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

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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 body¹. It has been recommended earlier that the constant addition of immunomodulators to feed is beneficial for prevention of diseases². 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 C₆ position³.

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 response⁴. β- Glucan provides significant protection against pathogen as a feed additive by upregulating phagocytosis, bacterial killing, and oxidative burst in chicken⁵. In the mammalian system, action of β- glucan is mediated through toll-like receptors (TLR) and dectin-1⁶. 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 body¹. 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 YCW⁷⁻⁸.

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