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*(Cyprinus carpio)*

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( )

( / / : / / : )

δ

*Cyprinus carpio*

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( $p < /$  )

( $p < /$  )

( $p > /$  )

*(Cyprinus carpio)*

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(Vale, 1998 ) ( )

Benarji, and Rajendranath, 1990; Soldatov, )  
- (2005  
(Watterson, 1999 )

(Triebkorn *et al.*, 2000)

-(Coppage and Mathews, 1974 )

(Nouri *et al.*, 2000; Tavakol, 2007)  
(Honarpajouh, 2003)

Dutta and Arends, 2003; Banaee *et* )  
(al., 2009a, b, c (Tarahi Tabrizi, 2001)

Khoshbavar )  
Rostami *et al.*, 2006; Soltani and Pourgholam, (Shayeghi *et al.*, 2007)

(Üner *et al.*, 2006) (2007 (Shayeghi *et al.*, 2007)

(Pourgholam, *et al.*, 2006; Banaee *et al.*, 2008) Arjomandi *et al.*, ) (Bagheri, 2007)

Pourgholam, *et al.*, 2001; ) Shayeghi ) (2010

Sharifpour *et al.*, ) (2006 (*et al.*, 2007; Arjomandi *et al.*, 2010

(2006 (USEPA, 2005)

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( ± / g)

(CHO-PAP)

NAD<sup>+</sup>

NADPH

)

( mg/l

± °C

%

OECD

OD

µg/L

/

/ mg/l)

LC<sub>50</sub>

- (Banaee *et al.*, 2008)

( /

Ganji and )

( )

(Arvand, 2002

(

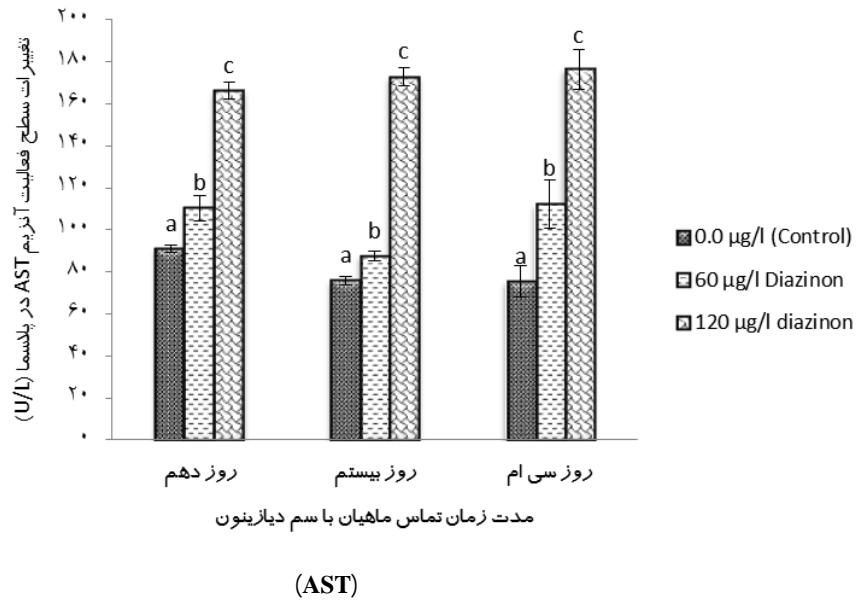
)

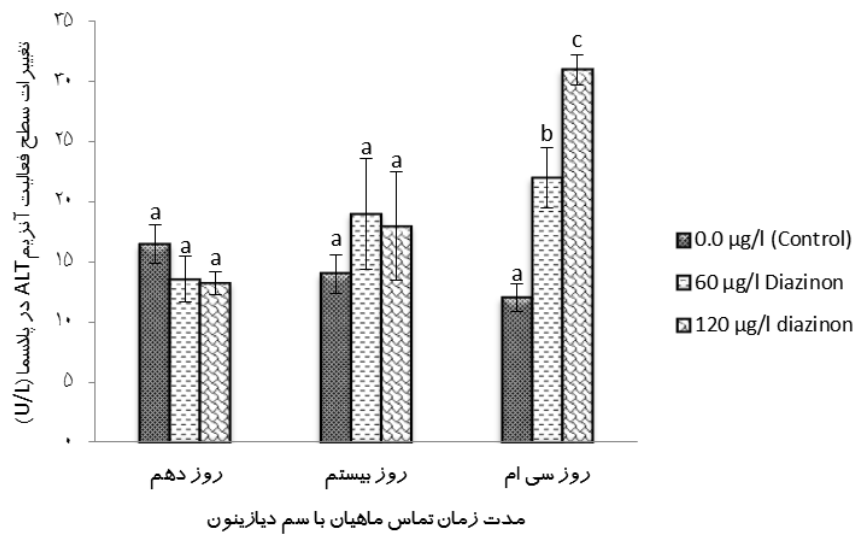
)

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$\mu\text{g/L}$   
( )  
Mintab 13 (ANOVA)  
Kolmogorov-Smirnov Normality Test  
AST ( $\alpha = /$  ) %  
( ) ( $p < /$  )  
ALT  
( $p < /$  )  
( )





(ALT)

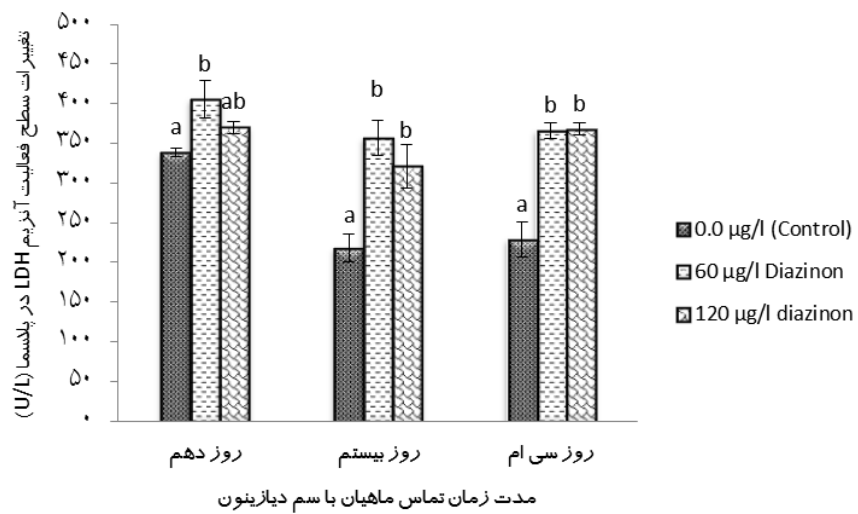
CK

( $p < /$ )

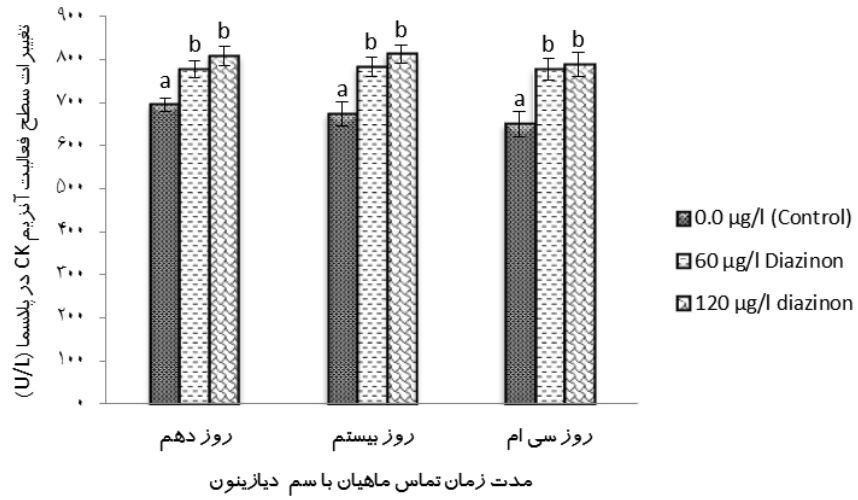
.( )

LDH

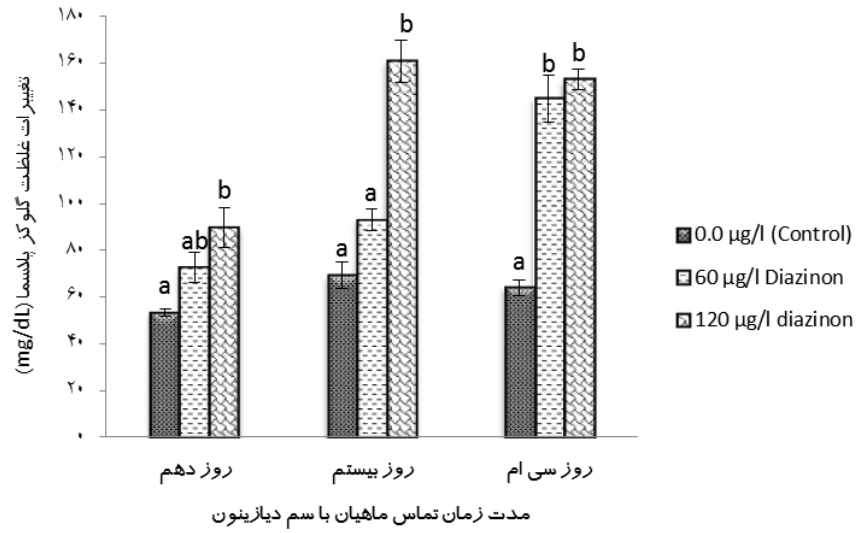
( $p < /$ )



(LDH)



(CK)



( $p < /$  )

.( )

( $p < /$  )

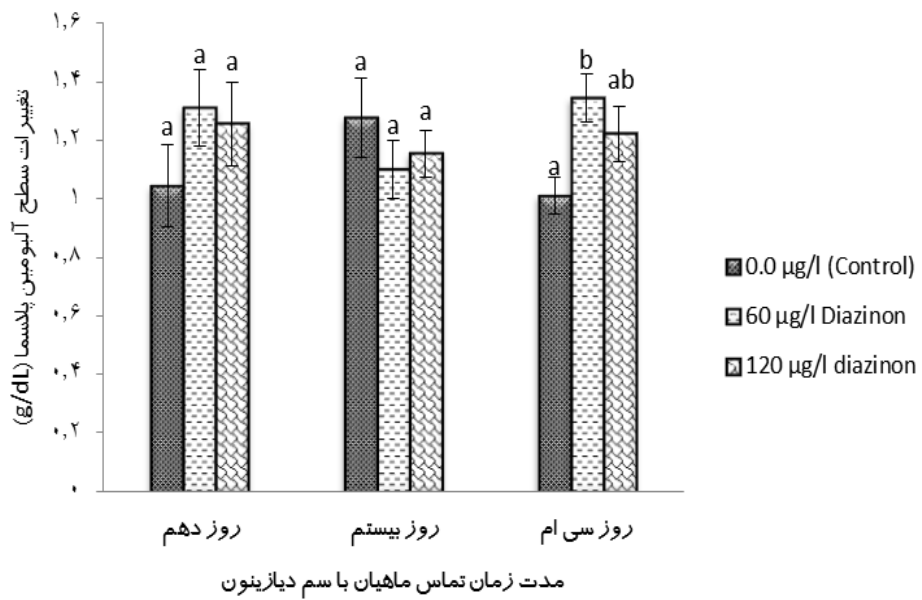
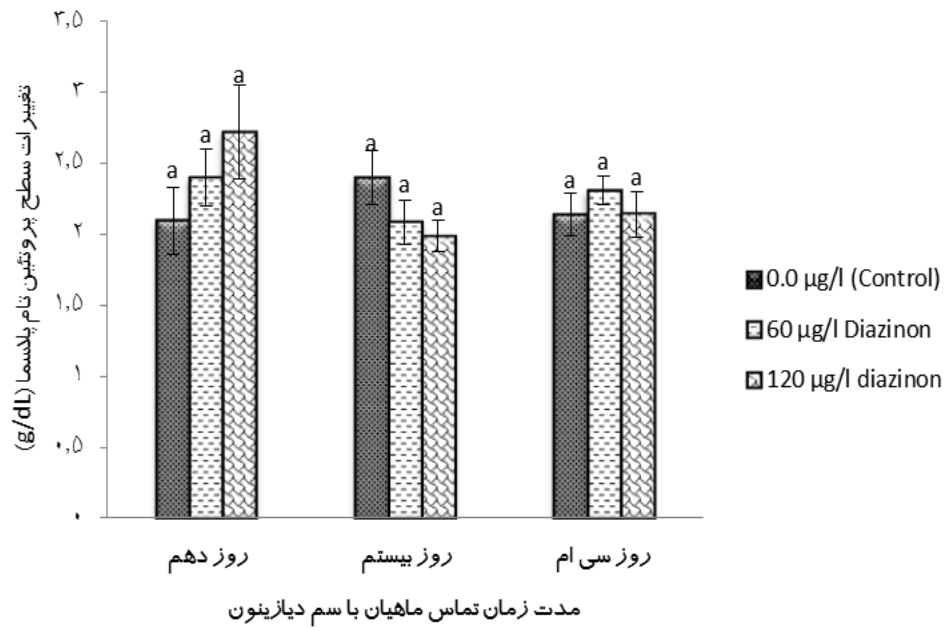
.( )

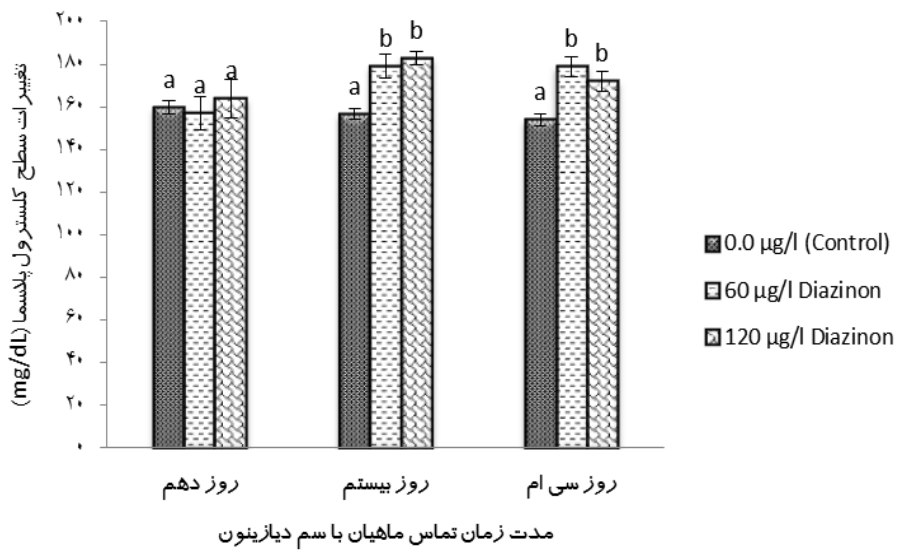
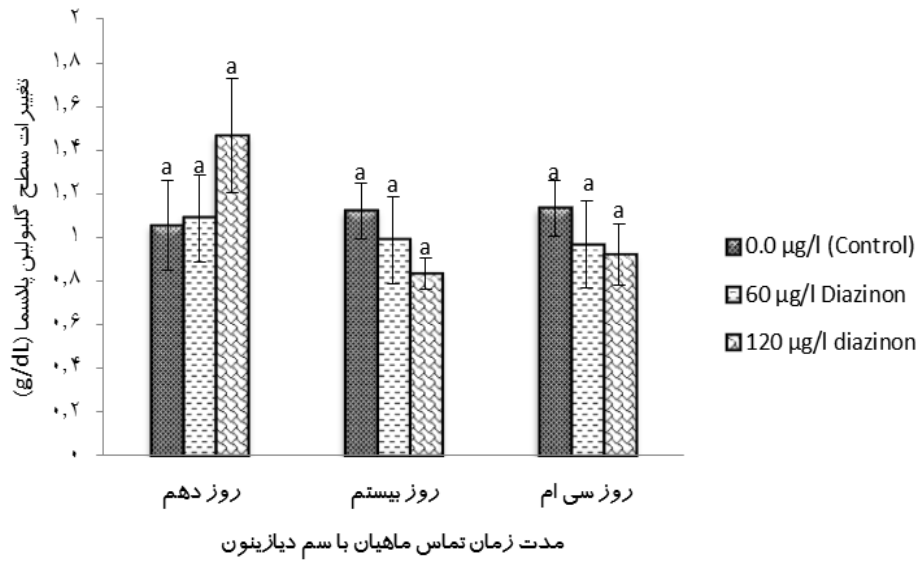
( $p < /$  )

.( )

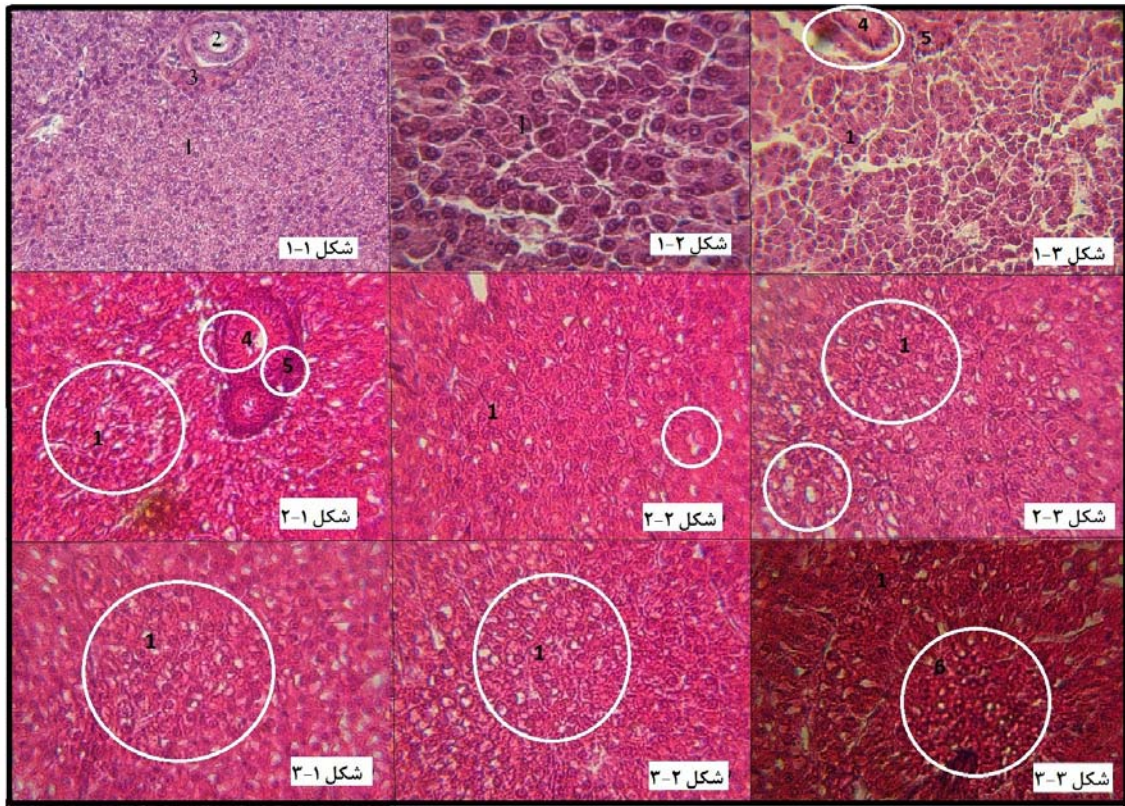
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( ) ( x ) :  
 ( ) ( )  $\mu\text{g/L}$  ( )  $\mu\text{g/L}$   
 (2) (1) (6) (5) (4) (3)

$\mu\text{g/L}$

$\mu\text{g/L}$ )

(

$\mu\text{g/L}$

...

- ( $p < 0.05$ )

(Hodgson, 2004)

(Vale, 1998)

- ( $p < /$  )

Banaee, )

.(2012

P<sub>450</sub>

.(de Aguiar *et al.*, 2004)

- (Keizer *et al.*, 1995)

(ROS)

Saha and Kaviraj, ) *Heteropneustes fossilis*

Das and ) *Labeo rohita* (2009

(Mukherjee, 2003

*Oncorhynchus mykiss*

(*Oncorhynchus mykiss*)

(Velisek *et al.*, 2006)

(Banaee *et al.*, 2011)

.(Isik and Celik, 2008)

.(Jon, 2007)

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<sup>1</sup> Diazoxon  
<sup>2</sup> Pyrimidinol

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Zaragoza *et al.*, )  
 .(2000

Velisek )  
 LDH (et al., 2006) (1998)  
 Ahmad *et al.*, 2002; Sanz *et al.*, )  
 (CK) *C.punctatus*  
 (Grzyb and Skorkowski, 2005) (AST) (Roy and Bhattacharya, 2006)  
 Gongga *et al.*, ) (Haagensen *et al.*, 2008) Srivastava *et* ) (ALT)  
 (Dickmeis *et al.*, 2001) (2004) Petrović *et al.*,) (al., 2004  
 CK (1996)  
 (Bhattacharya *et al.*, 2008)

-(Ozawa *et al.*, 1999)

AST (Velisek *et al.*, 2008)  
 Banace, ) AST ALT LDH  
 LDH CK ALT (2006)  
 (Svoboda, 2001)

...

ALT AST

Srivastava *et al.*, )  
 ALT AST (2004; Rao, 2006)  
*Channa punctatus*  
 (Agrahari *et al.*, 2007)

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## Biochemical Characteristics of Blood and Histopathological Study of Experimental Diazinon Poisoning in Common Carp (*Cyprinus carpio*)

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(Received: 23/10/2010 , Accepted: 07/03/2011)

### Abstract

Diazinon is commonly used for pest control in the agricultural farms surrounding freshwater reservoirs. Therefore, this study was conducted to determine the sub-lethal toxicity of this organophosphorous pesticide, in aquatic ecosystems as a pollutant, and its effects on histopathology of liver and some biochemical blood parameters of common carp, *Cyprinus carpio*. Diazinon was applied at sub-lethal concentrations of 60 and 120 µg/L during 10, 20 and 30 days. Compared to the control specimens, fish after a chronic exposure to diazinon had significantly ( $p<0.05$ ) higher plasma Aspartat transaminase (AST), Alanin transaminase (ALT), alkaline phosphatase (ALP), lactate dehydrogenase (LDH), cretinin phosphokinase (CK) activities, and levels of glucose, albumin and cholesterol, but no significantly differences in total protein and globulin levels were observed between treated fish and control group. The histopathological effects of diazinon on liver tissue of *C. carpio*, were examined by light microscopy. Disorientation of liver cells, cytoplasmic and nuclear material deposition, vacuoles formation in liver tissue, liver cell necrosis and destruction of the structure and rupture of the blood sinuses were observed in the liver tissue of treated fish by diazinon.

**Keywords:** *Diazinon, Biochemical parameters, Liver histopathology, Common carp*