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Amphipoda Odonata Oligocheta Plecoptera Trichoptera Ephemeroptera Diptera

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et al., 1999., Poff *et al.*,1997., McCafferty,1981)
(Sweeten ,2009 ., Abdoli

Sasan sarayi,2004 .,

(Sani, 1997)

, Sandin &)

Johnson, 2000 Sani, 1997 , Kyaby *et al.*, 1999 ,
Helsenhoff, 1999 Needham, 1996 , Robinson,
(2001,

Lydy *et al.*, 2000., Lin,)

(2008

(Rosenberg *et al.*,1999)

Rosenberg *et al.*,1999.,)

(Miller and Semmens,2002

(McCafferty,1981)

Alvarez *et*)

(*al.*,2009.,sandin and Johnson, 2000

(Bioassessment)

Ortize and)

Uyanik *et al.*,2005., Shannon , 1948. Puig,2007
(Fries and Bowles, 2002 .,

Afshin., 1984 .,)

(Ebrahim Nejad, 2000

Hilsenhoff,1988 ., Jessup *et al.*, 1999)

Forenshell, 2001 ., Sani, 1997 .,Quigley, 1986.,
Stephens& Farris,2004., Sweeten ,2009.,
(Zimmerman, 1993.,

Ephemeroptera, Plecoptera,

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.(Baker and Huggins, 2005

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Ahmadi and Winterbourn and Gregson,1981.,
Naficy, 2000., Lalli and Parsons,1997., Naderi
(Jolodar,2006.,

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Pipan, 2000., Roberts *et al.*,2005, Usinger,1963.,)

,2004, Shomali and Abdolmaleki 1997)

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$$H' = - \sum p_i \log 2p_i$$

EPT

$$H' =$$

EPT

$$n_i = i$$

$$P_i = i$$

$$n =$$

(Karr ,1998)

(HFBI)

(Hilsenhoff , 1999)

$$HFBI = \sum x_i t_i / n$$

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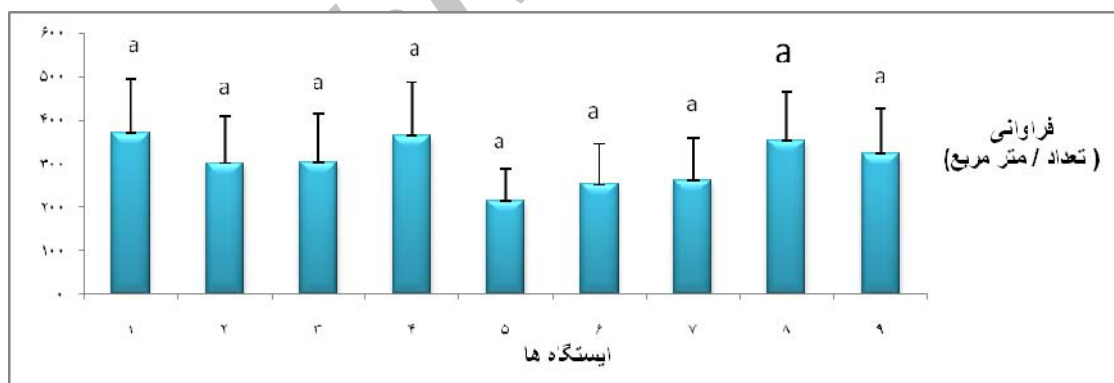
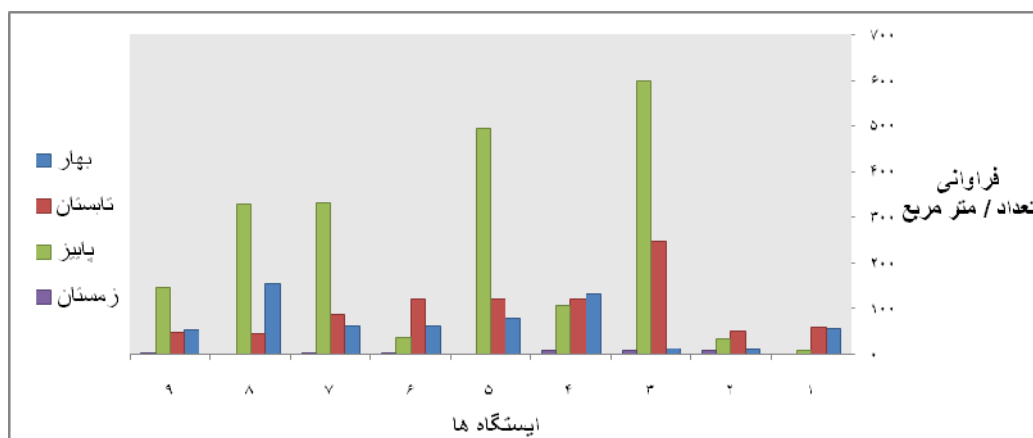
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Hydropsyche

Hydropsychidae

(Trichoptera)



(Diptera)

(Ephemeroptera)

Chironomidae

Simuliidae

Baetidae

Baetis

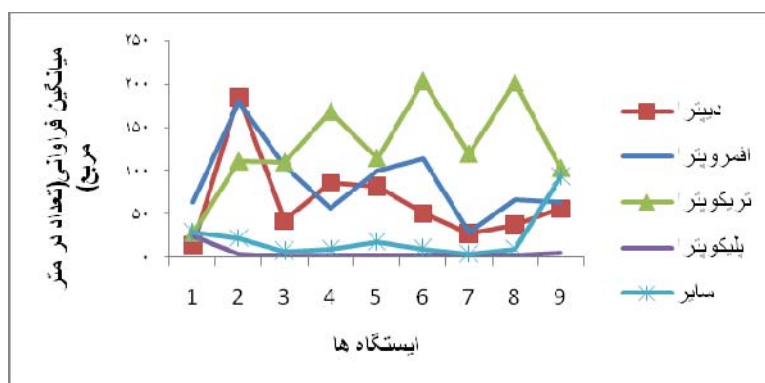
(plecoptera)

Pseudocoleon

Heptagenidae

Heptagenia

Amphipoda Oligochaeta Nemouridae
Hymenoptera odonata Gasteropoda Coleoptera Perlidae Perlodidae Leuctridae Chloroperlidae
Lopidoptera Colombola Decapoda



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Crustacea	Amphipoda	<i>Gammarus</i>	Gammaridae
	Decapoda	<i>Harrisii</i>	<i>Rhithropanopeus</i>
			Panopeidae
			Psychomyiidae
		<i>Nstabilis</i>	<i>Hydropsyche</i>
		<i>Angostopinis</i>	Hydropsychidae
	Trichoptera	<i>Glossossoma</i>	Glossosomatidae
			Philophotamidae
		<i>Hydroptila</i>	Hydroptilidae
		<i>Depseudopsinae</i>	Polycentropodidae

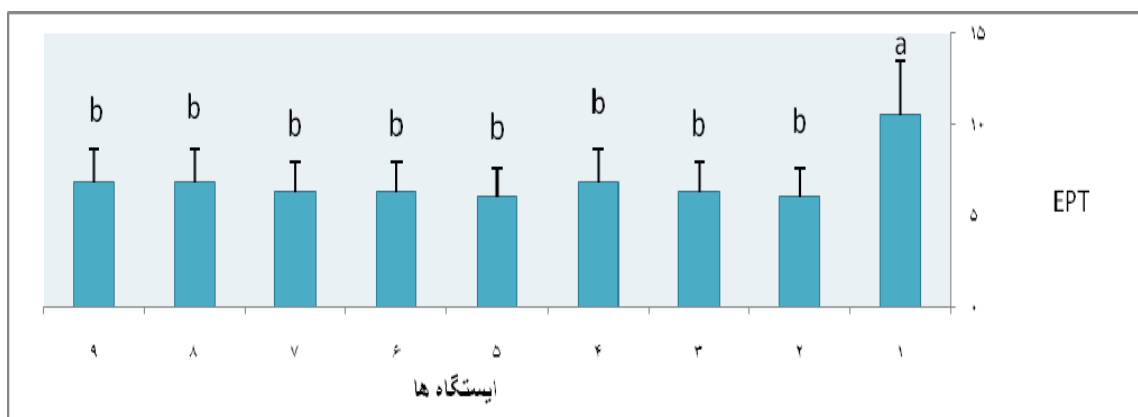
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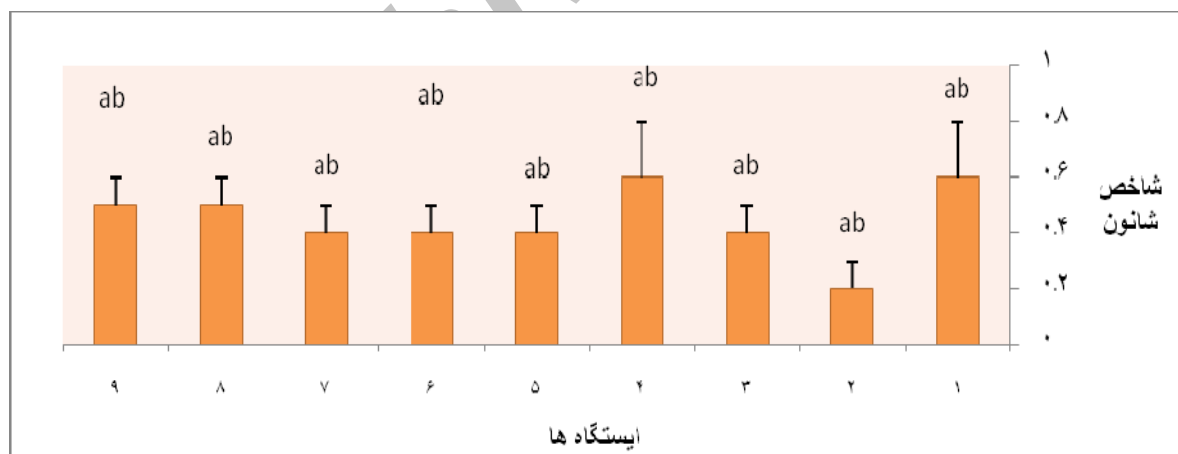
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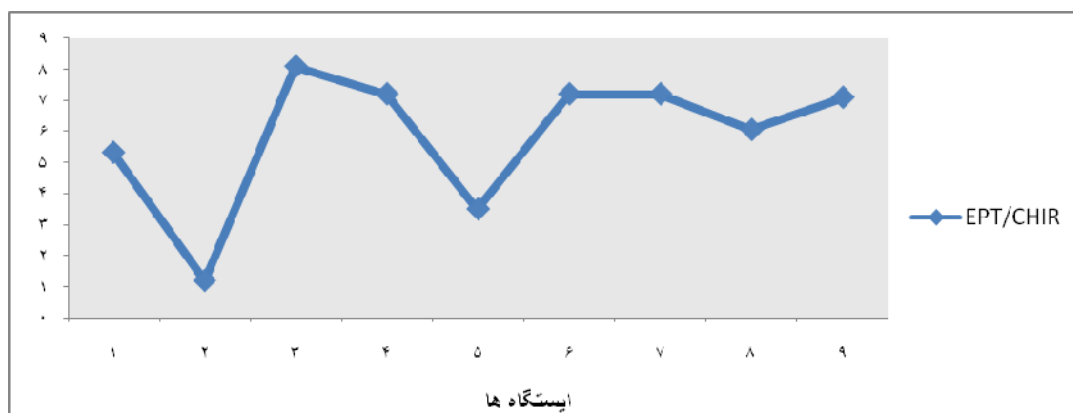
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, Fries and ,Bowles,2002)

.(Sandin and Johnson, 2000

., Jamalzad and Afroz, 1995

Sasansarayi, 2004 ., Abdolmaleki ,1997

Chironomidae

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Simuliidae

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Stephens)

and Farris,2004., Karr, 1998., Volker and Renn ,
(2000

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.(Hilsenhoff,1988)

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The Biological Assessment of the Zaringol Stream Using the Structure of Benthic Macroinvertebrates (Golestan Province)

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Abstract

This study was conducted to assess water quality level of Zarin Gol stream on macrobenthic invertebrates. Macrobenthic fauna were sampled from 9 selected sampling stations along the stream with an average distance of 22 km by using a Surber sampler every 45 days during the year. Sampling was replicated 9 times in each sampling station. Collected samples were fixed with 4% formalin, isolated, and then identified. The number of total abundance of macrobenthic fauna were counted to 2749.021 ± 1301.8 (ind/m²) belonging to 15 orders and 81 groups (families and genus). The minimum and maximum of total abundance (ind/m²) was at station 1 (370.63 ± 231.1) and at station 5 (215.73 ± 101.75), respectively. The main orders of macro benthic invertebrate communities in Zaringol stream included Diptera, Ephemeroptera, Trichoptera, Plecoptera, Oligocheta, Odonata and Amphipoda. Population structure of macro benthic invertebrates were analyzed by biotic Indices and the results showed significant differences in EPT and EPT/CHIR indices at different sampling stations ($p < 0.05$). Hilsenhoff and Shannon diversity indices indicated no significant differences ($p > 0.05$) along the stream. Evaluation of indicators revealed less water quality at stations 2 and 5 where located at the lowermost of fish farms. This reduction might be implicated to the effluents of water damps from fish farms running into the stream as diversity and total abundance (%) of susceptible macro-invertebrates decreased and that of resistant macrofauna increased due to water pollution. Hence, from the obtained results, this can be concluded that the use of benthic macro-invertebrates as bioindicator for the assessment of water quality of the stream is desirable.

Keywords: Macrobenthic invertebrates, Zarin Gol stream, EPT, EPT/CHIR index, Hilsenhoff index, Shannon diversity

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