from the other species of *Chloris* by the presence of two perfect florets in each spikelet instead of a single perfect floret as in others. These grasses constitute the major fodder to cattle at early stages.

No other chromosomal races of *C. bournei* were found in the vicinity for a morphological comparison. But this hexaploid race exhibited vigorous morphological growth compared to *C. barbata* and *C. montana* at tetraploid level. Similar findings in grasses were evident in terms of morphological changes attributed to polyploidy[3] i.e. plants showed thick rhizomes, increased number of tillers, thick green foliage and large spikes (table 1, figure 1).

The chromosomal numbers $2n = 50$, $2n = 40$ in this species were earlier reported[4]. The meiotic observations of pollen mother cells revealed the presence of 30 bivalents at diakinesis ($2n = 60$) in this grass (figure 2). Higher chromosomal associations other than bivalents were completely absent. Ring bivalents rather than rods were predominant. Grouping and secondary association of bivalents were also noticed in this race. The average chiasmata per cell was 54.05 ± 2.52. Anaphase-I segregations without any laggards and late disjoining of bivalents were normal. Pollen fertility was very high (table 1).

Most of the previous chromosome number reports in this species as well as others of the genus indicated the basic number as 10. The present observations establish the role of polyploidy in the speciation of the taxon *Chloris*.

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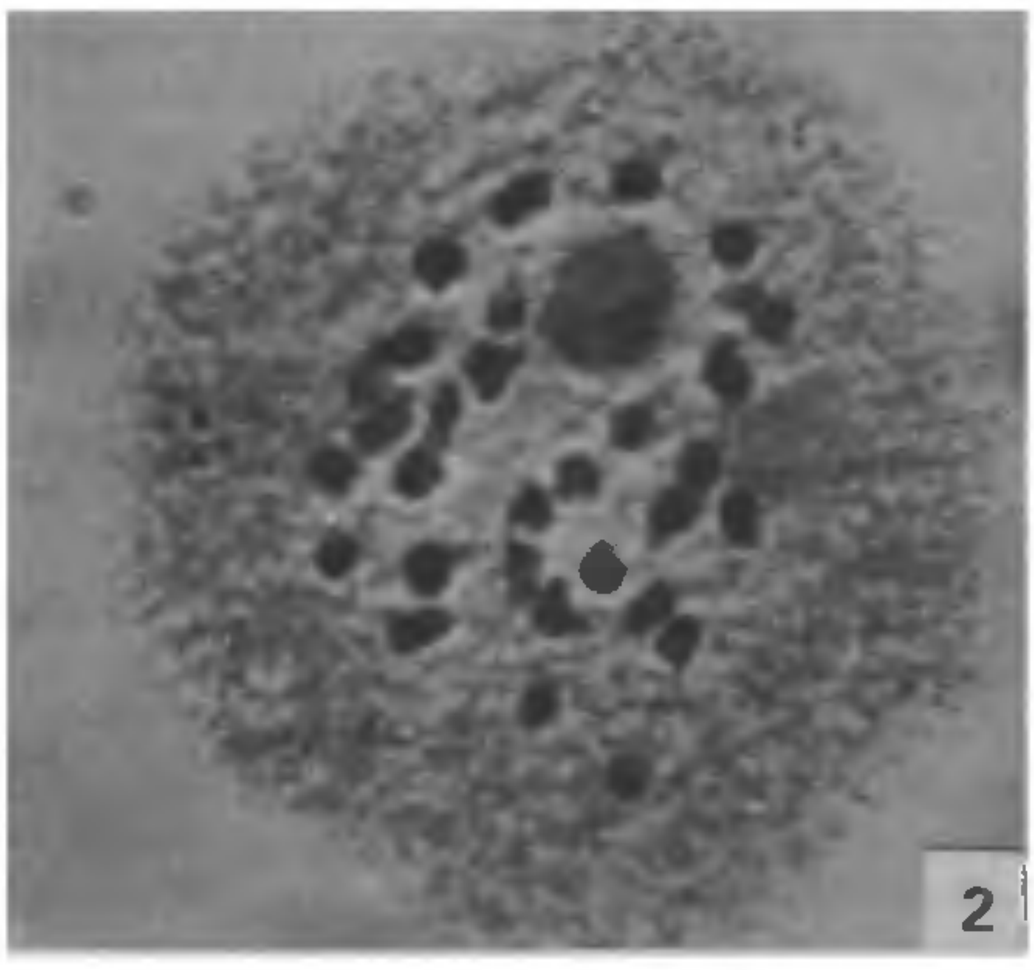

Figures 1–2. **1.** Morphology of *C. bournei*, and **2.** Diakinesis showing 30 bivalents (× 1500).

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HISTOCHEMICAL STUDY OF ALKALINE PHOSPHATASE AND 5'NUCLEOTIDASE IN THE ADRENAL GLAND OF MEGACHIROPTERAN BAT *RTEROPUS GIGANTEUS GIGANTEUS* BRÜNNICH

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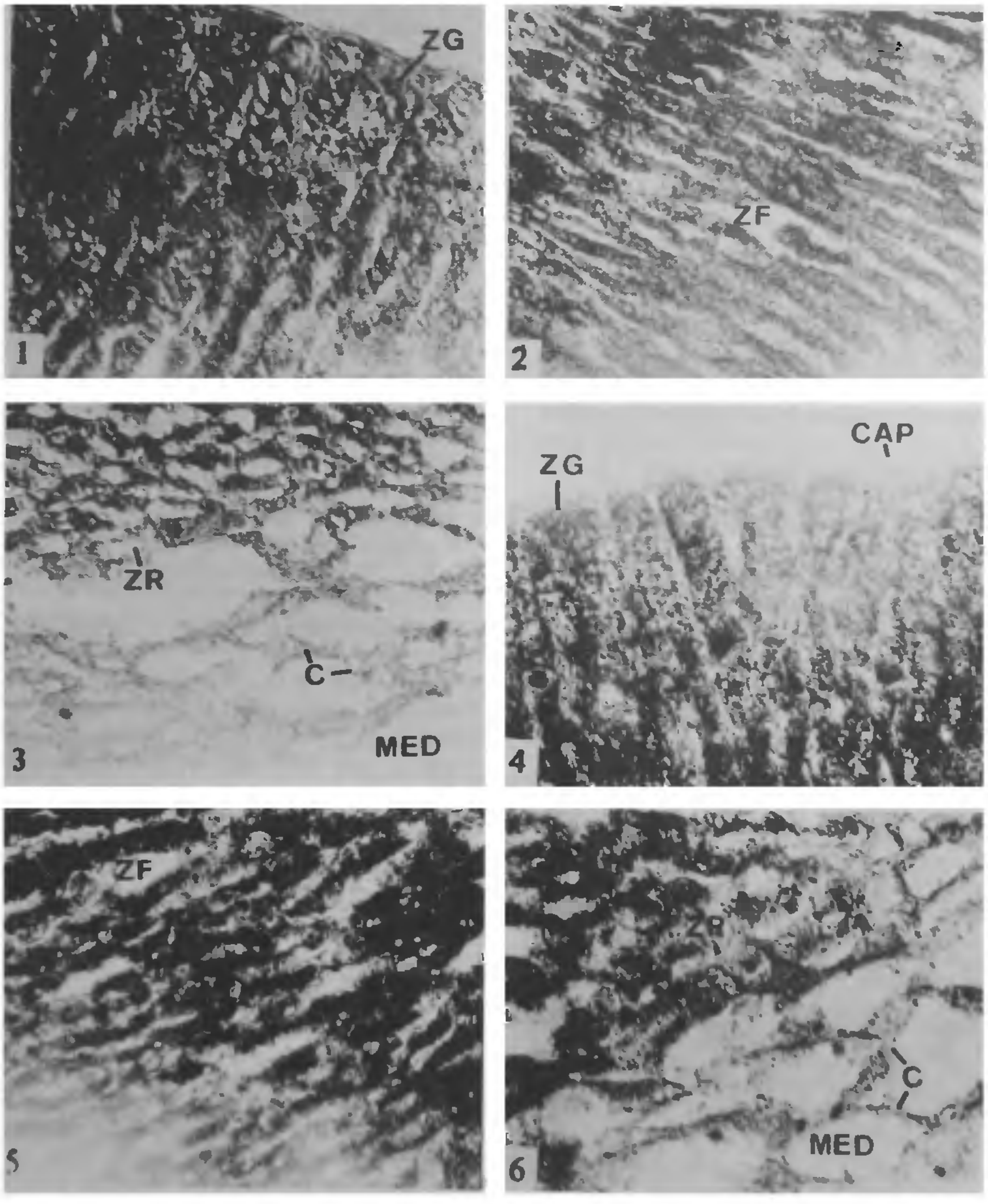
HISTOARCHITECTURAL studies on the adrenal gland of bats have revealed true zonation of adrenal cortex in some of the species[1–5], but no distinct zonation in Eptesicus[6] and Taphozous longimanus[5,7]. Not much

work has been done on the enzymological profiles of chiropteran adrenal gland[2,5,7–9]. The present study deals with the histochemical localization of alkaline phosphatase and 5′nucleotidase in the adrenal gland of *Pteropus giganteus giganteus*.

Adult males of *P. g. giganteus* were collected from



Figures 1—6. Alkaline phosphatase and 5′ nucleotidase activity in the adrenal gland of *Pteropus giganteus giganteus* (× 100). **1–3.** Alkaline phosphatase activity: Intense activity in zona glomerulosa (ZG) and zona fasciculata (ZF), moderate in reticularis (ZR) and slight in medulla (MED) can be seen; **3–6.** 5′nucleotidase activity: Intense activity in zona glomerulosa and zona fasciculata, high in reticularis and moderate in medulla can be seen.

their roosting sites. Surgical procedures for the recovery of adrenal gland were described earlier[5]. Tissues were fixed in 10% chilled neutral formalin (4°C) for 6–8 h. Frozen sections (10 μm) were processed for alkaline phosphatase according to the Gomori method described by Pearse[10], and for 5′ nucelotidase according to Wachstein and Meisel[11].

The adrenal gland of *P. g. giganteus* exhibits a characteristic tripartite cortex and well-developed medulla. Positive activity of enzymes alkaline phosphatase and 5′nucleotidase was observed in the cortex and medulla but with varying intensities.

The activity of alkaline phosphatase was intense in the zona glomerulosa (figure 1:ZG) and zona fasciculata (figure 2:ZF). Reticularis (figure 3:ZR) showed moderate activity of this enzyme whereas medullary cells (figure 3:MED) arranged in a cord-like fashion (C) exhibited slight activity. Intense activity of 5′ nucleotidase was manifested by zona glomerulosa (figure 4:ZG) and zona fasciculata (figure 5:ZF). Reticularis (figure 6:ZR) displayed high activity and cells of medulla exhibited moderate activity.

The present study highlights the pattern and distribution of alkaline phosphatase and 5′nucleotidase in the adrenal gland of *P. g. giganteus*. The differences in alkaline phosphatase profiles in the cortex and medulla may be related to the differential rate of substrate hydrolysis and transfer of metabolites across the cell membranes. High activity in the cortical region may be linked to considerable demands of the metabolites to mobilize and transfer large amounts of energy-rich precursors. The low concentrations of this enzyme may be due to lesser demands and transfer of metabolites. Positive alkaline phosphatase activity is linked with the secretion of adrenaline[12,13]. Elftman[14] and Nicander[15] reported in mammals a higher concentration of alkaline phosphatase in the adrenal cortex of males. This agrees with our findings in *P. g. giganteus*.

The higher concentrations of 5′nucleotidase in the cortical cells may be due to their relatively high metabolic functions. The differential activity of this enzyme in the cortex and medulla may be related to the role in maintaining the levels of nucleic acids in these regions. Our observations differ with those of Barka and Anderson[16], who reported 5′ nucleotidase to occur mainly in the adrenal medulla of rat.

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BIOLOGICAL CONTROL OF WHITE GRUB USING *VERTICILLIUM LECANII* (ZIMMERM) VIEGAS

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BIOINSECTICIDE is being increasingly used to control major insect pests of crop plants. Its use is inevitable especially when there is no traditional and economical method for controlling crop pests. Micro-organisms are useful for biological control of insect pests[1–4]. The present study attempts to examine the possible use of an entomophagous fungus in controlling the white grub (*Holotrichia consanguinea* Blanch.), a polyphagous pest, which attacks most kharif crops causing 10–100%