Clinical Studies on American Ginseng (*Panax quinquefolius* L.)

Athletic Performance

Author/Year	Subject	Design	Duration	Dosage	Preparation	Results/Conclusion
Morris *et al.*, 1996	Ergogenic response of ginseng to intense exercise	PC, CO n=8	1 week	8 or 16 mg/kg body weight	American ginseng root purified extract vs. placebo (brand not stated)	No significant intergroup differences in any measured parameters (oxygen uptake, heart rate, time to exhaustion, mean lactate concentration, rating of perceived exertion during submaximal ergometer exercise).
Goode *et al.*, 1993	Sub-maximal and maximal performance as measured by oxygen consumption and ventilation	R, PC n=39 (mean age 22.5 years)	90 days	3 capsules per day of 330 mg; 2 with breakfast and 1 at supper	American ginseng root extract, encapsulated (brand not stated) vs. placebo (wheat flour)	Significant reduction (p<0.01) in ventilation during submaximal exercise in post-test results compared to pretest values for entire ginseng group and compared to no significant change in placebo group. Increased ability to consume oxygen, especially in those who were less fit (not significant).

Diabetes

Author/Year	Subject	Design	Duration	Dosage	Preparation	Results/Conclusion
Vuksan *et al.*, 2001	Postprandial glycemia in healthy individuals	R, PC, CO, Cm n=12	1 day	16 treatments: 2 capsules (1 g), 4 capsules (2 g), 6 capsules (3 g) or placebo at 40, 20, 10, or 0 minutes before 25 g oral glucose challenge	Chai-Na-Ta® capsules containing 500 mg 3-year old, dried and ground American ginseng root vs. placebo capsules (corn flour)	Ginseng reduced postprandial glycemia in nondiabetic subjects. Ginseng significantly lowered glycemia over last 45 minutes of test after doses of 1, 2, or 3 g compared to placebo (p<0.05). No significant differences among three doses. Glycemia in last hour of test and area under the curve significantly lower when ginseng was administered 40 minutes before challenge than when administered 20, 10, or 0 minutes before challenge (p<0.05). Reductions were time-dependent and not dose-dependent, even though one of the doses (3 g) is relatively higher than normal.
Vuksan *et al.*, 2000a	Postprandial glycemia in nondiabetic individuals and individuals with type 2 diabetes mellitus	R, DB, PC n=19 (mean age nondiabetics 34 years; mean age diabetics 62 years)	4 weeks	3 g/day, 40 minutes before or w/25 g oral glucose	Chai-Na-Ta® Ontario-grown American ginseng root capsules vs. placebo (corn flour)	Type 2 diabetes mellitus subjects: ginseng significantly (p<0.05) lowered incremental glycemia; 22% ± 17% with glucose challenge and 19% ± 22%, 40 minutes before glucose challenge. Nondiabetic subjects: ginseng significantly (p<0.05) lowered incremental glycemia 18% ± 31% when taken 40 minutes before glucose challenge, but no difference when taken with glucose challenge.
Vuksan *et al.*, 2000b	Postprandial glycemia in individuals with type 2 diabetes mellitus	R, PC, CO n=10 type 2 diabetic individuals (6 males, 4 females) (age 63± 2 years)	16 doses (at least 3 day washout between each dose)	3, 6, 9 g ginseng or placebo, 120, 80, 40, or 0 minutes before receiving glucose challenge	Chai-Na-Ta® Ontario-grown American ginseng root encapsulated or placebo (corn flour)	Treatment with 3, 6, 9 g American ginseng significantly lowered incremental glycemia (p<0.05). Reductions, however, occurred independent of the dose used. This effect was seen irrespective of the time of administration.

Psychomotor Response

Author/Year	Subject	Design	Duration	Dosage	Preparation	Results/Conclusion
Johnson *et al.*, 1980	Effect of whole ginseng on mental performance	DB, PC, Cm n=38 dental students 4 arms: Arm 1: n=8 males, 1 female Arm 2: n=5 males Arm 3: n=13 males, 1 female Arm 4: n=10 males (approximately 25 years old)	Over 32 days	All arms: Approximately 2 g/dose, 8–14 doses over 30 days	4 arms: Arm 1: Asian red ginseng root (*Panax ginseng*) Arm 2: North American white ginseng root (*P. quinquefolius*) Arm 3: Eleuthero (a.k.a., Siberian ginseng) root (*Eleutherococcus senticosus*) Arm 4: Placebo	Both species of ginseng and eleuthero improved proofreading error detection, while only Korean and American ginseng improved mood-fatigue. None significantly affected mathematical performance and final grade performance, or the urinary concentrations of catecholamines.

KEY: C – controlled, **CC** – case-control, **CH** – cohort, **CI** – confidence interval, **Cm** – comparison, **CO** – crossover, **CS** – cross-sectional, **DB** – double-blind, **E** – epidemiological, **LC** – longitudinal cohort, **MA** – meta-analysis, **MC** – multi-center, **n** – number of patients, **O** – open, **OB** – observational, **OL** – open label, **OR** – odds ratio, **P** – prospective, **PB** – patient-blind, **PC** – placebo-controlled, **PG** – parallel group, **PS** – pilot study, **R** – randomized, **RC** – reference-controlled, **RCS** – retrospective cross-sectional, **RS** - retrospective, **S** – surveillance, **SB** – single-blind, **SC** – single-center, **U** – uncontrolled, **UP** – unpublished, **VC** – vehicle-controlled.