A non-irritating, highly effective antimicrobial formulation synergizing botanical and synthetic components to combat resistant pathogens

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Technology description

Summary

Germ theory and sanitization are widely considered some of the greatest discoveries by man, propelling healthcare into a new age. However, the increasing prevalence of resistant microbes and "superbugs" negates these advances and highlights the need for more effective compounds to fight pathogenic organisms. While alcohol-based sanitizers are a possible solution to resistant organisms, their topical use is accompanied by a disruption of the skin's moisture and pH balance, resulting in dry, cracked skin that is more susceptible to infection. This technology is the combination of botanical extracts, essential oils, and synthetic components that demonstrate synergistic antimicrobial activity. The blend can be further supplemented with alcohols, anti-irritants, anti-inflammatories and other compounds to increase efficacy and reduce irritation of the formulation. This technology has a wide spectrum of applications in the consumer, healthcare, veterinary care and industrial sectors.

A multitude of different formulations demonstrate powerful antimicrobial activity expanding potential applications

Multiple formulations containing components of (a) botanical extracts, (b) essential oils, (c) alkanediol, (d) synthetic antimicrobials such as Biguanides, and/or (e) quaternary ammonium compounds demonstrate antimicrobial/disinfectant activities. The combinations can be further supplemented with solvents, stabilizers, anti-irritants, organic acids and surfactants to enhance an individual formulation. The diverse constituents may facilitate the development of consumer products such as baby care, personal hygiene, lotions, sanitizers, disinfectants, surface wipes, acne and wound therapies, food, beverage and cosmetic preservatives.

Several combinations have been tested in vitro to validate the technology. The botanical blend/ essential oil oral rinse formulation showed increased antimicrobial activity during in vitro experiments

when compared to Listerine or Tom's of Maine products, including activity against Methicillin-resistant S. aureus (MRSA), C. albicans, and S. mutans. A surface disinfectant and hand soap formulation were also developed that exhibit increased antimicrobial activity when compared to individual components.

Application area

Personal and household products, particularly geared toward sensitive persons/environments such as infants, geriatric and nursing homes, pets, and immune-compromised individuals

Natural preservatives for food, beverage and cosmetics

Healthcare products such as surface and hand sanitizers/soaps for hospitals and battlefield wound treatment

Veterinary products

Industrial cleaners and disinfectants

Potential development as lubricants or enemas to combat the spread of sexually transmitted diseases (STDs) as many of the compounds demonstrate antibacterial, anti-fungal, and virucidal activities while remaining non-irritating

Advantages

Increased antimicrobial activity compared to individual components and leading brand name products

Multiple active ingredients substantially decrease the possibility of organisms developing resistance

Non-irritating

Multiple formulations increase the potential utility

Natural or plant-derived ingredients are favorably viewed by the public for personal care items and preservatives

Demonstrates broad-spectrum antimicrobial activity

Institution

Columbia University

Inventors

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