

Screening of Pharmacological Activities of Ezo-ukogi (*Acanthopanax senticosus* Harms)

Presented at the Annual Meeting of the Japan Society for Bioscience,

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[Study objectives]

Various pharmacological activities of Ezo-ukogi have been demonstrated by many studies in humans and animals. Such activities have been suggested to be due to Ezo-ukogiside as a specific active ingredient, as well as isofraxidine, chlorogenic acid, and other unidentified ingredients. Since not all of its active ingredients have been identified, Ezo-ukogi may have pharmacological activities that have not yet been confirmed by research.

This study was performed to seek potential pharmacological activities of Ezo-ukogi, with a focus on enzymes¹⁾ and receptors²⁾ involved in disease, among an enormous number of those that play roles in maintaining vital activities of the human body.

[Experimental procedures]

Effects of Ezo-ukogi extract (extract powder) on 81 different enzymes and 104 different receptors were screened using *in vitro* methods of evaluation.

[Results]

As a result of screening, Ezo-ukogi extract was shown to inhibit the activities of 49 enzymes and 21 receptors among those tested. Newly identified pharmacological activities included inhibition of the activities of 5-lipoxygenase (5-LOX) and phosphodiesterase 4 (PDE4), indicating the usefulness of Ezo-ukogi in alleviating bronchial asthma. In addition, Table 1 summarizes some of the potential therapeutic effects of Ezo-ukogi extract suggested in relation to the inhibition of enzymes and receptors observed in this study. The potential therapeutic effects suggested by this study need to be confirmed by further studies.

Table 1. Potential effects of oral Ezo-ukogi extract

Inhibited enzyme/receptor	Potential effects
5-Lipoxygenase 5-Lox	Anti-bronchial asthma
Protein Serine/Threonine kinase PDK1, AKT1, MEK1	Anti-cancer
Protein Serine/Threonine kinase ERK1, p38 α , JNK1	Anti-neurodegenerative diseases, anti-inflammation, anti-ischemic injuries
Protein Tyrosine Kinase BLK, FGFR2, HER2	Anti-B cell lymphoma, anti-uterine body cancer, anti-breast cancer
Protein Tyrosine Kinase ABL1, FGFR3, ZAP-70	Anti-chronic myeloid leukemia, anti-achondroplasia, anti-immunosuppression

Aldose Reductase	Anti-diabetes, anti-diabetic complications
Phosphodiesterase PDE3, PDE4, PDE5	Anti-thrombus formation, anti-bronchial asthma, anti-pulmonary hypertension
Serotonin(5-Hydroxytryptamine) 5-HT _{1A} , 5-HT _{2A} , 5-HT ₄	Anti-anxiety, anti-schizophrenia, gastrointestinal motility promotion
Dopamine D ₁ , D ₃ , D _{4.2}	Anti-schizophrenia, anti-parkinsonism
GABA A, Muscimol, Central	Neuroprotection

Note 1) What is an enzyme?

An enzyme is a protein produced in the body that speeds up chemical reactions occurring in the body. There is a specific enzyme for each chemical reaction needed to make biological systems function properly. An individual can be in a healthy state when these chemical reactions mediated by enzymes proceed smoothly and in orderly fashion, but can be in an unhealthy state when enzyme activity is excessive or insufficient.

Note 2) What is a receptor?

A receptor is a protein that is present in a cell and receives signals occurring within the body or from the outside, and sends signals to the cell. Without proper signal transmission by receptors, the cell cannot function properly and consequently the individual may be unhealthy.

[Presented at a scientific meeting]

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