EFFECT OF VASECTOMY ON BIOCHEMICAL COMPOSITION OF THE RAT TESTICULAR FLUID

Recent studies on long-term effect of vasectomy in rats have shown no impairment of gametic and endocrine functions of the testis. It seemed to be of interest to examine whether the operation alters the biochemical composition of the testicular fluid in this species. It has been reported that this fluid is a rich source of substrates and co-factors some of which may be involved in spermatogenesis and steroid biosynthesis.

Colony-bred adult albino rats of the Institute (180–200 gm.) were vasectomized according to the procedure of Kar et al. coeval animals served as unoperated controls. All of them were killed 180 days after the operation. Methods of collection of the testicular fluid and the analytical techniques were the same as employed previously.

It will be evident from the results presented in Table I that the only changes evoked by vasectomy were a reduction in lactic dehydrogenase and acid phosphatase activity, and a lowering of ascorbic acid concentration. The other parameters (pH, total protein, glucose-6-phosphate dehydrogenase, glycogen and lactic acid) did not record any alteration.

**Table I**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vasectomized</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Total protein (Gm./100 ml.)</td>
<td>6.60†</td>
<td>6.60</td>
</tr>
<tr>
<td>Lactic dehydrogenase (Units/mg. protein/min.)</td>
<td>0.056</td>
<td>0.046</td>
</tr>
<tr>
<td>Glucose-6-phosphate dehydrogenase (Units/ml.)</td>
<td>362.5 (325–400)</td>
<td>338.0 (328–350)</td>
</tr>
<tr>
<td>Acid phosphatase (Mg./hr./100 ml.)</td>
<td>65.5 (59–71.8)</td>
<td>40.3 (39–40.8)</td>
</tr>
<tr>
<td>Glycogen (Mg./100 ml.)</td>
<td>15.0</td>
<td>19.5</td>
</tr>
<tr>
<td>Lactic acid (Mg./100 ml.)</td>
<td>273.7</td>
<td>300.6</td>
</tr>
<tr>
<td>Ascorbic acid (Mg./100 ml.)</td>
<td>11.15</td>
<td>7.15</td>
</tr>
</tbody>
</table>

* Data based on three replicate analyses of pooled sample from 50 tests.  † Mean with range in parenthesis.

The reduction in lactic dehydrogenase activity in the testicular fluid of operated rats in spite of the virtual constancy of lactic acid level is intriguing. The loss of acid phosphatase activity is noteworthy and suggests a decrease in total energy production in the testis. Whether this has any bearing on the loss of fertilizing capacity of spermatozoa of some men after otherwise successful re-canilization of the vas cannot be assessed from the present preliminary data.

This investigation was supported by a grant from the Ministry of Health, Family Planning and Urban Development, Government of India. The authors are grateful to Dr. M. L. Dhar for his interest in this study.

Central Drug Research Institute, Lucknow (Communication No. 1308), October 8, 1968.


---

CO-DISTILLATION CLEAN-UP FOR DDT RESIDUES ESTIMATION

**ABSTRACT**

DDT and DDE co-distil with water. Small quantities of carrier solvents such as acetone, methanol, isopropanol and monoethyl ether of ethylene glycol aid and render such co-distillation quantitative. This finding has been utilized to advantage in developing a simple clean-up technique for the estimation of microamounts of DDT in materials of high fat content. The approach dispenses with the use of large quantities of costly solvents and adsorbents.

Investigations related to the methodologies of pesticides residues estimations, at this Institute, resulted in observations that DDT and DDE co-distil with water and that such co-distillation could be further aided through the use of small quantities of carrier solvents such as acetone, isopropanol, methanol and monoethyl ether of ethylene glycol (cellosolve or oxitol) to yield quantitative recoveries of DDT and DDE from aqueous suspensions containing 10 micrograms to 20 milligrams of DDT or DDE. Co-distillation of DDT with water has also been reported in other contexts.

The above-mentioned property of DDT and DDE offered promise for the segregation of these entities from extracts of plants,
The technique developed entailed shaking the substrate with a suitable solvent acetone or a solvent mixture consisting of two parts of petroleum ether 40–60°C; and one part of thiophene free benzene; removal of the solvent from the extractives or from an aliquot of the extractives; transferring the residue quantitatively with 10 ml acetone and 20 ml isopropanol to a two-litre capacity distillation flask; adding to the contents of the flask 1000 ml water; distilling; and allowing the droplets of about 800 ml distillate to pass through a train of absorption columns containing the solvent mixture. An apparatus designed for the purpose enabled complete isolation of the toxicant from the distillate with less than 50 ml of the solvent mixture. The solvent phases from the columns are combined, the solvent evaporated off at 40°C under a current of dry air protecting escape of DDT or DDE at this stage by using two drops of propylene glycol as fixative, and the residue so obtained is then processed through the Schechter and Haller colorimetric procedure as per further details recommended by the DDT Panel.

The technique has been successfully used in determining microamounts of DDT in white and yolk of the eggs. Recoveries from samples fortified with 50 μg to 1 mg DDT ranged from 90 to 112%.

In milk and oils alkali hydrolysis of the extractives and subsequent estimation of DDT, through DDE, is essential. Extractives from the substrates, after the removal of solvents, are hydrolyzed with alcoholic potassium hydroxide and the hydrolysates re-extracted with n-hexane, residue from which is then taken up in carrier solvents, and processed through the co-distillation technique. Quantitative recoveries were obtained from samples fortified with 50 μg to 1 mg. DDT.

The additional step of hydrolysis, in case of milk and oil samples, not only facilitates the application of co-distillation clean-up for the segregation of DDT and DDE but also brings about the much desired rupture of fat globule membrane essential for true recoveries and reliable residue data for these essential commodities.

This simple, expeditious and economic new approach for the estimation of traces of DDT in high fat content commodities curtails drastically the use of costly solvents and practically dispenses with the chromatographic adsorbents the use of which entails frequent cumbersome calibration.

Division of Agricultural R. S. Dewan
Chemicals, K. C. Gulati
Indian Agricultural Research Institute,
New Delhi-12, October 22, 1968.

1. “DDT, 1, 1, 1-trichloro-2, 2-bis (p-chlorophenyl) ethane; DDE, 1, 1-dichloro-2, 2-bis (p-chlorophenyl) ethylene.”

MINERALOGY OF A CHROME-MICA FROM A QUARTZITE VARUNA VILLAGE, MYSORE

Chrome-micas have been reported and described from many localities throughout the world and the status of the knowledge has been summarised by Whitmore.1 Among the Indian occurrences, not many are found in literature.2 5 A small belt of hornblende-schists, occurs 3 miles to the east of Chamundi Hills, near the village Varuna, Mysore District, which is considered to be the extension of the Nagamangala schist belt, occurring as discontinuous stringers and patches. The schist belt runs over 7 miles northwards from Varuna village with a width of 2 furlongs. The belt forms a small ridge whose trend is also N-S.

The schist is composed of large-sized prismatic crystals of hornblende, ranging from 1-1½” in length, and garnet. The belt is bordered on either side by hornblende-gneiss. Amidst this schist belt are found small narrow intercalated bands of kyanite-quartzite and chrome-mica bearing quartzite, which is very localised in its occurrence. Its strike is N 20° W to S 20° E, and dips at an angle of 70° towards east.

The quartzite exhibits a mosaic texture composed of quartz, chrome-mica with accessory...