

## EFFECTS OF FERMENTED PAPAYA PREPARATION ON SERUM COMPONENTS AND IMMUNOLOGICAL FUNCTIONS IN HUMANS

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We studied the effect of the one-month administration of FPP on the immunological, hematological, biochemical, and antioxidant functions of the blood and serum of 14 healthy and unhealthy subjects, and observed an increased mean rate of interferon- $\gamma$  production in both groups while a downtrend then uptrend or vice-versa were noted in the production of interferon- $\alpha$ , 2-5A synthetase activity, and phytohaemagglutinins or concanavalin A- stimulated proliferative activity. The exceptionally high levels of GOT and GPT and the lipid components in three unhealthy subjects were significantly decreased after 14 days of treatment. The thiobarbituric acid-reactive substances increased while the superoxide dismutase activity did not change. The ability of F.P.P. to increase interferon- $\gamma$  producing capacity provides greater resistance for lymphocytes or helper T cells to combat infection and diseases.

### Introduction

F.P.P., a health food product of the fermentation of herbal plants such as papaya was found to be a potent hydroxyl radical scavenger (9). In *in vivo* studies, F.P.P. was shown to provide antioxidant protection in the animal models of epilepsy (9,10), brain ischemia-reperfusion injury (8), and aging (11). It was also demonstrated to inhibit the chromosome-breaking effects of carcinogens in the bone marrow of mice (1), enhance the natural killer (NK) cells activity, and reduce the toxohormone L-induced lipolysis in rats (7). In humans, F.P.P. normalizes the decrease in blood glucose and superoxide dismutase (SOD) activity after alcohol consumption (6). To probe further into its purported therapeutic actions, we studied its effects on the hematological, biochemical, serological and antioxidant activities of the human serum components, as well as the immunological functions.

### Materials and Methods

Six grams of F.P.P. (Osato International Inc., Gifu) were orally taken by 14 subjects (healthy: 11; with liver malfunctions: 3). 25 ml of peripheral blood was drawn in heparinized tubes at 0, 2, and 4 weeks of F.P.P. treatment (April 13, April 27 and May 11, 1993). Measurement of interferon (IFN)- $\alpha$  and - $\gamma$ , 2-5 A synthetase were done using the whole blood method (2); the natural killer (NK) cells were analyzed by the cytotoxicity assay- using Cr-labelled K562 cells whereas; the phytohaemagglutinins (PHA) and concanavalin A (con A) - stimulated proliferative activity were

determined by standard methods. The hematological test consists of the routine analysis for WBC, RBC, HGB, hematocrit, platelet count and HbA1c. Routine biochemical and serological tests for BS, total protein, albumin A/G, ZTT, LDH, GOT, g-GTP, AL-P, total bilirubin, TG total cholesterol, BUN, uric acid, creatinine, amylase, HBs antigen, HBs antibody, LP (XI, X2), blood sugar, lactic acid, and pyruvic acid were done. The antioxidant functions of F.P.P. were measured in serum TEARS and SOD activity using fluorometry and electron spin resonance spectrometry/spin trapping technique. The Student's t-test was used to evaluate the statistical difference.