

DESCRIPTION OF DERMATOPHYTA FUNGUS ON OJEK HELMETS ONLINE IN KOTA SELATAN DISTRICT GORONTALO CITY

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ABSTRACT

Dermatophyta is a group of fungi that cause diseases of the skin that attack keratin parts such as the hair. *Tinea capitis* is a scalp disorder caused by the fungus *Dermatophyta* of the genus *Trichopyton* and *Microsporum*.

This study aims to determine the results of examination of *dermatophyta* fungi on online motorcycle taxi helmets in Kota Selatan District, Gorontalo City.

The method in this study used a qualitative approach, namely examination of *dermatophyta* fungi on online motorcycle taxi helmets for each inspection method. The type of research in this research is descriptive observational research.

The results showed that from examining 10 samples on online motorcycle taxi helmets, it was found that 8 samples (80%) were positive for fungus and 2 samples (20%) were negative for *Dermatophyta fungus*. The 8 samples examined were not from *Dermatophyta fungi*. The types of fungi found in 8 samples were *Rhizopus Sp* 2 samples (20%), *Aspergillus niger* 3 samples (30%), *Aspergillus fumigatus* 3 samples (30%) and *Aspergillus oryzae* 2 samples (20%).

Keywords: *Dermatophyta* Fungi, Online Motorcycle Helmets, Qualitative

INTRODUCTION

Health as a state of complete physical, mental and social well-being. Public awareness to maintain personal health and the surrounding environment is still low [14]. Based on percentage Only 32.3% of people in Indonesia practice clean and healthy living behaviors (*personal hygiene*), while the target set in 2014 was 70% [14].

Personal hygiene is a way of maintaining one's health and cleanliness in order to achieve physical and psychological well-being. Lack of attention to *personal hygiene* can cause disorders of the mucous membranes of the mouth, teeth, genitals, eyes, nose, ears, hair, skin, and physical disorders of the

nails. The skin is one of the organs in the body that needs more attention because it is the outermost organ and has direct contact with the outside world, making it more susceptible to infection, chemistry and physics. game microor [9].

With a total of 247,179 cases and 60.77 % new cases, skin and subcutaneous tissue disorders ranked third out of the ten most outpatient diseases in hospitals in 2010. Indonesia has many microorganisms, including bacteria, viruses, parasites and fungi, causing skin disease. These microorganisms are regulated by a variety of environmental, food, and climate variables. Environment [13].

A superficial form of the disease called dermatophytosis is caused by an invasion of fungi called *Dermatophyta* that destroy keratin. In fulfilling fungal nutrition, such as in the stratum corneum of the epidermis, nails, and hair. *Dermatophytosis* can spread directly from person to person (*anthropophilic organisms*), from soil to people (*geophilic organisms*), and from animals to people (*geophilic organisms*). Dermatophytosis mostly spreads indirectly from objects that are of daily use such as clothes, shoes, hats, and other objects [2].

Dermatophytosis transmission It can also occur accidentally through the use of replaceable towels, headgear, and combs, among other items that may serve as conduits for the spread of infectious organisms. Dermatophytosis of the skin and hair is called *Tinea capitis* [3].

Tinea capitis, often called scalp ringworm, is a skin condition that affects the hairy area around the head and is caused by the fungus *Dermatophyta*. *Trichophyton* and *Microsporum* are two genera that can cause *tinea capitis* [6].

The prevalence of dermatophytosis and skin cleanliness are correlated. This is in accordance with Agsa's 2012 study which found a relationship between complaints of skin disease and the cleanliness of the respondent's skin. The level of personal hygiene is important because the fungus can be spread by direct skin-to-skin contact with the patient or through indirect channels such as toiletries and clothing [6].

Online motorcycle taxis have been around since 2010, but their popularity exploded in early 2013. Online motorcycle taxi providers promise to always offer the highest standards of comfort and safety. (Gojek). Ordering facilities and easy pick-up services make people make online motorcycle taxis the main choice transportation Especially the people of Gorontalo City.

Based on a survey conducted by Pravitasari, the average length of time online motorcycle taxi drivers work in Palembang is around 12 hours per day. There are three communities monitored by researchers, namely the *Basecamp community* Gojek Pejuang Keluarga with 19 members, *Solidarity Basecamp community* with 23 members, and *Maxcod Bike Gorontalo Basecamp community* with 14 members. In carrying out their work, online motorcycle taxi drivers use helmets as a means of personal protection while driving. The use of helmets for a long time and becomes one of the risks of fungal growth due to humid and warm temperature conditions which can cause dermatitis [12].

Atopic dermatitis is a common skin condition that affects 10-20% of children and 1-39% of adults in the United States, Europe, Japan, Australia and other industrialized countries. According to case data of skin and other subcutaneous diseases, the prevalence of atopic dermatitis is lower in agrarian countries such as Eastern Europe, China and Central Asia. In fact, atopic dermatitis only accounted for 86% of the 192,414 cases of skin disease in public hospitals in Indonesia in 2011—the third highest number among the top ten diseases [12].

Indonesia has a prevalence of dermatitis of 6.78%, while Central Java has a prevalence of dermatitis of 7.95%. 10,150 people are affected by 10 of this disease. According to data from the Gorontalo Provincial Health Office in 2018, there were 17,443 people with dermatitis. Then there was an increase in 2019 as many as 18,009 sufferers and in 2020 there was a decrease of 15,638. based on the data above, most cases of dermatitis occurred in 2019 [1].

Fungi are a group of parasitic and saprophytic eukaryotic organisms that feed on dead organic matter for nutrition. Fungal diseases in humans (mycoses) are

classified according to the location on or within the body where the infection occurs. It is called a skin infection if it is only limited to the epidermis, subcutaneous if the infection penetrates clearly under the skin and systemic if the infection is in the body or spreads to the tools [10].

Risk factors Age, sex, and race are significant epidemiological determinants, as males are five times more likely than females to develop dermatophyte infection. Tinea capitis caused by *T. tonsurans*, however, affects adults more frequently than males, and young African Americans are affected more frequently. This occurs due to disease transmission which is influenced by factors such as personal hygiene, crowded and polluted environment, and socioeconomic status. The fungus that causes Tinea capitis can be found in children's toys, theater chairs, hats, pillows, and combs [11].

Clinical Manifestations i.e. Features The location of the aberration, the patient's cellular immunological response to the causative agent, the species and strain involved, and other factors all influence clinical characteristics. Typical morphology is a problem that is clearly characterized by variation (polymorphic), more active edges, and itchy skin [11].

Dermatophytosis is often diagnosed by medical examination, it can also be supported by several examinations such as microscopy, culture, as well as Wood's lamp examination in certain species. It was found that dermatophytes with branching septa and hyphae were seen upon examination with 10-20% KOH. To identify the type of fungus that causes dermatophytosis, culture examination is carried out [5].

The General Characteristics of Fungi, namely As heterotrophic creatures, fungi cannot produce their own food through the process of photosynthesis like plants because they do not have chlorophyll. To survive, fungi need organic matter taken

from plants, animals, insects and other sources. This organic material is then converted and digested by enzymes into inorganic material, which the fungus then consumes as food. This trait causes losses by spoiling food and household goods. In the same way, fungi can infect humans and animals and cause disease [5].

Fungus It can be found everywhere in nature, including in the air, water and soil. Because mushrooms need lots of moisture and enough oxygen to survive.

Transmission of the fungus occurs by spores accompanied by skin flakes, excreted by mycosis patients. These spore infections are most common in hot, humid areas where many people walk barefoot, such as swimming pools, spas, gyms, and locker rooms. These spores can also be found in house dust and in the air. bathroom and clothes.

Activities, living habits and the environment are one of the triggers for the transmission of fungi to humans. One of the professions in the city of Gorontalo is online motorcycle taxi. The existence of one predisposing factor such as a damp head and hair causes the fungus to be in the online motorcycle taxi helmet which is the personal protective equipment for online motorcycle taxi drivers in carrying out their work. Fungi that are in online motorcycle taxi helmets can contaminate the head and hair so that it can cause dermatitis.

If body hygiene is neglected, the body's health deteriorates, or if a person takes a lot of drugs such as antibiotics, steroids and birth control pills, the fungus will thrive. Mold is best spread in public places like locker rooms and swimming pools. The deepest skin tissue can be infected by the fungus. Scratching, using towels, and other methods can cause the infection to spread to other areas [7].

The fungus can be transmitted directly or indirectly. Direct transmission usually occurs through epithelium, hair, and fomite-producing fungi and can originate

from soil, animals, humans, or both. Plants, infested wood, objects or clothing, dust, and water can all indirectly spread disease. Apart from the mode of transmission, abnormalities especially on the skin are influenced by several variables, such as factors from the dermatophytes, the virulence of the fungus will differ depending on whether it is anthropophilic, zoophilic, and geophilic. In addition to these preferences, each type of mushroom has a unique affinity for certain people and body parts. For example, *Epidermophyton floccosum* more often affects the inner groin while *Trichophyton rubrum* rarely affects the hair. The ability of fungi to break down keratin and creatinine in the skin. [13].

Temperature and humidity factors, These two elements have a very significant impact on fungal infection, as shown in localization or localization; Fungal diseases most often affect sweaty areas such as the groin and between the fingers as well as social conditions and a lack of hygiene, this component is indispensable for fungal infections. Fungal diseases are usually found in lower social and economic groups than those above the higher social and economic groups. Factor. age, gender, and others, compared to adults, children are more likely to get tinea capitis. Compared to men, women are more likely to get fungal inflammation between the fingers, and it is usually related to the workplace. In addition there are other variables, such as elements of body protection such as shoes, head coverings, among others, the use of clothing made from nylon and transpiration factors can encourage the development of fungal-related disorders [13].

Morphology Hyphae are long filaments or strands of cells. Hyphae are divided into two groups, namely hyphae which do not have partitions on their walls are called aseptate and hyphae which have partitions on their walls are called septate (Jawet z, 2012). Hyphae reproduce

elongated by forming spores. Spores are reproductive structures, about 1-3 microns in size, with rectangular, conical, spherical, or oval shapes. Spores will continue to elongate and enlarge until hyphae are formed. There are two types of spores namely: 1) Sexual spores are spores that are produced in a unique organ where two hyphae have joined, and this union eventually gives rise to certain reproductive organs, such as: Ascospores are spores that develop in an ascus or pouch. Basidiospores are spores that form on the surface of the basidium. Oospore is a spore that will develop inside the oocyte. Sigospore is a spore that usually develops from two hyphae that have previously joined. 2) Asexual spores which are spores directly formed by hyphae without going through the merger of reproductive hyphae, for example: *Talospora* is divided into three groups namely *Arthospora*, namely *Blastospora* spores, daughter cells created from adult or parent cells which are often found in yeast, *Chlamidiospora*, in the form of hyphae with a protoplasmic protrusion in the middle which then divides into spores, and immediately develops into one hyphae by dividing protoplasm. Conidiospores, which are shaped microconidia and macroconidia, produced from the tip of the hyphae through division of the protoplasm. Sporangiospores are made from sporangia, which are the clumps of certain hyphae or mycelium where the spores develop [13].

Identifying fungi can be done based on their shape, namely colonies, hyphae, and spores. 1) Jamu colonies are groups of related fungi that usually grow in the same media. Because fungal colonies differ in color, shape, and properties between species, they are used to aid identification. Three types of fungal colonies are recognized: filamentous colonies, yeast colonies, and yeast-like colonies. 2) Hyphae. are tubular fungal structures that grow from spores/conidia and resemble

long strands of thread. The mycelium is the most conspicuous component of the mushroom body. The mycelium consists of a group of branching hyphae which form a net which is usually white. Hyphae have a solid wall around the protoplasm inside. The length of the hyphae cannot be determined with certainty because they continue to grow in the apical region. However, the hyphal diameter, which usually ranges from 3 to 30 μm , is stable. Different species have varying diameters, and environmental factors can also have an impact on their diameter [4].

Hyphae can be divided into two categories with different roles, namely those that support the reproductive organs and those that take nutrients from the substrate. Vegetative hyphae are hyphae that often grow into the substrate or reside above it and are responsible for absorbing the nutrients the fungus needs to survive. Fertile hyphae are hyphae that are usually tightly packed on the mycelium on the surface of the substrate because they are involved in reproduction. 3) Spores, fungi reproduce by means of spores. Mushrooms mostly reproduce vegetatively and generatively. Fungi produce asexual and sexual spores, which are two types of spores. While sexual spores develop via fusion nuclei of the same or different species, asexual spores develop directly from hyphae without nuclear fusion [13]. Dermatophytosis, the medical word for any fungal disease that affects the skin, describes how many forms of fungus can multiply on the skin. A group of dermatophyte fungi is the source of the fungal disease dermatophytosis.

A group of fungi known as dermatophytes prefer digestive tissue to contain horny compounds (keratin), such as the stratum corneum of the epidermis (skin of fingers, hair and nails). Many other names for dermatophytosis include tinea, ringworm, teigne, and herpes circinata. There are three genera of

dermatophytes: Epidermophyton (E), Trichophyton (T), Microsporum (M), and Only 23 of the 41 known dermatophyte species can infect humans or animals with disease. including 7 species of *Epidermophyton* and 15 species of *Trichophyton* [13].

According to Irianto, (2013) each species of dermatophytes has an affinity for certain hosts, as follows :

- 1) Animals and occasionally humans are prime targets for zoophilic dermatophytes, such as *Microsporum canis* and *Trichophyton verrucosum*. *Microsporum galinae*, *Microsporum nanum*, *Microsporum equinum*.
- 2) Fungi that live in the soil called geophilic dermatophytes can inflame the skin. Geophilic organizations namely: *Microsporum gypseum*, *Trichophyton terrestre*.
- 3) Humans are the preferred long-term host of anthropophilic dermatophytes, which is why they target people. Organism anthropic that is: *Trichophyton rubrum*, *Trichophyton mentagrophytes*, *Trichophyton schoenleinii*, *Trichophyton tonsurans*, *Trichophyton violaceum*, *Microsporum audouinii*, *Epidermophyton floccosum*.

Dermatophytosis is classified from several locations: Tinea capitis if it affects the hair, eyebrows, scalp and eyelashes. Tinea corporis, if it affects the body or body skin that is not hairy (glabrous skin), including tinea cruris which specifically affects the groin, lower abdomen and anus. Tinea barbae can also affect the beard, chin, mustache, and sideburns. Tinea manuum affects the hands as well as the palms. Tinea pedis can affect the soles and feet. Also *Tinea unguium* can attack nails [13].

Furthermore, research conducted by Fushiani (2017) concerning Dermatophyta examination. The proportion of Dermatophyta fungi found on student head coverings at SDN Pasirkaliki Mandiri 01

was 28.6% or 8 samples out of 28 samples. This suggests that engaging in sweat-producing activities while neglecting personal hygiene increases the chances of contracting dermatophytosis such as *tinea capitis* [3].

The above case is the same as the research conducted by Simanjuntak (2017) regarding the identification of Dermatophyta on the helmets of pedicab drivers. The results of this study found Dermatophyta species on the helmets of pedicab drivers in 16 samples (53.3%) of a total of 30 samples. Where the most species came from the *Trichophyton* genus, namely *Trichophyton Mentagrophytes* 8 samples (23.3%) which is one of the species that can infect the human head, while other species identified were *Trichophyton scholenii* (6.7%) 2 samples, *Trichophyton violaceum* (6.7%) 2 samples, *Microrporum audonii* (13.3%) 4 samples, and *Microrporum gypesum* 1 sample (3.3%). This is because there is no regular schedule for the pedicab driver in this case cleaning the helmet and wearing the helmet for a long time, thereby increasing the risk of the growth of the Dermatophyta fungus that causes *Tinea capitis* [3].

Based on the description above, it shows that there is still a lack of awareness to maintain personal hygiene and a lack of public knowledge, especially online motorcycle taxi drivers, about diseases resulting from dermatophytes. This disease is one of a kind. not fatal but causing disturbance convenience and reduced quality of life due to the easy spread of Dermatophyta. So it is important to do research regarding "Description of Dermatophyta Fungus on Online Motorcycle Helmets in Kota Selatan District, Gorontalo City".

RESEARCH METHODS

This type of research uses descriptive observational research as its methodology. The strategy used in this study is a

qualitative approach. This study used *purposive sampling*, with a correct sampling technique that allowed anyone the researcher met at random to be included in the sample.

Before carrying out the research the preparatory or pre-analytical stage where this stage is generated and affects the work process along with the tools and materials needed, namely: The equipment used for this research: Chemical glass, dropper pipette, petri dish, stir bar, autoclave, oven, and analytical balance, erlenmeyer, spirit lamp, sterile spatula, microscope, hotplate, measuring cup, incubator, sample glass, and glass deck and objects. The materials used to conduct this research are Media SDA (*Saboraud Dextrose Agar*), 10% KOH, a quadest, 70% alcohol, cotton, aluminum foil, spirit solution, cotton buds, label paper and matches.

Sampling is taken by wiping a cotton bud on the inside of the helmet. The swab results are stored in the sample cup and then identified according to the name and age. The ready samples are taken to the microbiology laboratory for examination. Next, the samples will be examined at the analytical stage.

In the analytical stage, namely the preparation of the first Sabouraud Dextrose Agar (SDA) media, the SDA powder is weighed according to what is needed, then the weighed SDA powder is dissolved into Aquades while being heated on a *hotplate*, SDA media was sterilized in an *autoclave* for 15 minutes at 121 °C.

Sample inoculation on SDA media, use a mask and *handscon* in order to avoid contamination. heat the entire length of the loop wire above the lamp spiritus, take a swab of the sample in the sample cup using a ring loop, open the *petridish cover* then the sample swab is directly planted in SDA media by inoculating it in certain places, close the *petridish* again then heat all the edges of the *petridish* above the spirit lamp, reheat the loop wire above the spirit lamp,

put it in the incubator (25-28°C) and Observations were made every day for 7 days, a small sample of suspicious colonies is infected with a straight loop and placed in the center of sterile SDA media to perform pure culture, the media is labeled with the date, name, and sample number, the media is incubated at room temperature (25-28°C) for 7 days, After the incubation period, the fungal culture examination process was carried out.

Macroscopic and microscopic examination of fungal culture. Macroscopic examination, the growth is observed every day, macroscopic observations that will be carried out include: color of the colony, presence or absence of a growth zone, presence or absence of a circular line, surface texture of the colony (grain, velvet, cotton, floccose) concentration, whether there is a characteristic odor and whether or not there are *exudate drops*.

Inspection microscopy Microscopic examination uses direct techniques, namely the slide of KOH solution is dropped, then the fungal colonies are taken sufficiently using a sterile loop, then placed on the slide and made like a smear, then covered using a cover glass. The preparations were observed under a magnification microscope of 10 × or 40 ×. This microscopic examination is carried out by observing the structure of the hyphae or the arrangement of fungal spores.

Post-Analytical, the final step in enforcing investigative findings is called post-analysis. as follows: A positive result (+) if the fungal culture is found to be a fungus belonging to the dermatophyte group. A negative result (-) if the examination does not reveal any dermatophyte fungi.

Next is an analysis. data with information collected and assessed descriptively is describe the morphological characteristics of the Dermatophyta fungus

based on macroscopic and microscopic observations then proceed with identification activities for identifying activities by comparing the characteristics of the fungi studied through observation with those in the identification guide.

RESEARCH RESULT

Based on findings from research by the Microbiology Laboratory at Bina Mandiri University, the results of examining fungi on online motorcycle taxi helmets in Kota Selatan District, Gorontalo City, obtained the following results:

Table 1. Distribution of the frequency of the presence of mushrooms in online motorcycle taxi helmets in Kota Selatan District, Gorontalo City

Source: Primary Data 2022

From table 1 above, it was found that from 10 samples in the form of helmets that

Mushroom type	Amount	Frequency (%)
<i>Rhizopus Sp</i>	2	20
<i>Aspergillus niger</i>	3	30
<i>Aspergillus fumigatus</i>	3	30
<i>Aspergillus oryzae</i>	2	20
Amount	10	100

had been examined, 10 samples (100%) were obtained. The results showed that there were no types of Dermatophyta fungi on online motorcycle taxi helmets in Kota Selatan District, Gorontalo City.

Table 2 The distribution of the presence of mushrooms in online motorcycle taxi helmets in Kota Selatan District, Gorontalo City is based on the length of time the helmets have been used.

Helmet use	Amount	Frequency (%)
<5 Years	2	20
≥5 Years	8	80
Amount	10	100

Source: Primary Data 2022

Table 2 above shows that 2 respondents (20%) used helmets for less than five years and 8 respondents (80%) used helmets for more than 5 years. (80%) with helmet use for more than 5 years.

DISCUSSION

Based on the results of examining samples on online motorcycle taxi helmets in Kota Selatan District, Gorontalo City at the Microbiology Laboratory of the Bina Mandiri Gorontalo University, which were examined macroscopically and microscopically, it was found that 10 samples (100%) were positive for the fungus. The 10 samples examined were not from *Dermatophyta fungi*. The type of fungus found in the 10 samples was the fungus *Rhizopus Sp* 2 samples (20%), *Aspergillus niger* 3 samples (30%), *Aspergillus fumigatus* 3 samples (30%) and *Aspergillus oryzae* 2 samples (20%).

Table 2 of the research findings shows that based on the number of samples used for less than five years and five years or more, respectively, there is fungus in online motorcycle taxi helmets in Kota Selatan District, Gorontalo City. 2 samples (20%). From the results of the researcher's interview with *the drive r ojek online*, they do the job for 10-14 _ o'clock per day, Thing this possible *drivers* helmet in time which long, plus with activity and temperature that environment cause *drivers* easy to sweating. Thing this explained that long use helmet important to know. In order to see the length of time a person is exposed with factor risk, Increasingly long use helmet the more big risk got an infection mushroom.

From the research results there are differences with Husna, where from 17 swab sample tool in the form of a helmet *drivers* taxibike *on line* which already checked that 6 sample (35.3%) positive there is *Dermatophyta* fungi and 11

samples (64.7%) were negative for *Dermatophyta fungi* [5].

There are differences in the results of the research and the fact that the results of the study did not find dermatophyta fungi but found fungi of the type *Rhizopus Sp* as many as 2 samples (20%) in online motorcycle taxi helmets in Kota Selatan District, Gorontalo City. According to research, the helmet is still in use. they When helmet wet, They don't carry spare helmets, both in the short and long term. The fungus *Rhizopus sp.* is a member of the order Mucorales phylum *Zygomycota*. The *Rhizopus* species fungus is one of the pathogenic fungi that can harm or irritate human body tissues. The possibility of finding *Rhizopus* fungus is influenced by humidity. Fungi are pathogens that cause infection and inflammation. requires a low humidity environment with a humidity level of 90% [5].

Based on the researchers' assumptions, there were no dermatophyte fungi due to the development of fungi, which often grow and develop according to temperature and are relatively easy to adapt to the environment and host cell suitability. environment, this causes the possibility that the fungus will not be found in the online motorcycle taxi helmets because each region has a different epidemiology. Several factors also caused the dermatophyta fungus not to be found on the helmet such as contact with a source of infection that was not noticed by the researchers, thus allowing other fungi to be obtained during the study, as well as the existence of accidental sampling was the method used, which allowed some flexibility in determining sample requirements by using anyone who is found and willing by chance as a sample. thus allowing for limitations in determining sample criteria, other types of fungi were obtained besides dermatophyta fungi.

The results showed the presence of *Rhizopus* and *Aspergillus fungi* on the

helmet drivers taxibike on line in Kota Selatan District, Gorontalo City, it is influenced by the cleanliness of online motorcycle taxi helmets and the temperature of the environment. Summer in Gorontalo, which lasts an average of 1.6 months and has an average daily high temperature above 32°C, lasts according to BMKG statistics (2022).

In addition to the *Rhizopus* fungus, the sample also contained *Aspergillus sp*, the fungus *Aspergillus niger* as many as 3 samples (30%), *Aspergillus fumigatus* 3 samples (30%), *Aspergillus oryzae* 2 samples (20%). *Aspergillus Sp*. mold can develop based on temperature factors, according to experts. Because temperature affects the development of fungi, *Aspergillus Sp*. can grow in a temperature range from 20°C, with an ideal temperature of 20 to 30°C. *Aspergillus niger* is a species that is easily distinguished from other *Aspergillus spp*. It can grow at temperatures as low as 6 °C and as high as 45 °C, and since it is an aerobic organism, oxygen is required for its growth.

CONCLUSION

Based on this research, it can be concluded that from previous research, examination of 10 samples on online motorcycle taxi helmets showed that 10 samples (100%) were positive for fungus. The 10 samples examined were not from *Dermatophyta fungi*. The type of fungus found in the 10 samples was the fungus *Rhizopus Sp* 2 samples (20%), *Aspergillus niger* 3 samples (30%), *Aspergillus fumigatus* 3 samples (30%) and *Aspergillus oryzae* 2 samples (20%). This is due to several factors such as contact with the source of infection which the researcher did not pay attention to so that it is possible for other fungi to be obtained during the study, as well as the existence of accidental sampling which is the method used, and anyone who is present and willing by

chance can be used as a sample. thus allowing for limitations in determining sample criteria, other types of fungi were obtained besides dermatophyta fungi.

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