Bundesinstitut für Risikobewertung

Henna hair dyes that contain p-Phenylenediamine (PPD) pose a health risk

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Regional inspection agencies have detected the substance p-Phenylenediamine (PPD) in henna hair dyes available in Germany. Though PPD is only authorised for oxidative hair dyes, the products in question do not work in this way. Instead, PPD is added to henna hair dyes in order to achieve a darker shade. A warning regarding these henna hair dyes was issued via the Community rapid alert system for non-food products (RAPEX), and the products were regionally withdrawn from the market. The Federal Institute for Risk Assessment has evaluated whether these products pose a consumer health risk.

PPD is a constituent in oxidative hair dyes (precursor) and authorised for this purpose. Whether this substance has harmful effects on health or not depends on the other ingredients: For hair dyes containing so-called coupling agents that bind to PPD and prevent further reactions that produce substances harmful for human health, the substance is authorised up to a final concentration of 2 %. Under the influence of hydrogen peroxide, PPD and coupling agents bind to form an unharmful, permanent colour pigment that enters the hair.

The objectionable hair dye products did not contain any ingredients that act as coupling agent during the oxidation process and would be able to bind PPD in order to prevent a harmful reaction product. If the hair dye powder is mixed with water, PPD will react with itself due to a lack of a suitable coupling agent. This oxidation reaction produces Bandrowski's base, which is especially harmful to human health. This base has mutagenic effects and is highly sensitising, resulting in allergies. BfR concludes that the analysed henna hair dyes that contain PPD constitute a grave health hazard and a serious risk.

The full version of this BfR Opinion is available in German on
http://www.bfr.bund.de/cm/343/henna_haarfaerbemittel_mit_p_phenylendiamin_ppd_stellen_ein_gesundheitsrisiko_dar.pdf