
A STUDY ON THE SPECIES OF MONKEYS

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Abstract

A complete populace investigation of three monkey species (for example *Macaca fascicularis*, *Macaca nemestrina* and *Trachypithecus obscurus*) was guided to decide the prevailing species, populace amount and gathering size. The study was directed between November 2011 and May 2012. The procedure adjusted for the investigation was filter testing strategy; Population study demonstrated that there were 23 gatherings of 508 people of three monkeys' species in three conditions of Peninsular Malaysia (Penang, Kedah and Perak). Single direction Anova test was utilized to locate the huge distinction among over three species and to think about their methods. Grown-up guys demonstrated a critical contrast between two species regarding populace (for example *Macaca fascicularis* and *Macaca nemestrina* and p -esteem is $p < 0.01$). Grown-up females, sub-grown-ups and adolescents were discovered to be huge when contrasted with *Macaca fascicularis* and *Macaca nemestrina* which were found $p < 0.008$, $p < 0.01$ and $p < 0.04$ separately. The newborn children were discovered non-critical and *Trachypithecus obscurus* indicated no variety in correlation with other two species. The study found that the *Macaca fascicularis* was the most predominant types of Peninsular Malaysia. It was noticed that the number of inhabitants in *Macaca nemestrina* was declining and the number of inhabitants in *Trachypithecus obscurus* was steady types of Peninsular Malaysia.

Key words: *Macaca fascicularis*, *peninsular Malaysia*, *scan sampling*.

INTRODUCTION

Understanding the advancement of human discernment and correspondence lays basically on near examinations with other surviving individuals from the primate request. There are two significant and interrelated floods of exploration; one spotlight on the development of the mind, while different targets explaining similitudes and contrasts in conduct. Such examinations accordingly fuse data about the phylogenetic connections between species just as the putative particular weights that may have assumed a function in forming animal varieties' intellectual abilities. Inside the hominoidea (primates and people), the last basic predecessor of people and their nearest family members, the chimpanzees and bonobos, is dated at around 6 mya [1], while the split between the Hominoidea and the Cercopithecoidea (Old World monkeys) happened somewhere in the range of 29 and 24 mya. Considering this phylogenetic data is an essential for recognizing the elements in the development of explicit transformations. One striking

element inside the primate request is a lopsided expansion in relative cerebrum size from monkeys to gorillas to people.

Specifically, the neocortex has encountered extensive development. The neocortex is significant for tangible observation, age of engine orders, and higher comprehension. During the 1980s, the most unmistakable theory was that the expansion in cerebrum size in primates was identified with frugivory, that is, the need to discover food that is patchily conveyed in reality. Lately, the center has gotten back to the possibility that primate knowledge advanced because of the difficulties of living in enormous and complex gatherings – the purported "Social Brain" theory. Regardless of whether this expansion in mind size simultaneously predicts an expansion in psychological capacities stays questionable. For example, it has been recommended that general cerebrum size best predicts the intellectual capacities across nonhuman primates.

All the more as of late, various researchers have meant to determine more explicit connections between specific cerebrum regions and psychological execution. Shultz and Dunbar for instance, asserted that the neocortex proportion and hippocampus volume are especially significant for critical thinking and chief control. Others, in any case, have called attention to that endeavors to connect cerebrum size to work is full of issues, including the decision of the factors entered in the investigations, and the issues related with various relationships. Further, size in essence probably won't be the basic factor, yet truth be told the measured quality and interconnectedness of various cerebrum territories. However, it is undisputed that human minds are excessively bigger than the cerebrums of other primate species. In accordance with this, an orderly examination of the intellectual abilities of human babies and incredible gorillas uncovered considerable contrasts in psychological execution.

Subjects were tried in generally indistinguishable trials (the purported Primate Cognition Test Battery [PCTB]). While extraordinary chimps and kids indicated moderately comparative skills in the actual area (space, amounts, causality), human kids dominated in the socio-intellectual undertakings; specifically as far as consideration sharing, collaboration, and mental state attribution. This backings the suspicion that social viewpoints were the main impetus in the advancement of insight, in any event in the change from gorillas to people. To build up a full comprehension of the developmental elements of primate insight, in any case, relative information for monkeys are required. With the expansion in mind size from monkeys to gorillas one would foresee that chimps would outflank monkeys in intellectual assignments. To be sure, Byrne and Whiten noted for instance that strategic double dealing is by all accounts more normal in incredible primates than in monkeys. Moreover, just extraordinary gorillas perceive themselves in mirrors loaning further help for the qualification among monkeys and primates. A meta-examination of distributed nonhuman primate discernment concentrates additionally showed that "extraordinary chimps altogether beat different heredities" (p. 115) in their general execution.

As opposed to these outcomes, an ongoing report by Amici and associates recommended that the intellectual capacities of monkeys and primates are not all that extraordinary. They looked at the presentation of three monkey species (arachnid monkeys, capuchin monkeys, longtailed macaques) and each of the four extraordinary chimp species in spatial uprooting and backing assignments (for example

utilizing for instance a whole material to pull in a prize) and found no help for an obvious distinction among gorillas and monkeys. Remarkably, an extra examination zeroing in on restraint undertakings uncovered that species living in frameworks with parting combination elements (chimpanzees, bonobos, orangutans, and insect monkeys) beat individuals from species that live in more steady gatherings (since quite a while ago followed macaques, gorillas and capuchin monkeys). Evidently, the degree of social multifaceted nature anticipated the inhibitory aptitudes better than phylogenetic relatedness or environmental conditions.

One potential clarification for the discrepant appraisals of the contrasts among monkeys and gorillas might be that the (meta-) examinations joined consequences of tests or perceptions made in various investigations utilizing various strategies. Besides, the contrasts among monkeys and gorillas may have been overestimated, in light of the fact that in numerous investigations profoundly prepared chimps were contrasted with credulous monkeys. Accordingly, albeit more similar investigations are currently accessible deliberate interspecific examinations are as yet uncommon.

The distinctions in outcomes may likewise be because of the way that various tests may take advantage of various psychological areas. All in all, there might be no expansion all in all insight from monkeys to gorillas, however more area explicit contrasts. Curiously, Amici and associates found no unmistakable qualification among monkeys and chimps in their spatial memory, interpretation, and backing undertakings, yet what stays obscure is whether there are contrasts between the two genealogies with respect to other intellectual viewpoints. For example, in the examinations extraordinary chimps and kids didn't vary in their physico-intellectual limits, however just in the trials depending on social perception. Maybe this is additionally the situation in the change from monkeys to primates. Consequently, we set out to efficiently contrast the aptitudes of monkeys with that of chimps, applying similar test as Hermann and partners on primates and little children. We in this manner led the total set-up of trials of the Primate Cognition Test Battery with Old World monkeys (olive mandrills and since quite a while ago followed macaques) housed at the German Primate Center and contrasted them with the aftereffects of incredible gorillas.

The information for the primates were generously made accessible to us by Hermann and associates. On the off chance that an expansion in mind size predicts a general expansion in psychological execution, we would conjecture that the monkeys perform less well than the gorillas in all trials. Conversely, if an expansion in cerebrum size is (pretty much) straightly identified with an increment in socio-psychological abilities, at that point we would foresee that the chimps outcompete the monkeys particularly in the socio-intellectual assignments, while they ought to perform on a pretty much tantamount level in the actual space. Nonetheless, it may likewise be the situation that the human heredity went through a nonlinear expansion in socio-psychological abilities, in which case we would foresee that primates and monkeys don't uncover significant contrasts in both of the intellectual spaces. As late investigations have indicated further factors can impact the exhibition in psychological undertakings, for example, a bashful or striking personality or the measure of inhibitory control To control for those angles we incorporated the demeanor and inhibitory control trials of Herrmann et al. in which we estimated the subject's response to novel items, individuals, and rewards, and their capacity to control their driving forces in a spatial memory task.

Comparable to the past examinations we expected to discover an impact of these boundaries on the intellectual exhibitions of the monkeys.

OBJECTIVE

1. A comprehensive population study of three monkey species (i.e. *Macaca fascicularis*, *Macaca nemestrina* and *Trachypithecus obscurus*) was piloted to determine the dominant species, population quantity and group size.

The study species

The Arunachal macaque

The Arunachal macaque is a recently depicted primate animal groups from the Eastern Himalayan mountain ranges in the upper east Indian territory of Arunachal Pradesh. It is an enormous bodied, dull hued, montane Old World monkey (OWM) which have been ordered based on its penile morphology, inside the sinica species-gathering of the sort, which likewise incorporates the Assamese macaque *M. assamensis*, the Tibetan macaque *M. thibetana*, the hat macaque *M. radiata* and the hat macaque. A piece of the species' realized dissemination range has been investigated since its disclosure and the species has generally been seen or detailed from heights somewhere in the range of 2,000 and 3,000 m in the areas of Tawang, West Kameng, Upper Subansiri and West Siang in Arunachal Pradesh while the neighborhood individuals have announced its occasional event upto 3,500 m.

It is conceivable, given the wide circulation scope of the species that the species may likewise happen in the abut zones of Bhutan and Tibet in the west and the north, in spite of the fact that these districts have not yet been investigated for the species. The easternmost conveyance of the Arunachal macaque, nonetheless, is probably going to expand just till the stream Brahmaputra, a characteristic boundary that apparently isolates this species from populaces of the Eastern Assamese macaque *M. assamensis*. The Arunachal macaque have generally been located in multimale-multifemale troops, with bunch sizes going from five to more than 60 people, with a mean size of 21.6 (\pm 10.4) people. Based on its social association, the species has all the earmarks of being a run of the mill individual from the sinica species-gathering of the macaques displaying a matrifocal society with open minded social connections among the grown-up guys and females inside a troop. By and large, each troop comprises of one to two grown-up guys, a few grown-up females and a variable number of subadults, adolescents and babies of both genders.

Based on 22 contemplated troops in the Tawang region of western Arunachal Pradesh, Kumar et al. (2008) revealed the general grown-up sex proportion in the species to be 52 guys for every 100 females, the baby to adult female proportion, 17 for each 100 females, and the adolescent to-grown-up female proportion, 110 for each 100 female. It was additionally found, in view of primer segment information on six soldiers in the Zemithang area of the very locale, that the grown-up females in these soldiers may have an interbirth timespan years (Kumar et al. 2008; Sinha et al. 2013).



Figure 1. An adult male Arunachal macaque on a rock façade in the Zemithang region of Tawang district in Arunachal Pradesh The typical dark body colouration and short tail is visible along with the seasonal light forehead patch typical of the species (from Sinha et al. 2005; photo credit: M D Madhusudan)

The Arunachal macaque has generally been accounted for from two differentiating scenes: subtropical woods and regions of serious human development and home. The subtropical vegetation generally incorporates broadleaved backwoods (up to 3000 m, with *Rhododendron*, *Acer*, *Alnus*, and *Quercus* as the predominant tree species), conifer-broadleaved woodlands (3000-4200 m, with *Abies densa*, *Juniperus*, *Larix*, *Picea*, *Rhododendron*, and *Quercus*), and timberland clearings, to a great extent pastureland made by clearing and consuming broadleaved woodlands and conifer-broadleaved woodlands, with bushes, for example, *Rosa* and *Berberis*, and forbs, for example, *Anaphalis*, *Potentilla*, *Sambucus*, *Rumex*, and *Senecio*. At low-to mid-heights, the wide leaved backwoods are additionally essentially debased in the region of human residences and show up as optional scour, with diminished tree cover and overwhelmed by tree species, for example, *Erythrina*, *Rhus*, *Elaeagnus* and *Debregeasia* (Kumar et al. 2008). Based on ongoing investigations, the species seems to have genuinely all around delimited home reaches, changing in size from 7 to 55 ha While the home scopes of neighboring soldiers may likewise cover partly (Kumar et al. 2008), with the inhabitant troops normally existing together calmly, actual covers, by the by, are consistently dodged to keep away from agonistic between bunch experiences by planning non-covering day by day development by each troop (Kumar, pers. obs.). Development inside and out of the frequently inexact characterized home reach, notwithstanding, gives off an impression of being essentially affected by accessibility of food (Mendiratta et al. 2009). This species is perhaps one of the most imperiled of every Indian primate (IUCN 2012). The Eastern Himalaya is additionally home to around 145 ancestral networks, which have expanded especially in populace size lately (four-crease in the province of Arunachal Pradesh alone since 1947; Anonymous 2006). The interest for wild meat from metropolitan populaces, combined with the dispersion of new chasing advances, has additionally fuelled the quick elimination of numerous Himalayan species, including primates (Aiyadurai 2011). The most

genuine endurance danger looked by the species over quite a bit of its appropriation range in focal (Upper Subansiri and West Siang areas) and western (Tawang and West Kameng regions) Arunachal Pradesh today is chasing (Kumar et al. 2007, 2008; N. Gama, unpublished information).

Albeit variable across areas, the main reasons referred to for its broad slaughtering has been in reprisal to trim harm brought about by the simians, for food and game, for pet-and business exchange, and for the supposed restorative estimation of its tissue for the two people and domesticated animals (Sinha et al. 2006b). It was assessed that a normal of around 30 individual macaques were killed per town (12 towns reviewed in the four areas) every year (somewhere in the range of 2004 and 2007) – a huge number thinking about that primatologists have had the option to record (from both essential and auxiliary sources) a populace of roughly 1,500 macaques over the four studied regions of the state up until this point (Kumar et al. 2007, 2008; N. Gama, unpublished information). Further, the grown-up females of the species neither all repeat at some random time nor conceive an offspring consistently, recommending a moderate to low birth rate for the reviewed populaces also (Kumar et al. 2008).

The bonnet macaque

The hood macaque *Macaca radiata* (Fig.2) is an endemic types of peninsular India and is inescapably conveyed over an assortment of environmental territories (Sinha 2001a). It is likewise one of the better-considered primate species from the Indian subcontinent, with graphic records going back to as right on time as 1925 (Pocock 1925; Hartman 1938; Simonds 1965; Sugiyama 1971). Fooden (1981 and 1986) have morphologically partitioned cap macaques into two subspecies, the southern „pale-bellied“ hat macaque (*Macaca radiata diluta*), dispersed in the profound southern locale of the landmass incorporating the conditions of Tamil Nadu and Kerala, and the northern „dark-bellied“ hood macaque (*Macaca radiata*), with a more broad appropriation through the conditions of Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Goa and Gujarat, stretching out up to Surat in the northwest of the promontory and the streams Krishna and Godavari in the upper east (Kumar et al. 2011). The cap macaque is generally found to live in multimale-multifemale troops of around 15 to 60 people (inspected in Sinha 2001a). The females, being philopatric like those of numerous other cercopithecine primates, stay in their natal gatherings for the duration of their lives, and during adulthood, structure solid, straight strength orders with girls involving predominance positions underneath those of their moms. Adolescent and subadult guys have generally been accounted for to emigrate from their natal soldiers, another commonplace cercopithecine include, hardly any occurrences, in any case, of guys remaining back in their natal soldiers and frequently accomplishing a high strength rank have additionally been accounted for in this species (Sinha 2001a; Sinha et al. 2005). Concerning social association in hat macaque, a drawn out examination by Sinha and his partners on an enormous, free-running populace of hat macaques in the Bandipur National Park – Mudumalai Wildlife Sanctuary of southern India, in any case, mentioned objective facts that were strikingly not the same as what was recently thought about the species. Sinha and partners (2003, 2005), above all announced the event of a huge extent (roughly half) of exceptional single-male yet multifamily troops (hereafter alluded to as „unimale troops“) in this populace. As indicated by them, the presence of quite a social association in the species had once in a while been accounted for in before examines or had been seen in extremely low extents.



Figure .2 An adult male bonnet macaque on a paved road near Suryakad, Tamil Nadu state. The round bonnet, long tail and cheek-pouch are visible (Photo credit: Author).

Sinha et al. (2005) further portrayed the unimale troops to have a profoundly female-one-sided sex-proportion over all age classes with broad inconstancy in conduct procedures including far and wide female resettlement, an illustration of inside species variety in social structure and social methodologies. Over its far and wide dispersion in Indian promontory, the hood macaque for the most part possesses two significant environmental specialties: an assortment of woodland types and zones of human development and residence. Sinha (2001a) inspected the distinctive woodland types occupied by the exceptionally versatile generalist macaques, which incorporate the montane evergreen rainforests of the Nilgiri slopes (now and again even upto a height of around 2100 m; Simonds 1965), low-rise semi-evergreen backwoods of seaside Kerala, sodden and dry deciduous timberlands of Karnataka and Tamil Nadu, bamboo woods, and the dry clean of the focal zones of the Deccan level. further educated that the monkeys are generally uncommon in extremely wet montane woodlands at higher heights, and the couple of troops that have been accounted for frequently apparently moved down to bring down rise, drier deciduous backwoods routinely. Besides, they simians should be incredibly uncommon in the shola woodlands and in the connecting meadows of the Nilgiri slopes of southern India. Hood macaques are, notwithstanding, significantly more typical in zones of human home and development, including towns flanking rural fields and ranches, unassuming communities (where they are normally experienced at sanctuaries or railroad and transport stations) or commonly even in the enormous urban areas like Chennai and Bangalore. Among perhaps the soonest gauge, proposed that the complete populace of hat macaques in the four south Indian states would be of the request for 1,70,000, with around 81,000 monkeys in Karnataka, 64,000 in Andhra Pradesh, 16,000 in Tamil Nadu and 11,000 in Kerala. What, by and by, stays obscure is the pace of decrease of a significant number of these populaces on the substance of the heightening of horticulture in provincial regions and the expanding bigotry towards the species in metropolitan territories over the most recent 30 years.

CONCLUSIONS

This study had, as its primary focus, the molecular phylogeny and comparative phylogeography of two primate species, the Arunachal macaque *Macaca munzala* and the bonnet macaque, *M. radiata*, from the Indian subcontinent. Our first goal was to investigate the molecular phylogenetic relationships between these two species, both members of the *sinica* species-group of the macaques, an exploration made more intriguing by the observation of the close morphological similarities between the recently-discovered Arunachal macaque and the sympatric Assamese macaque. Our results, however, revealed that, instead of the latter species, the Arunachal macaque showed greater genetic affinities with the allopatric bonnet macaque, especially in terms of its maternal inheritance. The ancestors of the modern Assamese macaque, nevertheless, appear to have subsequently contributed to the Arunachal macaque gene pool in the form of male-mediated introgression prior to the current course of the river Brahmaputra, currently a physical barrier to the two species, towards the end of the Pleistocene period. Our reconstruction of the phylogenetic history of these species suggest, on the basis of our morphometric and genetic data as well as published paleontological evidence, that the ancestral population of the present-day Arunachal macaques might have originated in southeast Asia, perhaps in regions close to present-day Myanmar and subsequently moved into the Indian subcontinent through the “corridor” in northeastern India to diversify further into multiple lineages including the Arunachal and bonnet macaques of today. We eventually concluded that the morphological similarity of the Arunachal macaque with other sympatric macaques within the *sinica* species-group might have been the result of long-term convergent morphological evolution, as exemplified by Bergmann’s and Allen’s rules.

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