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DIFFERENTIAL DISTRIBUTION OF DIATOM FLORA IN A FRESH WATER LAKE AND ITS FORENSIC APPLICATION

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The diatoms are unicellular organisms belonging to the class Bacillariophyceae of the Algal group.¹ They are widely distributed in fresh and sea-waters and are represented by a large number of species. The wall of diatoms are composed of pectin im-

Significance of diatom analysis from the lungs of people who have died of drowning is well recognised.³ The identification of a particular group of diatoms may suggest death by drowning, and the distribution of different genera in certain propor-

TABLE 1

| S. No. Diatom Group | Percentage of Individual Group | | | |
|-----------------------|--------------------------------|----------|----------|----------|
| | Sample 1 | Sample 2 | Sample 3 | Sample 4 |
| 1. Navicula..... | 47.2% | 51.2% | 22.4% | 17.8% |
| 2. Pinnularia..... | 6.1% | .6% | 3.5% | 8.9% |
| 3. Melosira..... | 14.5% | 10.2% | 9.8% | 11.9% |
| 4. Coscinodiscus..... | .9% | 6.02% | 4.9% | 1.98% |
| 5. Cymbella..... | 2.3% | 3.6% | 2.1% | 1.98% |
| 6. Gomphonema..... | 4.7% | 18.1% | 18.9% | 9.9% |
| 7. Gyrosigma..... | 5.6% | 1.8% | .7% | 5.9% |
| 8. Cyclotella..... | 1.4% | .6% | 2.1% | Absent |
| 9. Bacillaria..... | 1.4% | 1.2% | 3.5% | 3.96% |
| 10. Nitzschia..... | 5.1% | .6% | 5.6% | Absent |
| 11. Pleurosigma..... | 3.7% | Absent | .7% | Absent |
| 12. Synedra..... | 2.8% | 3.01% | 4.2% | 15.8% |
| 13. Denticula..... | 3.3% | Absent | 3.5% | 4.95% |
| 14. Rhopalodia..... | .9% | Absent | 9.8% | 2.97% |
| 15. Cocconeis..... | Absent | 1.8% | 1.4% | .99% |
| 16. Frustulia..... | Absent | 1.2% | .7% | Absent |
| 17. Achnanthes..... | Absent | Absent | .7% | .99% |
| 18. Amphipleura..... | Absent | Absent | Absent | 9.9% |
| 19. Surirella..... | Absent | Absent | 5.6% | 1.98% |

pregnated with silica and an outer mucilaginous portion found especially in Plankton Diatoms.²

¹ F. E. FRITSCH, THE STRUCTURE AND REPRODUCTION OF THE ALGAE, (1965).

² Mangin, *Observations sur les Diatomees*, 9 ANN. SCI. NAT., BOT. 177-219 (1908) (quoted by Fritsch).

tions may relate to a particular water where the death took place. The site of death can be delineated with some degree of accuracy if a particular

³ L.C. NICKOLLS, THE SCIENTIFIC INVESTIGATION OF CRIME 76 (1956); Bhasker, *Diatoms in Cases of Drowning*, 4 J. INDIAN ACAD. FOR. SCI. 1, 3-5 (1965).

genus is absent at a spot and also if significant differences are found in the densities of diatoms. With this aim in view the study of the diatom flora in a fresh water lake (Hussain Sagar) of approximately 1.5 sq. miles area was studied. Four spots separated nearly by half-a-mile distance were selected initially for sampling of water. 500 cc of water was taken from each location and preserved with 5-10% formalin. Each sample was then concentrated ten times by centrifugation for the microscopic study. 50 microscopic fields were minutely examined in the case of each sample to arrive at the total number of each diatom group. The percentage distribution of various diatoms are given in table 1.

It will be seen from this table that *Navicula* sp. has the maximum concentration in this lake, and it is 51.2% in sample 2 and only 17.8% in

sample 4. *Pinnularia* sp. shows the minimum percentage in sample 2. *Gomphonema* sp. shows minimum percentage in sample 1. *Cyclotella* and *Nitzschia* sp. are absent from sample 4. *Pleurosigma* sp. are absent in samples 2 and 4. *Denticula* and *Rhopalodia* are absent from sample 2. *Cocconeis*, *Frustulia*, *Achnanthes*, *Amphipleura*, *Suriella* are absent from sample 1. *Frustulia* is also absent from sample 4. *Achnanthes*, *Amphipleura* and *Surirella* are absent from sample 2. *Amphipleura* is absent from sample 3 which is only present in sample 4.

From the foregoing it can be inferred that differential distribution of diatoms at different locations of the same reservoir and also absence of some groups from a particular spot may be employed for defining a scene of death with some degree of accuracy. The work is in progress to select other areas of the lake at different depths for this study.

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