stress tolerance, increase photosynthetic rate, and increase disease tolerance. Although the precise mechanism by which plant biostimulants exert their effect on plants, one hypothesis is that they operate by up-regulating or down-regulating plant hormones.

Despite advances in agricultural compositions and methods, there remains a need for compositions and methods that can perform plant biostimulation, i.e., improving plant growth responses and development, while reducing the use of chemical fertilizers. Methods and compositions disclosed herein may address these needs and others.

SUMMARY

In accordance with the disclosure herein, as embodied and broadly described herein, the disclosurerelates to compositions and methods for plant biostimulation. Also disclosed herein are compositions comprising a cell-free supernatant of a microbial culture comprising a mixture of microorganisms, which may comprise one or more of bacteria, fungi, algae, and/or microorganisms. Methods of the present disclosure comprise using compositions disclosed herein to enhance the growth of plants.

In a first aspect of the present disclosure, there is provided a composition comprising a cell-free supernatant of a microbial culture inoculated with an isolated mixed microbial composition consisting of isolated microorganisms of either ΓN-M1, ATCC Patent Deposit Designation No. PTA- 12383, or ΓN-M2, ATCC Patent Deposit Designation No. PTA-121556.

In a second aspect of the present disclosure, there is provided a composition comprising an agronomically acceptable carrier and an effective amount of the cell-free supernatant composition of the first aspect.

In a third aspect of the present disclosure, there is provided a method of enhancing plant growth comprising providing a cell-free supernatant composition of the first aspect or a composition of the second aspect to a seed, to a plant, or to a

plant at a particular growth stage, or combinations thereof, thereby enhancing plant growth.

In a fourth aspect of the present disclosure, there is provided a method for preparing a cell-free supernatant composition comprising the steps of:

(a) inoculating a fermentation broth an isolated mixed microbial composition consisting of isolated microorganisms of either ΓN-M1, ATCC Patent Deposit Designation No. PTA-12383, or ΓN-M2, ATCC Patent Deposit Designation No. PTA-121556;

(b) incubating the inoculated fermentation broth; and

(c) removing essentially all microbes from the inoculated fermentation broth; thereby providing the cell-free supernatant.

In a fifth aspect of the present disclosure, there is provided a cell-free supernatant composition prepared by the method of the fourth aspect.

Disclosed are compositions comprising a cell-free supernatant of a microbial culture inoculated with an isolated microorganism, wherein the microorganism comprises one or more of *Aspergillus* spp., *Bacillus* spp., *Rhodopseudomonas* spp., *Candida* spp., *Lactobacillus* spp., *Lactococcus* spp., *Pseudomonas* spp., *Saccharomyces* spp., or *Streptococcus* spp.; or combinations thereof.

Also disclosed are methods of enhancing plant growth comprising providing the disclosed cell-free supernatant composition to a seed, to a plant, or to a plant at a particular growth stage, or combinations thereof, thereby enhancing plant growth. Growth is enhanced when a plant treated with a composition disclosed herein has