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Research Article

A COMPARISION OF INFANTS RELEASED FROM SWORD TAIL AQUARIUM LIYE-BREEDING TYPES WITH THEIR IN IRAN

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ABSTRACT

Introduction: the industry of aquarium fish is developing quickly in Iran and the number of people interested in keeping them increases every day. In this regard, fish growers and reproducers are trying to respond to this increasing demand by increasing the highly-demanded fish including sword tail aquarium live-breeding type. In fact, attempts have been made to improve the productivity and regeneration of these fishes through researches, experimental operations, variations in temperature, and various diets.
Methodology: the current study was conducted on 80 sword fish aquarium live-breeding types in two aquariums over 90 days during summer and autumn of 2013. Each of the 2 aquariums was divided to four sections. A certain degree of temperature was required for each part of these aquariums and a heater was installed in every section to provide the required heat. The temperature of each section was set respectively on 23, 25, 28 and 32 degrees centigrade. The results were later reported in the form of graphs and tables. The behavioral observation of the fishes was also studied by monitoring the aquariums.
Results: we believe that rising temperature to 23 to 28 degrees centigrade increases the number of fully-fledged fetuses in sword fish type. We also think that raising temperature to 28 to 32 degrees centigrade will decrease the number of non-fledged fetuses in sword fish type.
Discussion and conclusion: according to the above mentioned results, we can say that a relative increase in temperature has positive consequences on the evolution process of evolving fetuses, while an excessive increase in temperature has negative consequences on the evolution process of evolving fetuses. Based on the collection of the results of behavioral observations in sword tail type, it is possible that sword tail type members have group relations with their peers while swimming and feeding.
Keywords: comparison of the relationship between infants, live-breeding fish, sword tail, Iran

INTRODUCTION

As fishes live in water, various factors such as the physical and chemical factors of the water influence the life and the growth rate of fishes. The most important factors are temperature, density, and dissolved oxygen. A correct mixture of these factors is very efficient in the growth and development of the fishes. Due to economical consideration, we must make maximum use of the space. Increasing the density and temperature will have unfavorable consequences on the development of the fish. In this regard, growers and reproducers are trying to respond to this increasing demand by proliferating highly-demanded fishes including the 4 main types of sword fish, Guppy, Molly and Platt. Through empirical operations, temperature changes, and various diets; they attempt to improve the productivity and fertility of these fishes. Live breeding in fishes is a really complex phenomenon as it includes numerous changes in the pregnancy system of both male and female gender. In the viviparous type of teleosts, unlike other groups of vertebrates, there is no usual channel for the passage of seed like oviparous fishes. Some adaptation has taken place in viviparous fishes,

and fishes get pregnant in ovary and fetus is formed. Some modifications and changes have also taken place in the male genital. The male gender of the viviparous fishes has undergone compatibilities for internal fertilization. Some 2500 types of teleosts are already recognized of which some 500 are viviparous. Half of these fishes dwell in fresh water[1].

Although the reproduction of aquarium viviparous fishes is somehow different from type to type, their reproduction patterns are greatly similar to one another. The delivery time is somewhat under the control of the willingness of the female fish which can be postponed until ideal conditions are maintained. Puberty age of different types and also various members of a type differs according to environmental conditions[2,3].

Viviparous fishes swim in schools of 5 or more. There is a strong male in each school that is followed by the females. If you wish to have more males in the aquarium, it is recommended to increase the number of females as well so that no argument or fighting takes place among the males. Due to her extraordinary beauty, sharp tail, sword-like shape, and good adaptation with vegetal and pacifist fishes; sword tail fish is very popular with those who are interested in rearing aquarium fishes. Reproduction of this fish is easily possible. The length of sword fish body is different in various types. This fish comes in red, yellow and a mixture of colors and doesn't cost too much. Sword tail fish belongs to eastern Mexico and south east America and she is known by the scientific name "Xiphophrus Hellerii". Sword tail fishes are seen in various types: fence tail, black and white, black torso, red, green, yellow, sail-fin, spotted, orange and even jade. Sword tail fish is in the carp phylum of dentate fishes from the poecillidae family. The wild type of this fish usually has a silver color, while its developed type comes in various colors. This fish is a native of Mexico, Guatemala, and Honduras[4-6].

The male gender of sword tail fish has long, straight back fins. It has a slim, stretched and smaller body. It has a very long, sharp-pointed sexual fin which is never used as a fin. It has a bigger sword-like appendage in the lower area of his tail.

The female gender of sword tail fish has smaller back fins compared to the male. She is relatively bigger and fatter than the male. It has a ventral fin, while the male gender has no such fin and has a very long and sharp-pointed fin in its place. It has a smaller sword-like appendage in the lower area of her tail compared to the male[7,8].

Various types of swordtail fish include: Assorted Hi-Fin Swordtail ‹Black Hi-Fin Swordtail‹Black lyre tail Swordtail. ‹ Black Swordtail. ‹Calico Swordtail. ‹Gold Hi-Fin Swordtail. ‹ Gold lyretail Swordtail. ‹Gold Swordtail. ‹Gold Calico Swordtail. ‹Green Swordtail. ‹Koi Swordtail (Red & white).‹Neon Swordtail. ‹Pineapple Hi-Fin Swordtail. ‹ Pineapple Swordtail. ‹Pineapple Wagtail Swordtail. ‹Red Eye Swordtail.‹Red Hi-Fin Swordtail. ‹Red Lyre tail Swordtail, Red Swordtail.

Mating in swordtail fishes

The genitals are somewhat similar to the mammals' genitals. This tube is known as Gunopodium or sexual foot. The male fish's sperm moves through this channel towards the ovum and then moves toward the tube of ovary, the sperm of viviparous fishes has the ability to live and nourish in the ovary (that's why a female fish in this family can become pregnant 4 or 5 time even without a male fish around)[8].

The anal fin which is located at the end of the stomach has transformed in the male fishes and turned into a thin tube. Within the early moments of pregnancy, the seeds enter the body of mother fish and are fertilized in follicular ovary. The fetus's development begins right there. This type of pregnancy is known as follicular pregnancy. After the pregnancy period is over, the female fish begins delivering the infants. Infants, whose bodies have greatly developed, get out of the body of the mother fish in the form of a ball, then through a quick and leap-like move, they take the natural and usual shape and begin swimming[8].

The number of infants in each pregnancy depends on the type, age, nutrition, and the physical conditions of the female fish. For example, fishes who get pregnant for the first time deliver less infants, while old fishes deliver more dead fishes. We can't ignore the role of male fish in reproduction, as health and strength of the males has significant influence over the sperms. Non-normative nutrition in the pregnancy period will cause serious defects in the organs of the infants. For example, we can refer to a phenomenon referred to as curvature in the spinal column of the infants where the body of the infants takes the shape of a recumbent S[8].

There is physiological adaptation concerning the maintenance and control of the fetus's development and growth in the pregnancy period which is directly related to the mother's recessive phenotype. Evolutionary modifications after the formation of the seed takes place through the nutritional relationship between mother and the fetus. Influences after the formation of seed in the pregnancy period in viviparous fishes may take place through security, breathing, excretion, endocrine glands, and setting the temperature through the relationship between mother and fetus [9,10].

Temperature is one of the important and confiding factors in the growth level of aquatic organisms. Temperature can directly influence the metabolism of the aquatics. This factor affects the nutrition and growth level in these creatures and controls the physiological mechanisms of all organisms. In fact, the growth rate increases to the point that temperature reaches the optimized level, then the growth rate decreases as the temperature goes up. The results of a study conducted by Jobliny in 2005 showed that temperature influences the parameters of osmoregulation, hematology, and the ionic factors of plasma[11].

According to the results of a study conducted by Marshall in 2004, the direct influence of temperature on metabolism and food absorption and its resulting influence on increasing the amount of food is shown. Providing the appropriate temperature for the aquatics will increase their appetite and, consequently, the growth rate. According to this research, providing higher temperature for the aquatics will severely undermine their growth. Also, Mr. Rozallio et al. (2002) referred to temperature as the main factor of water in rearing viviparous aquarium fishes, and he has made it clear that water temperature plays a major role in the regeneration level of these fishes [1]. Water temperature, which is different for every type, may be called the most important influential factor on the aquatics' life which directly affects the growth metabolism

and formation stages of the fish egg. Temperature determines the level of gases dissolved in the water. The cooler the water, the more gas in it. Water can store a high level of heat in herself and exhibits high density. Fishes are ectotherm and their body's temperature adapts the environment's temperature. As the temperature increases, aquatics consume more oxygen an produce more carbon dioxide. They also produce more waste such as ammonium. Egg development is a crucial stage and the influences of temperature pressures have to be taken into consideration. The development pace of the fertilized eggs is greatly dependent upon temperature.

Given the fact that the main discussion of this research has been the influence of temperature on the physiology of swordtail aquarium viviparous fish types, maintaining the temperature required for conducting this research and exploring the conditions and metabolism changes and the studied aquatics' physiology in general is significantly important. In addition to studying the number of births, temperatures exhibited by swordtail during the research was also recorded and attached to the rest of the information[12-14].

METHODOLOGY

Aquarium is built in two ways.

In the sequential method, glasses are installed one after another. In the overlap method, vertical glasses are placed in the middle of horizontal glass. Today, the majority of aquarium manufacturers prefer to use overlap method to make their aquariums as it is simpler. It has been experienced that the sequential method guarantees higher strength and stability for the aquariums as it can bear higher pressures. The sequential method has been utilized to make the aquarium used in this research. To begin the procedure, we needed 2 aquariums to impose special conditions to conduct our research on the aquarium viviparous fish. The aquariums had the dimensions of 100*25*40 centimeters. A separating glass was used in every 25 centimeters of the aquarium. Using theses glasses, the area of each aquarium was divided to 4 sections. After the aquariums have been built, it took 48 hours for the adhesives to dry out and then the aquariums were ready to use.

There are strategies to prevent water pollution in each aquarium. The strategy utilized in our aquarium consisted of a bottom filter installed by the manufacturer. The filtering device along with the active coal was added to the environment after the procedure initiated. The sands in the bottom of the aquarium helped reduce water pollution. This sand was available in packs. It took 3 days to build the aquarium. Their place on the laboratory's table was determined in advance. The aquariums had to be moved with great care. To reduce the pressure and possible dangers and to provide higher safety for the aquariums, they were put on a sheet of Yonolit 5 centimeters wide.

After the aquariums had been secured, oxygenation devices, heaters, and thermometers were installed. The oxygenation devices must be place above the aquariums. The thermometer must have the longest distance possible from the heater. With the exception of only 3 centimeters, heaters must be completely under water. The heater must be installed on the wall of the aquarium in a way that her upper part remains out of the water. The lower section of the heater consists of the elements and the hating area which must always be completely in water. It must be plugged in when it is out of water. It can be taken out of water only when it is unplugged. Otherwise, the momentary temperature change will smash the glass around the heating element.

The aquariums were filled with tap water. The following steps were taken one after another to transfer and adapt the fishes. First, some water from the aquarium from which the fish was extracted was poured in the clean bucket that was provided for transferring the fishes. Then, the fish was caught by a sieve and transferred to the bucket. A piece of ice wrapped in a plastic bag was put in the bucket to reduce the water temperature and the fish's moves. After arriving at the laboratory, the lid of the bucket was removed. Some water from the destination aquarium was poured in the bucket and after 4 minutes (without transferring the bucket's water to the aquarium), the fish was transferred to aquarium by a sieve.

The fishes were deprived from any foods for a whole day after they had been transferred. 80 swordtail fishes were placed in their corresponding aquariums with a certain density and temperature. 80 fishes were put in each aquarium. Each aquarium was divided to 4 sections, one of which belonged to the control group. The temperature for this group was set to 25 degrees centigrade. The other 3 groups were put in the other 3 sections respectively.

The temperature of treatment groups was set as 23 degrees centigrade for group A, 28 degrees centigrade for group B, and 32 degrees centigrade for group C. Fishes were divided according to the size of their body, in other words, bigger fishes were divided among various groups. 20 fishes were put in every section of the aquariums. Each group consisted of 15 females and 5 males.

To fees the fishes, dry food or pellet made out of dead fish and smelling of fish was used. The level of oxygen in the aquarium water was measured using an oxygen meter. To measure the oxygen of the aquarium, a bar from the oxygen meter was inserted into the water and after 4 minutes, the number shown on the display of the device was recorded as the level of oxygen dissolved in water. Given that temperature in each of the sections of the aquarium is different, the oxygen density will be different in each section. The oxygen level was measured and recorded separately for each section. To maintain the required temperature for water, a heater was used in each section of the aquarium. Each heater features a scale. This scale can be modified so we can have the preferred temperature for water. To get the temperature of aquarium to our required temperature to create appropriate conditions for the conduct of the research, we needed 4 heaters for each aquarium.

The highest temperature which can be delivered by each heater is 32 degrees centigrade. Consider that as the temperature increases, the density of the dissolved oxygen decreases. Thus, while the temperature is increasing, water conditioning is required so we can create balance between temperature and oxygen. To measure the water temperature using the digital thermometer, the bar-shaped sensor of the device is placed inside the water for 2 minutes and the

measured temperature is recorded as the temperature of the water in aquarium. The accuracy of the aforementioned thermometer is 0.01 degrees centigrade. After the aquariums have been placed in the laboratory, mercury thermometers are installed in both aquariums and in each section. The water temperature can be measured using these thermometers. Effective factors in puberty and fertilization level such as length and weight of the body of the fish was measured in this research. To measure the length and weight of the fishes, 5 fishes were caught from each part randomly by sachook, then steps were taken to measure the aforementioned factors. Clean plastic bags and digital scale were used to measure the weight. To measure the length of the body of the fishes, some water was poured in a clean plastic bag and then a fish was randomly collected from each section of the aquarium. Lying the fish in the plastic bag on her right side, her length was measured in terms of millimeter using a caliper with 0.1 mm accuracy. This research lasted for 90 days with the aforementioned conditions. The researcher has collected his observations in different fields during his research period. In addition to physiological and reproduction observations, behavioral studies and observations were also recorded and discussed over the experiment period and they were presented in terms of specific behaviors.

RESULTS

In the present research, the results are shown in the form of table (1 to 7) in terms of the influence of temperature on the fishes' reproduction. The behavior of the fishes was also studied which is presented as follows:

Tables (1, 2, 3, and 4) the number of infants released by the swordtail fishes in various temperatures

Number of Deliveries	Temperature	Body weight	Sword tail
10	23	1.37	1
12	23	2.7	2
11	23	0.89	3
15	23	1.92	4
18	23	2	5
19	23	2.03	6
22	23	2.21	7
21	23	1.40	8
13	23	1.36	9
10	23	1.92	10
19	23	1.98	11
13	23	0.99	12
17	23	2.71	13
26	23	2.81	14
10	23	2.08	15
30	23	1.98	16
19	23	2	17
26	23	2	18
13	23	2	19
30	23	2.04	20

Number of deliveries	Body weight	Temperature	Swordtail
15	2.08	25	21
18	2.7	25	22
24	2.31	25	23
19	1.48	25	24
23	1.90	25	25
33	2.08	25	26
40	2.1	25	27
26	2.35	25	28
19	2.45	25	29
32	2.08	25	30
56	0.94	25	31
45	1.90	25	32
17	1.4	25	33
25	1.8	25	34
45	1.9	25	35
46	1.24	25	36

23	2	25	37
39	1.8	25	38
15	1.9	25	39
22	0.9	25	40

Number of deliveries	Temperature	Body weight	Sword tail
10	28	0.98	41
12	28	1.68	42
12	28	1.88	43
19	28	1.9	44
22	28	2	45
15	28	1.24	46
18	28	1.28	47
23	28	2	48
33	28	1.92	49
35	28	1.78	50
28	28	1.5	51
12	28	1.5	52
19	28	1.46	53
16	28	1.41	54
19	28	1.72	55
28	28	1.82	56
16	28	1.9	57
28	28	1.5	58
14	28	0.9	59
17	28	1.21	60

Number of deliveries	Temperature	Body weight	Sword tail
8	32	1.55	61
7	32	1.54	62
12	32	2	63
19	32	1.9	64
2	32	2.25	65
8	32	2.21	66
7	32	2.18	67
6	32	1.98	68
16	32	1.84	69
14	32	2	70
16	32	1.2	71
15	32	2.32	72
5	32	1.5	73
11	32	1.8	74
2	32	1.9	75
3	32	1.11	76
5	32	1.40	77
9	32	1.2	78
3	32	1.24	79
5	32	2	80

Tables (5, 6, and 7) laboratory conditions imposed upon sword tail type

Day	Daily meal weight	pH	O_2	CO_2	Male losses	Female losses
1	0.5	7	9.1	48		
2	0.5	7	9.3	48		
3	0.5	7.1	9.4	48		
4	0.5	7.2	9.3	48		
5	0.5	7.2	9.3	48		2

6	0.5	7.2	9.3	49		
7	0.5	7	9.3	49		
8	0.5	7	9.2	49		1
9	0.5	7	9.2	49.2		
10	0.5	7	9.2	49		
11	0.6	7	9.5	49		
12	0.5	7.2	9.1	49		1
13	0.5	7.2	9.2	48		
14	0.5	7.2	9.1	48		2
15	0.5	7.3	9.1	50		
16	0.5	7.3	9.1	50		
17	0.5	7.4	9.1	50	1	1
18	0.5	7.4	9.1	50		1
19	0.5	7.4	9.2	50		
20	0.5	7.3	9.2	50		
21	0.5	7.3	9.2	50		1
22	0.5	7.2	9.2	50		
23	0.5	7.2	9.2	51	1	1
24	0.5	7.2	9.3	51		1
25	0.5	7	9.3	51		
26	0.5	7	9.3	51		
27	0.5	7	9.3	51		
28	0.5	7	9.3	51		
29	0.5	7	9.3	51		
30	0.5	7	9.3	51		
31	0.5	7	9.1	51		
32	0.6	7.2	9.1	51		
33	0.5	7.2	9.1	51		
34	0.5	7.2	9.2	52		
35	0.5	7.2	9.3	52		
36	0.5	7	9.3	50		
37	0.5	7.3	9.3	50		
38	0.5	7.3	9.3	50		
39	0.5	7.23	9.4	51		
40	0.5	7.24	9.4	52		
41	0.5	7.21	9.1	52		
42	0.5	7.23	9.2	51		
43	0.5	7.18	9.2	52		
44	0.5	7.2	9.2	51		
45	0.5	7	9.2	51		
46	0.5	7.5	9.3	51		
47	0.5	7.3	9.2	52		
48	0.5	7.4	9.2	52		
49	0.5	7.3	9.1	52		
50	0.5	7.2	9.1	52		
51	0.5	7	9.2	51		
52	0.5	7	9.2	51		
53	0.5	7	9.2	51		
54	0.5	7	9.1	52		
55	0.5	7.1	9.1	52		
56	0.5	7.1	9.2	52		
57	0.5	7.2	9.3	51		
58	0.5	7.2	9.3	51		
59	0.5	7.1	9.3	52		
60	0.5	7.1	9.2	52		
61	0.5	7.3	9.2	51		

62	0.5	7.3	9.2	52		
63	0.5	7.4	9.3	53		1
64	0.5	7.4	9.3	53		
65	0.5	7.4	9.3	51		
66	0.5	7.4	9.1	53		
67	0.5	7.4	9.2	53		
68	0.5	7.4	9.2	53		
69	0.5	7.3	9.2	53		
70	0.6	7.3	9.3	52		
71	0.6	7.3	9.2	53		
72	0.5	7.2	9.1	53		
73	0.5	7.2	9.1	53		
74	0.5	7.2	9.1	52		
75	0.5	7.2	9.2	52		
76	0.5	7.1	9.3	51		
77	0.5	7.1	9.3	51		
78	0.5	7.3	9.2	51		
79	0.5	7.4	9.3	52		
80	0.5	7.4	9.4	53		
81	0.5	7.5	9.5	53		
82	0.5	7.5	9.5	54		
83	0.5	7.3	9.5	54		
84	0.5	7.1	9.6	54		
85	0.5	7.1	9.6	54		
86	0.5	7.1	9.5	53		
87	0.5	7.2	9.5	53		
88	0.5	7.2	9.4	53		
89	0.5	7.2	9.5	53		
90	0.5	7.2	9.4	52		

Results concerning behavioral observations in swordtail

Social behaviors

According to the studies on swordtail type, it was revealed that swordfishes have little activities concerning the social aspects. Swordfishes are pacifist, yet they are very slow in adapting themselves to their surroundings. They are very conservative in feeding and swimming. They don't move a lot while swimming. While feeding, the quickly run away from the feeding guy. People's presence by the aquariums, despite the long study periods, never became something usual for the fishes.

Swordtails jump out of the aquarium when they are frightened or anxious. Swordtails usually swim in schools of 5. These schools usually include 2 male and 3 female fishes. Members of this school usually swam together, in the same way and the same direction. Their swimming pattern was also similar.

Nutrition behaviors

Swordtails swim in a column when their food is being delivered. As soon as food was delivered, each fish would come to the surface of water and having taken a piece of the food, she would swim downstairs in a semicircular move give her place to the other fish beneath her. The other fish would exactly repeat this pattern. She would go to the surface, get her food and get back to the end of the column with a semicircular move. The whole food available in the surface would be consumed in this way. If some food sank to the bottom of the aquarium, the swordtails would usually avoid them.

Choice of settlement

Swordtails used to swim in the middle of the aquarium. In other words, neither the bottom nor the surface of the aquarium did they like. Their swimming method was like a column and they sometimes swayed a little to their side. In group move, only a few of them moved laterally. There were more movements in individual moves and they swam over the length of the column of water. They used to go through the water column very quickly.

Mating

In swordfishes, the body of the female is bigger than the body of the males. The color and the size of the fish's body and the length of the sword-like appendage in the tail of the male fish are determining factors in choosing the mate. During the process of mating, those males which have chosen the same female will compete with one another and attempt to copy the female fish's swimming pattern.

Mating behaviors

The chosen male fish was swimming with the female fish. The male fish was beneath the female fish while swimming and imitated her swimming pattern. During swimming, the male fish would approach the female fish in a good time and transfer the sperms through his genital fins to the female.

Mother's behaviors during pregnancy

During pregnancy, the female fish had fewer activities and tried to get more food. She also preferred to swim in the areas where there was less tension and impact.

Mother's behaviors before delivering infants

The female fish's stomach would swell before childbirth. She would calm down and lie at the bottom of aquarium. She had no appetite for food and refrained from attending groups and swimming in a school.

Mother's behaviors after childbirth

After childbirth, the mother would usually return to the group and strive to restore her lost energy. If she had access to her infants, she would use them as food. Thus, mother must be kept away from her infants after the childbirth.

The infants' behavior after birth

The infants were usually delivered in the form of a loop. Right after birth, they returned to their natural shape with a leap and leave their mother. They usually hid themselves among the sands or plants of the aquarium.

The nutrition behaviors of the infant right after they are born

The newly born infant would hide for a time, but she would later have to get out of her hiding to find food. She would usually come to the surface to get her food and then quickly return to the depth of the water among the stones. If there were no bigger fishes in her vicinity, she would continue searching the sand and stones at the bottom of the water for food.

Infant's nutrition behavior while growing up

If they didn't find themselves in a situation that endangered them, they would start looking for food on the stones in the first day and then other areas and places as time went by. They usually spent a long time searching for food. They had great appetite and a lot of movement.

In the infants' section, older baby fishes used to come to the surface, while younger babies used to stay in the bottom.

DISCUSSION

Summarizing the data gathered in this research, it was shown that sword tail fish (an aquarium viviparous fish type) has the best reproduction between 23 to 27 degrees centigrade. These results are quite similar to the figures stated by Mr. Naderi et al. (2011) about aquarium viviparous fishes [15-17].

Furthermore, according to the behavioral studies and observations conducted on swordtail fishes, the following conclusions were drawn. Based on these results, we think swordtail aquarium fish has strong social behaviors and interactions with her peers, yet she is weak in relationship with her surrounding environment and shows little adaptation with her surroundings. This is different from what was reported by Dierk Franck & Ralph-peter Hannes (1983). Based on what this researcher thinks, swordtail fish is very active [11, 18].

Observation of the nutrition behaviors in swordtail fishes showed that members of this type act as a group while feeding. Members of swordtail type set to get their food orderly and according to their turn. This is different from what was stated by Niclas Kolm (2012) [5, 19].

Observation of the settlement choosing tendencies in the sword tail type showed that the members of this type prefer to swim in the middle of the aquarium and usually form a column while swimming. This is quite different from results of the study conducted by Greater Chicago (2001). This researcher has drawn the conclusion that swordfish tail swims in all parts of the aquarium[20].

Observation of the mating behaviors in swordtail fishes showed that their mating is greatly influenced by the length of the body of male and female and also the length of the sword-like appendage in the caudal fin of them. These results were similar to what was reported by John Prenter (2008), Oscar Rios (2007), and Armando Hernandez (2012) [21-23].

Observation of the mating behavior in the swordfish type showed that the male sword fish imitates the female's swimming pattern while following her for mating. These results were similar to what was reported by Alexander L. Basolo & Kari E Benson (2006), Oscar Rios-Cardenas (2007), and Mirjan Amcoff (2013)[22,24,25].

Furthermore, observation of the behavior of the pregnant female fish in the swordtail species showed that the female fish has fewer activities during her pregnancy period. These results were similar to what was reported by Peter J. Hocart (2006)[26].

Observation of female fish's behaviors before childbirth showed that swordtail female fish becomes shy and dissociable and shows no willingness for getting food. This condition is likely to extend to a few hours after childbirth. These results are similar to what was reported by Peter J. Hocart (2006) [26].

It was observed that the female fish would return to her natural and usual mood and condition after child birth and return to the group.

In any cases of the infants' presence near their mother, the mother fish is likely to chase and hunt them. These results are similar to what was reported by Peter J. Hocart (2006) and Dr. Ali Farshchi (1982) [8, 26.]

Furthermore, observation of the infant's behavior right after it has been born showed that the infants get away from their mother and hide as quickly as they can. These results are similar to what was reported by Peter J. Hocart (2006) and Dr. Ali Farshchi (1982) [8, 26].

Observing the nutrition behaviors in swordtail type showed that the infants of this type would get out of the stones in the early hours after their birth. They would search for food in the surface of the water and hide again. These results are similar to what was reported by Peter J. Hocart (2006) and Dr. Ali Farshchi (1982) [8, 26].

Observation of the nutrition behaviors of the infants in sword tail types showed that infants have great appetite for food and spend most of their day searching for it.

Observation of settlement choosing in swordtail fishes' infants indicated that the infants swim just like their parents. In other word, they swim mainly in the middle of the aquarium. These results are different from what was reported by Greater Chicago (2001). This researcher believes that swordtail fish swims in every part of the aquarium [27].

CONCLUSION

Considering all the results stated based on the collected information, we suppose that daily increase in industrial pollutants which increases the earth's temperature will reduce the number of species and jeopardize the survivability and

regeneration of various animal species on the earth. Members of the swordtail species have relations and interactions with one another while swimming and feeding. By following the biological principles and reduction of fossil fuel consumption, we hope to help reduce the greenhouse gases emission and consequently prevent the uncontrolled increase in the environment's temperature. Looking forward to more revival of the environment and preventing the endangerment of various life forms.

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