alba) increase the 5-HT content of rat brain (Bose *et al.*, 1966)[5] as does LSD (Freedman,[6] 1961 ; Freedman and Giarman,[7] 1962). We now report on the effect of solanaceous alkaloids on the conditioned avoidance responses in trained rats.

The albino rats, weighing between 100–150 gm. were trained for the conditioned avoidance responses by the pole climbing[2] and jumping box techniques[8,9] in the usual way. In the former, the rats were trained to climb the pole when the buzzer was sounded for 5 seconds, while in the latter, they were trained to jump to the other part of the cage when the buzzer was sounded for the same duration. In case, they did not respond to buzzer, a mild electric shock was given. The animals had acquired the conditioned avoidance response (CAR), that is, they responded to buzzer only after 2 weeks training. The effect of drugs on the 'recently acquired CAR' was studied. Another group of rats continued to receive the training for 30–40 days and the effect of drugs on the 'overlearnt response' was studied.

TABLE I

Effect of drugs on the 'recently acquired CAR'

	Dose mg./kg.	Pole climbing technique percentage inhibition	Jumping box technique percentage inhibition
Atropine ..	100	40 (25)	48 (25)
Hyoscine ..	15	65 (20)	70 (20)
Total alkaloid of *Datura alba*	15	67 (15)	65 (15)
Chlorpromazine ..	3	75 (20)	80 (20)

The figures in parenthesis indicate the number of animals used in each experiment.

Chlorpromazine (3 mg./kg.), atropine (100 mg./kg.), hyoscine (15 mg./kg.) and total alkaloids of *Datura alba* (15 mg./kg.) were injected intra-peritoneally. The animals were tested for CAR 20–30 mts. after the administration of drugs as described earlier; if they did not respond to buzzer within 5 seconds, it was taken as impairment of CAR. Total alkaloids of *Datura alba* were extracted according to the B.P. (1963) method.[10]

Bradley[11] reported that atropine had no effect on the CAR by the above techniques. Our results (Table I) show that atropine impairs the 'recently acquired CAR' but has no effect on the 'overlearnt response'. Hyoscine and total alkaloids of *Datura alba* had similar actions, but were more potent than atropine in impairing the CAR.

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DUMORTIERITE FROM NEAR JAIPUR (RAJASTHAN)

DUMORTIERITE occurs in the quartzites of the Alwar series forty miles north-north-east of Jaipur near the village Deoan. The mineral is sometimes uniformly distributed in the rock and sometimes occurs in thin streaks, imparting a strong gneissic character to the rock.

The mineral dumortierite was separated from the rock by repeated centrifuging with heavy liquids. The mineral separate is very strongly coloured. The X-ray powder pattern of the mineral established its identity.

The optical data are :

$\gamma = 1{\cdot}695$.

$\gamma - \alpha = 0{\cdot}017$ (determined with Berek compensator).

α = deep blue, γ and β colourless.

$2V_z$ = less than 15°.

Bxa sections are pseudo-uniaxial in character. Quite often the mineral occurs in the form of needles and is twinned on a prism face.

A chemical analysis of the mineral shows that it completely agrees with the formula $4[(AlFe)_7BSi_3O_{18}]$ given by Claringbull and Hey[1] (1958, p. 903) and also confirms their idea that water has no place in its structure. The oxidation state of titanium had been suggested

as Ti''' (Schaller, 1905[3] ; Peck, 1926[2]) and it was also contended that this condition of titanium had a bearing on the colour of the dumortierite. Claringbull and Hey discarded this suggestion on the ground that adequate proof is lacking. The silica content of most analysed dumortierites fully satisfies the requirements of the formula suggested and sometimes it is even in excess. So it may be imagined that the titanium is present as Ti''' replacing alumina. It is however uncertain whether it has any bearing on the colour of the mineral.

Other minerals present in the rock are, quartz, muscovite, tourmaline, kyanite, sillimanite and magnetite and a little zircon. Of all these minerals only zircon is detrital and the rest have no semblance of a detrital character, having been developed during the metamorphism of the quartzite. The original sediment must have had a small clayey fraction from which the aluminous silicates crystallised. Petrographic evidence leads to the conclusion that dumortierite developed at the expense of kyanite and sillimanite by boron metasomatism. A careful search of the area had not revealed any major pegmatite body but small veins 2 to 4 cm. thick have been observed in the dumortierite-bearing rocks. These small veins could very well be offshoots of a hidden major pegmatite body which could have supplied the necessary boron for the dumortieritisation.

The varying colour and pleochroism, discussed in earlier literature, was thought to be due to the presence of titanium as Ti_2O_3 rather than as TiO_2. However the authors feel that it is in the presence of boron that sharp variations in the titanium and Fe content produce the different colours and pleochroism.

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A HAEMATOLOGICAL STUDY ON MRIGAL, *CIRRHINA MRIGALA* (HAMILTON)

The Mrigal, *Cirrhina mrigala*, is a fish of considerable importance both from the viewpoint of riverine and culture fisheries. So far not much work has been reported on its hæmatology and other aspects of physiology. In fact only a few accounts have appeared on the hæmatology of Indian fishes. Dhar[1] has published a note on the hæmatology of *Ophicephalus punctatus*. Banerjee[2-4] has made some haematological observations on *Heteropneustes fossilis* and *Anabas testudineus*, while Pradhan[5] has described the blood constituents of some Indian fishes. The present note gives a brief account of the morphology and size of erythrocytes, erythrocyte and leucocyte counts, packed cell volume, hæmoglobin content, erythrocyte sedimentation rate and clotting time of the blood of *Cirrhina mrigala*.

The blood samples were collected after severing the tail of fishes as soon as they were taken out from the University Fish Farm. Heparin has been used as anticoagulin.

Packed cell volumes of 30 fishes were determined. The values ranged from 38·0% to 49·5% with a mean of 38·9%. PVC values were found to be higher in males than in females (Table I).

The erythrocyte counts showed a range of 1·93–2·69 million erythrocytes/mm.^{3} and a mean of 2·2 million. Like PCV, the erythrocyte count was also high in males. Earlier workers have also reported higher erythrocyte number in males than the females.[4,5]

The erythrocytes are elliptical in shape with centrally situated nuclei. The mean sizes of erythrocytes and nuclei were $12{\cdot}6\,\mu \times 6{\cdot}9\,\mu$ and $6{\cdot}4\,\mu \times 2{\cdot}8\,\mu$ respectively. Erythrocytes of males and females were of the same sizes (Male : $12{\cdot}6\,\mu \times 6{\cdot}9\,\mu$; Female : $12{\cdot}7\,\mu \times 6{\cdot}9\,\mu$).

Leucocyte counts made on 12 fishes ranged from 6,200 to 8,200/mm.^{3} with a mean of 7,266. The total number of leucocytes were low in Mrigal as compared to *O. punctatus*[1] and *A. testudineus*[4] but higher than *Cyprinus carpio*.[6]

Erythrocyte sedimentation rate was from 0·05 mm. to 0·4 mm. and the mean 0·186 mm.

Blood clotting time of 8 fishes detemined by 0·5 mm. diameter capillary tubes in the month of December ranged from 40 to 65 seconds with a mean of 52·5 seconds. Clotting time was found to be much higher in Mrigal than in