

S 4-2**Physiological Functionalities of Korean Traditional Wine, *Yakju***

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Korean traditional wine has long been brewed by classical ways using *nuruk*, rice, flour, yeast and some medicinal plants or herbs. There has been growing interest in the study of the physiological functionalities of Korean traditional wine (*Yakju*), due to the beneficial effects of prevention and treatment in blood circulatory trouble, thrombosis, and arteriosclerosis etc, as a folk medicine. Many research groups have been studying how to improve the quality of Korean traditional wine (*Yakju*), as well as changes in microbes and enzyme activity during the fermentation, the characteristics of nutrients and acceptability, utilization of raw materials, standardization of the manufacturing process, storage, and so on.

In recent research, some physiological activities were illustrated in anti-cancer, gastro-protection, blood circulation, overweight and many other effects. We introduce the scientific contributions in many aspects.

The effect on anti-cancer

The antimutagenic activities of Korean traditional wine, *Yakju*, and its concentrate were assessed by the Ames test. The antimutagenicity was evaluated using the *Salmonella typhimurium* TA98 and TA100 with and without metabolic activation (S9 mix) toward known mutagens. The results confirmed that Korean traditional wine, *Yakju*, have the effect of antimutagenicity.

The cytotoxic effect of Korean traditional wine, *Yakju*, with different process and ingredients was examined against human and mouse cancer cell lines. The cytotoxicity of *Yakju* was similar to the effect of red wine.

Inhibitory effect of the Korean traditional wine, *Yakju*, on *in vivo* tumor growth and metastasis were monitored after implantation of B16BL6 cells into C57BL/6 mice with daily feeding the solubilized *Yakju* concentrates. Compared to non-fed control groups, B16BL6 tumor growth and metastasis to lung were clearly inhibited by feeding the Korean traditional wine, *Yakju* concentrates.

The findings to *in vitro* cytotoxicity, *in vivo* tumor growth and metastasis indicate that the inhibitory effect of tumor progression may be attributed to tumor cell differentiation or immune stimulation induced by certain components in the *Yakju*, as well as direct cytotoxicity.

The effect on gastro-protection

Gastro-protective effects of Korean traditional wine, *Yakju*, were evaluated in two types of acute experimental gastric ulcer in rats and also studied repeatedly alcohol administration in mice. The Korean traditional wine, *Yakju*, prevented the formation of gastric ulcers induced by 60% EtOH in 150 mM HCl and reduce gastric ulcers induced by absolute ethanol. The Korean traditional wine, *Yakju*, also showed inhibitory effect against 30% alcohol treatment for 7 days (twice/day).

These results might suggest that Korean traditional wine, *Yakju*, had preventive and inhibitory effects on gastric lesion and ulceration.

The effect on blood circulatory trouble & overweight

The effect of Korean traditional wine, *Yakju*, on blood circulatory trouble and overweight was illustrated that the plasma levels of low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, and body-weight were changed after rats were fed on high fat diet with Korean traditional wine, *Yakju*.

There was a significant decrease of plasma LDL cholesterol and weight loss in *Yakju* treated group compared with the high-fat diet group. However, HDL cholesterol level was increased in *Yakju* diet groups in dose dependent manners.

These findings indicate that Korean traditional wine, *Yakju*, may contain compounds with actions that can treat blood circulatory trouble as well as overweight.

The inhibitory effect of others

The effect of Korean traditional wine, *Yakju*, on other inhibitory activities for the ACE (Angiotensin I converting enzyme), oxidative electron donation, elastase (related to the inhibition of skin aging), SOD-like activity, nitrite scavenger, and tyrosinase was examined. Korean traditional wine, *Yakju*, had been exhibited ACE inhibitory activity, electron donating ability, elastase inhibitory activity, SOD-like activity, nitrite scavenging activity, and tyrosinase inhibitory activity, respectively.

These different physiological functionalities were due to the raw materials (rice and herb, and medicinal plants etc.), microbes, and fermentation metabolites. However, there have been some problems, such as a lack of unique characteristics, and functionality. Therefore, it is necessary to illustrate the concrete effects of Korean traditional wine, *Yakju*, medicinal herbs and fermentation metabolites, and to purify and characterize the single compounds of Korean traditional wine, *Yakju*, with excellent physiological functionality.

The study of Korean traditional wine, *Yakju*, is a valid scientific enterprise that deserves to proceed in parallel with broader studies to establish and confirm their advantage to human health and life.