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Assessment of Water Quality Using Benthic Macroinvertebrates and Physicochemical Parameters of Sarıkız Fountains and Gürdük Stream (Gediz Basin, Turkiye)

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Aim of the study: The basic aim of this study was to determine the biological richness of the stream with particular emphasis on the relationship between the structure of the benthic macroinvertebrate community and the physico-chemical features of their environment and to assess water quality of the Sarıkız Fountains (St.1) and Gürdük Stream (St.2, St.3).

Material and methods: Benthic macroinvertebrate communities from Sarıkız Fountains and Gürdük stream were sampled from five sampling sites, seasonally between 2016 - 2017. All phases of the study including sampling, collecting and identification were performed according to the methods (10870 BS EN ISO 2012) given by Water Framework Directive (WFD). All the collected animals were immediately fixed in Ethanol 70%. The macroinvertebrates were counted under the lowest possible taxon and a stereomicroscope. Samples were sorted and identified to the lowest possible taxon. Shannon-Wiener Diversity and Pielou's Evenness indices were used to characterize species diversity in the community. Non-metric Multidimensional Scaling (NMDS) was used to reveal dissimilarities that found in community and Principal Component Analysis (PCA) was performed as an eigenvector method to reveal the community ordination in Gediz Basin. The National Index based on BWMP (Spanish version) was used very first time to reveal the water quality.

Results: As the result of the study, 71 species from 57 genera belonging to 25 families (Athericidae, Baetidae, Caenidae, Ceratopogonidae, Chironomidae, Corixidae, Culicidae, Dixidae, Dytiscidae, Elmidae, Ephemeridae, Gomphidae, Helophoridae, Heptageniidae, Hydraenidae, Hydrohilidae, Hydropsychiidae, Leptoceridae, Leptophlebiidae, Luctricidae, Limonidae, Scirtidae, Simulidae, Sphaeriidae, Tubificidae) found in Gürdük Stream and Sarıkız Fountains. The richest species diversity (Shannon-Wiener) was found in Sarıkız Pınarları (St1) and Gürdük Stream (St.2 and St.3) respectively 2.22, 1.72 and 0.27. The national index used to determine water quality has yielded the same results. As the result the water quality of Gürdük Stream was found in Class Good.

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Keywords: Gediz River Basin, Bioindicators, Biological monitoring, benthic fauna.