JPII 12 (3) (2023) 355-365

Jurnal Pendidikan IPA Indonesia

http://journal.unnes.ac.id/index.php/jpii

THE INFLUENCE OF RARE PLANTS EXPLORATION IN TAMAN EDEN 100 LUMBAN JULU ON STUDENTS' SCIENCE PROCESS SKILLS

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DOI: 10.15294/jpii.v12i3.42696

Accepted: May 10th, 2023. Approved: September 29th, 2023. Published: September 30th, 2023

ABSTRACT

This study aims to determine the significant effect of rare plant exploration activities in Taman Eden 100 Lumban Julu on students' Science Process Skills (SPS) levels for deepening Biology learning material. The research method used was quasi-experimental with a significance level of $\alpha = 0.05$. The data analysis technique used the group average effect test. The results showed that the result of the normality test on the pretest Lo < Ltable was 0.1826 < 0.190 and on the posttest Lo < Ltable was 0.1707 < 0.190, and the homogeneity test results obtained Fcount < Ftable = 1.83 < 2.12. Hypothesis testing calculations obtained tcount > ttable = 25.50 > 1.72. This study concludes that the level of students' SPS by doing exploration has a significant influence. This can also be seen from the results of calculating the final increase (gain) score, where the gain value for each indicator is classified as medium and high. This shows that the science process skills possessed by students have increased.

Keywords: exploration; Garden of Eden; rare plants; science process skills

INTRODUCTION

A lecturer must be able to manage learning and facilitate students with the concept of Student-Centered Learning (SCL) (Zuraidah et al., 2015; Bustami et al., 2018; Sabah & Du, 2018; Tholibon et al., 2022). SCL-based learning can be realized if the lecturer implements a Participatory, Active, Innovative, Environmental, Creative, Effective, and Fun (PAILKEM) approach (Chen, 2019). One of the recommendations from PAILKEM is learning by utilizing the 'environment' as a learning resource that can develop and deepen learning content or materials.

The learning process in teaching science, especially Biology, should provide space and opportunities for students to make observations in the natural environment through relevant activities so that students can build their understanding of facts and concepts from learning material (Darling-Hammond et al., 2020; Kervinen et al., 2020; Amprazis et al., 2021; Fernández-González & Franco-Mariscal, 2021; Santos-Pastor et al., 2022). One of the Biology learning activities in the environment can be carrying out plant exploration activities, for example, exploring rare plants (Amprazis et al., 2021; Echeverria et al., 2021; Fernández-González & Franco-Mariscal, 2021; Skalstad & Munkebye, 2022). As a result of exploration activities, students will be able to compile descriptions and carry out exploration of rare plants, followed by identifying characteristics, interpreting, applying concepts, and then grouping/classifying plants, and this is closely related to the level of students' Science Process Skills (SPS) (Frame et al., 2015; Ibda, 2019). Haryanto & Arty (2019) explain that learning in nature is contextual learning to provide a real

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picture of the object of study to be studied. In addition, learning-based natural resources provide positive nuances for changing the learning paradigm from textual to contextual (Durakoglu, 2014; Ensiyawatin et al., 2021). Learning is not only done in the classroom using print and electronic media but also through nature-based observational learning (Klentien & Kamnungwut, 2015; Ma et al., 2018; De Smet et al., 2023). This approach encourages students to understand the scientific method and scientific attitudes better.

Exploratory learning is an alternative strategy that can be applied to improve the quality of the science learning process (Andrini, 2016; Valaei et al., 2017). Following the philosophy of constructivism, exploratory learning emphasizes the use of the natural environment around students' lives, both the physical, social, and cultural environment as science learning objects that allow students to build (construct) concepts based on their observations (Erdogan, 2016; Rachmatullah & Ha, 2018; Falloon, 2019; Darling-Hammond et al., 2020; Wasino et al., 2020; Fernández-González & Franco-Mariscal, 2021).

Taman Eden 100 is located in Lumban Rang Sionggang Utara Village, Lumbar Julu District, Toba Samosir Regency, North Sumatra Province. Taman Eden 100 is one of the tourism object forests that has potential and requires planning that can provide an overview of matters relating to its management in the future. For this reason, it is necessary to study and research the existing potentials. Taman Eden forest has very high biodiversity, so the Taman Eden 100 forests are used to become a natural plant conservation area. However, according to information from the management of Taman Eden 100 Tobasa, several plant species no longer live in this area, including Sumatran Vanda orchids, Sumatran orchids Corybas, which is a state-protected or rare orchid.

At the research location, there are step plants that have the potential to provide new insights about biodiversity, especially in that area. This study also focuses on the effect of exploration on students' science process skills. This shows that this study will analyze how exploring rare plants can affect students' science process skills, such as observation, experimentation, data analysis, and understanding of scientific concepts. This research offers the concept of enrichment in biology learning. This approach aims to dig deeper into biology learning material by integrating aspects of the exploration of rare plants. This research tries to bridge the knowledge gap about the impact of rare plant exploration on students' science process skills in the context of deepening biology materials. Therefore, the novelty of this research lies in a comprehensive approach that combines specific locations, developing student skills, and deepening learning materials.

This research aims to study the characteristics of rare plants through exploration in the natural forest environment to broaden knowledge, train, and improve various skills in conducting predictions where the data obtained will add input for conservation so that these plants do not become extinct so that they can be studied again by other generations to come.

METHODS

The method used in this study was quasi-experimental. The research design used in this study was The Matching Only Posttest Only Control Group Design (Campbell & Stanley, 1963). The steps in this research were: Before going to the Taman Eden 100 forest, a pretest was carried out to measure the level of students' science process skills. Then, when they entered the Taman Eden 100 forest, students carried out an exploration by following the mapped paths. Exploration activities for rare plants followed the lecturer's direction in observing, identifying, classifying, predicting, and interpreting the plants found. After completing the exploration activities, it was continued with a posttest on the level of students' science process skills in the class. This was to determine the effect of exploratory activities on the level of students' science process skills.

The instrument used to collect data on the level of students' science process skills was the test (pretest and test), observation sheets, and questionnaires. The average values of the pretest and posttest were calculated, then the data normality test was carried out.

The observation sheet consisted of 26 statements compiled based on SPS indicators. Student observation sheet filled with the mark *checklist* on the weighted item, the observer assessed the value, namely the researcher. SPS students can be known through the weight of the value in the observation sheet. The questionnaire instrument consisted of 30 questions. Instrument validation was done by consulting directly with the experts regarding language, material suitability, and content structure through expert tests.

Data normality testing used the Lilieforce test formula. Furthermore, the homogeneity test was carried out with the Barlett test. To determine whether there is a significant influence from the implementation of rare plant exploration on the level of students' science process skills, the group average effect test was conducted with a significance level of α = 0.05.

RESULTS AND DISCUSSION

Based on data calculations on the pretest before carrying out the exploration, the highest student score is 40.00 for 1 person, and the lowest score is 10.00 for 1 person, with an average score of pretest ($\bar{x}$) 23.19 and SD = 7.22. From the pretest score, students who completed according to the SPS scoring indicator were 0 students (0%), and those who did not complete were 21 students (100%).

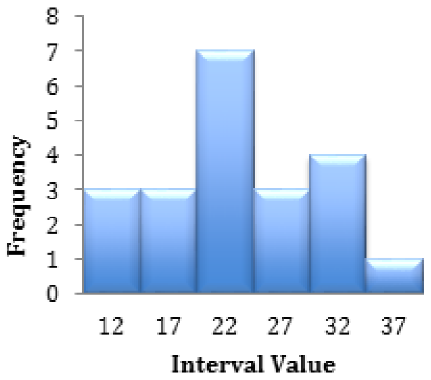

Figure 1. The Pretest Value of Students

Based on the calculation of the data in the posttest after carrying out the exploration, the highest score is 83.33 for 1 person, the lowest score is 46.66 for 2 people, and the posttest average score is obtained ($\bar{x}$) 65.33 and SD = 9.80. From the posttest score, students who completed according to the SPS scoring indicators were 16 people (76.1%), and those who did not complete were 5 people (23.8%).

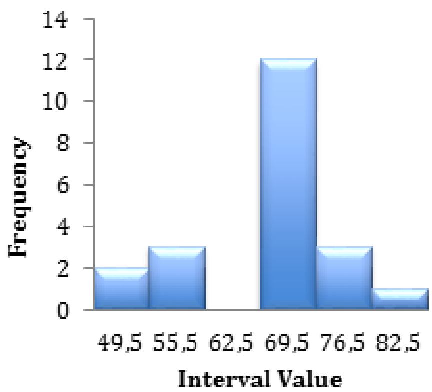

Figure 2. The Posttest Value of Students

Research results can be used as a source of learning biology. However, it is necessary to meet the requirements, namely clarity on the potential availability of objects and issues raised, suitability with learning objectives, material objectives, and their designation, information to be disclosed, guidelines for exploration and acquisition to be achieved so that the results of plant exploration research which is carried out in Taman Eden 100 Lumban Julu can be used as a source of student learning. The data obtained is not part of the teaching material product but is the result of exploration in the field, which will later be used as a deepening of the material for students, namely how a student can observe, classify, interpret, predict, ask questions, hypothesize, plan, prepare tools and materials, apply concepts, and communicate obtained from the field (Asy'ari et al., 2019).

In this study, the researcher describes the level of students' SPS through field exploration activities at Taman Eden 100 Lumban Julu. The researcher uses basic SPS indicators, which include observing, classifying, interpreting, predicting, asking questions, hypothesizing, planning, preparing tools and materials, applying concepts, and communicating. After obtaining the average value and SD from the pretest and posttest, it is continued to calculate the Gain value from the SPS instrument item indicators. The calculation results can be seen in Table 1 below.

Table 1. Gain Value Data

No.	Question Indicator	Gain Value
1.	Observe/Observation	0.40
2.	Group/Classification	0.50
3.	Interpret/Interpretation	0.75
4.	Foresee/Predict	0.59
5.	Asking question	0.58
6.	Hypothesize	0.40
7.	Plan Experiments	0.41
8.	Use Tools/Materials	0.70
9.	Apply Concepts	0.29
10.	Communicate	0.43

Based on Table 1 above, from the Gain calculation results, the final score increases. The Gain value on the observing indicator (Observation) is 0.40 (moderate), and the Observation sheet value is 95%. This is because observing requires sensitivity from the student's five senses during exploration activities. The sensitivity of the five senses of students is different. Furthermore, Sahnaz et al. (2018) reveal that there are several activities included in observing skills, such as using the senses of sight, touch, smell, hearing, and taste when observing the characteristics of an object, as well as using relevant and adequate facts from the observations.

The Gain value on the grouping indicator (classification) is 0.50 (moderate), and the value from the observation sheet is 70%, meaning that students are quite capable of recognizing rare plant species based on the characteristics given but still need further understanding based on IUCN, CITES categories. The Gain value on the interpret indicator (interpretation) is 0.75 (high), and the value of the observation sheet is 73.30%. The high level of this category indicates that students can organize and analyze, select findings, relate them to what is known, and then interpret them. The Gain value on the predicting indicator is 0.59 (moderate), and the value from the observation sheet is 92.5%. Students can predict the conditions by looking at the number and condition of environmental factors found in plant habitats (Sittaro et al., 2023). Students must be able to predict the state of future plants (Cooper et al., 2014). The Gain value of the asking questions indicator is 0.58 (enough), and the score from the observation sheet is 92.50%. This shows that students can answer and provide explanations when facing a problem. This is due to the ability to compose sentences in good communication.

The Gain value on the hypothesizing indicator is 0.40 (medium), and the value from the observation sheet is 65.00%. Students need to be able to connect hypotheses with problems that occur or with plants found in the forest. This is relevant to students' ability to predict, which is also in the moderate category. Mutammimah et al. (2019) reveal that the skill of making a hypothesis is the skill of making a reasonable estimate to explain a particular event or observation. The Gain value for the planning experiment indicator is 0.41 (moderate), and the score from the observation sheet is 80%. Students are quite capable of planning experiments and know how to arrange steps for observation activities according to the scope to be worked on. The Gain value of the using tools and materials indicator is 0.70 (moderate), and the value from the observation sheet is 80%. Students already know how to use tools and materials according to their designation when making observations and classifying plants (Fernández-González & Franco-Mariscal, 2021). The Gain value of the applying the concept indicator is 0.29 (low), and the score from the observation sheet is 80%. This is because students are still less able to implement the concepts they learn with the problems they face.

The Gain value of the communicating indicator is 0.43 (moderate), and the value from the observation sheet is 95%. Students can explain the results of observations and describe empirical data from observations. This is in line with the ability of students to ask questions, present data in the form of pictures, graphics, or other things that require good communication skills, and understand each other's situations and conditions at the right moment in conveying data.

Overall, from the results of the SPS indicator score, the research results from the exploration of rare plants in Taman Eden 100 Lumban Julu show that there is a significant influence in increasing students' science process skills, namely observing, classifying, interpreting, predicting, asking questions, hypothesizing, planning experiments, using tools and materials, and communicate learning outcomes (communication), and have no significant effect on improving students' science process skills on the indicator of applying concepts.

Furthermore, from the results of the normality test in the pretest with a significance level of $\alpha = 0.05$ with the number of students (N) 21 with $L_{table} = 0.190$ is, for the pretest $Lo<L_{table}$ namely 0.1826 <0.190 so that it is stated that the pretest value data is normally distributed as well as the normality test results in the posttest obtained $Lo<L_{table}$ namely 0.1707 <0.190 showing that the data is normally distributed.

The results of the homogeneity test data show that the pretest variance (S^2) = 52.26 and the posttest variance (S^2) = 96.13 the F_{count}= 1.83 and F_{table}= 2,12 points $F_{count}< F_{table}$= 1.83 < 2.12 so that it can be stated that the data presented has the same or homogeneous variance. The results of the calculation of the hypothesis test that has been done obtained t_{count} = 25,50 and t_{table}= 1.72 so that it can be stated that exploration activities have a significant effect on students' science process skills for deepening Biology learning material. This can also be seen from the results of calculating the final increase score (Gain), where the Gain values for each indicator are classified as medium and high. This shows that students's science process skills have increased.

The final Gain value is still relatively low, namely on the applying the concept indicator, namely only obtaining a gain value of 0.29, which is in the low category. Some of the things that cause this indicator not to be achieved are that students still find it difficult to relate what is learned in class to the reality on the ground (Lodge et al., 2018; Coman et al., 2020). According to Bolkan & Goodboy (2019) and Lukas et al. (2023), the skills of applying concepts are mastered by students if they can use the concepts they have learned in new situations or apply these concepts to new experiences to explain what is happening.

After that, the researcher presents the results of the GAIN data on science process skills in graphical form. The results of the GAIN calculation can be seen in Figure 3 below.

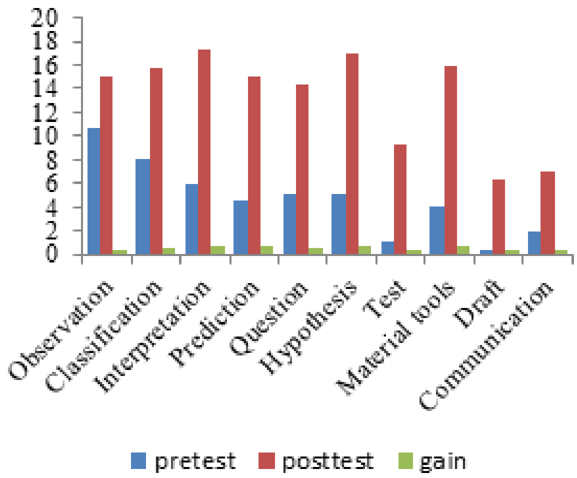

Figure 3. Science Process Skill Gain Calculation Results

Based on Figure 3 above, it can be explained that from the Gain calculation results obtained from the tests, the final score increases. The Gain value on the observation indicator is 10.66 (pretest), 15 (posttest), 0.4 (Gain). Classification is 8 (pretest), 15.66 (posttest), 0.5 (Gain). Interpretation is 6 (pretest), 17.33 (posttest), 0.75 (Gain). Prediction is 4.6 (pretest), 15 (posttest), 0.69 (Gain). Question is 5 (pretest), 14.33 (posttest), 0.58 (Gain). Hypothesis is 5 (pretest), 17 (posttest), 0.75 (Gain). Test is 1 (pretest), 9.33 (posttest), 0.4 (Gain). Material tool is 4 (pretest), 16 (posttest), 0.7 (Gain). Draft is 0.33 (pretest), 6.33 (posttest), 0.29 (Gain) and Communication is 2 (pretest), 7 (posttest), 0.43 (Gain). After the exploration activities were completed, an output was produced as material for deepening Biology learning materials, namely "Description of Endangered Plant Species". The description of rare plants found in the Taman Eden 100 forest can be seen in Table 2 below.

Table 2. Some Rare Plant Species are Found in the Agrotourism Forest of Taman Eden 100 Tobasa

No	Indonesia Name	Scientific Name	Family
1	*Nepenthes*	*Nepenthes tobaica* Danser	Nepenthaceae
2	*Nepenthes*	*Nepenthes ampullaria* Jack	Nepenthaceae
3	King's wood	*Compassia excelsa* (Becc.) Taub.	Leguminosae
4	Damar	*Agathis dammara* (Lamb.) Rich.	Araucariaceae
5	Edelweiss	*Anaphalis longifolia* (Blume) Blume ex DC.	Asteraceae
6	Shoe Orchid	*Paphiopedilum tone* (Rchb.f) Stein.	Orchidaceae
7	Jewel Orchid	Macodes petola (Blume) Lindl.	Orchidaceae
8	Sugarcane Orchid	Grammatophyllum speciosum Blume	Orchidaceae
9	Harp	Sandoricum koetjape (Burm.f.) Merr.	Meliaceae
10	Red Palms	Cyrtostachys lakka Becc.	Arecaceae

a. *Nepenthes tobaica* Danser. *Nepenthes tobaica* or tobaica semar sacs have a variety of colors and shapes of the pouches that make *Nepenthes* a unique beauty (Victoriano, 2021; Mansur et al., 2022; Tarigan et al., 2023). Ecologically, these nectar pockets function as traps for insects, some reptiles, and other small animals (Mansur et al., 2021; Tarigan et al., 2021). *Nepenthes tobaica* is a plant endemic to Sumatra and can be found around Lake Toba (Nainggolan et al., 2020). It has an oval bottom pouch, has two eye spots on the upper wall, the mouth of the pouch is oval, and the bottom cover of the pouch is slightly round. The bag is 20-25 cm long, greenish yellow. Climbing stems can reach 20 m, round, faceted, or winged, with a 0.4-0.5 cm diameter. The roots are stilt-shaped. The leaves are lanceolate in shape with a length of 8-10 cm and a width of 1.5-2 cm, with modified leaf tips in the form of tendrils and a pouch (ascidium) resembling a cup with an orbicular lid. The bones are generally parallel and curved, sitting scattered, alternate, and attached to the half-hugging stem. The rosette (lower pitcher) in the pitcher has hairy wings but not in the upper pitcher. The shape and color composition of the two types of pitcher are much different, separate from male and female flowers (dioecious). Fruit capsule shape (fusiform), locus, has many seeds. *Nepenthes tobaica* with IUCN conservation status: Least Concern (LC; Low Risk).

b. *Nepenthes ampullaria* Jack. *Nepenthes ampullaria* has a shrub or climbing habit, young plants with rosette leaves, the position of the leaves that propagate alternately (spirals), the shape of the blade leaves, green pouches with red spots, and oval-shaped tapering at the base (Schwallier et al., 2017; Nunn, 2018; Gilbert et al., 2022; Tarigan et al., 2023). *Nepenthes ampullaria* or semar ampularia has climbing stems that can grow up to 15 m. Rosette-shaped pouches are produced at the tips of leaves with tendrils not more than 15 cm long. The lower pouch is small, at most 10 cm in length and 7 cm in height. The top pocket is rarely produced, usually smaller than the bottom bag. Pouch colors vary from plain green to dark red and many other combinations. The leaves are green with a length of 25 cm and a width of 6 cm. The surface of the leaves is usually covered with a powdery brownish color, and the shoots grow fine brown hairs, which are more numerous when the plant is in a cold habitat. Another uniqueness that other *Nepenthes* do not have is the ability to produce "pocket groups", namely a group of leafless pouches that grow on upright stems or the ground. *Nepenthes ampullaria* is used as a substitute for coconut leaves in making ketupat. In Sumatra, this food is called "godah cake" (Hernawati et al., 2022). *Nepenthes ampullaria* with IUCN conservation status 2.3: Vulnerable (VU; Vulnerable).

c. *Kompassia excelsa* (Becc.) Taub. *Koompassia excelsa* or Tualang is also called King's Wood, Menggeris, or Sialang. It has a stem that can reach a height of more than 80 meters; the bark is gray. It has alternate and odd compound pinnate leaves. The leaves are pinnate with alternating leaflets. It has long leaflets of 2-5 cm and a width of 1–2 cm with 10-30 leaflets with long thin pods. The Tualang tree is favored by forest honey bees, so it can produce forest honey and is classified as a state-protected plant. The roots are planks or have spreading buttress roots. It has a double leaf compound, plagiotropic, oblong leaf shape, tapering, alternating leaf arrangement, opposite leaflets, spreading buttresses with irregular flowers, and an upper corolla inside. The height can reach 30 m or even more. *Koompassia excelsa* with IUCN conservation status: Least Concern (LC; Low Risk).

d. *Agathis dammara* (Lamb.) Rich. *Agathis dammara* or damar is a plant native to Indonesia with stems that can grow up to 55 m and 3.5 m in diameter. Damar has cylindrical and straight stems, green leaves with pinnate spines, lancet leaf shape, short petioles, leaf length 10-14 cm, and 3-4 cm wide. The leaves are placed opposite. The leaf surface is rather thick, the edges are flat, and the tips of the leaves are pointed. It is slightly reddish when it is still young (Adam et al., 2017; Adalina & Sawitri, 2020). The resin bark is rather soft and gray, usually peeling off into flakes. The branch structure is horizontal and ascends when larger. *Agathis dammara* with IUCN conservation status: Vulnerable (VU; Vulnerable).

e. *Anaphalis longifolia* (Blume). *Anaphalis longofolia* is known as the "Eternal Flower" or "Edelweiss". *Anaphalis longifolia* in North Sumatra grows in critical areas so that its survival rate becomes threatened (Oo, 2021). Besides having an ecological role, Edelweiss also has high attractiveness. The flowers are beautiful and can bloom for a long time, so they are called eternal flowers. This is one of the reasons for the continued decline in the Edelweiss population in nature. *Anaphalis longifolia* has a single root with fibers on the root branches. The leaves are linear (length equal to ten times wider), pointed, have white hairs like wool, leaves 9.00-10.00 cm long and 0.50 cm wide. When fresh, Edelweiss leaves are light gray-green due to the presence of wool-like hairs covering the leaves, and when dry, the color becomes dark because of the degraded mesophyll. Edelweiss has flowers that develop on a flat, golden base. The anthers form a tube that gathers together in one container. *Anaphalis longifolia* Blume ex Blume DC is a plant belonging to the genus Anaphalis and the family Asteraceae. This plant can be found as a bush with many branches and can reach 4.00-8.00 m in height. Edelweiss stems are covered with rough and fissured bark, which can store water. Edelweiss branches support grayish leaves. Anaphalis sp with IUCN conservation status: Endangered (EN; Endangered or Threatened).

f. *Paphiopedilum tonsum* (Rchb.f) Stein. *Paphiopedilum tonsum* is classified as a sandal orchid. This orchid has green leaves, the top with light green spots. Number of leaves 4-6, length 18-30 cm, width 3.5-4.3 cm, elliptical shape, pointed and serrated tip. The green pedestal leaves have reddish trichomes. Single flower at the end of the inflorescence stalk 15-30 cm long, rough trichomes, dense, purplish red. Flowers 8.5-9.5 cm in diameter, flower stalks and ovaries 5.5-9.5 cm, green with elongated grooves and purplish-red trichomes. Central round ovoid petals wide, obtuse, 3-3.7 cm long, 3.2-4.3 cm wide, the edges are not trichomed, the middle is smooth short trichomes, the edges are yellowish white, and the center is yellowish white green, shiny. The crown extends sideways, almost straight, ribbon-shaped, 4.5-5.5 cm long, and 1.3-2 cm wide, and has short trichomes, greenish with reddish-brown spots towards the base, towards the tip, brown and shiny. It has sac-shaped lips, 4.3-5.2 cm long and 2.4-3 cm wide, light orange with a red tint with light brown spots on the side lobes. The top of the monument is curved, 0.8-1.1 cm long and 0.8-1 cm wide, and has short trichomes, pale green and brown. Hartini (2019) explains that *Paphiopedilum tonsum* is only found in Sumatra, an endemic plant. *Paphiopedilum tonsum* with IUCN conservation status: Endangered (EN; Endangered or Threatened).

g. *Macodes petola* (Blume). Lindl. m*Macodes petola* or gem orchid has a single egg-shaped, dark green color with a smooth and shiny surface, totaling 5-7 strands. The arrangement of the leaf bones spreads. The main ones are thin veins with golden-yellow stripes and curved leaves. The number of main leaf veins is 5-7, with short veins resembling nets. The underside of the leaves is pale green with a leaf blade length of 3.5-7 cm. The width of the leaf blade is 2.5-4.9 cm and 0.5 mm thick with petiole length 3-4.1 cm. *Macodes petola* has a cylindrical stem, dropping then rising, fleshy. The upright part measures 6–10 cm and is 9-11 mm thick. Flowers on orchid gems are compound and located at the end (terminal), upright, dense with many up to nearly 20 flowers and a long inflorescence stalk of 14.10-15.30 cm. The inflorescence stalk is cylindrical and covered with hairs. The petals are oval, the pointed tip is whitish green, and the flowers are reddish brown and hairy on the upper surface. The flower crown is narrower than the petals and paler in color than the petals. The lip of the flower is white and pale brown at the base. *Macodes petola* conservation status IUCN is Endangered (EN; Endangered or Threatened).

h. *Grammatophyllus speciosum* Blume. *Grammatophyllus speciosum* or Sugar Cane Orchid is the largest orchid, can weigh more than 1 ton, and has panicles up to 3 meters long with a panicle diameter of about 1.5-2 cm. Each panicle can have dozens, even up to a hundred flowers, each about 10 cm in diameter. The inflorescence stalk is 200-250 cm long and 1.5-2 cm in diameter. Flowers come out of the base of the stem, yellow with brown spots or blackish red. Grammatophyllum speciosum has a cylindrical stem that is long and covered with leaf sheaths. When the leaves fall, a yellowish stem resembling sugar cane appears, stem length 150-160 cm, diameter 3.5-4.8 cm. The uniqueness and rarity of this largest and heaviest orchid plant make *Grammatophyllus speciosum* one of the protected orchids in Indonesia. *Grammatophyllus speciosum* has been included in CITES Appendix II since 2005. Conservation status IUCN Least Concern (LC) Low Risk

i. *Sandoricum koetjape* (Burm.f.) More. *Sandoricum koetjape* is also known as Sentul or Kepalat. Erect woody stems, gummy, and branching from the base can grow to 30 m. It has many branches and twigs with a 70-90 cm stem diameter. It has compound leaves, oval, alternate, 12-20 cm stalk length, flat edge, tapered tip, pinnate bone, smooth surface, shiny, round stalk green. Panicle-shaped compound interest, hair in the axillary leaves, hanging, 12-26 cm long, short pistil stalk 4-5 cm, white, long crown 6-8 cm, greenish yellow. The fruit is round, slightly sweet and sour, has hair with a 5-6 cm diameter, and is yellow. The outer flesh is red with a rather hard and thick texture, and the white inside is slightly watery. The seeds are round and brown (Lela et al., 2019). *Sandoricum koetjape* in IUCN data is also known as Melia koetjape or *Sandoricum vidalii*, with the conservation status of IUCN Least Concern (LC; Low Risk) since 2017.

j. *Cyrtostachys varnish* Becc. *Cyrtostachys varnish* or red palm has bright red petals under its leaves. Red palm is often also referred to as areca lipstick. As a result of being traded as an ornamental plant, the red palm is a rare plant out of 14 protected palm species. Red palms grow in clumps to a height of 5-15 m. It has a round, rather slender stem with bright green leaves up to 1.5 m long, slightly curved-finned with slightly stiff leaves. The leaf sheaths are red. The arrangement of the leaf blades is pinnate. Flowering grows on the stem nodes at the bottom of the frond canopy. Male and female flowers consist of 3 petals and an oval crown. The fruit is oval, dark brown to black, with a size of 0.8 cm x 0.5 cm, and has a single seed. Cyrtostachys lakka with conservation status is IUCN Least Concern (LC; Low Risk).

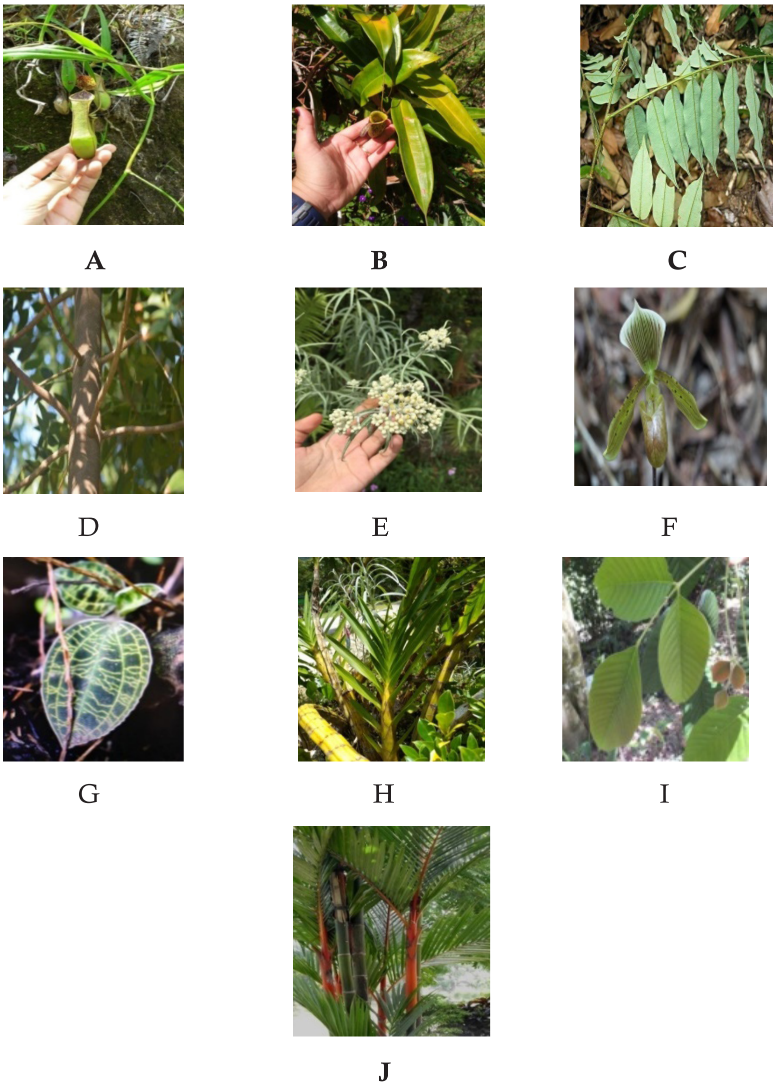

Figure 4. Plant Species Found in the Garden of Eden 100 Lumban Julu, Indonesia: A. *N. tobaica;* B. *N. ampullaria;* C. *Kompassia excelsa* (Becc.); D. *Agathis dammara* (Lamb.); E. *Anaphalis longifolia* (Blume); F. *Paphiopedilum tonsum* (Rchb.f); G. *Macodes petola* (Blume); H. *Grammatophyllus speciosum* Blume; I. *Sandoricum koetjape* (Burm.f.); J. *Cyrtostachys varnish* Becc

CONCLUSION

Based on the analysis results obtained from the pretest and posttest, students have obtained a final increase score, which is quite good. Furthermore, from the results of the normality test on the pretest $Lo<L_{table,}$ namely 0.1826<0.190, and the posttest at $Lo<L_{table,}$ namely 0.1707<0.190 and the homogeneity test results obtained $F_{count}< F_{table}= 1.83 < 2.12$. The calculation of hypothesis testing obtained $t_{count} > t_{table} = 25.50 > 1.72$. Based on the results of these calculations, the level of students' science process skills by conducting exploration has a significant influence. This can also be seen from the results of calculating the final increase score (gain), where the gain values for each indicator are classified as medium and high. This indicates that the science process skills possessed by students have increased.

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