

Antimicrobial activity of 4,9-dihydroxyperylene-3,10-quinone contained in *Cenococcum geophilum*

NOBUYASU ITOH^{1*}, NOBUO SAKAGAMI² AND MAKIKO WATANABE³

¹National Metrology Institute of Japan (NMIJ), National Institute of Advanced Industrial Science and Technology (AIST), 1-1-1, Umezono, Tsukuba, Ibaraki 305-8563, Japan (*correspondance: nobuyasu-itoh@aist.go.jp)

²College of Agriculture, Ibaraki University, 3-21-1, Chuuo, Ami, Inashiki, Ibaraki 300-0393, Japan (sakagami@ams.kuramae.ne.jp)

³Graduate School of Urban Environmental Sciences, Tokyo Metropolitan University, 1-1, Minami-osawa, Hachioji, Tokyo 192-0397, Japan (m.wata@tmu.ac.jp)

Cenococcum geophilum (*C. geophilum*) is a type of rhizobia that lives in catchment areas [1]. Sclerotium grains are resting bodies of *C. geophilum*, and they contain a remarkable amount of 4,9-dihydroxyperylene-3,10-quinone (DHPQ). Their DHPQ has been considered as a precursor of fossil perylene [2]. DHPQ itself has been found and synthesized more than 50 years ago [3], however, its role for sclerotium grains of *C. geophilum* is still unclear. From its chemical structure, antimicrobial activity has been suspected because the main structure of DHPQ is similar to that of tetracycline.

DHPQ was synthesized according to the literature [3], then, the antimicrobial activity of DHPQ was examined by minimum inhibitory concentration (MIC) using *Escherichia coli* (*E. coli*) and *Staphylococcus aureus* (*S. aureus*) as typical bacteria. Other hydroxyquinones having the same main structure such as tetracycline, 5,8-dihydroxy-1,4-naphthoquinone (DHNQ), and 1,4-dihydroxyanthraquinone (DHAQ) were also examined for comparison.

Tetracycline showed strong antimicrobial activity for both *E. coli* and *S. aureus*, and DHNQ showed weak antimicrobial activity. However, DHPQ and DHAQ showed no antimicrobial activity for both bacteria. This result suggested that remarkable amount of DHPQ in sclerotium grains of *C. geophilum* should have other important functions rather than antimicrobial activity.

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[1] Massicotte *et al.* (1992) *Can. J. Bot.* **70**, 125-132. [2] Itoh *et al.* (2012) *Geochim. Cosmochim. Acta* **95**, 241-251. [3] Calderbank *et al.* (1954) *J. Chem. Soc.* **1954**, 1285-1289.