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A presumptive new hylobatid subgenus with 38 chromosomes

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Abstract. The gibbon *Hylobates hoolock* has been found to possess a karyotype different in diploid number and banding pattern from that of any other hylobatid. We propose that the hoolock gibbon occupy its own subgenus in the genus *Hylobates*.

Most current classifications of the lesser apes recognize three major taxa, each of which has a distinctive chromosomal complement. It is well established that the nomascus, or concolor, gibbons have a diploid chromosome number of 52, the siamangs 50, and the remaining species, including the lar, pileated, and Kloss gibbons, 44. We have evidence that there is a fourth major hylobatid taxon occupied by a single species, the hoolock gibbon, formerly believed to have a diploid number of 44. Our data show that the hoolock has a karyotype distinct from other hylobatids and that its diploid number is 38.

We have examined three female animals from the Greater Los Angeles Zoological Gardens currently on breeding loan to the Gibbon and Gallinaceous Bird Center in Saugus, California. All three possess the distinctive karyotype and have the morphological and vocal features which identify them as hoolocks.

Whole blood cultures from them were set up and harvested in the standard manner or with culture synchrony induced to obtain long chromosomes (Yunis and Chandler, 1977). Metaphase spreads were stained with Giemsa. Karyotypes were prepared with chromosomes arranged in descending order of size (fig. 1). The two 10's in this Giemsa-stained karyotype are associated. This association occurs in a small percentage of late metaphase cells. The karyotype shows no acrocentric autosomes, a condition expected in a primate karyotype with a low diploid number.

Metaphase and prometaphase chromosomes were banded using the quinacrine mustard technique of Caspersson et al. (1970). Chromosomes 1, 3, 4, 6, 7, and 8 are large submetacentrics. Chromosome 10 has a very dull Giemsa-staining and fluorescent-banding subtelocentric region. The X chromosome has been identified on the basis of its resemblance to the banding pattern and overall morphology of the X chromosome of *Hylobates lar*. To confirm its identity, Hoechst staining for the late-condensing X is under way. The centromeric regions of all the chromosomes appear to be dull-staining, with the possible exception of the 12. Long, non-centromeric dull-staining regions are found on 1, 6, and 7, and dull-staining subtelocentric regions are found on the short arms of 9, 10, and 13.

Five of the large submetacentric chromosomes (1, 4, 6, 7, and 8) have no obvious equivalents among other hylobatid chromosomes. A low degree of chromosomal homology among the major taxa is typical of hylobatids (Couturier et al., 1982; van Tuinen and Ledbetter, 1982). This new karyotype exhibits only slight homology with that of *Hylobates lar*. More homology may emerge as we increase the banding resolution.

Our finding that *Hylobates hoolock* has a diploid chromosome number of 38 conflicts with the early result of Chu and Bender (1961). The single animal which they studied had a diploid complement of 44. We have found that other gibbon species are frequent-

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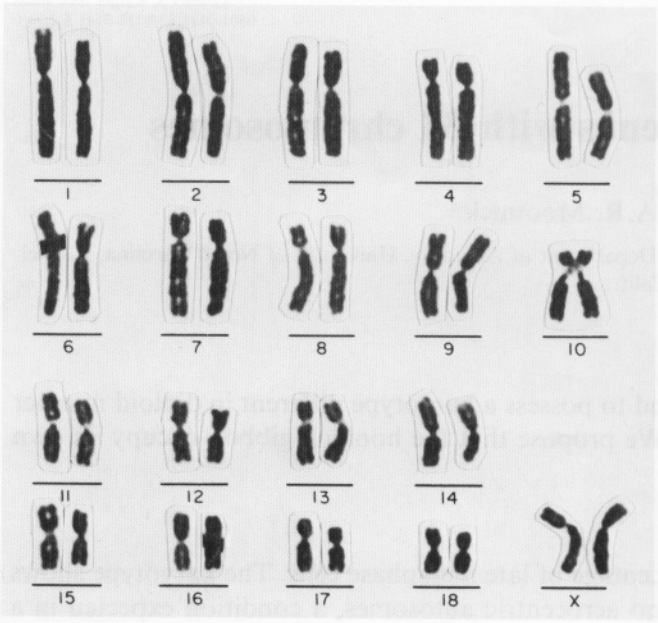

Fig. 1. Giemsa-stained karyotype of a single cell from a female *Hylobates hoolock*. The autosomes are arranged in descending order of size. The homologues of the 10 are associated.

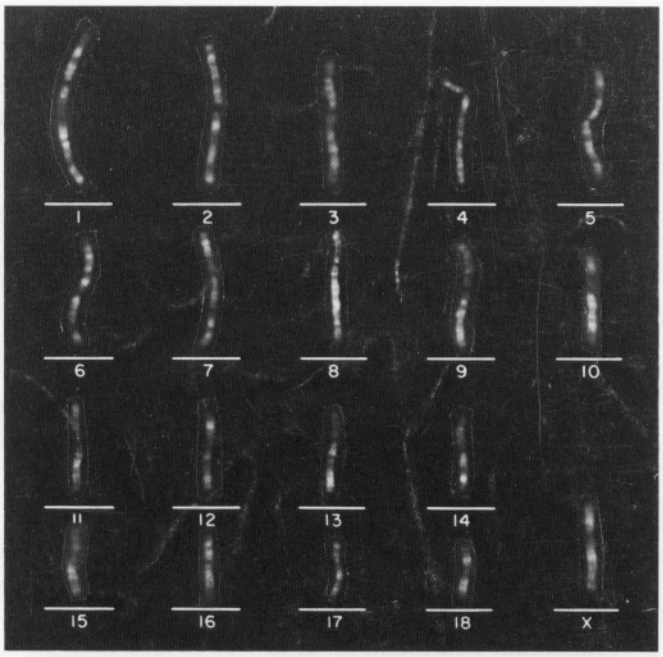

Fig. 2. A composite quinacrine mustard banded half-karyotype from cells of a single hoolock female.

ly misidentified as *hoolock*. Chiarelli (1972), in his review of gibbon karyology, reported that the kidney cells from a "black coated animal... classified as *Hylobates*" consistently gave a diploid count of 38 chromosomes. Examination of the karyotype of one of these cells shows the large submetacentrics typical of the hoolock. This inadequately identified gibbon was doubtless a hoolock.

That *Hylobates hoolock* has a karyotype different from any other hylobatid is in keeping with the anatomical data which show it to be distinct from other gibbons and the siamang (Groves, 1972; Creel and Preuschoft, 1976; Haimoff et al., in press). Clearly a revision of taxonomy for the hylobatids will be necessary. Groves' taxonomy (Groves, 1972) has enjoyed wide currency. It recognizes one genus, *Hylobates,* and three subgenera, *Nomascus, Hylobates,* and *Symphalangus*. We propose a fourth subgenus, occupied by the species *hoolock* and the two subspecies *hoolock* and *leuconedys*. We are currently investigating available names for the suggested new subgenus.

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