Original Article

Clinico-Epidemiological Profile and Mycological Characterization of Superficial Dermatophytosis at the Tertiary Care Center of North India

Suganya[1], Dimpi Bhankhur[1,*], Ashish Dalal[2], Pratibha Mane[1], Jyoti Sangwan Lathwal[1], Issac Immanuel Manickaraj Enoch Margasis[3]

[1]Department of Microbiology, Shaheed Hasan Khan Mewati Government Medical College, Nalhar, Nuh, Haryana, India (University: PGIMS Rohtak, Haryana, India).

[2]Department of Dermatology, Shaheed Hasan Khan Mewati Government Medical College, Nalhar, Nuh, Haryana, India (University: PGIMS Rohtak, Haryana, India).

[3]Medical School, Poblacion District, Davao City, Davao del Sur, Philippines (University: Davao Medical School Foundation Inc).

***Correspondence:** dimpibhankhur@gmail.com

DOI
10.21276/apalm.3775

Article History
Received: 03-12-2025
Revised: 16-01-2026
Accepted: 08-02-2026
Published: 02-03-2026

How to cite this article
Suganya S, Bhankhur D, et al. Clinico-Epidemiological Profile and Mycological Characterization of Superficial Dermatophytosis at the Tertiary Care Center of North India. Ann Pathol Lab Med. 2026;13(3):A101-A107.

Abstract

Background: Dermatophytes are ubiquitous fungi, prevalent worldwide. The tropical and subtropical climate favors this fungal infection, affecting all age groups. The incidence of infection depends on various host factors and fungal agent factors. Accurate clinical and laboratory diagnosis is essential to understand the ongoing trend in dermatophytosis. The present study was conducted to understand the clinico-epidemiological profile and mycological characterization of the fungus among cases of superficial dermatophytosis reporting to a tertiary care center in Southern Haryana.

Methods: A total of 88 skin, 12 hair, and 20 nail samples were collected from 120 cases of superficial dermatophytosis. The KOH wet mount and culture on Sabouraud's Dextrose Agar (SDA) were done. The species were identified based on morphological characterization of growth on SDA and microscopic examination of Lactophenol Cotton Blue wet mount.

Result: Among 120 cases, the male: female ratio was 7:3, with the most common affected age group of 21-30 years (21.7%). The farmers, students, and housewives had a higher infection rate. Itching (85.7%), dryness (82.3%), scaling (63.8%), and erythema (45.3%) were frequently reported symptoms. *Tinea corporis* and *T.cruris* were the predominant clinical entities. The rate of KOH and culture positivity was 65% and 54.16%. In culture, the highest isolates belong to *Trichophyton rubrum* and *Trichophyton mentagrophytes*.

Conclusion: Direct microscopy and culture together in routine practice improve the diagnosis. Culture is essential to understand the etiology of dermatophyte in the region with respect to national trends.

Keywords: dermatophytes; koh; sabourauds dextrose agar; lactophenol cotton blue

Introduction

Dermatophytes are keratinophilic fungi that colonize, invade, and infect keratinized tissues such as the stratum corneum of the skin, hair shafts, and nails [1]. These are classified into genera: *Trichophyton*, *Microsporum* and *Epidermophyton* [2].

The global burden of dermatophytosis is steadily increasing, with an estimated 20-25% of the world's population affected [3]. In India, reported incidence rates vary between 37 to 78%, largely attributed to its tropical and subtropical climate [4]. Before 2015, *T. rubrum* was the predominant species. But there is a recent change in dermatophyte etiology. Post 2016, *T. mentagrophytes* / *T. interdigitale* complex has emerged as the primary pathogen [5].

The predisposing factors include environmental conditions such as high humidity and temperature, host immune status, genetic susceptibility, occupational exposure, personal hygiene, animal contact, and socioeconomic conditions [6]. The various underlying conditions of deep dermatophytosis include HIV, solid organ transplantation, immunosuppressive therapies, and genetic immunodeficiencies [7]. Genetic predispositions such as HLA-DR4 are linked to protection, and HLA-DR8 or HLA-DR1 are associated with increased susceptibility to onychomycosis [8]. Additionally, invasive and disseminated forms of dermatophytosis are seen with mutations in the *CARD9* gene (Caspase Recruitment Domain-protein 9) and defects in Th17-mediated immune responses [9].

The clinical manifestations include erythematous, circular, scaly lesions on the skin with active lesions on the outer margin [10]. Atypical forms that may mimic other dermatological conditions are eczema, psoriasis, seborrheic dermatitis, dermatitis herpetiformis, erythema multiforme, impetigo, lupus erythematosus, and rosacea, thereby complicating accurate clinical diagnosis [11, 12]. Hence, accurate diagnosis and personalized treatment plans are essential to manage dermatophytosis. Proper diagnosis starts with ideal specimen collection. Factors such as prior topical antifungal or corticosteroid use are known to diminish fungal yields [13]. Microscopy using potassium hydroxide (KOH) mount is a rapid screening tool. Although it provides presumptive evidence, it doesn't replace the need for culture isolation, which is the gold standard diagnostic tool [14]. Fungal speciation requires culture on Sabouraud's Dextrose Agar along with antibiotics and Lactophenol Cotton Blue (LPCB) tease mount [3]. The urease test and *in-vitro* hair perforation test are used to identify *T. mentagrophytes*. Potato dextrose agar is convenient and useful for culture and identification [15]. The integration of molecular techniques has increased the diagnostic accuracy of species identification in less time. However, in resource-limited settings, conventional mycological methods are the main diagnostic tools [16].

The prevalence and etiology vary with time and region. Despite the widespread use of the KOH mount technique and SDA culture, there is a scarcity of information on dermatophytosis in Southern Haryana, India. The inappropriate specimen collection and culture techniques contribute to underreporting and misidentification. Therefore, the present study aims to know the clinico-mycological profile of dermatophytosis among patients attending our institute.

Materials and Methods

The cross-sectional study was done in the Microbiology department, SHKM GMC, Southern Haryana, from Jan to Dec 2024, after Institutional Ethics Committee approval. All the patients who reported to the Dermatology Outpatient Department (OPD) with clinically suspected dermatophytosis of the skin or hair, or nails, and had no history of prior antifungal treatment were enrolled in the study. All the patients with history of previous antifungal treatment were excluded. A structured patient information sheet was used to record socio-demographic information. The sample size was calculated based on the reported prevalence of dermatophytosis in North India (61.5%) [6]. Using the formula:

Where =1.96 (95% reliability), = 61.5%, =1- and = 20% of prevalence (allowable error) i.e. 12.3

= 60.21

The minimum sample required for the study was 60. During the study period of one year, 120 samples received, which all were included in the study.

The skin scrapings were collected by scraping the surface of the margin of the lesion using a sterile disposable blunt scalpel after cleaning of skin surface with 70% ethyl alcohol. For hair, the affected area was rinsed with normal saline, and approximately 2cm of the hair, along with roots, were plucked using sterile forceps. For nail specimen, nail clipping or scraping from the infected nail along with nail debris were collected after cleaning with 70% ethyl alcohol. All collected specimens were wrapped in sterile black paper, labelled with patient details, and sent to the mycology laboratory. The KOH direct microscopy was done according to the specimen type: 10% KOH for skin scrapings, incubated for 5-10 min, 20% KOH for hair, incubated for 20-30 min, and 40% KOH for nail clippings, immersed overnight in test tubes. The KOH wet mounts were observed for the presence of fungal components. The culture was done on SDA with cycloheximide and chloramphenicol incubated at 30°C for up to 4 weeks. The growth was examined on every alternate day. Identification was done based on colony morphology and LPCB mount. The urease and hair perforation test was done to differentiate *T. mentagrophytes* and *T. rubrum*. All the data was entered in MS Excel spreadsheet. The descriptive results were analyzed and expressed as a percentage. The association of specimen types (skin, hair and nail) with KOH and culture positivity was measured using Chi Square test, taking p value <0.05 as statistically significant.

Results

A total of 120 clinically suspected cases of dermatophytosis were enrolled. Most patients belong to the age group 21-30 years (n=26, 21.7%), followed by 11-20 years (n=22, 18.3%). The Male: Female ratio was 7:3. In occupational exposure, the highest cases were among farmers 41 (34.16%), followed by school students 19 (15.83%), and housewives, 17(14.16%). Urban predominance of cases was seen i.e. 78 (60%). The cases from lower socioeconomic strata were 85 (70.83%). Diabetes mellitus and prior steroid therapy were found in 22 (16.66%) and 14 (11.66%) cases. Family history of similar illness was present in 28 (23.33%) cases (Table 1).

Table 1: Socio-demographic distribution of individuals with dermatophytosis.

Variable	Total (120)	Percentage (%)
Sex		
Males	84	70
Females	36	30
Age Group (in years)		
0 to 10	7	5.8
11 to 20	22	18.3
21 to 30	26	21.7
31 to 40	19	15.8
41 to 50	17	14.2
51 to 60	17	14.2
61 to 70	11	9.2
71+	1	0.8
Location		
Rural	48	40
Urban	72	60
Occupation		
Farmer	41	34.16
School Students	19	15.83
House Wife	17	14.16
College Students	10	8.33
Nurse	6	5.00
Driver	5	4.16
Tailor	5	4.16
Electrician	5	4.16
Teacher	4	3.33
Mechanic	3	2.5
Lab Technician	2	1.66
Veterinarian	1	0.83
Carpenter	1	0.83
Business Man	1	0.83
Socioeconomic Status		
Lower	85	70.83
Middle	26	21.66
Upper Middle	8	6.66
Pet Exposure		
No	87	72.5
Yes	33	27.5
Associated Risk Factor		
Diabetes Mellitus	20	16.66
Steroid Therapy	14	11.66
Cancer Chemotherapy	1	0.83
Similar infection in family	28	23.33

The most common symptoms were itching 103 (85.7%), dryness 99 (82.3%), followed by scaling and vesicles in 77 (63.8%) and 76 (63%) cases. The less frequently reported symptoms were listed in Figure 1.

Tinea corporis was the most common clinical entity in 56 (46.66%) cases. *T.cruris*, *T.unguium*, and *T.capitis* were present in 18 (15%), 16 (13.33%), and 10 (8.33%) cases. The KOH and culture positivity rates were 65% and 54.16%. The skin scraping had the highest KOH positivity 63/88 (71.59%), followed by nail, 11/20 (55%). The hair specimen, 4/12 (33.33%), showed the least KOH positivity. A statistically significant difference was observed in KOH positivity with specimen types (skin, hair and nail) using Chi square test. (χ^2 = 7.85, p = 0.019). In skin scrapings, the culture positivity was 45/88 (51%). A higher culture positivity was observed in nail and hair specimens with 13/20 (65%) and 7/12 (58.33%). But no statistically

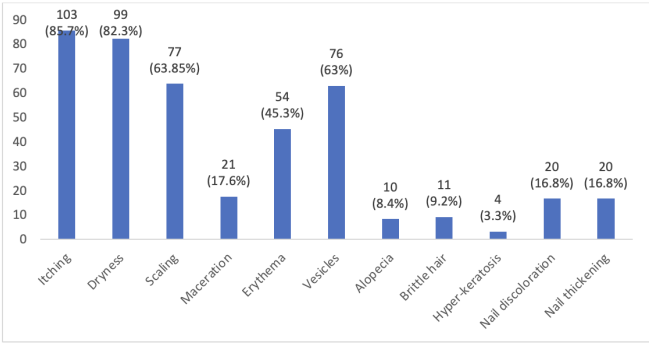

Figure 1: Distribution of symptoms among cases with dermatophytosis n (%).

significant association was observed between culture positivity and specimen types ($\chi^2 = 1.35$, p = 0.50). Figure 2, and Table 2.

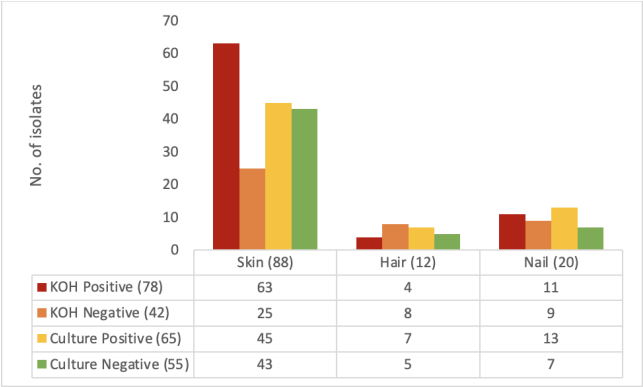

Figure 2: Koh wet mount and Culture results of skin, hair and nail specimens.

Table 2: Koh and Culture positivity among dermatophytic infections of skin, hair, and nail specimens.

	KOH Positive, Culture Positive	KOH Negative, Culture Positive	KOH Positive, Culture Negative	KOH Negative, Culture Negative	Total (n)
T. Corporis	23	8	21	4	56
T. Incognito	3	0	0	0	3
T. Cruris	5	3	6	4	18
T. Capitis	2	4	0	4	10
T. Manuum	1	2	0	4	7
T. Pedis	1	0	5	0	6
T. Faciei	1	0	1	0	2
T. Barbae	0	0	1	1	2
T. Unguium	7	5	1	3	16
Total	43	22	35	20	120

There were 65 culture-positive isolates, belonging to 9 different species of dermatophytes. *T. rubrum* 37 (56.92%) and *T. mentagrophyte* 18 (27.69%) were the highest culture isolates. There were 2 isolates of each species, *M. gypseum*, *T. schoenleinii*, and *E. floccosum*. Similarly, one isolate of *T. violaceum*, *T. verrucosum*, *T. tonsurans*, and *M. Canis* each grew on culture, Figure 3. All these culture isolates are preserved in culture to perform antifungal susceptibility testing for the future.

Discussion

Dermatophytosis is a major public health concern in India due to warm and humid climatic conditions. It affects individuals of all ages and genders, irrespective of their immune status. In the study, the highest incidence of dermatophytosis was seen in the 21-30year age group 26 (15.8.%). The infection was present in all age groups. Both national and international studies reported the maximum incidence in the second and third decades of life [17, 18, 19, 20, 21]. The increased susceptibility in this age group can be attributed to greater outdoor activity, occupational exposure, and physical activities. Studies from North India reported highest incidence among 21-30 years (24.52%) by Nepal *et al.* [22], 13-40years (65.47%) by Kushwaha

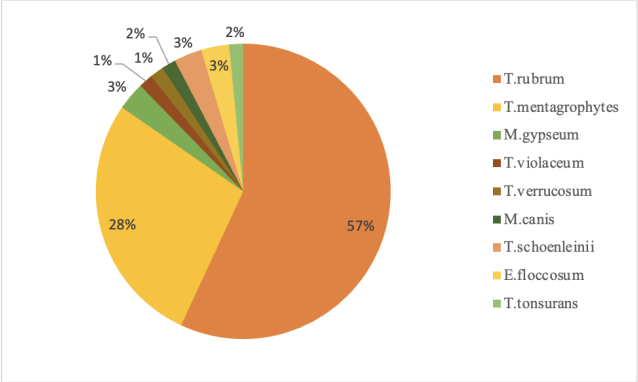

Figure 3: Distribution of various dermatophyte species from 65 isolates.

et al. [23] while 31-40 years (40.51%) by Kumar D *et al.* [24] and 31-45years (42.2%) by Lohariwala *et al.* [25]. A male predominance (M: F = 7:3) was seen, which was consistent with many regional studies where male preponderance ranged from 60–65% [17, 19, 20, 23, 27]. Similar high incidence in males was reported by North Indian studies [21, 23, 25, 27]. Both occupational and social reasons could be attributed to this trend. Housewives were among the top three affected occupational groups despite being only 36 (30%) of the study population. It suggests that the true burden in women may be underestimated and warrants further exploration. Exposure to a moist environment in the household and less medical care-seeking behavior are reasons for dermatophytosis in them. A higher number of cases among females were reported by Nepal *et al.* from Uttar Pradesh [22].

Individuals from lower socioeconomic status were the most affected, 85 (71%). Hygiene, sanitation conditions, and overcrowding are directly linked to dermatophytosis [6, 23]. Similarly, a study by Paul *et al.* reported 51.4% patients belonged to lower socioeconomic status [20]. More cases were from 60% urban populations. This was in agreement with a study by Kushwaha *et al.* reporting 74.86% as urban population [23]. This could be due to higher education and awareness among them [6]. While increased incidence among rural area was reported by Kaur *et al.* [21] and Nepal *et al.* [22], Lohariwala *et al.* [25] and Agarwal *et al.* [28]. Farmers were the most affected occupational group, 41 (34.16%), similar to Preethi *et al.* [29]. They had exposure to soil, dust, vegetation, and animal contact, which increased the risk of infection in them. Among the urban population, school students are most affected. While in the rural population, farmers were more commonly affected. The students 19(15.83%), and housewives 17 (14.16%) were next most common. This was in agreement with Lohariwala *et al.* [25] and Preethi *et al.* [29]. Highest incidence among students was reported by Kaur *et al.* [21], Nepal *et al.* [22] and Kushwaha *et al.* [23]. The sharing of common facilities, like locker rooms and sporting equipment, and overcrowding in classes were common factors in the transmission of infection. Household environmental conditions can be attributed to infections in housewives.

Among the associated risk factors and co-morbidities, diabetes mellitus and prior steroid therapy were present in 20(16.66%) and 14(11.66%) of individuals. Diabetes mellitus as risk factor was reported by Paul *et al.* in 6.3% [20] and Preethi *et al.* in 12% [29] of dermatophytosis. The immunosuppression and inappropriate steroid use result in chronic, recurrent, and treatment-resistant dermatophytosis. Nearly 27.5% of individuals had exposure to pets. A slightly higher pet exposure was seen in a study by Preethi *et al.* i.e. 43.7% [29]. Family history was present in 28 (23.33%) of cases, that was comparable to some national studies: Tahiliani *et al.* (20.8%) [19] and Preethi *et al.* (27%) [29] highlighting the contagious nature of infection within households. The prevalence among family members was reported by Lohariwala *et al.* from Haryana [25] as 12.2% and Kumar M B *et al.* from Chandigarh as 63.8% [27] and Das *et al.* from West Bengal as 50.4% [30].

In symptoms, itching in 103 (85.7%), dryness in 99 (82.3%), scaling in 77 (63.8%) and vesiculation in 76 (63%) were frequent. This was similar to patterns reported across multiple Indian studies. These findings were comparable to Tahiliani *et al.*, who reported itching (99%), dryness and scaling (80.3% and 89.1%) in their study [25]. The *Tinea corporis* and *T. cruris* were the two most common clinical entities in the study and across the country [19, 22, 30, 24, 25]. The presence of a warm, humid climate, lack of protective clothing, all add to infection risk. *T.barbae*, *T.pedis*, *T.incognito*, *T.faciei*, *T.manuum*, and *T.Capitis* were least common in our study and align with other national studies [19, 23, 30].

The KOH positivity rate was 65%. Slightly high positivity was reported in studies such as Jaiswal *et al.* (76.88%) [18], Tahiliani *et al.* (84.8%) [19], and Paul *et al.* (90.1%) [20], Lohariwala *et al.* (88.5%) [25], Nandini *et al.* (83%) [26]. While Das *et al.* reported 52.4% KOH positivity [30]. Culture positivity was 54.16%, similar to studies by Das *et al.* (53.4%) [30]. Higher culture positivity was reported by Nandini *et al.* as 75.3% [26] and by Paul *et al.* as 87.4% [20]. This culture positivity depends on the quality of the collected sample and the choice of culture media [15]. KOH positivity in skin samples (63/88, 71.59%) was higher compared to nail samples (11/20, 55%) and hair samples (4/12, 33.33%). While culture positivity was better in nails (13/20, 65%) and hair (7/12, 58.33%) than in skin samples (45/88, 51%). Kumar MB *et al.*

from Chandigarh reported KOH and culture positivity in skin scraping as 88.9% and 52.1% while 58.2% and 11.8% in nail samples [27]. This highlights the importance of culture as a complementary tool for definitive diagnosis, especially in KOH-negative cases, particularly in chronic or atypical infections.

The nine different species of dermatophytes grew on culture. *T. rubrum* 37 (56.92%) and *T. mentagrophytes* 18 (27.69%) were the most common species. This was in agreement with multicentric and regional studies across India [19, 20, 24, 26, 29]. Studies by Kaur *et al.* [21] and Agarwal *et al.* [28] reported *Trichophyton tonsurans* as a predominant species followed by *T. mentagrophytes*. But in these studies, majority of study participants had prior use of antifungals, steroids, and over-the-counter medications. One study from Haryana reported *T. mentagrophytes* as a predominant species [25]. Das *et al.* from Eastern India reported dominance of *T. verrucosum* followed by *T. rubrum* and *T. mentagrophytes*, reflecting geographical variability [30]. The predominant species in an area depends on age, sex, climate, socio-economic factors, other risks, and co-morbid conditions. This study provides the valuable local epidemiological data. The conventional species identification by colony morphology and microscopic findings have some limitations. The morphologically similar but genetically distinct strains in pathophysiology and resistance pattern with in *T. mentagrophytes*/*T. interdigitale* complex needs molecular identification. For better understanding of dermatophyte epidemiology and accurate species identification the molecular techniques like sequencing of ITS region are essential.

Conclusion

Dermatophytosis remains a significant public health concern, mainly affecting young, middle-aged adults with male preponderance and lower socio-economic groups. The *T. rubrum* was the predominant dermatophyte, followed by *T. mentagrophytes*. The combined use of KOH microscopy and fungal culture has better diagnostic accuracy compared to either method alone. Accurate species identification requires molecular techniques. The antifungal susceptibility and molecular identification were not performed as they were not available at the institute. Strengthening of laboratory diagnostic methods, national collaboration, rational use of antifungal, targeted interventions, patient education, and awareness are essential for reducing the burden of dermatophytosis.

Acknowledgements: We sincerely thank the Institutional Ethical Committee for approving and guiding the research work.

Funding: Nil.

Competing Interests: None.

References

1. Hameed S. Human Fungal Diseases: Diagnostics, Pathogenesis, Drug Resistance and Therapeutics. Boca Raton: CRC Press; 2024.
2. Gnat S, Nowakiewicz A, Zięba P. Taxonomy Of Dermatophytes - The classification systems may change but the identification problems remain the same. Advancements of microbiology. Polish Society of Microbiologists. 2019;58(1):49-58.
3. Jd J, M A, Ramalingam R. Clinicomycological profile of dermatophytosis in a tertiary care hospital in Tamil Nadu, India. Cureus. 2025;17(3):e79961.
4. Gnat S, Łagowski D, Nowakiewicz A, Dyląg M, Osińska M, Sawicki M. Detection and identification of dermatophytes based on currently available methods - a comparative study. J Appl Microbiol. 2021;130(1):278-291.
5. Kumar P, Ramachandran S, Das S, Bhattacharya SN, Taneja B. Insights into Changing Dermatophyte Spectrum in India Through Analysis of Cumulative 161,245 Cases Between 1939 and 2021. Mycopathologia. 2023;188(3):183-202.
6. Verma SB, Panda S, Nenoff P, Singal A, Rudramurthy SM, Uhrlass S, Das A, Bisherwal K, Shaw D, Vasani R. The unprecedented epidemic-like scenario of dermatophytosis in India: I. Epidemiology, risk factors and clinical features. Indian J Dermatol Venereol Leprol. 2021;87(2):154-17.
7. Thyssen JP, Schuttelaar MLA, Alfonso JH, Andersen KE, Angelova-Fischer I, Arents BWM, et al. Guidelines for diagnosis, prevention, and treatment of hand eczema. Contact Dermatitis. 2022;86(5):357-378.
8. Denning DW. Global incidence and mortality of severe fungal disease. Lancet Infect Dis. 2024;24(7):e428-e438.
9. Jota Baptista C, Oliveira PA, Gonzalo-Orden JM, Seixas F. Do Urban Hedgehogs (*Erinaceus europaeus*) Represent a relevant source of zoonotic diseases? Pathogens. 2023;12(2):268.
10. Dalei SR, Nayak D, Bhue PK, Das NR, Behera B. Current Status of Dermatophytosis: A hospital-based study in northern Odisha, India. Cureus. 2023;15(11):e48664.
11. Okpo E A, Andy I E, John G E and Chinyeaka R C. Epidemiology of dermatophytes among primary school children in Calabar, Nigeria. Christian Journal of Global Health. 2024;11(1):84-90.
12. Jaishi VL, Parajuli R, Dahal P, Maharjan R. prevalence and risk factors of superficial fungal infection among patients attending a tertiary care hospital in Central Nepal. Interdiscip Perspect Infect Dis. 2022;2022:3088681.
13. Mijaljica D, Spada F, Harrison IP. Emerging trends in the use of topical antifungal-corticosteroid combinations. J Fungi (Basel). 2022;8(8):812.
14. Warnnissorn P, Sawatdiwithayayong J, Surit P. Efficacy and rapidity of potassium hydroxide mount and modified chicago sky blue 6B Stain with potassium hydroxide in fungal keratitis detection. Korean J Ophthalmol. 2024;38(2):98-104.

15. Chander J. Textbook of medical mycology. 4th edition. New Delhi. JP Medical Ltd; 2017.
16. Aboul-Ella H, Hamed R, Abo-Elyazeed H. Recent trends in rapid diagnostic techniques for dermatophytosis. Int J Vet Sci Med. 2020;8(1):115-123.
17. Kaur P, Ganjoo S, Sawhney MPS, Agarwal P, Gupta N, Chambola S. Clinico-epidemiological profile of dermatophytosis in KOH positive patients in a tertiary care hospital in Gurugram, Haryana. Indian Journal of Health Sciences and Care. 2020;7(2):51-57.
18. Jaiswal S, Singh R, Rizwan MS and Singh AK. Prevalence and epidemiology of dermatophytosis: A clinico-mycological diagnostic approach in Uttar Pradesh. Int J Trop Med. 2024;19:41-4.
19. Tahiliani S, Saraswat A, Lahiri AK, Shah A, Hawelia D, Shah GK, et al. Etiological prevalence and antifungal sensitivity patterns of dermatophytosis in India - A multicentric study. Indian J Dermatol Venereol Leprol. 2021;87:800-6.
20. Paul D, Marak A, Thappa DM, Verma S, Lamba R, Chhangte MZ el al. Clinico-mycological profile of dermatophytosis in a tertiary care hospital in North-Eastern India. CosmoDerma. 2023;3:190.
21. Kaur I, Chaudhary A, Singh H. Clinico-microbiological aspects of tinea corporis in North India: emergence of *Trichophyton tonsurans*. Int J Res Dermatol. 2019;5:144-9.
22. Nepal S, Tyagi R, Kushwaha P, Agrawal D, Kaur S. Clinicoepidemiological Patterns of Dermatophytosis: A Cross-Sectional Study from Western Uttar Pradesh. International J Pharma Cli Res. 2024;16(10):122-7.
23. Kushwaha V, Agrawal P, Khan N F, Shivhare DP, Kumar A, Sharma H. Drug prescribing pattern of various antifungal drugs for dermatophytosis in a tertiary healthcare and teaching hospital. Int J Pharm Pharm Sci. 2023;15(4):16-21.
24. Kumar D, Mehrishib P, Chaudhary BL, Faujdard SS, Panwar S, Goyal S. Dermatophytoses: Causative Agents and Clinical Types in Patients Attending a Teaching Hospital in North India. Afr J Biomed Res. 2024;27:97-101.
25. Lohariwala A, Gupta S, Kaur N, Mahendra A. Emerging Antifungal Resistance in Dermatophytosis: A Clinicomycological Study From North India. Cureus 2025;17(9):e92679.
26. Nandini MS, Bindu D and Puhazhendi. Prevalence of dermatophytic infection in a tertiary care hospital in Chennai in India. Int. J. Life Sci. Pharma Res. 2023;13(5):L387-L39.
27. Kumar MB, Gulati N, Chander J, et al. Species Distribution and Antifungal Susceptibility Profile of Dermatophytes from a Tertiary Care Centre in North India. J Lab Physicians. 2022;14(4):449-455.
28. Agarwal R, Faizan S, Gupta P. Speciation and Clinical Classification of Dermatophytosis in Tertiary Care Hospital. Int J Med Pharm Res. 2024;5(5):169-173.
29. Preethi P, Narasimhan M, Maheswary D, Hemamalini, Bharathi M, Vajravelu LK. Clinico-mycological profile of dermatophyte infections at a tertiary care hospital from south India. J Pure Appl Microbiol. 2023;17(4):2591-97.
30. Das S, De A, Saha R, Sharma N, Khemka M, Singh S, et al. The current Indian epidemic of dermatophytosis: A study on causative agents and sensitivity patterns. Indian J Dermatol 2020;65:118-22.