MICROMETRICAL STUDY OF SEBACEOUS GLANDS IN SKIN OF RED KANDHARI COWS

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ABSTRACT
The sebaceous glands were multilobulated simple to branched alveolar type and situated in the papillary layer of the dermis surrounding the hair follicle. The depth of sebaceous gland in lactating, non-lactating and pregnant cow was 346.77, 399.79, 676.62 and 251.49 µm, 406.53 and 537.84 µm, 338.15, 361.05 and 525.22 µm at the dorsal, lateral and ventral aspect of body region respectively. The length of sebaceous gland in lactating, non-lactating and pregnant group was 75.19, 106.56 and 96.11, 96.94, 75.86 and 78.18, 78.35, 68.06 and 96.81 µm at the dorsal, lateral and ventral aspect of the body regions respectively. The width of the sebaceous gland in lactating, non-lactating and pregnant cow was 74.86, 59.42 and 64.07, 69.95, 68.99 and 53.95, 59.09, 53.95, 47.14 and 49.13 µm at the dorsal, lateral and ventral aspect of body regions respectively.

INTRODUCTION
Majority of the mammals are covered with hair coat, which forms the first line of defense against the invading pathogenic macro and microorganism as well as physical environment (Govindaiah and Nagaroenkar, 1983). Very less data is available in literature related to micrometrical study of sebaceous glands. Hence the present investigation has been made.

MATERIAL AND METHODS
The present study was conducted on 15 (fifteen) female red kandhari breed of cattle. The animals were grouped as lactating cows, non-lactating cows and pregnant cows. The skin biopsy samples were collected at the site of dorsal, lateral and ventral aspects at level of 7th rib. and fixed in 10% formalin. The tissues were processed in laboratory by adopting standard method of dehydration and clearing and embedding. The longitudinal and transverse sections of 5 to 6 microns thickness were obtained by rotary microtome. (Singh and Sulochana, 1997). The tissues were stained by using a harries haematoxyline and eosin stain for general histology, Verhoeff’s stain, crossman’s modification of Mallory’s triple stain per periodic acid Schiff stain.

The micrometry of stained histological sections was subjected to statistical analysis as per the standard procedures of Panse and Sukhatme (1967).

RESULTS AND DISCUSSION
The sebaceous glands were multilobulated simple to branched alveolar type and situated in the papillary layer of the dermis surrounding the hair follicle (Fig. 1, 2 and 3). Almost two sebaceous glands were associated with one hair follicle. The secretary cells were squamous type with centrally placed nuclei. In lactating cows the sebaceous glands were found bilaterally surrounded by hair follicle. The average depth of sebaceous gland in lactating cow at the dorsal, lateral and ventral regions ranged from 303.78 to 381.80 µm, 365.20 to 423.30 and 632.46 to 712.12 µm with a mean of 346.77 ± 5.03 µm, 399.79 ± 5.03 µm and 676.62 ± 5.3 µm (Table 1) respectively. The average length of the sebaceous gland ranged from 71.38 to 78.02, 104.58 to 112.83 and 91.30 to 102.96 µm respectively.

Fig. 1. Microphotograph of longitudinal section of skin from lactating cow showing -
Hf - Hair follicle
Sg - Sebaceous gland
Bv - Blood vessel
(Crossman’s modification of Mallory’s triple stain, 100X)

Fig. 2. Microphotograph of longitudinal section of skin from non-lactating cow showing -
Hf - Hair follicle
Sg - Sebaceous gland
Bv - Blood vessel
(Crossman’s modification of Mallory’s triple stain, 100X)

Fig. 3. Microphotograph of transverse section of skin from pregnant cow showing -
Hf - Hair follicle
Sg - Sebaceous gland
Bv - Blood vessel
Ap - Arrector pili muscle
Ef - Elastic fiber
(Crossman’s modification of Mallory’s triple stain, 100X)
### Table 1. Showing the measurements of the depth of sebaceous gland

<table>
<thead>
<tr>
<th>Region/group</th>
<th>Average milk yield per 30 days</th>
<th>Dorsal</th>
<th>Lateral</th>
<th>Ventral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean±SE</td>
<td>Range</td>
<td>Mean±SE</td>
</tr>
<tr>
<td>Lactating (µm)</td>
<td>75 to 90 lit</td>
<td>303.78-381.80</td>
<td>346.77±5.03</td>
<td>399.79±5.03a</td>
</tr>
<tr>
<td>Non-Lactating (µm)</td>
<td>-</td>
<td>235.72-263.94</td>
<td>251.49±5.04b</td>
<td>366.86-423.30</td>
</tr>
<tr>
<td>Pregnant (µm)</td>
<td>-</td>
<td>322.04-366.86</td>
<td>338.15±5.04a</td>
<td>341.96-375.16</td>
</tr>
<tr>
<td></td>
<td>H.S.</td>
<td>H.S.</td>
<td>H.S.</td>
<td></td>
</tr>
</tbody>
</table>

H.S. = Highly significant at 1 % level.

### Table 2. Length of sebaceous gland

<table>
<thead>
<tr>
<th>Region/group</th>
<th>Dorsal</th>
<th>Lateral</th>
<th>Ventral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean±SE</td>
<td>Range</td>
</tr>
<tr>
<td>Lactating (µm)</td>
<td>71.38-78.02</td>
<td>75.19±0.90a</td>
<td>104.58-112.88</td>
</tr>
<tr>
<td>Non-Lactating (µm)</td>
<td>92.96-12.96</td>
<td>96.94±0.90b</td>
<td>73.04-79.68</td>
</tr>
<tr>
<td>Pregnant (µm)</td>
<td>73.04-83.00</td>
<td>78.35±0.90c</td>
<td>63.08-73.04</td>
</tr>
</tbody>
</table>

Sig = Significant at 1% level.

### Table 3. Width of sebaceous gland

<table>
<thead>
<tr>
<th>Region/group</th>
<th>Dorsal</th>
<th>Lateral</th>
<th>Ventral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean±SE</td>
<td>Range</td>
</tr>
<tr>
<td>Lactating (µm)</td>
<td>71.38-78.02</td>
<td>74.86±0.8a</td>
<td>58.10-61.42</td>
</tr>
<tr>
<td>Non-Lactating (µm)</td>
<td>66.40-74.40</td>
<td>69.95±0.9b</td>
<td>64.74-73.04</td>
</tr>
<tr>
<td>Pregnant (µm)</td>
<td>49.80-58.10</td>
<td>53.95±0.8c</td>
<td>43.16-49.80</td>
</tr>
</tbody>
</table>

Sig = Significant at 1% level.
with a mean of 75.19±0.9 µm, 108.56±0.9 µm and 96.11±1.07 µm at dorsal lateral and ventral in the skin of lactating cow respectively (Table 2). The average milk yield was 75 to 90 lit (30 days and fat per cent was 4.7. The sebaceous gland width ranged from 71.38 to 78.02 µm, 58.10 to 61.42 µm and 58.10 to 71.38 µm at the dorsal, lateral and ventral body regions respectively (Table 3) in lactating cow.

In non-lactating cow, the sebaceous glands were found three to four in number of various shape and size surrounding one hair follicle. The holocrine activity was exhibited in lactating and non-lactating cows. The average depth of sebaceous gland at dorsal, lateral and ventral regions ranged from 235.94 to 263.94, 366.86 to 423.30 and 531.20 to 546.14 µm with a mean of 251.49±5.4, 406.53±5.04 and 537.84±8.4 µm respectively. The average length of the sebaceous gland ranged from 92.96 to 101.96, 73.4 to 79.68 and 74.70 to 83.00 µm with a mean of 96.94±0.9, 75.86±0.9 µm and 78.18±1.08 µm at the regions of dorsal, lateral and ventral in skin of lactating cow (Table 1). The sebaceous gland width ranged from 66.40 to 74.40, 64.74 to 73.04 and 54.78 to 69.72 µm with a mean of 69.85±0.8, 68.99±0.8 and 59.09±1.44 µm in dorsal, lateral and ventral region respectively.

The sebaceous glands in pregnant cow were found at the proximal part of the dermis associated with the hair follicle. The average depth of sebaceous glands in pregnant cow at dorsal, lateral and ventral regions ranged from 322.04 to 366.68, 341.96 to 375.16 and 514.60 to 544.48 µm with a mean of 338.15±5.04, 361.05±5.03 and 525±5.3 µm respectively. The average milk yield was 75 to 90 lit/30 days and fat per cent was 4.7. The average length of the sebaceous gland ranged from 73.04 to 83.00, 63.08 to 73.04 and 81.34 to 91.30 µm with a mean of 78.35±0.9, 68.6±0.9 and 86.81±1.07 µm in the regions of dorsal, lateral and ventral in skin of pregnant cow respectively (Table 2). The sebaceous gland width ranged from 49.80 to 58.10, 43.16 to 49.8 and 44.82 to 54.78 µm with a mean of 53.95±0.8, 47.14±0.7 and 49.13±1.44 µm at the dorsal, lateral and ventral regions respectively (Table 3) in pregnant cows.

In present study the average depth of sebaceous glands was found more in red kandhari cow when compared with reports of Mugale (2000) in Deoni cattle.

The information on depth of sebaceous glands in domestic animals in different groups is intraceable in the available literature. Hence the present record on sebaceous glands in red kandhari cow could not compared.

REFERENCES