

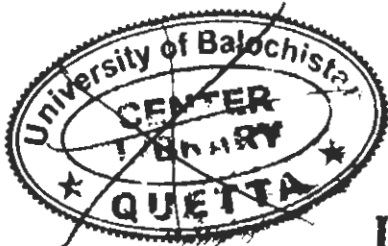
STUDIES ON THE POLLUTANTS OF QUETTA VALLEY
AND
THEIR METABOLIC STRESS ON POPULATION



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By

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**UNIVERSITY OF BALOCHISTAN
QUETTA
(1996).**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

شَدِيدُ كَيْدِهِمْ جَوَّادٌ مُرِيدٌ
أَجْمَلُ قَوْلِهِمْ

**Studies on the pollutants of Quetta Valley
and their Metabolic Stresses
on population**

By

SAYYEDA ABAN ASRAR

A DISSERTATION

**Submitted to the University of Balochistan in Partial
Fulfillment of the Requirmens for the Degree of**

**DOCTOR OF PHILOSPHY
IN
BIOCHEMISTRY**

Supervisor

External Examiner

**INSTITUTE OF BIOCHEMISTRY
UNIVERSITY OF BALOCHISTAN QUETTA 1996.**

DECLARATION

This is to Certify that the work presented in the theses entitled "Pollution of Quetta Valley and Their Metabolic Stresses on Population" is original and of high quality. The work has been carried out by Ms. Sayeda Aban Asrar under my supervision, with approval of under signed.

The thesis is submitted to the University of Balochistan in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY IN BIOCHEMISTRY

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DECLARATION OF ORIGINALITY

I certify that this thesis represent my work, and was composed by me.

Signature Alan Isler

Date 10.9.96

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A B S T R A C T

The work reported here has been carried out to explore pollutants of Quetta Valley in air, food and water. 1600 samples of Almond, Pistachio and Walnuts and peanuts were collected seasonally from different parts of Quetta city and examined qualitatively and quantitatively for the presence of Mycotoxin. Peanuts were found to be highly contaminated by saprophytic fungi *Aspergillus flavus* infection followed by pistachio, Almond and Walnuts. Level of Aflatoxin in Peanuts was found to be highest among four. Aflatoxin level in Peanuts was 80 ppb, Pistachio 70 ppb, Almond 25 ppb and Walnut 20 ppb. Fungal infections and subsequent aflatoxin production was high during summer and autumn seasons due to high temperature and moisture contents. Correlation of aflatoxin with liver cancer was discussed.

The degree of air pollution was determined on heavy traffic areas using road side trees as an indicator. The leaves of *Cupressus* sp, *Pinus*, *Fraxinus*, *excelsior*, *Rubinea*, *Pseudoaccasia* were collected and analyzed for micro, macro and heavy metals concentration. The detection and estimation of these elements was done by using atomic absorption spectrophotometer.

Significantly high lead, Nickel Manganese cadmium, Iron, and Zinc contents were found. These ^{are} highly toxic for all living systems and cause adverse effects directly or indirectly on human health. The common source of Lead, cadmium Nickel, Zinc, Iron and Manganese on tree leaves is motor vehicles. The heavy metal

concentration increases with increasing distance from the road. This study showed that maximum pollution is on Jinnah Road to access the disease caused by pollution, 16 diseases of minor and major characteristics were selected. A questionnaire was distributed to 1000 randomly selected shopkeepers and residents of heavy traffic fifteen roads of Quetta city. These were 95.1% respondents resulted in a 95.1% return.

The significance of lead as a health hazard in the Quetta City was calculated. The regression equations were developed and generalized for the larger population using the data in hand. It was observed that blood pressure, E.N.T, Fatigue gastro intestinal diseases and cancer are highly correlated with lead. There is a linear relationship between impact of hazardous pollutants on diverse profession and the number of patients of various diseases, χ test is used for determining the significance of pollutants on patients of various diseases, thereby rejecting our null hypothesis.

Water samples collected seasonally from different municipal water supplies of Quetta City were analyzed for their Chemical and microbiological characteristics. Calcium, Magnesium, Sodium, Potassium, Carbonate, Bicarbonate, Chloride, Sulphate, Nitrate, Boron dissolved solids, pH conductivity total Cations, total anions, Chromium, Lead, Nickel, Cadmium, Iron and Zinc, were determined quantitatively.

The presence of indicator bacteria in potable water was found to be an important and interesting topic. Most of the work done in this regard was based on the enumeration of indicator bacteria in the water samples. In environment getting polluted by human and animal

waste. Coliform and fecal coliform populations were found abundantly fecal streptococci were also isolated. This situation further intensifies the threat of the hazardous of fecal pollution.