

# CordyMax enhances aerobic capability, endurance performance, and exercise metabolism in healthy, mid-age to elderly sedentary humans

Jia-Shi Zhu, M.D., Ph.D. and James M. Rippe, M.D.

Pharmanex, Provo, UT and Rippe Lifestyle Institute, Shrewsbury, MA



## Abstract

Previous studies of oral supplementation with CordyMax (CM), a proprietary mycelial fermentation product of the Cordyceps sinensis, have demonstrated significant improvements in aerobic capacity in older humans and in exercise performance and metabolism in elite athletes (JACM 2001;7:231; FASEB 2002;16:A628). This randomized, double-blind clinical study further examined the effect of CM on endurance parameters in healthy, sedentary adults. Subjects (40-70 yrs old) received either CM (n=61) or placebo (P; n=70) for 12 weeks. VO<sub>2</sub>peak, respiratory exchange ratio (RER), time to complete a 1-mile walk (TMW), and work output (WO) by Jeukendrup bike test were examined at Weeks 0, 6, and 12. VO<sub>2</sub>peak was increased by 5.5% in CM (p=0.003), but by only 2.9% in P (NS). Exercise time to VO<sub>2</sub>peak was longer in CM (+4.1%, p=0.047), but no change in P. TMW was reduced by 29 sec in CM (p=0.05), but slightly increased in P (+19 sec, NS). WO was increased by 3.1% in CM (p=0.033), but fell in P (-4.9%, NS). RER was reduced by 2.1% in CM (p=0.018), but no change in P. Diastolic blood pressure was reduced by 5.2% in CM (p=0.045), but no change in P. Consistent with previous findings in healthy, elderly and athlete individuals, these data indicates that oral CM supplementation improves aerobic capability, exercise metabolism, and endurance performance in healthy, mid-age to elderly sedentary humans. Supported by a grant from Pharmanex.

## Introduction

- CordyMax™ improves glucose metabolism (↓ fasting blood glucose and insulin, improving oral glucose tolerance and facilitates insulin recovery, ↑ insulin sensitivity) (*J Alternat Compli Med* 8:309-314 & 315-323, 2002).
- CordyMax™ improves steady-state hepatic bio-energy status (*J Alternat Compli Med* 7: 231-240, 2001).
- CordyMax™ improves aerobic capability (↑ VO<sub>2</sub>max, ↑ anaerobic threshold, ↑ maximal ventilation) in older humans (*Chinese J Gerontology* 20: 297-298, 2001); improves cardiovascular and metabolic capacity during exercise in highly-fit athletes (*FASEB J* 16:A628, 2002).



**Cordyceps sinensis (Berk.) Sacc. 冬虫夏草**  
(Collected from Qinghai-Tibetan plateau of China)

### Isolation

**Cs-4** (A *Paecilomyces hepiali* Chen mycelial Cs-4 strain)

### Industrial Fermentation

**CordyMax™**



## Experimental Design

- Randomized • Double-Blind
- Placebo Controlled

Placebo group (n=70)	(3 g/day)
CordyMax™ group (n=61)	(3 g/day)



## Inclusion Criteria:

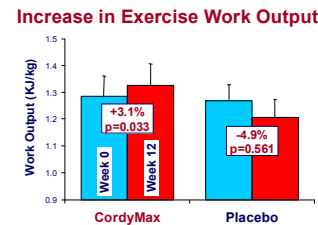
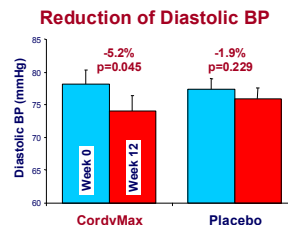
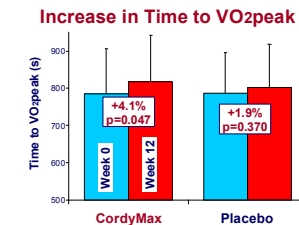
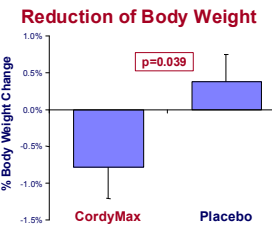
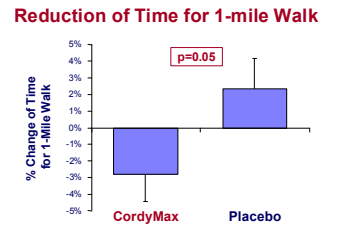
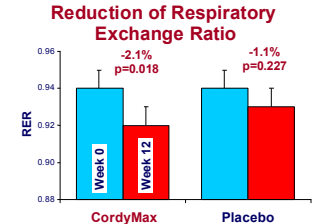
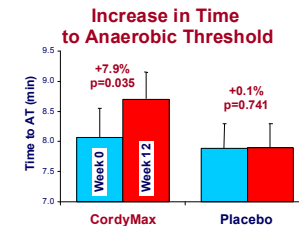
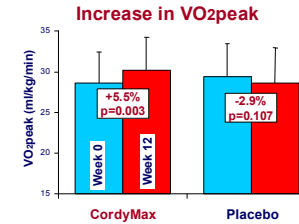
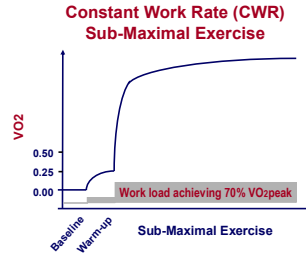
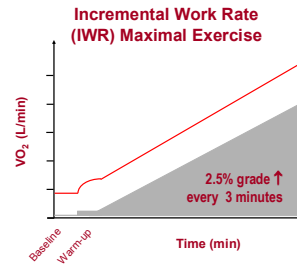
Healthy, sedentary males & females  
Age: 40 - 70 years

## Exclusion Criteria:

Active exercise  
Orthopedic limitations  
History of heart or other diseases  
Ischemia during the exercise tests  
Recent major surgeries  
Tobacco smoker  
BW >40% or <20% Metropolitan Life Insur Tables etc.

## Baseline characteristics of subjects at randomization

	Placebo	CordyMax	p
Age (yr.)	53.6 ± 0.93	53.9 ± 0.92	0.840
Body Weight (kg)	78.2 ± 1.86	75.9 ± 1.65	0.357
Peak VO <sub>2</sub> (ml/kg/min)	28.8 ± 3.60	28.5 ± 3.82	0.810
Heart Rate (bpm)	68.4 ± 1.00	67.2 ± 1.05	0.427



## Summary

Oral supplementation with CordyMax for 12 weeks in healthy, sedentary subjects:

- ↓ Body weight
- ↓ Diastolic blood pressure

During IWR maximal exercise:

- ↑ Peak VO<sub>2</sub>
- ↓ Time to AT or VO<sub>2</sub>peak

During CWR endurance exercise:

- ↑ Exercise work output
- ↓ Time for 1-mile walk
- ↓ RER

## Conclusion

Our findings suggest that oral CordyMax supplementation for 12 weeks improves aerobic capability, exercise metabolism, and endurance performance in healthy, mid-age to elderly, sedentary humans.