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CHEMICAL COMPOSITION AND DIGESTIBILITY OF NATURAL AND DOMESTIC FOOD OF THE LAR GIBBON (HYLOBATES LAR) IN MALAYSIA

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CHEMICAL COMPOSITION AND DIGESTIBILITY OF NATURAL AND DOMESTIC FOOD OF THE LAR GIBBON (*HYLOBATES LAR*) IN MALAYSIA

By

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Dedicated to my mother

and to the memory

of my father.

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I declare that this dissertation is my own original work, except where it is expressly stated to the contrary that no part of it has been submitted to any other University.

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ABSTRACT

The collection of samples of natural foods of the lar gibbon (Hylobates lar) was undertaken at the Krau Game Reserve over a period of one year. A total of 145 plant items were collected of which 35 were consumed by the lar gibbon. Food samples were chemically analyzed for both primary and secondary metabolites. The non-eaten food items were analyzed for all or some of these measures. The principal diet of the lar gibbon is Ficus spp. There are probably attracted to these most because of their soft and succulent nature. The protein and amino acid requirements in the wild are achieved by consuming young leaves and invertebrates. The lar tends to avoid foods of high fat content. It avoids mature leaves due to their poor nutritive value. The lar obtains carbohydrates, readily available sugars and energy from the ripe pulp of fruits. High *in vivo* digestibility values were obtained for the formulated basal diet when compared to the natural and domestic foods. The *in vivo* and *in vitro* assays of Randia scortechinii, Knema cinerea and Sarcotheca grifithii gave values in fairly good agreement with one another. The present study concludes that the lar gibbon lacks specialisation of the gastro-intestinal tract for either the bulk intake of fibrous food or for the detoxification of alkaloids. The lar gibbon tends to avoid food with a high level of tannins. Therefore they are selective feeders in comparison with some other primates, being restricted to a diet of succulent fruit pulp, young leaves, flowers and invertebrates.

CHAPTER I

INTRODUCTION

Interest in primates has developed dramatically during the last 20 years. The ordinary man has become as enthusiastic as the researcher, whether it be to marvel at the complexity and cleverness of their behaviour or to protest at abuses such as habitat destruction and trading evils. From an anthropocentric view, no other group of animals has attracted such intense multi-disciplinary interest that numerous national and international societies have been established to promote their protection and research.

The main interest during the nineteenth century was in their natural history and anatomy. It was not until the 1930's that intensive studies of primate behaviour began. In the begining psychologists investigated mental processes and they concentrated on the apes. The sexual bond was thought to be the basic cohesive element of primate groups whose structure was determined by social dominance (Zuckerman, 1932).

Carpenter (1934, 1940) pioneered the field study of primates, observing howling monkeys and spider monkeys in Central America, and gibbons in Thailand. Carpenter's observation and perception led to an uncanny understanding of primate society. He was enlightened, as were Nissen and Bingham in their searches for African apes, by Robert Yerkes, whose own important contribution was in the laboratory study of primates.

Further, primatological research was delayed by the Second World War. It was not until the late 1950's that studies were resumed,

mainly in Japan and by Americans in Africa. In the West, anthropologists searched for models of human evolution. More and better information was amassed on the ecology and behaviour of wild primates (De Vore, 1965; Altmann, 1967; Jay, 1968) with the discovery that behaviour patterns were not species specific, but that variation in behaviour occurred within species.

The quantitative description of primate behaviour in recent years was stimulated by Kummer (1971), Jolly (1972), Rowell (1972), Michael and Crook (1973), and Hinde (1974). They have produced some explanation and many hypotheses to explain primate behaviour and these are now being tested by refined techniques. This has led to increased efforts on ecological, sociological and physiological aspects of behaviour (Clutton-Brock, 1977; Chivers and Hladik, 1978).

In recent years, there has been increasing emphasis on detailed studies of feeding ecology (Clutton-Brock, 1977; Montgomery, 1978). But data collection has been conducted on diet selection and feeding behaviour with scant attention being paid to the nutrient analysis of natural foods nor to their digestibility.

In West Malaysia, Chivers (1974) has studied the feeding behaviour of siamang and Raemaekers (1977) that of lar gibbons at the Krau Game Reserve. Gittins (1979) has similarly reported on the agile gibbon in Perak. However, little work has been done on the nutrition of these species, in particular the type, chemical composition and digestibility of foods, feeding pattern and systems of feeding.