Claims

What is claimed is:

1. An apparatus for rearing aquatic arthropod larvae, comprising:

a container comprising a porous barrier which partitions the container into a first chamber and a second chamber, wherein:

the second chamber comprises a drain outlet; and

the porous barrier is capable of preventing the larvae from exiting the first chamber into the second chamber while permitting at least the passage of water between the chambers, when water is supplied to the first chamber and drained from the container via the drain outlet of the second chamber,

wherein the porous barrier has an average aperture diameter ranging from about 100 µm to about 1,000 µm, or from about 123 µm to about 152 µm; and wherein the apparatus is further configured to mass rear the aquatic arthropod larvae at a density ranging from about one larva to about 12 larvae per cm^2 of the bottom plate of the container, or at a density of about 10 larvae per cm^2 of the bottom plate of the container, and/or at a density ranging from about 1,500 larvae to about 4,000 larvae per liter of water in the container.

2. The apparatus of claim 1, wherein the drain outlet comprises a valve and/or a pipe sealed or affixed on the drain outlet opening,

optionally wherein the valve is an overflow valve, wherein water passes from the container through the overflow valve after the maximum water level has been attained in the container.

3. The apparatus of claim 1 or 2, wherein the drain outlet is positioned substantially 180° on a horizontal plane to the position where water enters the container.

4. The apparatus of any one of claims 1-3, further comprising a pipe for supplying water to the container, wherein the pipe for supplying water optionally comprises a filter, such as a mechanical filter, a biological filter, a chemical filter, or a combination thereof.

5. The apparatus of claim 4, further comprising a water tank connected, directly or indirectly, to the pipe for supplying water to the container, wherein the water tank stores water supplied to the container,

optionally wherein the water tank is connected, directly or indirectly, to the drain outlet of the second chamber, whereby water drained from the container is recycled and supplied to the container, wherein the water tank is optionally connected to the drain outlet via a filtering device capable of filtering water drained from the container, and wherein the filtering device comprises a filter and a waste outlet for removing waste.

6. The apparatus of any one of claims 1-5, further comprising a sensor for measuring a property of water supplied to and/or drained from the container, such as concentration of oxygen, temperature, pH, conductivity, oxidation-reduction potential (ORP), or concentration of a chemical compound.

7. The apparatus of any one of claims 1-6, further comprising a levelling valve arranged to maintain a minimum level of water in the container, and/or a microcontroller for automating the apparatus.

8. The apparatus of any one of claims 1-7, wherein the porous barrier is removable from the container, and/or permits the passage of feed, waste, and other debris, including waste produced by the larvae.

9. The apparatus of any one of claims 1-8, wherein the porous barrier comprises a mesh, membrane, screen, paper, woven cloth, non-woven cloth, fabric, fiber, foam, sieve, entangled wires, electrospun polymeric fiber, or a combination thereof, and optionally wherein the porous barrier has an average wire diameter ranging from about 1 μm to about 1,000 μm.

10. The apparatus of any one of claims 1-9, which comprises a plurality of the containers, such as 5, 10, 100, 500, 1,000, 5,000, or more of the containers.

11. The apparatus of claim 10, wherein at least some of the plurality of containers are sequentially connected to each other or stacked on top of one another, wherein water passes from the first container in the sequence or stack through intervening container(s) to the last container in the sequence or stack, wherein the first container is connected to or supplied by a

pipe supplying water and the last container is connected to a pipe draining water, and wherein the drained water is recycled to the first container, and/or

wherein at least some of the plurality of containers are connected in parallel to the pipe supplying water and/or the pipe draining water, and wherein the drained water is recycled to the containers.

12. An apparatus for rearing aquatic arthropod larvae, comprising:

(1) a first container comprising a porous barrier which partitions the first container into a first chamber and a second chamber, wherein:

the second chamber comprises a drain outlet; and

the porous barrier is capable of preventing the larvae from exiting the first chamber into the second chamber while permitting at least the passage of water between the chambers, when water is supplied to the first chamber and drained from the first container via the drain outlet of the second chamber; and

(2) a second container constructed substantially similar to the first container, wherein water drained from the first container passes into the first chamber of the second container; and

optionally (3) a rack on which the first and second containers are disposed.

13. A method for rearing aquatic arthropod larvae, comprising using the apparatus of any one of claims 1-12.

14. A method for rearing aquatic arthropod larvae, comprising:

(1) placing larvae or eggs of an aquatic arthropod in a first chamber of a container, wherein the container comprises a porous barrier that separates the first chamber from a second chamber of the container, wherein the second chamber comprise a drain outlet, and the porous barrier is capable of preventing the larvae from exiting the first chamber into the second chamber while permitting at least the passage of water between the chambers; and

(2) supplying water on a continual basis and other suitable conditions in the container for rearing the larvae or eggs in the first chamber, wherein water is drained from the container via the drain outlet of the second chamber; and

(3) mass rearing the aquatic arthropod larvae at a density ranging from about one larva to about 12 larvae per cm^2 of the bottom plate of the container, or at a density of about

10 larvae per cm^2 of the bottom plate of the container, and/or at a density ranging from about 1,500 larvae to about 4,000 larvae per liter of water in the container.

15. The method of claim 14, wherein water is supplied to the container at a flow rate of between about 0.5 L/min and about 5 L/min, or at about 3 L/min.

16. The method of claim 14 or 15, wherein the flow rate of water draining from the container is substantially the same as the flow rate at which water is supplied to the container.

17. The method of any one of claims 14-16, further comprising adjusting the flow rate at which water is supplied to the container, and/or adjusting the flow rate of water draining from the container.

18. The method of any one of claims 14-17, wherein water is supplied to the container at a flow rate that maintains the temperature in the container at about 22±3°C, about 26±2°C, or between about 25°C and 28°C.

19. The apparatus or method of any one of claims 1-18, wherein the aquatic arthropod is a pest.

20. The apparatus or method of any one of claims 1-19, wherein the aquatic arthropod is an insect, optionally a mosquito, such as from the genera *Stegomyia, Aedes, Anopheles, Culex*, or *Toxorhynchites*, wherein the mosquito is optionally selected from the group consisting of *Aedes aegypti, Aedes albopictus, Culex pipiens, Culex quinqufaciatis, Anopheles stephensi, Anopheles albimanus* and *Anopheles gambiae*.