

GIBBON TAXONOMY TO BE UTILIZED BY BREEDING FACILITIES

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Abstract

Two of the purposes for breeding gibbons in captivity are to retain species and subspecies diversity and to create a viable gene pool, with the ultimate goal of releasing offspring into protected native habitat. Accurate identification of an individual gibbon's species may be complicated within some gibbon species by

- 1) the variety of coat colors,
- 2) the existence of different colors for the two sexes,
- 3) the occurrence of coat color changes at sexual maturity, and in all species by
- 4) the impact of malnutrition and housing (e.g. indoors only or in full sunlight) on coloration,
- 5) the ease with which gibbon species' vocalizations are confused,
- 6) the difficulty with which some gibbon subspecies are distinguished from each other,
- 7) and a dearth of information on the individual gibbon's origins, as may occur when a gibbon is confiscated. Given these problems, it is not surprising that breeding facilities may encounter difficulties in the identification of gibbons. For this paper, gibbons' specific and subspecific status was determined through the comparison of study skins housed in North American and Southeast Asian museums and live specimens housed at the International Center for Gibbons Studies and zoos.

Introduction

Gibbons (*Hylobates*) are small, arboreal apes, inhabiting the tropical and semi-deciduous forests of Asia. They are distributed from Assam and Bangladesh in the northwest, eastward to Yunnan, Indochina, Thailand and the Malaysian Peninsula, and southward to the Indonesian and Malaysian islands. Adult gibbons weigh 5-15 kg and have long arms relative to their body size. Gibbons' pelage colors may vary within and between species, ranging from black to browns, grays, and buffs. With the exception of the siamang (*Hylobates syndactylus*), there is little sexual dimorphism in size, but some species do exhibit sex-specific color patterns.

The World Conservation Union (IUCN) considers all gibbon species threatened or endangered (Eudey, 1987; Groombridge, 1993). International captive breeding programs have been established to preserve the gibbon gene pool; unfortunately, some gibbon species have proved difficult to maintain in captivity. Factors contributing to the decline of some captive gibbons include hybridization, a monogamous mating system, few population founders from the rarer species, and behavioral abnormalities attendant with hand-rearing (Mootnick & Nadler, 1997).

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Gibbon systematics traditionally have been controversial and confusing. One of the purposes of zoos or other captive facilities is to breed gibbons so that species and subspecies diversity is retained. But the accurate identification of an individual gibbon may be complicated by

- 1) the variety of coat colors within some gibbon species,
- 2) the existence of different colors for the two sexes in some gibbon species,
- 3) the occurrence of coat color changes at sexual maturity for some gibbon species,
- 4) the impact of malnutrition and housing (e.g. indoors only or in full sunlight) on coloration,
- 5) the ease with which some gibbon species' songs are confused,
- 6) the difficulty with which some gibbon subspecies are distinguished,
- 7) and a dearth of information on the individual gibbon's origins who were confiscated. Given these problems, it is not surprising that zoos and other breeding facilities may encounter difficulties in the identification of gibbons.

Methods

Specific and subspecific status was determined through the comparison of study skins housed in NY, C, W, H, B, and S. Additional criteria followed Groves (1972), Marshall and Sugardjito (1986), and Geissmann (1995). Vocalizations of live specimens were compared to Marshall & Marshall (1978) and Marshall & Sugardjito (1986). Data was collected between 1977 and 1997 at the International Center for Gibbon Studies and at the following zoos: SDZ, LAZ, SZG, ZNM, TSI, and KBR. Geographic distributions for each species are summarized in Table 1; sample body weights are provided in Table 2.

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Table 1 Distribution and Nomenclature of Extant Gibbons (*Hylobates*)

Subgenus <i>Symphalangus</i> (2n=50 chromosomes)			
Species	Subspecies	Common Name	Distribution
<u>syndactylus</u>	<u>syndactylus</u>	Sumatran siamang	Sumatra
	<u>continentis</u>	Malayan siamang	Peninsular Malaysia
Subgenus <i>Nomascus</i> (2n=52 chromosomes)			
Species	Subspecies	Common Name	Distribution
<u>concolor</u>	<u>concolor</u>	Tonkin black-crested gibbon	S and C Yunnan Province, N Vietnam
	<u>hainanus</u>	Hainan black-crested gibbon	Hainan Island
	<u>jingdongensis</u>	Jingdong black-crested gibbon	C Yunnan Province
	<u>furvogaster</u>	Cangyuan black-crested gibbon	SW Yunnan Province
	<u>lu</u>	Laotian black-crested gibbon	NW Laos
<u>leucogenys</u>	<u>leucogenys</u>	Northern white-cheeked gibbon	S Yunnan Province, N Laos, N Vietnam
	<u>siki</u>	Southern white-cheeked gibbon	C Vietnam, C Laos
<u>gabriellae</u>	none	Buff-cheeked gibbon	S Vietnam, S Laos, W Cambodia
Subgenus <i>Bunopithecus</i> (2n=38 chromosomes)			
Species	Subspecies	Common Name	Distribution
<u>hoolock</u>	<u>hoolock</u>	Western hoolock gibbon	Assam, Bangladesh, Myanmar W of Chindwin river
	<u>leuconedys</u>	Eastern hoolock gibbon	Myanmar E of Chindwin river, SW Yunnan Province
Subgenus <i>Hylobates</i> (2n=44 chromosomes)			
Species	Subspecies	Common Name	Distribution
<u>klossii</u>	none	Kloss' gibbon	Mentawai Islands
<u>moloch</u>	none	Javan gibbon	W and C Java
<u>pileatus</u>	none	Pileated gibbon	Cambodia, SE Thailand
<u>agilis</u>	<u>agilis</u>	Mountain agile gibbon	highlands of S Peninsular Malaysia, Sumatra
	<u>unko</u>	Lowland agile gibbon	lowlands of S Peninsular Malaysia, Sumatra
<u>muelleri</u>	<u>albibarbis</u>	Bornean agile gibbon	SW Borneo
	<u>muelleri</u>	Eastern Mueller's gibbon	SE Borneo
	<u>abbotti</u>	Abbott's gibbon	W Borneo
<u>lar</u>	<u>funereus</u>	Northern Mueller's gibbon	N Borneo
	<u>lar</u>	Malayan lar gibbon	S Peninsular Malaysia

<u>carpenteri</u>	Carpenter's lar gibbon	NW Thailand
<u>entelloides</u>	Mainland lar gibbon	SE Myanmar, Thailand, S Yunnan Province, N Peninsular Malaysia
<u>vestitus</u>	Sumatran lar gibbon	N Sumatra
<u>yunnanensis</u>	Yunnan lar gibbon	W Yunnan Province

Table 2 Sample Body Weights for Gibbons (Hylobates)

Subgenus Symphalangus

Species	Subspecies	Institution	Reference #	Sex	Kg
<u>syndactylus</u>	<u>syndactylus</u>	ICGS	HS917	F	11.14
	<u>syndactylus</u>	ICGS	HS918	M	14.77
	<u>continentis</u>	ICGS	HS905	F	10.0
	<u>continentis</u>	ICGS	HS906	M	12.27

Subgenus Nomascus

Species	Subspecies	Institution	Reference #	Sex	Kg
<u>concolor</u>	<u>hainanus</u> *	KIZ	none given	unspecified	5.8-10.0
	<u>concolor</u> *	KIZ	none given	unspecified	7.7-10.0
	<u>jingdongensis</u> *	KIZ	none given	unspecified	6.9-8.7
	<u>furvogaster</u> *	KIZ	none given	unspecified	5.0-8.0
<u>leucogenys</u>	<u>leucogenys</u>	ICGS	HNL600	M	8.18
<u>gabriellae</u>	none	LAZ	94241	F	5.75

Subgenus Bunopithecus

Species	Subspecies	Institution	Reference #	Sex	Kg
<u>hoolock</u>	<u>leuconedys</u> *	KIZ	none given	unspecified	5.3-8.5
	<u>leuconedys</u>	ICGS	HHL303	F	7.04
	<u>leuconedys</u>	W	257988	F	6.60

Subgenus Hylobates

Species	Subspecies	Institution	Reference #	Sex	Kg
<u>agilis</u>	<u>albibarbis</u>	W	145326	F	6.0
	<u>albibarbis</u>	LPZ	588336	F	5.5
	<u>albibarbis</u>	LPZ	588335	M	6.05
	<u>agilis</u>	ICGS	HAA402	M	5.91
	<u>agilis</u>	ICGS	HAA404	M	7.27
	<u>agilis</u>	ICGS	HAA445	F	6.32
	<u>agilis</u>	ICGS	HAA401	F	5.82
	<u>unko</u>	W	123152	M	7.39
	<u>unko</u>	W	144092	F	5.80
<u>moloch</u>	none	ICGS	HMO802	M	8.41
<u>moloch</u>	none	ICGS	HMO801	F	8.18
<u>pileatus</u>	none	ICGS	HP114	M	7.86
<u>pileatus</u>	none	ICGS	HP116	M	10.45
<u>pileatus</u>	none	ICGS	HP117	F	6.36
<u>pileatus</u>	none	ICGS	HP119	F	8.64
<u>muelleri</u>	<u>muelleri</u>	C	41514	F	5.91
	<u>funereus</u>	C	85925	F	4.5
<u>lar</u>	<u>vestitus</u>	W	143569	M	5.5
	<u>vestitus</u>	W	112711	F	5.0
	<u>entelloides</u>	C	99740	M	5.88

klossii

entelloides
yunnanensis*

none

C
KIZ
W

99751
N=4
121679

F
not specified
F

5.70
3.9—5.0
6.13

*source: Ma, Wang, & Poirier, 1988