Conidiobolomycosis is a zygomycosis caused by fungi of the class Zygomycetes, order Entomophthorales, affecting humans and animals, including sheep. Recently in Brazil, nasal zygomycosis has been reported in sheep in the states of Mato Grosso, Piauí, Goiás and Rio Grande do Sul. The present work aimed to report the occurrence and the clinical, laboratorial, pathological and mycological findings of three outbreaks of conidiobolomycosis in sheep from Rio Grande do Norte state, Northeastern Brazil. The outbreaks affected 22 (8.3%) of 265 sheep raised in farms (n=5) in the semiarid region of the state and with no history of the disease previously. Environmental conditions contributing to the occurrence of the disease were excessive rain, elevated temperatures and excess of organic material in the pasture. A total of five sheep from the three outbreaks were clinically examined and the main symptoms included depression, progressive emaciation, sero-sanguinolent nasal discharge, tachycardia, dyspnea, miosis, unilateral exophthalmia with increased volume of ocular globe, corneal ulceration and nervous signs. Clinical evolution varied between 3-45 days. Hematology reveals in all sheep, inversion of the neutrophil: lymphocyte ratio besides of leucocytosis with neutrophilia (n=3). Serum biochemical evaluation showed hypoproteinemina (hypoalbuminemia) and increased activity of the enzymes aspartate aminotransferase and gamma-glutamyltransferase. Urea and creatinine values were high in three and two sheep, respectively. Cerebrospinal fluid analysis showed presence of fibrin reticules and pleocytosis. Necropsy revealed in all sheep the presence of a nodular mass with friable consistence and white-yellowish coloration after longitudinal section of the head, besides of infiltration of the mass to the frontal cortex of the brain in two sheep. Microscopic findings included meningitis, cortex necrosis and encephalitis with presence of eosinophilic Splendore-Hoeppli substance. Histopathology of the lungs reveals Splendore-Hoeppli-like material; hyperplasia of alveolar and bronchiolar epithelium associated to proliferation of conjunctiva and thickened inter-alveolar septa. The renal lesions were suggestive of amyloidosis. Fungal culture allowed the isolation of Conidiobolus coronatus and was determinant for the confirmation of the definitive diagnose.

**Keywords:** Conidiobolus coronatus, fungal diseases, upper respiratory system, zygomycosis