CLAIMS:

1. A method for automated indoor vertical cultivation of plants, the method comprising:

- supplying seeds, plant cuttings, or plant tissue culture, to an indoor vertical cultivation system for cultivation of plants, the indoor vertical cultivation system comprising at least one cultivation rack configured to house multiple habitats, wherein each of the multiple habitats is configured to grow the plants under optimal growth conditions unique to the plant therein;

- operating an electrical power converter module of a power converter, associated with the indoor vertical cultivation system, that is able to adapt to local power voltage and frequency in order to provide electrical power for operating the indoor vertical cultivation system used for measuring, controlling and monitoring the optimal growth conditions in each of the multiple habitats;

- operating a dehumidification module of a dehumidification arrangement, associated with the indoor vertical cultivation system, for producing the water necessary for cultivation as well as used during the harvesting of the plant, wherein the plant is dried prior to harvest; and

- operating a software module, associated with the indoor vertical cultivation system, for measuring, controlling and monitoring the optimal growth conditions in each of the multiple habitats that is capable of continual learning and improvement,

wherein the software module is configured to operate a water supply arrangement, a root chamber environment modulation arrangement, a light supply arrangement, an air conditioning arrangement, and an air sanitization arrangement, operatively coupled to each of the multiple habitats, to provide optimized deionized water with pH, electrical conductivity and optimal nutrients, optimal light intensity, and optimal air temperature and humidity, and clean air, respectively, thereto,

and wherein the software module is configured to obtain, from a database, and use a data associated with the plant in each of the multiple habitats, wherein the data corresponds to at least one of: a name, a growth condition,a unique tag number, and a harvesting schedule of the plant,

and wherein each of the multiple habitats are on a different harvest schedule,

and wherein the multiple habitats are configured in a way that provides a power converter to each habitat by enabling the connection to different powervoltage, phase, and frequency~~,~~

and wherein the root chamber environment modulation arrangement is synchronized with the software module for modulating temperature conditions in each of the multiple habitats for development of roots of the plant,

and wherein the root chamber environment modulation arrangement is further configured to modulate the water supply arrangement to spray water comprising nutrients onto the roots of the plant in the root chamber of the multiple habitats, based on the data obtained by the software module from the database.

2. ~~A~~The method according to claim 1, wherein the at least one cultivation rackis a movable rack.

3. ~~A~~The method according to claim 1 or claim 2, wherein each of the multiple habitats are hermetically sealed chambers and are stacked on the at least one cultivation rack in at least one of: a vertical orientation, a horizontal orientation, a diagonal orientation, and a random orientation.

4. ~~A~~The method according to any one of claims 1 to 3, wherein the optimal growth conditions are selected from at least one of: temperature, humidity, air quality, light, nutrients, water circulation, water vapour size, pH, biological oxygen demand, total dissolved solids, carbon dioxide level, and electrical conductivity.

5. ~~A~~The method according to any one of claims 1 to 4, wherein the nutrients are selected from a set of macronutrients and micronutrients, and wherein the set of macronutrients and micronutrients are unique for a given plant.

6. ~~A~~The method according to any one of claims 1 to 5, wherein the software module is further configured for

- measuring, by using a sensor arrangement, a set of growth conditions within each of the multiple habitats of the indoor vertical cultivation system;

- controlling, by using a controller arrangement, at least one growth condition from the set of growth conditions to achieve the optimal growth conditions in each of the multiple habitats for growing the plant; and

- monitoring, by using a camera arrangement, the growth of the plant during the entire life cycle from a vegetative phase of the plant through a harvesting phase of the plant in each of the multiple habitats.

7. ~~A~~The method according to any one of claims 1 to 6, wherein the software module is further configured for operating the controller arrangement for communicating with

- the water supply arrangement, for supplying water supply;

- the dehumidification system, operatively coupled to the water supply arrangement, for supplying clean deionized water, via the water supply arrangement, to each of the multiple habitats;

- a nutrient supply arrangement, operatively coupled to the water supply arrangement, for supplying nutrients with the water supply;

- the air conditioning arrangement, corresponding to each of the multiple habitats, for providing an optimal heating and cooling conditions for growing plants; and

- the light supply arrangement, corresponding to each of the multiple habitats, for providing an optimal light for growing plants;

- the air sanitization arrangement, corresponding to each of the multiple habitats, for providing clean air conditions for growing plants;

- a carbon dioxide arrangement, corresponding to each of the multiple habitats, for providing an optimal supply of carbon dioxide for growing plants; and

- a power source arrangement, corresponding to each of the multiple habitats, for providing a power converter to each habitat by enabling the connection to different power voltage, phase, and frequency.

8. ~~A~~The method according to any one of claims 1 to 7, wherein the sensor arrangement comprises at least one of: a gas concentration sensor, a temperature sensor, a humidity sensor, a total dissolved solids sensor, a water particle size sensor, a water temperature sensor, a pH senor, an electrical conductivity sensor, a light sensor and a plant colour sensor.

9. ~~A~~The method according to any one of claims 1 to 8, wherein the air sanitization arrangement employs a series of filters and an ultraviolet germicidal irradiation designed to trap and destroy virus, bacteria, mold, pest and other contaminants to a 99.99% success ratio.

10. The~~A~~ method according to claim 9, wherein the ultraviolet germicidal irradiation is generated from at least one of: a UV bulb and a biocidal film reflective panel.

11. ~~A~~The method according to any one of claims 1 to 10, wherein the dehumidification system is operatively coupled to the water supply arrangement, and wherein the dehumidification system collects moisture from the air, stores and delivers the captured clean deionized water, via the water supply arrangement, to each of the multiple habitats.

12. ~~A~~The method according to any one of claims 1 to 11, wherein the software module comprises standard operating procedures and process flows associated with the plants.

13. ~~A~~The method according to any one of claims 1 to 12, wherein the software module is trained using artificial intelligence tools.

14. ~~A~~The method according to any one of claims 1 to 13, wherein the software module provides a secure communication between the indoor vertical cultivation system and associated components therewith, and wherein providing secure communication comprises receiving access authorization information from a secure cloud-based server, and allowing access to the software module only for software components identified by the access authorization information.

15. An indoor vertical cultivation system for cultivation of plants, the indoor vertical cultivation system comprising:

- at least one cultivation rack configured to house multiple habitats, wherein each of the multiple habitats is configured to grow the plants under optimal growth conditions unique to the plant therein;

- a harvesting arrangement configured to harvest the plant having an optimal growth;

- a power converter, associated with the indoor vertical cultivation system, that is able to adapt to local power voltage and frequency in order to provide electrical power for operating the indoor vertical cultivation system used for measuring, controlling and monitoring the optimal growth conditions in each of the multiple habitats;

- a dehumidification arrangement, associated with the indoor vertical cultivation system, for producing the water necessary for cultivation as well as used during the harvesting of the plant, wherein the plant is dried prior to harvest; and

- a software module, associated with the indoor vertical cultivation system, for measuring, controlling and monitoring growth conditions in each of the multiple habitats that is capable of continual learning and improvement,

wherein the software module is configured to operate a water supply arrangement, a root chamber environment modulation arrangement, a light supply arrangement, an air conditioning arrangement and an air sanitization arrangement, operatively coupled to each of the multiple habitats, to provide optimized deionized water with pH, electrical conductivity and optimal nutrients, optimal light intensity, and optimal air temperature, humidity and clean air, respectively, thereto,

and wherein the software module is configured to obtain, from a database, and use a data associated with the plant in each of the multiple habitats, wherein the data corresponds to at least one of: a name, a growth condition,a unique tag number, and a harvesting schedule of the plant,

and wherein each of the multiple habitats are on a different harvest schedule,

and wherein the multiple habitats are configured in a way that provides a power converter to each habitat by enabling the connection to different powervoltage, phase, and frequency,

and wherein the root chamber environment modulation arrangement is synchronized with the software module for modulating temperature conditions in each of the multiple habitats for development of roots of the plant,

and wherein the root chamber environment modulation arrangement is further configured to modulate the water supply arrangement to spray water comprising nutrients onto the roots of the plant in the root chamber of the multiple habitats, based on the data obtained by the software module from the database.

16. ~~An~~The indoor vertical cultivation system according to claim 15, wherein the at least one cultivation rack is a movable rack.

17. ~~An~~The indoor vertical cultivation system according to claim 15 or claim 16, wherein each of the multiple habitats are hermetically sealed chambers and are stacked on the at least one cultivation rack in at least one of: a vertical

orientation, a horizontal orientation, a diagonal orientation, and a random orientation.

18. ~~An~~The indoor vertical cultivation system according to claim 15 or claim 17, further comprising

- a sensor arrangement for measuring a set of growth conditions within each of the multiple habitats of the indoor vertical cultivation system;

- a controller arrangement for controlling at least one growth condition from the set of growth conditions to achieve the optimal growth conditions in each of the multiple habitats for growing the plant;

- a camera arrangement for monitoring the growth of the plant during the entire life cycle from a vegetative phase of the plant through a harvesting phase of the plant in each of the multiple habitats;

- the water supply arrangement, for supplying water supply;

- the dehumidification system, operatively coupled to the water supply arrangement, for supplying clean deionized water, via the water supply arrangement, to each of the multiple habitats;

- a nutrient supply arrangement, operatively coupled to the water supply arrangement, for supplying nutrients with the water supply;

- the air conditioning arrangement, corresponding to each of the multiple habitats, for providing an optimal heating and cooling conditions for growing plants; and

- the light supply arrangement, corresponding to each of the multiple habitats, for providing an optimal light for growing plants.

- the air sanitization arrangement, corresponding to each of the multiple habitats, for providing clean air conditions for growing plants;

- a carbon dioxide arrangement, corresponding to each of the multiple habitats, for providing an optimal supply of carbon dioxide for growing plants; and

- a power source arrangement, corresponding to each of the multiple habitats, for providing a power converter to each habitat by enabling the connection to different power voltage, phase, and frequency.

19. ~~An~~The indoor vertical cultivation system according to any one of claims 15 to 18, wherein the sensor arrangement comprises at least one of: a gas concentration sensor, a temperature sensor, a humidity sensor, a total dissolved solids sensor, a water particle size sensor, a water temperature sensor, a pH senor, an electrical conductivity sensor, a light sensor and a plant colour sensor.

20. ~~An~~The indoor vertical cultivation system according to any one of claims 15 to 19, wherein the air sanitization arrangement employs a series of filters andat least one of: a UV bulb and a biocidal film reflective panel to generate an ultraviolet germicidal irradiation designed to trap and destroy virus, bacteria, mold, pest and other contaminants to a 99.99% success ratio.

21. ~~An~~The indoor vertical cultivation system according to any one of claims 15 to 20, wherein the dehumidification system is operatively coupled to the watersupply arrangement, and wherein the dehumidification system collects moisture from the air, stores and delivers the captured clean deionized water, via the water supply arrangement, to each of the multiple habitats.

22. A computer program product comprising a non-transitory computer-readable storage medium having computer-readable instructions stored thereon, the computer-readable instructions being executable by a computerized device comprising processing hardware to execute a method of any one of claims 1 to 14.

~~23. A computer program product that employs artificial intelligence to continually optimize the method of any one of claims 1 to 14 to reduce water, power and cycle time while increasing yield weight, improving crispness, flavour and/or shelf life through the measurement, collection, management, analysis, and correlation of the data collected during the run of previous methods.~~