The Science Behind Wipex® Table Bussers™ Wipes
Gil Tansman, M.S., Ph.D. candidate, University of Vermont; email: gil.tansman@uvm.edu

Scientific studies have produced a body of peer-reviewed literature that demonstrates the effectiveness of cinnamon and clove essential oils, propolis, and vinegar as powerful antimicrobial agents. These products are natural, come from familiar sources, and have been used as household remedies for a variety of purposes. For instance, clove and cinnamon essential oils are used for indigestion, skin enhancement, and mood improvement; propolis has been used to soothe sore throats; and vinegar has been used as a simple general purpose household cleaner. Some of these uses have suggested antimicrobial properties, prompting scientists to investigate their potential antimicrobial and bactericidal effectiveness.

Cinnamaldehyde and eugenol are compounds that are naturally present in the essential oils of cinnamon and cloves, respectively. Both compounds are the main components of their respective essential oils and contribute to the characteristic smell of the oils. Propolis is the brown resinous substance produced by honey bees to seal shut their hives, and vinegar is produced through the natural fermentation of alcohol into acetic acid.

Cinnamaldehyde from *cinnamon essential oil* has been proven effective against the bacteria: *Staphylococcus aureus*; *E. coli*; *Enterobacter aerogenes*; *Proteus vulgaris*; *Pseudomonas aeruginosa*; *Vibrio cholerae*; *Vibrio parahaemolyticus*; *Salmonella typhimurium*; *Bacillus subtilis*; *Klebsiella pneumoniae*; *Mycobacterium tuberculosis*; *Campylobacter jejuni*; *Salmonella enterica*; and *Listeria monocytogenes*; as well as various yeasts and molds.

Eugenol from *clove essential oil* has been proven effective against the bacteria: *Escherichia coli*; *Klebsiella pneumoniae*; *Pseudomonas aeruginosa*; *Proteus vulgaris*; *Bacillus subtilis*; *Staphylococcus aureus*; *Mycobacterium tuberculosis*; *Campylobacter jejuni*; *E. coli*; *Listeria monocytogenes*; and *Salmonella enterica*.

*Propolis* has been proven effective against *S. aureus*, *S. epidermidis*, *B. subtilis*, *C. diphtheriae*, *B. catarrhalis*, and *C. albicans*, which represent a diversity of gram negative and gram positive bacteria, as well as a fungal species.

Acetic acid, the primary ingredient of *vinegar*, has been proven effective against foodborne bacterial pathogens including *S. aureus*, *B. subtilis*, *S. typhi*, *E. coli*, *S. enterica*, and *L. monocytogenes*.

Based on the diversity of bacteria against which clove and cinnamon essential oils, as well as propolis and acetic acid (vinegar), have been proven effective, it is evident that these ingredients are powerful broad spectrum antimicrobial agents for both gram positive and gram negative bacteria. The studies further demonstrated the effectiveness of the compounds at low concentrations, making them ideal active ingredients in antimicrobial formulations. As an added benefit, at formulation concentrations, the oils contribute pleasant fragrances that are reminiscent of their parent plant materials. Cinnamon and clove essential oils, propolis, and vinegar can thus work together as active ingredients that are natural and effective antimicrobial agents.

References:
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