

Brief Communication

**VIRUS-LIKE PARTICLES IN TUMORS OF THE MUCOSA
OF THE ETHMOID IN INDIAN CATTLE**

Tumors of the mucosa of the ethmoid have been reported in various species of animals from different parts of the world. The occurrence of this type of neoplasm in domestic animals in Kerala was first recorded in 1960 (*Rajan et al.* 1972) and since then an increasing incidence of the tumor has been observed. The epidemiological features of the neoplasm are suggestive of an infectious agent. *Cohrs* (1952, 1953), without isolating virus, was able to reproduce tumors of the mucosa of the ethmoid in sheep by intranasal instillation of aqueous extracts of the emulsified tumor or its cellfree extracts. *Yonemichi et al.* (1978) demonstrated virus particles, morphologically indistinguishable from visna-maedi virus, in ethmoid tumors of sheep. Subsequently, *Sulochana et al.* (1980) were able to isolate hemagglutinating agents from ethmoid tumor tissues of Indian cattle.

Attempts were made to detect the presence of virus in these tumor tissues by electron microscopical examination. Affected animals were slaughtered and pieces of 2—4 mm³ of the tumors were immediately collected and fixed in 2.5 % glutaraldehyde solution, buffered to pH 7.4 with cacodylate. They were postfixed in 1 % OsO₄ solution buffered with cacodylate. After embedding in Epon, ultrathin sections were prepared on an LKB ultratome, picked up on uncoated copper grids, stained with uranylacetate and lead citrate and examined in a Philips electron microscope, EM 201, at 60 kV and magnification varying between 30,000 and 100,000 times.

Sections from one of the tumors revealed thickening and crescent-like projections of the plasma membrane at certain regions (Fig. 1). The projections contained distinct electron-dense spots, possibly nucleocapsids. The cell surface projections showed a tendency to form distinct buds which got separated to form free particles, 95—140 nm in size. The free particles were numerous and more or less uniform in size and had identical morphological features (Fig. 2). They contained electron-dense spots, as described above, and the outer membrane of the bud-like projections and the free particles were covered with peplomer-like structures.

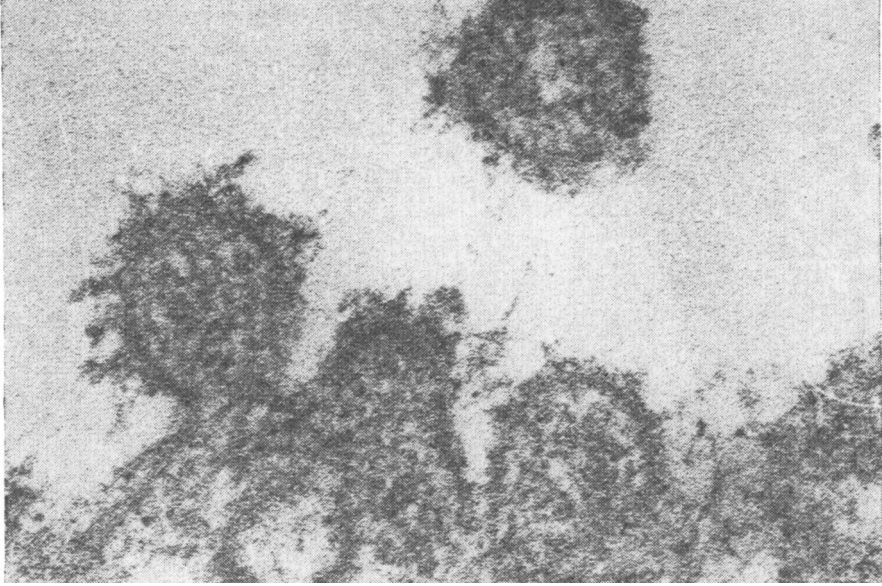


Figure 1. Bud-like projections of the plasma membrane. Note aggregation of electron-dense spots, free particle and peplomer-like structures on free particle and buds. $\times 192,000$.

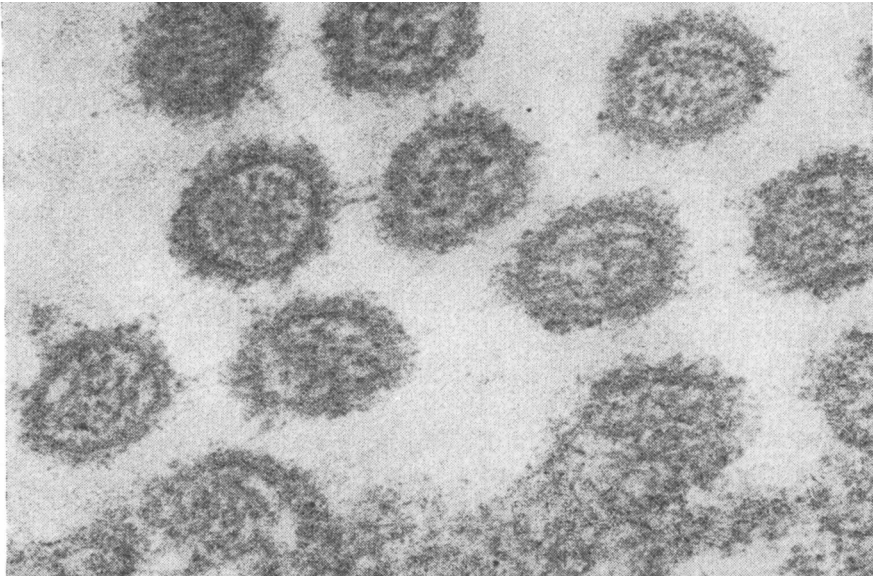


Figure 2. Free particles and bud-like projections of the plasma membrane. Note the conformity in size of the particles. $\times 175,000$.

The maturation and assembly at the plasma membrane, the release by budding, the presence of nucleocapsid-like structures, and the well defined outer rim covered by peplomer-like projections are strongly suggestive of an enveloped virus. Due to the localization of the tumors, being exposed to the air flowing through the nasal passages, the possibility of a satellite virus has to be considered. Thus, the importance of the observed virus-like particles in the etiology of tumors of the mucosa of the ethmoid needs further investigation.

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(Received January 16, 1981).

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