INTRODUCTION

Aerobiology, which deals with airborne bioparticles, is a scientific and multidisciplinary approach focused on the transport of organism and biologically significant material. The term "aerobiology" came into use during 1930s as a collective term for studies of airspora, like airborne fungal spores, pollen grains and other micro-organisms in terms of their source, release, dispersal, deposition and impact on other living organisms. In case of human immune system, the respiratory organ is the direct target of inhaled airborne bioparticles, resulting into a variety of adverse effects, e.g. infection and allergic disorders including bronchial asthma, seasonal rhinitis, conjunctivitis, atopic dermatitis etc. The term "allergy" was first introduced by von Pirquet (1906) as a changed responsiveness in individuals who had previously been exposed to allergenic substance. About 15% of the world population is known to suffer from major allergic diseases. In India, nearly 10% population suffers from allergic disorder (Vishwanathan 1964). A normal adult inhales about 14-15 cubic meters of air per day, which contains a good number of bioparticles including pollen grains. Pollen grains, an important cause of respiratory allergy (Blackley 1873) are at present the major sources of morbidity among atopic subjects (Kjellman, 1993), Allergenic extracts have been used for the diagnosis and treatment of allergy for over 80 years. Despite this, little is known about the nature of these materials, neither in terms of allergen or antigen contents, nor in terms of their ability to desensitize patients. So the study of allergenic pollen is very useful for proper diagnosis and treatment of respiratory allergy.

From medical specially, clinical point of view, it is important to know the details about the occurrence of the pollen load in the atmosphere. The correlation between the onset of different airborne pollen seasons and occurrence of a patient's symptom is now well known. Pollen grains causing allergy are quite variable in different ecological and climatic conditions. This makes it very important to identify pollinosis - causing species from every region and to prepare aqueous sterile extracts from them for diagnosis and immunotherapy. That is why an aerobiological survey is needed to make a pollen calendar of a particular area. Pollen calendar of an area is essential to rest the relevant antigens on the patients, and to correlate the seasonal occurrence of the pollen types to the patients' allergic symptoms.

The aerobiological survey of an area involves aeropalynological study, identification of airborne pollen grains, and determination of atmospheric pollen count. Although the atmosphere consists of a large number of pollen grains, only a few of them are responsible for allergic manifestations. To know the details about the occurrence and concentration of these allergenic pollen which can be inferred from

the pollen calendar is very essential for the clinicians. A pollen calendar of a region is a prerequisite for the immunological treatment of pollen allergies. For identification of airborne pollen grains surveyed from a particular area, it is necessary to know the floral distribution of that area through ecofloristic survey and the morphology of common pollen grains of the study area.

Dispersal of pollen grains into the air gets affected by meteorological factors and this relationship has to be defined before the identification of allergenic pollen (Antepara *et. al.* 1995). So, the aeropalynological survey in relation to meteorological parameters is needed as weather factors have great influence on the occurrence and distribution of pollen in the atmosphere.

The diagnosis and treatment of allergic disorders caused by pollen grains, require preparation of allergen extract which is a complex mixture of proteins, lipids, carbohydrates, nucleic acids and lectins. The allergenic extracts used in clinical allergy, contain non-allergic protein antigents and some times irritant components as well as active allergenic proteins. The allergen content and composition of extracts prepared by different companies may vary, resulting in unreliable diagnosis and immunotherapy of patients. So, the standardization of the crude allergen extracts is required for proper diagnosis and immunotherapy of patients. The work in the field of aerobiology in relation to allergy remained unexplored for long time in the developing countries, such as India and allergic diseases were considered to be uncommon in these countries (Turner 1989). From the last three decades it was found that allergic disorders caused by pollen grains are quite common in India (Chanda and Sarkar 1972; Shivpuri and Agarwal, 1982; Jaggi and Gangal, 1987; Agarwal and Jhumbs, 1995; Malik *et. al.* 1991a, Singh *et. al.*, 1993, 1995, Chakraborty *et.al.* 1996, 1998a, 2001, Boral and Bhattacharya 2000). Inspite of this, there are many areas that remained unexplored for quantification of aeroallergen load in the atmosphere, their identification and proper standardization. That's why the present study was undertaken. The main objectives of this study are :

1. An ecofloristic survey of the Jalpaiguri town of West Bengal was carried out to make a list of angiospermous plants showing their mode of pollination, habit, flowering period, etc., with the object of identifying the airborne pollen grains. All these data are essential prerequisites for aerobiological investigation.

2. The pollen morphological study of common pollen grains of Jalpaiguri was done supplemented by a pollen key for identifications of the airborne pollen grains.
3. The volumetric aerobiological survey for two consecutive years of Jalpaiguri town, yet unexplored biozone, was carried out with reference to meteorological parameter to make a pollen calendar of the area which will be helpful to correlate the seasonal occurrence of the pollen types with the patients allergic symptoms.
4. To identify the allergic pollen types and to prepare the allergenic pollen calendar in the study area.
5. To study the allergenic significance of some common pollen types of Jalpaiguri town by clinico-immunological tests.