

PDF - ANTIVIRAL ACTIVITY OF GOSSYPIUM HIRSUTUM EXTRACT ON NEWCASTLE DISEASE VIRUS IN EMBRYONATED EGG - researchcub.info

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF STUDY

There has been a great challenge in recent times in antiviral therapy of poultry diseases. Fewer substances are available for treatment of antiviral infections when compared with the large amount of antibiotics available for treatment of bacterial diseases in poultry; (Esimone et al., 2007). At the same time, the frequency of viral resistance to the relatively few antiviral agents are increasing; (De Clerq, 1993).

One of the most important reasons for lack of success in developing antiviral drugs is due to the nature of infection of viral agents which totally depend upon the cell they invade for their multiplication and survival (Vanden Berghe et al., 1986; Vlietnick et al., 1997). Since many of the existing disinfectants and antiseptics fail to kill all pathogenic viruses, the demand for new antiviral agents is great and needs all possible approaches toward the development of new antiviral drugs.

The research in the use of phytochemicals as antimicrobials for treatment of certain animal diseases is of paramount interest to scientists and the poultry industry, (Hammer et al., 1999). Plants and plant products present some hope to scientists, serving as an alternative avenue to discovery from current mainstream approach of attempting to design narrow spectrum drugs for specific molecular targets, (Cowan, 1999). While numerous reports exist on the antimicrobial effects of these plants against some bacteria, only very few reports exist on the antiviral activity of these plants.

Medicinal herbs have the potential for addressing multiple targets with minor side effects, development of low resistance due to selective pressure of infective agents and cost effectiveness, (Cowan, 1999). The antiviral properties are rarely studied using laboratory based assays to establish their efficacy in traditional medicine, (Esimone et al., 2005).

Conventional techniques for evaluating antiviral agents include; *In vitro* and *in vivo* techniques. *In vitro* techniques include, plaque inhibition/reduction assay, virus yield reduction assay, inhibition of virus induced cytopathic effect, inhibition/reduction of synthesis of virus specific polypeptides, immunological assays for detecting viral antigens and viral enzyme inhibition assays, (Fernando et al., 2008). The *in vivo* methods include the use of ferrets, laboratory mice, cotton rats and chicken for measuring a number of parameters indicating the extent of inhibition of infection (Sidewell, 2000).

The embryonated chicken egg system is a standard method for the propagation and isolation of egg adapted viruses. Antiviral agents have successfully been screened using embryonated chicken egg as media for both virus cultivation and inhibition assays, (Heartl et al., 2004).

Newcastle disease is one of the most significant diseases of importance in the poultry industry in Nigeria, with a morbidity of up to 100% and mortality ranging between 80 – 100% in severe cases, (Kouwenhoven, 1993). The survived cases of this disease fail to gain the presumed body weight in case of meat production and show drastic decrease in egg production during the course of the disease in case of laying birds. Onset of disease is usually sudden with flock showing somnolence, diarrhoea, respiratory distress, drop in egg production, severe prostration and neurological signs which manifest as paralysis of the legs, twitching of the muscles, torticollis and circling movement. Disease is highly contagious and persists in poultry flock. This has posed a major concern for the poultry industry in Nigeria which has necessitated a search for suitable antiviral agents for these diseases.

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