



RESEARCH PAPER

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**Evaluation of aquatic insect fauna such as heteroptera, ephemeroptera, diptera, trichoptera, coleoptera, odonata and so on in east of golestan province**

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**Abstract**

The largest branch of a million species of animals is arthropods that have been identified from them. Ranked first in terms of the number and variety of animal species possess. Arthropods compatibility so that all ecosystems and habitats around the world have been occupied. Altitude of 5000 meters to 6000 meters deep seas of mountains is seen. In this study in 2011-2012, insects (arthropods), river water, stagnant water and the city of Khan Bobin, Dalande, Ramiyan, Azadshahr, Nodehkhandoz, Gonbad, Kalale, and Minodasht Galikash in Golestan province were studied. Sampling of gentle streams, steep, algae and aquatic plants, mud and sand substrate was performed. Samples collected by stereo microscope and the key to the diagnosis and identification of aquatic insects were counted.

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## Introduction

Apart from natural beauty, fish resources, human use, etc., have their place in the waters of many microorganisms (Usinger, 1974). Oups of aquatic insects are arthropods that live in the water phase of your life. Some of them live near water and are somehow associated with the water. Semi-aquatic insects of this group as some have called. The importance of insect transmission of disease agents and some of the stages of his life as an indicator of water pollution is. The immature stages of some of them have been used in research related to toxicology (Merrit and Commius, 1996). The largest branch of a million species of animals is arthropods that have been identified from them. Ranked first in terms of the number and variety of animal species possess. Arthropods compatibility so that all ecosystems and habitats around the world have been occupied. Altitude of 5000 meters to 6000 meters deep seas of mountains is seen. Among the arthropods, insects are known groups where large numbers are found in ponds and streams. Each of the main groups of species of aquatic insects, are observed in all continents, in Africa so that a stream is like a brook in California (Usinger, 1974). Apart from Culicidae mosquitoes that are medically important insects, a number of other aquatic insects are able to transmit diseases such as anthrax and tularemia (Foil, 1899). Today, 11 orders of insects are aquatic (Hujat, 2003). Some of them are somewhat semi-aquatic. All of these insects, except the frame aquatic (Coleoptera), and water mites (Hydracarina) before puberty and after puberty in dry, live in water. Although I sometimes frame and sleep all the time in water but are totally dependent on oxygen. Thus, the secondary and incomplete insects have adapted to aquatic life (Usinger, 1974). Iran having a diverse climate and water flow with large and small there are also ponds, natural and artificial dams arthropods is the perfect place to grow Some of them are also important in disease transmission in the role played And also in a number of water resources as national wealth of our nation are the biological richness of the collection. Except in Iran do extensive research on the Culicidae

family mosquito's larvae are aquatic, and significantly country in other major work has been done. Motivation and aims of the study were evaluation of aquatic insect fauna such as heteroptera, ephemeroptera, diptera, trichoptera, coleoptera, odonata and so on in east of golestan province.

## Materials and methods

To perform this study from April to September over the 20 samples from nine locations, which result in approximately 1867 samples collected larvae, nymphs and adults of aquatic insects. The samples based on habitat type and activities were collected with different methods. More larvae and pupae were caught by a wire mesh Order a day were insect nymphs, dragonfly wings and hairy Zygoptera and using scoop nets by dipping it in water and climate Paste the ground floor and then scrape the bottom of the bed and then the insect larvae or nymphs With the help of water or pulling the wire mesh wire mesh in the bottom water flow and Against the grain of the specimens were caught. Age and the aquatic insects that are swimming in water with high speed and there are more stagnant waters, were caught with the screen. Trichoptera with a number of atmospheric water out and explore the rocks were collected. Then the samples collected in sealed glass containers in which water was transported to the laboratory. And ethanol was 70% and by stereo microscope and the key to the detection and identification of aquatic insects was counted. Based on the results of orders, families and genera of aquatic insects were on the tables.

## Results and discussion

Species obtained in this study are presented in the table. A remarkable diversity of aquatic insects in the river, the water there is ongoing and in various regions of Golestan province. Results showed that 6 straight. It sampled 20 times Khanbobin, Deland, Ramiyn, Azadshahr, Node Kkhandoz, Gonbad, Kalale, Galykesh, Minoodasht were in total, in total, 1867 samples of larvae, nymphs, pupae, adults were collected. Order by Order Dipteral collected in the

1205 sample (64/54 percent) (highest number) and subsequent orders, respectively, Coleoptera) Heteroptera with 206 samples, (11/03 percent). Order Hemiptera are a few of them that live in water. Some half thoroughly aquatic and others are semi-aquatic. Like all old water aquatic frame, although they are totally dependent on water, Use of oxygen for respiration. A day of Ephemeroptera, with 178 samples, 9/53) percent. (Wing-haired Trichoptera with 56 samples, 7/07) of (, Trichoptera insects like moth are dragonfly and Zygoptera of Odonata with 90 samples, 4/82) percent (frame Coleoptera samples with 56 2/99) percent (were identified (table 1).

Order Age of families Gerridae, Corixidae, Hydrometridae, Nepidae. Gerridae family members who are most familiar old water on the skating surface. They never do not go under water. (Usinger, 1974; Pennak, 1953). *Gerris* is such that the sample is found almost worldwide distribution. An interesting feature of this species, polymorphism is in their

wings. Some have normal wings and some have large wings and have been developed. Another feature is the fork in the right direction Skating surface water that provides water without breaking (Usinger, 1974). Of the Order Diptera Family Culicidae, Chironomidae, Tabanidae Simuliidae, Sciomyzidae and orders a day and Heptagenidae, Baetidae and Order and Dragonfly Aeshnidae, Gomphidae, Libellulidae and the Order of hard Balpvshan Dytiscidae, Gyrinidae and hairy wings Order Limmephilidae, were identified. Among insects, Diptera are the most diverse and most invertebrates Order Diptera with 1205 samples) 64.59 percent (the most abundant fish was sampled. Examples above stage was their larval or pupation. Of this Order Simuliidae families with 250 samples) 13 / 99% (Chironomidae' 5 samples) 0.26% (Culicidae 300 samples (16/06%) and Tabanydae with 360 samples (19.28 percent) were caught.

**Table 1.** Frequency distribution of aquatic insect orders a different city in Golestan Province.

Mino- dasht	Galikesh	Kalale	Gonbad	Nodekha ndoz	Azadsahr	Ramian	Daland	Khanbo bin	Region
									Order
13.33	8.28	14.70	4.65	17.94	9.61	9.58	7.06	13.02	Heteroptera
21.66	6.50	7.56	6.97	10.68	10.38	14.23	6.52	5.58	Ephemeroptera
25	70.41	57.98	76.74	63.24	6.53	61.79	74.45	66.44	Diptera
30	5.91	7.14	4.65	5.55	7.69	6.56	6.52	5.58	Trichoptera
6.66	3.55	5.46	4.65	2.13	2.30	2.08	2.17	1.39	Coleoptera
3.33	5.32	7.14	2.32	2.99	4.61	5.37	3.26	6.97	Odonata

Samples belonging to the family Culicidae and Chironomidae larvae and Tabanidae all the water flowing and stagnant waters of Culicidae were caught Vja Ray Global spread of mosquitoes that have a large group of Balan. This insect family Culicidae. Maximum number of pits are located in the riverbank were collected. Culicidae mosquito larvae are easily separated from the others the thoracic segments are welded together and larger than other parts of the body. Are more accustomed to vegetarianism Simulium genus of the family and family Simuliidae, Tabanidae, Tabanus genus was diagnosed Simuliidae small, black, and humpback humpback are (Borror *et al*, 1998). Black fly larvae and San aquatic herbicides

disc shaped by the wind behind your body, stick to rocks and other objects. There is a small square bracket in the chest with a strong Proleg. The mouth parts are formed with a shoulder. Larval body is protruding from the rear forward. The larvae are placed in steep streams. The larvae of diptera pupae within the cocoon of silk that are close (Pennak, 1953). Order Htropterus Gerridae family of the 26 samples (1.39 percent (, Corixidae, with 115 samples) 6.15 percent), Hydrometridae with 59 (3.16) and Nepidae,. With 6 samples (0/32%) were identified Order one of these families Heptagenidae day 93 samples (4.98%) and Baetidae with 85 samples (4/55 percent) were caught these families were identified to

genus Baetis and Heptagenia. This very unique animals Dfand, why are hiding among the rocks and aquatic plants. Starting in the last skin, mouth parts are analyzed. At this stage do not feed and die soon after mating and spawning (Borrer *et al*, 1998). Order of dragonflies and Asia Beck Aeshnidae three families with 11 samples) 58/0 percent) Gomphidae with 32 (1.71%) and Libellulidae with 47 samples (2.1 percent) were identified. Order Coleoptera Dytiscidae family of 38 samples (2.03 percent) Gyrinidae with 18 samples (96/0 percent) and the Order Trichoptera Limnephilidae family, with 132 samples (7.07

percent) were identified (Table 2). Perhaps the strangest part of the family Hydrometra, Hydrometridae petra is aquatic. These people have a slim body, long cylindrical and are fragile. Head length in this group is sometimes stretched to the length of the abdomen. Sprueing and got great feet and occasionally dropped Hemylitra not detectable (Pennak, 1953). All are carnivorous and predatory. Balan half aquatic groups are heterogeneous in terms of anatomy and habitat of each family is separated. Because they know Plyflytyk groups (Usinger, 1974).

**Table 2.** Frequency distribution of different families of aquatic insect's city of Golestan province.

Total percentage of families in each region	Mino-dasht	Gali-kesh	Kalale	Gonbad	Node khandoz	Azad-sahr	Ramian	Daland	Khan-bobin	Region / Family
	Frequ-ency	Frequ-ency	Frequ-ency	Frequ-ency	Frequ-ency	Frequ-ency	Frequ-ency	Frequ-ency	Frequ-ency	
13.39	11.59	21.14	6.77	12.5	10.40	11.42	16.04	13.33	1.05	<i>Simuliidae</i> ,
15.53	21.73	16	12.71	22.22	15.83	17.71	11.94	13.33	10.56	<i>Sciomyzidae</i>
16.06	18.11	21.14	12.71	15.97	21.71	12.57	14.17	0.18	12.32	<i>Culicidae</i>
19.28	22.64	0	14.40	25.69	24.88	18.28	17.91	16.07	17.60	<i>Tabanidae</i>
0.26	0	0	0.84	0	0.45	0	0	0	0.70	<i>Chironomidae</i>
1.39	0	0	2.96	0	1.80	1.14	0.37	0	2.81	<i>Gerridae</i>
0.32	0	6.85	0	0	0	0.57	0.74	0	1.05	<i>Nepidae</i>
6.15	9.42	0	11.44	8.33	0	6.85	4.10	2.67	7.74	<i>Corixidae</i>
3.16	0	6.85	9.32	0	0	2.28	4.10	0	8.09	<i>Hydrometridae</i>
4.55	7.24	5.14	5.50	0	2.71	2.28	4.47	4.46	6.33	<i>Baetidae</i>
4.98	2.17	2.28	2.96	6.94	8.14	5.71	5.59	1.4	3.87	<i>Heptagenidae</i>
2.51	2.17	0	3.81	0	1.80	2.28	0.37	2.67	4.22	<i>Libellulidae</i>
0.58	0	1.70	0.84	0	0	0.57	1.11	0.44	1.40	<i>Aeshnidae</i>
1.71	3.62	0	2.96	0	2.71	0	0.37	0	2.11	<i>Gomphidae</i>
0.96	0	0	1.69	0	0	1.14	1.1	0	3.16	<i>Gyrinidae</i>
2.03	0	0	1.69	0	1.80	6.85	3.73	0	2.81	<i>Dytiscidae</i>
7.07	1.44	2.85	5.50	8.33	7.69	10.28	9.32	23.66	14.08	<i>Limnephilidae</i>

The World Publishing has a great family Tabanidae. (Pennak, 1953) of the serious pests of humans and animals and they are bloody. A sex is readily detected. As seen in males and females separately are joined. Insects such as mosquitoes or Tendipedidae Chironomidae are everywhere to be seen. No trunk and does not bite. Most larvae are aquatic organisms. Many of the larvae in the chamber where they live [Pennak, 1953) this chamber is open on both sides of the nest hair Balan (Borrer *et al*, 1998). This study showed that 6 orders of aquatic insects in the water there is ongoing and the inhabitants of Golestan Province. (Diptera) large order of insects that are found in all habitats. Many of them live in water. Aquatic ecosystems in the world live in the pit. Complete metamorphosis and their larvae are vermiform and without eye. The common

characteristic of these insects, is the lack of thoracic legs. Instead bumps and false joints of the body without being seen. Many of them are done with the skin to breathe in oxygen from the air, get some time (Zhadin and Gerd, 1970). Relatively oldest and most primitive insect orders are the Ephemeroptera Usinger, 1974)) among the insects, the Ephemeroptera and Plecoptera are aquatic Nymfhay (Ahmadi and Nafisi, 2001) is characteristic of them having three long tail. Adults are short-lived but Nymfha with 2-3 years it has been compensated. In the long run to 27 times their skin. . Nymf around Bshshhay leaf sections of abdominal, are thin and feathery. Gill is very important in identifying the sex of the animals. The conversion of energy from plant foods are meat (Esmail sari, 1995). Abundant aquatic insect larvae and pupae of this study was Simulium.

These are the stages of his life spent in the fast flowing waters. And in other parts of the world, our country has been studied (Lane, 1996). Eleven orders of 29 orders of insects live in water (Hujat, 2003). Actual number of waterfowl and a few are semi-aquatic. All insects except beetles and aquatic scenes before puberty are aquatic and terrestrial after adulthood [Usinger, 1974]. Percent of fish samples in this study was to belong to the Order Tricoptera. Iran is not available, it still exists in Iran reported that Iranian entomology to detect and study their biology have not done much work) (Hujat, 1996). But extensive studies on this insect is in the world and about 4,000 species of them have been identified (Habibi talat, 1988) belongs to the family Tabanus sex was never identified in this review Larvae of this insect have bumps around your body that makes it easy to detect insects in this family are scattered all over the world of dragonflies (Odonata) of fresh water are all known bugs. Dragonflies are very useful insects,, (Romoser, 1981) although the fry larvae they are attacked. These animals have two sons playing under the Order are such that each two species obtained Zygoptera body aircraft such as the larvae are thicker and shorter than Zygoptera. They have relatively long legs stretched out and they will look like spiders. Bshshh rectal wall was not identified and removed. Gill while three were in Zygoptera is clearly visible in the abdomen. Shklnd and swimming fins act as leaf Gill (Esmail sari, 1995) larvae prominent feature of these animals, their development is very much lower lip. This organ has two front claws that are used for hunting. Lower lip at rest, folded and placed under the head. The genus Libellula is less mobility and can be hidden under the mud bed. But more Zygoptera are hidden amidst aquatic plants (Poalii darestani, 2005). Iran to report on Chirinomidae not provided, while in other countries, the study of their effects to allergy-causing them to have the larvae in red only insects that body hemoglobin is (10/58%) of insects this study belong to four families of the Order Najvrbalan and Gerridae, Corixidae, Hydrometridae, Nepidae were. About 9/14 the percentage of samples belonging to the review of

orders a day and had two families (Hujat, 1996) has pointed to the existence of two families of Iran. The most obscure of them in the water, and spring tails (Collembula) are a few of them can be found in the water like Sminthuridae study. Although these species are found in the water accidentally, but never in the water are not spawning (Poalii darestani, 2005). What are the results of this study during inferential Represents the frequency of these insects in the country Unfortunately, far less than those in Iran and their important role in the natural balance of supply and Fish food is given. The results show that it's not identified in entomology and study their behavior using molecular biology and morphology of action Able to understand the biological value of these insects, or possibly due to losses of some species can we used them or our control.

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