

# World Congress and Exhibition on Antibiotics

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## Antibacterial activities of metabolites from *Platanus occidentalis* (American Sycamore) against fish pathogenic bacteria

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One approach to the management of common fish diseases in aquaculture is the use of antibiotic-laden feed. However, there are public concerns about the use of antibiotics in agriculture and the potential development of antibiotic resistant bacteria. Therefore, the discovery of other environmentally safe natural compounds as alternatives to antibiotics would benefit the aquaculture industries. Four natural compounds, commonly called platanosides, [kaempferol 3-O- $\alpha$ -L-(2",3"-di-E-p-coumaroyl)rhamnoside(1), kaempferol 3-O- $\alpha$ -L-(2"-E-p-coumaroyl-3"-Z-p-coumaroyl)rhamnoside (2), kaempferol 3-O- $\alpha$ -L-(2"-Z-p-coumaroyl-3"-E-p-coumaroyl)rhamnoside (3) and kaempferol 3-O- $\alpha$ -L-(2",3"-di-Z-p-coumaroyl)rhamnoside (4)] isolated from the leaves of the American sycamore (*Platanus occidentalis*) tree were evaluated using a rapid bioassay for their antibacterial activities against common fish pathogenic bacteria including *Flavobacterium columnare*, *Edwardsiella ictaluri*, *Aeromonas hydrophila* and *Streptococcus iniae*. The four isomers and a mixture of all four isomers were strongly antibacterial against isolates of *F. columnare* and *S. iniae*. Against *F. columnare* ALM-00-173, 3 and 4 showed the strongest antibacterial activities, with 24-h 50% inhibition concentration (IC<sub>50</sub>) values of 2.13 $\pm$ 0.11 and 2.62 $\pm$ 0.23 mg/L, respectively. Against *S. iniae* LA94-426, 4 had the strongest antibacterial activity, with 24-h IC<sub>50</sub> of 1.87 $\pm$ 0.23 mg/L. Neither a mixture of the isomers nor any of the individual isomers were antibacterial against isolates of *E. ictaluri* and *A. hydrophila* at the test concentrations used in the study. Several of the isomers appear promising for the potential management of columnaris disease and streptococcosis in fish.

### Biography

Kevin K Schrader completed his PhD in 1995 from Auburn University, AL, and Postdoctoral studies with Mississippi State University in 1996-1997. He is a Research Microbiologist at the USDA, ARS, Natural Products Utilization Research Unit, National Center for Natural Products Research. He has authored and co-authored more than 80 papers in peer-reviewed journals, one U.S. patent, an edited book, and over 10 invited book chapters, and he has been serving as an Editorial Board Member of *repute*.

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