
BRIEF COMMUNICATION

SEmen COLLECTION IN THE Squirrel Monkey

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The first successful attempt to collect semen from monkeys was reported by Mastroianni & Manson (1963) using adult macaques. A monophasic, alternating current was applied through two surface electrodes, one around the base of the penis, the other against the ventral aspect of the glans near the frenulum. The method was successful in eight out of eleven monkeys. Weisbroth & Young (1965) later described the use of a rectal probe to stimulate ejaculation of semen in several species of Old World macaques.

A specially designed rectal probe has now been used to stimulate ejaculation of semen in a species of New World monkey, Saimiri sciureus (the common squirrel monkey), in order to collect spermatozoa for artificial insemination of adult female monkeys after induction of ovulation with gonadotrophins (Bennett, 1967a, b). The male squirrel monkey is a comparatively small primate weighing about 900 g and having a body length of about 30 cm. It adjusts well to captivity and is easy to handle.

A small bipolar rectal probe (Text-fig. 1) was made of a 12·5 cm length of perspex rod with a diameter of 0·6 cm. Affixed to opposite sides of the rounded tip of the perspex rod were two flat copper electrode plates 2 cm in length and 0·8 cm wide. Copper wires recessed into the length of the perspex rod and sealed within by Araldite (Ciba Ltd) connected the copper electrode plate to a supply of alternating current, delivered from a custom-made pulse generator.

During the procedure of electro-ejaculation the monkeys were lightly tranquillized by a dose of 1 to 2 mg/kg of Sernylan (Parke, Davis & Co., Middlesex) injected intramuscularly into the thigh when the monkey was securely held in a gloved hand. The rectal probe was lightly smeared with vaseline, avoiding the copper electrode plates, and then inserted gently into the rectum while the monkey was lying in an unrestrained supine position. The probe was held in place with a gloved hand. A rhythmic electrical pulse from 0 to peak voltage commencing at 0 up to 2 volts was delivered to the probe and the voltage was gradually increased over 5 min to an absolute maximum of 10 volts. Above this voltage the monkey showed symptoms of distress. After the first few pulses at 2 volts, erection of the penis was obtained. Ejaculation usually occurred at voltages between 5 and 8 volts within 5 min of commencing the rhythmic

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electrical stimulation. Multiple collections could be obtained if the monkey was allowed a short rest.

The ejaculate, collected into small warmed glass tubes of 0.5 cm diameter and 3 cm length, was obtained usually as two distinct fractions: a colourless sperm-free coagulum, and a sperm-rich fluid. The coagulum and sperm-rich fractions were weighed together as total ejaculate.

Aliquots of the sperm-rich fraction were taken and the number of spermatozoa/ml was determined using a haemocytometer (Table 1). The percentage of dead spermatozoa in an ejaculate (Table 1) was obtained using the method of Campbell, Dott & Glover (1956). Sometimes the whole ejaculate coagulated immediately after collection, subsequently undergoing partial liquefaction. The coagulum never completely liquefied. The spermatozoa were motile at ejaculation and showed forward progression. They resembled those of men but

![Text-FIG. 1. The bipolar rectal probe used for electro-ejaculation of the squirrel monkey.](image)

**TABLE 1**

**ELECTRO-EJACULATED SEMEN OF THE SQUIRREL MONKEY RECOVERED AT 5-DAY INTERVALS**

<table>
<thead>
<tr>
<th>Monkey</th>
<th>Ejaculate weight (mg)</th>
<th>Spermatozoa (millions/ml)</th>
<th>% dead spermatozoa</th>
<th>Coagulum content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacko</td>
<td>205.4 118.0 162.4 127.2 77.4</td>
<td>2 92 86 87 42</td>
<td>16 6 3 9 7</td>
<td>+++ + + + +</td>
</tr>
<tr>
<td>Guy</td>
<td>114.4 317.8 186.0 208.6 66.0</td>
<td>7 17 11 12</td>
<td>7 4 7 12</td>
<td>+ + + + + +</td>
</tr>
<tr>
<td>Sam</td>
<td>397.7 133.6 117.2 58.4 45.2</td>
<td>0 3 22 43</td>
<td>– 5 8 5</td>
<td>+ + + + +</td>
</tr>
</tbody>
</table>

Amount of coagulum in the ejaculate: +++ , very large; ++, large; +, small; –, none.
Fig. 1. Spermatozoa of the squirrel monkey (×665) showing the rounded head and long tail.

Fig. 2. A lateral view of a squirrel monkey spermatozoon showing the flattened head. ×665.

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Semen collection in the squirrel monkey

the head was flattened from side to side and the tail was longer (Pl. 1, Figs. 1 and 2). The lengths of the head, mid-piece and tail of the spermatozoa were 6 µ, 12 µ and 60 µ respectively. The coagulum was seen to solidify within the urethra as in macaques (Mastroianni & Manson, 1963; Weisbroth & Young, 1965) and it is probably formed in the same way when the secretion of the cranial lobe of the prostate joins the other seminal fluids.

When collections were first made, very few spermatozoa were obtained but large quantities of coagulum were ejaculated. In repeated collections made at 5-day intervals, the amounts of coagulum gradually decreased and the numbers of ejaculates containing only sperm-rich fluid increased. This phenomenon has been observed in guinea-pig semen collected by electro-ejaculation (Freund, 1958) and was suggested as a trend in an electro-ejaculate from a pig-tailed monkey (Weisbroth & Young, 1965).

Electro-ejaculation is a successful procedure in the squirrel monkey and adequate volumes of semen containing numerous active spermatozoa can be obtained for study and artificial insemination.

REFERENCES

Bennett, J. P. (1967b) Induction of ovulation in the squirrel monkey (Saimiri sciureus) with pregnant mares serum (PMS) and human chorionic gonadotrophin (hCG). J. Reprod. Fert. 13, 357.