

〈Communication〉

Effects of Muconic Acid Derivatives to Improve Hair Quality

Kotaro KATAYAMA¹, Sotaro SATO¹, Kenji MATSUMOTO², Hiroyuki MIYAMOTO¹,
Yoshinobu TANAKA³, Hiroki HOTTA^{1,2,*}, Yoshio TSUJINO^{2,**}

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Abstract

As interest in antiaging agents increases, there is a growing demand for technology that reduces hair curling and twisting caused by heredity and aging. Conventional methods of hair straightening temporarily change the cysteine bonds using reducing agents; however, this can easily cause hair damage and requires repeated treatments. In the current study, we developed a novel hair treatment method to improve the efficacy and sustainability of hair straightening. A new heated mixture (CMC) was created by heating and mixing muconic acid, an organic acid, and cysteamine hydrochloride, which are often used in permanent-wave solutions. The CMC showed superior hair quality improvement effects compared to the ingredients that are prescribed as wave improvement ingredients, such as glyoxylic acid, 2-naphthalenesulfonic acid, α -ketoglutaric acid, and 2-(2-aminoethylthio) succinic acid (ATS).

In the curl retention test, the CMC demonstrated very high shape memory and persistence at 80°C, and unlike other treatments, it maintained its effect even at 60°C. Furthermore, the CMC treatment resulted in a glossy surface while maintaining its flexibility and strength, and it was confirmed that it had a quality improvement effect that was not observed in conventional products. These results suggest that CMC may reduce the frequency of salon treatment, provide long-lasting straightening effects, and may be effective even when using a hair dryer at home.

In the future, we plan to analyze the mechanism of action at the molecular level, including the formation of bonds within the hair. This new treatment agent is expected to be an important development in the field of hair straightening technology as it provides excellent results in terms of improving hair quality and durability of hair straightening.

Key words: muconic acid, cysteamine hydrochloride, hair quality improvement, hair straightening, curl retention.