INTRODUCTION AND AIM OF WORK

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Breathing produces by far the greatest total exposure of the body to environmental contaminants. One obtains daily intakes of air of 10000 L (for adult who never exercises) up to over 20000 L (for a person who is physically very active much of the time). Comparing these volumes with the average adult's daily intake of about 1.5 to 2 L of food and water, air easily can expose a person to about 10,000 times more mass of an environmental pollutant than does food or water therefore air pollution is the most dangerous form of pollution **(Phalen, 1997).**

Gasoline is the primary product of petroleum refining and is perhaps the most widely used energy source in the world. In addition to industrial applications, the ready availability of gasoline to power automotive engines has made the automobile an indispensable part of modern life and commerce. Gasoline also fuels other equipments used by the public including lawnmowers, snow blowers, small generators, motorcycles and boats.

With the broadly use of gasoline in illuminating fuels, heating fuels, motor fuels, vehicles for many pesticides, cleaning agents and paint thinners, there are increasing opportunities for occupational and environmental exposure to this liquid fuel.

Typical gasoline contains more than 300 individual hydrocarbons consisting primarily of paraffins, cycloparaffins, olefins, and aromatics. Composition of gasoline varies with source of the crud oil, refinery processes and conditions, and the blending of refinery streams in the gasoline boiling range to meet performance criteria as well as regulatory requirements.

Performance criteria may change depending on countries and regions of use and seasons of the year **(Roberts *et al.*, 2001).**

The toxicological effects of any substance may be explained as an interference with the cellular or subcellular processes, which leads to a disruption of the normal metabolism of a living organism upon exposure to such substance. Petroleum hydrocarbons (gasoline) magnified the toxic effects by competing with some endogenous metabolites or block some pathways, this interference may or may not be lethal **(Kuhnhold, 1980).**

The toxic effects of gasoline are exerted on variety of organs of living systems such as the lung, liver and kidney **(Akiubue, 1997).** Most of the available informations on the toxic effects of gasoline has been with the type refined and used in developed countries of the world. It is known that the composition of gasoline different from one country to the other. In addition to that most studies used a wholly-vaporized gasoline in spite of the composition of vapors to which humans are most likely exposed in refinery or work place, or when engaged in automobile refueling is the lighter, more volatile fraction of gasoline. In order to evaluate the potential for health effects from inhaling gasoline vapors, it is essential to understand the major differences in the composition of vapors versus liquid gasoline. The small chain, low carbon-numbered components are more volatile and thus in higher percentages in the vapor phase than the larger and heavier molecules. It is noteworthy that the concentrations of aromatics (the more toxic of the gasoline components) are depleted to about 2% in the vapor phase, with the light paraffin's (the less toxic) enriched to about 90% **(Page and Mehlman, 1989).**

With the removal of lead from gasoline and the use of new technologies, it is very important to conduct studies on toxic effects of reformulated gasoline or unleaded gasoline which will shed the light on this new formula and either it is more or less benefit than the old one.

Therefore the present study devoted to investigate the effects of inhalation of refined unleaded gasoline vapors used in Egypt on some physiological, biochemical and histopathological parameters of adult male albino rats.

The study includes the effect of gasoline on body and organ weights, blood parameters (red blood cell counts, RBCs, white blood cell counts, WBCs and its differential count), and respiratory functions of blood [blood pH, oxygen and carbon dioxide partial pressures, PO_2 and PCO_2; percent O_2 saturation, $\%O_2$ sat. bicarbonate HCO^-_3; total carbon dioxide, TCO_2, and base excess, BE contents of both arteral (a) and venous blood (v)]. The study includes also determination of certain serum enzymes (aspartat and alanine amino transferases, sAST, sALT, urea creatinine and cholinesterase) and immunoglobulin G. Radio immunoassays were also carried out for determination of certain hormones (corticosterone, triiodothyronine, thyroxine and testosterone). Histopathological examinations were carried out finally in certain organs (lung, trachea, liver, kidney, brain and testes) as cumulative indicator for the physiological effects of gasoline.