Crypt size may also affect results since the number of cells/crypt in rats is approximately 450[14] and 500 in mice[18] as compared to 181 in the gerbil. 2 factors which may affect the various parameters were analyzed; age and diurnal variation. Both variables were carefully monitored.

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Morphology of a non-occluded virus isolated from citrus red mite, *Panonychus citri*

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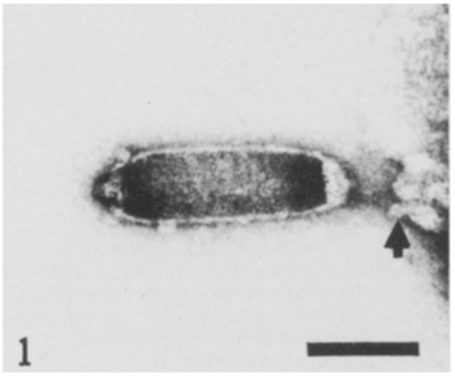
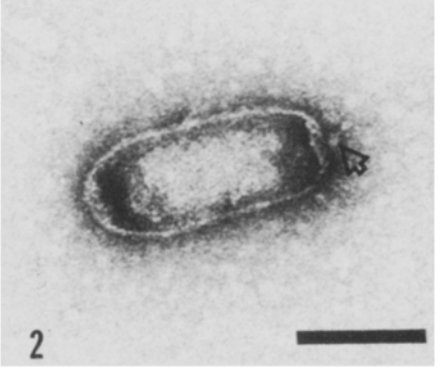
Summary. The size and morphology of virus particles isolated from citrus red mite *(Panonychus citri)* are similar to those observed in thin sections. The similarity to the virus particles isolated from *Oryctes rhinoceros* suggests affinity to the *Baculovirus* group.

The noninclusion virus of the citrus red mite, *Panonychus citri* is rodshaped and located in midgut epithelial cells[2]. Similar rod-shaped virus particles were reported in nuclei of fat cells of *Panonychus ulmi*[3]. We report here attempts to isolate and describe the morphology of the citrus red mite virus.

Laboratory colonies of citrus red mites were infected with virus disease by spraying them with an aqueous suspension of triturated diseased mites. Mites were incubated for disease development symptoms ordinarily appearing within 6-7 days, collected and stored at −5 °C until used. For testing, 1-2 g of mites were frozen in liquid nitrogen in a mortar, then ground to a fine powder with a pestle[4]. The frozen powder was suspended in 0.1 M potassium phosphate buffer at pH 6.6 and homogenized in a Virtis homogenizer[5] cooled in an ice bath. After clarification with 2 cycles of high (25,000 × g) and low (10,000 × g) speed centrifugation, particles were further concentrated either by high speed centrifugation (36,000-50,000 × g) or by dialysis of the supernatent from low speed centrifugation against a 40% solution of polethylene glycol (PEG) 6000. The pellet obtained from the high speed centrifugation was resuspended in 0.1 M potassium phosphate buffer at pH 6.6 and centrifuged again at low speed. Concentrated materials were layered over linear (0.15-1.5 M) sucrose gradients and subjected to rate-zonal centrifugation in preformed density gradients at 80,000 × g for 2.5-3.0 h (SW 25.1 rotor in a Spinco Model L ultracentrifuge). Fractions were collected with an ISCO Model D density gradient fractionator and flow densitometer equipped with a 254-nm UV-light source. Negatively stained samples were prepared with 3.0% uranyl acetate which were examined with a Hitachi HU 12 electron microscope.

Discrete banding of virus particles in gradients was never





Figures 1 and 2. Nucleocapsids isolated from citrus red mite and negatively stained with 3% uranyl acetate. Solid arrow indicates possible remnants of virion envelope; open arrow indicates the knob or projection sometimes observed at one end of the virion. Bar × 100 nm.

achieved, even when various manipulations, including use of layered step gradients, linear gradients of different densities, variation of centrifugation speed and when cesium chloride and potassium tartrate gradients were used. Virus particles were detected in the lower levels of the gradients, usually in the 3rd quadrant, and although sufficient quantities were not collected for nucleic acid analysis, enough were collected to determine morphological properties (figs 1 and 2). Rod-shaped virus particles in section are about 111×266 nm with an electron dense core of about 58×194 nm. Such rods form within the nuclei of midgut epithelium cells and generally acquire an envelope, composed of single or multiple layers, as they pass through the nuclear membrane[2]. Isolated rods in this study were 81×206 nm (range 71–86×180–223 nm); thus, isolated virions were similar in size to those seen in sections. Remnants of the envelope seen originally in sectioned material were also seen in isolated virions (fig. 1). Whether the envelopes are composed of nuclear membrane materials is unknown at this time. Ends of the nucleocapsids are electron dense, giving them the appearance of being capped at both ends (figs 1 and 2). Also, many rods appear to have a knob or projection at one end (fig. 2).

Morphologically, the virus particles isolated from citrus red mites are very similar to those isolated from *Oryctes rhinoceros* by Monsarrat et al.[6]. Both are non-occluded, are similar in size and structure, and are located in midgut epithelium reproducing within the nuclei. According to Matthews[7], the taxonomic status of such viruses is still uncertain, but it was proposed that they be included in the family Baculoviridae as subgroup C (non-occluded rod-shaped nuclear viruses). The Oryctes virus is the type species of the proposed subgroup, composed of virus particles with similar structure isolated from mites, Crustacea, Coleoptera and Hymenoptera.

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Intracerebroventricular angiotensin II increases arterial blood pressure in rhesus monkeys by stimulation of pituitary hormones and the sympathetic nervous system

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Summary. Intracerebroventricular injections of angiotensin II in anesthetized rhesus monkeys increase systemic blood pressure and heart rate. These effects are accompanied by an increase in plasma ADH, cortisol, adrenaline and noradrenaline. Angiotensin II may participate in central mechanisms of blood pressure regulation by its stimulatory effect on the sympathetic nervous system, on ADH and on ACTH release in primates.

Much of what is known about the central angiotensin II (ANG II) blood pressure effects has been learned from studies in rats and dogs, in which endogenous brain ANG II has been shown to increase arterial blood pressure by the stimulation of the release of antidiuretic hormone (ADH), adrenocorticotrophic hormone (ACTH), adrenaline and noradrenaline[1–4]. Few data have been reported for primates. Neuronal fibers and cells containing ANG II-like immunoreactivity with a similar distribution to that in human brain have been identified in rhesus monkey brain[5]. ANG II injected into specific brain areas or into the ventricular system of rhesus monkeys and baboons elicits a drinking response and ADH release[6–9]. The following experiments were designed to test whether central injections of ANG II in monkeys have the same effects and to verify the concept in primates that ANG II participates in central mechanisms of blood pressure regulation. This question is important since inhibitors of the renin-angiotensin system with possibly central effects have recently been introduced for the treatment of arterial hypertension in man.

Methods and materials. ANG II was injected into the 3rd brain ventricle in sodium pentobarbital anesthetized (32 mg/kg i.p.) male rhesus monkeys (n: 5), weighing 8–10 kg; the dose was 0.5 µg/kg diluted in 25 µl artificial cerebrospinal fluid[10–12]. Systemic blood pressure was measured directly in the femoral artery using a Statham P 23Db pressure transducer. Heart rate was calculated from the ECG using a biotachometer. Blood was withdrawn from a

Effect of intracerebroventricular angiotensin II on plasma hormones of anesthetized rhesus monkeys (n: 5)

	Control	Min after i.c.v. injection of 500 ng/kg ANG II 15	60	180
Plasma renin concentration (pmoles ANG I/ml/h)	2.4±0.5	1.8± 0.4	1.2± 0.2*	1.0±0.2**
Angiotensin II (fmoles/ml)	8.5±2.5	8.2± 2.5	5.3± 2.5	4.6±1.6
Antidiuretic hormone (pg/ml)	5.0±1.5	70.5±19.1*	60.7±11.5**	22.9±3.8
Cortisol (µg/100 ml)	16.3±1.9	19.6± 3.6	25.1± 2.9**	32.9±2.9**
Adrenaline (pg/ml)	3.5±1.3	11.1± 3.6*	12.5± 2.7*	10.7±4.5
Noradrenaline (pg/ml)	33.1±5.2	67.3±28.1	50.4±13.5	34.9±5.8

Values are means±SEM. *$p < 0.05$ vs control values; **$p < 0.01$ vs control values.