CLAIMS

1. A smart insect collection device comprising:

a trapping device provided with a lure to attract insects into the trapping device;

a sensing device having a through opening provided in fluid connection with the trapping device, the sensing device comprising:

an optical source configured to emit an optical beam;

a first lens group configured to collimate the optical beam to form a beam width between 10-120mm and a beam height within 5 to 10 times a size of a target insect;

a second lens group configured to collect the optical beam from the first lens group and arranged apart from the first lens group defining a sensing zone within the through opening;

an optical detector configured to receive the beam from the second lens group and translate the beam to electrical signals;

a processing unit configured to switch on the optical source and receive the electrical signals from the optical detector; and

a collecting module comprising:

a selection plate having at least one through hole wherein each through hole is configured to engage an opening of a collection container for collection of insects therein, the sensing device provided between the trapping device and the selection plate, the selection plate movable between a plurality of positions including at least one non-collecting position where no collection container is in fluid communication with the through opening of the sensing device and at least one collecting position where the through opening of the sensing device is in fluid communication with a collection container; and

a controller in communication with the processing unit and with a motor provided to move the selection plate between the at least one non-collecting position and the at least one collecting position, the controller programmable to activate the motor to move the selection plate to the at least one collecting position in response to the processing unit identifying an insect passing through the through opening to be an insect of a predetermined kind for collection.

2. The smart insect collection device according to claim 1, wherein the electrical signals from the processing unit are used to identify at least one of: a type, a species, a

subspecies, and a sex of the insect in order to determine if the insect passing through the sensing device is an insect of a predetermined kind for collection.

3. The smart insect collection device according to claim 1 or claim 2, wherein the selection plate comprises a plurality of through holes and is selectably movable to any one of a corresponding plurality of collecting positions according to identification by the processing unit of at least one of: a predetermined type, a predetermined species, a predetermined subspecies and a predetermined sex of the insect.

4. The smart insect collection device according to any one of the preceding claims, wherein the controller is further programmable to activate the motor to move the selection plate between the plurality of positions in accordance with a predetermined schedule.

5. The smart insect collection device according to any one of the preceding claims, further comprising a capacity sensor provided to detect a volume of insects collected in the collection container.

6. The smart insect collection device according to claim 5, wherein the controller is further programmable to activate the motor to move the selection plate from a first collecting position to a second collecting position upon the capacity sensor detecting that a volume of insects in the collection container at the first collecting position has reached a predetermined level.

7. The smart insect collection device according to any one of the preceding claims, wherein the trapping device comprises a CDC miniature light-trap.

8. The smart insect collection device according to any one of the preceding claims, further comprising a plurality of legs for positioning the smart insect collection device at an elevated height.

9. The smart insect collection device according to any one of the preceding claims, wherein the collection module comprises a funnel provided between the sensing device and the selection plate.

10. The smart insect collection device according to any one of the preceding claims, further comprising a fan provided in the trapping device to drive insects in the trapping device towards the sensing device.

11. The smart insect collection device according to any one of claims 1 to 9, further comprising a fan provided at a bottom of each collection container to draw insects in the through opening of the sensing device towards the collection container when the collection container is in fluid communication with the through opening.

12. The smart insect collection device according to any one of the preceding claims, wherein the processing unit comprises memory for storing instructions to activate the motor for moving the selection plate.

13. The smart insect collection device according to any one of the preceding claims, further comprising a support plate provided between the sensing device and the selection plate, the support plate having a through hole in fluid communication with the through opening of the sensing device, wherein the sensing device and the controller are supported on an upper surface of the support plate, and wherein the selection plate is movably attached to a lower surface of the support plate.