Table 1 *Physico-chemical features of water*

Locality (Loc. No.)	Water temp. (°C)	pH	Chloride (mg/l)	Total hardness (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Carbonate (mg/l)	Bicarbonate (mg/l)
Garacharma tank (AN 360)	30.5	8 0	59.35	52.78	7.22	8.43	7.74	97.6
Near Air Port, School Line Port Blair (AN 519)	33	6.8	18.06	38.18	5.12	6.16	7.74	93.15
School Line Port Blair (AN 521)	33	7.0	33.54	31.69	4.129	5.67	6.87	24 4
Banbooflat (AN 582)	29.5	7.6	36.12	20.21	5.16	1.77	6.34	61

Distribution: West *et al*[6] described this variety from England, which was latter recorded from Japan by Hirano[7]. Grönblad *et al*[8] reported this taxon from Uganda and Lake Victoria.

All these desmids, except *Staurastrum bieneanum* Rabenh var. *ellepticum* Wille Forma Skuja, are known to occur outside Asia also. *Pleurotaenium truncatum* (Bréb.) Naeg var. *Farquharsonii* (Roy *et* Biss) W. *et* G. S. West, *Staurastrum bieneanum* Rabenh var *ellipticum* Wille Forma Skuja and *S. gracile* Ralfs var. *coronulatum* have been reported from south and Far east Asian countries. Occurrence of these taxa in Andaman Islands further extends their distribution in South east region of Asia.

Physico-chemical analysis of different waters harbouring these desmids has been performed with respect to certain parameters. The results are given in table 1.

These results reveal that these waters are essentially neutral with very slight shifts towards acidity or alkalinity. They are softer and somewhat less polluted. With respect to global distribution, it will be seen that all the four desmid taxa described above have an extensive spread over more than one continent and occur in both old and new worlds. Nevertheless, their records are few and scarce and hence may be considered rare and, perhaps, endangered taxa.

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ALACHLOR TOXICITY TO A FRESHWATER TELEOST *CLARIAS BATRACHUS*

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THE investigations on the effects of pesticides on fish are concerned with the histopathological changes in the tissues especially liver, kidney and gills. Eisler[1]

studied the effects of endrin on the liver of *Shaeroides maculatus*. Eller[2] reported the effects of pesticides on the liver, brain, gills, gonads and pancreas in *Salmo clarki*. Bhattacharya *et al*[3] have reported the pathology in the liver of *Clarias batrachus* induced by endrin. Haematological studies may lead to the identification of some parameters which may, not only diagnose pathological changes in fish but also indicate the quality of water. The toxic effects of 2 chloro-2′6′-diethyl N acetanilide (alachlor), an extensively used herbicide for the weeds of cereals, legumes and cotton, was studied on the blood of a freshwater teleost *C. batrachus*.

Live fish (15–20 cm long), after acclamatization to the laboratory conditions were selected irrespective of sex; and twenty fish were treated with the sublethal concentration of 0.001% of alachlor (Monsanto Chem. Ltd.) in water at 25 + 2°C at pH 6.8 for 15 days.

Blood from the cut caudal vein was collected in two vials, one containing the anticoagulant EDTA for blood cell studies. Blood in the second vial (without EDTA) was allowed to clot and the serum was separated from this. The red and white blood cells were counted using the Spencer haemocytometer. Absolute blood parameters were determined by the standard methods of Dacie and Lewis[4]. The enzymes, alkaline phosphatase, acid phosphatase, glutamic oxalacetic transaminase and glutamic pyruvic transaminases were assayed following Oser[5]. Bilirubin, cholesterol and urea were estimated following Wootton[6], Henry[7], and Fawcett and Scott[8]. The data were analysed by the student *t* test for significance at 1 and 5% levels.

The results are given in table 1. Exposure of *C. batrachus* to alachlor resulted in a significant increase in the total leukocyte count, MCV, MCH, in the activities of AlPase, AcPase, GOT, GPT and blood urea, and a significant decrease in erythrocyte count, Hb%, MCHC and PCV. However, the decrease of serum bilirubin and cholesterol after alachlor treatment was not significant.

The significant fall in RBC count, Hb content and PCV indicates the anaemic condition of the fish. This agrees with the results of Goel *et al*[9] who report anaemia in *Heteropneustes fossilis* after malathion treatment. Anaemia has also been reported in *Colisa fasciatus* on exposure to lead[10]. Further, the increase in MCV and MCH, and the decrease in Hb% and MCHC shows that the anaemia is of macrocytic nature. This may also reflect a possible chronic liver disease[4].

Macrocytic anaemia is associated with leukocytosis. The latter can either be due to physical stress or to some pathological condition. In this study the fish was not subjected to any physical stress. Hence an increase in the number of leukocytes may be to cope up with the removal of cell debris of necrosed tissues under the toxicant stress. Leukocytosis has also been reported by Goel and Garg[11] in *Channa punctatus* when exposed to 2′4′-diamino,3′-aminoazobenzene (DAAB).

A decrease in the amount of bilirubin points to a possible hepatodysfunction. A fall in icteric index confirms this.

Phosphatases (AlPase and AcPase) are lysosomal enzymes. Their accumulation points to tissue damage. Increased activity of these enzymes is also reported in

Table 1 *Effect of the herbicide alachlor on haematology of Clarias batrachus.*

Biological value	Control	Experimental	% age Alter.
RBC × 10^6/cmm	2.57 ± 0.09	1.61 ± 0.29[b]	37.27
WBC × 10^3/cmm	26.49 ± 0.18	37.59 ± 0.06[b]	41.87
Hb g/dl	11.33 ± 0.12	9.13 ± 0.91[b]	19.41
PCV/dl	28.24 ± 0.11	24.66 ± 0.33[b]	12.90
MCV/μm^3	109.90 ± 0.42	152.24 ± 1.96[b]	38.49
MCHC/dl	39.54 ± 1.13	37.14 ± 0.05[b]	6.07
MCH/pg	44.07 ± 0.46	56.65 ± 0.01[b]	26.27
AlPase P/ml serum	0.10 ± 0.00	0.36 ± 0.01[b]	266.00
AcPase P/ml serum	0.23 ± 0.03	0.35 ± 0.03[a]	52.17
GOT/ml serum	0.44 ± 0.01	0.53 ± 0.01[a]	20.69
GPT/ml serum	0.51 ± 0.01	0.64 ± 0.01[b]	25.38
Urea mg/dl serum	23.65 ± 0.99	45.16 ± 0.65[b]	90.95
Bilirubin mg/dl serum	3.00 ± 0.05	2.33 ± 0.29	29.33
Cholesterol mg/dl serum	238.09 ± 0.99	209.52 ± 8.25	11.98

All values are mean ± standard error (ten estimations).
a: $P < 0.05$; b: $P < 0.01$.

Heteropneustes and *Channa* on exposure to pesticides and aminoazodyes respectively[9,11].

An increase in the activity of GOT and GPT points to the liver damage and possible myocardial damage under the chemical stress of alachlor.

An increase in blood urea in the experimental fish is due possibly to the inability of toxicated kidney to filter urea in adequate amounts.

Decrease in blood cholesterol is not so well-defined but hypocholesterimic conditions are frequently obtained in anaemia and similar decrease is seen in cases of acute infections[12].

The significant changes in the blood parameters studied indicate that the fish body is under stress on exposure to alachlor. Macrocytic anaemia points to respiratory stress and leukocytosis may suggest inflammation in tissues. The blood urea observations indicate anomalies in kidney functioning. The altered pattern of serum enzymology indicates distorted metabolism resulting from liver dysfunction or from cellular injuries in different tissues of experimental fish.

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NEWS

A SCIENTISTS'S ELAPSED EXPECTATIONS

. . . "Why do scientists peak sooner than most other professionals? No one knows for sure. I suspect it has something to do with the single focus and detachment of the subject. A handiness for visualizing in six dimensions or for abstracting the motion of a pendulum favours a nimble mind but apparently has little to do with anything else. In contrast, the arts and humanities require experience with life, experience that accumulates and deepens with age. In science, you're ultimately trying to connect with the clean logic of mathematics and the physical world, in the humanities with people. Even within science itself, a telling trend is evident progressing from the more pure and self-contained of sciences to the less tidy, the seminal contributions spring forth later and later in life. The average age of election to England's Royal Society is lowest in mathematics. In physics, the average age at which Nobel prize winners do their prize-winning work is 36; in chemistry it is 39, and so on. Another factor is the enormous pressure to take on administrative and advisory tasks, descending on you in your mid-30's and leaving time for little else. Such pressures also occur in other professions, of course, but it seems to me they arrive sooner in a discipline where talent flowers in relative youth." (Reproduced with permission from *Press Digest*, *Current Contents*®, No. 28, July 9, 1984. Copyright by the Institute for Scientific Information®, Philadelphia, PA, USA)