

ANCIENT SUNRISE®

Henna for Hair



Catherine Cartwright-Jones PhD

Ancient Sunrise® Henna for Hair Chapter 1, Ancient Sunrise® Henna for Hair

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Cover Graphic by Alex Morgan

Published by TapDancing Lizard® LLC

339 Tallmadge Rd. Kent, Ohio, 44240

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Ancient Sunrise® Henna for Hair

Foreword

A friend asked me to decorate her skin with henna when I was teaching at Kent State University in 1992. It was part of her culture and she loved to have henna for celebrations. I had heard of henna but didn't know much about it, so I began researching. My curiosity quickly outran the university's library; I found little published on the subject of henna in the English language. When I asked people from countries where henna had been in cultural use in centuries past, I got some reminiscences, but little substantive information. I also asked hairdressers about henna; they all insisted it was dangerous and ruined one's hair.

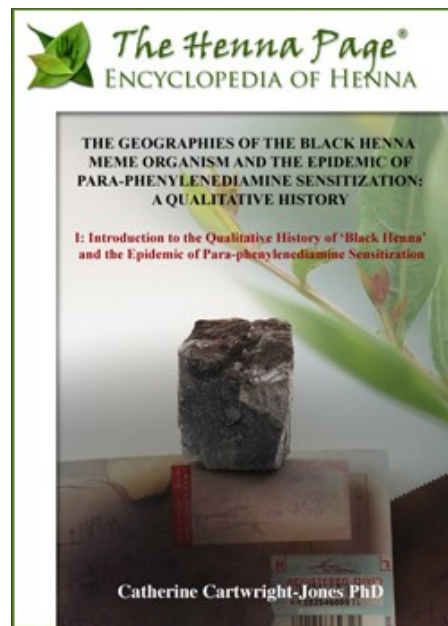


Henna: *lawsonia inermis*. New leaves grow after summer rain.

The more I researched, the more I found stylists' disdain for henna perplexing, and the more I felt challenged by the lack of research on henna published in English. I gradually assembled five file cabinets of scarce and scattered information and began to form some ideas about the science, botany, and history of henna that other people had not, possibly because they were always focusing on something else. There were scraps of information on henna in anthropology, botany, and chemistry, but these scraps were always incidental to some other focus, such as kinship patterns, semi-arid zone habitats, and quinones. Though people often claimed "the history of henna is lost in the mists of time" or that it was somehow secret, I thought I saw connections and a continuous interrelationship of the science and cultures of henna.

I did my master's work on henna, focusing the master's thesis on henna "Developing Guidelines on Henna: a Geographical Approach,"¹ as a way to position future research on henna as a multidisciplinary approach, drawing from cultural history, commerce, globalization, agriculture, ethnobotany, ethnomedical practices, and bioscience, rather than just a folkloric footnote in Orientalism.

Referencing the mass of information I'd constructed on henna by 2014, I co-authored "Lawsonia inermis L. (henna): Ethnobotanical, phytochemical and pharmacological aspects" for the Journal of Ethnopharmacology."² This research work was a first in academic publication in that it was a multidisciplinary comprehensive review of henna, a collaboration among chemists, botanists, and physicians as their research linked to phytopharmacology: the paper linked the corroborations between laboratory science research on lawsone and lawsonia inermis and the ordinary individuals' observations of henna which had passed into folk practices and superstitions.



“The Geographies of the Black Henna Meme Organism and the Epidemic of Para-phenylenediamine Sensitization: A Qualitative History.”

I filed my doctoral dissertation, “The Geographies of the Black Henna Meme Organism and the Epidemic of Para-phenylenediamine Sensitization: A Qualitative History”³ in 2015. This work went beyond henna and into the problem of ‘black henna’, a source of the current epidemic of para-phenylenediamine sensitization.

¹ Cartwright-Jones, C., 2006. “Developing Guidelines on Henna: a Geographical Approach,” masters essay Kent State University, <http://www.hennapage.com/henna/encyclopedia/mastersessay/geoapproachtohenna.zip>

² Semwal, R., Semwal, D., Combrinck, S., Cartwright-Jones, C., Viljoen, A.M. 2014. Lawsonia inermis L. (henna): Ethnobotanical, phytochemical and pharmacological aspects. *Journal of Ethnopharmacology* 155: 80–103.

³ Cartwright-Jones, C. *The Geographies of the Black Henna Meme Organism and the Epidemic of Para-phenylenediamine Sensitization: A Qualitative History*. PhD dissertation. 2015. Kent State University, Kent, Ohio.

Henna is NOT black



Images of 'before' and 'after' para-phenylenediamine 'black henna' on children⁴

Henna is NOT black. There is no such plant as 'black henna' though there are many products labeled 'black henna.' 'Black henna' products that stain skin black in an hour contain high levels of para-phenylenediamine. The higher the level of para-phenylenediamine applied to skin and the larger the area of the temporary black tattoo, the more likely it will cause a severe allergic reaction and life-long sensitization to the chemicals in oxidative hair dye.

A broad sensitization assessment in spring 2014 found that 16% of youths are sensitized to para-phenylenediamine in Manchester, UK,⁵ and much of that number was attributed to children having had 'black henna' temporary tattoos. The number of people sensitized to para-phenylenediamine has steadily risen since the late 1990's and will certainly continue to rise as more people acquire 'black henna' temporary tattoos on vacation or as a cultural cosmetic at a social or cultural festival such as weddings, Diwali, and Eids.

Pure henna has a high level of safety and is harmless when used for hair dye and temporary skin art. Pure henna stains skin and hair some color in the range of orange-red to coffee color. Pure henna cannot stain arm, leg, or torso skin black.

⁴ Images of 'before and after' 'black henna' from Florida Department of Health

⁵ Smith V, Clark S, and Wilkinson M. "Allergic contact dermatitis in children: trends in allergens, 10 years on. A retrospective study of 500 children tested between 2005 and 2014 in one U.K. centre." *British Association of Dermatologists' Annual Conference*. Leeds Teaching Hospitals NHS Trust, Leeds, U.K. (2015).

Mapping the use of 'black henna' temporary tattoos



- Areas where there is para-phenylenediamine 'black henna' activity in seasonal and informal economies.
- Home areas of tourists who patronize para-phenylenediamine 'black henna' in seasonal and informal economies.

Areas where para-phenylenediamine skin painting is common in informal economies of tourism, and the areas to which their patrons return

The map above shows the areas of seasonal and informal economies where artists apply para-phenylenediamine 'black henna' to tourists and the homelands to which the sensitized tourists return. There may be more males than females sensitized in vacation souvenir applications in areas of tourism, as larger skin decorations are often intended to emulate permanent, masculine tattoos. Judging by vacation photographs and journals posted online as well as medical reports at least half of the 'black henna' patrons were between the ages of two and fifteen. Consumer warning labels on home hair dye packaging may be insufficient to prevent injuries; many people were sensitized as young children on vacation, did not receive a correct diagnosis because pediatricians often were unfamiliar with the appearance of the injury and did not advise their patients of future oxidative hair dye sensitization, and the incident is forgotten over decades when these children grow up, mature, and decide to dye their graying hair.⁶ Others believe that they were painted with henna, a safe, natural, and traditional body art rather than a high concentration of para-phenylenediamine, so they are unaware that there is a sensitizing chemical in common between 'black henna' and oxidative hair dye.

⁶ Burlaga. M.. "Public Warned Against Use Of Additives In Henna For Temporary Tattoos." *Northland News Center*. <http://www.northlandsnewscenter.com/news/local/Public-Warned-Against-Use-Of-Additives-In-Henna-For-Temporary-Tattoos-124789374.html> (June 30, 2011)

Large demographics of cultural groups have been sensitized through ‘black henna’ replacing or augmenting traditional henna in social and religious celebrations. Para-phenylenediamine has been used to decorate skin in cultural celebrations for twenty to forty years in areas of East Africa, the Arabian Peninsula and South Asia, and more recently in diaspora. This sensitized population is largely female, with multiple exposures of 20% to 60% para-phenylenediamine skin painting, each being applied with paste in contact with skin for a duration of twenty or thirty minutes. The awareness of the risk of skin reaction is not absent, but women’s preference for fast, convenient, fashionable black skin art prevails over the estimation of risk. The practice, though not done before the 1970’s, has been embedded in many communities for long enough that it is considered part of the culture.



- Areas where para-phenylenediamine ‘black henna’ is used in family and cultural celebrations as skin decoration.
- Diasporic areas where para-phenylenediamine ‘black henna’ is used in family and cultural celebrations as skin decoration.

This map shows the areas where women use para-phenylenediamine ‘black henna’ to ornament skin for weddings, Eids, and other religious and cultural celebrations, and areas of diasporic communities where the practice is continued.

Attempts by governments to ban ‘black henna’ have largely been ineffective as the desire for fast, black temporary tattoos continues, and the patrons either do not know the risk, don’t think they will be affected, or don’t consider the risk of injury to be significant. Enforcement of bans has rarely succeeded because of the availability of para-phenylenediamine and ‘black henna’ and the seasonal informal economies of the practitioners.

“Henna for Hair” at hennaforhair.com

I wrote the book “Henna for Hair” after I found a research paper on the hair dye industry, “Dyeing with Henna and Related Materials.”⁷ This paper detailed the chemistry of “compound henna,” information about compound henna that had been kept a trade secret by the hair dye industry, which was causing the rumors and misinformation about henna. I wrote the first “Henna for Hair” book and posted it at hennaforhair.com to help people get accurate information on the science and art of dyeing hair with henna. That book was downloaded over a quarter of a million times and translated into several languages. The effect of all of those free downloads was to upset many long-held and highly inaccurate assumptions about henna, and to reinvigorate interest in dyeing hair with henna.

For decades the hair dye industry has drifted towards highly profitable proprietary chemical solutions. It has abandoned a safe, perfectly functional solution that had worked well for over six thousand years but which could not be patented and could not be hurried. Henna was not a good fit for the capitalist modern mass production consumer paradigm that requires a high volume of identical products producing fast, reliable results to yield maximum profits for corporations and shareholders. Henna is an inherently variable plant and requires time and experience to produce optimum dye results.

Once, in a large part of the world, every woman knew how to henna her hair. Women learned how to mix and apply henna from women in their families, or from neighbors at the village bath. The critical learning process of how to ‘do’ henna, best understood by watching another person mix and apply henna does not reduce to a few sentences on a package very well. Once, every woman could bake her own bread, make her own yoghurt, and mend her own clothing: industry offered convenient solutions which created problems: inferior bread, yoghurt full of chemicals, and poor quality, disposable clothing. When these skills are lost, they are not always easy to regain. The family and village art and craft of henna was lost as the chemical hair dye industry grew.

After I completed my PhD, I decided to put together a second book of the art and science of dyeing hair with henna, again free and downloadable. I hoped ‘Ancient Sunrise® Henna for Hair’ could bridge the learning gap that was once filled by regular visits to the village bath. I wanted to make the book as thorough as possible, a resource for beginners at home, professional cosmetologists, as well as people who wanted in-depth research and analysis on henna. The urgency of writing the new book came from calculating the numbers of people sensitized to oxidative hair dye by ‘black henna’ temporary tattoos in the conclusion of my dissertation. Learning to henna hair is no longer just a matter of beauty; it is a matter of keeping people out of the hospital. People who are sensitized through ‘black henna’ temporary tattoos have extreme sensitizations, and these sensitizations are life-long.⁸ A person who has had one of these black temporary tattoos may have more than an itch or puffy eyes following chemical hair dye; the coal tar derivatives in chemical hair dye may put the person in intensive care or the morgue.

⁷ Amro, Bassam Izzidin, 1989, “Dyeing with Henna and Related Materials.” thesis for PhD at the University of Wales.

⁸ Onder, M.,2003. "Temporary holiday“tattoos” may cause lifelong allergic contact dermatitis when henna is mixed with PPD." *Journal Of Cosmetic Dermatology* 2, no. 3/4: 126-130.

The epidemic of PPD sensitization and the urgency of using pure henna

Up to the late 1990's, about 3% of people were allergic to chemical hair dye and the allergic reactions were rarely life threatening. An estimated 1.5% of people are born allergic to para-phenylenediamine, others acquire sensitivity through exposure to the chemical during their lives. In 1998, an epidemic of exposure to para-phenylenediamine began, and the sensitization epidemic followed.

9



The globalization of 'black henna' temporary tattoos created with para-phenylenediamine began in 1998 with the February release of the "Frozen" video from "Ray of Light" by Madonna. By spring 1998, millions of people worldwide had seen the video, the 'black henna' on Madonna's hands and wanted to acquire a 'black henna' temporary tattoo on their summer vacation. Hopeful artists who caught onto the 'secret formula' purchased boxes of Bigen black hair dye and painted para-phenylenediamine onto people, having no idea that the high chemical content and prolonged skin exposure was dangerous. Other entrepreneurs advertised 'black henna' kits online and orders flooded in. Beachfronts such as the boardwalk on Venice Beach quickly filled up with artists advertising 'black henna' and lines of customers formed. The reports of injuries followed but were often misdiagnosed, as physicians had never seen such injuries before. By 2005, in some broad sensitization assays, 8% of adolescents were allergic to para-phenylenediamine, almost tripling in ten years the sensitization to a chemical frequently found in consumer products.¹⁰

The numbers have risen sharply because of the extremely high para-phenylenediamine content in the 'black henna' paste. Kligman's sensitization assay in 1966 found that 100% of people would become sensitized to para-phenylenediamine in five or fewer exposures to a test patch of 10%

⁹ Victoria Villalobos. "Debating; Venice Beach, CA." Uploaded to Smiledarling Photostream, Flickr, November 29, 2009. <http://www.flickr.com/photos/smiledarling/4284305642/> (accessed November 22, 2013).

¹⁰ Smith V, Clark S, and Wilkinson M. "Allergic contact dermatitis in children: trends in allergens, 10 years on. A retrospective study of 500 children tested between 2005 and 2014 in one U.K. centre." *British Association of Dermatologists' Annual Conference*. Leeds Teaching Hospitals NHS Trust, Leeds, U.K. (2015).

para-phenylenediamine.¹¹ All ‘black henna’ pastes that stain skin black quickly have a much higher percentage of para-phenylenediamine than was used in the assay, and most ‘black henna’ temporary tattoos cover a much larger area of skin than a sensitization patch test. Greater and prolonged exposure to an allergen creates greater risk of sensitization. ‘Black henna’ pastes contain 15% to 80% para-phenylenediamine, far more than the 10% patch test. In the few incidents that a large number of people were painted at the same time with the same ‘black henna’, 50% became sensitized to para-phenylenediamine and, by extension, oxidative hair dye.¹²



An artist applies ‘black henna’ to a woman in Darfur.¹³

Muslim and Hindu women have long enjoyed henna body art as part of celebrating weddings, festivals such as Ramadan and Eid al-Adha, Karva Chauth and Diwali, and ‘black henna’ is currently in fashion. ‘Black henna’ is a favorite for weddings in many cultural groups.

People from westernized, industrialized countries enjoy vacation activities normally disallowed during their work year: sleeping late in the morning, eating and drinking too much of delicious things, and relaxing on the beach. These activities include changing one’s appearance on vacation: getting an ornamental braid in one’s hair, wearing ‘not suitable for work’ clothing, and getting a temporary tattoo when a permanent tattoo might reduce their employability.

¹¹ Kligman, A. M. 1966. “The identification of contact allergens by human assay. 3. The maximization test: a procedure for screening and rating contact sensitizers.” *Journal of Investigative Dermatology*, v. 47, issue 5, p. 393-409.

¹² Star Tribune. July 2, 2011. “Temporary tattoos put blisters on metro kids” *Star Tribune*, Minneapolis, MN, , <http://www.startribune.com/local/124797314.html> accessed December 24, 2011

¹³ Farran, Albert González, March 30, 2013. “El Fasher: (In black dress) Fatama Abaker Bakhit, ‘Tata,’ performs a drawing on Enam Mohammed's foot with "henna."” Uploaded to UNAMID Photo’s Photostream, Flickr.com <http://www.flickr.com/photos/58538810@N03/8730156123/> (accessed November 23, 2013).

Children beg their parents for ‘black henna’ temporary tattoos as vacation souvenirs, as permanent tattooing is forbidden to children. Children love to show off their ‘black henna’ temporary tattoo as it represents being a powerful, rebellious, dangerous adult. The children who have gotten ‘black henna’ on vacation from 1998 to 2015 (using the average age as 10) will see their first gray hair between the years 2018 and 2045. If one hundred people get ‘black henna’ as children and thirty years later purchase oxidative hair dye to cover their gray, fifty of them will have an allergic reaction and twenty of that fifty will have a severe reaction. These twenty people who have extreme reactions to hair dye may require emergency hospitalization as the swelling of the scalp from hair dye application spreads to eyes, ears, mouth and airways. Anaphylaxis reactions to para-phenylenediamine can be fatal.



‘Black henna’ temporary tattoos for sale in Daytona Beach¹⁴

Every winter and spring school break, and every summer, more people acquire ‘black henna’ temporary tattoos on vacation. Blistering and scarring develops in the area of the pattern three to twenty days after application so the ‘black henna’ artists rarely see the damage they’re doing. The latent severe chemical sensitivities caused by these applications often remain invisible for years, resurfacing when the person began to dye their hair with the same chemical as was in the ‘black henna.’

¹⁴ Alyson Harris. Photos from Alyson Harris's post in PPD Free Henna Artists. Facebook. June 7, 2013. https://www.facebook.com/photo.php?fbid=10100351029251757&set=gm.644464748915528&type=1&relevant_count=2&theater (accessed September 18, 2013)



Delayed hypersensitivity reaction to para-phenylenediamine following a 'black henna' temporary tattoo¹⁵

People who have been exposed to 'black henna' should not be assumed to be sensitized to only para-phenylenediamine; cross sensitizations to other coal tar derivative chemicals in cosmetic and consumer products are common. Toluene-2,5-diamine (PTD) is often substituted in home hair dye kits as a "PPD-free" hair dye. However, about half of people who are allergic to para-phenylenediamine are also allergic to toluene-diamines.¹⁶



Blistering reaction to 'black henna'¹⁷

A blistering reaction to 'black henna' will be followed by future allergic reactions from further contact with consumer products containing –diamines and other coal tar derivatives. (See Appendix II for a further list of chemicals.) These sensitizations cannot be reversed or lessened by the passage of time from 'black henna' to using oxidative hair dye; sensitizations are life-long. Traditional patch testing may be insufficient to establish sensitization as reactions may

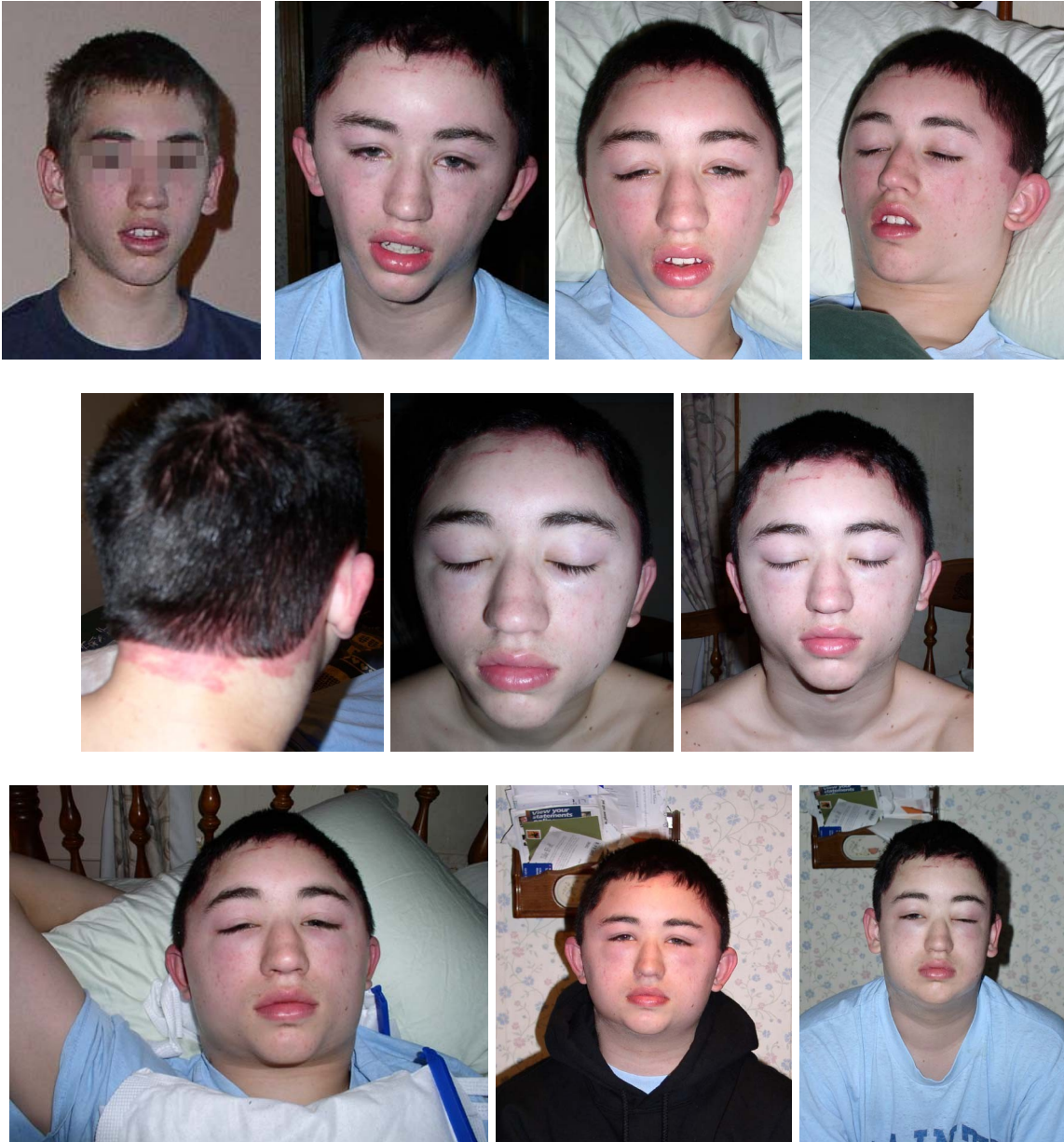
¹⁵ Spider Girl. Saturday, December 23, 2006. "Spider on the Road, The Henna Incident Saturday, September 10, 2005. WARNING: DO NOT EVER USE BLACK HENNA" [blogspot.com](http://spidergirlontheroad.blogspot.com/2006/12/henna-incident.html)
<http://spidergirlontheroad.blogspot.com/2006/12/henna-incident.html> (accessed December 19, 2011)

¹⁶ Ingram, John R., T. Hughes, M., Stone, N. M. 2014. "Potential danger of hair dyes marketed as free from para-phenylenediamine." *International Journal Of Dermatology* **53**, no. 4: e257-e258.

¹⁷ Kungfu-kickass. Comment, "Acute allergic reaction to henna" posted to WTF/Reddit. March 2013,
http://www.reddit.com/r/WTF/comments/1be5to/acute_allergic_reaction_to_henna/
<http://i.imgur.com/UrbXOv.jpg> (accessed November 25, 2013)

occur as late as thirty days after exposure, and patch tests themselves may result in severe reactions.

When this person was twelve years old, he got a 'black henna' temporary tattoo while on vacation in Grand Cayman with his parents. It blistered and itched, but no particular significance was attached to the itching; the pediatrician supplied a soothing cream. He was not advised about a sensitization to oxidative hair dye. When he was sixteen, he asked to dye his hair black on December 30. The next day, he said he felt like someone was pulling his hair out.



As the reaction to oxidative hair dye progressed over the next several days, his head began to swell, his lips began to swell, and his eyes swelled shut. On the second day after hair dye application, he was hospitalized until the swelling could be halted and slowly reduced.

Such a reaction is not unusual, will become more frequent, and many reactions have been and will be far worse. As more people get ‘black henna’ temporary tattoos every vacation season, more people will get severe allergic reactions to oxidative hair dye. See Appendix I for further examples of extreme reactions to the chemicals in oxidative hair dye.



18



19

The chemical beauty industry has downplayed the hair dye risk from the global epidemic of PPD allergy, sometimes by highly selective reading (or misreading) of the literature.²⁰ For highly sensitized persons, a complete avoidance of all contact with coal-tar derivatives is crucial. New “safer” chemical solutions do not adequately address the problem because they do not take cross-sensitization into consideration. Exposures to the high PPD content in ‘black henna’ usually creates other sensitivities, just as people who have ‘hay fever’ reactions to one plant pollen often are allergic to other pollens. If a person is sensitized to PPD, they may mistakenly assume that ‘no PPD’ hair dyes are safe for them to use. The different chemical may have a reduced likelihood of allergic reaction, but a reduced likelihood is not the same as ‘no’ likelihood of allergic reaction. Since the FDA doesn’t require cosmetic companies to list the ingredients of professional salon products, a stylist may not have the declaration of ingredients of a product, and may never know whether there is a similar chemical in a hair dye that their client will react to until the onset of the allergic reaction. (See Appendix II for further information on coal-tar derivative chemicals.)

¹⁸ <http://news.softpedia.com/news/Woman-Ends-Up-in-Burns-Unit-After-Allergic-Reaction-to-Hair-Dye-125692.shtml>

¹⁹ <http://www.dailymail.co.uk/health/article-2109186/Carmen-Rowe-hair-dye-Pictures-swollen-face-woman-25-allergic-reaction.html#ixzz3oIom4tqN> accessed October 11, 2015

²⁰ Ingram, John R., T., Hughes, M., and Stone, N., M. (2014) "Potential danger of hair dyes marketed as free from para-Phenylenediamine." *International Journal Of Dermatology* 53, no. 4: e257-e258.



These over-the-counter home hair dyes contain para-phenylenediamine, though their packages show the word 'natural,' plants, fruits, and claim to be gentle and nourishing.



These products, often sold in health food stores, and advertised as being 'herbal' and without ammonia, contain para-phenylenediamine.



Products marketed as henna often contain para-phenylenediamine.



**HENNA POWDER
FOR HAIR**

Henna a leaf of a small shrub of an Indian Plant, dried and powdered used as hair dye.

DIRECTIONS FOR USE:

1. Unpack Henna pouch into a bowl and pour water in it to make the paste. Knead it well breaking all lumps.
2. Apply the paste with a brush and thin toothed comb to hair, from root to top, parting hair to small bunches. Leave no hair untinged. Apply repeatedly to the borders of the hair on brow. Do not let the paste remain unused for long, as its efficiency reduces.
3. Let the pasted hair absorb colour thoroughly and go completely dry. For quick results, Hair Dryer may be used. Then wash the hair with water and soap or shampoo until rinsing water becomes clear and entirely colourless. After drying hair with a towel or a dryer, set in required style Brilliant shine appears on hair.
4. Use the contents of the pouch on single application and do not preserve balances. This Product is for external use only. It should not be used for dyeing eyelashes or eyebrows. To test allergy, please first apply Henna within inside your elbow. Let it dry for sometimes and watch the reaction. In case of reddening, burning, itching or irritation in or around that portion, consider yourself allergic to the product. Otherwise go ahead safely with the use of Henna.

Paraphenylene-diamine content after dilution not more than 1.5% for Black 0.2% for Brown / Chestnut / Burgandy / Yellow / Dark Brown / Light Black / Natural Black/Mahogany Henna.

POISON: Not for Internal Use.
Do not use to dye eyelashes or eyebrows
Avoid contact with eyes
Keep out of reach of children.
Caution : This preparation may cause skin irritation in certain person and should be used only in accordance to this leaflet.

<p>INGREDIENTS: Herbal Henna Powder Para Phenylene Diamine. Citric Acid. Herbal Amla Powder Barium Peroxide. Magnesium sulphate.</p>

Some products sold as 'henna' contain para-phenylenediamine but have no declaration of ingredients; some have a declaration on the inside of the package. Even when para-phenylenediamine is declared, there is no requirement for listing the percentage of para-phenylenediamine in the powder; it might be 0.1%, or it might be 30%.

.Products for export labeled as ‘henna’ may not be required to have a complete and precise declaration of contents by the originating countries’ governments. As long as there is no international agreement on what can be sold as ‘henna’, as long as there are no quality standards for henna, and as long as there are no required verifications of ingredient declarations on advertising and packaging of henna, a package of powder marked henna may be anything from benign to useless to lethal. USA importers of these products are not required to ‘discover’ the ingredients; a package imported as ‘henna’ may be sold as ‘henna’ without further investigation into what exactly that product sold as ‘henna’ contains. The only way to be certain what is in a package of ‘henna’ is to send it to an independent certified laboratory. That is exactly what we do for Ancient Sunrise®.

Using Ancient Sunrise® pure henna, indigo, and cassia is one absolutely certain way for maturing people to safely, permanently dye their hair or cover their gray without any coal tar derivatives, additives, or adulterants. Each Ancient Sunrise® shipment of henna, cassia, and indigo is independently laboratory tested for purity and Catherine Cartwright-Jones PhD reviews all the lab results: Ancient Sunrise® *proves* the purity so you know what you’re getting. Independent laboratory testing also ensures that Ancient Sunrise® has no metallic salts, so if a person becomes sensitized to PPD, they can transition to Ancient Sunrise® without waiting for their hair to grow out or risking damage to their hair.

Stylists and PPD Sensitization

Stylists and their clients, as much as people who use home hair dye kits, benefit by changing to henna. In 2005, the UK Health and Safety Executive (HSE) identified hairdressers as having the highest incidence of occupational skin disease in the UK, and that statistical hazard has been found repeated in every broad study done on worker's health.²¹ Epidemiological studies dating back to the 1980s have found that hair stylists are at risk for a range of chronic occupational-health conditions, including skin and respiratory diseases and adverse reproductive outcomes. There are chemicals in hair glues and straighteners, such as formaldehyde, styrene, and trichloroethylene, which have been linked to cancer, liver damage, and dermatitis.²² Many stylists have severe consequences from poorly understood and unlisted coal tar derivatives in the chemicals they handle every day. A stylist who became sensitized to chemicals lamented,

“I was so miserable for over a year! No one could help me get relief. Finally at Cleveland clinic a dermatologist got me cleared up. I had to give up all of my clients. Now my question is where can I find a salon in the Akron area that I can work with henna and such? I miss doing hair so much and feel like everyone needs to know about it.”²³

Hairdresser's health problems caused by para-phenylenediamine and other chemicals in oxidative hair dyes have been known for over one hundred years. Medical journal articles were published about the injuries and assays done on sensitizations, and studies done of oxidative hair dye chemicals' links to cancer, non-Hodgkins's lymphoma, asthma, and lupus, toxicities were limited to publications for the medical profession; the mass of ordinary people who purchased and worked with hair dye were unaware of the hazards of exposure to the products.

European and American women began dyeing their hair with henna during the 19th century through cultural interchange and colonial trade with North Africa, Persia, and the Ottoman Empire. Entrepreneurs adapted PPD dyes from the fur and textile industries into hair dye products to compete for market share gained by henna. By 1898, there were already cases of occupational dermatitis PPD among women's hairdressers in France.²⁴ PPD gradually replaced henna as the preferred hair dye among European hairdressers because of its relative convenience and accessibility. Health problems from PPD were recognized as significant health risk to both hairdressers and client; PPD-based hair dye was prohibited in Germany in 1906.²⁵ In 1907, French chemist Eugene Schueller, founder of l'Oreal, developed a hair color formula based on PPD that he sold to Parisian hairdressers, but by 1910, those dyes were causing dermatitis among hairdressers in Spain.²⁶

²¹ Working Group on Action to Control Chemicals, Occupational skin disease in hairdressers and barbers. http://www.hse.gov.uk/aboutus/meetings/iacs/acts/watch/050505/pl_annex1.pdf. Accessed on October 17, 2009.

²² http://www.theatlantic.com/health/archive/2015/11/getting-toxic-chemicals-out-of-black-womens-hair-salons/415902/?utm_source=SFFB

²³ Gretchen Gallatin Doerfler, 2015. <https://www.facebook.com/groups/ancient.sunrise/10156192129800375>

²⁴ Cathelineau H 1898. "Note sur 18 cas d'accidents provoques par teinture pour cheveux a base de chlorhydrate de PPD". *Bulletin de la Société Chimique de France*: 9: 28–35.

²⁵ Fregert S. [Chemical demonstration of paraphenylene diamine in hair dyes]. *Hautarzt* 1972; 23: 393–394.

²⁶ Azua J. 1910. "Dermatitis producida por una tintura de pelo (quinona resultante de la accion del agua oxigenada sobre el clorhidrato de parafenileno-diamina" *Actas Dermo-Sifiliográficas* 1910; 2: 220–228.

Under the present EU Cosmetic Directive, PPD is allowed in hair dye products with a concentration limit of 6%, far lower than ‘black henna’ temporary tattoo concentrations that range from 15% to over 80%. Even though many hair care manufacturers apply PPD in lower concentrations, sensitization to PPD is high among hairdressers and patients because of daily exposure.²⁷ Between 1980 and 1993, nearly half of hairdressers patch tested in Madrid had allergic reactions to PPD.²⁸ There are similar levels of sensitization among hairdressers in every country; those who dye hair darker colors have higher levels than those working with lighter colors.

In addition to the sensitization problems that may force stylists to choose between chronic health problems and their career, stylists may wish to temporarily discontinue using coal tar derivative chemicals for the duration of pregnancy and nursing. There have been studies that propose a link between hair-dye use during pregnancy and the development of childhood malignancies; physicians recommend that concerned pregnant women avoid all chemical hair coloring;²⁹ henna is regarded as safe for pregnant and nursing women as long as it is tested free of contaminants and adulterants. Coal tar derivatives in oxidative hair dye are mutagenic in vitro, are carcinogenic to animals,³⁰ and these chemicals penetrate human skin.³¹ In 1980, the FDA required a label warning on hair dyes containing 4-methoxy-mphenylenediamine (4-MMPD) stating the following: “contains an ingredient that can penetrate your skin and has been determined to cause cancer in laboratory animals.”³² If oxidative hair dyes, particularly the higher levels found in darker colors and increased number of exposures pose a significant health risk to stylists, their families and clients, learning the technology of henna hair dye is more than a trendy fashion alternative, it is urgently needed to prevent harm.

This book, “Ancient Sunrise® Henna for Hair” has been researched, written, and published free to reclaim the forgotten technologies of dyeing hair safely, permanently, and beautifully from the centuries prior to the invention of coal tar derivative dyes. The technique of dyeing hair with henna, once learned at the village bath from a family member or friend, can now be learned online in a virtual village conversation.

You can do this. Begin now. Ancient Sunrise® will help.

²⁷ Thysssen, J. P., Johansen, J. D., Menne, T., 2007. “Contact allergy epidemics and their controls” *Contact Dermatitis* 2007: 56: 185–195

²⁸ Conde-Salazar L, Baz M, Guimaraens D, Cannavo A. “Contact dermatitis in hairdressers: patch test results in 379 hairdressers (1980–1993).” *American Journal of Contact Dermatology* 1995: 6: 19–23.

²⁹ Saitta, P. DO; Cook, C. E., DO; Messina, J. L., MD, Brancaccio, R., MD; Wu, B. C., MBS, Grekin, S. K., DO, FAOCD, Holland, J. MD. 2013. “Is There a True Concern Regarding the Use of Hair Dye and Malignancy Development? A Review of the Epidemiological Evidence Relating Personal Hair Dye Use to the Risk of Malignancy.” *Clinical & Aesthetic Dermatology* Volume 6 • Number 1|46 46

³⁰ Ammenheuser M.M, Warren, M.E. 1979 “Detection of mutagens in the urine of rats following topical application of hair dyes.” *Mutation Research*. 66(3):241–245.

³¹ Wolfram, L.J., Maibach H.I. 1985. “Percutaneous penetration of hair dyes.” *Archives of Dermatological Research*. 277(3):235–241

³² Product and ingredient safety: hair dye products. *U.S. Food and Drug Administration*. <http://www.fda.gov/Cosmetics/ProductandIngredientSafety/ProductInformation/ucm143066.htm>.

Appendix I: Cross Sensitizations to Para-Phenylenediamine

Coal tar derivative chemicals in consumer goods should not be used on a person who has had a ‘black henna’ temporary tattoo, or who is suspected to have an allergy to oxidative hair dye. A person sensitized through ‘black henna’ temporary tattoos may also be allergic to dark-colored cosmetics, dyed clothing, rubber products, and perfumes, and medications such as hydrochlorothiazide.³³ Cross-reactivity between chemicals in the azo group and p-phenylenediamine may occur due to the same central molecular structure of a benzene ring with 1,4 attachment of nitrogen salts.”

People who have had a ‘black henna’ temporary people may have severe reactions to any product that has an ingredient in the content declaration that contains chemicals with the following components.

- phenylamine
- thalene
- phenylenediamine
- toluenediamine
- para-toluene diamine
- aminophenol
- diaminophenol
- Disperse dyes
- Benzocaine
- Substituted para-diamines
- Ortho- or para-aminophenols

‘Black henna’ cross-sensitizations may also cause cross-sensitization reactions to:

- Nitroanilines
- Nitrophenylenediamines
- Nitroaminophenol
- Azo derivatives

‘Black henna’ temporary tattoos may sensitize people to eyelash, eyebrow, and eyeliner cosmetics, even though the PPD concentrations in these cosmetics are low, 0.3% to 1%, and may not be declared on the product label. People sensitized by ‘black henna’ and re-exposed through cosmetics and hair dye may have post-inflammatory hyper- or hypopigmentation, scarring and lifelong sensitization. These extreme reactions affect not only consumers, but threaten the livelihood of hairdressers and aestheticians.³⁴

³³ Jacob SE, Zapolanski T, Chayavichitsilp F. 2008 . “Sensitivity to para-phenylenediamine and intolerance to hydrochlorothiazide.” *Dermatitis*. 2008 Nov-Dec;19(6):E44-5.

³⁴ Kind F, Scherer K, Bircher AJ. 2012, “Contact dermatitis to para-phenylenediamine in hair dye following sensitization to black henna tattoos - an ongoing problem.” *Journal der Deutschen Dermatologischen Gesellschaft* Aug;10(8):572-8. doi: 10.1111/j.1610-0387.2011.07882.x. Epub 2012 Feb 2.

Appendix II: Incidents

As of this writing in 2015, there have already been many hospitalizations and mortalities reported. This is a brief list of accessible newspaper articles on people who have had severe injuries and hospitalizations, including fatalities, from extreme allergic reactions to the paraphenylenediamine in oxidative hair dye. To view more incidents of allergic reactions to oxidative hair dye, Google “Hair Dye Allergic Reaction.”



“My head turned into a football! Shocking pictures show swollen face of woman, 25, after allergic reaction to home colouring kit.”³⁵

Carmen said she performed a patch test 48-hours before with no problems. ‘The most disgusting thing is my head started to leak pus,’ she said”

Doctors eventually diagnosed an allergic reaction to the Paraphenylenediamine in the dye. Carmen, of Swansea, said: ‘I woke up and my head was so swollen that I couldn’t see. I was blind.

‘I looked in the mirror and half of my face was swollen. It looked like half of my head had been pumped up like a football.

‘I went straight to hospital and by the time I got there my head was swollen everywhere, even my ears were huge. The doctors admitted me immediately.

‘The most disgusting thing is my head started to leak pus. I had to wrap my head in a towel, it was horrible and it smelt like a wet dog.’

³⁵ <http://www.dailymail.co.uk/health/article-2109186/Carmen-Rowe-hair-dye-Pictures-swollen-face-woman-25-allergic-reaction.html#ixzz3oIom4tqN> accessed October 11, 2015



“Hair dye allergy left woman looking like 'Elephant Woman’” A woman was rushed to hospital after an allergic reaction to a hair dye left her looking like the "Elephant Woman"³⁶

She said: "I went straight to see my GP but when I got there I looked like an alien with one side of my face was going out like a rugby ball."He took one look at me and sent me straight to A&E. By the time I got there the other side of my face had swelled up too.

"I couldn't see my ears, the swelling must have gone out about three inches on either side. It was terrifying."The incident took place when Paula, a production manager, dyed her hair on June 7 to cover up a few stray grey hairs.

She went to work as usual the following day, but that evening her head, face and neck began swelling up like a balloon.

Her eyes closed, her scalp stretched and began to weep, and her throat swelled making it difficult to breathe.

She said: "I did everything it said on the tin and had no reaction to the 48 hour test, so my sister went ahead and dyed my hair for me.

"The next day my face was so bad both eyes were completely swollen shut and you couldn't see my eyelashes. I looked like a sumo wrestler or the elephant woman.

³⁶ “Hair dye allergy left woman looking like 'Elephant Woman’” A woman was rushed to hospital after an allergic reaction to a hair dye left her looking like the "Elephant Woman" June 17, 2009. The Telegraph, UK.
<http://www.telegraph.co.uk/news/health/5558616/Hair-dye-allergy-left-woman-looking-like-Elephant-Woman.html>
accessed October 22,2015



Teenager sues L'Oreal after hair dye left her with 'severe burns and ears swollen to 3 times their normal size'³⁷

A young mother is suing beauty company L'Oreal after she claims a home hair dye left her with peeling skin and ears that had ballooned to three times their normal size. Crystal Atkinson, 19, claims that her L'Oreal hair dye gave her burns that were so severe the pain has prevented her from picking up her baby and even leaving the house. The distraught mother-of-one had the Garnier Nutrisse chestnut brown hair dye applied by a mobile hairdresser - days later she was writhing in agony as a painful rash spread across her body and burns appeared on her face neck and scalp.

Miss Atkinson, of Darwen, Lancashire, said: "I have chemical burns on both sides of my face, between my neck and half my scalp, behind my ears and a rash all over my body." "I haven't been able to go out or hold my baby because my skin is peeling off and there's pus leaking out of my face." "The pain is unbearable and it looks disgusting.

"I went to one hairdresser and she said that in her 40 year experience she's never seen anything like it."

³⁷ "Teenager sues L'Oreal after hair dye left her with 'severe burns and ears swollen to 3 times their normal' size' Daily Mirror, UK, January 15, 2008. <http://www.dailymail.co.uk/news/article-508307/Teenager-sues-L'Oreal-hair-dye-left-severe-burns-ears-swollen-3-times-normal-size.html#ixzz3oIsAXZmV> accessed October 11, 2015



“Woman Ends Up in Burns Unit After Allergic Reaction to Hair Dye”³⁸

Zoe Vernon was admitted to the burns unit at the Manchester’s Wythenshawe Hospital, where she was placed on a drip, steroids and spent three days recovering from what doctors called the worst case of hair-dye allergic reaction they had ever witnessed. Now, Miss Vernon is using her own example to tell other women that, whether they do anything about it or not, they should be aware of the heavy chemicals that go into the makeup of such hair products.



“Woman who wanted hair like Cheryl Cole suffers bad allergic reaction to L'Oreal dye”³⁹

Rachel Bulmer, 27, said her face swelled up like a balloon, her skin burned and half her locks fell out after using the L'Oreal gel, despite doing an allergy test. The swelling was so severe, that her hearing was damaged.

³⁸ “Woman Ends Up in Burns Unit After Allergic Reaction to Hair Dye” <http://news.softpedia.com/news/Woman-Ends-Up-in-Burns-Unit-After-Allergic-Reaction-to-Hair-Dye-125692.shtml> accessed November 23, 2015

³⁹ “Woman who wanted hair like Cheryl Cole suffers bad allergic reaction to L'Oreal dye” November 17, 2009 <http://www.mirror.co.uk/news/uk-news/woman-who-wanted-hair-like-431489>, accessed November 23, 2015



“Hair dye blunder put me in intensive care for a week” October 25,2009, Mirror, UK⁴⁰

After a couple of hours Connie's hair had been dyed a glossy chestnut brown. She says: "My only worry when I left the hairdressers was that my hair was a little too dark."

But later that evening her head began to itch and by the next morning large blisters had appeared on her scalp.

Connie, from Daventry, Northants, went to see her GP, who prescribed antibiotics and anti-inflammatories after confirming she was suffering from an allergic reaction.

The following morning she woke up unable to breathe. "By now my whole head had begun to swell. I had felt so unwell I'd stayed at my mum's," she says. "And when she saw me gasping for breath, she was terrified. I remember looking in the mirror and reeling in shock. My head was so enormous I looked like the Elephant Man."

Connie's mum Carolyn rushed her daughter to hospital.

"As the doctors examined me I began to feel incredibly sleepy," says Connie. "I was lapsing into unconsciousness."

She was so ill she had to be transferred to another hospital. "All I can remember is feeling petrified. I could feel it spreading down my neck - my whole body had begun to swell as well." Connie spent a week in intensive care surrounded by machines.

⁴⁰ “Hair dye blunder put me in intensive care for a week” October 25,2009, Mirror, UK
<http://www.mirror.co.uk/news/uk-news/hair-dye-blunder-put-me-in-intensive-426905>



Woman's hair dye horror.⁴¹

Susan Taylor was rushed to A&E when her head, neck and face began to swell and burn within hours of using the Garnier Nutrisse hair colour.

‘Mrs Taylor, a part-time carer, applied the light brown hair dye at 4pm.

As she went to bed at 10pm she felt her face burning up and looked in the mirror to find it was 'bright red'.

She then woke up at around 1am unable to swallow and with a burning sensation so bad her husband Anthony drove her to A&E at Fairfield Hospital where she was put on a drip and given antihistamines.

She was monitored and sent home but was still in pain two days later and went to see her GP who prescribed her steroids. When the symptoms had still not eased a week later she went to an NHS walk-in centre and was prescribed penicillin and referred to a dermatologist.

She said: "I want this to serve as a warning to other women. The instructions told me to test the product against my skin for 48 hours before applying it but I only did it for 24 hours because I've used it before without any problems.

"Garnier have been apologetic and offered to pay for a taxi to the dermatologist and any prescription but I think that's just insulting. It's been a horrendous experience. What if I'd needed to go to work or was dying my hair for my son's wedding?"

⁴¹ Manchester Evening News, 2009, "Woman's hair dye horror."

<http://www.manchestereveningnews.co.uk/news/greater-manchester-news/womans-hair-dye-horror-916577>