

**STUDIES ON THE POTENTIAL EFFECTS
OF *GLYCYRRHIZA GLABRA* EXTRACT ON
SENSORIMOTOR GATING IN MICE**

Thesis presented by

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١. Instrumental analysis
٢. Physical chemistry
٣. Computer skills
٤. Statistics

Special courses:

١. Pharmacology
٢. Clinical pharmacology and therapeutics
٣. Neuropharmacology
٤. Molecular pharmacology
٥. Selected topics in pharmacology and toxicology

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Abstract

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Liquorice extract was reported to have nootropic and/or anti-amnesic effects. Prepulse inhibition (PPI) of startle response is a multimodal, cross-species phenomenon used as a measure of sensorimotor gating. Previous studies indicated that liquorice/its constituents augmented mouse brain monoamine levels. Increased brain monoamines' transmission was suggested to underlie PPI disruption. However, the effect of anti-amnesic dose(s) of the extract on PPI has not been investigated despite the coexistence of impaired memory and PPI deficit in some neurological disorders. The effect of administration of the anti-amnesic dose of the extract (100 mg/kg for 7 days) was tested on PPI of acoustic startle response in mice. It resulted in PPI disruption and therefore its effect on monoamines' levels was investigated in a number of mouse brain areas involved in PPI response mediation. Results demonstrated that the extract anti-amnesic dose augmented cortical, hippocampal and striatal monoamine levels. It was therefore concluded that liquorice extract (100 mg/kg)-induced PPI deficit was mediated through augmenting monoaminergic transmission in the cortex, hippocampus and striatum. These findings can be further investigated in experimental models for autism, psychosis and Huntington's disease to decide the safety of using liquorice extract in ameliorating memory disturbance in disorders manifesting PPI deficit.

Keywords: Glycyrrhiza glabra; Prepulse inhibition; memory

List of Abbreviations

Ach	Acetylcholine
APO	apomorphine
°C	Celsius
°-HT	Serotonin
Ag/AgCl	silver/silver chloride
CSF	cerebrospinal fluid
DA	Dopamine
dB	Decibel
EDTA	Ethylene diamine tetra-acetic acid
FEMA	Flavor and Extract Manufacturer's Association
g	gram(s)
G	Glycyrrhizin
GA	Glycyrrhetic acid
GABA	Gamma-aminobutyric acid
GIT	gastrointestinal
hr	hour(s)
HD	Huntington's disease
HPLC	High Performance Liquid Chromatography
i.p.	Intraperitoneal
kg	Kilogram
LE	Liquorice extract
LSD	lysergic acid-diethylamide
M	Molar
mA	Milliampere

mg	milligram
min	minute(s)
ml	millilitre
mM	millimolar
mm	millimeter
ms	milliseconds
NACGM	National Association of Chewing Gum Manufacturers
NE	Norepinephrine
NMDA	N-Methyl-D-aspartate
NT	Neurotensin
p.o.	per oral
PADI	Possible Average Daily Intake
PnC	caudal pontine reticular nucleus
PPI	Prepulse inhibition
PSA	prostatic specific antigen
s	second(s)
SNMC	Stronger neo-minophagen C
V	volt
W	watt
μl	microlitre
μm	micrometer

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Introduction