Inside Popular Botanical Ingredients in Pediatric Skincare Products

Feverfew, colloidal oatmeal, and sunflower seed oil may provide benefits for children with eczematous skin conditions.

By Jeanine B. Downie, MD

Botanical extracts have been used on the skin for millennia. Contemporary written reports and accumulated evidence tell us that Cleopatra used botanical-based topical formulations for cosmetic purposes and to condition her skin. Today, the US cosmeceutical (a moniker developed to describe specialty cosmetic products formulated with pharmaceutical grade ingredients and/or pharmaceutical-type manufacturing standards) market is an estimated $5.8 to $10 billion industry, and a majority of those products are built upon botanical extracts. Botanical ingredients are also now incorporated into many mass-market skincare products, including several products developed specifically for children. Following is a look at some of the more popular botanical ingredients used in pediatric skincare products. The emphasis is on topical application and skincare formulations, not on oral botanical-based supplements.

Understanding the Research
When it comes to topically-applied botanical ingredients, it is important that an individual evaluating products keep in mind the limitations of the available data. While there are often many published studies documenting the biological activities of botanical ingredients ingested orally or applied topically, there are generally few published controlled trials of finished formulations. So, for example, while there is good scientific evidence that topically applied aloe vera confers local anti-inflammatory effects, it is less clear what concentration of aloe vera is necessary to confer those benefits or whether any particular aloe-containing lotion is more beneficial than another.

Furthermore, when it comes to botanical ingredients, the quality of the raw botanical material is a crucial consideration. Chemical composition of the soil, soil quality, and other environmental fac-
tors influence the quality of a plant, either positively or negatively. Furthermore, botanical compounds within plants, once harvested, are susceptible to oxidation and may quickly degrade, depending on cold, heat, humidity, light exposure, etc. This requires harvesters to handle materials in a timely and well-controlled manner throughout the process of collecting and synthesizing plant extracts. Many respected manufacturers derive botanical ingredients only from specific, controlled crops to ensure quality and consistency.

These important considerations are not necessarily limitations of topical botanicals, as many high-quality botanical-based skincare formulations are currently on the market. These have demonstrated clinical effectiveness, achieved high levels of patient and physician endorsement, and in many cases have controlled data to support their efficacy. Physicians interested in learning more about specific formulations can contact the manufacturers with requests for information. Trusted manufacturers test their finished formulations in controlled trials. These may not always be as rigorous as pharmaceutical drug trials, but they are generally well-designed and reliable. Results may not be published in the literature, but data often are provided to enquiring physicians for evaluation.

**Feverfew**

A popular topical botanical currently is feverfew (*Tanacetum parthenium*), a member of the sunflower family. Feverfew’s common name derives from its ancient oral use as a fever reducer. The antioxidant-rich botanical is shown to have anti-inflammatory and anti-cancer properties and is used as an oral supplement to treat migraine headaches. A novel parthenolide-free extract of feverfew (PFE-feverfew) compound has removed the parthenolide component to obviate the sensitization potential. In one study, the agent had in vitro anti-inflammatory effects, as indicated by a reduction in release of pro-inflammatory cytokines. In vivo, PFE-feverfew reduced DNA damage and hyperplasia following UV exposure. There was also a reduction in UV-induced skin erythema as a result of PFE-feverfew application.

Another trial confirmed the ability of PFE-feverfew to inhibit the activity of pro-inflammatory enzymes and the release of pro-inflammatory mediators from macrophages and from human peripheral blood mononuclear cells. In vivo, PFE-feverfew inhibited dermatitis in two different murine models.

Most feverfew-containing skincare products are intended for anti-aging use or to manage adult dermatoses, such as rosacea. However, given its efficacy in combating dermatoses in vivo, there is increasing interest in using feverfew for atopic dermatitis and “sensitive skin.” PFE-feverfew is formulated into the Aveeno Active Naturals line in their “Ultra-Calming” products. These include a facial cleanser, daily facial moisturizer with SPF, and a sunscreen, which are not necessarily marketed for children, but may be suitable for use on eczema-prone skin.

**Colloidal oatmeal**

Use of finely ground colloidal oatmeal (*Avena sativa* L.) to soothe skin is an ancient practice, and the use of oatmeal baths is still common to help control pruritic, inflammatory skin manifestations like...
poison ivy and chicken pox. Colloidal oatmeal functions as a cleanser, moisturizer, buffer, as well as a soothing and protective anti-inflammatory agent. Colloidal oatmeal has been used to treat atopic dermatitis and inflammatory skin diseases and is known to repair barrier dysfunction, reduce skin inflammation and irritation.

The anti-pruritic effects of colloidal oatmeal were demonstrated in a study of burn wounds. Patients who applied a topical moisturizer containing colloidal oatmeal reported significantly less itch and used fewer antihistamines than patients who used the vehicle moisturizer without colloidal oatmeal.

Colloidal oatmeal also provides protective and moisturizing benefits, thought to derive from the high concentration of starches and beta-glucans that hold water. The botanical is high in oat phenols, some of which are strong ultraviolet absorbers and under investigation as sunscreen ingredients.

Colloidal oatmeal is featured in Aveeno Baby Soothing Relief products, including creamy wash, bath treatment, and moisture cream, as well as Aveeno Baby Daily Care washes and moisturizer. Aveeno Daily moisturizing lotion and Aveeno Eczema Care also feature colloidal oatmeal.

**Sunflower seed oil**

Botanically-derived oils have been studied as possible low-cost moisturizers, but studies suggest variability in their effectiveness. For example, application of sunflower (Helianthus annuus) seed oil was shown to accelerate epidermal barrier function repair in mouse models, while other botanical oils actually delayed repair. When sunflower seed oil was applied three-times daily to preterm infants in one study, it was shown to improve overall skin health and reduce nosocomial infections compared to controls.

Sunflower seed oil contains high levels of essential fatty acids, including linoleic acid. A novel sunflower oleodistillate (SOD) has been shown to increase epidermal lipid synthesis and to reduce inflammation both in vitro and in animal models. In one study, an SOD 2% emulsion demonstrated moisturizing properties in 20 adult volunteers with atopic skin and was found to have a strong steroid-sparing effect. Other studies in infants and babies with AD have shown a positive impact on quality-of-life parameters.

Sunflower oleodistillate is the primary component of Stelatopia products from Mustela, which include moisturizing cream, cream cleanser, and milky bath oil.

**Lavender and Chamomile**

Lavender (Lavandula angustifolia or Lavandula officinalis) takes its name from the Latin word “to wash,” presumably because it was commonly used
as a fragrance in baths. Lavender oil is shown to have strong antioxidant properties. Orally, lavender oil supplementation has been associated with anti-inflammatory and analgesic effects. Topically applied lavender oil has shown antimicrobial effects and is under investigation as an anti-tick treatment. Despite these potential uses for topical lavender oil, currently its primary use in skincare products is as an anxiolytic and sleep-promoting fragrance. Studies have shown that lavender oil aromatherapy effectively reduces anxiety in mouse models of induced anxiety with demonstrated effects on neurotransmitters such as dopamine, serotonin, and their derivatives. In various trials, lavender aromatherapy has been shown to reduce anxiety among dental patients, pre-surgical patients, and test-taking graduate nursing students.

Studies show that unstable lavender oil exposed to oxidation has the potential to induce allergic reactions, although no widespread reports of lavender allergy are in the literature. In fact, in mouse models, topical application of lavender oil was shown to inhibit immediate type allergic reactions.

Chamomile (Matricaria recutita) contains the flavinoid apigenin, which is suggested to have anti-tumor effects. Chamomile also has anti-inflammatory, antimicrobial, and wound-healing benefits. Aveeno Baby Calming Comfort bath and lotion contain lavender extracts for fragrance. Nature’s Baby Organics makes a wash with lavender and chamomile. Aquaphor Baby Gentle Wash and Shampoo contains chamomile, as does Mustella baby shampoo.

Potential Adjuncts

Fearful of irritants and allergens, parents often fret about which products to use to bathe and moisturize their children. Use of a gentle, soap-free, moisturizing cleanser is always appropriate. However, if parents are interested in “natural” or botanical skincare, the accumulated evidence suggests that some products may be worthwhile. For patients with “sensitive skin,” eczema, atopic dermatitis, or any acute or chronic, inflammatory, pruritic skin condition, products containing feverfew, colloidal oatmeal, or sunflower seed oil may be useful adjuncts to other therapeutic interventions. The listing of brands and product lines provided here is not exhaustive. Patients may use alternative products, but they and
Chamomile is thought to have anti-inflammatory, antimicrobial, and wound-healing benefits.

should carefully evaluate the offerings with the guidance of their physician. Generally, consumers do best to choose established brands and/or those that provide detailed data about the performance of their specific formulations.

Lavender and chamomile-containing formulations may have less utility in terms of promoting skin health, but these products appear to do no harm to the skin and may have calming and soothing benefits for children, especially young babies.

D. R. Downie has served as a consultant/lecturer or researcher for Johnson & Johnson.

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