Available online at www.pharmaresearchlibrary.com/ijcps ISSN: 2321-3132

Review Article

International Journal of Chemistry and Pharmaceutical Sciences

IJCPS, 2013: Vol.1(8), 519-520

www.pharmaresearchlibrary.com/ijcps

# Pharmaceutical Effect of Biological Extracts Depends on Its Structural and Chemical Configuration: A Review

**Ganguly Subha***

AICRP on Post Harvest Technology (ICAR), Department of Fish Processing Technology, Faculty of Fishery Sciences, West Bengal University of Animal and Fishery Sciences, 5, Budherhat Road, P.O. Panchasayar, Chakgaria, Kolkata - 700 094, WB, India

*E-mail: ganguly38@gmail.com

Available Online 27 December 2013

## Abstract

This review is constructed with the aim of highlighting the chemical structure influencing the pharmaceutical and biochemical effect of purified β-glucan from an edible mushroom as an immunomodulator on the innate immune responses in broiler Also, mushroom glucan as a feed supplement significantly provides protection against disease. This article portrays the chemical potentiality of β-glucan (mushroom origin) as an immunostimulant in poultry.

**Key words:** Fungus, Chicken, Immunomodulator, Yeast

## Introduction

Immunomodulator stimulates leucocytes, particularly cells of the macrophage system and modulates and potentiates the immune system of the body[1]. It has been recommended earlier that the constant addition of immunomodulators to feed is beneficial for prevention of diseases[2]. One of such immunostimulant compound is β-Glucan, polymers of glucose which consists of a linear backbone of β-1, 3 linked D- glucopyranosyl residues having varying degree of branching from the $C_6$ position[3].

**Review on chemical structure and biochemistry**

β- Glucans are major structural components of yeast, mushrooms and fungal mycelia. Supplementation of β- glucan in diets increase the macrophage phagocytic activity, PHA-P- mediated lymphoproliferative response and also humoral response[4]. β- Glucan provides significant protection against pathogen as a feed additive by upregulating phagocytosis, bacterial killing, and oxidative burst in chicken[5]. In the mammalian system, action of β- glucan is mediated through toll-like receptors (TLR) and dectin-1[5]. In the present work evaluation was carried out for short term dietary influence of a purified β- glucan, prepared from an edible mushroom, on the innate immunity and disease resistance of broiler birds. Immunomodulator is a substance that stimulates leucocytes-particularly cells of the monocyte/ macrophage system and thereby modulates, and most often potentiates, the immune system of the body[1]. The term immunomodulator was often used interchangeable with immunostimulants, adjuvants and biological response modifiers. Glucan and mannan are the main components of yeast cell wall (YCW) that are gained from pure culture of yeast, *Saccharomyces cevisiae*. β-D- glucan is major component of yeast cell wall and has been shown to stimulate non-specific immune response. Glucans with β 1-3, β 1-4 and β 1-6 glucosidic linkages are major structural components of YCW[6-8].

## Conclusion

It can be concluded that dietary β-glucan may provide immunostimulatory properties which may be directly implied to its chemical properties and structural configuration. It proves to be effective in the reduction incidences of any infection in poultry.

## References

1. Seljelid R. Immunomodulators-medicine for the 90is In: Pathogenesis of wound and biomaterial associated infections (ed. Wadstrom T, Eliasson I, Holder I and Ljungh A.). Springer-verlag, Berlin. 1990;107-13.

2. Onarheim A M. Now a yeast extract to fortify fish. Fish Farmer. 1992;15: pp.45.
3. Bohn J A, BeMiller J N. (1□3)-β-glucans as biological response modifiers: a review of structure-functional activity relationships. Carbohydrate polymers. 1995;28: 3-14.
4. Guo Y, Ali R A, Qureshi M A, The influence of beta-glucan on immune responses in broiler chicks. Immunopharmacology and Immunotoxicology. 2003;25: 461-72.
5. Lowry V K, Farnell M B, Ferro P J, Swaggerty C L, Bahl A, Kogut M H. Purified beta-glucan as an abiotic feed additive up-regulates the innate immune response in immature chickens against Salmonella enterica serovar Enteritidis. International Journal of Food Microbiology. 2005;98: 309-18.
6. Brown G D, Gordon S. Fungal beta-glucans and mammalian immunity. Immunity.2003;19: 311-5.
7. Paul I, Isore D P, Joardar S N, Samanta I, Biswas U, Maiti T K, Ganguly S, Mukhopadhayay S K. Orally administered β-glucan of edible mushroom (Pleuratus florida) origin upregulates immune response in broiler. Indian J. Anim. Sci. 2012; 82(7): 745-8
8. Paul I, Isore D P, Joardar S N, Roy B, Aich R, Ganguly S. Effect of dietary yeast cell wall preparation on innate immune response in broiler chickens. Indian J. Anim. Sci. 2013;83(3): 307-9.