

## SHORT NOTE:

ULTRACYTOCHEMICAL EVIDENCE FOR THE PRESENCE OF SEROTONIN (5-HT) IN THE PINEAL ORGAN OF *CHALCIDES OCELLATUS* (FORSK.)

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## INTRODUCTION

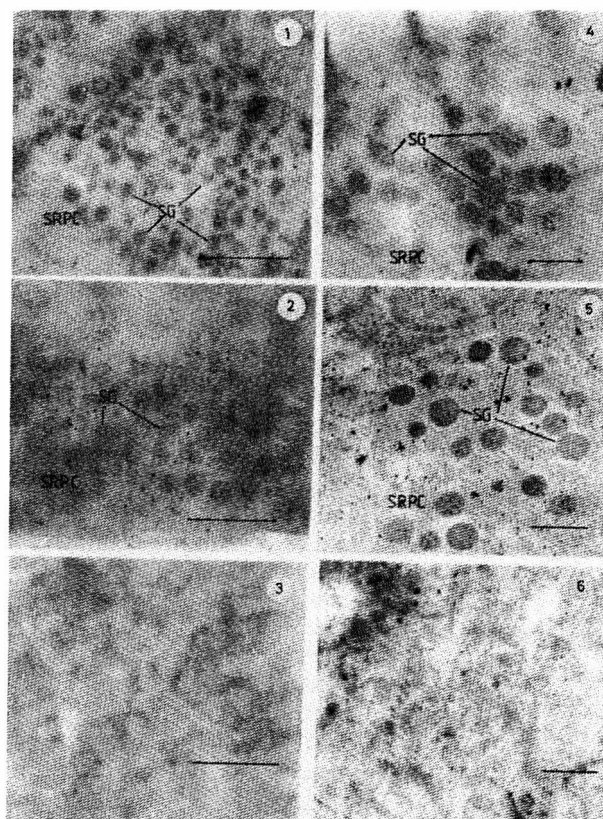
In the pineal organ of lizards the evolutionary regression of photosensory function has been accompanied by tendency to synthesise a number of indoleamines (Colling, 1971, 1979) of these, serotonin has been demonstrated to occur in the pineal organ of *Sauromalus varius* and *Cerrhonotus multicannatus* biochemically by Quay and Wilhoft, 1964; by fluorescence and histochemistry in *Anguis fragilis*, *Lacerta muralis* and *L. vivipara* by Collin, 1968 and by ultracytochemical methods in *L. muralis* by Collin, Juillard and Falcon, 1977.

Numerous secretory granules were demonstrated in the secretory rudimentary photoreceptor cells (SRPC) of the pineal organ of *Chalcides ocellatus* (Mahmoud, 1982). The release of their content by diffusion and/or by micropinocytosis into the capillaries has been demonstrated by Mahmoud, 1982. The aim of the present work was to identify and localise serotonin in the SRPC of the pineal organ of *C. ocellatus*.

The lizards used in this study included members of both sexes, over 9cm mouth-vent length, immediately after decapitation the pineal organ was removed, fixed by immersion and prepared for electron microscopy in accordance with the argentaffin and chromaffin ultracytochemical methods described by Etcheverry and Zieher, 1968; Collin *et al.*, 1977.

With the argentaffin reaction, a precipitate of silver was found over the secretory granules of SRPC (Figs. 1, 2 and 3). As the incubation time increased the silver precipitate became denser, but the background tended to be weaker. Following the chromaffin reaction, whichever fixation procedure was used, similar precipitates of chromium dioxide were found in these granules (Figs. 4, 5 and 6).

The presence of precipitate of metallic silver and chromium dioxide in the secretory granules of the SRPC in the pineal organ of *C. ocellatus* is probably consistent with the occurrence of serotonin in these granules. Similar ultracytochemical observations were reported in *L. muralis* by Collin *et al.*, 1977. Meiniel, Collin and Roux (1975) concluded from *in vitro* and *in vivo* experiments using radioactive  $^3\text{H}$  5-HT that



Figs. 1-6 Argentaffin reaction, precipitate of metallic silver in the SG of the SRPC (Figs. 1 and 2), is absent in control neighbouring cells (Fig. 3). Chromaffin reaction, precipitate of  $\text{CrO}_2$  in the SG of the SRPC (Figs. 4 and 5) is absent in control neighbouring cells (Fig. 6). Incubation time: 2 hrs. Figs. 1 and 4; 4 hrs., Figs. 2 and 3; 5 hrs., 5 and 6. Scale = 5000  $\mu$ .

serotonin is stored in the secretory granules of the SRPC in *L. vivipara*.

Further investigations are needed to identify the production and storage site of other indolamines in order to determine the phylogenetic and biosynthetic capacities of the SRPC in *C. ocellatus*.

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## SHORT NOTE:

CLUTCH PARAMETERS IN A SWISS POPULATION OF *RANA TEMPORARIA*

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Egg numbers and egg sizes of anuran amphibians have frequently been shown to vary among individuals and populations, possibly having important demographic and life history consequences. Here I present data on egg numbers and egg sizes from a *Rana temporaria* population 21km northeast of Berne, Switzerland (elevation 600m).

During the 1985 breeding season, 16 amplexed pairs of frogs (representing the range of female body sizes) were taken from the breeding pond and each pair set into a plastic container to allow spawning. The volumes of the whole egg masses and of three

subsamples were measured for each pair and the latter preserved in 70% ethanol. The number of eggs in the subsamples were counted, and the total number of eggs per spawn mass was extrapolated from the average ratio of number of eggs to spawn mass volume in the subsamples. In two small egg masses, for which all eggs had been counted, the deviation from the actual number of eggs was less than 4%. From every egg mass the diameters of a sample of 15 preserved eggs were measured with a micrometer eye piece (to nearest 1/100mm). Yolk volume of an egg mass was calculated as  $n(4/3)(d/2)^3\pi$ ,  $n$  = number of eggs,  $d$  = mean diameter of eggs, assuming spherical shape of the yolk.