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Effect of Natural Feeding Capacity of Dengue Mosquito (*Aedes aegypti*) Larvae and Different Stocking Densities of Gold Molly Panda Fish (*Poecilia* spp) on the Feeding Speed and Function of Natural Predators in Gold Molly Panda Fish (*Poecilia* spp)

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ABSTRACT

The Gold Molly Panda (*Poecilia* Spp) freshwater ornamental fish is a type of fish that is easy to care for, and bred with high tolerance for the water and environment, lots of diversity, and has good economic value in the ornamental fish market. This interdisciplinary research was aimed at observing the consumption rate and number of natural feedings of dengue mosquito (*Aedes aegypti*) larvae by Gold Molly Panda (*Poecilia* Spp) fish with different stocking densities in quantitative apprach in ANOVA two factors whit 10 times replication design using 3 differences in the density of fish stocking groups Gold Panda Molly fish (*Poecilia* Spp) fish as natural predator and another side to combated or eradication of dengue mosquito (*Aedes aegypti*) in larvae stages. The scholar has proven that the factors number of feeding and has a very significant effect on the speed of consumption of Gold Molly Panda (*Poecilia* Spp) fish. The results of the comparison analysis have provided recommendations for application that the stocking density of Gold Molly Panda (*Poecilia* Spp) fish 2 – 4 tails can be eaten between 25 – 75 larvae of the dengue mosquito (*Aedes aegypti*) in an average time of 133 - 186.67 minutes.

Keywords: Speed of consumption, Natural food, Dengue mosquito (*Aedes aegypti*) larvae, Stocking density, Gold Molly Panda fish (*Poecilia* Spp).

INTRODUCTION

Many households in the dry area catch rainwater or clean water that was collected by residents aims to ensure the availability of clean water in a particular household. The

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application of giving Gold Panda Molly (*Poecilia Spp*) fish to the tub or water holding tank must ensure that it continues to guarantee its cleanliness, and the function of functioning as a natural predator for eradicating or minimizing the number of dengue mosquito (*Aedes aegypti*) larvae. Preventive efforts for the transmission of dengue fever by breaking the life cycle of the dengue mosquito (*Aedes aegypti*) mosquito when it is in larval phase by making the Gold Panda Molly (*Poecilia Spp*) natural food. The application of giving or retain of Gold Panda Molly (*Poecilia Spp*) fish to the tub or water holding tank must ensure that it continues to guarantee its cleanliness, and the function of functioning as a natural predator for eradicating or minimizing the number of dengue mosquito (*Aedes aegypti*) larvae or pupa. Preventive efforts for the transmission of dengue fever by breaking the life cycle of the dengue mosquito (*Aedes aegypti*) mosquito when it is in larval or pupa phase and becomes a natural food for Gold Panda Molly (*Poecilia Spp*) fish.

The Gold Molly Panda (*Poecilia Spp*) fish is a type of freshwater that is distributed in waterways and waters of Central America, Pacific and Atlantic[1]. The Gold Molly Panda (*Poecilia Spp*) as ornamental fish, have characteristics live in fresh [2] and or brackish waters. The beauty, diversity, and ease of maintenance, life with low oxygen conditions, small size of brooders with an average size 51 mm for males and 46 mm for females, survival rate of up to 100% and fast breeding because the maximum gonadal maturity level reaches 14.80% and the gestation period ranges from 23 – 44 days. The morphology of Molly fish that male fish's dorsal fin looks bigger and wider than the female's, with 14-15 dorsal fin rays; The number of anal fin rays is 8-10 fingers. The base of the caudal fin is wide, and the shape of the caudal fin is rounded. The body color is dark gray on the top, while the color on the belly looks lighter, the dorsal fin is gray with black spots, and the lateral line is 27-30 scales. Ikan Gold Molly Panda (*Poecilia Spp*), this fish covering in the fish with type of omnivore or food plant and small animal. Another species Molly fish (*Poecilia latipinna*, Lesueur 1821) has been used as a bio control to the mosquito population [3,4]

The taxonomy and classification of the Gold Molly Panda fish (*Poecilia Spp*) in the order *Cyprinodontiformes* and Family *Poeciliidae* has also been carried out by researchers. , to map the taxonomy of mollies to Atlantic Molly fish species (*Mollienesia*) or known by the scientific name *Poecilia Mexicana, Poecilia marcellinoi, Poecilia vivipara* which was found in Brazil, and Guatemala [1], discovered in Maros Indonesia with the Order: *Cyprinodontiformes,* family: *Poeciliidae,* species: *Poecilia latipinna* and as endemic living pests competing for food and oxygen in farmer's ponds [5], and the molly fish (*Poecilia sp*) from the species Black Molly (*Poecilia sphenops*) and local molly fish in Yogyakarta known as the *Cethul* fish (*Poecilia reticulata*) have functioned as predators and natural control for the development of *Aedes aegypti* mosquito larvae which are vectors for dengue fever [6]. Another type of molly fish *Poecilia butleri, Poecilia petenensis, Poecilia orri, Poecilia velifera, Poecilia sphenops* was distributed in Mexico, *Poecilia gillii* in Nicagragua, *Poecilia*

maylandi in Italia and Mexico, and *Poecilia vittate* in Hawai [7]. The molly fish (*Poecilia latipinna*) and Molly fish (*Poecilia sphenops*) from different locations in the Kolathur region (1307'1.25"N, 80012'41.18"E) and Perugalathur (12054'18.36"N, 8005'41.28"E) in the Chennai, Tamil Nadu India [7] (**Figure 1**).

Gold Molly Black Molly

Golden Doubloon Molly Golden black molly

Figure 1 Several type of molly fish.
(source: https://perikananlautan.blogspot.com/2019/06/mengetahui-perbedaan-ikan-molly-jantan.html https://www.rumah.com/panduan-properti/ikan-molly-53498)

The feeding factor can be improve the growth and survival of Gold Molly Panda (*Poecilia Spp*), Black Molly (*Poecilia sphenops*) and similar fish [2]. According to the absorption of food (feeding rate) is higher than in spring where the water temperature is warmer than in winter [8,9]. The number and quality of feeding, time feeding, and feeding management is very important factor in fish growth, and survival rate during the rearing period of Gold Molly Panda (*Poecilia Spp*) [9, 10]

Deployment Density of Gold Panda Molly (*Poecilia Spp*) Fish based on previous studies have proven that the maintenance of freshwater catfish (*Pangasius sp*) has shown optimum growth with a stocking density of 20 fish/liter of water, with a recirculation system with a water discharge of 0.1 seconds. L-1 survival rate (survival rate) of 73.34 ± 4.30 %, water quality temperature ranged from 26-380C, temperature within the normal range [11]. Another study on the maintenance of goldfish (*Cyprinus Carpio*) initial seed weight of an average of 3.5 g/fish, with a low stocking density. different A = 4 tails; B = 7 tails; C = 10 fish and D = 13 fish / aquarium, and maintained for 4 (four) weeks. [12]. Other research on the maintenance of freshwater pomfret (*Colossoma macropomum*) in observing ponds is the daily growth rate for Siamese catfish (*Pangasius hypopthalmus*) fish larvae, and the different Feed Convention Ratio (FCR) using 10 individuals/m2 [13,14].

The results of previous studies have shown very significant differences in the effect of stocking density on the survival rate, biomass production of fish, the efficiency of feed utilization and the relative growth rate on the rearing of Tilapia fish seeds (*Oreochromis niloticus*, Linn 1758) with a size of 8 – 9 cm/head reared with a stocking density treatment of A 2 individuals/m2; B 4 fish/m2; and C 6 fish/m2 [15]. The results of this study became the rationale for conducting observations by implementing stocking density (treatment A = 2, B = 4, and C = 6 fishes per aquarium) and providing natural food in the form of dengue mosquito larvae (*Aedes aegypti*) with different quantities of consumption speed of Gold Panda Molly (*Poecilia Spp*) fish kept in aquariums in laboratories and further can be implemented in a clean water tank. Furthermore, this research was intended to use the Gold Panda Molly (*Poecilia Spp*) fish as a natural predator to eradicate dengue mosquito (*Aedes aegypti*) larvae, having a reduced impact on the transmission of dengue fever infection

The dengue mosquito is one's type of mosquito that have ability as a vector of dengue fever with the scientific name as (*Aedes aegypti*) Larvae (Linnaeus, 1757) [16] (Melanie, Rustama, Sihotang, & Kasmara, 2018). The dengue mosquito, during its life, the dengue fever mosquito has a varied life cycle, when the adult mosquito flies freely in the air or around housing, when it lays its eggs on the surface of clear and calm (stagnant) water, when the eggs hatch into larvae, these larvae swim in the water, and when they become her pupa is under the power of water and ready to become a new individual mosquito that can fly freely. The life cycle of the dengue mosquito, from laying eggs to becoming individual mosquitoes, lasts for 14 - 17 days [17 – 21].

The life cycle of dengue mosquito (*Aedes aegypti*), First stage of life cycle of dengue mosquito (*Aedes aegypti*) as the egg of adult, female mosquitoes lay eggs on the inner walls of containers with water, above the waterline, besides that this mosquito can lay eggs in polluted water conditions. Second stage of life cycle of dengue mosquito (*Aedes aegypti*) as larvae live in the water. They hatch from mosquito eggs. This happens when water (from rain or a sprinkler) covers the eggs. Larvae can be seen in the water, very active swimming. Third stage of life cycle of dengue mosquito (*Aedes aegypti*) as pupae live in the water like. The fourth stage of life cycle of dengue mosquito (*Aedes aegypti*) is adult dengue mosquito with characteristics: the adult female mosquitoes bite people and animals. Generally, the mosquitoes need blood to produce eggs, after feeding, female mosquitoes look for water sources to lay eggs, live indoors and outdoors, and they have life cycle during 10 - 32 days in open water, and then stagnant water can be life during 17 - 37 days [19,22] (**Figure 2**).

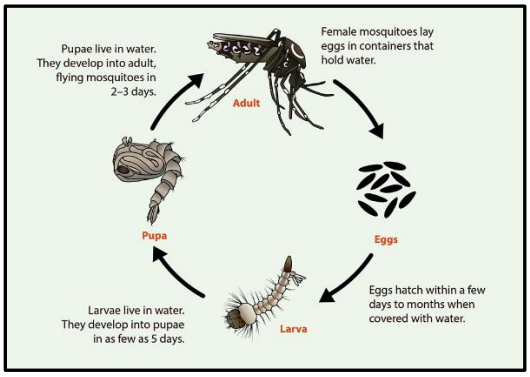

Figure 2 Life cycle of dengue mosquito (*Aedes aegypti*)
(Source:https://www.cdc.gov/mosquitoes/about/life-cycles/aedes.html)

The aim of this research is on the maintenance and observation of the feeding behavior of the molly panda fish is related to the developmental stages of the life cycle of the dengue mosquito (*Aedes aegypti*), especially during the larval and pupal phases, and the feeding behavior of the gold panda molly fish as an all-eating or omnivorous fish, so this research is directed at raising fish gold panda molly (*Poecilia* Spp) which functions as a natural predator for larvae or pupae. This research was inspired by the circumstances and facts about the spread and transmission of dengue fever 4003 cases and 50 deaths by this case in Timor-Leste in April 2022). That is way this research originally based in the thinking that cultivating of Gold Panda Molly fish (*Poecilia* Spp) fishes can be eradicate mosquito (*Aedes aegypti*) larvae, and pupae, and reduce the prevalence of dengue transmission by dengue mosquito (*Aedes aegypti*) in immature control [23], and develop more effective control outbreaks of dengue by non- insecticidal methods (e.g. effective urban drainage), suppression of mosquito populations [24].

The ability of some freshwater ornamental fish to become natural predators or as biocontrol by eating several mosquito larvae, so that the breeding of adult mosquitoes can be limited and can finally reduce the transmission of dengue fever, including: beta fish (*Betta spp*) can eat 34 – 37 larvae of dengue mosquito (*Aedes aegypti*), gold fish (*Cyprinus carpio*) can be eat 25 - 27 larvae of dengue mosquito (*Aedes aegypti*), and nila fish (*Oreochormis niloticus*) can be eat 22 – 30 larvae of dengue mosquito (*Aedes aegypti*) during 24 hour observed [25], and manvis (*Pterphylium altum*) fish can be eaten 7 - 20 tails larvae dengue mosquito (*Aedes aegypti*) [26].

The results of this previous study became the rationale for providing different amounts of food (larvae of dengue mosquito (*Aedes aegypti*)) and implemented for gold panda molly fish with a function as a natural predator or biocontrol. This study implemented the provision of larvae dengue mosquito (*Aedes aegypti*) with treatment A = 25 tails, B = 50

tails, and C = 75 tails, to then observe the speed of consuming the amount of food given in the form of hours of observation.

In this study, have been formulated four research problems as follows: (1) Does the stocking density factor of the Gold Panda Molly (*Poecilia* Spp) that differences have affected to the feeding speed of the Gold Panda Molly (*Poecilia* Spp) which functions as a natural predator in the development of dengue mosquito (*Aedes aegypti*) larvae stage? (2) Does the number of dengue mosquito (*Aedes aegypti*) larvae that differences have affected to the speed feeding of Gold Panda Molly fish (*Poecilia* Spp) which functions as a natural predator in the development of dengue mosquito (*Aedes aegypti*) larvae stage? (3) Does the combination of factors of different stocking density of Gold Panda Molly (*Poecilia* Spp) and different natural feeding capacity of dengue mosquito (*Aedes aegypti*) larvae have affected to the feeding speed of Gold Panda Molly (*Poecilia* Spp) which functions as a natural predator in development of dengue mosquito (*Aedes aegypti*) larvae? (4) What is the best of comparison of the stocking density of the Gold Panda Molly (*Poecilia* Spp) fish which application for functions as a natural predator in the development of the best dengue mosquito (*Aedes aegypti*) larvae stage? Based on research problem, this research has literature reviews, hypotheses and objectives given respond of research problem there was explain too.

The benefits of this research is to develop of knowledge in science interdisciplinary, as information for further research for the development of interdisciplinary knowledge, and to encourage the improvement of the quality of public health through the first stage of health (preventive action) research, based on interdisciplinary of knowledge such as Gold Panda Molly (*Poecilia* Spp) fish farming to minimize transmission of dengue fever and eradication of dengue mosquito (*Aedes aegypti*) in stages of larvae and pupae.

The analytical framework and Hyphotesis

Based on theoretical reviews and **Diagram 1,** this research was establishing three hypotheses to test the influencing stocking density of gold panda molly (*Poecilia* Spp) fish and different amounts feeding of larvae of dengue mosquito (*Aedes aegypti*) to the speed of consumption of larvae of dengue mosquito (*Aedes aegypti*) by Gold Panda Molly fish (*Poecilia* Spp) such as:

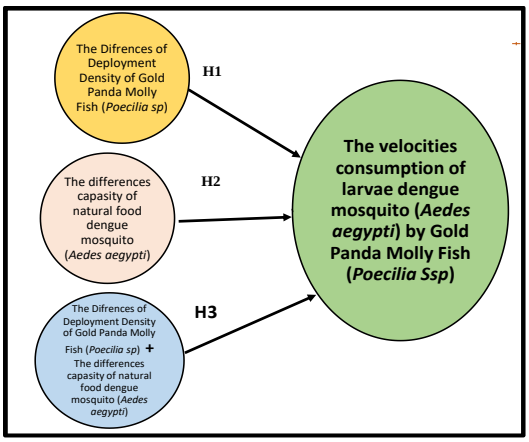

Diagram 1 Research conceptual framework based on Laurence Green

Ho1: Stocking density of Gold Panda Molly fish (*Poecilia* Spp) did not give a significant difference to the speed of consumption of larvae of dengue mosquito (*Aedes aegypti*) by Gold Panda Molly fish (*Poecilia* Spp).

Ho2: Different number feeding of dengue mosquito (*Aedes aegypti*) larvae did not give a significant difference to the speed of consumption of larvae of dengue mosquito (*Aedes aegypti*) by Gold Panda Molly (*Poecilia* Spp) fish.

Ho3: The combination factors between stocking density of Gold Panda Molly fish (*Poecilia* Spp) and feeding of different amounts of larvae of dengue mosquito (*Aedes aegypti*) did not give a significant difference to the speed of consumption of larvae of dengue mosquito (*Aedes aegypti*) by Gold Panda Molly fish (*Poecilia* Spp).

METHODS

This research has running in Pescas UNITAL Laboratories during fourteen days include four days for preparation, starting on wednesday 13 June 2023 and ended on 25 June 2023, ten days for observation or measurement of replication.

This research using quantitative approach with research design applied an ANOVA two factors whit replication [27] design using 3 differences in the density of fish stocking groups Gold Panda Molly fish (*Poecilia* Spp) namely treatment per aquarium A = 2 fish, B = 4 fish, and C = 6 fish. In the natural feeding capacity group of dengue mosquito larvae (*Aedes aegypti*), there were three different treatments, namely I = 25 tails, II = 50 tails, and III 75 tails as 9 treatments from two variables, and then by 10 times of replications. The velocity consumption of number dengue mosquito larvae (*Aedes aegypti*) unit using minutes per replication (**Table 1**).

AI (2 fishes and 25 tails of larvae)	BII (4 fishes and 50 tails of larvae)	CIII (6 fishes and 75 tails of larvae)
AIII (2 fishes and 75 tails of larvae)	BI (4 fishes and 25 tails of larvae)	CII (6 fishes and 50 tails of larvae)
AII (2 fishes and 50 tails of larvae)	BIII (4 fishes and 75 tails of larvae)	CI (6 fishes and 25 tails of larvae)

Table 1 Design of randomized block for this research

RESULTS AND DISCUSSION

The descriptive analysis form ANOVA two factor with replication was shown this research tested velocity of consumption (treatment A I) with 2 tails Gold Moly Panda (*Poecilia* Spp) fish was eaten 25 tails of dengue mosquito (*Aedes aegypti*) larvae, it took an average of 170 minutes. The A II treatment with 2 tails of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 190 minutes to eat 50 tails of dengue mosquito (*Aedes aegypti*) larvae. In the A III treatment with 2 tail of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 200 minutes to eat 75 tail of dengue mosquito (*Aedes aegypti*) larvae. Meanwhile, in the treatment of B I with 4 tails of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 120 minutes to eat 25 larvae of dengue mosquito (*Aedes aegypti*) larvae. The treatment of B II with 4 tails of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 130 minutes to eat 50 tails of dengue mosquito (*Aedes aegypti*) larvae, and treatment of B III with 4 tails of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 150 minutes to eat 75 tails of dengue mosquito (*Aedes aegypti*) larvae. The treatment of C I with 6 tails of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 100 minutes to eat 25 tails of dengue mosquito (*Aedes aegypti*) larvae. Treatment of C II with 6 tails of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 85 minutes to eat 50 tails of dengue mosquito (*Aedes aegypti*) larvae, and treatment of C III with 6 tails of Gold Moly Panda (*Poecilia* Spp) fish, it was taking an average of 75 minutes to eat 75 tails of dengue mosquito (*Aedes aegypti*) larvae.

The Gold Moly Panda (*Poecilia* Spp) fish as ornamental fish or as natural predator can eat all the larvae in the aquarium. The condition of the Gold Moly Panda (*Poecilia* Spp) fish at that hungry time, that fish can able to eat all the larvae their life place. The Gold Moly Panda (*Poecilia* Spp) fish is a fish that easily digests various types of food in various forms and various food sources. Its omnivorous nature (eats anything) live food such as mosquito larvae, water fleas, or tubifex worms allows the Gold Moly Panda (*Poecilia* Spp) fish to be used as a mosquito larva predator fish [9, 25, 26, 28,29]. The research results have proven that Gold Moly Panda (*Poecilia* Spp) fish can be natural predators for dengue mosquito larvae (*Aedes aegypti*), and various mosquitoes which generally nest in clean, stagnant water tanks.

The inferential analysis to calculate the magnitude of the effect on the two factors (a) the number of dengue mosquito (*Aedes aegypti*) larvae fed as food to Gold Moly Panda (*Poecilia* Spp) fish and (b) the stocking density of Gold Moly Panda (*Poecilia* Spp) fish, using ANOVA two factor with ten (10) replications, have proven that result was reject Ho and receipt H1 significantly that mean (**Table 2** and **Table 3**)

1. In the partial analysis, this analysis to calculate the effect on the treatment of differences in the number of dengue mosquito (*Aedes aegypti*) larvae fed as food to Gold Moly Panda (*Poecilia Spp*) fish, the number consumption of dengue mosquito (*Aedes aegypti*) larvae has been a different effect on the feeding speed or capacity of Gold Moly Panda (*Poecilia Spp*) fish.
2. In the partial analysis, this analysis to calculate the magnitude of the effect on the different treatments stocking density of Gold Moly Panda (*Poecilia Spp*), the different stocking densities of Gold Moly Panda (*Poecilia Spp*) fish have a different significant effect on the speed or natural food capacity of dengue mosquito larvae (*Aedes aegypti*) larvae.
3. In the simultaneous analysis, this analysis to calculate the magnitude of the effect of interaction between factors of the number of dengue mosquito (*Aedes aegypti*) larvae fed as food to Gold Moly Panda (*Poecilia Spp*) fish, and the different of stocking density of Gold Moly Panda fish (*Poecilia Spp*) (in the part of interaction).

Tabel 2 Analisis of Variances

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Sample (number consumption of larvae)	2055.56	2	1027.78	9.12	0.00	3.11
Columns (density of fishes)	150222.22	2	75111.11	666.81	0.00	3.11
Interaction	10444.44	4	2611.11	23.18	0.00	2.48
Within	9124	81	112.64			
Total	171846.22	89				

Tabel 3 ANOVA two Factor with replication

Anova: Two-Factor With Replication				
SUMMARY	A = 2 fishes	B = 4 fishes	C = 6 fishes	Total
I = 25 tails of larvae				
Count	10	10	10	30
Sum	1700	1200	1000	3900
Average	170	120	100	130
Variance	133.33	82.22	6.44	965.45
II = 50 tails of larvae				
Count	10	10	10	30
Sum	1900	1300	850	4050
Average	190	130	85	135
Variance	353.11	24.22	12.00	2034.62
III = 75 tails of larvae				
Count	10	10	10	30
Sum	2000	1500	750	4250
Average	200	150	75	141.67
Variance	242.44	154.44	5.56	2854.78
Total				
Count	30	30	30	
Sum	5600	4000	2600	
Average	186.67	133.33	86.67	
Variance	387.13	241.89	116.64	

Another inferential analysis this study also produced the most appropriate comparison value for the total stocking density of Gold Panda Molly (*Poecilia* Spp) fish which functions as a natural predator on dengue mosquito larvae (*Aedes aegypti*) by using a comparison technique at low stocking numbers, especially in treatment A = 2 tails of fish, and B = 4 tails of fish, through a paired t-test analysis technique of two samples for means. The results of the comparative analysis between the two groups of Gold Panda Molly (*Poecilia* Spp) fish densities have shown in **Table 4** below.

Based on the results of a comparison test with the t test at a low number of stockings, especially in treatment A = 2 tails of fish, and B = 4 tails of fish, there is a difference in the stocking density of treatment B = 4 tails of fish Gold Panda Molly (*Poecilia* Spp) fishes eats 53.33 minutes faster than the treatment A = 2 tails of fish Gold Panda Molly (*Poecilia* Spp) fish. Statistically the stocking density treatment B = 4 tails of Gold Panda Molly (*Poecilia*

Spp) fish has a better effect on preying on dengue mosquito mosquito larvae (*Aedes aegypti*) as evidenced by the calculated F value (15.41) which is greater than the F table value (1.70) at 1% error rate and F table (2.05) at 5% error rate. In the same analysis, the stocking density of treatment B = 4 tails of Gold Panda Molly (*Poecilia* Spp) fish was statistically very significantly different in preying on dengue mosquito (*Aedes aegypti*) mosquito larvae because of the P value (0.00) at an 1% error rate and an error of 5%. is smaller than the P value (0.05).

The application of natural feeding for dengue mosquito mosquitoes (*Aedes aegypti*) to Gold Panda Molly (*Poecilia* Spp) fish that live in tanks or water storage tanks must ensure that they maintain cleanliness, and function as natural predators to eradicate or minimize the number of dengue mosquito (*Aedes aegypti*) larvae as significantly. The results of this study have proven that the best stocking density for Gold Panda Molly (*Poecilia* Spp) fish to function as a natural predator for eradicating or minimizing the number of dengue mosquito (*Aedes aegypti*) larvae.

Table 4 The results of a comparative analysis of the speed of consumption on dengue mosquito (*Aedes aegypti*) larvae between the stocking density of Gold Panda Molly fish (*Poecilia* Spp) treatment A = 2 tails of fish, and B = 4 tails of fish.

t-Test: Paired Two Sample for Means		
Stocking density of Gold Panda Molly (Poecilia Spp) fish	*A = 2 tails of fish*	*B = 4 tails of fish*
Mean	186.67	133.33
Variance	387.13	241.89
Observations	30	30
Pearson Correlation	0.44	
Hypothesized Mean Difference	0	
df	29	
t Stat	15.41	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.70	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.05	

The comparison analysis resulted was given recommendation that the best stocking density for Gold Panda Molly (*Poecilia* Spp) fish to function as a natural predator for eradicating or minimizing the number of dengue mosquito (*Aedes aegypti*) larvae are using the stocking density of 2 tails of Gold Panda Molly (*Poecilia* Spp) fish, because they were able to kill 25 -75 dengue mosquito larvae (*Aedes aegypti*) with an average time range of 170 - 187 minutes more better then stocking density of 4 tails of Gold Panda Molly

(*Poecilia* Spp) fish, because they were able to kill 25 -75 dengue mosquito larvae (*Aedes aegypti*) with an average time range of 120.0 - 133.33 minutes.

CONCLUSION

The findings of this study provide evidence of the Gold Panda Molly (*Poecilia* spp) fish's role in maintaining ecological balance and its effectiveness as a natural predator in controlling the transmission of dengue fever. When the larvae of the dengue mosquito (*Aedes aegypti*) enter their larval phase, they serve as a natural food source for the Gold Panda Molly fish. The research highlights several significant factors: firstly, varying stocking densities of Gold Panda Molly fish greatly influence the rate at which they consume dengue mosquito larvae. Secondly, the consumption rate of Gold Panda Molly fish is significantly affected by the number of dengue mosquito larvae provided as food. Thirdly, the combined influence of stocking density and larval feeding rates has a substantial impact on the consumption speed of dengue mosquito larvae by Gold Panda Molly fish. For practical application, maintaining cleanliness in tanks or water storage where Gold Panda Molly fish reside is crucial to ensure their effectiveness as natural predators, capable of significantly reducing the larvae population. Under certain conditions, two Gold Panda Molly fish can potentially consume between 25 to 75 dengue mosquito larvae within an average time frame ranging from 133 to 186.67 minutes.

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CONFLICT OF INTEREST

There is no conflict of interest.

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