Immunohistochemical Evaluation of the Muscularis Mucosae in the Ruminant Forestomach

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Summary

The muscularis mucosae and condensed fibrous layer of the ruminant forestomach were studied by immunohistochemistry using specific antibodies against α-smooth muscle actin (αSMA) and γ-smooth muscle actin (γSMA). The specimens were collected from the rumen, reticulum and omasum of cattle, water buffalo, sheep, goat, Barbary sheep, Japanese serow, sika deer and mouse deer.

The muscularis mucosae showed immunoreactivity for both αSMA and γSMA. On the other hand, the condensed fibrous layer appearing between the propria mucosa and tela submucosa was immunoreactive only for αSMA except for that in the goat and Barbary sheep reticulum which is intermingled with γSMA immunoreactivity. The distribution of muscularis mucosae and/or condensed fibrous layer varied among the compartments of forestomach and ruminant species. In the rumen, only the condensed fibrous layer was detected. On the other hand, the omasum contained only the muscularis mucosae. In the reticulum, both were detected. The amount of the condensed fibrous layer in the reticulum varied among different species in the following order of abundance: goat > Barbary sheep > sika deer> sheep > water buffalo > cattle and Japanese serow. Smooth muscle cells of external muscle layer were immunoreactive for αSMA and γSMA whereas those of blood vessels and pericytes were immunoreactive only for αSMA. The present findings on the actin immunoreactivity and distribution profile of muscularis mucosae and the condensed fibrous layer provide additional knowledge to further understand the histophysiological specialization of the different compartments of the ruminant forestomach.

Received August 2002; accepted for publication August 2002