TRANSGENERATIONAL TOXICITY OF TRIBUTYLTIN AND ITS COMBINED EFFECTS WITH POLYCHLORINATED BIPHENYLS ON REPRODUCTIVE PROCESSES IN JAPANESE MEDAKA (*ORYZIAS LATIPES*)

KUKUH NIRMALA,† YUJI OSHIMA,*‡ RICHARD LEE,§ NOBUYOSHI IMADA,‡ TSUNEO HONJO,‡ and KUNIO KOBAYASHI‡

†Faculty of Fisheries, **Bogor Agricultural University**, Kampus IPB Darmaga, Bogor, Indonesia

‡Faculty of Agriculture, Kyushu University, Hakozaki, Fukuoka 812, Japan

§Skidway Institute of Oceanography, Savannah, Georgia, USA

Abstract

Japanese medaka (*Oryzias latipes*) were fed daily on one of four diets containing tributyltin (TBT), PCBs, a combination of TBT and PCBs, or a control diet (with nothing added). Contaminant doses were 1 g/g body weight per day for 3 weeks. The combination of TBT and PCB showed additive effects on the spawning of medaka, resulting in a significant reduction in spawning frequency, and on the number of spawned eggs and fertilization success when compared with effects in fish fed either a TBT or PCB diet. The adverse effects on the reproductive success of medaka may have been due to endocrine disruption caused by accumulation of both TBT and PCB. The TBT treatment significantly reduced embryo and larval survival from eggs (279 ng TBT/g), which were spawned from females containing 2,390 ng TBT/g body weight from the TBT diet. This result indicates transgenerational toxicity. The PCB diet caused fewer adverse effects than the TBT diet with respect to spawning frequency, egg survival, hatching, and swim-up success of larvae. When both TBT and PCB were in the diet, there were additive effects on spawning success as noted above but antagonistic effects on embryological success of eggs and swim-up success of larvae.

Keywords : Tributyltin Polychlorinated biphenyls Combined effects Medaka *Oryzias latipes* Reproduction