



Little evidence for vibrissal capsular muscles in humans

Sven Schumann¹

Received: 27 December 2023 / Accepted: 23 January 2024 / Published online: 3 February 2024
© The Author(s) 2024

Dear Professor Takeda,

With great interest, I have read the review about atavistic and vestigial anatomical structures in the human body by Dhawan (Dhawan et al. 2023). I want to congratulate the authors for this sophisticated publication but also share my personal opinion about one specific topic mentioned in the review.

Vibrissae (pili tactiles, whiskers, sinus hairs) are specialised sensory hairs which respond to mechanical stimuli. Vibrissae are characterised by a specific morphology. The thickened hairs are emitted from the follicle sinus complex (FSC) which contains the hair follicle surrounded by two large blood sinuses (the upper ring sinus and the lower cavernous sinus). The FSC is covered by a thick collagenous capsule and a layer of skeletal muscle. The musculature derives from the facial muscles which move the upper lip and the wing of the nose. The FSC is densely innervated. Sensory information from vibrissae is transmitted mainly via the infraorbital nerve (from the maxillary branch of the trigeminal nerve).

As mentioned in the review, Tamatsu postulated the existence of vestiges of vibrissal capsular muscles in the human upper lip (Tamatsu et al. 2007) of Japanese females

and males. Unfortunately, there are several ambiguities concerning this study (e.g. confusion of blood vessels with hair follicles). Similar bundles of striated muscle fibres are visible not only in the human upper lip, but also in the lower lip (Fig. 1 A + B). These fibre bundles more likely represent the rectus labii muscle, which passes from the oral mucosa to the skin (synonyms: compressor labii muscle (Klein 1868); muscle compresseur des lèvres de KLEIN (Testut 1899)) (Fig. 1 C). In addition, I never observe blood sinuses or similar structures surrounding human face hairs in West-European body donors.

To my knowledge, there are no more publications supporting the existence of vibrissal capsular muscle residues in humans. Therefore, I only see little evidence for the existence of these structures. I want to encourage all anatomists to share own findings about this topic, especially since there is a controversy about the presence (Narisawa and Kohda 1993) or absence (Standing 2016) of arrector pili muscles in the face and the possibility of different findings in different populations.

Kind regards,
Sven Schumann.

✉ Sven Schumann
sven.schumann@uni-mainz.de

¹ Institute of Anatomy, University Medical Center
of the Johannes Gutenberg-University Mainz,
Johann-Joachim-Becher-Weg 13, 55128 Mainz, Germany

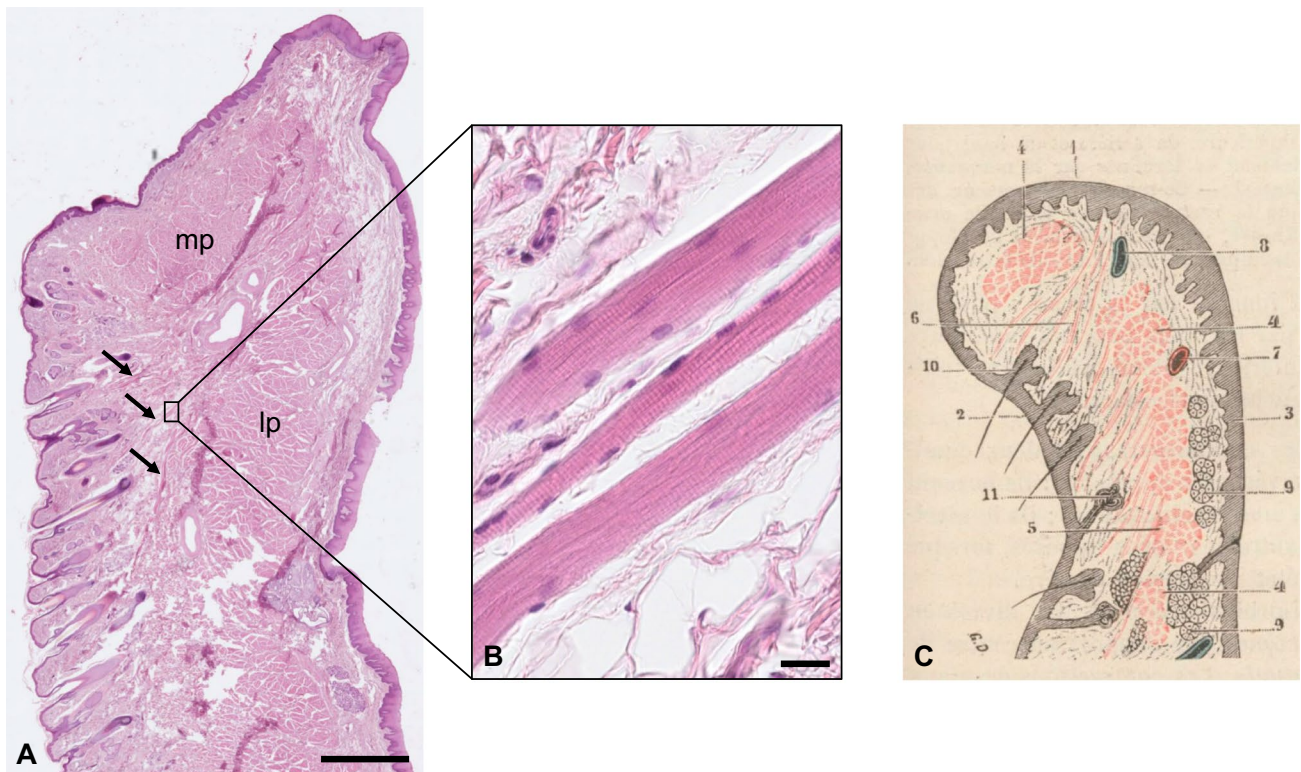


Fig. 1 **A:** Human lower lip. Marginal part (mp) and labial part (lp) of the orbicularis oris muscle are indicated. Bundles of skeletal muscle fibres are visible (arrows). Bar=2000 µm, hematoxylin and eosin stain, specimen from the histological teaching collection Mainz,

Germany. **B:** Skeletal muscle fibre bundle in higher magnification. Bar=20 µm. **C:** Schematic drawing of the inferior lip (taken from Testut 1899, Fig. 602). The muscle compressor des lèvres de KLEIN is marked with 6

Funding Open Access funding enabled and organized by Projekt DEAL.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Dhawan SS, Yedavalli V, Massoud TF (2023) Atavistic and vestigial anatomical structures in the head, neck, and spine: an overview. *Anat Sci Int* 98(3):370–390
- Klein E (1868) Zur Kenntnis des Baues der Mundlippen des neugeborenen Kindes. *Sitzungsberichte der mathematisch-naturwissenschaftlichen Klasse der kaiserlichen Akademie der Wissenschaften*. Wien 58:575–584
- Narisawa Y, Kohda H (1993) Arrector pili muscles surround human facial vellus hair follicles. *Br J Dermatol* 129(2):138–139
- Standring S (ed) (2016) *Gray's Anatomy - the anatomical basis of clinical practice*. Elsevier, Amsterdam, p 150
- Tamatsu Y, Tsukahara K, Hotta M, Shimada K (2007) Vestiges of vibrissal capsular muscles exist in the human upper lip. *Clin Anat* 20(6):628–631
- Testut L (1899) *Traité d'anatomie humaine. Ostéologie - Arthrologie - Myologie*. Octave Doin, Paris

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.