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# Histoenzymic localization of hydrolases in goat kidney

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The present experiment was undertaken to obtain histoenzymic data in the goat kidney.

Fresh tissues collected from 8 goats were subjected to cryostat sectioning. Sections, 8 µm thick were incubated for the demonstration of alkaline phosphatases, acid phosphatases and glucose-6-phosphatases (Barka and Anderson 1963), 5-nucleotidase and adenosine triphosphatase (Wachstein and Meisel 1956) and nonspecific esterases (Gomori1952).

The observations showing relative intensities of various enzymes in different segments are summarized in Table 1.

other segments being weak to absent (Fig. 1).

Acid phosphatase (ACPase) activity was strong to very strong in PCT (supra- and perinuclear), very weak in glomerular epithelium and weak in rest of the tubular epithelium of the goat kidney (Fig. 2).

5-Nucleotidase (5-NTase) was moderate to strong in PCT and weak in Bowman's capsule and distal convoluted tubules (DCT) (Fig. 3).

Adenosine triphosphatase (ATPase) recorded strong to very strong reactions in PCT, weak to moderate in DCT and weak in

Table 1. Relative intensities of histoenzymic activities in various segments of nephron in goat

| Enzymes | Glomerular epithelium | Proximal convoluted tubule | Henle's loop | Distal convoluted tubule | Collecting tubules |
|---|---|---|---|---|---|
| AKPase | ± | +++++ | + | ± | - |
| ACPase | ++ | ++++ | ++ | ++ | ++ |
| 5-NTase | ++ | +++ | - | ++ | - |
| ATPase | ++ | +++++ | ++ | ++/+++ | ++ |
| G-6-Pase | - | +++/++++ | - | +++ | - |
| Ease | - | +++/++++ | + | + | + |

-, Absent; ±, doubtful; +, very weak; ++, weak; +++, moderate; ++++, strong; +++++, very strong.

Alkaline phosphatase (AKPase) reactivity in goat was localized as very strong along the brush borders of the epithelium of proximal convoluted tubules (PCT), the reaction in rest of the goat nephron (Fig. 4).

Glucose-6-phosphatase (G-6-Pase) was more or less uniformly moderate in PCT and DCT (Fig. 5).

Nonspecific esterases (Ease) reaction product was moderate to strong in the PCT, being relatively stronger in straight tubules and very weak to absent in other segments (Fig. 6).

Thus, in goat PCT all the enzymes showed

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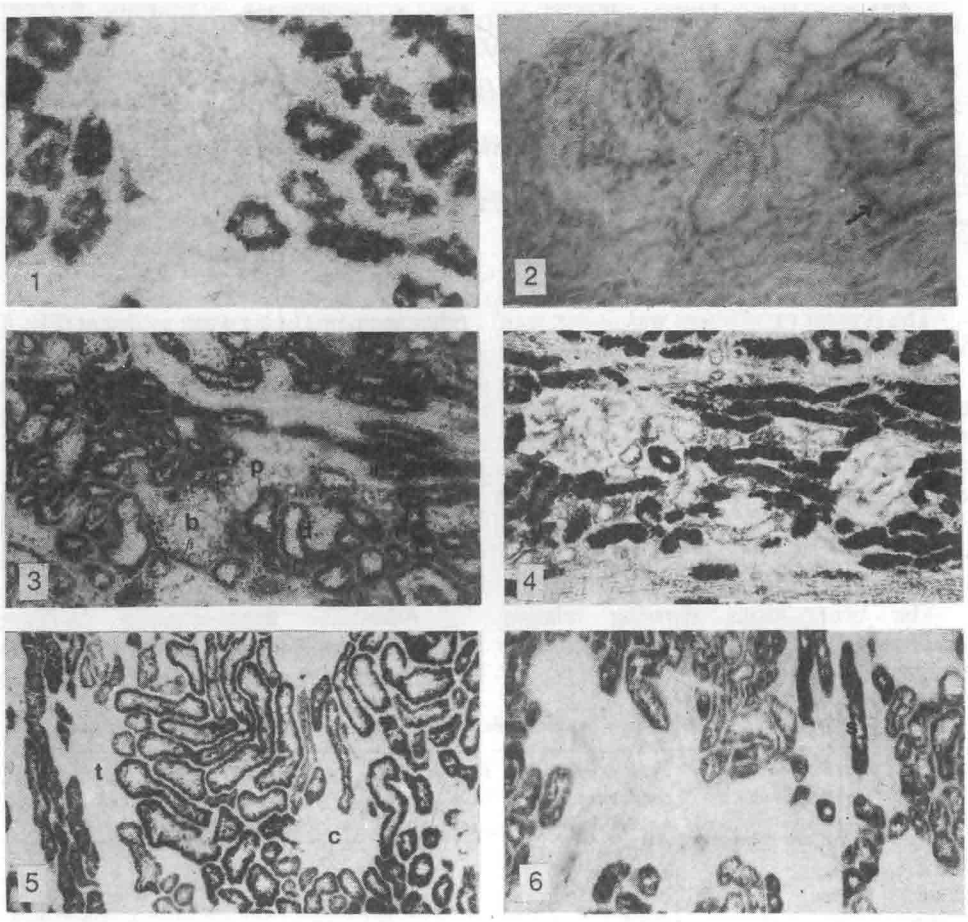


Figs 1-6. Sections of goat kidney showing: 1. AKPase activity in the proximal convoluted tubules. × 460; 2. ACPase activity prominent in proximal convoluted tubules (arrow) × 460; 3. 5-NTase activity with varying intensities in decreasing order in proximal tubules (p), distal tubules (d) and Bowman's capsule (b). × 230; 4. ATPase strongest in proximal tubules. × 230; 5. G-6-Pase strongest in proximal tubules, and not demonstrated in renal corpuscles (c) and thin segments in areas at 't'. × 230; 6. Ease activity strongest in straight segment of proximal tubule (s). × 230.

maximum intensities. In DTC the AKPase was doubtful, Ease was very weak and all other enzymes varied from weak to moderate. The activities were not demonstrated in Henle's loop for 5-NTase and G-6-Pase, in collecting tubules for AKPase, 5-NTase and G-6-Pase, and in glomerular epithelium for G-6-Pase, and Ease; otherwise these 3 segments had very weak to weak reactivities.

The different hydrolases studied in kidney of the goat have more or less similar distribution in different segments of the nephron as in sheep, cattle and pig (Robinson and Gopinath 1974) and buffalo (Nanda *et al.* 1983). However, certain species variations are concluded. The AKPase was very strong also in thin descending loops in buffalo. The 5-NTase in DCT was localized only in goat. The G-6-Pase was localized in PCT as well as DCT in goat and buffalo, but was limited to PCT in other animals. The Ease was not found in any segment other than PCT and collecting tubules in cattle, sheep and pig, whereas in goat and buffalo it was located with varying intensities

in almost all the segments of the nephron, and was relatively stronger in buffalo than in goat.

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