

SOME BIOLOGICAL AND PHARMACOLOGICAL PROPERTIES OF ASCORBIGEN

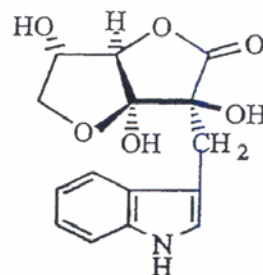
Mandar Joshi^{1,3}, John Bauer^{1,2,3}, Karl Werbovetz¹, Todd Barszcz¹ and P.N. Patil¹

¹*Division of Pharmacology, and Division of Medicinal Chemistry and Pharmacognosy, College of Pharmacy;* ²*College of Medicine and Public Health, The Ohio State University;* ³*Center for Cardiovascular Medicine, Columbus Children's Research Institute, Columbus, Ohio.*

Dietary plants such as cabbage, radish, turnip tamarind and ambala contain high amounts of ascorbigen. It's a cyclized ascorbic acid condensed with an indol. Ethnocultural fact indicates that populations which consume high amounts of plant products containing ascorbigen exhibit low risk for cancer. Ascorbigen is relatively non-toxic, but considered as antioxidant, immunomodulating natural product. In mice it is considered as a donor of ascorbigen acid (1,2,3).



Ambala Fruit



Ascorbigen

Dr. Maria N. Preobrazhenskaya, et al.³, of the Gause Institute of New Antibiotics, Russian Academy of Medical Sciences, Moscow, Russia, brought ascorbigen to our attention and provided the substance for the research. Our report contains semi-quantitative and quantitative evaluation of the ascorbigen on rat aortic rings, Guinea pig ileum, tracheal smooth muscle, atrial rate and frog skeletal muscle. The potential antioxidant property in relation to that of ascorbic acid and anti-leishmaniasis activity was also evaluated. Results of tests in vitro indicate that ascorbigen does not interfere with the normal functions of Guinea pig tracheal smooth muscle, atrial rate, and skeletal muscle activity. Guinea pig ileum was relaxed at 10^{-3} M and 3×10^{-3} M of ascorbigen. The activity of serotonin or histamine was not significantly affected by ascorbigen. On the rat vascular tissue, α -adrenoceptor mediated contractile activity is significantly reduced in the presence of ascorbigen (3×10^{-3} M). Relative to that of ascorbic acid, antioxidant property at micro molar concentration of ascorbigen is about half. Ascorbigen (1μ M to 1mM) demonstrates protective effects against glucose induced cell toxicity in human umbilical vein endothelial cells. The anti-leishmaniasis activity is relatively weak when compared with the standard drug pentamidine. The study of additional biologic activities is proposed.

1. Preobrazhenskaya, MN. et al. (1993) Pharm. Ther., 60(2), 301-313.
2. Lavrenov, SN. et al. (2003) Carbohydr. Res. 338(2), 143-152.
3. International Science and Technology Center Project #1910, Project Manager L.N. Soya-Serko, Ph.D. Investigation of the biological role of indole derivatives in cruciferous vegetables and synthesis of the most important natural compounds their analogs and derivatives with the aim to obtain new anti-carcinogenic, anti-tumor or immunomodulating compounds. Moscow, January 2003. *Progress Report*, March 3, 2003. Site visit, Feb. 2003, communication with P.N. Patil.