In-Situ Conservation of *Siebenrockiella crassicollis* to develop the Psycomotors and Environmental Awareness of Students

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DOI: https://doi.org/10.33369/bjset.2.2.32-39

ABSTRACT

This research aims to study the weight growth, eyes and neck health of *S. crasiicollis* in the conservation areas of SMAN (High School) Sukakarya and Balong Swamp, Sukakarya District, Musi Rawas Regency, South Sumatra Province. Data collection was carried out by means of observation for 8 weeks in the conservation areas of SMAN Sukakarya and Balong Swamp. The research results showed that the average weight growth of *S. crassicollis* for eight weeks was seen from the sex. Male *S. crassicollis* (ABP tagging code) grew 6.25 grams and female *S. crassicollis* (ACI tagging code) 1.37 grams. Whereas, in the Balong swamp the average body weight growth of *S crassicollis* for eight weeks was also seen from the sex. Male *S. crassicollis* (AHJ tagging code) grew 4.62 grams in weight and female *S. crassicollis* (ABQ tagging code) at 4.00 grams. Eye and neck health in both locations showed that all S. *crassicollis* eyes were clean, there was no dirt, clear glow and wide open and the neck was erected and looked up with very good / healthy criteria. Biotic components found were pandanus water, algae, ferns and grasses. Animals found include small fish, small shrimp, and water snails. While the abiotic component results of the environmental temperature measurement, and water temperature range from 27^0C to 32^0C, the pH of water between 6.5 to7. Based on observations, it can be concluded that the tortoise's body weight has increased and decreased according to the nature of the tortoise's body weight which is reversible, the eyes and neck health of the *S. crassicollis* shows very good results, where the healthy tortoise's eyes can be seen from clear, non-dirty eyes, wide open and not swollen, while the healthy neck can be seen from frequent lifting of the neck / looking up.

Keywords: *Siebenrockiella crassicollis*, in-situ conservation, psychomotor, environmental awareness.

INTRODUCTION

Tortoise is easily recognizable animals because they have a unique body shape. The uniqueness of the body has a shield or shell called a carapace on the back and a plastron on the abdomen, carapace and plastron is a modification of the skin composed of keratin (Miller, 2001; Setiadi, 2015). In addition to its unique shape, tortoise have a long life span, namely recorded tortoise on the Galapagos Island are able to live up to 100 years even the Aldabra tortoise can live to age 152 years (Miller, 2017). Tortoise reproduce oviparously (lay eggs). Age of reproductive maturity is generally 7 years. The female tortoise will use its hind legs to dig the ground or sand to store their eggs. Tortoise is able to lay eggs from 5 to 100 eggs (Miller, 2001). In general, tortoise is distinguished by groups of tortoise (living in the sea), tortoises, freshwater tortoise, and tortoise soft shielded. The simplest way to determine the type of tortoise is to compare the features found on the shield, head, scale, and color.

According to Kusrini, 2005, Tortoise is one of the long-lived vertebrates, it can be up to 55 years old and some types of tortoises can even reach nearly one hundred years of age. Tortoises are generally slow to reach sexual maturity, for example some species can take up to twenty years. Like Herpetofauna's research, generally in Indonesia tortoise research is very rarely done. The data on the habitat, population, reproduction, density, and behavior of Indonesian tortoises is very scarce.

One type of tortoise that is commonly found in the Sukakarya District, Musi Rawas Regency,South Sumatra Province is the white cheek tortoise (*Siebenrockiella crassicollis)*, White

cheek tortoises, including the small type, because the largest size ever found was only 200 mm. Growth is very slow, only a few millimeters a year. The 5 pieces of back with a size were not the same. The edge pieces are 24 (left = 12 and right = 12). Side pieces are 8 (left = 4 and right = 4) (Iskandar, 2000).

S. crassicollis has a deep black head, a large white patch behind his head. Other white patches are above the eyes in the upper jaw and the corners of the mouth are relatively small and blurred. The entire ridge is black. The belly shield is similarly, only the boundary between the pieces is dirty white and in some individuals it can be completely black. His life in small streams is slow, flooded areas like swamps. Although reported as a carnivorous animal, this species eats fish, shrimp, snails, as well as fruits and foliage. This type will stop eating if there are other types near it, so it should be maintained separately (Iskandar, 2000).

One of the locations where most Tortoise were found is the swamp area around Sukakarya High School with coordinates latitude 03^0 14, 648^0 longitude 103^0 13.789. The number found was 8 Tortoise from January to May 2019 with the condition of the dominant plant habitat is pandanus water, algae and ferns. And the discovery of small fish, small shrimp and water snails as natural food *(S. crassicollis).* Another habitat is in the Balong swamp area with a coordinate point latitude 03^0 13, 029^0 longitude 103^0 12,648 found 6 Tortoise*(S. crassicollis*), with dominant plants are water pandanus, fern species, algae, lotus, and lotus and small fish, small shrimp and water snails (Nasirudin, 2019). This is consistent with the Iskandar's opinion (Iskandar, 2000) which states that the habitat or place of life is in small rivers with slow flowing, inundated areas such as swamps. Although reported as a carnivorous animal, this species eats fish, shrimp, snails, as well as fruits and foliage. This type will stop eating if there are other types near it, so it should be maintained separately.

In an effort to preserve the environment, it is necessary to instill a concern for environmental preservation of students. Education can be a benchmark of progress and prosperity of a country. The progress of education in Indonesia is pursued through the development of formal education in various levels, ranging from primary, secondary, to higher education. All levels are expected to fulfill functions and achieve national education goals, such as those contained in Law Number 20 Year 2003 concerning the National Education System, which has the aim to develop capabilities and shape the dignified character and civilization of the nation in order to develop the life of the nation and aim to develop the potential of students to become human beings who believe and piety God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible.

Based on these educational goals, education should be a milestone for change for a better nation, because through education it is expected to shape learning experiences to be able to design solutions to problems. These learning experiences are not fully achieved in the classroom, because not all learning processes and materials presented in the classroom can represent conditions and problems in the environment around students. One learning that is very possible can be carried out outside the classroom and take advantage of the conditions or the potential of the environment, namely Biology learning.

RESEARCH METHOD

The research was done in Sukakarya District Area Musi Rawas Regency, South Sumatra Province. The first location where most tortoise were found a swamp area around Sukakarya High School with a coordinate point latitude 03^0 $14{,}648^0$ longitude 103^0 13,789, and the second location was in the Balong swamp area with a coordinate point latitude 03^0 $13{,}029^0$ longitude 103^0 12,648. Research instruments and materials which are used include: tortoise cages, digital / manual scales, GPS (*Global Positioning System*) / cellphones Digital cameras / cellphone cameras, Meters, Nets, white cheek tortoise, pens and paper.

RESULTS AND DISCUSSION

Observation Data in the Conservation Area SMAN Sukakarya Swamp

Weight growth in grams of *S. crassicollis* for 8 weeks in the SMAN Sukakarya Swamp Conservation Area is shown in Table 1 below:

Table 1. Weight Growth of *S.crassicollis* for 8 weeks in the First Location

No	Tagging Code	Initial Weight (grams)	Final Weight (grams)	Difference in Weight Initial-Final (grams)	Average Growth / week (grams)
1	♂ AHK	520	530	10	1,25
2	♂ABP	650	700	50	6,25
3	♀ ABX	553	555	2	0,25
4	♀ AHI	682	690	8	1,00
5	♀ ACI	624	635	11	1,37
Averages		**605,8**	**622**	**16,25**	**2,024**

The average weight growth of *S. crassicollis* for eight weeks is seen from the sex. Male *S. crassicollis* (ABP tagging code) has a body weight growth of 6.25 grams and female *S. crassicollis* (ACI tagging code) of 1.37 grams from the data shows that the growth of body weight in male *S. crassicollis* is greater than the S female crassicollis. The average body weight growth for 8 weeks can be seen in Figure 1. Growth of *S. crassicollis* body weight for 8 weeks in the Conservation Area SMAN Sukakarya Swamp was observed.

Based on the figure 1 above, it can be seen clearly the comparison of the average growth of male and female *S. crassicollis* body weight for 8 weeks of observation. The picture shows clearly that the growth of *S. crassicollis* body weight is not constant. *S. crassicollis* male, for eight weeks seen from week 1 to week 3 experienced an increase in body weight, but in week 4 experienced a decrease in body weight growth to week 5, then in weeks 6 to 7 the growth in body weight *S. crassicollis* increases again, and decreases again at week 8. For female *S. crassicollis* the growth of body weight resembles the pattern of male *S. crassicollis* body weight growth, ie experiencing increased body weight growth from week 1 to week 3, then decreased growth body weight at week 4 to week 5 and then increased body weight growth at weeks 6 and 7, then at week 8 decreased.

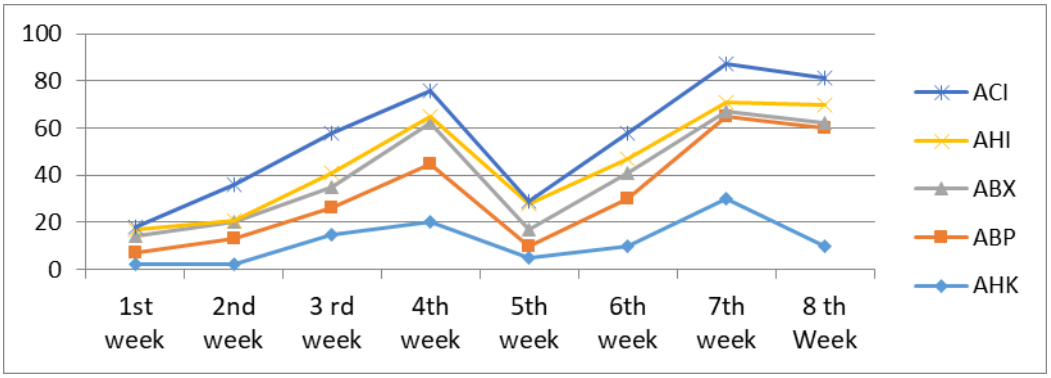

Figure 1. Weight Growth *S.crassicollis* of for 8 Weeks in the First Location

In general, the weight growth of *S. crassicollis* has reversible fluctuations, namely the increase and decrease in body weight which is influenced by various factors, both external and internal factors. This is in accordance with the statement of Angelita (2012), factors that influence the growth of body weight can be in the form of food consumed and the condition of the environment in which it lives (its habitat). While the factors that can cause a decrease in body weight growth are caused by the use of considerable energy as a result of the acclimatization process in the environment where a species in

adapting to physiological conditions to support the growth of cells and tissues when the environment changes must involve energy expenditure large enough to avoid natural selection. Meanwhile, according to Effendie (1997), the amount of food in an environment will affect the animal population in the form of the amount and quality of food available, the easy availability of food and the duration of food collection. Where food is initially supplied and then left because it is in its natural habitat, there will be competition in terms of foraging.

Chart of growth of *S. crassicollis* body weight based on sex. From the picture it can be seen that weight growth has increased in male S. crassicollis. This can be seen from the largest weight growth is male *S. crassicollis* with ABP tagging code with a weight gain of around 6.25gram. In *S. crassicollis* the female body weight growth was seen to decrease, this is because the average weight growth for eight weeks in individuals with AHI and ABX tagging codes of 1.00 grams respectively and 0.25 grams of body weight growth caused by several factors which affected the overall growth rate for 8 weeks overall for female *S. crassicollis*.

Eye and neck health of male and female S. crassicollis in the area the swamp conservation

Based on observations of clean and clear eye health, and often lifting the neck (indicating tortoise is not limp or healthy), on *S. crassicollis* with the method of direct observation of the object of research. Eyes health results while observation are categorized as very good, the result of eyes checks of the tortoise is said to be very good, if when observing the eyes of tortoise is clean, there is no dirt, clear, and wide open. The tortoise is good, if when observing the eyes of tortoise is clean, there is no dirt, clear, but not wide open. The tortoise is pretty good, if when observing the eyes of the tortoise is clean, there is no dirt, the eyes are somewhat turbid and not open wide. The last, if the tortoise is not good enough when observing the eyes of the tortoise is not clean there is dirt, rather turbid and not open with wide (swollen eyelids).

Table 2. Eye and Neck Health of *S. crassicollis* in the First Location

No	Tagging Code	Condition of the Body		Criteria
		Eyes	Neck	
1	♂ AHK	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
2	♂ ABP	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
3	♀ ABX	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
4	♀ AHI	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
5	♀ ACI	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy

Checking the average neck health of *S. crassicollis* seen from an erect neck. For eight weeks the results were included in the excellent category. Tortoises are said to be very good if when observing tortoise often look up (raise their necks), because based on the literature mentioning that one indicator of a healthy tortoise is often looking up (raising its neck). The tortoise is said to be good, if during observation the tortoise only occasionally looks up (raises its neck). The tortoise is said to be quite good, if when observing the tortoise rarely looks up (raises its neck). And it is not good, if while observing they are never seen raising its neck (tortoise look lethargic and unwell).

Observation Results Data in the Balong Swamp Conservation Area.

Weight growth of *S. crassicollis* for 8 weeks in the Balong Swamp Conservation Area is shown in Table 3;

Table 3. Weight Growth of *S.crassicollis* for 8 weeks in the Second Location

No	Tagging Code	Initial Weight (grams)	Final Weight (grams)	Difference in Weight Initial-Final (grams)	Average Growth / week (grams)
1	♂ BMW	669	686	17	2.12
2	♂ AHJ	663	700	37	4.62
3	♀ ABQ	743	775	32	4.00
4	♀ ABN	467	469	2	0.25
5	♀ CLM	624	635	11	1.37
Averages		**633.2**	**653**	**19.5**	**2.472**

The average weight growth of *S. crassicollis* for 8 weeks is seen from the sex. Male *S. crassicollis* (AHJ tagging code) had a body weight growth of 4.62 grams and female *S. crassicollis* (ABQ tagging code) of 4.00 grams. From these data it can be seen that the weight growth in male *S. crassicollis* is greater than that of female *S. crassicollis*. The average weight growth for eight weeks in the Balong Swamp Conservation Area is shown in Figure 2;

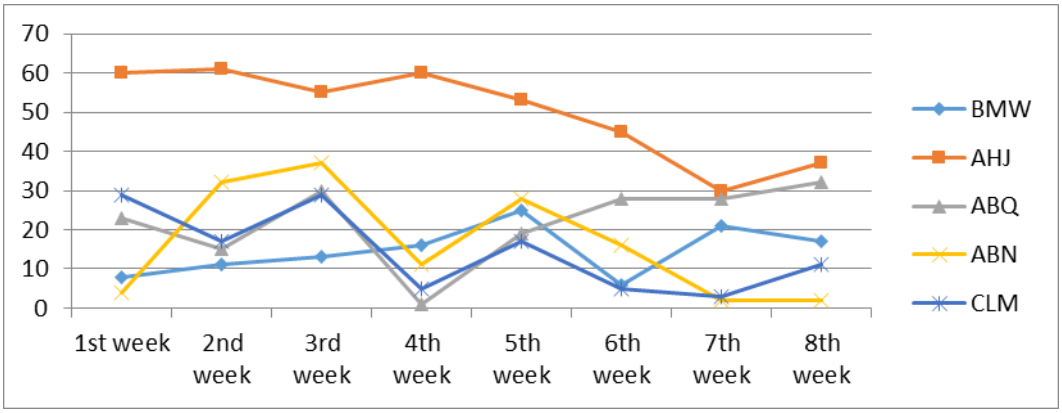

Figure 2. Weight Growth *S.crassicollis* of for 8 Weeks in the Second Location

Based on Figure 2, it shows the weight growth of *S. crassicollis* is not constant. For male *S. crassicollis*, eight weeks were seen from week 1 to week 3 gaining weight, but in week 4 there was a decrease in weight growth to week 5, then in weeks 6 to 7 weight growth *S. Crassicollis* increases again, and decreases again in week 8. For female *S. crassicollis*, the weight growth resembles the pattern of male *S. crassicollis* weight growth, which is experiencing an increase in body weight growth from week 1 to week 3, then has decreased growth body weight at week 4 to week 5 and then increased body weight growth at weeks 6 and 7, then at week 8 decreased.

Eye and Neck Health of male and female S. crassicollis in the Balong swamp

Observation of the eyes and neck health of a tortoise in the Balong Swamp Conservation Area is shown in Table 4. The observations of average eye and neck health are very good, the result of eyes checks of tortoise is said to be very good, if when observing the eyes of a tortoise is clean, there is no dirt, clear, and wide open. The tortoise is said to be good, if when observing the eyes of a tortoise is clean, there is no dirt, clear, but not open wide. The tortoise is pretty good, if when observing the eyes of the tortoise is clean, there is no dirt; the eyes are somewhat turbid and not open wide. The tortoise

is not good enough when observing the eyes of the tortoise is not clean; there is dirt, rather turbid and not open with wide (swollen eyelids).

Table 4. Eye and Neck Health of *S. crassicollis* in the Second Location

No	Tagging Code	Condition of the Body		Criteria
		Eyes	Neck	
1	♂ BMW	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
2	♂ AHJ	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
3	♀ ABQ	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
4	♀ ABN	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy
5	♀ CLM	Clean no dirt, Clear glow and wide open	Upright and Looking Up	Very Good/ Healthy

Checking the average neck health of *S. crassicollis* is seen from an erect neck. For 8 weeks the results were included in the very good category. Tortoise are said to be very good if when observing Tortoise often look up (raise their necks) because based on the literature mentioning that one indicator of a healthy tortoise is often looking up (raise its neck). The tortoise is said to be good, if during observation the tortoise only occasionally looks up (raises its neck). The tortoise is said to be quite good, if at the time of observation the tortoise rarely looks up (raises its neck). And it is not good, if while observation they are never seen raising its neck (tortoise look lethargic and unwell).

Environmental Conditions Data (Abiotic Factors)

Environmental temperature measurement results and water temperature ranges from 27 ^{0}C to 32 ^{0}C, while the pH of water between 6.5 to7. This is not much different from research conducted by Puspitasari 2007. Puspitasari (2007) states that the suitable temperature for the growth and environment of the tortoise range of 24.4 ^{0}C to 27.8 ^{0}C, and the pH of water ranges from 7-8. And another researcher (Fitria, 2008) which states that *S. crassicollis* lives in flooded areas such as swamps and lakes with water depths between 10-50cm. Whereas according to Amir and Khairuman (2011) stated that the suitable temperature for freshwater's tortoise lived well at temperatures of 27 ^{0}C - 32 ^{0}C. While according to Highfield (2007) at 27 ^{0}C - 30 ^{0}C the immune system could work optimally.

Table 5. Environmental Temperature Measurement in both of Location

No	Time	Environment Temperature		Water Temperature		pH of Water	
		Ranges	Averages	Ranges	Averages	Ranges	Averages
1	Morning / 09. 00 – 10.00 WIB	10 º C - 40 º C	28 º C	10 º C - 40 º C	27 º C	6 – 8	6, 5
2	Noon / 13. 00 – 14. 00 WIB	10 º C - 40 º C	32 º C	10 º C - 40 º C	29 º C	6 – 8	7
3	Afternoon / 16. 00 – 17. 00 WIB	10 º C - 40 º C	30 º C	10 º C - 40 º C	28 º C	6 – 8	7

S. crassicollis Habitat Condition in the Conservation Area

Based on the two locations of conservation areas (Figures 2 and 3), it can be seen that the growth of tortoise has increased and decreased every week; this is due to many factors that affect mainly food, limited space, tortoise activity itself, and biotic and abiotic factors. From the two conservation area locations, it can be seen on the tortoise growth chart in the SMAN Sukakarya swamp that their growth is faster than the Balong Swamp conservation area. It is caused by abundance of natural food such as small fishes, shrimp, and water snail. The research results were used as practicum guide and it is useful to increase the psychomotor and environmental awareness of students.

Figure 2. SMAN Sukakarya Swamp (First Location)

Figure 3. Balong Swamp Desa Ciptodadi I (Second Location)

CONCLUSION

From the observation of the *S. crassicollis's* body weight for 8 weeks in the SMAN Sukakarya Swamp and in Balong Swamp, we found that the *S. crassicollis*'s body weight has increased and decreased according to the nature of the tortoise's body weight which is reversible. However, the growth in the first location is faster than second location, this is caused by biotic factors in the first location are more supportive than others. The eyes and neck health of the *S. crassicollis* in the two location of conservation areas shows a very good result, healthy eyes can be seen from clear, non-dirty eyes, wide open and not swollen, while the healthy neck can be seen from the frequent lifting of the neck. Therefore, it can be concluded that finally the weight growth, eyes and neck health of *S. crassicollis* have increased in both of the location conservation areas.

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