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Presentation Abstract

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Presentation Title: Retinal projections in a palaeognath bird, the chilean tinamou (Nothoprocta perdicaria)

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Abstract: The Tinamidae is a family comprising 47 species of birds, which forms a monophyletic group with the flightless 'Ratites'. Together they establish the avian line of the Palaeognathae. They are generally considered to be a very basal group, which segregated from the Neognathae (containing all other extant birds) very early in the evolution of birds. It is thus of interest to compare the basic neuronal circuitry of these groups to gather insights into evolutionary trends in the conservation and variations of the avian visual system.
We investigated the retinal ganglion cell layer and the retinofugal pathways in the palaeognath Chilean Tinamou, *Nothoprocta perdicaria,* by means of retinal wholemounts and injection of cholera toxin B subunit into the vitreous body of the eye of deeply anesthetised animals. As is the general pattern in birds, retinal projections were confined to the contralateral side and led to known retinorecipient regions, including the layers 2 [[unable to display character: –]] 7 of the Optic Tectum, the nuclei of the Lateral Geniculate Complex (nucleus geniculatus lateralis pars ventralis (GLv) and the substructures of the nucleus geniculatus lateralis pars dorsalis (GLd)), the intergeniculate leaflet (IGL), a prominent lateral anterior nucleus (LA), the pretectal nuclei (tectal grey (GT) and nucleus lentiformis mesencephali (LM)) and the nucleus of the basal optic root (nBOR). In addition, retrogradely labelled neurons were found in the nucleus isthmo-opticus (ION). The Optic Tectum showed some conspicuous differences compared to typical avian neognath model organisms

such as the chicken (*Gallus gallus*) and the pigeon (*Columba livia*). Most notably, the retinorecipient layers 3 and 5 were thicker throughout their entire extent, whereas layer 4 was substantially thinner.
Our results indicate that the retinal projections in palaeognath birds reflect an evolutionarily conserved avian pattern and show only minor differences on a macroscopic level. Future studies will determine whether this also applies to the microcircuitry in identified circuits such as the tecto-isthmic loops and the tecto-rotundal pathways.

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