

C

H

A

P

II

T

E

R

MATERIALS AND METHOD

METHODOLOGY USED FOR SAMPLING

SAMPLING SITE

The present dissertation is based on the intramural aerobiological studies of library building of Shivaji University, Kolhapur. Kolhapur is a city located between 16° 43' North latitude and 74° 14' East longitude. The height from sea level is 557.21 meters. The city enjoys monsoon rains from June to September. The average rainfall is about 900-1000 mm annually. During summer there are occasional heavy downpours. The average temperature ranges from 19° to 40°C.

The Vidyanagar campus of Shivaji University is located 4 Kms from Central Bus Stand or Railway Station. (Fig.1). The campus possesses vast open space with cultivated patches of vegetation here and there. Ficus, Eucalyptus, Acacia, Leucina are the dominant trees while natural grasses and weeds form undergrowth.

Barr. Balasaheb Khardekar Library of Shivaji University has a four storied spacious building. All the floors are well ventilated. There are different sections in the library such as text book section, reference section, periodical section, reading rooms etc. Among them in the text book section or in the periodical section the recent volumes are always in circulation. But in the reference section or the old volumes of the periodicals are comparatively less in circulation and handled occasionally only. Such library materials have chances of being spoiled by insect and fungal attack. The sections of library having such old record were selected for collecting air samples.

METHODOLOGY USED FOR AIR SAMPLING

The Rotorod Air Sampler was used for collecting air samples. The rotorod sampler was fully described by W.A.Parkins (1957). The device relies upon the high efficiency with which small air borne particulates are deposited on narrow cylinders oriented at right angle to the high velocity winds. A small constant speed battery operated motor is used to whirl thin sticky coated brass rods about its axis at a constant high speed. It has been developed into a cheap and portable and high efficiency sampler with high sensitivity by Tilak (1982). It is well fitted to use in the field and relatively independent of external wind speed. Collecting arms of the model are made up of 0.159 cm (1/6 inch) square section brass rods slightly bent inwards. The vertical arms are 6 cm long and 4 cm from the axis. Petroleum jelly is used as an adhesive on cello tape. The collection efficiency of this model is 85%.

According to Gregory (1951) the width should give more than 60 to 70% efficiency of deposition for 20 μ diameter spores at wind speed above 4 m.p.h. (2 mm/sec.). The model employs D.C. controlled speed motor of the type used for record players. With the rods in position the motor gives 2300 r.p.m.

The sampler was operated inside a hall in the library building where the old books and back volumes of the periodicals are kept for reference purposes. The sampler was kept 1 to 2 feet above ground. The sampling was done weekly (on every Friday) for 1 hr from 4.00 to 5.00 p.m. The period of investigation is from October 1993 to July 1994 i.e. 10 months.

SAMPLING METHODS

For present investigation the sampling was carried out by operating rotorod air sampler (Plate -I). This sampler is used for wind borne particles. After applying petroleum jelly to the cellotape, the edges of the cellotape are trimmed back to the width of the rods with sharp razor blade . The cellotape is cut in to four equal parts 1.5 cm length, before adhesive is applied and after applying the adhesive these are exposed for one hour and then mounted beneath a cover glass with suitable mountent like glycerine jelly which has best optical properties for visual examination. It was prepared as follows :

Gelatin	40 gms
Glycerine	120 ml
Distilled water	140 ml
Phenol crystals	0.5 gms

SCANNINGS

The total spore counts obtained on the known areas during evening hour were scanned under 10 X 45 x eye piece, objective combination. The spores trapped on cellotape were observed and counted regularly. The number of sproes per unit volume of the air was computed with the help of conversion factor and efficiency. With the help of conversion factor the trapping efficiency assuming to be 85%, the number of sproes counted on the tape of known area was readily converted in to an estimated number of spores per cubic meter of air. the sampling was done for one hours in a week from 4.00 to 5.00 p.m. according to Indian standard time (IST).

The identification of spores was based on the comparison with parasitic and saprophytic fungi material, collected in and around the field and studied microscopically and comparing with the reference slides. Also for the identification the books-

- 1) Aerobiology by S.T.Tilak 1982.
- 2) Air borne pollen and fungal spores by S.T.Tilak 1989.
- 3) Illustrated genera of Imperfect fungi by N.L.Burnett Barry B. Hunter 1972 were used.

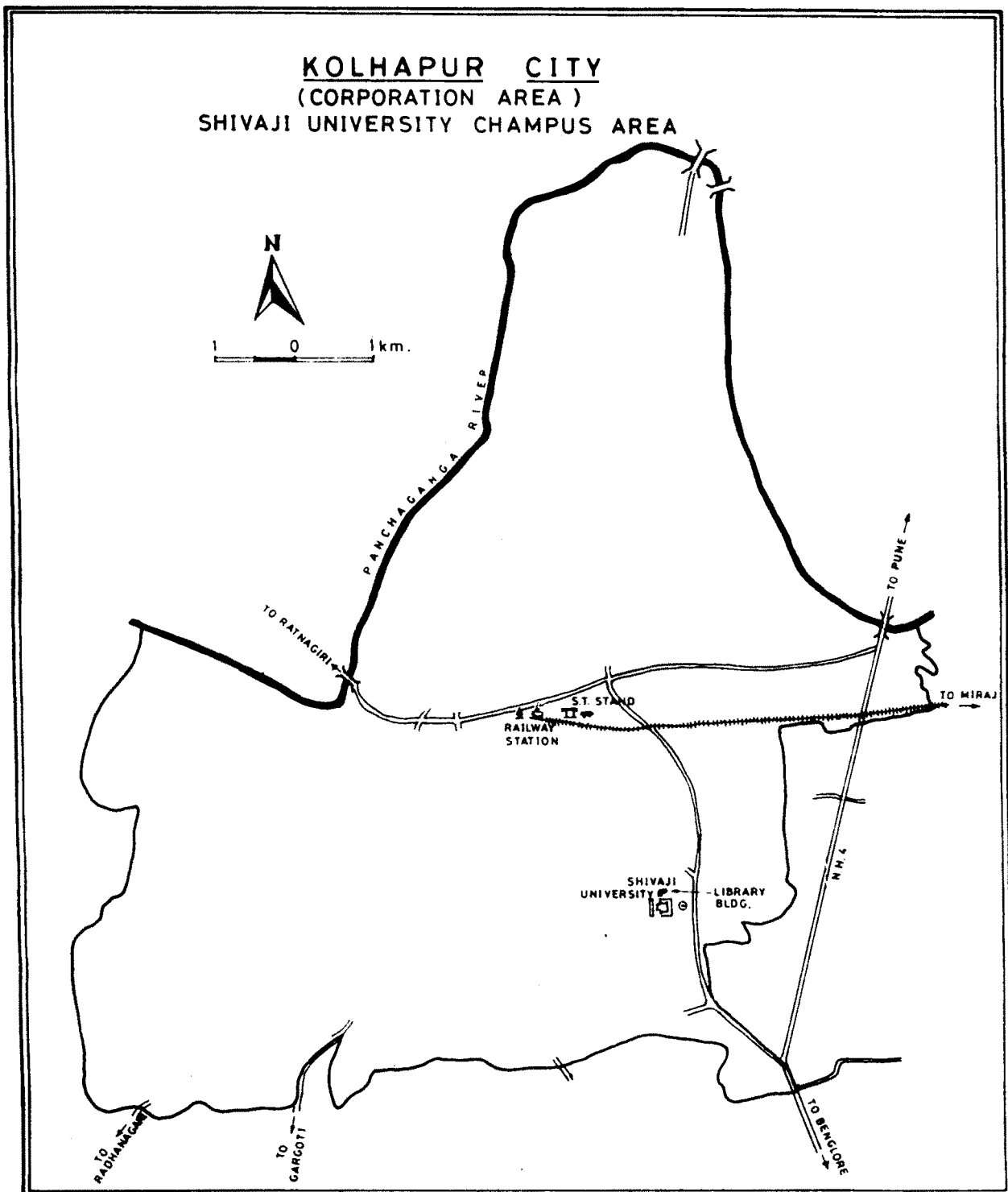
The percentage contribution of each spore type to the total airspora was calculated by random counting each type.

The aerial survey by culture plate technique

Simultaneously Petri plates containing Potato-Dextrose-Agar medium were also exposed in the air for half an hour per week along with the Rotorod air sampler. The fungal colonies developed were identified and counted after incubation of the exposed culture plate in an inverted position at in 30°C.

The study of effect of biopollutants on human beings :

For the study of effect of biopollutants inside the library buildings, the persons visiting the library daily and those working, there for at least 10 years were interviewed. the results are expressed in Table No.VI



EXPLANATION OF PLATE-I

ROTOROD AIR SAMPLER

PLATE -I

