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## SHAPE QUANTIFICATION OF SULAWESI MACAQUES ISCHIAL CALLOSITIES

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The endemic seven species of Sulawesi macaques have a pair of sitting pads (ischial callosities) of unique and various shapes. Previously, only verbal descriptions were available for this character. Although useful, these verbal descriptions cannot fully describe shape variation and are somewhat subjective. Moreover, verbal descriptions cannot also be used directly to reconstruct the general shape pattern which is important to infer the relationship between morphological types. Here, we present a shape quantification of Sulawesi macaque ischial callosities using geometric morphometric tools to optimally describe shape variation and objectively reconstruct general pattern of callosity morphotypes. Using consensus coordinates of the callosity outlines, we compare the relationships of each Sulawesi macaque species with each other, and with the two geographically neighboring macaque species, *Macaca nemestrina* and *M. fascicularis*. We found that variation exists in the dorsal part and in the degree of bending (curving of outline) of the callosity. There are three general morphotypes of callosity in Sulawesi macaques and these morphotypes relate congruently with geographical distribution. The pathway of shape change may have originated from oval without bending morphotype in the central region and southern peninsula, to outward bending in the southeastern peninsula and to oval or reniform with inward bending in the northern peninsula.

Keywords: ischial callosities, Sulawesi macaques, *Macaca*, morphometrics