Title

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~~Formulation and~~ Chemical Composition of a High Efficacy Disinfectant against Avian Influenza H5N1 Virus.

Description

This invention relates to the ~~formulation and~~ chemical composition of a fast acting disinfectant cleaner that has a 100% killing efficacy against the highly pathogenic H5N1 Virus by specifically and synergistically blending alcohol with twin-chain quaternary ammonium compound, essential oil, non-ionic surfactant, and solvent.

The use of synergistic combination of twin-chain quaternary ammonium compound, ethyl alcohol or methyl alcohol, non-ionic surfactant, essential oil and water as a fast acting disinfectant cleaner to combat the current high lethality and virulence H5N1 Virus has been an area of considerable research and investigation of the patentee.

The patentee has discovered the ~~formulation and~~ chemical composition of a fast acting disinfectant that has 100% killing efficacy against the virulent H5N1 virus by synergistically formulating and combining twin-chain quaternary ammonium, alcohol, non-ionic surfactant, essential oil, and water.

The invention includes the use of anti-viral agent using Dideycl Methyl Ammonium Chloride, Ethyl Alcohol or Methyl Alcohol as a synergistic anti-viral and antimicrobial agent, Nonyl Phenol or Alcohol Ehtoxylate as the cleaning and emulsifying agent, peppermint essential oil to further enhance the synergistic effect of the anti-viral properties, water as a carrier and to enhance the solubility of above said chemicals <u>at a temperature of 32°C to 35°C.</u>

BACKGROUND OF THE INVENTION

Avian influenza is an infection caused by avian (bird) influenza (flu) viruses. These influenza viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, avian influenza is very contagious among birds and can make some domesticated birds, including chickens, ducks, and turkeys, very sick and kill them.

Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions or with surfaces that are contaminated with secretions or excretions from infected birds. Domesticated birds may become infected with avian influenza virus through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (such as dirt or cages) or materials (such as water or feed) that have been contaminated with the virus.

Usually, “avian influenza virus” refers to influenza A viruses found chiefly in birds, but infections with these viruses can occur in humans. The risk from avian influenza is generally low to most people, because the viruses do not usually infect humans. However, confirmed cases of human infection from several subtypes of avian influenza infection have been reported since 1997. Most cases of avian influenza infection in humans have resulted from contact with infected poultry (e.g., domesticated chicken, ducks, and turkeys) or surfaces contaminated with secretion/excretions from infected birds.

During an outbreak of avian influenza among poultry, there is a possible risk to people who have contact with infected birds or surfaces that have been contaminated with secretions or excretions from infected birds.

Of the human cases associated with the ongoing H5N1 outbreaks in poultry and wild birds in Asia and parts of Europe, the Near East and Africa, more than half of those people reported infected with the virus have died. Most cases have occurred in previously healthy children and young adults and have resulted from direct or close contact with H5N1-infected poultry or H5N1-contaminated surfaces. In general, H5N1 remains a very rare disease in people. The H5N1 virus does not infect humans easily, and if a person is infected, it is very difficult for the virus to spread to another person.

Due to the high lethality and virulence of H5N1 Virus, its endemic presence, its increasingly large host reservoir, and its significant ongoing mutations, the H5N1 virus is the world's largest current pandemic threat. The world is teetering on the edge of a pandemic that could kill a large fraction of the human population.

In view of the above, the patentee has invented a highly effective disinfectant to protect those who are exposed to the pathogenic H5NI virus through direct or direct contact with the said virus.

SUMMARY OF THE INVENTION

The patentee has discovered the ~~formulation and~~ chemical composition of a fast acting disinfectant cleaner that has 100% killing efficacy against H5N1 Virus by synergistically blending alcohol, twin-chain quaternary ammonium compound, essential oil and non-ionic surfactant with water. By first mixing alcohol and solvent in the mixing tank to create an exothermic reaction for the purpose of enhancing the solubility of oil based chemical product in said composition. Second adding quaternary ammonium compound into said chemical composition to increase the anti-viral and anti-microbial properties of said chemical composition at a temperature range of 32°C to 35 °C.
Third adding essential oil to said chemical composition to further enhance the synergistic effect of the anti-viral and anti-microbial properties of said chemical composition at a temperature range of 32°C to 35°C. Fourth adding non-ionic disinfectant to increase the cleaning properties of said chemical composition at a temperature range of 32°C to 35°C.

In an embodiment of the invention, the ethyl alcohol (C_2H_5OH) is used as it is less toxic than methyl alcohol and as a co-disinfectant in the said ~~formulation and~~ chemical composition.

In another embodiment of the invention Didecyl Dimethyl Ammonium Chloride is used as the main disinfecting agent against H5N1 in the said ~~formulation and~~ chemical composition because of its high potency properties against H5N1 virus.

In yet another embodiment of the invention Alcohol Ethoxylate non-ionic surfactant is used as a cleaning agent in said ~~formulation and~~ chemical composition because of its lower toxicity properties than Nonyl Phenol.

In yet another embodiment of the invention the peppermint essential oil used is Mentha Peperita as a synergistic co-disinfectant in the said ~~formulation and~~ chemical composition because of its excellent compatibility with Didecyl Dimethyl Ammonium Chloride and its good residual anti-microbial activity.

In yet another embodiment of the invention water is used a co-carrier of the synergistically blended chemical raw materials. It is also used to create an exothermic reaction with alcohol to enhance the solubility of the essential oil in the said chemical composition.

The foregoing embodiments are susceptible to considerable variation in its practice.

Accordingly, the embodiments are not intended to be limited to the specific exemplifications set forth hereinabove. Rather, the foregoing embodiments are not within the spirit and scope of the appended claims, including the equivalents thereof available as matter of law.

DETAILED DESCRIPTION OF THE DISINFECTANT EFFICACY OF SAID INVENTION.

In accordance with this discovery, it is an object of the invention to provide the test procedures to ascertain the disinfectant efficacy of said invention against Avian Influenza H5N1 Virus.

The method and test procedures are herein described.

1.0 Purpose
The purpose of the test is to ascertain the efficacy of said invention/disinfectant against Avian Influenza H5N1 virus.

1.1 Observation Parameter
The test parameter is based on the observation of the percentage of death virus after the introduction of said invention/disinfectant.

2.0 Test Method
Using Isolated AI H5N1 virus from Tasikmalaya 2005, collected from Microbiology Department of Faculty of Veterinary, Bogor Institute of Agriculture (IPB). The test was done in the unit of the Integrated Services of Medicine of Microbiology, Faculty of Veterinary IPB. Five live egg embryos Specific Pathogen Free (SPF) were used as medium for the test.

2.1 Test Procedure

Three components were used; AI H5N1 Virus, Live Egg Embryos and said disinfectant 100% concentration.
The preparation of the disinfectant solution was done by diluting 1 part of said disinfectant to 1 part distilled water by weight.
Subsequently, 2 ml of AI H5N1 Virus (10^{9} EID_{50}) was introduced in to the said disinfectant solution and then the mixture was incubated for 15 minutes at 37ºC.
0.2 ml of said mixture was then injected into 11 days old live embryo via allantois and kept in the incubator at 37ºC, observation was then carried out daily till the death of embryo.
The liquid of the allantois was taken out for rapid test, HA/HI using AI standard serum.

3.0 Results

Based on observation all the embryos died two days after the introduction of the mixture of said disinfectant and H5NI Virus. The liquid from the allantois of the death embryo was then taken for rapid test HA/HI using AI standard serum. The results as tabulated below:

Table1. The Efficacy Result of said invention/disinfectant against AI H5NI Virus

Concentration	Dilution	Percentage of Inactive Virus AI H5N1 (%)
100	**1:1**	**100**

Based on Table 1, the said invention/disinfectant has the ability to inactivate 100% of AI H5NI virus.

4.0 Conclusion

Based on the said efficacy test, the said invention/disinfectant is highly effective against Avian Influenza H5N1 Virus.

50. Reference

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Claims:

What is claimed is:

1)The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 comprising all of the synergistic following chemicals: Alcohol, Quaternary Ammonium Compound, Essential Oil, Non-Ionic Surfactant and Water, comprising of all the steps a to d sequentially:
a.First mixing alcohol and solvent in the mixing tank to create an exothermic reaction for the purpose of enhancing the solubility of oil based chemical product in said composition.
b,Second adding quaternary ammonium compound into said chemical composition to increase the anti-viral and anti-microbial properties of said chemical composition at a temperature range of 32°C to 35 °C.
c.Third adding essential oil to said chemical composition to further enhance the synergistic effect of the anti-viral and anti-microbial properties of said chemical composition at a temperature range of 32°C to 35°C.
d.Fourth adding non-ionic disinfectant to increase the cleaning properties of said chemical composition at a temperature range of 32°C to 35°C.

2) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 Virus as in claim 1wherein the Alcohol used is either Methyl or Ethyl Alcohol is added to the mixing tank containing solvent at temperature range of 25°C to 30°C., and stir said mixture for 5 to 10 minutes to allow exothermic reaction to take place till the temperature if said mixtures reaches 32°C to 35°C before adding the quaternary ammonium compound, essential oil and non-ionic surfactant.

3) The ~~formulation~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 Virus as in claim 1 wherein the Quaternary Ammonium Compound is a Twin Chain Quaternary Ammonium Compound.

4) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 Virus as in claim 3 wherein the Twin-Chain Quaternary Ammonium Compound consists of Didecyl Dimethyl Ammonium Chloride, as main disinfecting agent against H5N1.

5) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 Virus as in claim 1 wherein the Essential Oil is Peppermint as co-disinfectant

6) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 Virus as in claim 1 wherein the Non Ionic Surfactant used is either Alcohol Ethoxylate or Nonyl Phenol Ethoxylate. as cleaning agent

7) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 as in claim 6 wherein the said surfactants consist of either 9 or 10 moles of ethylene oxide.

8) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 as in claim 7 wherein said surfactant used is Secondary Alcohol Ethoxylates.

9) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 8 wherein the Alcohol Ethoxylate surfactant consists of 10 moles of ethylene oxide.

10) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 9 wherein the content of said surfactant ranges from 0.5 to 5 wt %.

11) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 1 wherein the solvent used is water to create an exothermic reaction with alcohol to enhance the solubility of the essential oil in the said chemical composition.

12) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 11 wherein the water content ranges from 1% to 60 % wt/wt

13) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 2 wherein the alcohol is ethyl alcohol.

14) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 as in claim 13 wherein the composition content of said alcohol ranges from 10 % to 90 % wt/wt.

15) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 4 wherein the composition content of Didecyl Dimetyl Ammonium Chloride ranges from 0.5% to 10% wt/wt.

17) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 5 wherein the botanical name of the peppermint used is Mentha Peperita.

18) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus as in claim 17 wherein the content composition of peppermint ranges from 0.1% to 5 % wt/wt.

19) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 virus wherein the, composition prepared in accordance with claim 1, comprising:

a) 10- 90 wt % of Ethyl Alcohol
b) 0.5- 10 wt % of Quaternary Ammonium Compound
c) 0.1- 5 wt % of Essential Oil
d) 0.5- 5 wt % Non-Ionic Surfactant
e) 1- 60 wt % Solvent

20) The ~~formulation and~~ chemical composition for 100% killing efficacy against highly pathogenic H5N1 wherein the formulation and composition prepared in accordance with claim 19, comprising of:

a) 60 wt % of Ethyl Alcohol

b) 1.5 wt % of Quaternary Ammonium Compound

c) 3 wt% of Essential Oil

d) 3 wt % of Non-Ionic Surfactant

e) 32.5 wt % of solvent