

## DISTRIBUTION OF SULFONAMIDE RESISTANCE GENES IN BACTERIA ISOLATED FROM RAINBOW TROUT IN TURKEY

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### DISTRIBUCIJA GENA OTPORNOSTI NA SULFONAMIDE KOD BAKTERIJA IZOLOVANIH IZ KALIFORNIJSKE PASTRMKE U TURSKOJ

#### *Apstrakt*

Cilj ovog istraživanja bio je da se ispita otpornost bakterija na sulfonamide i učestalost pojave gena otpornosti na sulfonamide kod bakterija izolovanih iz kalifornijske pastrmke (*Oncorhynchus mykiss*) sa farmi u Rizi i Trabzonu, Turska. Izolovano je 13 bakterijskih vrsta i sve bakterije su pokazale otpornost na sulfametoksazol. Među genima otpornosti na sulfonamide najčešće je utvrđen *sul1* (24%), zatim *sul2* (20%) i *sul3* (12%). Geni višestruke antimikrobne otpornosti otkrivene su kod 3 od 33 (9%) bakterija. Dva *Aeromonas hydrophila* soja sadržavala su oba gena, *sul1* i *sul2*. Ovim istraživanjem utvrđeno je da su bakterije otporne na sulfonamide i njihovi geni rezistencije prisutni u različitim vrstama. Ovo istraživanje takođe ukazuje da je vodena sredina rezervoar *sul* gena, u kojoj ovi geni mogu biti prenošeni ne samo na bakterije koje žive u vodi, nego i na one koje su povezane sa bolestima ljudi.

*Ključne reči: otpornost bakterija; patogeni riba, sulfonamidi, farme kalifornijske pastrmke*

#### *Abstract*

The aim of this study was to investigate the antimicrobial resistance to sulfonamide and the prevalence of sulfonamide resistant genes of bacteria isolated from rainbow trout (*Oncorhynchus mykiss*) farms in Rize and Trabzon, Turkey. 13 bacterial species were isolated and all of the bacteria exhibited resistance to sulfamethoxazole. Among sulfonamide resistance genes, *sul1* (24%) was found in the highest frequency followed by *sul2* (20%) and *sul3* (12%). Multiple antimicrobial resistance genes were detected in 3 of 33 (9%) bacteria. Two *Aeromonas hydrophila* strains contained both *sul1* and *sul2*

genes. This study revealed that sulfonamide resistant bacteria and their resistance genes were distributed in different species. This research also suggests that the aquatic environment is a reservoir of *sul* genes, in which the genes may be transferred among not only aquatic bacteria but also human related bacteria.

*Keywords: Antimicrobial resistance; Fish pathogen; Sulfonamide; Rainbow trout farms*