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REPORT ON MAMMALS COLLECTED DURING THE BISHOP MUSEUM EXPEDITION TO MT. DAYMAN, MILNE BAY PROVINCE, PAPUA NEW GUINEA

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REPORT ON MAMMALS COLLECTED DURING THE BISHOP MUSEUM EXPEDITION TO MT. DAYMAN, MILNE BAY PROVINCE, PAPUA NEW GUINEA

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Abstract. From 22 February 1985 through 18 March 1985, the authors carried out a research expedition to collect mammals and birds and their associated ectoparasites in eastern Papua New Guinea. Fieldwork was conducted in a primary rainforest at 1,500 m near the eastern slope of Mt. Dayman. This paper reports on 338 mammal specimens (representing five orders, 10 families, and 32 species) that were collected. In addition, 51 nests of mammals were taken and examined for ectoparasites. The nest ectoparasite collection represents the most extensive assemblage examined from New Guinea. Species accounts and tables include descriptions and measurements of mammals collected, general descriptions of nests and burrows, and notes on associated ectoparasites. Several mammal species previously known from only a few specimens were collected; these include *Murexia rothschildi*, *Microperoryctes papuensis*, *Dorcopsis macleayi*, *Pipistrellus collinus*, and *Chiruromys lamia*.

INTRODUCTION

In 1985 the authors (representing Bernice P. Bishop Museum and the University of California, Davis) conducted a collecting expedition into the mountainous region of eastern Milne Bay Province, Papua New Guinea. The primary objectives were to collect mammals, their ectoparasites, and ectoparasites from host-associated mammal nests. A secondary goal was to collect other vertebrates (especially birds) and their ectoparasites. A report on the avifauna of the region has been prepared for separate publication (Engilis and Cole 1997).

Collections were concentrated on Garatin Ridge, a major spur running west to Mt. Dayman at the eastern end of the Owen Stanley Range (Figure 1). Our intent at the start of the expedition, which we later modified in response to new information and circumstances, was to collect vertebrates along an altitudinal gradient beginning in the Agaun Valley (1,050 m) and moving up a series of ridges (Figure 2) to alpine grasslands near the summit of Mt. Dayman (2,800 m). We chose this geographic region because of the relative lack of

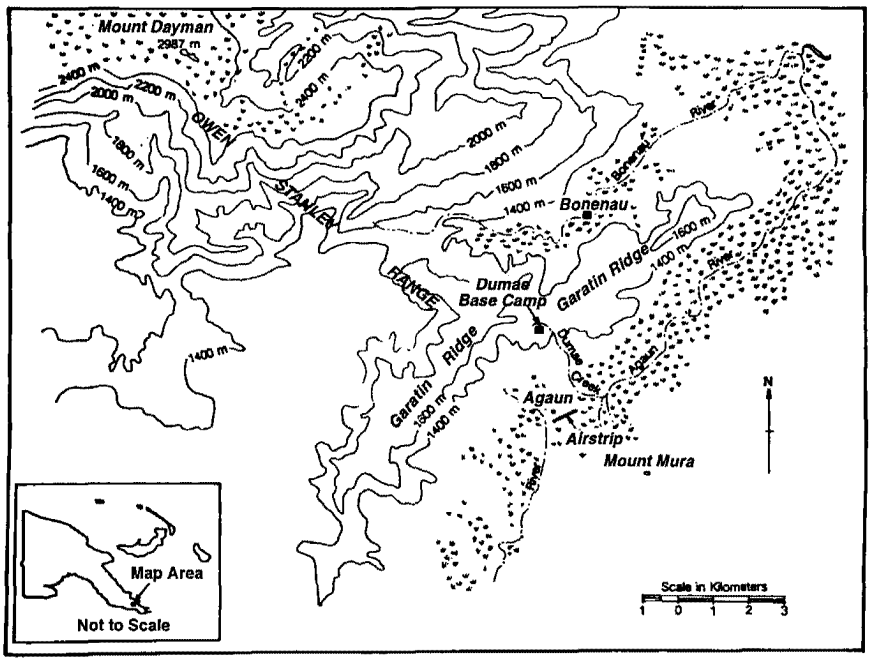

Figure 1. Location of Dumae Creek Base Camp on Garatin Ridge. Adapted from 1:100,000 topographic map (Dayman sheet), Royal Australian Survey Corps, 1966.

comprehensive collections from the area, including the paucity of museum specimens of several locally endemic mammal species. Another consideration was the availability of a well-maintained, grassy landing strip at Agaun Village, providing access to this relatively undisturbed region. Finally, we understood that the attitudes of the local villagers were likely to facilitate carrying out our plans, which turned out to be only partially correct.

We were joined by Garry Isso of the Wau Ecology Institute and three Daga men from the village of Agaun. The latter were hired to collect specimens and to arrange for specimen purchase from local residents. They also acted as translators and interpreters as required. Our information that the Daga people of the Agaun Valley and nearby areas were inquisitive and friendly was generally accurate. That our research plan would be approved by the elders of the villages controlling the land where we wanted to travel, for a reasonable payment, was less accurate. Our presence in the area, and our desire to collect specimens, was viewed with general mistrust and concern.

While we were in protracted negotiations with the council of elders who controlled the territory over which our route to Mt. Dayman would cross, we obtained permission from an Agaun family to camp on Garatin Ridge, near a path that led from the Agaun Valley to the village of Bonenau and eventually to Mt. Dayman. Other trails leading north to Mt. Dayman and east to Rabaraba and Alotau were said to be well traveled and well defined.

We established our base camp at Dumae Creek (1,550 m), a short distance from the top of Garatin Ridge (1,700 m), on 25 February. Local carriers were hired to transport field gear, including collecting equipment and food from Agaun. From this base camp we

Figure 2. Dissected ridge system of Mt. Dayman, typical of the collecting localities of this expedition.

were able to obtain specimens, either collected by our team or purchased from local residents, from 30 different locations in the valleys and spur ridges leading up to Mt. Dayman. Most of the residents from whom we purchased specimens came from nearby villages.

HISTORICAL BACKGROUND

Significant exploration by Europeans into the Owen Stanley Range followed the establishment of British New Guinea as a Crown Colony in 1888 and the appointment of Sir William MacGregor as its administrator (Frodin and Gressitt 1982). MacGregor was an indomitable explorer who encouraged expeditions as a government monopoly (Souter 1963), including R. E. Guise's climb of Mt. Suckling in 1891. The first zoological survey conducted on Mt. Dayman took place in 1894, when MacGregor sent Guise and W. E. Armit to search for a source of jade that lowland tribes used to make artifacts (Brass 1956). Guise collected and prepared 200 bird skins before illness and poor weather forced him and Armit off the mountain. Although there was an ascent of the mountain in the early 1900s (Strong 1916), the next vertebrate collecting expedition to the region was not until 1940 when Fred Shaw Mayer visited Mt. Mura (1,880 m), a peak adjacent to Garatin Ridge (Laurie 1952; Brass 1956). Most of Mayer's collecting in the region was concentrated on nearby Mt. Simpson.

In 1953 the American Museum of Natural History's (AMNH) Fourth Archbold Expedition surveyed the north slope of Mt. Dayman (Brass 1956). The expedition was under the leadership of botanist L. J. Brass, mammalogist Hobart M. Van Deusen, and zoological collector Geoffrey M. Tate. On several occasions during the early 1980s, J. I. Menzies visited the region to collect mammals for the Papua New Guinea National Museum. Subsequent to our expedition, the area was visited by P. A. Woolley of La Trobe University, Victoria (P. A. Woolley, pers. comm., 1987), and in 1992 Pavel German of the Australian Museum, Sydney (T. Flannery, pers. comm., 1995).

METHODS

Mammals

The authors and local assistants captured mammals in live traps, snap traps, snares, or by hand. Traps were set in a variety of locations such as burrows, the forest floor, and shrubs and trees (including lianas entangling trees). Nylon mist nets were set in glades at various levels in the forest canopy and in gardens on or near the Agaun Valley floor to capture bats. Although selective trapping and snare setting produced a few interesting captures each day, our most productive method of obtaining an array of mammal species, and the only way in which we obtained nests, was purchase from local hunters who brought into camp specimens they had captured by snare or hand. Care must be taken in evaluating information from native collectors or other informants about the habitats, nests, and behavior of the animals. Several factors caused us to have confidence in such information recorded and reported here, including the language abilities of the local people, particularly our assistants, who were able to help us interview in depth each collector when they brought us specimens for purchase. Information recorded includes a precise description of the collecting site, how the specimen (or nest) was captured, and specimen behavior when captured.

The reliability of our informants was continually challenged by the team and found to be remarkably accurate. We used mammal nests as a critical standard, looking closely at type of material and structure relative to the species (or species group) of the occupant(s). Our principal test of authenticity, however, was the association of nest and host arthropod

fauna, which was carefully screened by Radovsky before recording and reporting these relationships. For example, the larval stages of fleas are found associated only with the host nest and would not be present in a random handful of leaves thrown together to appear nestlike. Every recorded nest was authenticated by such faunal associations.

Specimens were prepared as a round skin and skull; modified round skin, skull, and partial skeleton; or full skeleton; or they were fluid preserved. When processed, each specimen was given a sequential Bishop Museum field catalog number, prefixed by "BBM-NG-" to indicate the Bernice P. Bishop Museum (BPBM) New Guinea collection. Standard body measurements were taken in the field and appear in Tables 1–32. Skulls and other osteological material were cleaned with a dermestid beetle colony at Bishop Museum. Cranial measurements and species determinations were recorded by Engilis at Bishop Museum for all skin/skull and skeletal preparations. Cranial measurements for liquid preserved specimens were not made unless required for species identification.

Nests

All nests processed by the team were purchased from Daga hunters working on commission. In an attempt to prevent crossover contamination and loss of ectoparasites, we provided and encouraged the use of clean plastic bags for each nest collected. Some nests were examined for ectoparasites in the field, and the remainder were analyzed at the University of Papua New Guinea upon our return from the field.

Nests of mammals present a special situation for ectofaunal recovery in the field. The simpler type of Berlese-Tullgren funnel, which uses heat, light, and desiccation to drive arthropods down into a collecting jar, is very effective for qualitative sampling of soil, litter, and nests. However, this method requires a source of electricity, a convenience not available to our team. We tested burning pyrethrin mosquito coils to expel arthropods from the nest without success, perhaps because of the extreme climate. Consequently, we teased apart some nests in large enamel pans and put all recovered ectoparasites in alcohol vials. This technique was time-consuming but reasonably effective. The remaining nests were protected from heat, desiccation, and disturbance and taken to the University of Papua New Guinea where they were processed in a bank of Berlese funnels.

Ectoparasites

With few exceptions, each mammal specimen collected by the team was removed from the trap or net, placed in a clean plastic bag, euthanased with chloroform, examined and treated for ectoparasite recovery, and processed for preservation.

All specimens were combed or brushed over a white enameled pan to recover ectoparasites. Ectoparasites were examined with a stereoscopic microscope (10–60×), sorted to major taxonomic groups, and transferred to glass vials containing 70% ethanol. Each vial was referenced by the BBM-NG number assigned to the host. A few individuals of nearly all mammal species collected were washed with a detergent solution. Additional ectoparasites were recovered through this technique, and some parasites, for example, certain fur mites, were recovered only in this way. When time allowed, the nasal passages of mammals were flushed with water to recover nasal mites. Finally, an occasional mammal that had not been exposed to chloroform was examined under the microscope for living ectoparasites. This latter technique was the principal means by which some species of parasites could be detected and recovered, and it permitted observations of behavior, including feeding, on the host. Many of these methods had not been previously applied in New Guinea. All ectoparasite species were accessioned and deposited in Bishop Museum.

Vegetation

A vegetation analysis was conducted to document dominant forest trees, determine the percentage of canopy cover, and describe forest physiognomy. Vegetation survey techniques and analysis were adopted from Mueller-Dombois and Ellenberg (1974) and are described, along with our results, in Engilis and Cole (1997).

In general, the forest on Garatin Ridge between 1,400 m and 1,600 m was found to be transitional, composed of dominant plants of both mid-montane and lower montane species as described by Johns (1982). The lower limit of the cloud forest was at 1,500 m. Above this elevation an increase in epiphytes, mosses, lianas, and ground cover was noted. Two cloud forest indicator species, *Dawsonia* (Polytrichaceae) and *Asplenium* (Aspleniaceae), formed dense ground cover above 1,500 m. Below this altitude the forest was more mesic, with larger stature trees, particularly *Lithocarpus*.

MAMMAL SPECIES ACCOUNTS

This expedition was the most extensive and comprehensive mammal collecting effort in the eastern Owen Stanleys in decades. In addition to collecting mammals and birds, we conducted the first survey of vertebrate ectoparasites in the eastern Owen Stanleys, and one of very few surveys of mammal nest ectoparasites in the tropics. We prepared 338 mammals, representing 10 families and 32 species. We also examined 51 nests of 11 mammal species for ectoparasites.

The taxonomic classification used in this paper is based on the arrangement presented by Wilson and Reeder (1993) or, where appropriate, is taken from recently published taxonomic revisions that are individually cited as they apply. While in the field, we relied on the taxonomic keys written by Lidicker and Ziegler (1968). Common names used in this report follow Flannery (1990). An attempt was made to assign a name from the local Daga language to each species captured. We discovered that, not only did most species have a local name widely recognized by residents, but that this name was usually species specific. We cross-checked the local names of animals at each opportunity, testing our informants' reliability and consistency from day to day, and against such parameters as age and sex, which often causes difficulty even among scientists. We were impressed by the knowledge of the local people of their native fauna. The Daga names we obtained are presented for the first time here, with spelling based more or less on phonetics.

Order DASYUROMORPHIA

Family Dasyuridae

***Murexia rothschildi* (Tate, 1938)**
Common Name: Broad-striped Dasyure
Daga Name: Im-po-pom
Specimens Collected: 8 total: 2 adult female (BBM-NG 109487, 109489), 3 subadult male (109481, 109483, 109485), and 3 sucklings (109490 A, B, C from 109489); see Table 1
Nests Collected: 5
Remarks: The species is rare in museum collections. An extensive search indicates that this may be only the fourth series collected. In 1905, A. H. Meek captured two individuals, which were "discovered" and described by G. H. H. Tate in 1937 (Tate 1938) as the holotype, deposited at the British Museum, and a paratype, at the American Museum of Natural History (AMNH). In 1940, F. Shaw Mayer collected six individuals, currently housed at the British Museum (Laurie 1952). In 1969 two individuals were captured by

the Alpha Helix Expedition (Flannery 1990). Subsequent and consequent to our collections, eight individuals were captured and taken alive to La Trobe University, Victoria (P. A. Woolley, pers. comm., 1987).

The adults and subadults we obtained were each associated with one of five nests. One of the females showed a high degree of vascularization of the marsupium, indicating that she perhaps had recently weaned young. The other female arrived with three sucklings in the marsupium. We believe that these very brief observations might constitute the sum of the written knowledge regarding the reproductive activity of this species in a field setting.

Nest Description: The five nests were purchased from a local family of hunters working for the expedition. Each nest site was located in similar terrain—a sloping hillside in primary forest. The nest, consisting of a loose mass of leaves, was in an underground chamber accessed by two ca. 1 m tunnels. Each tunnel was 8–10 cm in diameter. In each case the uphill tunnel was open and the downhill tunnel was closed over with dirt, leaves, and other debris.

Order PERAMELEMORPHIA

Family Peroryctidae

***Echymipera kalubu* (Fischer, 1829)**
Common Name: Spiny Echymipera
Daga Name: Ore-um
Specimen Collected: 1 subadult male (BBM-NG 109575); see Table 2
Nests Collected: 0
Remarks: This very young animal was purchased from a Daga hunter. Age determination was based on dentition; the PM^4 and M^4 were beginning to erupt, the dPM^4 was still present.

***Microperoryctes longicauda* (Peters and Doria, 1876)**
Common Name: Striped Bandicoot
Daga Name: Moo-goy
Specimens Collected: 2 adult male (BBM-NG 109239, 109386); see Table 3
Nests Collected: 0
Remarks: One specimen was captured in a snare set along a small game trail in primary forest and the other was purchased from a Daga hunter who captured it by hand in primary forest on Garatin Ridge. Daga hunters reported that this species is found in disturbed habitat and among garden plots of the Agaun Valley. In general appearance, *M. longicauda* is a larger version of *M. papuensis*.

***Microperoryctes papuensis* (Laurie, 1952)**
Common Name: Papuan Bandicoot
Daga Name: E-pause-it
Specimens Collected: 2 adult female (BBM-NG 109383, 109579 [with pouch young]), 2 adult male (109408, 109600), and 1 subadult male (109384); see Table 4
Nests Collected: 3
Remarks: Prior to our expedition, this second smallest peroryctid had been recorded only from Mt. Mura, east of our camp, from Betamin on the eastern slope of Mt. Dayman, and from Kagi, Central Province. Subsequent to our captures, two specimens were purchased by P. A. Woolley from local hunters in 1986, and an additional three specimens were purchased by Pavel German from local collectors in 1992 (Alpin and Woolley 1993). The three nests we obtained (with their occupants) were found in primary forest on Garatin

Ridge. *Microperoryctes papuensis* occurs in sympatry with *M. longicauda* and is in appearance a smaller version of *M. longicauda*. We found no overlap in head and body, tail, hind foot, and all cranial measurements recorded (see Tables 3 and 4). This morphometric separation was also noted by Lidicker and Ziegler (1968).
Nest Description: Each hunter who brought us a nest had a slightly different description of the nest cavity. The one we consider most reliable was described (by a Daga hunter who worked for us) as an underground cavity approximately 50 cm beneath ground surface with a single entrance tunnel (tunnel opening approximately 7 cm in diameter) leading into a "gourd-shaped" chamber. The second nest description (by a hunter not known to the authors) is similar to the first, except the hunter stated that there were two entrances into the nest chamber (also "gourd-shaped"). The hunter who brought us the third nest (also not known to the authors) was not certain of the number of nest chamber entrances. The nests themselves, which were oval and measured approximately 15 by 25 cm, were constructed from tree leaves.

***Peroryctes raffrayanus* (Milne-Edwards, 1878)**
Common Name: Raffray's Bandicoot
Daga Name: Unknown to authors
Specimens Collected: One adult female (BBM-NG 109509) and 1 adult male (109582); see Table 5
Nests Collected: 1
Remarks: These two individuals were collected in quite different habitats. One was captured in a snare set along a game trail in primary forest, and the other was captured in its grass nest in open fields near Agaun. The latter capture is noteworthy because this species is reported to venture away from undisturbed forest habitat only rarely (Flannery 1990).

Order DIPROTODONTIA

Family Phalangeridae

***Phalanger carmelitae* Thomas, 1898**
Common Name: Mountain Cuscus
Daga Name: My-a-tune
Specimens Collected: 2 adult male (BBM-NG 109290 and 109305); see Table 6
Nests Collected: 0
Remarks: Both of our specimens were brought in by Daga hunters who told us that this species was fairly common in the primary forest of the area around our camp. One individual was captured during the day as it slept in a tree hollow, and the other was captured at night while it was foraging in the canopy.

Family Macropodidae

***Dorcopsis macleayi* (Miklouho-Maclay, 1885)**
Common Name: Macleay's Dorcopsis
Daga Name: Eye-pit
Specimens Captured: 3 adult male (BBM-NG 109208, 109284, 109302) and 1 adult female (109364); see Table 7
Nests Collected: 0
Remarks: This forest wallaby, which has previously been collected on few occasions (Flannery 1990), was common in the hill forest on Garatin Ridge and was reported by Daga hunters to be common throughout the region. Trails of this wallaby crisscrossed the

forest floor near camp and were useful not only for our walking but also for locating traplines and snares. Our three captures were along these paths—two captures by snare and one by hand. The Daga prized this animal's meat as a food source and its pelts for clothing and ornamentation.

Taxonomy: The taxonomy of *D. macleayi* and *Dorcopsulus vanhuerni* is somewhat confusing, compounded by the small number of museum specimens of *D. macleayi*. Our designation of the Dayman wallaby specimens as *D. macleayi* is based on external characters including length, texture, and sheen of dorsal hair and percentage of furred vs. unfurred tail in relation to tail length. *Dorcopsis macleayi* has two-thirds to three-fourths of the tail furred (our three captures had two-thirds of their tails furred), whereas *D. vanhuerni* is only half furred (Flannery 1990). Further research into the *D. vanhuerni* complex is needed.

Family Burramyidae

***Cercartetus caudatus* (Milne-Edwards, 1877)**
Common Name: Long-tailed Pygmy Possum
Daga Name: Wom Wom
Specimens Collected: 18 total (15 adult, 3 subadult); see Table 8
Nests Collected: 10
Remarks: We were able to record collecting information for five of the ten *Cercartetus* nests brought to us by Daga hunters. Three were located underground, under the roots of small trees. Each of these nests contained an adult female (we are unsure if others escaped during excavation). A central nest chamber was connected to two tunnels, each ca. 1 m by 5 cm. One tunnel was open, and one was plugged with dirt, leaves, and other debris. The hunter who brought us one of these nests thought that he was excavating a *Pogonomys* burrow and was surprised when he unearthed a *Cercartetus*. He noted that, like those of *Pogonomys*, the entrances to this nest angled away from, rather than toward, the roots of a large tree nearby. This hunter, who was fluent in English, having attended school in Agaun village and Rabaraba, was consistently correct in identifying resident mammal species by their local names. For this and other reasons, we came to respect his information regarding habits and habitats of the local fauna. One nest (which contained three adult males) was located in the cavity of a living tree; the fifth nest, containing one adult female, was found in a tree fern and appeared to be constructed entirely of tree fern vegetation. Dwyer (1977), while working near Mt. Erimbari in the Eastern Highlands, noted that most *Cercartetus* nests were "spherical structures of dead leaves attached to stems." He also noted that some nests were found in pandanus, and one in a hollow tree; we also found one nest in a tree hollow (see above). Dwyer made no mention of underground burrows.

Family Petauridae

***Dactylopsila palpator* Milne-Edwards, 1888**
Common Name: Long-fingered Triok
Daga Name: You-rup
Specimen Collected: 1 adult male (BBM-NG 109581); see Table 9
Nests Collected: 0
Remarks: This specimen was obtained from a Daga hunter who captured it alive while it foraged in the subcanopy. Our base camp, at 1,550 m, was at the lower altitudinal range for this species according to Daga hunters.

***Dactylopsila trivirgata* Gray, 1858**
Common Name: Striped Possum
Daga Name: Ah-koo-rum
Specimen Collected: 1 adult female (BBM-NG 109207); see Table 10
Nests Collected: 0
Remarks: Our single specimen was captured by Daga hunters near the village of Agupon (1,000 m), reportedly as it was sleeping in a hollow of a tree in secondary forest. Alan Ziegler (1972) states that this species is replaced by *D. palpator* at mid-montane elevations. Conversations with Daga hunters who are able to differentiate these two species support this opinion for the Dayman area.

Family Pseudocheiridae

***Pseudocheirops corinnae* (Thomas, 1897)**
Common Name: Golden Ringtail Possum
Daga Name: Yah-why-ap
Specimens Collected: 5 adult male (BBM-NG 109272, 109306, 109458, 109587) and 1 adult female (109494); see Table 11
Nests Collected: 0
Remarks: According to Daga hunters, this medium-sized ringtail is common in mid-montane forests and exists sympatrically with *Pseudocheirus forbesi*. Several were captured in snares set along game trails or taken from subcanopy trees while they slept. None were collected in association with nest materials. The single female acquired by the team had two pouch young. This animal differed noticeably from the five males collected in being slightly larger in body size with a shorter tail (76% of head-and-body length vs. 90–121% for the males).

***Pseudocheirus forbesi* (Thomas, 1887)**
Common Name: Plush-coated Ringtail
Daga Name: Oh-mon-ken
Specimens Collected: 3 adult (BBM-NG 109156, 109279, 109512) and 2 subadult (109491, 109510); see Table 12
Nests Collected: 3
Remarks: Common in the mid-montane forest of Garatin Ridge according to Daga hunters. The Dayman population is boldly marked on the face and head and possesses a dark mid-dorsal stripe running from between the ears to the rump. Three individuals were collected during daylight hours in their nests, which were simple mats of leaves placed in the fork of tree branches in the subcanopy. No ectoparasites were recovered from the nests, indicating that the nests were used for only short stays.

Order CHIROPTERA

Family Pteropodidae

***Paranyctimene raptor* Tate, 1942**
Common Name: Unstriped Tube-nosed Bat
Daga Name: More-ip
Specimens Collected: 4 adult male (BBM-NG 109425, 109463, 109464, 109467) and 1 adult female (109568); see Table 13
Remarks: One individual was captured in a fine-mesh mist net near base camp, in very dense forest understory (1.5 m above ground); the remaining specimens were netted along the forest edge, near a garden plot ca.1.5 km north of Agaun.

***Rousettus amplexicaudatus* (E. Geoffroy, 1810)**
Common Name: Rousette Bat
Daga Name: Unknown to authors
Specimens Collected: 2 adult male (BBM-NG 109139, 109154) and 3 adult female (109140, 109141, 109142); see Table 14
Remarks: A common bat in disturbed habitat of the Agaun Valley. All five of our specimens were netted in the understory of a small coffee plantation in the village of Agaun.

***Syconycteris australis* (Peters, 1867)**
Common Name: Common Blossom Bat
Daga Name: Bee-beep
Specimens Collected: 25 total; see Table 15
Remarks: This is a common species in New Guinea (Flannery 1990). Our specimens were captured in garden plot areas near the village of Agaun and in dense primary forest near Dumae Camp. According to Daga hunters, this small pteropid bat roosts in dense foliage and tangled vines during the day.

Family Vespertilionidae

***Pipistrellus collinus* Thomas, 1920**
Common Name: Mountain Pipistrelle
Daga Name: Unknown
Specimens Collected: 23 total; see Table 16
Remarks: The dorsal pelage color of *P. collinus* is commonly a bone brown from tip, with basal two-thirds fuscous black; the ventral surface is a buffy brown (Kitchener et al. 1986). This color is apparently consistent throughout all of its distributional range except eastern Papua New Guinea, where the color can be a dorsal cinnamon red-brown with a ventral buffy red-brown. All 23 individuals from our collection exhibited this reddish color. Correspondence and loans from AMNH, BPBM, and the Museum of Vertebrate Zoology at the University of California, Berkeley, indicate that there are only very few other individuals of this color in museum collections. The 23 *P. collinus* from our expedition were collected alive by a Daga hunter from a communal roost in a tree cavity.

The taxonomy of the New Guinea pipistrelles is somewhat confused. Koopman (1993) refers to all New Guinean pipistrelles as *P. tenuis*, a designation at odds with both Kitchener et al. (1986) and Flannery (1990). Flannery (pers. comm., 19xx) has caught at least two of the *Pipistrellus* species Koopman lists as synonyms in sympatry which he (Flannery) considers clearly distinct species. Further, several specimens from our collection were sent to D. Kitchener (Western Australian Museum), where our species determinations were confirmed. For these reasons, we chose to reject Koopman's treatment of this taxon and accept the treatment presented by Kitchener et al. (1986).

Order RODENTIA

Family Muridae

***Anisomys imitator* Thomas, 1904**
Common Name: Uneven-toothed Rat
Daga Name: Pocket
Specimens Collected: 2 adult female (BBM-NG 109288, 109588); see Table 17
Nests Collected: 1

Remarks: An uncommon rodent of the mid-montane rainforests (Menzies and Dennis 1979). One individual was caught in a snare set by the authors along a game trail in primary forest; the second (also from primary forest) was purchased with its nest from a Daga hunter. No ectoparasites were recovered from the nest.

***Chiruromys lamia* (Thomas, 1897)**
Common Name: Broad-headed Tree-mouse
Daga Name: Unknown to authors
Specimens Collected: 2 adult male (BBM-NG 109291, 109595); see Table 18
Nests Collected: 0
Remarks: One specimen was collected as it foraged in the subcanopy near the Yaiton River; the other was collected by hand near Beirut Creek. These specimens were distinguished from *C. vates* by their rounded ears and smaller size. They were separated from *Pogonomys*, which they superficially resembled, by having overlapping tail scales.

***Coccymys ruemmleri* (Tate and Archbold, 1941)**
Common Name: Unknown
Daga Name: Unknown to authors
Specimen Collected: 1 adult female (BBM-NG 109165); see Table 19
Nests Collected: 0
Remarks: Captured by the authors in a live trap set on the forest floor at Garatin Ridge, 1,600 m. Ziegler (1972) states that there are few records of this species occurring below 2,400 m.

***Leptomys ernstmayri* Rümmler, 1932**
Common Name: Large-footed Hydromyine
Daga Name: Air-right
Specimens Collected: 7 total (3 male, 4 female); see Table 20
Nests Collected: 4
Remarks: *Leptomys ernstmayri* is uncommon at Garatin Ridge according to Daga hunters. We captured only one (BBM-NG 109273), in a live trap set at the base of a tree in primary forest. The other specimens were purchased with their nests from Daga hunters. All of the nests were reportedly dug up from burrow systems that contained a central nest chamber about 1 m beneath ground surface. One nest, from primary forest habitat, contained three individuals (adult female and two juvenile males); the remaining three nests, from secondary forest areas, contained one adult each. Our hunters told us that some animals escaped capture during nest excavation.

There is some debate whether *L. elegans* is a monotypic species in New Guinea, or if there is validity to the separation of *L. ernstmayri* and a lowland species (*L. signatus*) from the Western Province. We accept the original definition of this as a unique species, as described by Rümmler (1932) and discussed by Musser and Carleton (1993). Rümmler's (1938) measurement tables clearly illustrate that *L. ernstmayri* is smaller than *L. elegans* in two key measurements. These tables show that the M^1–M^3 of *L. elegans* is >6 mm with a condyl length between 39 and 40 mm, whereas the M^1–M^3 of *L. ernstmayri* is <6 mm with a condyl length between 33.6 and 35.8 mm. Rümmler (1938) also stated that *L. ernstmayri* replaces *L. elegans* at elevations above 1,000 m. Our seven specimens, captured at elevations between 1,240 and 1,525 m, had M^1–M^3 measurements between 5.1 and 5.2 mm and a condyl length between 32.7 mm and 33.4 mm. Our measurements are somewhat smaller than those reported by Rümmler, who based his descriptions on the type specimen, which was collected in the Huon Peninsula, approximately 200 km west of our collecting site.

***Mallomys aroaensis* (De Vis, 1907)**
Common Name: Dusky Black-eared Giant Rat
Daga Name: Unknown to authors
Specimen Collected: 1 adult female (BBM-NG 109289); see Table 21
Nests Collected: 0
Remarks: One of the largest murid rodents in New Guinea, our lone specimen, identified at Bishop Museum as *M. aroaensis* by Tim Flannery, was captured by a Daga hunter several kilometers northwest of our base camp, near the Yaiton River (1,650 m). This specimen represents the easternmost record for New Guinea. Although referred to as *M. aroaensis*, it should be noted that this is a very large individual, with most of its critical measurements equal to or exceeding the range for this species as presented by Flannery (1989).

***Melomys mollis* Thomas, 1913**
Common Name: Thomas's Melomys
Daga Name: Caw-nin
Specimens Collected: 61 total; see Table 22
Nests Collected: 0
Remarks: A very common murid in primary forest and forest edge. Trapped most frequently on the ground, with a few collected on fallen logs and several on tree buttresses, 1 m above ground. No nests were located, and Daga hunters reported that this species builds a burrow system among the tangled roots of large trees, making access to their nests nearly impossible.

***Melomys platyops* (Thomas, 1906)**
Common Name: Lowland Melomys
Daga Name: Unknown to authors
Specimen Collected: 1 adult male (BBM-NG 109167); see Table 23
Nests Collected: 0
Remarks: Reported by Daga hunters to be more common at lower elevations and also in the Agaun Valley. This is consistent with comments made by Flannery (1990), who reported that this species is more common in disturbed habitats, such as around villages. Our single specimen, which is considerably smaller than its congener *M. mollis*, was captured in a live trap on primary forest floor near Dumae Camp at approximately 1,500 m, which is somewhat higher than its reported altitudinal range of sea level to 900 m (Musser and Carleton 1993).

***Parahydromys asper* (Thomas, 1906)**
Common Name: Waterside Rat
Daga Name: Unknown to authors
Specimen Collected: 1 adult female (BBM-NG 109158); see Table 24
Nests Collected: 0
Remarks: One of only two genera of hydromyine captured on the expedition (the other being *Leptomys*), this individual was caught in a live trap set on primary forest floor, approximately 10 m from a small, flowing stream. Menzies and Dennis (1979) suggest that this species usually inhabits streambanks and streamside vegetation, but it has also been found in forests and gardens.

***Pogonomys loriae* Thomas, 1897**
Common Name: Large Tree-mouse
Daga Name: Quar-root
Specimens Collected: 14 total; see Table 25
Nests Collected: 0
Remarks: According to Daga hunters, this common arboreal murid in the Garatin area nests in communal burrows at the base of large trees. One specimen was collected in a snap trap tied to a liana on the side of a tree trunk, 1 m above the ground. All other specimens were collected in their nests, which were globular balls (20 cm dia.) of loosely woven dried grasses and palm leaves, with an inner nest bowl of finer plant material. Each nest was in a gourd-shaped expansion at the end of a tunnel or tunnels that slanted under the roots of large trees. Daga hunters reported that they were able to find nest areas by looking for small piles of feces near the opening of a tunnel leading to the nest chamber. Some hunters believed that each nest was accessed by a single tunnel, while others said that more than one tunnel served a single nest. Each hunter reported that mice escaped during excavation, which would suggest multiple tunnels. *Pogonomys loriae* overlaps the range of the smaller *P. sylvestris* along a narrow altitudinal range between 1,000 and 2,000 m (Menzies and Dennis 1979). We observed that *P. loriae* was usually collected below 1,600 m and *P. sylvestris* above that altitude.

Our hunters were not able to distinguish between *P. loriae* and *P. sylvestris*, and information regarding such things as burrow description for *P. loriae* presumably could apply to either species.

***Pogonomys sylvestris* Thomas, 1920**
Common Name: Gray-bellied Tree-mouse
Daga Name: Quar-root
Specimens Collected: 25 total; see Table 26
Nests Collected: 10
Remarks: A very common tree mouse in the Garatin area above 1,600 m. One individual was collected on a liana twining up a tree and the others were collected in their subsurface nests by Daga hunters. As reported for *P. loriae*, many individuals escaped during excavation. However, several nests were obtained with more than one adult present. Two nests had two adult females and one adult male, and one nest had three adult females and one adult male, perhaps revealing complex social nesting behavior. Such nesting behavior has been reported for *P. sylvestris* in other regions of New Guinea (Menzies and Dennis 1979).

***Rattus exulans* (Peale, 1848)**
Common Name: Polynesian Rat
Daga Name: No-nar-e-kai
Specimens Collected: 18 total; see Table 27
Nests Collected: 3
Remarks: A commensal species that is common in and around human dwellings, gardens, and forest edge of the Agaun Valley. Three nests, each containing an adult female and two sucklings, were collected. Two nests were found in small coffee trees near Agaun, and the third nest was found in a tree near a forest clearing.

***Stenomys niobe* (Thomas, 1906)**
Common Name: Moss Forest Rat
Daga Name: E-yah-gar-e-got
Specimens Collected: 81 total; see Table 28
Nests Collected: 0
Remarks: The most common murid encountered in the primary forest and forest edge. Collected on the forest floor, climbing vines, fallen logs, and tangles of vegetation within 3 m of the ground. In a subsequent expedition to this region, Flannery (pers. comm., 19xx) reported that the most common *Stenomys* species at around 1,300 m was *S. vandeuseni*. Our collections, generally from areas just a few hundred meters higher in elevation, were predominately *S. niobe*, and only one of our captures was identified as *S. vandeuseni*. We base our identification of *S. niobe* on body and cranial measurements, color of the ventral pelage (gray rather than buffy), tail scale pattern (16–19 rows of tail scales per cm), and inconspicuous whitish hairs (as opposed to brown) on tail scales. Approximately 10% of our captures exhibited light tail tip color (averaging 5 mm) in the living animal. Subsequent examination of these same specimens at Bishop Museum failed to show this lighter color, indicating that this is possibly a live animal characteristic that fades somewhat after preparation.

Taylor et al. (1982) state that *Stenomys* (= *Rattus) niobe* lacks white markings on the ventral pelage, and that this pelage character can be used to distinguish *S. niobe* from *S. verecundus*. An examination of over 600 specimens at Bishop Museum indicates that this is not always so. Based on this review, there is an indication that as one moves east along the central cordelia, from the Star Mountains in the Western Province to Mt. Dayman in Milne Bay Province, the occurrence of white blaze marks on the ventral pelage of *S. niobe* increases from no blaze marks to 20% of the specimens showing this character. Our collections, representing the most easterly specimens examined, showed a 20% incidence of this marking.

***Stenomys vandeuseni* (Taylor and Calaby, 1982)**
Common Name: Slender Rat
Daga Name: E-yah-gar-e-got
Specimen Collected: 1 adult male (BBM-NG 109217); see Table 29
Nests Collected: 0
Remarks: The only example of this species collected by the authors was trapped on the forest floor. Its forelimbs and chest hairs were stained a burgundy red color, which seemed to indicate recent contact with fruit from an unlocated plant species.
Taxonomy: Three species of *Stenomys* are known from the Mt. Dayman region: *S. niobe*, which is widespread in nearly all montane regions of New Guinea; *S. verecundus*, which is widespread in lowland forests of Milne Bay, Northern, and Central provinces; and *S. vandeuseni*, which had been recorded only from Mt. Dayman's northern slope prior to this expedition and is presumed endemic to mid-montane forests of the eastern Owen Stanley Range. Our specimen was small, externally similar in size to *S. niobe* but distinctive in coloration. Its pelage was coarser and more grizzled than that of *S. niobe*. The ventral surface of the tail was mottled with white (unlike any *S. niobe* in the Dayman area), and the tail scales were larger (13 rows of scales per cm) and more conspicuous. The skull was considerably longer than in *S. niobe*, with a more telescoped rostrum. The M^1–M^3 measurement was large, 6.0 mm. The Dayman *S. niobe* M^1–M^3 range was 5.1–5.7 mm, $\bar{x}$ = 5.3 mm. Our specimen differed from *S. verecundus* in its much smaller overall size and had cranial measurements smaller than the normal range of *S. verecundus*. It closely resembled two specimens of *S. vandeuseni* borrowed from the collection of the AMNH (AMNH 157900 and 157906), and all cranial measurements fell within the range reported

for *S. vandeuseni* (Taylor et al. 1982). We therefore assign BBM-NG 109217 to the species *S. vandeuseni*, thus extending its known range to the southern ridges of Mt. Dayman.

The status of *S. vandeuseni* is still under debate. Although recently elevated from a subspecies of *S. verecundus* to a distinct species, its relationship to its congeners, especially in terms of distribution, is hampered by a lack of adequate collections and geographic information. Flannery (pers. comm., 1995) reports that a large series of *S. vandeuseni* was collected in the Agaun Valley, approximately 300 m (and 3 hours' walk) below our moss-forest base camp. He further notes that *S. niobe* and *S verecundus* were less common in this disturbed, valley habitat.

***Stenomys verecundus* (Thomas, 1904)**
Common Name: Slender Rat
Daga Name: E-yah-gar-e-got
Specimens Collected: 1 subadult female (BBPM-NG 109516) and 1 subadult male (109520); see Table 30
Nests Collected: 2
Remarks: Both of our captures were subadults (M^3 not fully erupted), lacking the guard-hair spines of the dorsal pelage characteristic of adults. The body and cranial measurements were somewhat larger than for *S. niobe*, and the terminal 60 mm of the tail of these two individuals was a whitish buff color, in contrast to the mottled, brown-black of the basal portion of the tail. Flannery (pers. comm., 1995) stated that the identification of *Stenomys* and *Rattus* in far eastern New Guinea is fraught with difficulty, and that the southeastern form of *S. verecundus* closely resembles a small *Rattus leucopus*. This species has been recorded from a variety of habitats, from rainforest to garden (Flannery 1990). Our two specimens were collected in their nests in primary forest near Simun Creek. The nests yielded no ectoparasites.

***Uromys anak* Thomas, 1907**
Common Name: Black-tailed Giant Rat
Daga Name: Unknown to authors
Specimens Collected: 2 adult female (BBM-NG 109475, 109599); see Table 31
Nests Collected: 0
Remarks: Both specimens were captured by hunters in primary forest. One was an old animal, as indicated by extreme tooth wear.

***Uromys caudimaculatus* (Krefft, 1867)**
Common Name: Mottled-tailed Giant Rat
Daga Name: Unknown to authors
Specimen Collected: 1 adult female (BBM-NG 109566); see Table 32
Nests Collected: 0
Remarks: Captured in a snare set on the forest floor along a game trail.

Abbreviations for Body and Cranial Measurements (Tables 1–32)

HB	Head and body length, measured from tip of nose to base of tail.
T	Tail length; not including any hairs on tip.
HF	Hind foot length; measured from end of heel to tip of longest claw (cu).
E	Ear; measured from notch to tip, excluding hair.
CBL	Condylobasal length of skull; measured from the anterior border of the median incisive alveoli to the posterior border of the occipital condyle.
ZYW	Greatest width across the zygomata; measured at right angles to the long axis of the skull.
MAS	Greatest width of skull at mastoid process; measured at right angles to the long axis of the skull.
PAL	Length of palatine bone; measured from the anterior border of the median incisive alveoli to the posterior border of the palate (not including the spine).
IFL	Incisive foramina length.
BUL	Bullar length.
LIW	Least interorbital width (least distance between the orbits); measured at right angles to the long axis of the skull.
NL	Length of nasal bone.
P^4	Length and width of fourth premolar.
M^1–M^2	Greatest length of upper toothrow; measured from the anterior border of M^1 to the posterior border of M^2.
M^1–M^3	Greatest length of upper toothrow; measured from the anterior border of M^1 to the posterior border of M^3.
P^4–M^4	Greatest length of upper toothrow; measured from the anterior border of the last premolar (P^4) to the posterior border of last molar (M^4). (*Note:* There is some disagreement regarding the designation of the last premolar as P^3 or P^4, since both P^4 and dP^4 are of variable occurrence. We recognize the designation of the last premolar as P^4, as discussed by Ziegler and Lidicker [1968].)

Table 1. Selected body and cranial measurements (mm) for *Murexia rothschildi* (Tate, 1938)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109481	♂	107	124	24	17	30.2	15.6	12.7	16.7	7.1	10.4	0.9 × 0.4	5.1	7.4	–
109483	♂	102	126	25	18	30.9	15.9	13.1	16.8	7.3	10.4	1.0 × 0.6	4.9	7.3	–
109485	♂	106	113	24	17	31.0	15.6	13.1	17.0	7.2	11.1	0.8 × 0.6	5.3	7.4	–
109487	♀	131	165	26	18	36.2	18.8	14.4	19.5	7.8	13.4	1.4 × 1.4	5.0	7.0	9.8
109489	♀	130	170	28	20	35.8	20.6	14.9	18.3	8.1	13.2	1.2 × 1.2	4.5	6.7	9.5

Table 2. Selected body and cranial measurements (mm) for *Echymipera kalubu* (Fischer, 1829)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109575	♂	275	60	55	27	57.4	25.4	24.5	36.0	7.3	36.1	–	7.7	11.7	–

Table 3. Selected body and cranial measurements (mm) for *Microperoryctes longicauda* (Peters and Doria, 1876)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109239	♂	295	210	70	27	65.4	24.9	21.7	39.5	14.2	29.3	2.6 × 2.3	6.8	10.1	14.8
109386	♂	272	223	67	29	62.4	23.6	22.3	38.2	13.5	26.0	2.4 × 2.4	6.9	10.2	14.3

Table 4. Selected cranial and body measurements (mm) for *Microperoryctes papuensis* (Laurie, 1952)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109383	♀	187	148	46	26	47.1	17.8	15.6	26.9	10.6	20.5	1.5 × 1.7	4.5	7.0	9.9
109408	♂	197	147	47	27	47.4	17.4	15.5	27.7	10.1	20.0	1.6 × 1.4	4.7	7.0	9.7
109579	♀	171	145	46	25	45.8	17.3	15.1	26.0	10.4	19.5	1.8 × 1.6	4.7	7.1	10.2
109600	♂	194	140	46	25	47.2	18.0	15.6	27.5	10.3	20.9	1.7 × –	4.7	7.2	10.3
109384	♂	125	114	36	21	33.4	–	13.1	19.4	8.9	12.3	–	5.1	–	–

Table 5. Selected cranial and body measurements (mm) for *Peroryctes raffrayanus* (Milne-Edwards, 1878)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109509	♀	420	165	81	33	77.5	29.4	23.5	47.2	15.7	33.3	3.1 × 3.6	8.6	12.3	17.4
109582	♂	371	124	82	32	–	29.5	24.5	–	15.9	–	3.3 × 4.0	8.1	12.0	17.3

Table 6. Selected cranial and body measurements (mm) for *Phalanger carmelitae* Thomas, 1898

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109290	♂	425	350	55	26	74.3	48.9	38.5	–	–	27.3	4.4 × 4.9	11.0	16.3	25.6
109305	♂	405	345	56	26	78.3	48.6	40.6	–	–	28.9	4.8 × 4.4	11.1	16.5	24.5

Table 7. Selected body and cranial measurements (mm) for *Dorcopsis macleayi* (Miklouho-Maclay, 1885)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109208	♂	420	315	120	38	76.8	42.1	–	10.0	–	32.6	–	8.8	13.7	–
109284	♂	435	335	114	43	80.2	45.6	33.9	10.1	15.2	36.9	9.1 × 7.8	9.0	14.3	28.2
109302	♂	365	320	118	38	–	–	–	–	–	–	–	–	–	–
109364	♀	315	395	110	37	75.5	44.4	–	10.1	–	31.5	8.8 × 3.1	8.6	13.7	–

Table 8. Selected body and cranial measurements (mm) for *Cercartetus caudatus* Milne-Edwards, 1877

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109303	♂	106	142	18	19	25.2	16.5	12.5	13.9	5.4	10.6	1.1 × 0.7	2.9	4.0	5.7
109429	♀	102	132	17	16	26.0	16.0	13.0	14.7	5.1	11.8	1.1 × 0.7	3.0	4.0	5.7
109467	♂	106	150	17	18	25.8	16.4	12.4	14.3	4.9	11.4	1.1 × 0.8	3.1	4.3	6.0
109526	♀	103	141	16	17	25.5	16.3	–	14.4	5.0	11.0	1.1 × –	2.9	4.0	5.9
109531	♂	89	151	16	19	25.5	15.7	12.4	14.1	5.1	10.4	1.2 × 0.8	3.0	4.2	6.0
109533	♂	92	156	16	18	25.3	15.7	12.3	14.3	4.9	10.6	1.3 × 0.9	3.2	4.3	6.1
109535	♀	96	151	18	18	25.1	16.1	12.7	14.1	5.1	10.4	1.3 × 0.7	3.2	4.3	6.2
109465	♂	108	142	17	18	26.8	16.5	12.8	15.1	5.3	11.7	1.2 × 1.0	3.0	4.1	5.9

Table 9. Selected body and cranial measurements (mm) for *Dactylopsila palpator* Milne-Edwards, 1888

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109581	♂	240	218	49	27	56.0	44.9	36.4	–	9.0	22.5	2.7 × –	6.5	9.0	–

Table 10. Selected body and cranial measurements (mm) for *Dactylopsila trivirgata* Gray, 1858

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109207	♀	315	285	45	29	56.3	39.6	32.4	30.0	7.9	20.3	2.5 × –	6.9	9.7	14.0

Table 11. Selected body and cranial measurements (mm) for *Pseudocheirops corinnae* (Thomas, 1897)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109272	♂	344	321	42	25	64.7	39.4	30.6	35.6	–	20.9	4.0 × 4.3	9.2	13.8	20.8
109306	♂	235	385	47	24	64.0	38.5	28.0	35.4	–	20.0	4.1 × 4.1	9.1	13.5	20.8
109307	♂	350	315	47	25	64.8	39.9	29.0	–	–	21.2	–	9.0	13.0	20.2
109458	♂	295	350	35	25	65.5	40.0	29.9	35.9	–	–	3.9 × 4.2	9.1	13.3	20.5
109494	♀	380	290	42	26	65.5	38.2	29.3	36.2	–	21.1	4.0 × 4.3	9.5	13.9	21.2
109587	♂	305	305	42	26	–	40.9	29.0	–	–	–	4.1 × 4.5	9.5	13.6	21.1

Table 12. Selected body and cranial measurements (mm) for *Pseudocheirus forbesi* (Thomas, 1887)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	MAS	PAL	LIW	NL	P^4	M^1–M^2	M^1–M^3	P^4–M^4
109156	♂	252	260	34	24	53.5	29.8	28.4	27.6	–	–	2.4 × 2.8	6.0	9.1	13.6
109279	♀	286	255	32	21	51.7	30.5	27.0	26.8	–	18.0	2.7 × 3.0	5.7	8.9	14.2
109512	♀	–	–	38	19	46.7	27.4	24.8	23.9	–	16.3	2.5 × –	6.0	8.7	13.1
109491	♀	189	168	24	15	39.9	25.1	22.8	20.4	–	12.6	2.2 × 2.7	5.9	9.0	–
109510	♂	175	173	30	16	–	24.3	22.9	21.8	–	15.6	2.4 × 3.0	6.3	9.2	–

Table 13. Selected body and cranial measurements (mm) for *Paranyctimene raptor* Tate, 1942

BBM-NG	S	HB	T	HF	E	FA	CAL	GSL	CBL	ZYW	LIW
109425	♂	78	16	12	12	50.4	5.6	25.2	24.2	15.7	4.2
109463	♂	83	14	12	10	52.0	5.5	26.8	24.1	16.0	4.8
109464	♂	87	8	11	12	50.1	6.6	26.7	24.5	16.0	4.4
109467	♂	82	14	15	14	50.6	–	26.8	25.5	16.2	4.8
109568	♀	82	14	14	13	50.7	5.4	–	24.4	15.6	4.4

Table 14. Selected body and cranial measurements (mm) for *Rousettus amplexicaudatus* (E. Geoffroy, 1810)

BBM-NG	S	HB	T	HF	E	FA	CAL	GSL	CBL	ZYW	LIW
109139	♂	110	14	17	18	76	–	34.1	32.8	–	7.2
109140	♀	107	15	18	19	74	–	32.8	31.3	18.2	6.9
109141	♀	115	15	20	21	84	–	35.5	34.2	21.5	7.8
109142	♀	113	15	19	22	84	–	36.3	35.1	22.0	8.3
109154	♂	128	13	21	23	85	–	37.7	36.4	23.6	8.4

Table 15. Selected body and cranial measurements (mm) for *Syconycteris australis* (Peters, 1867)

BBM-NG	S	HB	T	HF	E	FA	CAL	GSL	CBL	ZYW	LIW
109176	♀	75	0	10	14	42.6	–	26.5	25.1	15.4	5.0
109226	♀	72	0	10	15	42.0	–	25.9	24.3	13.3	4.4
109426	♂	73	0	11	16	42.6	–	26.4	25.0	16.1	5.4
109460	♀	74	0	11	15	43.1	–	26.5	24.7	14.6	4.9
109461	♂	75	0	11	15	42.6	–	–	25.5	–	–
109504	♂	70	0	11	15	40.7	–	–	23.5	14.2	–
109507	♂	70	0	10	16	40.4	–	–	23.7	14.1	–
109540	♀	68	0	10	13	42.0	–	–	24.3	14.4	–
109569	♂	80	0	12	16	44.0	–	–	25.9	15.7	5.2
109570	♂	67	0	11	17	41.1	–	–	23.8	14.1	4.4
109571	♀	66	0	11	14	39.6	–	–	23.9	13.9	4.5
109573	♀	71	0	11	16	38.4	–	–	24.3	13.4	4.4
109574	♂	71	0	10	15	41.7	–	–	24.5	15.5	5.3

Table 16. Selected body and cranial measurements (mm) for *Pipistrellus collinus* Thomas, 1920

BBM-NG	S	HB	T	HF	E	FA	TIB	CAL	GSL	CBL	ZYW	LIW	MAS	C^1–M^3
109543	♀	44	33	9	11	32.3	14.7	9.3	12.8	12.2	8.3	3.3	7.4	4.3
109544	♂	49	34	9	12	33.4	15.2	9.5	13.2	12.6	8.3	3.2	7.0	4.5
109545	♂	45	35	9	10	34.5	14.5	10.3	13.3	12.3	8.5	3.5	7.2	4.4
109546	♀	45	35	9	9	34.9	12.8	10.4	13.0	12.3	–	3.3	7.2	4.5
109547	♀	49	33	9	10	34.5	14.3	10.4	12.9	12.3	8.6	3.4	7.6	4.3
109548	♀	48	31	9	10	33.7	13.6	9.7	12.8	12.2	–	3.3	7.2	4.3
109549	♀	45	35	8	10	35.2	15.0	9.2	13.3	12.5	8.7	3.3	7.6	4.4
109551	♀	45	35	8	11	33.9	13.0	–	13.0	12.3	8.2	3.4	7.0	4.4
109557	♀	49	32	8	11	34.9	13.2	–	13.3	12.6	8.7	3.4	7.5	4.5
109559	♀	51	33	9	11	33.6	13.0	9.8	13.0	12.3	8.0	3.1	7.0	4.4
109560	♂	50	36	9	11	33.8	14.8	9.2	13.4	12.7	8.2	3.5	7.5	4.5
109563	♀	48	33	8	10	32.6	13.3	8.9	13.5	12.6	8.3	3.5	7.5	4.5
109564	♀	50	34	8	10	33.4	12.4	–	13.2	12.4	8.6	3.5	7.3	4.4

Table 17. Selected body and cranial measurements (mm) for *Anisomys imitator* Thomas, 1904

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109288	♀	246	312	67	24	58.9	29.4	36.0	9.4	24.8	3.1	7.5	7.2	9.7
109588	♀	277	345	62	22	62.7	33.3	38.4	10.2	27.1	3.4	7.2	7.5	9.8

Table 18. Selected body and cranial measurements (mm) for *Chiruromys lamia* (Thomas, 1897)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109291	♂	116	142	25	20	29.2	17.3	15.2	4.6	10.4	3.6	4.9	3.5	4.8
109595	♂	115	141	24	18	–	–	–	–	–	–	–	–	–

Table 19. Selected body and cranial measurements (mm) for *Coccymys ruemmleri* (Tate and Archbold, 1941)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109165	♀	94	142	21	20	24.5	14.2	12.7	3.5	9.6	4.1	4.2	3.0	4.0

Table 20. Selected body and cranial measurements (mm) for *Leptomys ernstmayri* Rümmler, 1932

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109273	♀	129	151	35	22	29.7	14.8	16.2	5.5	12.5	4.2	5.8	4.4	5.1
109477	♀	135	160	35	21	–	–	–	–	–	–	–	–	–
109478	♂	107	111	33	21	–	–	–	5.3	10.4	3.2	–	4.3	–
109479	♂	119	132	35	21	29.4	13.5	15.9	5.4	11.9	3.7	5.1	4.2	5.2
109514	♀	128	138	33	20	30.4	14.7	16.1	5.4	12.3	3.7	5.2	4.3	5.1
109518	♀	96	97	28	18	–	–	–	–	–	–	–	–	–
109522	♂	132	142	35	21	32.1	14.7	17.2	5.4	13.0	4.0	4.9	4.2	–

Table 21. Selected body and cranial measurements (mm) for *Mallomys aroaensis* (De Vis, 1907)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109289	♀	495	395	76	31	79.1	39.7	43.8	12.0	33.5	15.1	9.8	13.4	17.7

Table 22. Selected body and cranial measurements (mm) for *Melomys mollis* Thomas, 1913

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109163	♀	131	156	33	22	35.5	17.8	19.7	5.6	13.3	6.1	5.5	5.9	7.3
109166	♀	139	140	33	21	36.0	19.0	20.1	6.3	13.9	5.6	5.5	6.2	7.6
109178	♂	153	158	37	21	36.1	18.4	19.3	6.3	13.7	5.0	6.0	6.3	7.5
109181	♀	119	148	32	21	35.1	17.7	19.3	5.9	12.7	5.4	5.4	6.8	7.8
109182	♂	146	142	33	20	34.7	17.9	19.3	6.1	12.6	5.6	5.6	6.1	7.3
109209	♂	147	136	34	21	–	17.3	19.6	5.7	13.0	5.9	4.8	6.2	7.4
109210	♂	132	136	33	21	34.6	17.8	19.4	5.9	13.0	5.7	5.3	6.0	7.1
109228	♀	137	133	33	20	33.7	17.6	19.3	5.9	13.0	5.5	5.3	6.1	7.3
109229	♂	133	143	35	22	34.8	18.1	19.4	6.3	13.0	5.7	5.2	6.3	7.4
109242	♀	152	124	34	24	35.1	18.3	19.4	6.0	13.3	5.2	5.5	6.2	7.4
109243	♂	145	142	32	20	35.5	18.3	19.8	6.0	13.8	5.8	5.8	5.9	7.4
109244	♂	150	146	34	21	–	17.6	–	5.8	13.3	5.5	5.5	5.8	7.1
109267	♀	152	159	35	23	35.8	18.3	20.0	6.0	13.1	5.8	5.5	6.2	7.4
109268	♀	140	146	35	22	30.9	–	17.6	5.7	–	–	–	6.1	7.3
109269	♀	133	141	34	21	34.0	17.2	19.1	6.1	13.3	5.1	5.2	6.1	7.2
109300	♂	150	142	35	21	34.7	17.6	19.3	6.4	12.6	5.7	5.6	6.4	7.6
109323	♀	150	140	37	22	34.5	17.4	19.0	5.4	12.7	5.2	5.5	6.3	7.7
109331	♀	153	140	32	21	34.7	18.4	19.2	5.8	13.4	5.7	5.6	6.1	7.4
109343	♀	145	142	35	20	34.9	17.9	18.8	5.8	12.4	6.0	5.5	6.3	7.6

Table 23. Selected body and cranial measurements (mm) for *Melomys platyops* (Thomas, 1906)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109167	♂	124	111	30	18	31.4	15.9	17.6	5.7	11.5	5.0	5.1	6.0	7.1

Table 24. elected body and cranial measurements (mm) for *Parahydromys asper* (Thomas, 1906)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109158	♀	208	275	54	16	48.0	26.1	27.5	6.9	14.5	5.1	6.5	9.2	–

Table 25. Selected body and cranial measurements (mm) for *Pogonomys loriae* Thomas, 1897

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109308	♂	149	196	25	16	32.2	17.8	17.1	3.7	11.0	4.6	5.1	4.4	5.8
109349	♂	135	192	22	18	30.7	–	16.4	4.2	10.7	4.2	4.9	4.0	5.6
109395	♂	140	200	24	16	32.2	19.3	16.3	4.6	11.7	4.7	5.3	4.1	5.8
109433	♀	135	187	23	17	30.5	17.6	15.8	4.2	11.1	4.7	4.9	4.4	5.8
109435	♀	123	187	25	16	30.3	17.2	16.1	4.2	10.6	4.4	4.8	4.4	5.8
109437	♂	130	185	24	15	29.9	17.1	15.6	4.1	10.8	4.6	5.2	4.5	6.1
109438	♀	125	170	25	15	29.9	17.8	16.2	4.3	10.8	4.3	4.8	4.7	6.3
109440	♀	135	160	22	15	30.4	17.7	16.0	4.3	11.1	4.4	4.9	4.3	5.7

Table 26. Selected body and cranial measurements (mm) for *Pogonomys sylvestris* Thomas, 1920

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109238	♀	84	151	22	16	25.1	14.7	13.5	4.4	8.8	3.1	4.0	3.5	4.6
109387	♂	109	166	22	17	28.1	16.2	15.1	4.7	10.9	3.9	4.3	3.5	4.9
109391	♂	111	150	24	16	27.8	17.1	15.0	4.7	9.8	3.0	4.2	3.8	5.2
109392	♂	94	146	23	15	25.3	14.7	13.6	4.5	9.0	3.1	4.2	3.8	5.0
109393	♂	95	147	22	14	25.4	15.0	14.0	4.4	9.2	3.1	4.3	3.7	4.9
109400	♂	114	152	23	17	28.6	16.4	15.6	4.7	10.8	3.9	4.6	3.6	4.9
109405	♂	106	161	21	17	28.3	16.4	15.5	4.7	10.4	3.6	4.4	3.7	4.9
109445	♂	115	154	21	16	28.1	15.8	15.2	4.5	10.2	4.0	4.2	3.6	4.8
109453	♀	110	172	24	15	28.3	17.1	15.8	4.9	10.6	3.7	4.3	3.4	4.7
109454	♂	115	170	24	15	28.8	16.8	15.9	4.8	10.3	3.5	4.4	3.5	5.0
109455	♀	103	157	23	15	26.2	15.4	14.4	4.7	9.9	3.3	4.2	3.6	4.9
109456	♀	108	157	23	16	28.2	16.8	15.5	4.7	10.2	3.4	4.4	3.8	5.1
109469	♂	92	141	22	21	24.6	14.4	13.5	4.4	8.9	3.1	4.0	3.8	5.1
109471	♀	111	164	23	16	28.7	16.5	15.6	4.5	10.6	3.3	4.0	3.6	4.8
109472	♀	91	156	24	16	26.0	15.5	14.2	4.6	10.2	2.9	4.2	3.6	4.9
109473	♂	101	144	23	16	25.8	15.3	14.1	4.6	9.8	3.2	4.0	3.8	5.1
109594	♀	92	128	24	16	25.1	15.2	13.3	4.5	7.8	3.0	4.6	3.5	4.7

Table 27. Selected body and cranial measurements (mm) for *Rattus exulans* (Peale, 1848)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109138	♂	142	118	24	17	30.3	15.4	16.7	4.3	12.3	5.3	5.5	3.4	4.8
109144	♀	119	113	22	16	27.9	–	15.4	4.5	10.1	4.9	5.8	3.7	4.7
109145	♂	137	114	24	16	29.5	–	16.6	4.7	11.4	5.7	5.6	3.4	4.4
109146	♂	127	123	25	17	29.5	15.5	16.9	5.0	11.4	5.8	5.6	3.6	4.6
109147	♂	124	149	27	18	31.6	15.7	17.3	4.7	12.6	5.8	6.2	3.7	5.1
109148	♂	125	125	26	16	30.2	15.3	16.9	5.0	11.1	5.7	5.6	3.4	4.7
109149	♂	129	119	27	16	28.3	14.8	15.8	5.0	10.4	5.4	5.6	3.9	5.0
109150	♀	125	127	25	16	29.1	–	16.5	4.8	11.0	5.6	5.6	–	–
109151	♀	107	119	24	15	27.5	14.6	15.3	4.8	9.9	5.2	5.4	3.5	4.7

Table 28. Selected body and cranial measurements (mm) for *Stenomys niobe* (Thòmas, 1906)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109159	♀	98	116	28	19	29.0	14.5	16.4	5.4	11.9	4.4	5.1	3.9	5.2
109160	♀	113	126	26	18	29.5	15.0	16.4	5.3	11.8	4.6	4.8	4.1	5.2
109161	♀	116	128	28	19	29.0	14.9	16.4	5.6	12.1	4.7	5.4	3.8	5.1
109162	♀	105	118	26	19	28.5	13.9	16.1	5.1	11.7	4.5	5.5	4.0	5.3
109164	♀	122	121	28	18	29.9	14.5	16.6	5.3	12.1	5.0	5.4	4.0	5.2
109168	♀	116	131	27	20	29.6	14.4	16.9	5.5	12.1	4.9	5.6	4.0	5.2
109184	♂	117	123	26	18	28.4	14.7	16.0	5.2	11.0	4.0	5.0	4.0	5.2
109198	♀	111	118	27	19	29.8	14.9	–	5.3	11.6	4.9	5.7	4.0	5.3
109201	♀	113	128	26	18	28.9	14.9	16.0	5.4	11.2	4.4	5.5	4.0	5.2
109202	♂	108	137	26	20	29.3	14.9	16.4	5.5	11.9	4.3	4.9	4.0	5.2
109211	♂	113	122	27	19	30.2	15.0	17.2	5.5	12.3	4.6	5.3	4.1	5.3
109212	♂	111	141	30	19	28.9	–	–	5.4	11.8	4.4	5.2	4.2	5.3
109231	♂	126	128	28	19	29.6	–	17.0	5.3	11.5	4.3	5.4	3.9	5.3
109240	♀	120	145	28	20	31.2	15.8	17.8	5.3	13.1	4.4	5.2	4.4	5.7
109246	♂	118	110	27	19	29.3	14.9	16.8	5.3	12.6	4.5	5.3	3.9	5.1
109248	♂	108	111	26	20	29.8	15.3	–	5.8	11.5	4.6	5.4	4.1	5.4
109271	♀	83	101	24	17	23.8	12.7	13.4	4.9	9.4	3.8	4.7	4.1	5.1
109287	♂	111	115	29	20	28.7	–	16.3	5.5	11.6	3.9	5.1	3.9	5.2
109327	♂	110	115	26	19	28.8	14.9	16.3	5.2	11.9	4.3	5.5	4.1	5.1
109328	♂	113	129	28	18	29.5	14.3	17.0	5.2	12.7	4.8	5.1	3.9	5.2
109367	♀	109	119	27	18	28.7	15.0	16.4	5.6	11.8	4.2	5.3	4.2	5.4
109371	♂	119	110	26	17	28.9	14.4	16.5	5.3	12.0	3.8	5.2	3.9	5.2

Table 29. Selected body and cranial measurements (mm) for *Stenomys vandeuseni* (Taylor and Calaby, 1982)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109217	♂	111	156	32	20	33.5	16.1	17.8	5.7	14.4	6.1	5.5	4.4	6.0

Table 30. Selected body and cranial measurements (mm) for *Stenomys verecundus* (Thomas, 1904)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109516	♀	126	147	34	18	31.4	16.1	17.6	5.4	12.6	5.4	5.3	5.0	6.4
109520	♂	115	125	31	16	29.4	–	16.8	5.6	11.9	5.1	5.0	6.2	–

Table 31. Selected body and cranial measurements (mm) for *Uromys anak* Thomas, 1907

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109475	♀	298	397	65	26	68.7	34.1	41.1	9.9	25.5	7.9	6.7	10.5	13.1
109599	♀	315	375	66	25	71.0	35.2	–	10.6	27.3	7.3	7.6	10.7	13.5

Table 32. Selected body and cranial measurements (mm) for *Uromys caudimaculatus* (Krefft, 1867)

BBM-NG	S	HB	T	HF	E	CBL	ZYW	PAL	LIW	NL	IFL	BUL	M^1–M^2	M^1–M^3
109566	♀	290	315	62	27	60.0	31.5	35.5	9.2	23.7	6.5	5.7	8.5	10.9

ECTOPARASITES

Arthropods collected from the bodies of mammals appear in Table 33. A principal object of the expedition was to collect *ectoparasites*. We use that term in a broad sense and do not restrict it to permanent parasites such as fur mites, speleognathine nasal mites, and lice (Phthiraptera = Mallophaga, and Anoplura). Bat flies (Diptera: Nycteribiidae and Streblidae) are largely host-associated but have a developmental phase (in puparium) in the roosting area of the host. Fleas (Siphonaptera) are parasitic only as adults, and some adult fleas spend more time in the nest than on the host. Most groups of dermanyssoid mites represented in our collections are like fleas in being nest- as well as host-associated, but some dermanyssoids are restricted to the host. Ixodid ticks lay their eggs off the host, usually in the general environment; they are parasitic in each stage after the egg, but they typically leave the host to molt, necessitating that they acquire another host on which to feed in the following stage. Chiggers are parasitic only as larvae; their other active stages are as free-living predators. All of these ectoparasites have in common their taking nutrients from the host, their presence at times on the host or in its superficial cavities such as nasal passages, and their more intimate association with the host or its nest than that of such quick-feeding "micropredators" as mosquitoes.

Pseudoscorpions (Pseudoscorpionidae) are included in Table 33 despite their being predators, usually in the general soil and litter environments. The association of some pseudoscorpion species primarily or exclusively with mammals or their nests, where they may feed on ectoparasites, has been increasingly recognized (Durden 1987); Durden (1991) reported on mammal-associated pseudoscorpions at Bishop Museum collected in Papua New Guinea through 1978. Pseudoscorpions were common on some rodents in our collections, where they were partly submerged in and clinging to the hair of the rump. Some pseudoscorpions, observed carrying egg masses held to the ventral surface of the abdomen, utilized mammals as a biotic dispersal agent. A more interdependent relationship between pseudoscorpions and New Guinea rodents, one of phoresy, may also exist.

Most of the mammal species we studied had rarely or never been examined for arthropods before. The diversity of techniques employed to recover ectoparasites yielded rich collections. The 51 mammal nests for which the occupant(s) was identified by its continued presence represent a total of 11 species in the five marsupial genera *Murexia*, *Microperoryctes*, *Peroryctes*, *Cercartetus*, and *Pseudocheirus* and the four murid genera *Anisomys*, *Leptomys*, *Pogonomys*, and *Rattus*. The resulting nest collections yielded an abundance of parasitic mites, fleas, and flea larvae. They are important in representing the first nests of most of the mammals to be examined for arthropods and the first extensive assemblage of mammal nests to be thus examined from anywhere in New Guinea. Although most of the collected arthropods from hosts and nests have not yet been studied and no group of them has been reviewed in print, we are confident that this material will be rewarding and includes a number of undescribed species.

Some dermanyssoid mites were observed alive on the host under a dissecting microscope, and the results suggest the potential of the collections. The known specimens of *Notolaelaps novaguinea* Womersley (Laelapidae) were more than doubled, and the first males were taken (Radovsky 1994). Observations of a *Meristaspis* species (Spinturnicidae) on *Paranyctimene raptor* help to clarify the feeding relationships of spinturnicids associated with Pteropodidae (Radovsky, unpublished data).

Table 33. Arthropods collected from mammals, Milne Bay Provence, Papua New Guinea, 1985

Mammals	Mites and Ticks (Acari)[a]					Fleas	Lice	Bat Flies	Pseudo-scorpions
	D	C	F	N	T				
Murexia rothschildi	x	x	x		x	x			
Echymipera kalubu	x				x				
Microperoryctes longicauda	x	x		x	x	x			
Microperoryctes papuensis	x	x				x			
Peroryctes raffrayanus	x	x			x	x			
Phalanger carmelitae	x					x			
Dorcopsis macleayi							x		
Cercartetus caudatus	x	x	x		x	x	x		
Dactylopsila palpator	x				x		x		
Dactylopsila trivirgata		x				x			
Pseudocheirops corinnae				x					
Pseudocheirus forbesi	x	x				x			
Paranyctimene raptor	x	x							
Rousettus amplexicaudatus	x	x		x	x			x	
Syconycteris australis	x							x	
Pipistrellus collinus	x							x	
Anisomys imitator		x	x		x	x			
Chiruromys lamia	x				x				
Coccymys ruemmleri	x								
Leptomys ernstmayri	x			x	x	x	x		
Mallomys aroaensis	x			x					x
Melomys mollis	x	x	x	x	x	x	x		x
Melomys platyops	x					x	x		x
Parahydromys asper		x							
Pogonomys loriae	x		x				x		
Pogonomys sylvestris	x			x	x	x	x		x
Rattus exulans	x	x				x	x		
Stenomys niobe	x	x	x		x	x	x		x
Stenomys vandeuseni	x					x	x		
Uromys anak	x			x	x				
Uromys caudimaculatus	x	x				x	x		

[a]Abbreviations of ectoparasite taxa

- D Dermanyssoid mites (Mesostigmata: Dermanyssoidea)
- C Chiggers (Prostigmata: Trombiculidae)
- F Fur mites (Prostigmata: Myobiidae and Astigmata: Myocoptidae)
- N Nasal mites (Prostigmata: Erynetidae: Speleognathinae)
- T Ticks (Metastigmata: Ixodidae)

CONCLUSIONS

To state at the completion of a research project that more work is needed may appear to be pro forma, but we believe that expression of need is justified in this instance. The region is still relatively isolated, there are no roads, development is confined to village sprawl,

and although forests are being cut and cleared for garden plots there is, as yet, no commercial harvest of timber. Survey crews have come through the region several times (Agaun residents, pers. comm., 1985) in search of road paths, only to be dissuaded by steep terrain and unstable soils. Still, given the extent of primary forest in the region, commercial harvest ventures must be considered an imminent threat. In addition, the valley and surrounding mountains seem well suited for agricultural crops such as coffee and cardamon. If so, these enterprises could profit from a roadway to facilitate movement of supplies and equipment into the region and crops out to market. We believe, therefore, that the current opportunity to acquire a much more complete picture of the biological resources of the eastern extent of the Owen Stanley Range may continue to exist for only a few more decades. Our brief collecting efforts, and the very few others that came before us, are rich with examples of endemic species little known to science. Some of our collections, such as *Murexia rothschildi* and *Microperoryctes papuensis*, limited though they are, have doubled the number of examples of those taxa to be found in museum collections. There has been only one expedition to the area to collect frozen tissue (Pavel German's expedition, as previously noted). There is little or no information written about the herpetological fauna, a description of vegetation other than that associated with the present expedition (Engilis and Cole 1997) has not been written, and a host of other research topics await investigation.

To be certain, conducting research in this area poses some difficulties. The region is isolated and accessible only to entry by air and subsequent travel by foot. Many of the indigenous Daga people are suspicious of the motives of outsiders and very concerned about potential profits to be gained from the local natural resources. This is especially true of the people living in the small villages outside the Agaun Valley. This suspicion extends to biologists, armed with mouse traps, in quest of basic inventory information. In the Agaun Valley, however, the Daga people are relatively friendly, helpful, many educated at a mission school there, able to speak English, and possessing a rich, traditional knowledge of the animals and plants of the area.

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