periodic-silver methenamine (PA-AG-M) in *Rana pipiens*[6,7] and with silver impregnation in *B. bufo*[8]. In all the cases the renin granules have been found to be restricted to the wall of afferent vessels. The granules present inside the glomerulus near the vascular pole are also renin as indicated by their affinity to Bowie's stain.

Keeping the architectural configuration in mind it is interesting to speculate the secreting mechanism of renin in this amphibian. Currently[9] two control paths, feed-forward and feedback for the release of renin granules have been envisioned for non-mammalian and mammalian vertebrates respectively. As the mucula densa is absent in *B. melanostictus*, and JG apparatus consists only of JG cells, the investigator favours a feed-forward mechanism for the release of renin from the JG cells. Although mucula densa has been reported earlier in some amphibia[10].

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EFFECT OF COPPER ON THE ESTRADIOL RECEPTORS IN RAT UTERUS

R. K. PURI* AND R. K. JOHRI†
Division of Endocrinology, Central Drug Research Institute, Lucknow 220 001, India.
Present Address:
* Department of Cell Biology, Mayo Clinic, Rochester, Minnessota, U.S.A.
† Regional Research Laboratory, Jammu Tawi 180 001, India..

IT has been understood that a Cu-IUCD has a localised effect and prevents implantation[1]. However, the mode of action of copper in the uterus remains unclear. The effect of metallic copper on endogenous steroid hormones has been investigated as one of the many events responsible for the contraceptive efficacy of Cu-IUCD[2-4]. Earlier reports indicate that copper wire fitted in one horn of rat uterus induces estradiol uptake in both horns[5,6]. *In vitro* studies further reveal that metallic copper influences estradiol receptor complex[4,7,8]. However, these investigations were confined only to cytosol fraction obtained from uterus and no direct estimate of the effect of copper on nuclear receptors and on the translocation process is available. Therefore, these events have been studied in the present work.

In one group of healthy adult albino rats (150–175 g) a pure (99%) copper wire (diameter 0.2 mm; area 12.6 mm^2) (group C) and in other group (B), a nylon thread of the same specifications was fitted bilaterally in the uterine lumen under asceptic conditions. One group (A) was sham-operated and kept as control. Twelve days post-operated animals were killed by decapitation and the uterine horns were processed to isolate nuclear and cytosol fractions as reported earlier[9]. The specific binding of estradiol to nuclear receptor was determined by the exchange assay method[10]. The method of *West et al*[11] was employed to determine the cytosol receptors. Dissociation constant (K_d) was determined by the method reported earlier[9]. The effect of metallic copper on the distribution of radioactive estradiol between cytosol and nuclear fraction was studied using both uterine horns. The uteri were incubated with metallic copper of the same area and diameter as mentioned previously at 37° C in 2 ml of Eagle medium containing 0.03 mmol of (1,3,5,7) ^{3}H-estradiol-17 β (specific activity 49 Ci/ mmole, supplied by Biochemical Centre, Amersham), for various times as indicated (table 2). At the end of the respective incubations the mixtures were cooled and the uteri washed thrice for 3 min by tris-EDTA buffer (0.01 M–Tris-HCl, 0.001 M-EDTA and 1%-sodium azide,

TABLE 1

Estradiol receptor concentration in control and treated rat uteri.

Group	Treatment	Nuclei	$K_d \times 10^{-9}$	Cytosol	$K_d \times 10^{-9}$
A	Nil				
	Estrous (6)	198 ± 35	1.05 ± 0.15	435 ± 37	2.15 ± 0.15
	Diestrous (6)	380 ± 57[a]	1.25 ± 0.05	670 ± 101[b]	2.05 ± 0.15
B	Nylon thread (12)	230 ± 75	1.10 ± 0.12	450 ± 80	2.25 ± 0.16
C	Copper wire (12)	76 ± 45[c]	3.15 ± 0.32	200 ± 48[d]	5.14 ± 0.23

Values are means (± SEM) of dount ^{3}H-estradiol (f moles per mg protein). The number of animals is shown in parantheses. ($a = p < 0.02$) ($b = p < 0.05$) ($c = p < 0.05$); (estrous), $p < 0.001$ (diestrous), $p < 0.1$ (nylon) $d = p < 0.001$ (estrous and diestrous), $p < 0.02$ (nylon).

TABLE 2

In vitro study of distribution of receptor bound progesterone in control and copper-treated uteri.

Incubation time (min).	Control		Treated	
	Nuclei	Cytosol	Nuclei	Cytosol
15	800	3800	1210	2100
30	1750	5000	1500	3435
45	3211	5200	1535	3525
60	5150	5275	1190	3545

Values represent DPM/uteri (both horns). Incubations were done in duplicate and a total of 5 replicates were used.

pH 7.4) containing 0.001 mmol of unlabelled estradiol. In the control incubations copper was omitted. The homogenates were centrifuged to get the nuclear and cytosol fractions as mentioned[9]. The receptor bound activity in the nuclear and cytosol fractions was determined using a packard liquid scintillation spectrometer (model: 33, efficiency 57%), at various incubation times. Protein was determined by the method of *Lowry et al*[12]. A student's *t*-test was employed to assess the significance of difference between the groups.

The estradiol receptor concentration was higher in diestrous phase than in the estrous phase in control rats. This change was uniform for both nuclear and cytosol fractions (table 1). This effect may be explained by an estradiol-induced increase in the synthesis of its own receptors in the cytosol and a high estradiol secretion in plasma during the diestrous phase[13]. Further, the concentration of both the nuclear and cytosol receptors in group C animals showed a significant decline. On the other hand, a nylon thread did not show any effect, suggesting a qualitative difference between the action of an inert (nylon) and an active (copper) device. Data presented in table 1 reveal that the affinity of the receptors for estradiol was significantly altered after copper treatment. An observed increase in the value of K_d in Group C as compared to Groups A & B would suggest a decrease in the binding affinity. This was true for both nuclear and cytosol receptors. This event is likely to affect the process of translocation of the receptor protein complex from cytosol to nucleus. The *in vitro* studies (table 2) also show that in the control group, there was no significant change in the concentration of bound steroid in the cytosol fraction and the values were more or less constant, whereas bound steroid in the nuclear fraction showed an appreciable rise. On the other hand, in copper-treated uteri, the concentration of bound steroid both in the nucleus and in the cytosol was practically constant during the incubations. However, at all time intervals, the values for cytosol were higher than in the nuclear fraction. These

results would indicate that the nuclear binding of steroid receptor complex is possibly inhibited by metallic copper which decreases the translocation process. Copper thus might have a localised effect which results in reduced incorporation of the hormone in the target organ, thus imparting contraceptive efficacy to a Cu-IUCD.

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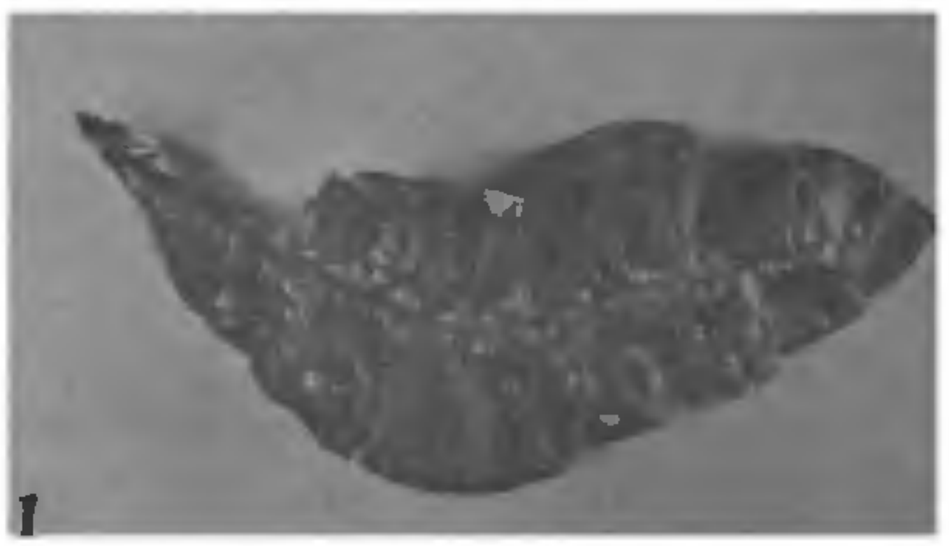
A NEW PSYLLID GALL ON THE LEAVES OF *ALSTONIA KURZII* H. K. F. (APOCYNACEAE) FROM THE SOUTH ANDAMAN ISLANDS.

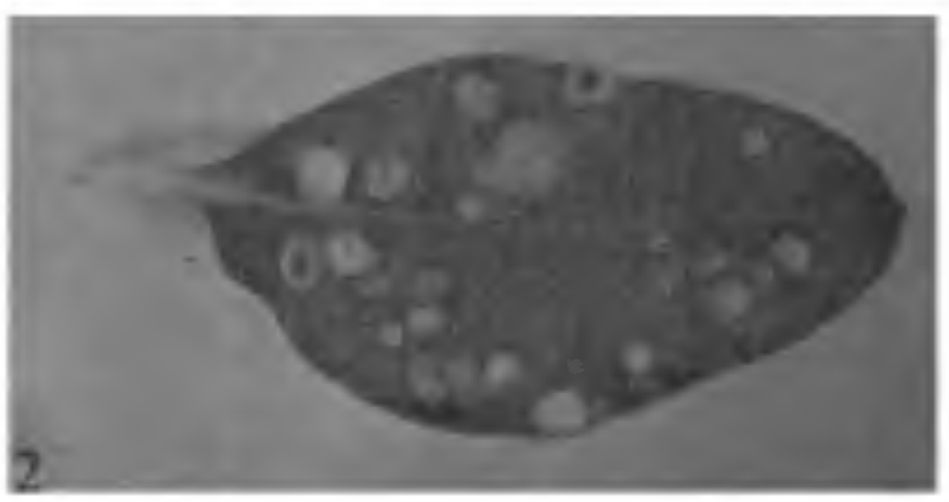
C. KANDASAMY AND R. M. SHARMA*
Division of Entomology, UPASI Tea Research Institute, Cinchona 642 106, India

* Zoological Survey of India, Andaman & Nicobar Regional Station, Port Blair 744 101, India.

INFORMATION of psyllid galls on the species of Apocynaceae is meagre except for an isolated report on the occurrence of leaf galls on *Alstonia scholaris* R. Br[1,2]. During a recent survey made in Neil, Harelock and Peel Islands of South Andaman, leaf galls from *Alstonia kurzii* H. K. F. were collected and the identity of the gall making psyllid was confirmed as *Pauropsylla tuberculata* Crawford (Psyllidae: Hemiptera). Psyllid galls on the leaves of *A. kurzii* is a new report.

These characteristic leaf galls, though occurring scattered throughout the laminar surface, tend to agglomerate at the midrib region (figure 1) resulting in the crinkling of leaves. As many as 75 galls were counted on a single leaf surface. The size of the gall varied from 3 to 8 mm in diameter. These pouch galls are epiphyllous as well as hypophyllous (figures 2, 3). They are solitary, globose and light green on young leaf and dark brown on mature leaf. The gall chamber is unilocular and, as in any other psyllid gall, the cavity encloses only one nymph. The nymph is yellow in colour and all the five instars developed inside the zoocecidia. At the time of emergence, the exit hole is made either on the dorsal or on the ventral side of the leaf, depending on the nature of the gall.





Figures 1-3 1. Leaf galls on *Alstonia kurzii*, 2. Dorsal side of the leaf, 3. Ventral side of the leaf.