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# DESCRIPTION OF CANDIDA SPECIES INFECTION ON THE SKIN BETWEEN THE FINGERS OF MILKFISH SELECTORS

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**ABSTRACT**
Candidiasis is a fungal infection of the skin caused by the Candida fungus. Candida fungi live in the human body as saprophytes which can be in the digestive tract, respiratory tract and vagina of normal or healthy people. Candida infections on the skin between the fingers most often occur when the hands are repeatedly soaked in water for long periods of time, this occurs in housemaids, cooks, vegetable and fish handlers. The aim of this research was to determine whether there was skin candidiasis infection between the fingers of milkfish sorters in Mojolaban Sukoharjo and what species of Candida were found. The research used a descriptive method with the population of milkfish sorting workers taken by purposive sampling based on criteria in accordance with the objectives of the examination which obtained a total of 14 respondents. Data was taken from the results of questionnaires and skin scraping cultures on CHROMagar-Candida media which were then identified macroscopically and microscopically. The results were presented in tabular form and analyzed descriptively, where 3 of 14 skin scraping samples from milkfish sorters in Mojolaban Sukoharjo were found (positive) to be infected with Candida krusei.

Keywords: candidiasis; milkfish sorting; skin scraping

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## INTRODUCTION

Candida is a yeast group of fungi which consists of many species and several species that are often found in clinical materials, namely Candida albicans, Candida glabrata, Candida parapsiolis, Candida tropicalis, Candida krusei, Candida kefyr, Candida guillirtmondii, Candida lusitaniae, Candida dubliniesis. Candida is known to live as a commensal in the human body but can turn into a pathogen in favorable circumstances, for example in patients with risk factors. (Lopes and Michail, 2022). Among all the species above, the one that most often causes disease in humans, both superficial and systemic infections, is Candida albicans, namely approximately 70-80%, followed by Candida tropicalis, approximately 30-40%. Candida albicans, Candida dubliniensis is also often found to cause oropharyngeal candidiasis (KOF) in HIV/AIDS sufferers (Wahyuningsih et al, 2012). Skin is the outer part that we need to take good care of, because skin has a very crucial function in life. Several living creatures cause skin diseases, such as bacteria, viruses and fungi. Bacteria, viruses and fungi are common infections and can affect the skin but are never fatal. One of the skin diseases caused by fungal infections is candidiasis. Candidiasis is a fungal skin infection caused by the Candida fungus. The Candida fungus lives in the human body as a saprophyte which can live in the digestive organs, respiratory organs and vagina of normal or healthy people, but under certain circumstances the Candida fungus can turn into a pathogen that

causes candidiasis. This infection can occur acutely, subacutely, and chronically (Maulidyah, 2018).

Areas that can become infected with candidiasis are in the folds of the skin, including the thigh folds, breast folds, stomach folds, armpit folds, glans penis, and fingers and toes. Health problems on human skin can affect appearance, so it is important for us to maintain healthy skin (Maulidyah, 2018). Candida infections in the skin between the fingers are most common if the hands are soaked in water for a long time repeatedly, this occurs in housemaids, cooks, vegetable and fish handlers. Generally, this type of infection can touch the hands, because the hands accidentally come into contact with other people's body areas. Apart from that, this infection can also occur due to continuous submersion in water. In fact, under normal conditions, this fungus does not easily infect a person, but when the surface of the skin is damaged, the fungus will be easier to infect (Maimunah, 2018). According to the description above, it is necessary to know the description of Candida species infection in the skin between the fingers of the milkfish sorters in Mojolaban Sukoharjo.

## METHOD

This research uses a descriptive method to determine whether or not there is a Candida sp infection. The population in this study were milkfish sorting workers in Mojolaban Sukoharjo. The research used a population of milkfish sorting workers taken by purposive sampling according to the criteria for examination purposes which resulted in a total of 14 respondents. Data was taken from field information using questionnaires and skin scraping cultures on CHROMagar-Candida media which were then identified macroscopically and microscopically. The results are presented in table form and percentages and analyzed narratively.

## RESULTS

The number of samples in this study was 14 samples which were examined at the Parasitology Laboratory of the National College of Health Sciences. The research began by providing direction to the milkfish sorters as respondents regarding filling out informed consent, when to take samples, and also how to take samples. Some data on the characteristics of respondents and information related to work as a milkfish sorter in keeping the skin of their hands clean were also asked by giving a questionnaire with the results as presented in table 1.

Table 1 shows the distribution of respondents' characteristics, namely that all milkfish sorting workers are male with ages ranging between 23-35 years as many as 4 people and ages between 36-60 as many as 10 people. The distribution of milkfish sorters with 8-12 hours of work a day is 14 people. The distribution of 33 milkfish sorters with the habit of using gloves was 11 people. The distribution of milkfish sorters with the habit of diligently washing their hands with soap was 11 people. The distribution of milkfish sorters with the habit of frequently treating their hands when they finished work was 11 people. Laboratory diagnosis uses skin scraping samples and culture on CHROMagar-Candida media. Growing fungal colonies are identified macroscopically by looking at the type of colony, surface of the colony and color of the colony. Macroscopic observation of colonies on CHROMagar-Candida media obtained from skin scrapings of milkfish sorters in Mojolaban Sukoharjo produced yeast colonies, smooth surfaces, with purple pigment as shown in figure 1. Then microscopic examination was carried out to strengthen the identification results. Microscopic observation using a 10x objective lens followed by 40x. Culture results from skin scraping samples are as shown in table 2 and figure 1 as follows.

Table 1.
Respondent characteristics data based on a questionnaire on the Milkfish Sorter

| Variable | Identification of Candida sp | | | | Total | |
|---|---|---|---|---|---|---|
| | Positif | | Negatif | | f | % |
| | f | % | f | % | | |
| Gender | | | | | | |
| Man | 3 | 21,43 | 11 | 78,57 | 14 | 100 |
| Woman | 0 | 0 | 0 | 0 | 0 | 0 |
| Age | | | | | | |
| 23-35 yrs | 1 | 7,14 | 3 | 21,43 | 4 | 28,57 |
| 36-60 years old | 2 | 14,29 | 8 | 57,14 | 10 | 71,43 |
| Length of work | | | | | | |
| <1 year | 0 | 0 | 3 | 21,43 | 3 | 21,43 |
| >1 year | 3 | 21,43 | 8 | 57,14 | 11 | 78,57 |
| Working hours in a day | | | | | | |
| <5 hours | 0 | 0 | 0 | 0 | 0 | 0 |
| >5 hours | 3 | 21,43 | 11 | 78,57 | 14 | 100 |
| Use gloves when working | | | | | | |
| Yes | 0 | 0 | 0 | 0 | 0 | 0 |
| No | 3 | 21,43 | 11 | 78,57 | 14 | 100 |
| Basic hand washing (after work) | | | | | | |
| Yes (Using soap) | 0 | 0 | 11 | 78,57 | 11 | 78,57 |
| No (Do not use soap) | 3 | 21,43 | 0 | 0 | 3 | 21,43 |
| Habit of treating hands (after work) | | | | | | |
| Yes (always treat) | 0 | 0 | 11 | 78,57 | 11 | 78,57 |
| No (Not treating) | 3 | 21,43 | 0 | 0 | 3 | 21,43 |

Tabel 2.
Identifikasi spesies Candida pada media CHROMagar-Candida

| Sample number | Growth of Candida sp. colonies | Colony macroscopic |
|---|---|---|
| P1 | - | Negatif |
| P2 | - | Negatif |
| P3 | - | Negatif |
| P4 | - | Negatif |
| P5 | - | Negatif |
| P6 | - | Negatif |
| P7 | - | Negatif |
| P8 | - | Negatif |
| P9 | - | Negatif |
| P10 | - | Negatif |
| P11 | + (Candida krusei) | Yeast colonies, smooth surface. The colony pigment is purple |
| P12 | + (Candida krusei) | Yeast colonies, smooth surface. The colony pigment is purple |
| P13 | + (Candida krusei) | Yeast colonies, smooth surface. The colony pigment is purple |
| P14 | - | Negatif |

Table 2 shows that 3 people (21.43%) were infected with Candida krusei from the culture results and 11 people (78.57%) were not infected.

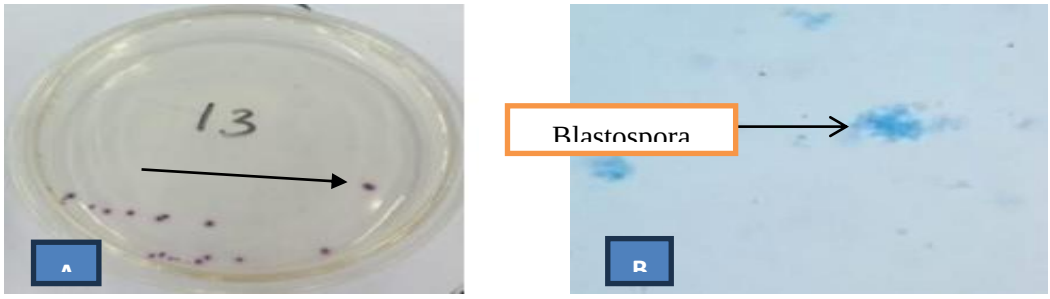


Figure 1. A. Macroscopic view of CHROMagar-Candida media
B. Microscopic view of fungal colonies at 400x magnification
(Source: Primary data, 2023)

## DISCUSSION

This study aims to determine whether there is skin candidiasis infection in milkfish sorting workers and also what species cause this infection. Candidiasis means a variety of infections caused by Candida albicans and other species in the genus Candida. The problem of cutaneous candidiasis in Indonesia ranks third in the incidence of dermatomycosis, but in several cities, namely Makasar, Medan and Denpasar, it ranks first in the incidence of dermatomycosis (Adiguna MS, 2004 in Seru, 2013). Research conducted by Citrashanty at RSUD Dr. Soetomo Surabaya revealed that the number of candidiasis patients ranks third after dermatophytosis and pityriasis versicolor (Soetojo and Astari, 2016). Candida is a commensal fungus that lives in the oral cavity, digestive tract and vagina, but if a person's normal flora balance or immune defense decreases, the commensal nature of Candida can turn into a pathogen that causes candidiasis. Candidiasis attacks all ages, both men and women and has a variety of clinical features. Areas that can be infected with intertriginous candidiasis are skin folds, including the groin, breast folds, stomach folds, armpits, glans penis, and fingers and toes (Polii et al, 2016). Examinations were carried out on 14 clinical materials in the form of skin scrapings from milkfish sorting workers who were suspected of suffering from candidiasis. The results of culture samples from skin scrapings between the fingers of milkfish sorting workers in Mojolaban Sukoharjo who experienced clinical symptoms appeared to be itchy skin with erythema and maceration indicating the presence of infection caused by Candida sp for 3 respondents from 14 samples. Colonies growing on CHROMagar-Candida (CAC) media were identified as the species Candida krusei which produces yeast colonies, smooth and convex surfaces with purple pigment and no other species of Candida were found. On microscopic examination of the culture results from the purple colonies, blastospores were obtained.

Figure 2. Picture of suspected skin candidiasis in milkfish sorting workers

Candida krusei is one type of Candida which is classified in the fungal kingdom, phylum ascomycota, subphylum saccharomycotina, class saccharomycetaceae, genus Candida, the

krusei species is cylindrical in shape, resembling rice grains with a length of approximately 25 micrometers, which is very different from other Candida species which are round and oval in shape. Candida krusei is one of the causes of oral candidiasis, where a decrease in the immune system can trigger Candida infections which are opportunistic pathogens. Several studies say that the Candida krusei group has lower pathogenicity than Candida albicans. This low pathogenicity is caused by the inability of the fungus to change shape into hyphae as well as a decrease in expression and Hwplp (hypae specific polystrene) which functions in the fungal attachment process (Mutiawati, 2016; Suryani et al, 2022).

CHROMagar-Candida media is a very sensitive and reliable medium, a differentiation medium that is widely used for rapid identification in determining Candida species. CAC media can identify 5 species of Candida and one genus Trichosporon according to the color and type of colonies that grow on the agar. CAC's ability to identify five important species that cause candidiasis in just 48 hours is very helpful in treating candidiasis, but if identification fails, confirmation is needed using the fermentation-assimilation/morphology method. The fermentation-assimilation and morphology methods have long been considered the gold standard and have been widely used and are known to have high capabilities in identifying various Candida species. The fermentation-assimilation method assesses the ability of fungi to metabolize various carbohydrates and carbon sources, while the chromogenic media in this case CAC only assesses enzymatic reactions which are visible as color formation in growing colonies and are often difficult to distinguish, especially in colonies that grow into pink colonies and purplish (Wahyuningsih et al, 2012). Apart from that, the incubation temperature can also result in the color of the colonies having a distorted shape because this media cannot be used if incubated at a temperature of 250C, for a period of more than 48 hours. for example, Candida albicans colonies will be pink and Candida colonies will not form the proper color (Rosit, 2015).

Candida has a tendency to colonize the skin in the folds (intertriginosa) where the environment is moist and warm. Milkfish sorting workers in Mojolaban Sukoharjo have exogenous risk factors because their work involves sorting milkfish for more than 5 hours every day. When carrying out this work they always come into contact with water and also wet milkfish without using gloves. Most of the workers have also been working in this job for more than one year. The etiology of this disorder is yeast of the genus Candida. Of more than 200 species of Candida, the most common cause of candidiasis is Candida albicans, which is normal flora on the skin. Candida albicans, which is currently the most important species, grows on CAC medium as bright green colonies which are quite easy to distinguish from other species, but was not found in this study.

Positive culture results for Candida sp infection with the Candida krusei species were only found in 3 workers, but this does not mean that the other 11 workers did not experience fungal infections including candidiasis, this could be because most of these workers, after finishing work, always washed their hands with soap. and treat wounds that occur between their fingers. According to the workers, they always apply autan as their treatment. Candidiasis is often diagnosed as dermatitis, so it is often treated alone and results in an unclear picture of this disease. According to the questionnaire data, apart from most of them having worked for more than 1 year, the age of the workers is also predominantly between 36-60 years. This shows that apart from the work itself being a risk factor, the worker's age can also increase the risk of infection. In elderly or elderly people, there is a decrease in immunity or imperfect immunological status, where there are diseases that are susceptible to candidiasis, for example

diabetes mellitus or other immunological diseases. So, to prevent skin candidiasis infections, workers must maintain their body's immunity and personal hygiene.

## CONCLUSION

Based on the research conducted, it was discovered that 3 out of 14 skin scraping samples from milkfish sorters in Mojolaban Sukoharjo were positive for infection caused by Candida krusei.

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