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Research Article



Emerging incidence of fungal dermatitis in canines caused by *Curvularia* spp: An opportunistic fungal pathogen

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Abstract

The study was carried out to estimate the occurrence of canine fungal dermatitis caused by opportunistic fungal pathogens. A total of 264 skin scrapings and hair plucks from dogs with the history of recurrent skin problems were collected for the period of twelve months. Samples were collected from different dog breeds including non descriptive animals and of various age groups. Samples were screened for the identification of various etiological agents associated with the skin infestation like for mites, bacteria, fungi., Out of them 52 (19.69%) samples were positive for fungal etiology. Among these, *Curvularia* spp an opportunistic fungi was isolated either alone or as a combined infection with other opportunistic fungi in 16 cases (30.77%) of recurrent dermatitis.

Keywords: fungal dermatitis, skin scrapings, *Curvularia* spp.

Introduction

In recent times, opportunistic fungal infestations are posing a serious threat and loss to human and animal health globally by incurring huge expenditure and by repeated exposure to therapeutic agents. The reasons behind the rise in such opportunistic fungal invasion and proliferation are the usage of many chemicals, steroidal drugs, anti-inflammatory agents, biologicals etc. The climatic conditions of the tropical and subtropical areas also favour the growth of such opportunistic fungal proliferation. Even though these fungi have very low virulence to cause mortality, the morbidity they cause is of important concern. One such opportunistic fungi associated with canine dermatological cases in recent times is *Curvularia* spp.

Curvularia is a pigmented fungus that has been associated with phaeohyphomycosis (1) and eumycotic mycetomas (2). They are ubiquitous and

are usually recovered from vegetative matter and soil (3).

This report deals with a study on the isolation of *Curvularia* fungi from samples subjected to fungal culture during the period of one year in Centralised Clinical Laboratory, Madras Veterinary College, Chennai and their relative significance in canine dermatitis.

Materials and Methods

Hair plucks and scabs collected from dogs with a history of recurrent skin problems and presented in Centralised clinical laboratory, Madras Veterinary College for a period of one year were subjected to fungal culture media using Sabouraud's Dextrose Agar (SDA) without addition of antibiotics to facilitate

growth of rapid growers and in the Dermatophyte test medium for the isolation of dermatophytes. The plates were incubated at 25⁰ and 37⁰C for 4-6 weeks.

The colonies were examined on the consecutive days to identify the gross morphology. When the colonies were fully grown, the fungi were identified based on colonial appearance and microscopic appearance by Gram's stain and Lactophenol staining of Tape impression smears (4). The tape impression smears were screened in detail under the 10X magnification for the presence of sporangia, conidia, phialides, shapes of conidia and for other characteristic fungal elements.

Results and Discussion

A total of 264 suspected clinical samples such as hair plucks and scabs were screened for presence of fungal etiology. Out of them 52 (19.69%) samples were positive for fungal growth in the SDA media. Among this, *Curvularia* sp., was isolated in 16 cases (30.77%) .They were isolated as a single species in 11 cases (21.25%) and along with *Malassezia* spp and *Trichophyton* spp in 2 cases each (3.84%) and along with *Rhizopus* spp and *Fusarium* spp as combined infection in one case (1.92%).

Out of the 16 *Curvularia* spp. positive samples, five samples were from German shepherd; four from Pug; three from Doberman ; one from Rajapalayam and other three from non descriptive breeds. Similarly, seven positive samples were from less than 2 years age group dogs; three samples were from 2 and 5 years group and remaining six samples were from dogs above 5 years old.

In all the *Curvularia* positive cases, colonies were found to be developed within 2 to 3 days after inoculation. The colour of the fully grown *Curvularia* colonies were dark brown to black on the obvious side. On the reverse side, the colonies appeared black. The texture of the colonies were hairy and to some extent wooly and the colonies were appeared to be slightly raised. On gross morphological examination on consecutive days after inoculation, the developed colonies revealed conidiophores and it was found to be erect and branched with septate hyphae.

Microscopic examination of lactophenol cotton blue stained tape impression smears revealed conidiophores and conidia. Conidia were found to be emerging from the apical part of conidiophores. They were large and often 4 celled. The sub terminal spore of conidia was larger than the other three and appeared to be slightly curved and bulging outwards. Based on cultural and morphological characteristics it was found to be *Curvularia* sp.



Fig 1: Appearance of *Curvularia* colonies on SDA on day 2



Fig 2: Appearance of *Curvularia* colonies on SDA on day 5

Fig 3: Appearance of *Curvularia* sp microconidia under 10X magnification

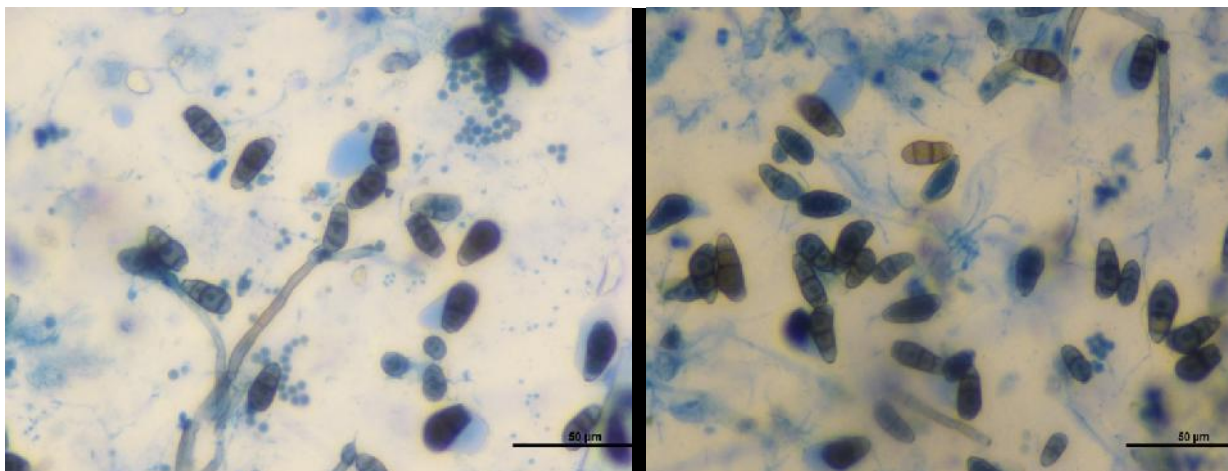
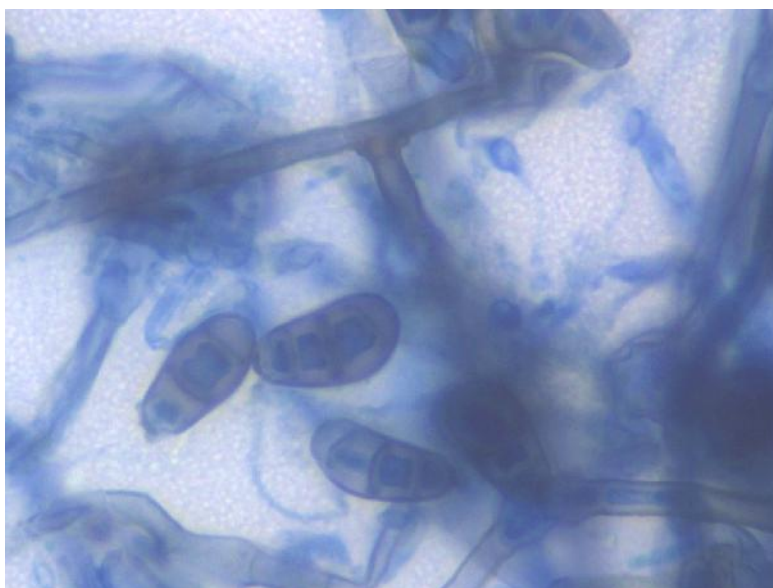


Fig 4: Appearance of *Curvularia* sp microconidia under 100X magnification



Curvularia species are relatively common pathogens of animals and humans (5). They are members of the dematiaceous fungi causing phaeohyphomycosis in a wide range of hosts including canines. Phaeohyphomycosis is the term to denote the cutaneous and systemic diseases caused by black moulds like *Curvularia* that develops dark walled septate mycelia in tissues. The organisms are widely present in the environment.

The most common types of phaeohyphomycosis in veterinary medicine are the subcutaneous and systemic forms. Subcutaneous phaeohyphomycosis is the most common form and is characterized by the presence of granulomas in the adipose panniculus. It follows the

traumatic implantation of the etiologic agents or, as progression from superficial to cutaneous to subcutaneous infection. The systemic form involves internal organs other than soft tissues adjacent to the skin.

In most of the cases reported in domestic animals, there is no involvement of the epidermis or upper dermis, and traumatic implantation or wound contamination is thought to be the primary mode of infection (1). Further the absence of any evidence for traumatic injury or not even a history of injury in the past, in *Curvularia* positive dermatitis dogs may be attributed to the fact that an initial superficial infection

would have occurred and from that, the infection would have spread to the underlying and adjacent deep layers of the skin. The lesions could thus be a combination of cutaneous and subcutaneous forms. (6).

Based on the study, it was clearly evident that opportunistic fungal pathogen are posing a silent threat in long standing recurrent cases of canine dermatitis. Hence when veterinarians come across longstanding and unhealing skin lesions, opportunistic fungi like *Curvularia* should be strongly suspected along with pyoderma, dermatophytes and mite infestation. To have a definite diagnosis fungal culture can be carried out to determine the actual etiological agent and appropriate treatment can be started against it.

Conclusion

The diagnosis of any fungal involvement in dermatitis including *Curvularia* spp requires the coordinated effort of the clinician's experience and expertise of the laboratory personnel. As most of the opportunistic fungi are caused by the exogenous fungi present in the environment, care should be taken to avoid environmental contamination while collection. Aseptic collection of suspected samples and prompt inoculation in appropriate mycological media are important factors that decide the successful isolation of actually responsible fungi.

Further as the opportunistic fungi are present ubiquitously in the environment it is difficult to

prevent their invasion in canine skin. The better option for the prevention of opportunistic fungi in such situation would be, to maintain good health status of canines. Because opportunistic fungal invasion in dogs begins when they have been weakened by some diseases, improper management, stress etc., Moreover the inadvertent use of drugs and chemicals which alter the host defense mechanism also facilitate the fungal invasion and infestation .Hence judicious use of drugs has to be strictly adhered.

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