.001 ~ 0.005 %, Water-Soluble Phosphoric Acid (as P₂O₅); 0.0001

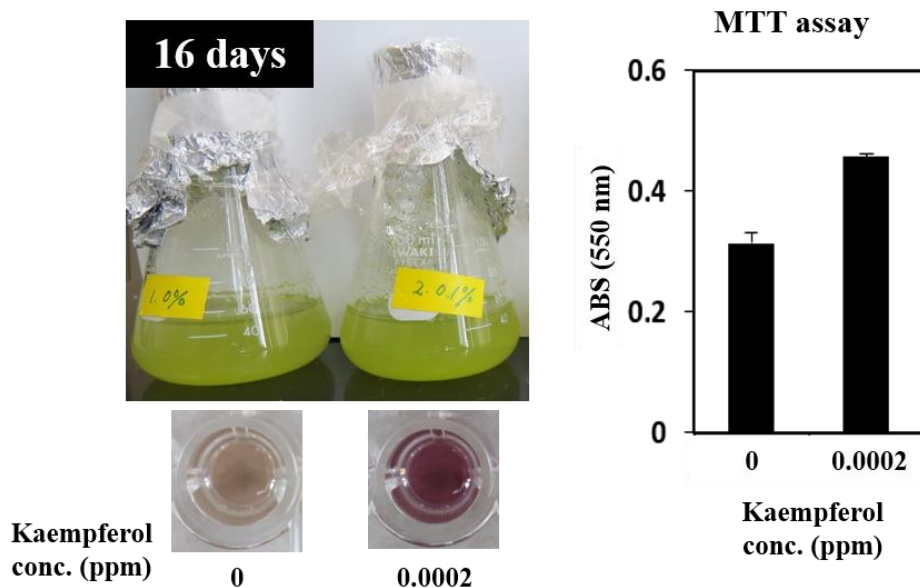
~ 0.0005 %, Water-Soluble Potassium (as K₂O); 0.0001 ~ 0.0005 %, Total Sulfur (as S); 0.0001 ~ 0.001 %, Calcium (Ca); 0.5 ~ 3 ppm, Magnesium (Mg); 0.3 ~ 3 ppm, Iron (Fe); 0.01 ~ 0.05 ppm, Zinc (Zn); 0.01 ~ 0.05 ppm, Silicon (Si); 1 ~ 5 ppm

Effect of HB-101.

- Measurement of density of kaempferol in HB-101.

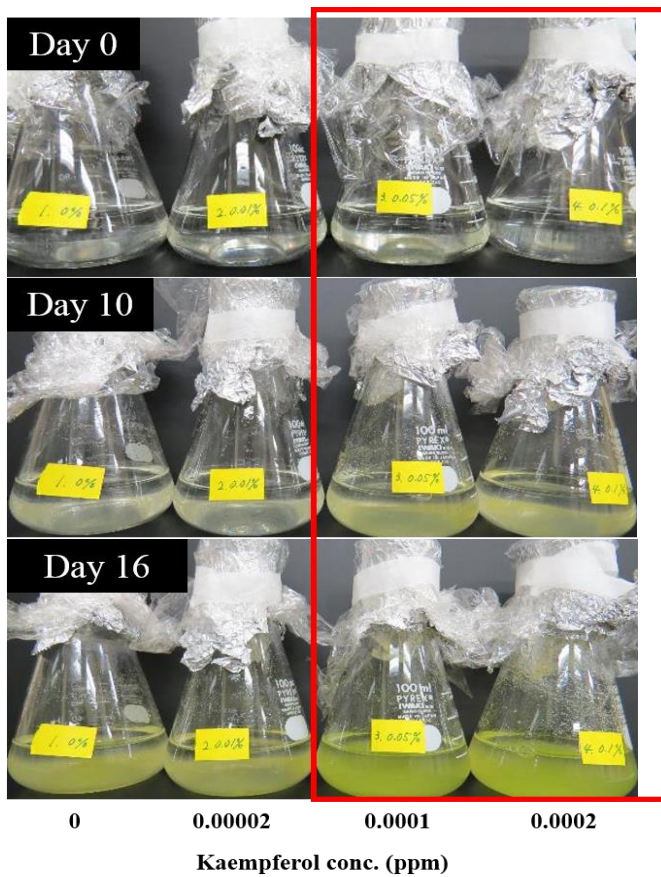


- Activation of mitochondrial enzyme of plant culture cell by kaempferol.



The kaempferol included in HB-101 was purified and it added to the plant culture cell. And the mitochondrial enzyme activity of the cultured cells were measured by MTT assay. As a result, it was suggested that a mitochondrial enzyme was activated.

• **Proliferative effect of kaempferol on plant culture cell.**



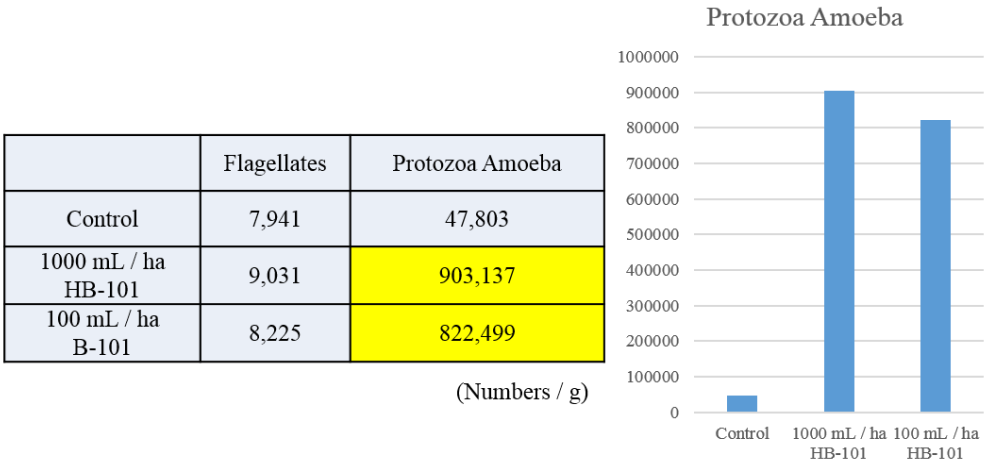
The kaempferol included in HB-101 was purified and it added to the plant culture cell. As a result, the proliferation of the cultured cell was promoted.

• **An increase of plant root biomass by HB-101.**



Arabidopsis thaliana was grown on the medium that contained HB-101 or not. As a result, the biomass of the root of the *Arabidopsis thaliana* grown with the medium including HB-101 has increased.

• **An increase of useful microorganism in soil by HB-101.**



	Nitrogen Cycling Potential (lbs / ac)	Actino Bacteria Biomass (µg / g)
Control	100-150	4.94
1000 mL / ha HB-101	300+	11.2
100 mL / ha HB-101	300+	10.2

The change of the microorganism in the soil was examined adding HB-101. As a result, a remarkable increase of the protozoa amoeba was observed. The protozoa amoeba can supply the nitrogen source that the plant can be used to the soil. Therefore, it is thought that the application of HB-101 to the soil is effective to be able to supply an unused nutrient to the plant.

As mentioned above, HB-101 shows the useful effect in the plant and the soil.

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