Neural larva migrans or cerebrospinal nematodiases is the migration of helminth larvae into the brain of mammals and birds. It causes extensive tissue damage and inflammation, and results in severe and usually fatal neurological disease. The ascarid Baylisascaris procyonis, the intestinal raccoon roundworm, is the most common cause of neural larva migrans. Other species involved include B. columnaris (the skunk roundworm), B. melis (the badger roundworm), and B. transfuga (the bear roundworm).

Two outbreaks of neural larva migrans in birds due to B. procyonis were diagnosed in California from April until July 2007. One of the outbreaks happened in a privately owned outside aviary in which canaries and doves were housed together; 12 out of 22 canaries died or were euthanized after 3-4 days of illness. Clinical signs included loss of balance and equilibrium, torticollis, star gazing, and inability to fly or walk. The other outbreak occurred in a farm where 18 canaries (9 chicks and 9 adults) were kept in a 20 acre pasture; 5 out of 9 emu chicks died, were euthanized, or disappeared (missing birds were presumably dead) 1-10 days after the first clinical signs were observed. Sick chicks were seen being attacked by adults, were ataxic, walking backwards, and unable to stand without assistance; 2 canaries and 3 emu chicks were necropsied. No significant gross lesions were found. Microscopic lesions in the brain were confined to the brain stem, within the white matter tracts/fasciculi and grey matter nuclei in the pons/medulla oblongata. There were multiple foci of malacia infiltrated by macrophages, reactive astrogliosis around these necrotic foci, vacuolation of the neuropil, areas of hemorrhage, presence of swollen axons and axonal spheroids, and lymphocytic perivascular cuffing. Since the distribution and morphology of the brain lesions were consistent with those of neural larva migrans, serial histological sections of the brain were examined in search for nematode larvae. Few larvae morphologically consistent with Baylisascaris sp. larvae were found in the brain of 1 canary and 1 emu chick, in the region of the medulla. There was no inflammation surrounding these larvae, and the neuropil around these parasites was normal. Few larvae of Baylisascaris sp. were also noted within the myocardium and skeletal muscle of 1 emu chick in association with nonsuppurative myocarditis and myositis, respectively. Larvae of Baylisascaris sp. were found in the brain of a canary by brain squash but none was found in the brain of an emu chick. These larvae tested positive for Baylisascaris sp. by PCR. The submitters reported that raccoons were commonly seen in the vicinity where the canary aviary was located, and that both raccoons and active latrines were present near the area where the emus were fed.

Identification of the species of Baylisascaris larvae in a brain squash or on histopathology is difficult since other closely related species are morphologically similar. The PCR assay used here is able to differentiate between B. procyonis and B. transfuga but not between B. procyonis and B. columnaris, or between B. procyonis and B. melis so identification of the particular species of Baylisascaris involved in cases of neural larva migrans is best determined epidemiologically. Based on the history of exposure to raccoon feces in both outbreaks, we conclude that B. procyonis was the species of Baylisascaris involved. Environment, enclosures and feedstuff could be contaminated with dried raccoon feces containing B. procyonis infective eggs, with the transmission occurring by the fecal-oral route. To the best of our knowledge, there are no published reports of neural larva migrans in canaries.