

Certified Pollen and Mold Counter

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Opinion

Certified pollen and mold counters receive their certification through the American Academy of Allergy, Asthma and Immunology (AAAAI). In order to become a counter you must successfully complete an Aeroallergen Course [1]. This course teaches the identification and categorization on the various classes of airborne allergens found in ambient air. It also describes the lifecycle, modes of transport, reproduction, and methods of dispersal of aeroallergens. You must also be able to recognize diurnal, seasonal, and weather-induced patterns of allergen incidence, describe the health effects, which may result from exposure to airborne allergens, and practice hands-on application of acquired knowledge within the course.

Pollen and mold counters use many types of air samplers to collect pollen grains and mold spores that are then counted using a microscope [2]. I prefer the Burkard 7 day recording volumetric spore trap. Advantages of using the Burkard include: high efficiency, greater accuracy for small fungal spores and it permits analysis for diurnal rhythms and permanent slides for future reference. The Burkard should be placed 3 to 6 stories above ground away from overhanging vegetation and unobstructed air flow from nearby buildings or structural features. The Burkard sampler head moves by orifice at 2mm per hour and air is brought in at 10 l/min. Cornstarch, skin cells, exhaust particles, and ink are among the many debris captured on a slide in addition to pollen and mold. When the wind is strong, performing the count can be time consuming. Sometimes it's like trying to find a needle in a haystack. When preparing a slide for collection in a Burkard you'll need lubriseal or high vacuum grease to spread a thin layer as smoothly as possible on to the slide. On a Burkard, use the formula below when calculating a single longitudinal traverse sweep along the slide.

C=Concentration of pollen grain/m³

N=Number of pollen counted on traverse sweep

W=Width of entire sample (14mm) slide

F=Field diameter of objective lens (variable) Ex. 0.48mm

V=Total volume of air sampled (14.4m³)

$C = \frac{N \times W \times 1}{V} \times \frac{1}{F^2} \times 14.4$ Ex. $C = \frac{N \times 14 \times 1}{14.4} \times \frac{1}{0.48^2} \times 14.4$

F V 0.48 14.4

For Rotorod, use the following calculating concentrations:
 $C = \frac{N}{V}$

N=Total number of pollen

V=Volume of air

C=Concentration

Opinion

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Plants can be either amphiphilous (wind and insect pollinated), aerobic (air born), Entomophilous (insect pollinated) or Anemophilous (wind pollinated). It is helpful to know what type of plants are growing in the area of concern in order to assist with the identification of the particles found on the sampler which will aid the physician in identifying the patient's symptoms chronology and the relevance of in vivo or in vitro sensitivity.

Pollen produce male gametes necessary for plant fertilization, which means humans wouldn't be able to live without them. Pollen grains are small and typically invisible to the naked eye except during the heaviest production days of the season when pollen concentrations can make the air look slightly foggy. Pollen structure consists of an exine (the outer layer of the wall of a pollen grain), intine (the inner layer of the pollen grain, which is the cause of the allergy symptoms), and the sexine (the outer covering of a pollen grain, which is used to identify the pollen being counted). Pollen grains are influenced by temperature, light and moisture. The key characteristics you need to identify pollen include; shape, orientation, size, the presence and number of pores or colpi, and ornamentation (surface). The surface can vary greatly. The surface can be any of the following; psilate (a smooth surface) like you see with grass, granular-fine or coarse as with cottonwood, reticulate (netlike) seen with ash and willow, regulate (irregular pattern) usually seen in box elder, echinate (spiny) seen in ragweed, scabate (rough), and verrucate (warty or bumpy). The internal characteristics will help with identification as well. The internal structure can have a thick intine, seen in cottonwood, stellate appearance, seen in cedar, prominent starch granules, which has a popcorn appearance, as seen in dock and the less prominent starch granules, like with grass. Pollen size ranges from 5 to 250 microns. Most airborne grains are between 20-60 microns. You could fit 50 to 70 microns within the core of a human hair. It would take about 12,000 pollen grains lying side by side to fill an inch of space.

Then, there are the dreaded Mold spores. Not only do they cost billions of dollars in damage to our agricultural crops each year, they also cause millions of people to feel sick from allergies and a wide range of skin diseases from ringworm to athlete's foot. Mold growth can be prevented by maintaining a dry and airy environment, heating foods to the proper temperature and using

fungicides [3]. But, they can be beneficial as well...yes, beneficial. Molds are instrumental in the decay of dead things. Molds are also a source of medicine in antibiotics, such as penicillin. Some molds are delicious if you like mushrooms or cheese. Camembert and Blue Cheese to name a couple.

Mold characteristics include: pseudoseptate (apparently divided by a septum or septa), seen in *Drechslera*, asymmetric (uneven in distribution), seen in basidiospores (mushrooms), and septate (divided by a septum or septa) as with *Alternaria*, my personal enemy.

I admit I have a love-hate relationship with pollen and mold. You see, I, like so many others, suffer from allergies. But, I do get a sense of satisfaction when counting these lovely little monsters and reporting them to physicians, researchers and the general public. It's good to know what is in the air we breathe and "who's the culprit" of our allergy symptoms. By reporting what's in the

air, the public can judge whether or not to go outside or stay indoors and "take cover".

I've been counting pollen and mold for over five years and have loved every minute of it. Counting thousands of pollen grains and mold spores by making tally marks in sets of five may sound tedious for some, but for me, it's the most enjoyable part of my workday.

References

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