CLAIMS

What is claimed is:

1. A method of temporarily repelling or exterminating mosquitoes in an area of interest, the method comprising:

    generating a primary fog from a fogging fluid that includes an insecticide or an insect repellent;

    exposing the primary fog to an ultrasonic mist in an ultrasonic mister reservoir to thereby generate a secondary fog that contains the insecticide or the insect repellent, wherein the secondary fog has a density that is greater than a density of the primary fog;

    wherein the ultrasonic mister reservoir is configured to retain an aqueous solution and an ultrasonic transducer unit;

    wherein the ultrasonic transducer unit is further configured to maintain a fixed distance between a vibrating surface of a transducer of the ultrasonic transducer unit and a surface of the aqueous solution; and

    directing the secondary fog to the area of interest, wherein the area of interest is at least 25 m^2, wherein the secondary fog distributes over the area of interest to a height of no more than 1 m; and

    wherein the secondary fog is maintained in the area of interest for at least 1 minute, thereby repelling or exterminating the mosquitoes.

2. The method of claim 1, wherein the secondary fog has a persistence of at least 2 minutes, and/or wherein the majority of the secondary fog settles in the area of interest.

3. The method of claim 1, wherein the primary fog is generated using thermal fogging.

4. The method of claim 1, wherein the primary fog comprises propylene glycol, vegetable glycerin or glycerol, and optionally wherein the primary fog further comprises a humectant and/or a detergent.

5. The method of claim 1, wherein the insecticide is an adulticide.

6. The method of claim 1, wherein the insecticide is a natural insecticide selected from the group consisting of a natural pyrethrin, capsaicin, or an essential oil, or wherein the insecticide is a synthetic insecticide selected from the group consisting of an

organophosphate, a synthetic capsaicin, a synthetic pyrethroid, a neonicotinoid, a picardin, a permethrin, an allethrin, a carbamate, and an organochlorine.

7. The method of claim 1, wherein the fixed-distance transducer is coupled to a floating frame that floats on an aqueous medium, and/or wherein the ultrasonic mist comprises size- and/or density-controlled mist particles, and optionally wherein the size and/or density of the mist particles is controlled by a power and/or frequency controller that is operationally coupled to the ultrasound transducer.

8. The method of claim 1, wherein the secondary fog is directed by an exit nozzle, or wherein the secondary fog is directed by a guide channel extending at least 3 m away from a location of the secondary fog, wherein the guide channel has a plurality of openings that allow for partial escape of the secondary fog.

9. The method of claim 1, further comprising a distribution pod coupled to the guide channel and configured to distribute the secondary fog away from the distribution pod.

10. The method of claim 1, wherein the area of interest is a residential area selected from the group consisting of a front yard, a back yard, a bedroom, a waiting room, or a community assembly area, or wherein the area of interest is an agricultural area selected from the group consisting of an orchard, a vineyard, and a berry growing operation.

11. The method of claim 1, wherein the secondary fog is directed to the area of interest for less than 10 minutes, and/or wherein the secondary fog has a temperature that is within 10 °C of ambient temperature.

12. The method of claim 1, wherein the mosquito is *Aedes aegypti*, *Culex spec*., or *Anopheles spec*.

13. The method of claim 1, wherein the primary fog and the secondary fog are produced in a single portable container, and optionally wherein the primary fog and the secondary fog are produced using a portable energy source.

14. An insecticide fogging device, comprising:

    a housing at least partially enclosing a mister, a fogging insecticide reservoir, and an ultrasonic mister reservoir;

wherein the fogging insecticide reservoir is fluidly coupled to the mister, and wherein the mister is configured to generate a primary fog comprising a fogging insecticide and to deliver the primary fog to the ultrasonic mister reservoir;

wherein the ultrasonic mister reservoir is configured to retain an aqueous solution and an ultrasonic transducer unit;

wherein the ultrasonic transducer unit is configured to increase humidity above the aqueous solution and to increase density of the primary fog, thereby generating a secondary fog;

wherein the ultrasonic transducer unit is further configured to maintain a fixed distance between a vibrating surface of a transducer and a surface of the aqueous solution; and

wherein the housing comprises an output port for release of the secondary fog.

15. The fogging device of claim 14, wherein the housing is configured as a portable container, and/or wherein the mister comprises a thermal fogger.

16. The fogging device of claim 14, wherein the ultrasonic mister reservoir has a volume sufficient to (1) retain at least 5 liter of the aqueous solution, and (2) allow for an increase in density between the primary fog and the secondary fog of at least 10%.

17. The fogging device of claim 14, wherein the ultrasonic transducer unit is configured to float in the aqueous solution and contains at least one ultrasonic transducer coupled to the unit such that the ultrasonic transducer maintains a fixed distance from a surface of the aqueous solution.

18. The fogging device of claim 14, further comprising a control unit that is operationally coupled to the mister and/or the ultrasonic transducer, and optionally wherein the control unit is further configured to measure and/or adjust (1) a temperature in the housing, (2) a flow rate of insecticide from the fogging insecticide reservoir to the mister, (3) a rate of misting by the mister, and/or (4) activity of the transducer.

19. The fogging device of claim 29, further comprising an interface configured to allow an operator to provide an input to the control unit, and optionally wherein the interface is configured to allow the operator to specify a desired height of the secondary fog above ground, and/or optionally wherein the interface is configured to allow an operator to specify a desired insecticide concentration of the secondary fog.

20. The fogging device of claim 14, further comprising an elongate guide conduit coupled to the output port, wherein the guide channel optionally has a plurality of openings that allow for partial escape of the secondary fog along a length of the guide channel, and optionally further comprising a distribution pod coupled to the guide channel and configured to distribute the secondary fog away from the distribution pod.