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A New Generic Name for the Hoolock Gibbon (Hylobatidae)

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Contrary to usual practice, the generic nomen Bunopithecus *is not applicable to hoolock gibbons. We recount the history of its application and explain why it is spurious. We supply a new generic name, list the characters and content of the genus, and compare it to the other 3 genera of the Hylobatidae.*

KEY WORDS: Hylobatidae; gibbon; *Bunopithecus; Hoolock*; taxonomy; nomenclature.

In the early part of the 20th century, at least since Elliot (1913), it was standard practice to divide the small apes (Hylobatidae, sometimes downgraded to subfamily Hylobatinae of the Pongidae) into 2 genera: *Hylobates* (smaller gibbons) and *Symphalangus* (siamangs). This 2-way split was shown to be untenable by Groves (1968), who urged that the concolor gibbons (formerly regarded simply as a species of *Hylobates: H. concolor*) were at least as different from *Hylobates* and *Symphalangus* as they were from each other. His solution was to recognize only a single genus, with 3 subgenera. Groves (1972) further noted that each subgenus has a distinctive karyotype.

It remained for Prouty *et al.* (1983a) to show that hoolock gibbons (hitherto called *Hylobates hoolock*, and placed in the subgenus *Hylobates*), have a different karyotype again, and so should be set apart in a fourth subgenus. Prouty *et al.* (1983b) proposed that the subgenus should be *Bunopithecus*, using a name proposed 60 yr earlier for a fossil gibbon.

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Bunopithecus sericus was described by Matthew and Granger (1923) on the evidence of a mandibular fragment with M_{2-3} from fissure deposits at Yen-ching-kao (Yanjinggou) in Sichuan, China; the deposits were at that time supposed to be Late Pliocene, but are now known to be Middle Pleistocene. The specimen resembled *Hylobates* "except for the greater width of molar [sic] and large size of hypoconulid on m_2 and m_3." The authors added that "the hypoconulid is as large as the entoconid on both teeth. In the gibbon it is small on m_2 and absent on m_3; m_3 is narrower and smaller than m_2 in the gibbon but broader in *Bunopithecus*. The species is about the size of the hoolock." (Matthew and Granger, 1923: 588). Colbert and Hooijer (1953), using a much larger comparative sample, were able to show that all 3 of the supposed distinctions could be found in modern gibbons, and reduced *Bunopithecus* to a subgenus of *Hylobates*.

Colbert and Hooijer (1953:29 [Fig.7.A]) figured the 2 molars of the mandible of *Bunopithecus sericus* alongside the corresponding molars of a modern gibbon from collections of the American Museum of Natural History. The specific identity of the modern specimen is not given, and Eric Delson (pers comm to Groves 22/11/2004) reports that it has no locality, but we think it is probably a hoolock, judging by the large size of the teeth.

The caption of Colbert and Hooijer's (1953) figure was misread by Frisch (1965:80), who referred to "two specimens of the Pleistocene gibbon . . . illustrated in Colbert and Hooijer . . . " and ". . . the two known specimens" and accordingly listed 2 specimens in his Tables XXV and XXVII (pp. 82, 88). On p. 87 he noted resemblances of the 2 (!) to *Hylobates hoolock*. Based on Frisch's opinion of its affinities, Groves (1972) provisionally listed *sericus* as a subspecies of *Hylobates hoolock*. Prouty et al. (1983b) reported examining a considerable number of hylobatid mandibles, but it is difficult to avoid the implication that they too, like Groves (1972), were influenced by Frisch (1965) when they opted to use *Bunopithecus* as the name for the subgenus containing the hoolock.

This interpretation of *sericus* as a fossil hoolock has been widely accepted. Until recently the only exception was Gu (1989), who in the course of a review of the fossil hylobatid material in China remarked that the teeth of the type of *sericus* "closely resemble those of *H. concolor*" (Gu, 1989:512). We do not agree with her, but it is nonetheless unfortunate that her opinion, dissenting from the consensus that it is a hoolock, has been overlooked by most subsequent commentators.

The matter has been recently reviewed by Groves (2004), who found that the type of *Bunopithecus sericus* is outside the range of modern Hylobatidae in its dental characters. The anterior fovea is much larger and less sharply demarcated in general, but with a larger mesial crest; the entoconid is reduced; the hypoconulid is very large; and the wide central basin

so characteristic of modern gibbons is undeveloped and encroached on by the surrounding cusps and grooves.

Recognition of the 4 subgenera of Prouty *et al.* (1982a,b) as full genera is now widespread (Geissmann, 2002; Brandon-Jones *et al.*, 2004), and we are in agreement that this is warranted. A generic name is a mandatory part of the scientific name whereas a subgeneric name is not, so it is vital that the name that is given to the genus containing the hoolock should be correct. The major reason why Groves (2001:289, 293) continued to recognize only subgenera, not full genera, of gibbons was a reluctance to foster a wider circulation of the incorrect nomen *Bunopithecus*. We therefore feel it urgent to rectify the matter.

Although under the Code (*International Commission on Zoological Nomenclature*, 1999), Art. 13.1, we are not obliged to provide a description of a new taxon (it would suffice to provide a bibliographic reference to one), we feel that in this instance, rather than simply refer to the description by Prouty *et al.* (1983b), it may be convenient to give a full generic diagnosis.

***Hoolock* gen.nov.**

Bunopithecus Prouty, Buchanan, Pollitzer and Mootnick, 1983b. *Amer.J.Primat.* 5:85. In part; not of Matthew and Granger, 1923:588, Fig. 18.

Type species *Simia hoolock* Harlan, 1834.

Diagnosis. A genus of Hylobatidae distinguished from all others by having a diploid chromosome number of 38; by the high number of coccygeal vertebrae (averaging 4.5); by the convex nasal bones pointed at the tip; by the narrow chest girth; by brow hair length increasing at the onset of maturity in males; and by the vocalizations, which are not sexually dimorphic, and include a guttural growl. Of all the gibbon taxa, hoolock infants display the greatest contrast in color compared to their mothers (infants are nearly white). Differs from *Symphalangus* and *Nomascus* in having testes in pre- to parapenial sacs rather than a pendulous scrotum, the early-developing ischial callosities, intermembral index below 136, the low flat skull vault, the backwardly directed crown hair, and the production of both in-breath and out-breath vocalizations during territorial calls, in all of which states it resembles *Hylobates*. Differs from *Hylobates* in the large teeth and wider tooth row, the presence of a throat sac in both sexes, the nasal septum extending below the level of the alae, the large genital tuft, the long clitoris, the long baculum, and the presence of a baubellum (os clitoridis), in all of which respects it resembles *Symphalangus*, and in all except the large teeth and presence of a throat sac in the female it resembles *Nomascus*. Differs from both *Symphalangus* and *Hylobates*, and resembles *Nomascus* alone, in

the pattern of sexual dichromatism: both sexes turn black after infancy, and the male remains overall black and the female becomes varying shades of brown and fawn at maturity; female hoolock gibbons produce an orange-toned water soluble substance on the entire body during high humidity or extreme heat, similar to the female *Nomascus*.

Etymology. The common English name of members of the genus is *hoolock*, derived from the Bengali and Hindi *ulluck*, which in turn may derive from the Assamese *houlou*. The pronunciation of both *ulluck* and *houlou* sounds similar to the tones the hoolock produces during vocalization.

Contents. A single species, *Hoolock hoolock* (Harlan, 1834), is currently recognized; but the differences between the 2 recognized subspecies are apparently fixed, so that they are diagnosably different and are better ranked as separate species: *H. hoolock* (Harlan, 1834) west of the River Chindwin and *H. leuconedys* (Groves, 1967) east of it. The descriptions which follow are based on Groves (1967) modified and extended by observations on numerous specimens by Mootnick, both living in the Gibbon Conservation Center at Santa Clarita (California, USA) and elsewhere, and preserved (in North American, European and Chinese collections): As far as concerns the black-phase morphs, i.e., the adult males and the juveniles of both sexes: In the eastern hoolock gibbon (*Hoolock leuconedys*), the male develops a grizzled silvery colored chest and a silver genital tuft, and in all black-phase individuals—adult males and juveniles of both sexes—the white brow streaks are widely separated instead of being partially joined in the midline.

Differences between the pale phases—adult females—are as follows. In the western species, adult female hands and feet are generally the same color as the body hair, with a black fringe on the fingers, toes, and the edge of the hands; there is some black in the genital region. In the eastern species, adult female hands and feet are slightly paler than the limbs are and may have a few white or black hairs; the genital region is similar in color to the surrounding area.

Hybrids between the 2 taxa are known from the headwaters of the Chindwin.

Notes. Generic characters in the Hylobatidae are mosaic in nature, presumably reflecting differential loss of aspects of the original hylobatid morphotype. The first split within the family was between *Nomascus* and the others, followed by *Symphalangus*, and *Hoolock* and *Hylobates* separated last. Genetic distances among the 4 genera imply separation times exceeding those between *Homo* and *Pan*, and comparable to those between *Homo* or *Pan* and *Gorilla*, so reinforcing the need to recognize them as full genera (Hayashi *et al.*, 1995; Hall *et al.*, 1998). Characters of the soft anatomy differ

between *Hylobates, Hoolock* and *Symphalangus* (Groves, 1972:35–38, 52–53); we have not added these to the generic diagnosis because those of *Nomascus* are unknown to us; there is a publication on the anatomy of *Nomascus* in Chinese (Wu *et al.*, 1978), but it has not been translated.

Like *Nomascus, Hoolock* occur in the widest range of elevations of all gibbon species. The 2 genera share a mode of color change which is unique among the Primates; both sexes change from a pale infant coat to an overall black one, but females change again at sexual maturity to brown or fawn. The possible significance of this for sexual selection is unknown. Because the 2 genera do not form a monophyletic clade, we suppose if to be a symplesiomorphic condition, which may relate to their distribution outside the tropics and their tolerance of high altitudes. The other feature which they share, the production of presumably thermoregulatory orange secretion in females (which has at times been mistaken for pelage pigmentation), we also interpret as symplesiomorphic. Hoolocks are the only apes in South Asia (NE India and Bangladesh).

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