IDENTIFICATION OF THE PART OF THE SENSES AND THEIR AUXILIARY ORGANS IN AIDING HUMAN ACTIVITIES

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ABSTRACT

Each individual is created with a complete sense system that is used to be able to interact with the surrounding environment, which can be obtained through the senses, namely the eyes, ears, nose, tongue, and skin. DestinationThis study aims to determine the parts of the senses and their complementary organs that help human activities.

The method used in this research is the experimental method, the experimental method is an action and observation or testing a hypothesis. Experiments can be carried out in a laboratory or outside the laboratory, experimental work implies learning to do, because it can be included in the learning method.

The results of the research on taste sensitivity showed that the results obtained for the first probandus for the garlic sample contained 1 guessing error, while for the onion sample there were 2 guessing errors, for the apple sample all were correct. The second proband for the garlic sample was all answered, the onion contained an error 1 while the apples were all correct. In this blind spot study, we found differences in the distance of the blind spots in one proband to another. This is because the size of the eyeball, the convexity of the eye lens and the distance from the lens to the retina are different for each person.

Keywords: sensory system, organ appendages

INTRODUCTION

Pharmacy in Greek is called "Pharmakon" which means beautiful or beautiful, which then changes its meaning to poison, and then again turns into medicine or medicinal ingredients. Pharmacy is the science that studies how to make, mix, mix, formulate, identify, combine, analyze, and standardize drugs and medications, as well as the properties of drugs and their safe distribution and use. Pharmacy studies all natural sciences, not only focusing on chemistry but also studying human anatomy and physiology [5].

In pharmacy we study anatomy. Anatomy comes from the Greek language which consists of ana which means part and tomi which means cutting, so Anatomy is the study of the structure or structure of the human body and the relationship between one part and another. While Physiology is the study of the functions of the human body under normal conditions. so physiological anatomy is the study of the structure and function of the human body under normal circumstances and in human anatomy and physiology we also learn about the sensory system [6].

Every individual is created with a sensory system used whichcomplete to be able to interact with the surrounding environment, which can be obtained through the senses, namely the eyes, ears, nose, tongue, and skin. The information is

transmitted to the brain to be processed and interpreted so that individuals can see, hear, smell, taste, and touch. So, each sense organ has a sensitivity to external stimuli called receptors [8].

Our sense organs have parts that can receive stimuli in the form of sensory nerve endings or receptor cells. One type of receptor is only able to respond to one kind of stimulus, the stimulus received by the receptor cell is first converted into nerve impulses and then transmitted to the central nervous system through sensory nerve fibers. In the central nervous system, these nerve impulses are processed and interpreted so that individuals know what is happening around us. After that, the brain ordered the type of response to be given. Commands from the brain are conveyed to muscles or glands as effectors in charge of responding to these stimuli [8]

The human body has senses that function as receptors or recipients of stimuli from the surrounding environment. Humans have five kinds of senses, namely the sense of sight (eyes), the sense of hearing (ears), the sense of smell/smell (nose), the sense of taste (tongue), and the sense of touch (skin).

The experimental relationship in the pharmaceutical field is because in the pharmaceutical field knowledge is also needed about the sensory system related to drug administration and the mechanism of action of drugs on the sensory system [8].
Somatic sensations are detected by widely distributed receptors that provide information about the body's interactions with the environment in general. In contrast, each specialized sense has highly localized and specialized receptors, which respond to certain environmental stimuli. The senses include sight, hearing, taste and smell.
This sense serves to recognize any changes in the environment, both inside and outside the body. The senses that exist in living things have special receptor cells. These receptor cells function to recognize environmental changes that occur. Based on their function, these receptor cells are divided into two, namely interoreceptors and exoreceptors [3].

These interoreceptors function to recognize changes that occur in the body. Interoreceptor cells are found in muscle cells, tendons, ligaments, joints, blood vessel walls, digestive tract walls, and so on. These cells can recognize various changes in the body such as pain in the body, decreased oxygen levels, glucose levels, decreased/increased blood pressure and soon [3].

Exoreceptors are the opposite of interoreceptors, exoreceptors function to recognize environmental changes that occur outside the body. Which includes exoreceptors, namely: 1) the sense of sight (eyes), this sense functions to recognize changes in the environment such as light, color and so on; 2) sense of hearing (ear), this sense serves to recognize changes in the environment such as sound; 3) the sense of touch (skin), this sense serves to recognize environmental changes such as heat, cold and so on; 4)The sense of taste (tongue), this sense serves to recognize environmental changes such as tasting sweetness,bitter and so on; 5) The sense of smell (nose), this sense serves to recognize environmental changes such as recognizing / smelling smells. These five senses are commonly known as the five senses [13].

Kinds of Sense System

The sensory system in humans is divided into:

1. Sight (Eyes),the eye is the organ of vision that receives stimulation in the form of light. The eyeball is located in the eye socket and is covered with a layer of fat. The eyeball can move and be directed in one direction with the help of three eye muscles, namely:

a. The medial rectus oculi muscle (muscle around the eye) functions to move the eyeball.
b. The superior obliques oculi muscle functions to turn the eye up and down.
c. The inferior obliques oculi muscle functions to move the eyeball down and inward [12].

In addition, there are eye muscles that function to close the eyes and lift the eyelids The eye muscles are the orbicularis oculi muscle and the inferior rectus oculi muscle, while the eye muscles that function to lift the eyelids are the levator palpebralis superior muscle. [13].

The eyeball is composed of the eye membrane which consists of three layers, namely the sclera or white membrane, the choroid or black membrane, and the retina or mesh membrane.

a. White membrane, white membrane (sclera) is the outer part of the eyeball which is composed of horny substance and is a strong and white layer. The function of this membrane is to protect the very delicate structures of the eye and help maintain the shape of the eyeball, the sclera will form the cornea. The cornea is a clear and transparent layer that functions to receive light that enters the eye, the cornea is protected by a thin membrane called the conjunctiva. The cornea will also always be moistened with tears.
b. The black membrane, the black membrane (choroid) is the middle layer of the eyeball that contains many blood vessels. The function of this membrane is to provide nutrients and oxygen to the eye and absorb light and reduce light reflecting around the inner eye. The pupil is the slit in the middle of the iris. Its function is to regulate the intensity of light entering the eye. If the light is dim, the muscles of the iris contract so that the pupillary gap widens and more light enters the eye.

Conversely, if the light is bright, the pupillary slit will narrow and the light entering the eye is less or not excessive. The lens of the eye is behind the iris, the eye lens has accommodation power, namely the ability to convex (thicken) and concave (thin). The eye is determined by the distance of the object being seen. The distance of the object that can be clearly seen by normal eyes is called the near point of the eye. While the farthest distance that the normal eye can clearly see is called the far point. eye.The far point distance in the normal eye is infinity.

c. Mesh membrane, also called the retina, the retina is the innermost layer of the eye that is sensitive to light. This retina has nerve cells, in the retina there are yellow spots and blind spots. Yellow spots are the part of the retina that is most sensitive to light because it is a a gathering place for nerve cells in the form of cones and rods. One can see when the image falls on this point. In the yellow spots there are cones and rods.

The function of cone cells and rods cells, as follows: 1) cone cells function to see in a bright place, these cells require the protein iodopsin; 2) rod cells function to see in the dark, these cells require the protein rhodopsin. Rhodopsin can be formed when there is a combination of iodopsin and vitamin A [1].

The blind spot is the meeting point of the nerves or the exit of the

eye nerve to the brain. The blind spot does not contain rods and cones so it cannot respond to light stimuli 1).

The working mechanism of vision is that the eye can see objects because of the light reflected by the object, so the eye cannot see the object. The process of the eye seeing objects is as follows: 1) the light reflected by the object is caught by the eye, penetrates the cornea and is transmitted through the pupil; 2) the intensity of light that has been regulated by the pupil is passed through the lens of the eye; 3) the accommodation power of the eyepiece regulates light so that it falls exactly on the yellow spot; 4) in the yellow spot light is received by cone cells and rod cells. Then conveyed to the brain; 5) the light that is conveyed to the brain will be translated by the brain so that we can know what we see[4].

2. Sense of Hearing (Ear), the ear is a sensory tool that is sensitive to stimuli in the form of sound waves. The human ear is able to hear sounds with frequencies between 20-20,000 Hz. Apart from being a hearing tool, the ear also functions to maintain the balance of the human body [5].
   a. The parts of the ear, the human ear can be divided into three parts, namely the outer, middle, and inner parts, as follows:
      1) The outer ear consists of: a) the auricle, which functions to accommodate vibrations; b) the external ear canal or ear canal, serves to transmit vibrations; c) oil glands, function to filter incoming air as carriers of sound waves; d) tympanic membrane or drum membrane, serves to receive and amplify sound vibrations.
      2) The middle ear, consisting of: a) the middle ear is located on the inside of the tympanic membrane. The function of the middle ear is to transmit sound vibrations from the outer ear to the inner ear. The middle ear contains the Eustachian canal and the three ossicles; b) Eustachian tube, serves to reduce air pressure in the middle ear so that the air pressure outside and inside will be the same. This pressure balance will keep the eardrum from being damaged. This channel will be closed under normal circumstances, and will open if we swallow something; c) auditory bone, serves to deliver and amplify vibrations to the inner ear. There are three ossicles, namely the hammer, anvil and stirrup. These bones connect the eardrum and the oval window.
      3) Inner ear, the inner ear functions to deliver sound vibrations to the hearing center by nerves. The components of the inner ear are as follows:a) jorong window, serves to receive and transmit vibrations b) cochlea, functions to receive, amplify, and convey sound vibrations to the auditory nerve. In the canal of the silos is lymph fluid and there are auditory nerve endings; c) three semicircular channels, functioning as a tool to determine body position and maintain balance [5].
   b. The mechanism of hearing work, the sound we hear will be captured by the earlobe, then it reaches the eardrum so that it makes the eardrum vibrate. These vibrations are transmitted by the three auditory ossicles to the jorong window and

transmitted to the cochlea. Inside the cochlea, the lymph fluid will vibrate so that it stimulates the tip of the nerve endingsf hearing and generate nerve impulses that are directed to the brain [5].

3. Sense of Smell/Smell (Nose), The nose is one of the five senses that functions as the sense of smell. The sense of smell in the form of chemoreceptors is located on the inner surface of the nose, namely the upper mucus layer. Olfactory receptors are not clustered like taste buds. The olfactory epithelium contains 20 million specialized olfactory cells with erect axons as olfactory nerve fibers. At the end of each olfactory cell (olfactory cell) on the surface of the epithelium contains several odorous hairs that react to odorous chemicals. in the air [2].

   The nose is a sensory organ that responds to stimuli in the form of smells or chemicals in the form of gases. Inside the nasal cavity there are olfactory nerve fibers which are equipped with olfactory cells. Each olfactory cell has fine hairs (olfactory cilia) at the ends and is covered by a mucous membrane that functions as a humidifier of the nasal cavity. roof of the nasal cavity. In this sensitive area there are 2 types of cells as follows:
   a. Supporting cells are epithelia.
   b. Smell cells as receptors in the form of nerve cells.

   Smell cells have hair-shaped ends of dendrites. Adaptation to smells is fast at first in 2-3 seconds, but then goes more slowly. The specialty of the human sense of smell is that it can smell something even in very small amounts in the air. Some animals have a sense of smell. odorants are more sensitive because they have more odor receptors [10].

   The olfactory process begins when certain chemical substances in the form of gases or vapors enter with the inspired air reaching the olfactory receptors. This substance can be dissolved in nasal mucus. So that there is a binding of substances with membrane proteins on the dendrites. Then an impulse arises that spreads to the axons. Thousands of axons combine to form a bundle called the I brain (olfactory) nerve. This 1st brain nerve penetrates the lamina cribosa of the ethmoid bone into the nasal cavity and then synapses with tractus olfactory neurons and the impulses are transmitted to the primary olfactory area in the cerebral cortex for interpretation [2].

   When we breathe, chemicals in the form of gases enter our nose. Chemical substances that are the source of the odor will be dissolved in the mucous membranes, then will stimulate the fine hairs on the odor cells. Smell cells will transmit this stimulus to the brain and will be processed so that we can find out the type of smell from these chemicals [10].

4. Sense of Taste (Tongue), the tongue is a sensory organ that is sensitive to stimuli in the form of chemical solutions. The tongue has thick muscles, the surface is protected by mucus and is full of nodules. We can feel the taste on the tongue because there are receptors that can receive stimuli. These receptors are taste buds or taste buds. The taste buds are a collection of nerve endings found in the nodules of the tongue. Papilla somewhat rough because it has protrusions on the surface of the tongue. Inside the papilla, there are many taste buds (taste buds), which are circular parts consisting of two types of cells, namely supporting cells and taste buds that function as receptors [5].

The tongue is divided into the root lingua (base of the tongue), the dorsum lingua (back of the tongue), and the lingua aspect (tip of the tongue). The part of the tongue is related to the type of taste, namely the bitter taste is at the base of the tongue, the sweet taste is at the tip of the tongue, the salty taste is on the left and right ends of the tongue and the sour taste is located on the left and right sides of the tongue [11].

The sense of taste is able to receive stimuli from soluble chemicals. Taste buds can distinguish 4 kinds of taste, namely:

a. Sweet taste, formed by several organic chemicals (sugars, glycols, alcohols, aldehydes, ketone amides, amino acids, proteins, sulfonic acids). It is located on the front of the tongue.
b. Salty taste, produced by salt which is ionized due to the concentration of Na. located on the front side of the tongue.
c. Sour taste, caused by acid due to the concentration of hydrogen ions. It is located on the back side on both sides of the tongue.
d. Bitter taste, not formed by a chemical substance, sweet taste-forming substances when there is a change in its chemical structure by becoming bitter [9].

Disorders that are permanent, for example, occur in people who have experienced trauma to certain parts of the brain. The tongue is also often irritated due to injury or vitamin C deficiency [5].

Sense of Touch (Skin)

In addition to producing sweat, in the dermis there are nerve endings as touch receptors. Skinis a sensory organ that is sensitive to stimuli in the form of touch, pressure, heat, cold, and aches or pains. This sensitivity is caused by the presence of nerve endings in the skin. Usually there are two kinds of sensory nerve endings, namely free nerve endings that detect pain or pain, and webbed (papilated) nerve endings. Touch cells are also found at the base of the hair. So when the hair that appears on the surface of the skin is touched by an object, the nerve cells will be stimulated [2].

The skin is the most extensive organ of the body in adults it is about 1.9 m2. Although the entire surface of the skin has touch receptors, the presence of these nerve endings yis uneven in various organs of the body. The surface of the skin that has many tactile nerve endings is the tips of the index fingers, palms of the hands, soles of the feet, lips, and pubic area. Therefore, these areas are very sensitive to stimuli in the form of touch. A blind person uses the sensitivity of his sense of touch to read Braille [2].

RESEARCH METHODS

The method used in this research is the experimental method, the experimental method is an action and observation or testing a hypothesis. Experiments can be carried out in a laboratory or outside the laboratory, experimental work implies learning to do, because it can be included in the learning method. The tools and materials used in this research are: cutter, cotton bud, HVS paper, ruler, tongs, slayer, black marker, tissue, toothpick, small container, mineral water, apple, onion, garlic, star fruit, salt, sugar, pilkina.

Research procedures, the working procedures of this experiment are:

1. Probandus with closed eyes were given food samples with various flavors and then asked to guess the tasted food samples.
2. Determine the area of the tongue where the taste is detected.
3. Proves the presence of blind spots in the eyes. Find the blind spot in the right eye by closing the left eye and holding the paper about 10 cm from the face.

While the vision is focused on the circle, slowly move the paper away from the face until the cross is out of sight. At this time, the shadow of a cross hit the blind spot of the right eye.

4. Proves the presence of blind spots in the eyes. Find the blind spot in the left eye by closing the right eye and holding the paper about 10 cm from the face. While the vision is focused on the circle, slowly move the paper away from the face until the cross is out of sight. At this time, the shadow of a cross hit the blind spot of the left eye.

RESEARCH RESULT

Table 1. blind spot

No.	Proband	Results	
		Right eye	**Left Eye**
1.	Proband 1	40 cm	55 cm
2.	Proband 2	34 cm	45cm
3.	Proband 3	54 cm	65 cm
4.	Proband 4	44 cm	50 cm

Source: Anatomical and Physiology Report

In this study, we first prepared white HVS paper which already contained the circle and cross symbols which were colored black. To test for blind spots in the right eye by closing the left eye and the paper containing the symbol was placed about 10 cm from the eye. While the vision was focused on the circle, the paper was slowly shifted away from the face of the probandus until the cross disappeared from sight.

Just at the time when the cross is missing, the distance between the paper and the blind spot determiner with the eye is measured with a ruler (in cm). Next to test the blind spot in the left eye by closing the right eye and the paper containing the circle and cross symbols is placed about 10 cm from the eye. while the vision is focused on the circle. Slowly slide the paper away from the face until the cross is out of sight.

In this experiment we found differences in the distance of the blind spots in one proband with another. This is because the size of the eyeball, the convexity of the eye lens and the distance from the lens to the retina is different for each person.

Refraction of light from an object will form an image of the object if the light falls on the yellow spot on the retina, because the light that falls on this section will hit the rods and cones cells which pass it on to the optic nerve and the optic nerve passes it on to the brain so that the impression of seeing occurs. Conversely, the image of an object will be invisible, if the refracted light from an object falls on the blind spot on the retina.

Table 2. Taste Sensitivity (Garlic)

No	Probandus	Garlic				
		1	**2**	**3**	**4**	**5**
1	Probandus 1	-	+	-	+	+
2	Probandus 2	+	+	+	+	+
3	Probandus 3	+	+	+	+	+
4	Probandus 4	+	+	+	+	+

Source: Anatomical and Physiology Report

Table 2. Taste Sensitivity (Onion)

No	Probandus	Onion				
		1	**2**	**3**	**4**	**5**
1	Probandus 1	-	+	+	+	+
2	Probandus 2	+	-	+	+	+
3	Probandus 3	+	-	+	+	+
4	Probandus 4	+	+	+	-	+

Source: Anatomical and Physiology Report

Table 4. Taste Sensitivity (Apple)

No	Probandus	Apel				
		1	**2**	**3**	**4**	**5**
1	Probandus 1	+	+	+	+	+
2	Probandus 2	+	+	+	+	+
3	Probandus 3	+	+	+	+	+
4	Probandus 4	+	+	+	+	+

Source: Anatomical and Physiology Report

In the second study conducted a taste sensitivity test. The first thing to do is

make the necessary ingredients, namely apples, garlic and onions. The three ingredients are cut into cubes and must be the same size and then placed in a cleaned mica container. the containers are labeled to distinguish them.

After that, the first probandus was invited to do the experiment by blindfolded using an opaque cloth. Each sample is fed into the mouth of the proband and must be chewed. After that, the probandus was asked to guess the sample of the food being fed. Experiments for each sample (apple, onion, garlic) were carried out 5 times for each proband. The same is done for the second to fifth probands.

The results obtained are for the first probandus for the garlic sample there is 1 guessing error, for the onion sample there are 2 guessing errors, for the apple sample all correct. The second proband for the garlic sample was answered all, the onion contained 1 error and the apples were all correct.

The third probability for the garlic sample was all correct, for the onion sample there was 1 error in guessing, for the apple sample all were correct. The fourth proband for the garlic sample contained 1 error, all correct onions and all correct apples. The error in guessing food samples for each proband and especially in the onion and garlic samples was caused by the almost similar taste similarities between onion and garlic so that the tongue for each probandus was difficult to distinguish because the taste was almost similar.

In addition, it can also be caused by various factorsFor example, it occurs in people who experience trauma to certain parts of the brain, it can also be caused by irritation of the tongue due to injury or vitamin C deficiency

Table 5. Sense of Taste

No.	Probandus	Result			
		Sweet	**Acid**	**Salty**	**Bitter**
1.	Probandus 1	2,9 dtk	2,4 dtk	1,5 dtk	4,39 dtk
2.	Probandus 2	2,4 dtk	1,99 dtk	1,59 dtk	3,47 dtk
3.	Probandus 3	2,9 dtk	2,94 dtk	3,05 dtk	4,46 dtk
4.	Probandus 4	2,70 dtk	2,16 dtk	2,40 dtk	3,54 dtk

Source: Anatomical and Physiology Report

In the third study conducted a taste map test on the sense of taste. the first thing we did was make a solution for each sample. The solution used is a solution of sugar, salt, pilkina, and star fruit juice. Each was dissolved with distilled water (water) in a beaker and then copied into a test tube with the same size. The last step is to label the solution that has been made, in order to distinguish one solution from another. Probandus were required to taste all the flavors in each sample by closing their eyes. The purpose of this experiment was to determine the speed of taste sensitivity of the probandus tongue in responding to the taste of each sample.

The results obtained by the first probandus for the sweet solution sample is 2.9 seconds, the acid solution is 2.4 seconds, the salty solution is 1.5 seconds and the bitter solution is 4.39 seconds. The second probandus for the sweet solution sample is 2.4 seconds, the acid solution is 1.99 seconds, the salty solution is 1.59 seconds and the bitter solution is 3.47 seconds. The third probandus for the sweet solution sample was 2.9 seconds, the acid solution was 2.94 seconds, the salty solution was 3.05 seconds and the bitter solution was 4.46 seconds. The fourth probandus for the sweet solution sample is 2.70 seconds, the acid solution is 2.16 seconds, the salty solution is 2.40 seconds and the bitter solution is 3.54 seconds.The difference in the speed of guessing the taste for each sample is caused by the speed of the receptors in

responding to the interaction of the body with its environment to get to the brain. So that each proband has a different speed in guessing the taste, depending on the speed at which the receptors send stimuli to the brain.

DISCUSSION

In this study using three experiments, namely:

Blind Spot

In this experiment, a blind spot test was performed on the eye. The first thing we prepare is a white HVS paper that already contains the circle and cross symbols that are colored black. To test for blind spots in the right eye by closing the left eye and the paper containing the symbol is placed about 10 cm from the eye. While the vision is focused on the circle, the paper is slowly shifted away from the face of the probandus until the cross is out of sight.

Just at the time when the cross is missing, the distance between the paper and the blind spot determiner with the eye is measured with a ruler (in cm). Next to test the blind spot in the left eye by closing the right eye and the paper containing the circle and cross symbols is placed about 10 cm from the eye. While the vision is focused on the circle. Slowly slide the paper away from the face until the cross is out of sight.

Just at the time when the cross is missing, the distance between the paper and the blind spot determiner with the eye is measured with a ruler (in cm). In this study, we found differences in the distance of the blind spots in one proband with another. This is because the size of the eyeball, the convexity of the eye lens and the distance from the lens to the retina is different for each person. Refraction of light from an object will form an image of the object if the light falls on the yellow spot on the retina, because the light that falls on this section will hit the rods and cones cells which pass it on to the optic nerve and the optic nerve passes it on to the brain so that the impression of seeing occurs. On the other hand, the image of an object will not be visible.

The results obtained are for the first probandus in the right eye 40 cm, in the left eye 55 cm. Probandus to both right eyes 34 cm and 45 cm in the left eye. The third proband of the right eye is 54 cm, the left eye is 65 cm, and the fourth probandus of the right eye is 44 cm and the left eye is 50 cm. at a distance of 55 cm, 45 cm, 65 cm, 50 cm, the signs of the black circle are still visible compared to a distance of 40 cm, 34 cm, 54 cm, 44 cm because our focus view is closer to the positive sign, and this is what is meant by blind spots on our sense of sight as humans.

Taste Sensitivity

In the second experiment conducted a taste sensitivity test. The first thing to do is make the necessary ingredients, namely apples, garlic and onions. The three ingredients are cut into cubes and must be the same size and then placed in a cleaned mica container. The containers are labeled to distinguish them. After that, the first probandus was invited to do the experiment by blindfolded using an opaque cloth. Each sample is fed into the mouth of the proband and must be chewed.

After that, the probandus was asked to guess the sample of the food being fed. Experiments for each sample (apple, onion, garlic) were carried out 5 times for each proband. The same is done for the second to fifth probands. the results obtained are for the first probandus for the garlic sample there are 2 guessing errors, for the onion sample there is 1 guessing error, for the apple sample all are correct. The second proband for the garlic sample was all answered, the onion had an error of 1 and the apples were all correct.

The third probability for the garlic sample was all correct, for the onion sample there was 1 error in guessing, for the apple sample all were correct. The fourth probability for the garlic sample was all answered, the onion had 1 error, and the apples were all correct. The error in guessing food samples for each proband and especially in the onion and garlic samples was caused by the almost similar taste similarities between onion and garlic so that the tongue for each probandus was difficult to distinguish because the taste was almost similar.

In addition, it can also be caused by various factorsFor example, it occurs in people who have experienced trauma to certain parts of the brain, it can also be caused by irritation of the tongue due to injury or vitamin C deficiency.

Sense of Taste

The third experiment conducted a taste map test on the sense of taste. the first thing we did was make a solution for each sample. The solution used is a solution of sugar, salt, pilkina, and star fruit juice. Each was dissolved with distilled water (water) in a beaker and then copied into a test tube with the same size. The last step is to label the solution that has been made, in order to distinguish one solution from another. Probandus were required to taste all the flavors in each sample by closing their eyes. The purpose of this experiment was to determine the speed of taste sensitivity of the probandus tongue in responding to the taste of each sample.

The results obtained by the first probandus for the sweet solution sample is 2.9 seconds, the acid solution is 2.4 seconds, the salty solution is 1.5 seconds and the bitter solution is 4.39 seconds. The second probandus for the sweet solution sample is 2.4 seconds, the acid solution is 1.99 seconds, the salty solution is 1.59 seconds and the bitter solution is 3.47 seconds. The third probandus for the sweet solution sample is 2.9 seconds, the acid solution is 2.94 seconds, the salty solution is 3.05 seconds and the bitter solution is 4.46 seconds. The fourth probandus for the sweet solution sample is 2.70 seconds, the acid solution is 2.16 seconds, the salty solution is 2.40 seconds and the bitter solution is 3.54 seconds.

The difference in the speed of guessing the taste for each sample is caused by the speed of the receptors in responding to the interaction of the body with its environment to get to the brain. So that each proband has a different speed in guessing the taste, depending on the speed at which the receptors send stimuli to the brain.

CONCLUSION

Exoreceptors are the opposite of interoreceptors that occur outside the body. Which includes exoreceptors, namely; 1) the sense of sight (eyes), this sense functions to recognize changes in the environment such as light, color and so on; 2) the sense of hearing (ears), this sense serves to recognize changes in the environment such as sound; 3) the sense of touch (skin), this sense functions to recognize environmental changes such as heat, cold and so on; 4) the sense of taste (tongue), this sense serves to recognize environmental changes such as tasting sweet, bitter and so on; 5) the sense of smell (nose), this sense serves to recognize environmental changes such as recognizing or smelling odors. These five senses are commonly known as the five senses.

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