amphenicol in bacterial systems. Both antibiotics inhibit protein synthesis, stimulate ribonucleic acid synthesis, and partially inhibit deoxyribonucleic acid synthesis.

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## Deoxyribonucleic Acids of Marine Mollusca

Recent investigations have demonstrated a wide range of deoxyribonucleic acid (DNA) base compositions which correlate well with other taxonomic criteria in both bacteria[1–4] and protozoa[5,6]. The available data for metazoans are less extensive[4,7]. However, a considerable variation in DNA base composi ions is found among the porifera[8], and the published analyses for three species of molluscs[4,9] indicate the probability of a range of compositions in that phylum. This communication describes work on several other species of molluscs. DNA was isolated from sperm on testes using a modification[10] of Marmur's procedure[11]. Base compositions were estimated from density gradient centrifugation studies[13] and from thermal denaturation temperatures[12]. The results are recorded in Table 1.

Table 1. Properties of Mollusc DNA's

| Class and species | Tm (°C) | % GC* | Density (g/ml.)† | % GC§ |
|---|---|---|---|---|
| Lamellibranchia | | | | |
| *Crassostrea gigas* (Thunberg) (Pacific oyster) | 80·7 | 28 | 1·693<br>1·708‡ | 34 |
| *Saxidomas giganteus* Deshayes (Butter clam) | 82·5 | 32 | 1·693 | 34 |
| *Protothaca staminea* (Conrad) (Native littleneck clam) | 82·8 | 33 | 1·694 | 35 |
| *Clinocardium nuttalli* (Conrad) (Basket cockle) | 82·8 | 33 | 1·696 | 37 |
| Gastropoda | | | | |
| *Haliotis kamtschatkana* Jonas (B.C. abalone) | 84·5 | 37 | 1·702<br>1·714‡ | 43 |
| *Polinices lewisii* Gould (Moon snail) | 85·6 | 40 | 1·704 | 45 |

* Percentage guanine-cytosine calculated from thermal denaturation temperature, Tm (12).
† Relative to *E. coli*, buoyant density, 1·710 g/ml. (ref. 13).
‡ Heat denatured DNA.
§ Percentage guanine-cytosine calculated from buoyant density.

All DNA samples were unimodal with respect to buoyant density and thermal denaturation temperature. Representative lamellibranch (*Crassostrea gigas*) and gastropod (*Haliotis kamtschatkana*) DNA's were unimodal in the cæsium chloride gradient after heat denaturation. All the mollusc DNA's were rich in adenine-thymine, those of the lamellibranchia containing the largest amount of these bases. The range of guanine-cytosine (GC) contents was 11–12 per cent. In common with other nucleic acids of extreme base composition, there is some divergence between GC content calculated from thermal denaturation temperatures and from buoyant densities[12,13]. There is reasonable correlation of the foregoing results with earlier data. Thus Sueoka, using the buoyant density technique, obtained a GC content of 37 per cent (38 per cent using the method of calculation of Marmur and Doty) of DNA in the quahog, *Venus* (*Mercenaria*) *mercenaria* L.[4], and Lee and Barbu, by chemical analysis, found 31 per cent GC in the blue mussel, *Mytilus edulis* L., DNA[9].

The two prosobranch gastropods have a mean GC content 7–8 per cent higher than the mean value of the lamellibranchs and none of one class intrudes into the region of the other. It is of interest that the GC content, 35 per cent, of a cephalopod, *Octopus vulgaris lam.*, DNA[9] lies in the mid-region of the range bounded by the lamellibranchs and the prosobranch gastropods.

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## Metabolism of 3-Hydroxyanthranilic Acid labelled with Carbon-14 Carboxyl in Normal and Neoplastic Mice

The *o*-aminophenol, 3-hydroxyanthranilic acid (3-OHAA) is a metabolite of tryptophan normally present in urine in trace quantities. Recent observations have been concerned both with the carcinogenic property of 3-OHAA to induce cancer of the bladder and with elevated levels of urinary excretion of 3-OHAA in neoplastic diseases[1].

A limited amount of carboxyl-$^{14}$C-labelled-3-OHAA ($^{14}$C-3-OHAA) was available for experiments with a few animals. The carboxyl-$^{14}$C-labelled-3-OHAA was given to control mice and mice with transplantable tumours of mouse origin in an attempt to examine the influence of these tumours on metabolism of 3-OHAA. These preliminary observations indicate a lowered rate of metabolism of 3-OHAA in the ascites mice accompanied by a reduced level of urinary quinolinic acid labelled with carbon-14 ($^{14}$C-QA).

Female Swiss albino mice were used in these experiments. Three homologous transplantable tumours were used in this work. The mammary adenocarcinoma appears spontaneously in about 3 per cent of our virgin females when 6–8 months of age. The Ehrlich ascites tumour has been maintained in our mice in ascites form for several years by intra-abdominal injection of a suspension of tumour cells at intervals of 10–15 days. A transplantable brain tumour (glioblastoma multiforme) was induced by intracranial implantation of methylcholanthrene pellets[2]. Tumour mice were injected with $^{14}$C-3-OHAA 5 days after intracranial transfer of the brain tumour cells and 9 days after intra-abdominal transfer of the ascites cells. Previous experiments demonstrated active growth of tumours at this time. A moribund condition usually developed 5–7 days later.

The carboxyl-$^{14}$C-labelled-3-OHAA was from a preparation previously described[3]. It was injected by intra-abdominal route in doses of 0·0011 mM containing 0·024