Research Paper:

Airborne biological materials: Their identification, origin and impact on environment

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Asian Journal of Environmental Science, (June, 2011) Vol. 6 No. 1 : 1 -11

SUMMARY

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M.N.ABUBACKER Department of Botany, National College, TIRUCHIRAPPALLI, (T.N.)INDIA abubacker_nct@yahoo. com Identification, origin and impact on environment of airborne fungal spores, pollen grains and other biological materials of Tiruchirappalli, Tamilnadu was studied for a period of one year from January to December 2009 at 10 m height from the ground level using vertical cylinders as trap. *Alternaria padwickii, Aspergillus niger, Cladosporium herbarum, Curvularia lunata, Helminthosporium oryzae* and *Nigrospora oryzae* were major concentrated fungal spores. *Azadirachta indica, Casuarina equisetifolia, Cocos nucifera, Eucalyptus globules,* Grass spp. including *Oryza sativa, Parthenium hysterophorus, Typha anquastata* were the major contributors of pollen types. The other biological materials included, epidermal cells, epidermal hairs, protozoan cyst, mites and thrips. The major concentration of fungal spores, pollen and mites will lead to allergy and trigger attacks of asthma.

M.N. Abubacker and Amatussalam, A. (2011). Airborne biological materials: Their identification, origin and impact on environment. *Asian J. Environ. Sci.*, **6**(1): 1-11.

Study of airborne biological materials is known as aerobiology (Meier *et al.*, 1933). This field is related to the study of fungal spores, pollen grains, bacteria and other biological materials present in the air. The scope of it is now well known to carry a heterogenous population of an array of bio-particles (Singh *et al.*, 2005). These bio-particles vary in origin, size and structural complexity and were called to constitute airspora (Studenkin and Sokolova, 1977; Nilsson, 1992).

Several aerobiological studies were conducted by many workers (Gregory, 1973, 1983; Norman and Lichtenstein, 1986; Rao *et al.*, 1995; Singh, 1998; Dales *et al.*, 2000; Potdar *et al.*, 2000; Anderson *et al.*, 2001; Sears *et al.*, 2006; Amato *et al.*, 2007; Emberlin, 2008). The purpose of this report is to provide a comprehensive picture of airspora for the clinical aspects because the inhalation of spores of different species results in different health effects from allergy to Aspergillosis (Tobin *et al.*, 1987; Miller, 1990).

MATERIALS AND METHODS

Vertical cylinders of 0.5 cm diameter (Fig. 1) were used as trap (Ramalingam, 1968). A cellophane strip is stuck on the cylinder and coated with glycerine jelly. Exposed it daily round the clock for a period of one year at 10 m height at three different places in Tiruchirappalli to know the atmospheric concentration of fungal spores, pollen grains and other biological materials and their average was expressed in number (cm³). The exposed cellophane strips (2x2 cm) on the cylinders were prepared for microscopy (Ramalingam, 1968). An area of 0.15 cm² was scanned from each exposure for the biological material counts. The fungal spore types were identified and confirmed with the literature of eminent biologists (Ellis, 1971; Subramanian, 1971; Ainsworth et al., 1973; Gregory, 1973; Gilman, 1975; Tilak, 1982). The pollen types were identified and confirmed with the help of literature of some other biologists (Erdman, 1969; Tilak, 1982; Nair et al., 1986). The identification was confirmed with the help of reference slides of pollen collected directory from the plants. The pollen grains were mounted in safranin stained glycerine jelly.

RESULTS AND DISCUSSION

Table 1, 2 and 3 illustrate the list of atmospheric concentration of fungal spores, pollen grains and other biological materials respectively. Altogether 24 fungal spores, 15 pollen types and other biological materials like

Key words :

Allergy, Asthma, Biological materials, Fungal spores, Pollen grains

Received: December, 2010 Accepted : January, 2011