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MIHS PRESIDENT'S MESSAGE

MOLD is in the Air?

Timothy J. Kearney, MIHS President

Is it that time of year again, already? It's hard to believe that we have already completed the first quarter of 2003. It seems that just as "Spring is in the Air" so too are continuing concerns surrounding Toxic Mold and Indoor Air Quality. The Michigan legislature has participated in the continuing national trend toward proposed legislation to require property seller disclosure regarding toxic molds and the establishment of standards for permissible exposure limits to mold, assessment of its health threat, as well as mold identification and remediation guidelines. As of this writing, at least four bills, pending from seven, have been proposed in the state legislature to address these concerns. The AIHA, MIHS and WMIHS have remained vigilant in responding to these proposed bills to express our mutual concerns over many of the technical and professional issues which the impact.

Following the introduction of Federal legislation by Michigan Rep. John Conyers in the last session of Congress the AIHA has met with Rep. Conyers' staff on numerous occasions and is working with them on reintroduction of this legislation in the 108th Congress. AIHA's response to the proposed federal regulation can be viewed on our MIHS website at: <http://www.mihswb.org/PDFs/5040.PDF> AIHA has monitored and commented on nearly a dozen federal and state legislative issues and has a task force looking at future activities and potential involvement. Mr. Aaron Tripler, AIHA's Director of Government Affairs, responded in February to Michigan Representative Chris Kolb's proposed House Bill 4094, a bill introduced to create the "toxic mold protection act" for Michigan. Mr. Tripler's comments can be viewed on our MIHS website at <http://www.mihswb.org/PDFs/MI-HB4094-Letter-02-06-03.pdf> .

On behalf of the MIHS/WMIHS, I and David Huizen, President of WMIHS, have drafted letters supporting AIHA's comments regarding the technical difficulties of establishing permissible exposure limits for molds.

As stated by Dr. Stephen Redd from the Centers for Disease Control in recent testimony before a U.S. House of Representatives oversight committee hearing on the issue of mold, "There are no accepted standards for mold sampling environments or for analyzing and interpreting the data in terms of human health. Molds are ubiquitous in the environment, and can be found almost anywhere samples are taken. It is not known, however, what quantity of mold is acceptable in indoor environments with respect to health. For these reasons, and because individuals have different sensitivities to molds, setting standards and guidelines for indoor mold exposure levels is difficult and may not be practical." Therefore, AIHA believes other, more appropriate performance measures will need to be explored.

Please plan on visiting the MIHS website regularly over the coming months. We plan on continuing to update to the Legislative Issues section of the MIHS website (<http://www.mihswb.org/legislate.htm>) as information becomes available. If you are interested in participating actively in the MIHS board's effort to remain well informed in regards to these proposed bills, please feel free to contact myself, Gerry Plattenberg or any of your officers or directors. You can find the email address for any of your local section officers/directors at http://www.mihswb.org/board_mem.htm . Lets hope that through each member's continued vigilance we can all help ... "Clear the Air" regarding these public concerns.

Timothy J. Kearney
MIHS President

Highlights of Recent National AIHA Activities

Donald J. Hart, Ph.D., CIH, CHMM
AIHA Board of Directors

As the AIHA Board Coordinator to MIHS, Tim Kearney has invited me to periodically contribute updates to the membership. As a member of MIHS for almost 20 years, it is my privilege and pleasure to be your conduit to the national AIHA Board of Directors. Please feel free to contact me anytime via phone at 248-680-5198 or via e-mail at donald.hart@gm.com. The following items are highlights of some of the recent activities of AIHA.

AIHA Board of Directors Name Davis Executive Director

In December 2002 the AIHA Board of Directors unanimously approved the appointment of Steven H. Davis, CAE, to serve as the acting executive director of AIHA. At the AIHA Board meeting held January 30-31, 2003 the AIHA Board of Directors approved the removal of the "acting" tag and made Mr. Davis the Executive Director. He has been with AIHA for 4 1/2 years and has over 25 years of association management experience. Steven is very personable and would be happy to meet with anyone at any time. Feel free to attend the AIHA business meeting at the AIHce on Thursday morning in Dallas and talk to Steven afterwards about anything that comes to mind.

Henshaw Meets with AIHA Board

OSHA Administrator John L. Henshaw met with the AIHA Board of Directors on January 31, 2003 to give an update on OSHA activities. Although it is clear that enforcement activities are still very important to OSHA, it is equally clear that OSHA intends to take on a much more of a partnership and alliance role in working towards reducing adverse health and safety effects for workers. He briefly touched on progress since the alliance that was formed between AIHA and OSHA in October 2002. The following is the press release announcing that alliance:

The Occupational Safety and Health Administration and the American Industrial Hygiene Association (AIHA) have established an Alliance to use their collective expertise to help prevent injuries and illnesses in the American workplace while sharing best practices and technical knowledge in many areas, including in the field of ergonomics, announced OSHA Administrator John L. Henshaw today.

"OSHA and the AIHA have always enjoyed a fruitful, close working relationship," said Henshaw. "This Alliance will bring us even closer in an important partnership to help reduce ergonomic hazards in the workplace, as well as to expand our already close cooperation in the field of occupational safety and health."

Under the terms of this Alliance, OSHA and the AIHA will work together to provide AIHA members with information and guidance to help reduce and prevent employee exposure to ergonomic hazards, and to reach out to association members

with specifics on developing, implementing and improving ergonomic programs.

The Alliance provides avenues for both organizations to work together on outreach and communication projects, including the development and dissemination of information at conferences, events and through their respective websites. AIHA members' worksites will be encouraged to participate in OSHA's cooperative programs, such as compliance assistance, the Voluntary Protection Program, the Consultation Program, and SHARP. AIHA members will also be afforded opportunities to mentor and assist OSHA personnel as they proceed with professional certifications.

OSHA and AIHA will also promote and share information on best practices with others in the occupational health and safety profession. Both organizations will participate in forums and roundtable discussions on ergonomic issues and also examples of hazard recognition strategies and analytical tools that support solutions to ergonomic hazards. Finally, OSHA and AIHA will assist association members with the development and delivery of training and education programs for reducing and eliminating ergonomic hazards in the workplace.

A team of OSHA and AIHA representatives will meet at least quarterly to develop an action plan, determine working procedures, and identify roles and responsibilities of participants.

AIHA LQAPs are Being Re-organized

AIHA's Laboratory Quality Assurance Programs (LQAPs) are being re-organized by sun-setting the various laboratory committees and placing the LQAPS directly under the Analytical Accreditation Board (AAB). This re-organization will be phased in throughout most of 2003. Once the re-organization is complete, the programs should run more efficiently and will be more cost effective for AIHA. Customer satisfaction should increase, particularly with those organizations that are participating in the programs for the first time.

AIHA 2003 Budget

Due to the use of zero-based budgeting and some very hard work by AIHA's Treasurer Mike Brandt, AIHA's Financial Committee, and Steven Davis and the rest of the AIHA staff, the 2003 budget is projected to be revenue positive even without AIHA's investment income. In these somewhat difficult economic times, this is a significant accomplishment. This will allow AIHA to conduct the necessary business and still have contingent money to fund necessary projects that arise during the year. One consequence of this is that the AIHA Governmental Affairs group will be able to spend a little more effort on local section issues.

What's in The Synergist?

by Alan Amberg, CIH, MIHS Board



Let's face it! Evaluating moldy interior spaces has become one of the latest controversial areas impacting our profession. Every day we are reading in our local papers about the latest "mold victims" that are allegedly sickened and at a

minimum frustrated with a home situation gone awry. This Synergist's January 2003 technical exchange article by Robert Collins attempts to shed some light on the potential problems surrounding air sampling for these culturable fungal contaminants of concern. Whether you are curious from afar or deeply involved in the controversy, this article attempts to delineate the various factors that affect the reliability of results from spatial and time variability, to comparability to actual inhaled particles. While it doesn't go into explanations or interpretation of sampling results, it does explain why results can be so misleading. If you are going to test, check this article out!

(This article was re-printed with permission from The Synergist.)

Technical Exchange Culturable Air Sampling for Fungal Contaminants What Is Actually Being Measured? By Robert L. Collins

The decision to collect air samples potentially containing fungal contaminants can be very controversial. Building investigators often collect these samples without understanding the nature of information derived from them. As a result, the interpretation of analytical results often proves to be both questionable and unreliable. As the primary exposure route for fungal contaminants is inhalation, common sense dictates that air samples should be part of a comprehensive investigation. It is imperative, therefore, that investigators know and understand the exact nature of results obtained from air samples. This article is intended to discuss the sampling methods used when collecting culturable air samples so readers derive a better understanding of the strengths and weaknesses of the methods.

The ultimate goal of culturable air sampling is to determine the type and quantity of culturable fungal spores present on the sample collected. Nonculturable air sampling can identify the type of fungal contaminant present in the collected sample to the genus level only (i.e., Cladosporium, Stachybotrys, etc). Moreover, nonculturable air sampling cannot differentiate Aspergillus spores from Penicillium spores. Analytical results for nonculturable air samples will show only the quantity of

Aspergillus and Penicillium spores collectively as a single group.

By contrast, analyses of culturable air samples can differentiate Aspergillus spores from Penicillium spores with further differentiation to the species level possible. The question then becomes, how is the type and quantity of culturable fungal spores on a collected sample related to the type and quantity of viable fungal contaminants in the air that are relevant to occupant exposures?

Culturable vs. Viable

Viable fungal spores are capable of germinating, growing and reproducing under conditions found in natural or man-made environments. Culturable fungal spores are capable only of germinating, growing and reproducing under unique conditions defined by the sampling and analytical method used. A fungal spore can be viable but not culturable.

For example, the growth medium most often used to collect culturable fungal spore samples, malt extract agar, preferentially favors the detection of xerophilic fungal contaminants, which grow most favorably when the water activity (Aw) at the surface of the growth medium is between 0.60 and 0.80. By contrast, hydrophilic fungal contaminants (fungal contaminants with water activities in excess of 0.90) do not grow well on malt extract agar and are often prevented from growing because the plate already contains well-established colonies of xerophilic fungal contaminants. This is one reason why Stachybotrys chartarum (Aw=0.94) is rarely found in culturable air samples. As a result, the failure to detect culturable spores of S. chartarum on a collected sample does not necessarily mean that there are no viable S. chartarum spores present in the air being sampled.

Spatial Variability

A sampling instrument collects a sample of air present only within its capture zone. For that sample to be representative of a space as a whole, the concentration of viable fungal spores must be consistent throughout the space. In reality, contaminant concentrations within the space being sampled will vary from point to point according to a normal distribution around the average concentration. This means that, at any given time, the concentration measured at any point has a 50 percent chance of being higher or lower than the average concentration.

This variability in contaminant concentrations within the space being sampled can be improved by increased mixing within the space. This can occur only through increased airflow. Theoretically, as airflow is increased within the space, the standard deviation of the normal distribution decreases, producing a narrower distribution around the average contaminant concentration. As airflow in the space approaches infinity, the standard deviation approaches zero, resulting in ideal mixing within the space. This would produce uniform contaminant concentrations throughout the space being sampled, signified by a vertical line at the average

contaminant concentration.

In reality, ideal mixing can never be attained in the space being sampled. Moreover, as airflow is increased, surface contaminants will be lifted off exposed surfaces, increasing the overall concentration of airborne contaminants. This will, in turn, raise the average concentration within the room and shift the normal distribution curves toward higher concentrations. These conditions can be simulated using aggressive air sampling techniques similar to those required for clearance testing after completion of asbestos abatement projects.

Time Variability

Sampling times can vary from one to 30 minutes depending on the method used. This is, at best, a grab sample. For this sample to be representative of the average concentration of viable fungal spores present over a given exposure time (up to 24 hours for residential structures), the concentration of viable fungal spores present in the space would have to remain relatively unchanged over time. Factors that make this unlikely include:

- Varying concentrations of viable fungal contaminants in the outside air;
- Mechanical ventilation systems that cycle on and off in response to temperature and manual activation;
- Disturbances created as people and contents interact with the environment in the space; and
- Variability in settling rates for viable spores based on particle size.

This temporal variability can be countered by taking multiple samples and averaging the analytical results obtained. This can be cost-prohibitive, as dozens of samples may be required for each space. Investigators often try to select locations and times for sampling to produce conservative analytical results that might actually overestimate the concentration of viable fungal spores. This aspect of bioaerosol sampling is still very much an art.

As can be seen, this spatial and temporal variability in the concentration of viable fungal contaminants can result in an overestimate or underestimate of the average concentration of viable fungal spores actually present in the space during the exposure period of interest. The choice of sampling techniques, locations and methods can greatly impact the usefulness of this data. These factors must be considered before any samples are collected to ensure that analytical results obtained are as representative of the actual conditions as possible, given the limitations of the techniques available.

Sampling Effects on Culturability

Many of the fungal spores normally present in sampled air are already nonviable because of genetic defect or environmental damage (e.g., desiccation or physical damage). The number of nonviable spores present can be increased further by additional desiccation or physical damage during the sample collection process. Culturable air sampling methods available for use by field investigators include absorption, filtration and impaction methods.

The most commonly used methods for collecting culturable air samples are impaction methods.

Absorption methods collect fungal spores in a fluid or film using a sampling rate equal to or greater than 12.5 liters per minute. This is accomplished in the Porton All-Glass Impinger (AGI-30) by drawing the sample at approximately 12.5 Lpm through a curved inlet, simulating nasal passages, to a central jet where it is impinged on a suitable collection liquid. In the Cyclone Scrubber, sampled air is brought into the scrubber tangentially, where it can impinge on a liquid film flowing through the scrubber at a rate of 1-4 milliliters per minute. In either case, the collected liquid sample can be serially diluted and plated out onto an appropriate growth medium for incubation with subsequent analysis.

Filtration methods use lower sampling rates (ranging from 1-4 Lpm) to pass sampled air through mixed cellulose ester, Teflon® or polycarbonate filters. In this case, the airstream passes directly through a filter medium that collects all particles in the desired size range. Once the sample is collected, it is solubilized by washing the filter with a suitable liquid. Once all contaminants have been transferred to the liquid, it can then be serially diluted and plated out for incubation with subsequent analysis.

Impaction methods collect fungal spores directly onto a suitable growth medium using a sampling rate varying from 28.3-180 Lpm. This is accomplished in the Andersen N6 Single Stage Cascade Impactor by drawing air through a sample nozzle that is intended to distribute the flow equally over the face of the growth medium below. Before reaching the surface of the growth medium, the airstream passes through a plate containing 400 small holes that accelerates the airflow toward the growth medium below. At or near the surface of the growth medium, the airstream is forced to make a 90 degree turn to pass around the edges of the collection plate. This turn allows smaller particles to pass around the growth medium while larger particles (the size of fungal spores) cannot make the turn and impact on the surface. In the Surface Air System Bioaerosol Sampler, sampled air is processed in much the same manner as in the Andersen N6 Single Stage Cascade Impactor, except that the sampling rate is 100 Lpm or 180 Lpm, depending on the model used. In the Reuters Centrifugal Sampler, air is sampled at 40, 50 or 100 Lpm, depending on the model used. Strips containing a suitable growth medium are used in lieu of agar plates. Air is brought into the sampler and directed centrifugally to impact on the agar strip. In each case, the airstream is accelerated through the sampler and redirected so that particles in the desired size range impact on the growth medium. Once collected, the exposed growth medium is incubated for subsequent analysis.

Every sample method currently available has the potential to desiccate or physically damage the spores collected. As a result, a fraction of the viable spores entering the sampler may be rendered nonviable before they reach the lab for analysis. When combined with the selective nature of the growth medium and analytical conditions used, it is easy to see how culturable air sampling results will always underestimate the concentration of viable spores actually present in the air being sampled. This underestimation can be significant if these factors are not considered when developing the sampling plan and methods used.

Viable Building Contaminants vs. Inhaled Contaminants
Sampling methods available for culturable air sampling differ significantly in sampling rates used and the manner in which the sampled air is processed. In every case, however, the method is designed to collect as many viable fungal spores as possible. This is not necessarily comparable to the number of particles actually inhaled by a building occupant, however.

The amount of air inhaled deeply into the lungs where gas exchange occurs (i.e., the alveolar volume) is equal to the tidal volume minus the residual volume. The tidal volume is the amount of air actually inhaled, while the residual volume is the amount of air left in the lungs after exhalation. These volumes in a typical resting adult male are 500 mL and 150 mL respectively, resulting in an inhaled resting alveolar volume of approximately 350 mL per inhalation. When this resting alveolar volume is multiplied by the resting respiration rate of a typical adult (approximately 12 inhalations per minute), a resting minute ventilation rate of approximately 4 Lpm is obtained.

Ventilation rates will, of course, rise with increases in metabolic rate from exercise and/or work. Maximum voluntary ventilation rates can reach as high as 170 Lpm in the typical adult male. In women, ventilation rates tend to be slightly lower, while in children, frequency tends to be higher while inhalation volumes tend to be lower, resulting in a lower overall ventilation rate. Filtration methods tend to most closely mimic the resting ventilation rate of building occupants, while high volume SAS and RCS impaction samplers more closely approximate ventilation rates of adult building occupants doing exercise and/or heavy work. Therefore, investigators must consider the type of occupants and the level of activity normally being undertaken when selecting the most appropriate sampling method.

Sampling Media and Analysis Effects

Malt extract agar with a constant incubation temperature of 25 C is typically used to collect and analyze air samples for culturable fungal contaminants. This combination of collection media and incubation temperature will result in the amplification and identification of fungal contaminants that are predominantly fast colonizers with relatively low moisture requirements (A_w between 0.60 and 0.80) capable of growing at ambient temperatures.

This will identify fungal contaminants that can colonize quickly in building environments, but not necessarily those that can serve as opportunistic pathogens in building occupants. Without measurements of actual occupant exposures, a causative link for opportunistic diseases potentially related to these exposures cannot be confirmed. Of course, the investigator can choose a different growth medium and analysis temperature that will enable him/her to better determine occupant exposures to potentially pathogenic fungal contaminants. Investigators must ensure that the growth medium selected and analysis methods used will identify the fungal contaminants of greatest interest and/or concern.

Conclusions

For building investigations that include sampling for fungal contaminants to produce reliable results, sampling must consist of three elements:

- Development of a sampling plan that starts with a hypothesis for where the contaminants will be found and what their source may be;
- Collection of appropriate samples that will verify or not verify this hypothesis; and
- Interpretation of analytical results from collected samples.

The reliability of results obtained from sampling is critically dependent on each one of these elements. Factors affecting each of these elements for culturable air samples include:

- Spatial variability of contaminant concentrations
- Time variability of contaminant concentrations
- Culturable fungal contaminants vs. viable fungal contaminants
- Effects of sampling on culturability
- Viable building contaminants vs. inhaled contaminants
- Effects of sampling and analysis

The variety and complexity of factors potentially affecting the usefulness of information derived from culturable air sampling may seem overwhelming at times. However, an understanding of culturable fungal contaminants present in the air and their potential effects on building occupants can be a very useful and important tool when performing building investigations. If investigators are capable of negotiating this minefield of potential adverse impacts on sampling effectiveness, they can produce reliable and useful sampling results, making meaningful improvements in indoor environmental conditions possible.

Collins is a PE, CSP, CIH and CMR with RLC Consulting Ltd., Columbus, Ohio.

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MIHS Best Student Awards Night - February 11, 2003

By Laura Randall, CIH, MIHS Board

The MIHS Student Night meeting was held on February 11, 2003 at the Italian Epicure in Novi, Michigan. One of MIHS's objectives is to support a Best Student Award annually for students enrolled in local university industrial hygiene programs. A faculty member from each respective university recognized the following students at the dinner meeting (in alphabetical order):

- Jacob Ewer, University of Michigan
- Joan Wideman, Wayne State University
- Michelle Winther, Oakland University

MIHS presented each award recipient with a black leather briefcase with an MIHS nameplate. Students were selected from their respective universities for this recognition. Please join MIHS in congratulating these students!

Special thanks goes to:

The student section of U of M and especially Jacob Ewer, student section president, for making the arrangements for this year's awards. Additionally the U of M student section sponsored a School of Public Health Road Rally from which the proceeds were donated to Ronald McDonald House in Ann Arbor.

Sharkey Mingela, MIHS Board member, for being the MIHS liaison for the local universities student sections.

Nancy McClellan, MIHS Board member, for obtaining the black leather briefcases with nameplates.

Oakland University's industrial hygiene student section will be making arrangements for next year's awards night.

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 President: Bobbie Schaefer
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 Sec/Treasurer: Robert Cammleri
 Faculty Advisor: Sarunas Mingela PhD

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 Faculty Advisor: Bonnie Taffe, PhD

University of Michigan
 President: Aaron Jones
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 Sec/Treasurer: Missy Vieno
 Faculty Advisor: Richard Garrison, PhD



(Left to Right) Jerry Plattenberg (MIHS President-Elect), Joan Wideman (WSU Best Student), Dr. Bonnie Taffe (WSU Faculty), Carrie Taub (WSU Academic Achievement Awardee), and Tim Kearney (MIHS President)

Enjoying Student Night - Pat Brogan

WSU - Bonnie Taffe (center) presented the Best Student Award to Joan Wideman (left), and the Academic Achievement Award to Carrie Taub (right).



Wayne State University attendees



Enjoying Student Night: Tom Kakos, Bill Cleary, Steve Paul, Peter Warner



U of M: Jacob Ewer accepts the Best Student award from Ted Zellers



OU: Sharkey Mingela (right) and Charles McGlothlin, Industrial Health and Safety Program Director (left), present the Best Student Award to Michelle Winther (center).



Oakland University attendees

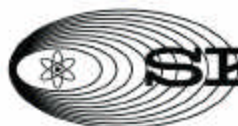


University of Michigan attendees

MIHS Treasury Report 3/3/03

By Deb Moilanen, CIH, Treasurer

	Account Balance
ASSETS	
Cash and Bank Accounts	
MIHS	14,088.89
SAVINGS	24,078.81
Paypal	0.00
PETTY CASH	60.32
TOTAL Cash and Bank Accounts	38,228.02
TOTAL ASSETS	38,228.02
 LIABILITIES & EQUITY	
LIABILITIES	
	0.00
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TOTAL LIABILITIES & EQUITY	38,228.02



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