ANIL AGGRAWAL'S
Internet Journal of Forensic Medicine and Toxicology
The world's first online journal devoted entirely to forensic medicine and toxicology · Published 1 January and 1 July

VOL. 14, NO. 1
Downloaded from www.anilaggrawal.com · ISSN 0972-8074 (Online) · https://www.anilaggrawal.com/ij/vol_014_no_001/others/editorial.html

Guest Editorial

Ref: Vinayak V. The two D's in Forensic Science (Guest Editorial). *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology, 2012*; Vol. 14, No. 1 (January - June 2013): ; Published January 1, 2013,

The two D's in Forensic Science

-Vandana Vinayak, M.sc, PhD,
Senior Scientific Officer cum Principal Investigator DBT Research Project (Biology Division, Diatom Research Unit),
Forensic Science Laboratory,
Madhuban, Karnal.
Haryana,
India.
.
Email: kapilvinayak@gmail.com
Email: stpapd@gmail.com

[Listen to this editorial]
Vandana Vinayak, India



Every thing which is living has DNA. It can be any cell of our body so when a crime occurs according to Locard's Principle there is an exchange of some trace substances and if these traces have some cells in them they do have the DNA. Nowadays DNA has emerged as an important tool in all the criminal investigations. Another important ‘D' which is gaining its importance in the current

scenario of forensic investigations is Diatom which is a microscopic alga and plays very clinching evidence in death due to drowning cases. Till now many methods have been described to detect diatoms from the biological sample but they have their own limitations some being biohazardous other being costly and vague.

Drowning is death as caused by suffocation when liquid causes interruption of body's absorption of oxygen from the air leading to asphyxia whether or not the fluid is aspirated into the lungs. A body recovered from the water need not to be always died due to drowning. Sometimes Medical officers finds difficult to ascertain the cause of death due to drowning or otherwise dumping the dead body after killing specially in skeletonized stage or at adipocere stage when body is recovered from water site or adjacent to it. Diatom test here helps the detecting the cause of death which can be ante mortem or post mortem.

...Country's most highlighted ‘Shopian rape and Murder case' was solved with the help of this test and holds its importance in cases when a homicidal case is simulated as a case of suicidal or accidental drowning. The seasonal variation in diatom genera for different water sites also helps in generating database of diatom in different seasons of the year. Like c ontinuous water monitoring in Brahmsarover Lake of Kurukshetra (Haryana) showed seasonal variation of diatoms for different months in Brahmsarover Lake of Kurukshetra...

The basic principle of diatom test implies on the fact that diatoms are present in almost all water bodies and when a person has a live entry into the liquid medium infiltrated with diatoms, these tiny microscopic algal frustules enter our respiratory system from there they enter pulmonary venous circulation and then reach distant organs like bone marrow, brain, kidney and other organs. If the victim was dead before he/she was drowned in liquid medium diatoms won't enter as the circulation has stopped. For proper forensic investigation of a drowning case besides collecting proper biological sample i.e. femoral bone marrow, water from where dead body was recovered needs to be tested for diatoms type and presence. Several circumstances arise that makes localization of the precise site of drowning an important medico legal issue. Therefore correct water sample collection and its concordant match with the diatoms recovered in the biological sample can help visualize the site of drowning. Country's most highlighted ‘Shopian rape and Murder case' was solved with the help of this test and holds its importance in cases when a homicidal case is simulated as a case of suicidal or accidental drowning. The seasonal variation in diatom genera for different water sites also helps in generating database of diatom in different seasons of the year. Like c ontinuous water monitoring in Brahmsarover Lake of Kurukshetra (Haryana) showed seasonal variation of diatoms for different months in Brahmsarover Lake of Kurukshetra. In summers the dominating diatom genus was *Cyclotella* 56.66%, *Navicula* 35.2%, *Aulacoseira* (26.66%) and *Asterionella* (20%) whereas in the autumn season the change in weather condition changes the diatom genera as well as diversity, it being *Cyclotella* (37.93%), *Navicula* 46.7%, *Aulacoseira* (28.94%) and *Asterionella* (28.94%) as dominating diatom genus. The generation of diatom database for different water bodies at different places will be a landmark in determining the time period of year when the death due to drowning took place by comparing and individualizing the diatom found in the biological and water sample of the drowned body. This will also help in solving cases when the dead body is in skeletonised stage or is transported to different place accidentally or intentionally to dodge the police of the crime committed.

The reader is referred to go some excellent reviews and publications that explain in more details the aspects of the above.[1-5]

References

1. Peabody A. J., and R. M. Burgess. *Diatoms in the diagnosis of death by drowning* , *In* D. G. Mann (ed.), Proceeding of the Seventh International Diatom Symposium. Koe-nigstein, Otto Koeltz; 1984, p.537- 541.

2. Pollanen, M. S. Diatoms and homicide. *Fo-rensic Science International* , 1998; 91 :29-34.

3. Cameron, N. G. *The use of diatom analysis in forensic geoscience* , In K. Pye and D. J. Croft (eds.), Forensic Geoscience: Principles, Techniques and Applications. London: Geologi-cal Society; 2004, 232: 277-280.

4. Horton, B. P., and R. J. Edwards. Quan-tifying Holocene Sea Level Change Using Inter-tidal Foraminifera: Lessons from the British Isles. *Cushman Foundation for Foraminiferal Research, Special Publication* , 2006; 40: 97.

5. Vinayak. Vandana. Diatom Atlas from the fresh water bodies of Haryana. Lap Lambert Academic Publishing Germany. 2012; 1-104.

Editorials - Cumulative Index

Request a PDF file of this editorial by clicking here. (If your screen resolution can not be increased, or if printing this page is giving you problems like overlapping of graphics and/or tables etc, you can take a proper printout from a pdf file. You will need an Acrobat Reader though.)