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BRIEF COMMUNICATIONS

A Note on the Structure of Tail Hairs From a Pygmy Hippopotamus (*Choeropsis liberiensis*)

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The pygmy hippopotamus (*Choeropsis liberiensis*), like the Nile hippopotamus (*Hippopotamus amphibius*), defecates by backing into vertical objects while making a series of rapid, propellerlike tail movements that spread a mixture of urine and feces in a wide swath. Split hairs from the distal ventral surface of the pygmy hippopotamus tail were studied with the scanning electron microscope to determine whether the splitting was a normal character of the hair or was due to damage. The results suggest that splitting is a normal feature of the hair that may facilitate the dispersal of urine and feces.

Key words: scent marking, hair structure, pygmy hippopotamus

INTRODUCTION

The pygmy hippopotamus (*Choeropsis liberiensis*) (Fig. 1) defecates by backing into vertical objects while making a series of rapid, propellerlike tail movements that spread a mixture of urine and feces in a wide swath [Leuthold, 1977]. Both Pocock [1923] and Lochte [1951] have described and illustrated the tail. The tail is short and stout and the ventral surface of the distal end is covered with bristlelike hairs (Fig. 2). Pale cream in color, these hairs measure 5 cm in length. Many of the hairs are split over three-quarters of their length into as many as six or more unequal sections (Fig. 3). Scanning electron microscopy (SEM) was used to determine whether the splitting of these hairs was a result of physical damage much like human "split ends."

METHODS

Several tail hairs were collected from an adult female pygmy hippopotamus which had died at the National Zoological Park in Washington, DC. The hairs were

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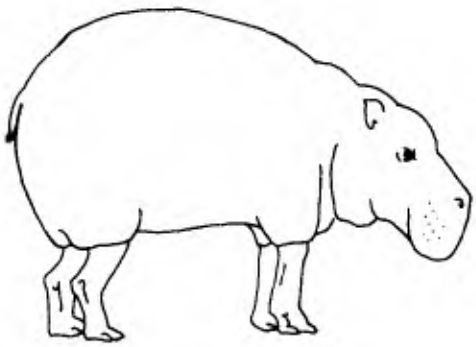

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Fig. 1. Adult pygmy hippopotamus.

Fig. 2. Pygmy hippopotamus tail.

Fig. 3. Pygmy hippopotamus tail hair.

preserved in 10% formalin. A 5-mm segment containing the base of the split was mounted on a square-glass coverslip (22 mm) with Elmer's Glue-All, a polyvinyl resin. The segment was coated first with carbon using a EFFA vacuum evaporator then with gold-palladium using a lab-designed direct-current sputtering unit. The hair was examined with a Cambridge Mark IIA scanning electron microscope using a Cambridge Series 200 Goniometer stage. For comparative purposes a human head hair with a split end was also examined by the same methods.

RESULTS

The split pygmy hippopotamus hairs were characterized by smooth lines of dehiscence. Individual sections were U-shaped with smooth interior and exterior surfaces. No medullary or cortical fragments were apparent on the interior surfaces. The smooth dehiscent lines and the absence of medullary and cortical fragments suggest that this is the normal condition for the hairs of the tail (Fig. 4).

The human split ends are a result of both physical and chemical abuse. The damage, visible in its fractured and frayed appearance, is obvious in the scanning electron micrograph (Fig. 5). In contrast the pygmy hippopotamus hair appears to be damaged when examined macroscopically, but the micrograph in Figure 6 shows that in fact it is not damaged.

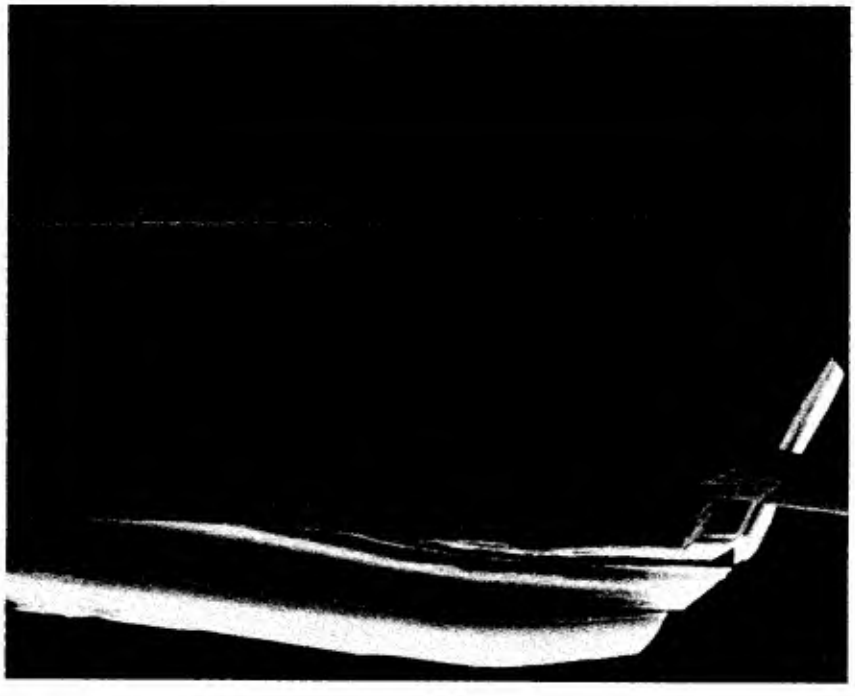

Fig. 4. Scanning electron micrograph of individual sections of the split pygmy hippopotamus tail hair (× 40).

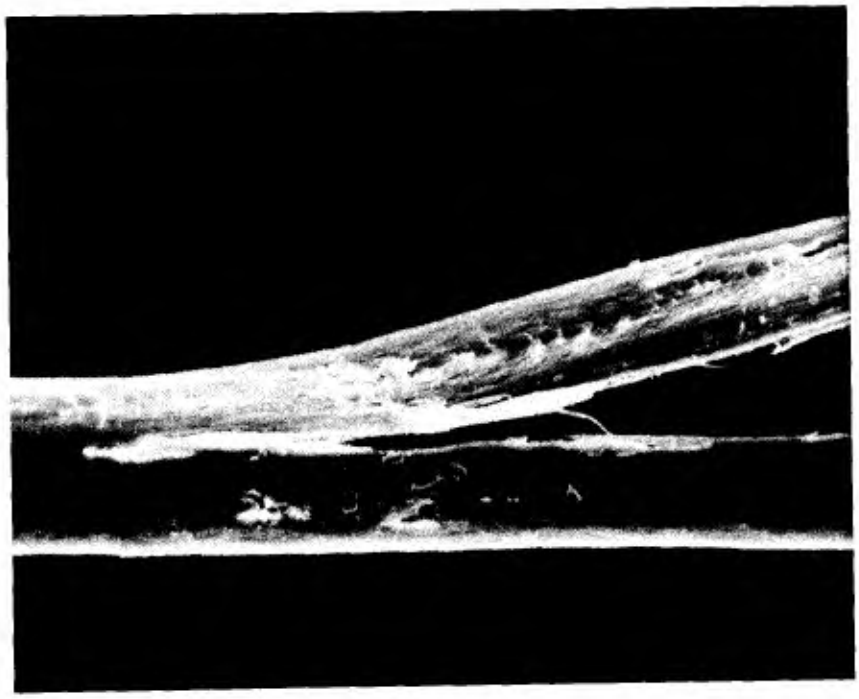

Fig. 5. Scanning electron micrograph of human "split end" (× 300).

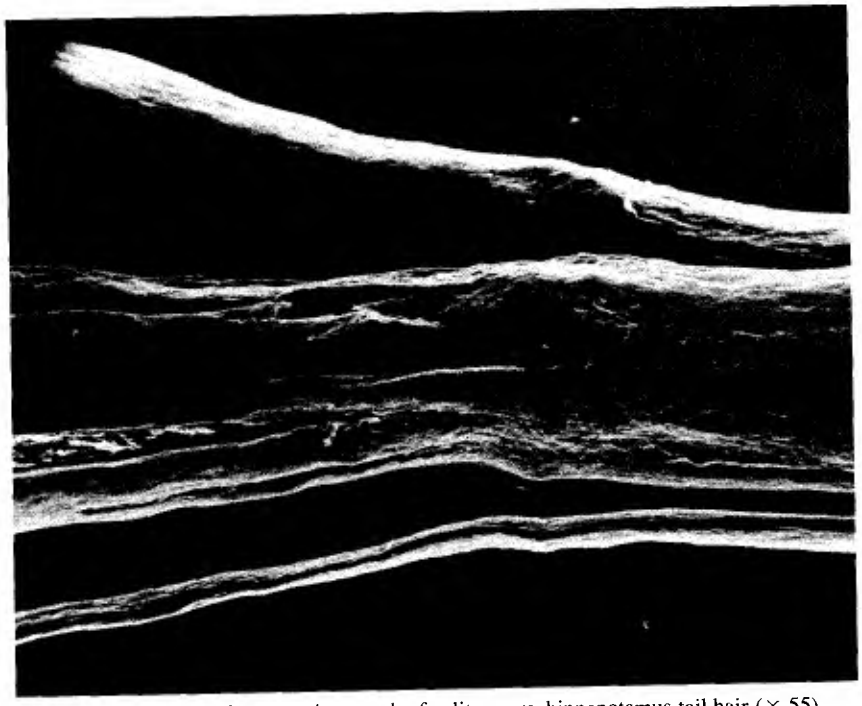

Fig. 6. Scanning electron micrograph of split pygmy hippopotamus tail hair (× 55).

DISCUSSION

Appelt [personal communication] examined with light microscopy serial cross sections of pygmy hippopotamus tail hairs. He observed preformed lines of dehiscence at the base of the split hairs, further evidence that the splitting is normal and not due to damage. His findings suggest that the hairs open along these lines as a result of the mechanical action of the rotation of the tail during defecation. Appelt [1976, 1978] also described a similar phenomenon in the tail hairs of the white rhinoceros (*Ceratotherium simum*) and the Nile hippopotamus (*Hippopotamus amphibius*). In addition he noted that upper lip bristles of the latter are split in the same way as the tail hairs.

The Nile hippopotamus, like the pygmy hippopotamus, spread their urine and feces onto vertical objects by rapid tail movements. Lang [1975] suggested that in the pygmy hippopotamus at least, this behavior is a form of territorial scent marking. The splitting of the tail hairs of these species may function to increase the hair's surface area and improve the efficiency with which the urine and feces mixture is spread in the environment. Specialized hairs for the retention, release or application of glandular secretions have been described in several mammalian species [Müller-Schwarze et al, 1977; Stoddart, 1979; Sokolov et al, 1980]; hair apparently specialized for the dispersal of other scent-marking material (urine and feces) has not been described. This hypothesis must, however, be tested further since the similar splitting of upper lip bristles in the Nile hippopotamus and the tail hairs of the white rhinoceros is not explained by it.

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