

# **Summary**

The present study dealt with "Studies on the effect of air pollution caused by brick kilns on the flora and related health problems of the brick kiln labourers in North and South Dinajpur districts of West Bengal" consisting of (1) Studies on the effect of brick kiln emission on vegetation, (2) Studies on the effect of brick kiln emission on percent of organic carbon, pH, available phosphorous and available potassium of the soil of the surrounding area of the brick field, (3) Studies on the effect of extract of soil collected from brick field on the growth of shoot and root after germination of plants seeds and (4) Studies on the health problems of the brick kiln workers.

Vegetation analysis was carried at different distances from the chimney towards south and south-west direction in five brick fields, such as BCK brick field, Balurghat, BB brick field, Balurghat, SBI brick field, Raiganj, RBI brick field, Raiganj and SKC brick field, Islampur.

Twenty angiosperms and one fern were found in the brickfield of BCK and minimum numbers of herbaceous plant species were recorded at a distance of 50 m towards both south and south-west direction from the chimney. Three plant species, such as *Croton* sp., *Leucas* sp. and *Gnaphalium* sp. were present at all distances and showed their respective lowest density on the southern side of the chimney at 50 m distance. Only two plant species, e.g. *Croton* sp. and *Leucas* sp. showed lowest density on the south-western side at the same distance and were present at all distances.

In the brickfield of BB nineteen angiosperm and one fern were recorded. Lowest number of plant species was recorded at 50 m distance towards both south and south-west direction from the chimney. In this brickfield only *Croton* sp. showed its lowest density at 50 m distance on both sides and was recorded at all distances.

Altogether twenty one plant species including one fern were found in the brickfield of SBI. Minimum number of plant species was recorded at a

distance of 50 m towards both south and south-western direction from the chimney. On the southern side three species, e.g. *Croton* sp., *Polygonum* sp. and *Leucas* sp. and four species, such as *Croton* sp., *Polygonum* sp., *Ocimum* sp. and *Leucas* sp. on the south-western side showed their respective lowest density at a distance of 50 m and these were present at all distances.

On the southern side of RBI brick field twenty one plant species and on the south-western side twenty two plant species were found. At a distance of 50 m lowest number of plant species was recorded on both sides. In this brick field three plant species, such as *Croton* sp., *Leucas* sp. and *Argemone* sp. showed their respective lowest density at a distance of 50 m from the chimney on both sides and were recorded at all distances.

In the brick field of SKC twenty one and twenty plant species were recorded on the southern and south-western sides respectively. Lowest number of species was recorded at a distance of 500 m from the chimney on both sides. In this brick field only *Croton* sp. showed the lowest density at 500 m distance from the chimney towards south and south-west direction and was present at all distances.

Soil samples were collected from two brickfields from different distances from the chimney and percent of organic carbon, pH, available phosphorus and available potassium were analysed. At BB brick field soil organic carbon ranges from 0.13% to 0.93%. ANOVA showed that there was no significant differences in percent of organic carbon of the soils collected from different distances and different directions from the chimney. At BCK brick field organic carbon ranges from 0.04% to 0.89%. ANOVA showed no significant difference in percent of organic carbon of soils of different direction as well as with regard to distances. The pH of soil at BB brickfield ranges from 5.0 to 6.3. From ANOVA it appeared that there were significant differences in pH between groups at 50 m and 200 m distances but others were insignificant. At BCK brick field the pH ranged from 4.5 to 6.1. ANOVA

showed that pH values at 100 m had significant differences between groups. Available phosphorus content of soil at BB Brick field ranges from 6 kg/ha to 102 kg/ha with an average of 52.75 kg/ha. ANOVA showed significant difference in available phosphorus of soils between groups at 50 m and 500 m. At BCK brickfield it ranged from 26 kg/ha to 92 kg/ha. ANOVA showed that at 500 m distance there was significant differences in available phosphorus between the groups. At BB brick field available potassium ranged from 98 kg/ha to 336 kg/ha and average was 224.68 kg/ha. ANOVA showed there was no significant difference between different groups. At BCK brick field available potassium of the soil ranged from 201 kg/ha to 425 kg/ha and average was 317.37 kg/ha. The ANOVA showed that at 50 m distance there was significant difference between the groups.

The growth of root of jute was found higher with the supplement of extract of soil collected from 50 m distance. The growth of shoot of jute was higher in extracts of soils collected from 50 m to 500 m distances in comparison to that of control. The F value between duration and distance differed significantly at 1.0% level. The growth of ladies finger root and shoot was excellent in extracts of soil collected from all distance (50 m, 100 m, 200 m and 500 m) in comparison to that of control. The F value of duration and distance differed significantly at 1.0% level. The growth of radish root was positive in the extract of soil collected from 50 m, 100 m and 200 m distances. The growth of radish shoot was higher than the control.

Four hundred brick kiln workers responded to the questionnaire and it was found that they were suffering from various types of problems and these were categorized into following variable classes: (i) Respiratory disease, (ii) Nutritional problems, (iii) Dermatological problems, (iv) Haematological disorder, (v) Gastrointestinal problems, (vi) Ophthalmological problems, (vii) Urinogenital problems, (viii) Musculoskeletal problems, (ix) Neurological disorder, (x) Auditory problems and (xi) Venereal disease. Again each variable class was divided into several subclasses. It was also found that

many workers were affected with more than one variable class. From the percent table it was clear that chances of worker getting affected with respiratory disease, nutritional problems and dermatological problems were more. The frequencies of respiratory disease, nutritional problems and dermatological problems were 25.123, 20.985 and 19.409 respectively. From the analysis of relationship between the above said diseases and sexes the followings were concluded: (1) female have more chance of being affected by infection of the respiratory system (sinusitis, upper respiratory tract infection, lower respiratory tract infection) and their chances of being affected are twice more than that of males, (2) chances of male having chronic obstructive pulmonary disease are more than female and approximately fifteen times more than that of females, (3) chances of male being affected with anthracosis are approximately twice more than that of females, (4) proportion of workers affected by different nutritional deficiencies is not changing over sex and whatever be the sex, the chances of an individual to be affected by iron deficiency is more, (5) proportion of workers affected by different dermatological problems is not changing over sex and whatever be the sex, the chances of an individual to be affected by eczema and scabies are more.