Acide ribonucléique (A.P.N.) et azote protéique des cerveaux adultes dans quelques classes de vertébrés; valeurs rapportées à la quantité diploïde d'acide désoxyribonucléique de l'espèce.

Espèce	Carpe	Tortue	Canard	Poule	Rat	Cobaye	Chat	Chien	Homme
A. D. N. quantité diploïde mg · 10^{-9}	3,5	5,0	2,6	2,2	6,1	6,9	6,9	6,7	6,8
A. P. N. mg · 10^{-9}	4,5	16,3	4,4	4,5	7,2	16,1	7,9	7,9	26,3
N. protéique mg · 10^{-9} . .	21,9	55,1	41,5	26,4	74,6	87,1	88,4	96	78,5

essais antérieurs. Pour la carpe et la tortue, dont nous n'avons pas déterminé personnellement la quantité d'A.D.N. des noyaux, nous avons appliqué les valeurs de MIRSKY et RIS[1]. Les résultats de nos essais sont consignés dans un tableau et les Figures 1 et 2 où nous donnons à titre de comparaison ce que l'on obtient en rapportant les valeurs expérimentales soit au poids frais (figure 1), soit à la quantité diploïde d'A.D.N. (Fig. 1 et Tableau).

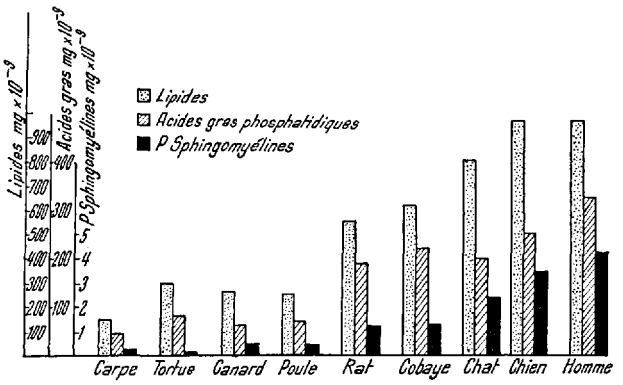

Fig. 2. Les composés lipidiques des cerveaux adultes dans quelques classes de vertébrés; valeurs rapportées à la quantité diploïde d'acide désoxyribonucléique de l'espèce.

Alors que la Figure 1 ne reflète aucune régularité, l'examen de la Figure 2 nous révèle un accroissement progressif des lipides, des acides gras phosphatidiques et surtout un accroissement régulier de la sphingomyéline quand on passe de la carpe aux mammifères et d'un petit mammifère à un grand mammifère. La tortue, par contre, se distingue nettement des autres espèces par le fait que son cerveau ne renferme que des traces indosables de sphingomyéline. Nous pensons que la situation exceptionnelle de ce reptile pourrait s'expliquer par ses caractéristiques phylogénétiques: espèce qui acquit de bonne heure un type structural fondamental demeuré relativement invariable.

On ne saurait nier l'existence d'un certain parallélisme entre nos schémas rapportés antérieurement, qui traçaient les variations des lipides, des acides gras, des sphingomyélines, de l'azote protéique au cours du développement à l'intérieur de l'espèce (1 à 6) et le Graphique II qui présente les valeurs de ces constituants à l'échelle cellulaire dans les diverses classes. Ajoutons que l'on note également un accroissement de l'A.P.N. quand on compare les valeurs d'un poisson et des oiseaux d'une part et des mammifères d'autre part (Tableau). Là encore la tortue occupe une situation spéciale présentant des valeurs nettement plus élevées que la plupart des vertébrés examinés. C'est là un phénomène qui trouvera peut-être une explication dans un fractionnement des divers types d'A.P.N. et la connaissance de leur signification. L'azote protéique revêt un comportement analogue à celui de l'acide ribonucléique.

R. BIETH et P. MANDEL

Institut de chimie biologique, Université de Strasbourg, le 29 janvier 1953.

[1] E. MIRSKY et H. RIS, J. Gen. Physiol. *34*, 451 (1951).

Summary

The ratio of lipids, of phosphatidic fatty acids and of sphingo myelin to the species characteristic quantity of D.N.A. of a diploid chromosome group shows a parallelism between the individual biochemical development of brain and its constitution in various classes of vertebrates arranged in order of their palaeontological appearance. The tortoise is characterized by its particular phylogenetic position.

Influence of 5-Hydroxytryptamine (Enteramine) on the Course of the Acute Lethal Sublimate Intoxication in the Rat

Numerous experiments carried out with crude enteramine extracts and with pure enteramine, have demonstrated that this substance exerts in the rat an intense antidiuretic action[1].

The study of the renal excretion of test substances (thiosulphate, creatinine, *p*-aminohippuric acid) has shown that the reduction in urine flow coincides with a simultaneous, though less intense and prolonged, reduction in glomerular filtration rate and in renal plasma flow. When the interference of a systemic hypotension may be excluded, as it is in our case, the above changes in renal circulation and function must be necessarily accounted for by a constriction of the afferent glomerular bed, with ensuing decrease in intraglomerular hydrostatic pressure and in blood flow through the peritubular capillary network.

Therefore, the action of high doses of enteramine would at the last result in a partial and temporary exclusion of the kidney from the general circulation. As a consequence of this exclusion various phenomena ought to occur:

(a) More complete metabolism, due to the more prolonged stay in the circulation, of substances which, though capable of being metabolized in the organism, are as a rule eliminated for the greater part unchanged thanks to their prompt renal excretion.

We have encountered this phenomenon in the case of thiosulphate. In control rats, 32·5 percent of the subcutaneously injected thiosulphate was found unaltered in the urine; in rats injected with different doses of

[1] V. ERSPAMER and A. OTTOLENGHI, Exper. *8*, 31, 152, 232 (1952); Arch. int. Pharmacodyn. *93*, 260 (1953).

	Number of rats	Number of deaths after					Number of survivals*
		32	48	60	80	120 h	
Sublimate A	15	0	0	7	15	15	0
Sublimate A + Enteramine	10	0	1	1	2	3	7
Sublimate B	10	1	8	8	9	9	1
Sublimate B + Enteramine	10	0	4	5	7	7	3
Sublimate C	14	7	12	13	14	14	0
Sublimate C + Enteramine	28	0	6	9	21	25	3
Sublimate C + Methoxy-trypt.	14	1	4	4	8	14	0

* After 20 days, 10 animals (1 control) were still alive.

Discoglossus skin extracts, only 25·4 percent and respectively 17·2 and 9·3 percent of thiosulphate appeared in the urine.

(b) Greater acute toxicity of certain substances, in the case the organism usually provides to get, totally or in part, free of them through their prompt renal excretion. Extensive researches on this subject have not been carried out as yet, but some preliminary observations seem to indicate a higher toxicity of potassium chloride, ammonium nitrate and prontosil in enteramine-treated animals.

(c) Lower acute toxicity of other agents, when the toxic syndrome provoked by these agents is dominated by the signs of severe damage of the kidney, as excretion organ.

The reduction in blood flow through the kidney caused by enteramine would act, under these circumstances, on the one hand to protect this organ against a massive attack by the poison, diluting somewhat in the time the acute injury, and on the other to allow further detoxication mechanisms and further elimination routes of the offender to become efficient.

Among the best known and practically more important nephrotoxic agents is mercury. It is well known that above all the inorganic soluble salts of this metal may lead, when administered in lethal or sublethal doses, to severe degenerative changes in the proximal tubule epithelium.

The purpose of this investigation was to establish the course of the acute lethal sublimate poisoning comparatively in control rats and in rats repeatedly given enteramine s.c., in doses sufficient to reduce, for a period of 12–15 h, the blood flow through the kidney and, therefore, the exposure of the organ to the toxic injury.

We used in our experiments 101 young rats of both sexes, weighing from 80 to 130 g, kept on a normal diet. In the morning a subcutaneous injection of 0·5 ml of a 0·2 percent solution of mercuric chloride per 100 g of body weight (10 mg/kg) was administered to the animals and, immediately after, always subcutaneously but in a different site, 0·5 ml of a 2/10,000 enteramine picrate solution (1 mg/kg) or of distilled water (controls). This first enteramine injection was followed by 6–7 other ones, at 2-hour intervals. The course of the intoxication was then closely observed. In case of death, a *post mortem* examination of the viscera was carried out and the kidneys were fixed in formol-saline.

A group of animals was injected with 5-methoxytryptamine HCl (3 mg/kg) instead of enteramine picrate.

The results are illustrated in the accompanying Table.

The data contained in the Table clearly demonstrate that the administration of enteramine significantly delays death in sublimate intoxication, moreover allowing a certain number of poisoned animals to survive. With 10 mg/kg of sublimate, only 1 out of 39 control rats (2·5 percent) survived for more than 5 days, while out of 62 enteramine-, and 5-methoxytryptamine-treated animals, 13 survived (21 percent). However, also in these animals, dead or killed 10–50 days after poisoning, the macro- and microscopical examination of the kidney always revealed clear signs of the suffered tubular damage and, in two cases, a diffuse ulcerative colitis.

One experiment carried out on a group of 30 older rats (180–300 g) has given inconclusive results, owing to the greater resistance of these animals to the mercury poisoning.

The results reported in this paper once again confirm the vascular point of attack of enteramine in the rat kidney and afford a first example, though of mere doctrinal interest, of a possible incomplete protection of the kidney from the injury of nephrotoxic agents, through a partial and temporary pharmacological exclusion of this organ from the general circulation.

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Zusammenfassung

Der Verlauf der akuten letalen Sublimatvergiftung bei der Ratte kann durch wiederholte subkutane Enteramininjektionen insofern beeinflusst werden, dass der Tod bei der Mehrzahl der Tiere verzögert wird und dass etwa 20 % der Tiere die Vergiftung überleben.

Die protektive Wirkung des Enteramins kommt dadurch zustande, dass die Substanz eine partielle pharmakologische Ausschaltung der Niere aus dem allgemeinen Kreislauf verursacht (Drosselung des afferenten Gefässsystems des Glomerulus) und damit eine verminderte Zufuhr des nephrotoxischen Stoffes zur Niere.

Soluzioni di RINGER prive di potassio rimuovono la contrattura da ouabaina e restaurano la contrattilità del cuore di rana

Concentrazioni tossiche di glucosidi cardiotonici della digitale, dello strofanto e di altre piante provocano la