Abstract This study was performed to investigate the metal concentrations in muscle, liver, gonad, and gill of gilthead seabream (*Sparus aurata* L., 1758), European seabass (*Dicentrarchus labrax* L., 1758), and keeled mullet (*Liza carinata* Valenciennes, 1836) from Yelkoma Lagoon, northeastern Mediterranean region. So, the levels of cadmium, cobalt, chromium, copper, iron, manganese, nickel, lead, and zinc in tissues of specimens from the lagoon were determined by inductively coupled plasma optical emission spectrometer. Concentrations of metals in muscles of the examined species ranged from 0.10 to 0.47 mg kg\(^{-1}\) for cadmium, 0.10 to 0.43 mg kg\(^{-1}\) for cobalt, 0.17 to 0.72 mg kg\(^{-1}\) for chromium, 0.62 to 1.03 mg kg\(^{-1}\) for copper, 28.9 to 52.3 mg kg\(^{-1}\) for iron, 0.75 to 0.96 mg kg\(^{-1}\) for manganese, 0.11 to 0.57 mg kg\(^{-1}\) for nickel, 0.19 to 0.47 mg kg\(^{-1}\) for lead, and 6.01 to 13.9 mg kg\(^{-1}\) for zinc, respectively. Additionally, metal concentrations in muscles of fish were assessed for human uses according to provisional tolerable weekly intake and provisional tolerable daily intake.

Keywords Fish · Metals · Tissues · Yelkoma Lagoon · Mediterranean

Introduction

Yelkoma Lagoon is located in Yumurtalık town of Adana city and on the coast of the Mediterranean where close by İskenderun Bay. Approximate surface area of the lagoon is 2,000 ha with an average depth of 0.5 m. Some commercial fish species of the lagoon were European eel (*Anguilla anguilla*), gilthead seabream (*Sparus aurata*), European seabass (*Dicentrarchus labrax*), and miscellaneous mugil species, besides blue crab (*Callinectes sapidus*). It is reported that the lagoon may be faced to agricultural pollutants directly or indirectly (Anonymous 1997). Transfer of metals from point and nonpoint sources into coastal waters is of major interest in environmental chemistry and biology (Szefer et al. 1996; Summers et al. 1996). Heavy metals within coastal lagoons are an increasing concern because they have high...
phytotoxic effect and ability to change the primary productivity of the coastal environment (Lacerda 1994). Therefore, it is imperative to analyze metals within commercial species in assessing potential toxic levels from the human-nutritional standpoint (Vazquez et al. 1995; Vazquez and Sharma 1996). In general, metal accumulations in different tissues of the fish show significant differences. For example, fish liver showed higher enrichment coefficients than gill and muscle (Canlı and Atlı 2003; Türkmen and Ciminli 2007; Yılmaz et al. 2007). The aim of the study was to determinate the metal levels in different tissues of *S. aurata*, *D. labrax*, and *Liza carinata* collected from Yelkoma Lagoon and to assess whether these fish are acceptable for human consumption.

### Materials and methods

Specimens were collected with various fishing methods by fishermen in autumn 2006 and spring 2007 from Yelkoma Lagoon, Mediterranean region in Turkey (Fig. 1). Three fish species examined in this study are gilthead seabream (*S. aurata* L., 1758), European seabass (*D. labrax* L., 1758), and keeled mullet (*L. carinata* Valenciennes, 1836; Table 1). Samples were frozen in pre-washed polyethylene bags, and frozen samples were brought to the laboratory in ice chests. Total length and weight of the samples were measured before dissection.

Approximately 0.5-g sample of muscle, liver, gonad, and gill each (the tissues of two to four samples were pooled when liver and gonad