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Lectin Histochemistry of the Parotid and Mandibular Glands of Barking Deer, *Muntiacus muntjak*

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INTRODUCTION

The barking deer (*Muntiacus muntjak*), is a ruminant belonging to the family Cervidae. These animals are regarded as the oldest known species of deer. These animals inhabit areas of tropical forest and have a large distribution, being found from India eastwards across southeastern Asia as far as Indonesia [1]. Salivary glands play important roles in the digestive system, especially in ruminants. However the saliva of ruminants contains no digestive enzymes [2]. Lectin histochemistry is a sensitive method for detecting sugar residues or glycoconjugates [3,4]. To our knowledge, there is no report documenting the distribution glycoconjugate in the parotid and mandibular glands of barking deer. The present study was performed to characterize the parotid and mandibular glands glycoconjugates in the barking deer using lectin histochemistry.

MATERIALS AND METHODS

Parotid and mandibular glands were taken from two males adult barking deer. Paraffin wax sections of the glands were stained with seven kinds of biotinylated lectins (BK- 1000, Vector Lab., Burlingame, USA). The sections were observed using a light microscope equipped with an image analyzer (Olympus BX51, Tokyo, Japan). The intensities of staining reactions for lectins were graded as negative (–), weak (+), moderate (++) and strong (+++).

RESULTS AND DISCUSSION

The results showed that acinar cells of parotid gland were serous while those of the mandibular gland were of the mixed type. The distribution pattern of glycoconjugates varied among parotid and mandibular glands (Table 1).

Table 1 Lectin binding pattern of the salivary glands of the barking deer

Salivary glands	ConA	SBA	DBA	WGA	UEA	RCA	PNA
Parotid gland							
Serous cell	++	++	-	+++	+	+	+
Duct epithelial cell	+	++	-	+	+	++	+
Duct lumen	++	++	-	+	+	+	+
Mandibular gland							
Serous cell	+	+	-	+	-	+	+
Mucous cell	++	++	+++	+++	+ +	+++	-
Duct epithelial cell	++	++	++	+++	+ +	+++	++
Duct lumen	++	+	++	++	+	++	+

-, negative; +, weak; ++, moderate; +++, strong; ConA, Concanavalin A; SBA, Soybean Agglutinin; DBA, Dolichos biforus Agglutinin; WGA, Wheat germ Agglutinin; UEA, Ulex europeus Agglutinin; RCA, Ricinus communis Agglutinin I; PNA, Peanut Agglutinin.

In the parotid gland, the cytoplasm of the serous cells reacted strongly with WGA, and moderately with Con A and SBA, and weakly with UEA, RCA and PNA. There was no positive staining to DBA in the serous cells and duct epithelial cells and duct lumen of the parotid gland of barking deer. The striated duct epithelial cells reacted moderately with SBA and RCA, and weakly with Con A, WGA, UEA and PNA.

The mandibular gland showed that moderate staining of cytoplasm of striated duct epithelial cells with Con A, SBA, DBA, UEA and PNA, and strong with WGA and RCA. The secretion in the duct lumen of mandibular glands was positive to all lectin applied with moderate to strong intensities. The lectins Con A, SBA, WGA, UEA, RCA, and PNA were observed in acinar cells and/or in epithelium of the ducts, suggested various distribution of glycoconjugates with Man-α, Glc-α, Gal-β1-3, GalNAc, GlcNAc, sialic acid and Fuc-α sugar residues.

CONCLUSION

The results of this study revealed differences distribution of the carbohydrates and their glycoconjugates in the salivary glands of the barking deer. The glycoconjugate with GalNAc α sugar residue were not found in the serous acinar cells both glands.

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