A new host of *Hemipteroseius indicus*

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Summary. The discovery of the predator mite, *Hemipteroseius indicus* capable of effectively reducing nymphal and adult populations of the phytophagous insect pest, *Dysdercus koenigii* infesting cotton has been reported for the first time.

Current literature on nymphal and adult parasites working as natural enemies of the red cotton bug, *Dysdercus koenigii* damaging cotton and okra in the tropics contains information only about a tachinid fly[3,4] and none on any species of mite. This communication places on record, for the first time, the occurrence of a mite, *Hemipteroseius indicus*[5] as a new and powerful predator attacking nymphs and adults of this bug.

Observations. The mite population consisting of all stages was largely confined to the dorsal part of the thoracic region around the scutellum in both male and female individuals of this insect where these comfortably sheltered predators were seen feeding intensely on the bugs. Predation neither inhibited mating between sexes in these hemipterans nor detrimentally affected the production of mature oocytes in the mated females. However, the gravid female, if preyed upon severely, died without laying any eggs although she manifested the typical distended condition of the abdomen caused by the presence of ripe oocytes in her ovaries. Predatory attack on nymphs occurs even in the newborn 1st instar individuals which, like those of later instars, harbour these acarines in the ventral region of their thoraces, especially at the base of the legs. Nymphs of any instar heavily preyed upon succumbed without progress in their development.

Scope. Future investigations can explore the possibility of considering this acarine species as a potential biological agent for inclusion in pest suppression programs formulated to check the multiplication and eventual establishment of *D. koenigii* in cotton fields.

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2 To whom request for reprint should be made.

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Functions of nuclear bodies as revealed by ultrastructural autoradiography and cytochemistry

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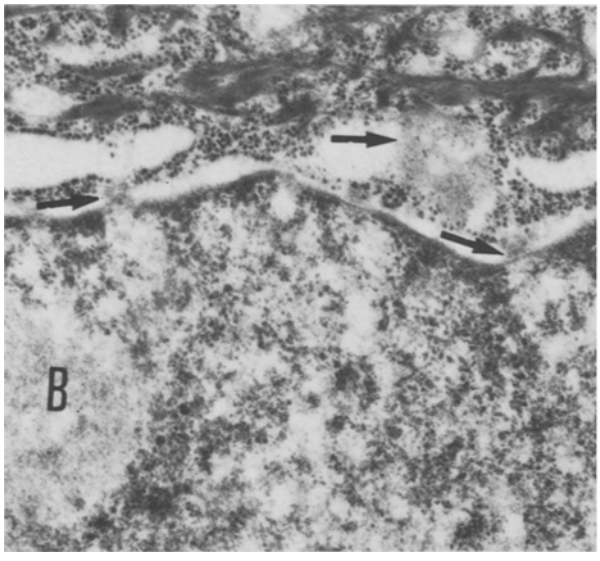
Summary. The simple nuclear body containing a few RNA particles appears through the nuclear pores in the cytoplasm, originating from the nucleolus. The complex nuclear body consisting mainly of RNA components is highly active in the incorporation of RNA precursors. Accordingly, the appearance of nuclear bodies may be related either to transport to the cytoplasm of nucleolar components or to the enhancement of rRNA synthesis.

Nuclear specific components appearing often in cancer and precancer cells were first designated 'nuclear bodies' by Weber et al.[1]. Their fine structure and chemical components, both simple and complex types, according to Bouteille et al.[2], are now well known. To our knowledge their function remains unsettled as yet, although suggestions have been made by several authors[1-6].

Material and methods. Biopsy materials were obtained by operative excision from the following patients: 4 male and 2 female patients (42–50 years old) with Bowen's disease; precancerous dermatosis with chronic atypical epithelial proliferation of the skin, and 4 male patients (50–60 years old) with senile keratosis; actinic keratosis induced by sunlight or X-rays. The materials were cut into tiny blocks, fixed in 2.5% glutaraldehyde alone, or fixed in 2.5% glutaraldehyde and postfixed in 1.0% osmium tetroxide, and embedded in epoxy epon resin by routine methods. Ultrathin sections were stained with saturated uranyl acetate followed by lead citrate and examined with an electron microscope, either HU-11D-S or JEM-100C.

Sections of samples fixed only with glutaraldehyde were used for extraction of DNA using Bernhard's EDTA technique[7]. Since nuclear bodies of several types appear in lymphoblasts in the germinal center of normal mouse spleen[8], we have tried to observe similar materials by an autoradiographic electron microscopic technique. Swiss F26 strain mice, 12 weeks old, weighing 28–30 g, were injected i.p. with 0.9 mCi of uridine (New England Nuclear, NET-367; sp. act. 37.6 Ci/mmole). The injected animals were sacrified after 1 h. The autoradiographic technique of Granboulan[9] was used with Ilford L4 emulsion diluted 1:5 in distilled water.

Results and discussion. Many of the nuclear bodies originating from the nucleolus[2,6] in Bowen's disease migrate to the periphery of the nucleoplasm to attach to the nuclear envelope, where the content of the nuclear body seems to



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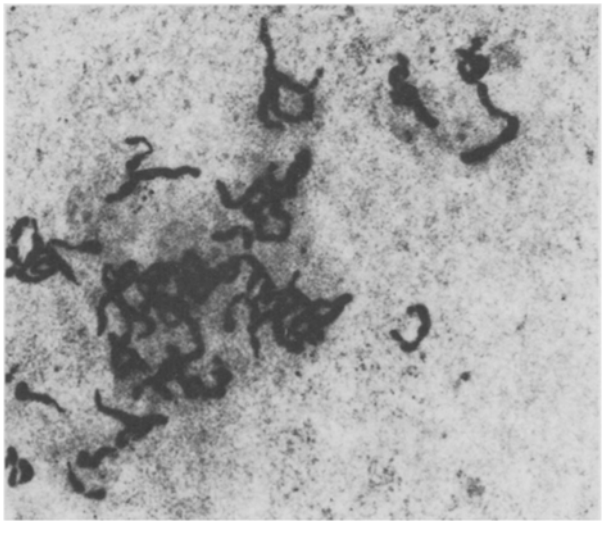

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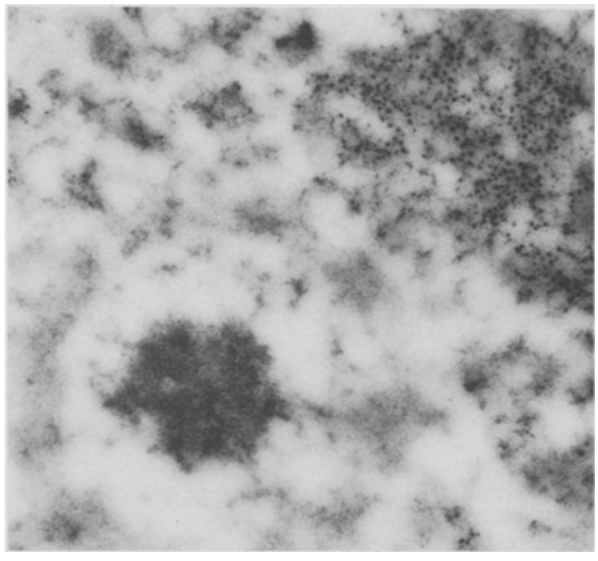

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Figure 1. The dense nucleoplasm contains a less dense nuclear body (B) in Bowen's disease. Nuclear bodies (arrows) appear through the nuclear pores into the cytoplasm. Numerous ribosomes and tonofilaments can be seen in the cytoplasm. × 29,000.

Figure 2. Electron autoradiograph of [^{3}H]UdR of the complex nuclear body appearing in the lymphoblast nucleus. × 42,000.

Figure 3. The complex nuclear body stained by the EDTA technique. Numerous dense interchromatinic granules and the less dense capsule are clearly identified in senile keratosis. × 32,000.

emerge through the nuclear pores into the cytoplasm, in which numerous ribosomes – free or attached to the endoplasmic reticulum – and tonofilaments are encountered (fig. 1), as already described by Rupec[5]. The nucleolus of a lymphoblast in the germinal center of the mouse spleen is the most intensively labeled site 1 h after i.p. injection of [^{3}H]UdR, but the silver grains are not incorporated by the simple nuclear body. However, the incorporation of RNA precursor occurs at a relatively high rate in the complex nuclear body, which is composed of dense granular and fibrillar components (fig. 2). When the EDTA staining method is employed, the simple nuclear body appearing in senile keratosis contains a few particles which are stained by this technique, but it does not contain any elements to be bleached out. The complex nuclear body consists of intensively stained dense granules 12–16 nm in diameter, being surrounded by the less dense amorphous capsule. No components within the nuclear body are bleached out by the EDTA technique. Dense interchromatinic granules appear as clusters of non-randomly distributed particles of an average diameter of 20–25 nm (fig. 3). Although electron microscopic autoradiography after cell incubation with [^{3}H]leucine was made by Bouteille et al.[2], incorporation of RNA precursor has never been reported except for our preliminary report[8]. So far as the present study is concerned, no strong evidence has been presented for the occurrence of RNA synthesis in the simple nuclear body. But it is quite likely that the complex nuclear body is brought into close relation with the synthesis of rRNA, as suggested by several authors[1–4,6].

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