

nutmeg newsletter



August 2021

C T S C C S e p t e m b e r C h a p t e r M e e t i n g

Disinfectant Products and Their Role in Breaking the Chain of Infection

**Tuesday,
September 14, 2021**

12:00pm – 1:00pm EST
Webinar – Link will be
provided after registration



Speaker

Callum Couser

R&D Scientist
Reckitt

Registration

Online at www.ctscc.org
SCC Members: \$5
Non-members: \$10

Abstract Disinfectant products have always played a crucial role in helping to prevent community spread of illnesses, but the current Global Pandemic has placed them in the public spotlight like never before. In the age of armchair epidemiologists, what is the science behind the link between these products and public health? We'll examine how these products help keep us safe, and how they are formulated to meet a wide variety of consumer needs.

Speaker Bio Callum is an R&D scientist at Reckitt, a global leader in Health, Hygiene, and Nutrition, where he manages the in-market Lysol Liquids portfolio for the North American market. He works on developing and refining disinfectant and sanitizer formulations, and develops ways to effectively communicate the efficacy and purpose of these products to consumers. He has held various roles in Reckitt's R&D Centers of Excellence in Europe and the US, with his primary expertise being the interaction of consumer products with household appliances; beginning with auto-dish detergents, and most recently, laundry sanitizers.



ALZO International Inc.

Thank you to our September
meeting host!!

Inside this issue:

- Letter from the Chair
- Technical Corner:
Botanical Antiperspirants
- New England SCC Golf Outing
- Upcoming events

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Letter from the Chair

Dear CTSCC Members and Friends,

I hope this letter finds you happy and healthy! This summer has been so nice being able to spend time with friends and family again; I have thoroughly enjoyed my time off in the sun (with ample sunscreen of course). As autumn rolls in, we transition back to school and unfortunately back to socially distancing. The CTSCC will be hosting several events throughout the back half of the year, online if needed or in person if we can, please check our website for updates!

We are so grateful to Valerie George of John Paul Mitchell Systems for presenting virtually in May. As someone who regularly changes the color of my hair, I loved learning about the science behind hair color and hope you all did as well! To continue our fantastic virtual series, we have invited Callum Couser from Reckitt Benckiser to teach us about surface cleansing and disinfecting on Tuesday, September 14th. This will be another lunchtime webinar discussion and should provide great takeaways on how to keep your surfaces clean! Definitely an item that is still top of mind in our world, be sure to save the date.

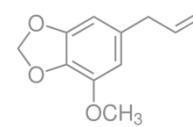
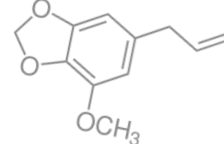
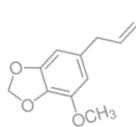
In October, we will be offering an online education seminar rather than our traditional in person event. Although we would love to meet in person, we will be saving that opportunity for November. Please keep an eye on our website for updates! Finally, as always, thank you to the CTSCC board members for continuing to bring valuable education to our members. If you would like to join our group of wonderful volunteers, please reach out anytime, we would love to have you!

Thank you again for all your support,



Jen Macary

2021 Chair, Connecticut Chapter
Society of Cosmetic Chemists



Technical Corner

This article was originally published in the NYSCC
Cosmetiscope Vol. 27 Issue 4



Strategic Development of Botanical Antiperspirants

Authors: Phil Klepak, Barbara Schmidt

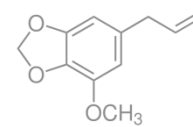
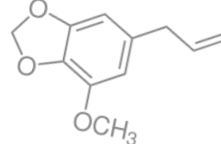
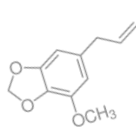
Background

There has been a growing trend over the last several years of using natural products with medicinal activities, particularly in overseas markets. Plant extracts have been identified for the treatment of acne, psoriasis, and dandruff. At present, the FDA has only classified a few botanicals as GRASE for a specific OTC drug use. This article addresses whether some plants contain sufficient bioactive phytochemicals that could function as “natural” antiperspirants when applied from a topical formulation. According to the U.S. FD&C Act, the FDA classifies antiperspirants (reduce underarm perspiration) as OTC drugs, while deodorants are classified as cosmetics. Globally, most countries classify antiperspirants as cosmetics, including those products with duration of effect claims. This is true in the European Union, Australia, New Zealand, South Africa, and Latin America. In Canada, classification depends on the claims, and in Japan they are “quasi-drugs” (the difference vs. a cosmetic is somewhat ambiguous). Only the U.S. and UK have quantitative standards for antiperspirant performance. Therefore, if your product reduces perspiration statistically better than a control, you can label your product an antiperspirant.

Ingredients from Nature Natural products have a range of bioactivities to reduce sweating including astringency to contract skin pores, absorbency, decreased sweat stimulation via the parasympathetic nervous system, and protein aggregation forming sweat pore plugs. Plants have been used for centuries to reduce excessive sweating, but in Traditional Chinese Medicine and Ayurveda, most were taken orally for fever diseases like malaria or perceived systemic health issues. Topical sweat reducers for everyday sweating are uncommon in ethnobotanical literature and even fewer have been tested clinically in controlled trials.

In Traditional Chinese Medicine, Chinese sumac galls, turmeric, schisandra, ephedra root, mulberry leaf, and Amur cork tree bark are applied topically to reduce excessive sweating. All of these herbs can be mixed with minerals or starches to help absorb sweat. Chinese sumac galls contain gallotannins with astringent and protein cross-linking properties that may reduce sweat. The other herbs contain primarily polyphenols (turmeric, schisandra) and/or alkaloids (Amur cork tree bark, mulberry leaf, and ephedra) with little scientific validation aside from polyphenol astringency. Mulberry leaves and ash tree bark (Qin Pi) were tested in a clinical trial for foot sweating. When used as a 15-minute foot soak, they reduced foot sweating by an average of 15% in a pilot study with 20 healthy volunteers. 1 Both herbs have antibacterial properties, which could help reduce foot odor.

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Technical Corner

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A combination of five Ayurvedic herbs (Himalayan cedar, nut grass, jasmine, black turmeric, and vetiver) traditionally used as a topical remedy for foot odor and excessive sweating were tested in a controlled clinical trial. 2 After 15 days, there was a reduction in foot odor, sweating, and itching. The herbs contain a variety of phytochemicals such as essential oils rich in antimicrobial terpenes that may be responsible for the positive results.

In North America, the Navajos used rough cocklebur liniment for underarm sweating. In Europe, traditional antiperspirant formulations include common yarrow (*Achillea millefolium*), soapwort (*Saponaria officinalis*), and elderberry (*Sambucus nigra*) flowers, sage (*Salvia officinalis* and *S. libanotica*), horsetail (*Equisetum arvense*), rockrose (*Cistus ladanifer*), and Milkvetch (*Astragalus* spp.). However, there are no published clinical studies to validate any of these herbs as effective antiperspirants.

Research and Development Challenges of a Natural Antiperspirant Clinical efficacy testing of the final antiperspirant formulation is necessary to support the specific claim of “reduces underarm sweating”. This means that the natural extract should be tested at the level required to demonstrate the intended claim. The performance target can be either a statistically significant sweat reduction compared to a placebo or to meet or exceed the minimum quantitative FDA standard using their statistical standard.

Ingredient screening tests could be helpful prior to conducting an underarm wetness clinical study, namely measuring the electrical conductance/impedance of the skin, TEWL from the skin by detecting changes in relative humidity, or protein aggregation in a microfluidic test system. Some challenges should be recognized and factored into R&D plans. First, our evidence from pilot studies suggests that natural extracts may not be as effective as aluminum-based salts. Since natural extracts are a mixture of compounds, there can be substantial variation depending on the source.

A standardized phytochemical profile may be necessary for quality control. Furthermore, some natural extracts can be difficult to work with. For example, are they prone to contamination or do they present preservation concerns? Formulations containing natural extracts could have a shorter shelf life due to degradation of the active component over time. It may be appropriate to follow the stability of several marker compounds.

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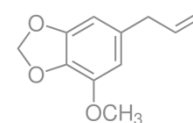
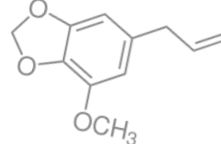
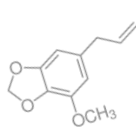
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SEPPIC
Ingredients that inspire



Technical Corner

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Botanical ingredients are available as a liquid extract mixed in solvents like glycerin and glycols or in powder form with or without excipients. Many phytochemicals are easily oxidized, especially at room temperature in the presence of solvents including water and alcohols. We have observed considerable, rapid degradation of phytochemicals in plant extracts when stored in a liquid or cream base. In contrast, we found dry extracts from the same plants retained their phytochemical integrity and clinical antiperspirant efficacy for 18-24 months at room temperature. Also, we have observed a loss of phytochemicals when mixed with certain “inert” excipients, possibly due to irreversible adsorption. One significant hurdle of using dry extracts is difficult dissolution. Experimental trial and error experiments are required to find the optimal solvents, heat, and agitation for dissolution.

Many cosmetic chemists are aware of the unique challenge posed by natural products in cosmetic formulations. High batch temperatures must be avoided to reduce phytochemical degradation. When using waxes that require high melting temperatures, the extracts could be incorporated at the end of the batch, after the temperature has dropped. Even after extracts or pure phytochemicals are fully dissolved and incorporated into the formula, they can precipitate once the batch cools or after a longer period of time. They can cause an emulsion to split over time or lose viscosity. They can react with packaging and frequently change the formula color from light to brown. A rigorous experimental process is usually required to find a formula that optimizes both phytochemical and formulation stability. Specific guidelines and protocols for the efficacy assessment of underarm antiperspirants are well documented in a variety of published sources such as the FDA/Federal Register (2003), EEMCO (2003), and Clearcast (2019).

These gravimetric protocols quantify the amount of eccrine sweat produced in the underarms during specific time intervals and under controlled conditions. More sophisticated testing options are also possible to support claims such as longer duration of efficacy, physical activity resistance, psychological stress protection, extreme heat resistance, night sweats, etc.

Based on our knowledge and testing of natural extracts, they exhibit less efficacy than aluminum-based salts, so it is important to ensure that their wetness reduction performance can be measured with statistical confidence. Also, assessing small amounts of sweat at weak excretion rates is difficult, and requires experimental skill. Therefore, the following is recommended to design and conduct a successful clinical test of natural extracts:

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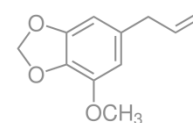
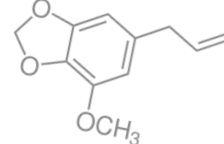
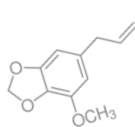
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Technical Corner

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- Baseline sweating values in both armpits should be similar and not skewed. A spread between the lowest and highest sweaters of at least 600 mg is recommended with a minimum of 100 mg sweat per armpit.
- Pro-perspirer panelists (i.e., sweating more after product treatment) should not be enrolled.
- Mixed gender test panels are not recommended to avoid any questionable results due to surface area and sweat volume differences. Female panelists are generally used.

Typical sweat reduction clinical trial results for a formulation containing a combination of two plant extracts rich in polyphenols and diterpenes were as follows: 24% at the original concentration of actives, 29% at twice the concentration of actives, and 20% at the original concentration of actives then aged for 18 months.



Marketing Justification

The global underarm products market is healthy with growth fueled by the youth population. Lifestyle changes which include a focus on hygiene, daily grooming routines, disposable income leading to discretionary toiletry products becoming daily necessities, and product format and ingredient innovations are key factors currently driving the market.

A concurrent global trend in the cosmetics market in general is the rising consumer awareness of natural ingredients with therapeutic or biological effects. Despite significant evidence to the contrary, the safety of aluminum salts is under continued scrutiny even though the links to breast cancer, Alzheimer's disease, and dermal absorption are not generally accepted in the scientific and medical communities, and some studies are even discredited. This continued negative perception of aluminum-based antiperspirants is contributing to a growing consumer demand for natural antiperspirants specifically for sticks, creams, and emulsions.

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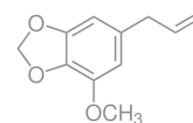
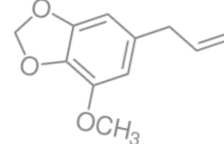
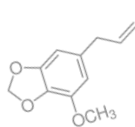
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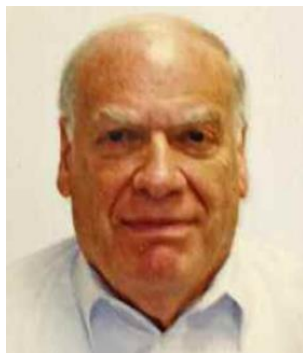
Technical Corner

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1. P.C. Leung, et al. Evaluation of the topical antiperspirant effects of a simple herbal formula, Clin. Med. Invest., 2(1): 1–3 (2016).
2. A.V. Kamble and M.R. Joshi, A clinical study to evaluate the efficacy of Ayurvedic/herbal deodorant on sole, WJPR, 6(13): 862–872 (2017).

About the Authors



Phil Klepak Phil Klepak retired in 2018 after 31 years of direct experience in all aspects of antiperspirant and deodorant technology with Reheis/SummitReheis/Elementis as Global Director of Technical Services. This included knowledge of chemistry, formulations, process troubleshooting, clinical testing protocols, etc. He also taught the SCC continuing education course on antiperspirants and deodorants for many years.



Barbara Schmidt, Ph.D. Barbara Schmidt has a Ph.D. from the University of Illinois, Urbana-Champaign where she studied phytochemistry. She specializes in botanical raw materials for the personal care and dietary supplement industries. She authored an ethnobotany textbook in 2017 and is currently teaching phytochemistry for the Rutgers University Global Institute for BioExploration (GIBEX).

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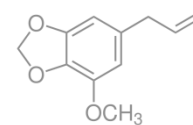
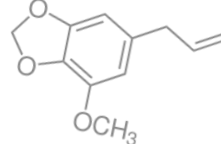
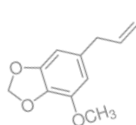
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New England Chapter Golf Outing

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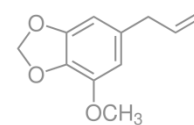
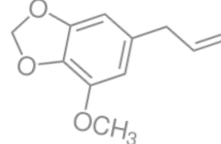
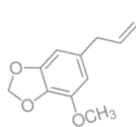
REGISTRATION DUE
9/15

NEW ENGLAND SCC **7TH ANNUAL**

GOLF TOURNAMENT

\$175/PERSON OR \$700 PER TEAM (4 PLAYERS)

OCTOBER 6, 2021	LOCATION
Check in: 9:00am	Blissful Meadows Golf Club
Shotgun Start:	801 Chockalog Rd
10:00am	Uxbridge, MA 01569



Upcoming Events

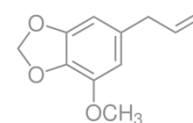
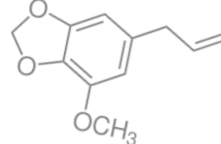
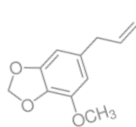
NYSCC Webinar: Skin Aromachology & Stress
August 24

NYSCC: Skin, Hygiene and the Microbiome
September 14, in-person at the Chart House or via Livestream

FLSCC Sunscreen Symposium
September 23-25

NYSCC Supplier's Day
November 10-11





Connect with area professionals through the newsletter!

Do you have an **employment opportunity** in the Connecticut area or beyond?

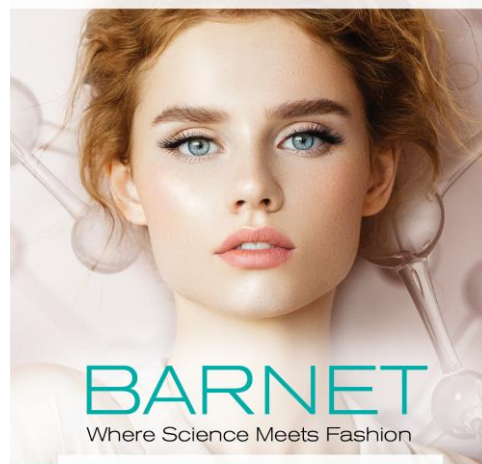
Is there a **technical article**, raw material insight, relevant writing, or other piece you'd like to share with the community?

Have you captured **photos** at CTSCC events?

Please contact Yingxia Wang to be featured in the newsletter (yingxia.wang@unilever.com).

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