

Distribution of chemical markers in the retina of the spadefoot toad (*Pelobates fuscus fuscus*)

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Pelobates fuscus is a fossorial species which is active mostly at night. Thus, it is often preyed on by some owl species. Sometimes its skeletal remnants are also found in diurnal predatory birds' nest. Its lifestyle does not provide protection against predators. Vulnerable as it is, vision may be an important aspect of selection. The connection between the toads activity and visual capabilities had not been studied and neither the structure of its retina. Hence our objective was to study the retinal structure and neurochemistry in order to gain insight into the potential acuity of vision. Six eyes were used in our study. After fixation we made 15 µm thick cross section with cryostat and utilized indirect immunofluorescence to localize chemical markers known to be present in the retina of other anuran species. We used primary antibodies against calretinin, tyrosin-hydroxylase, serotonin, substance P, neuropeptide Y and somatostatin. Calretinin-like immunoreactivity was found in cones, many displaced bipolar- and orthotopic bipolar cells, a few but distinct amacrine cell types and in ganglion cells. Discrete immunoreactive bands were seen in all sublaminae of the inner plexiform layer (IPL). Strong tyrosine hydroxylase immunoreactivity was found in two types of large amacrine cells and in the first sublamina of the IPL. Similar cells were seen labeled with anti-serotonin antibodies except that their dendrites were distributed all over the IPL, but were especially strongly present in the 2nd and 3rd sublaminae. Substance P-immunoreactivity was seen in at least two, possibly three types of amacrine cells, the dendrites of which were distributed in sublamina 1, 3/4 and 5. Our most interesting findings are related to NPY-positivity. We have observed two, possibly three types of large amacrine cells, with dendrites distributed in sublaminae 1 and 3. Many strongly immunopositive centrifugal fibres were seen in sublamina 1. Finally, Müller cells were weakly immunoreactive for neuropeptide Y. Somatostatin immunoreactivity was not observed in any cell or fiber in the retina. Although minor differences were observed in the distribution of neuro chemical markers between *Pelobates* and the other anuran species studied formerly by other laboratories, conspicuous differences (if any) remain to be recognized that could explain the unusual daily activity pattern of the species from the point of view its vision.