

on the second. After this action the female came out of her trance and flew to a nearby perch. She watched the male who, after some preening and a few more chirrups and chuckles, went into the full basic display.

The post-basic display was noted on two occasions, but not at the same time as the pre-basic displays described above, and also involved the female. First the female sat on the display perch, a little apart from the male, and went into the "trance-like" condition described above. The male immediately went into the full basic display, rising and falling about 10 times. Then, still with wings spread, he turned to the female and clapped her between his spread wings several times. Immediately after this the birds separated and no further activity took place.

Subsequently I have seen them make half-hearted attempts at the pre-basic display, but never as fully as on the occasions described above.

I wish to acknowledge the scrutiny and helpful suggestions given by Clifford D. Frith.

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AN UNUSUAL NESTING HABIT FOR SWIFTLETS

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Throughout their Oriental-Pacific distribution swiftlets have been described as nesting on the rock walls or roofs of cavities and caves. Many such sites are under overhanging rock surfaces, a situation that presumably provides protection from predation by mammals and reptiles. Some species make their nesting sites even safer by only using locations that occur in total darkness (Tarburton 1986). This practice makes brooding swiftlets less vulnerable to attack from visually directed predators such as mammals and birds. Consequently, the major predators, e.g. snakes and feral cats, on nesting swiftlets take birds at low or narrow passages between their nests and the cave entrance. Predation at the nest is very limited.

Swiftlets nesting at high altitudes in PNG provide exceptions to these generalities in that they sometimes nest on cave floors. This has been noted in two species, the Mountain Swiftlet *Collacalia hirundinacea*, which is found in the mountains of Irian Jaya (Greenway 1978), mainland PNG (Mayr & Rand 1937; Rand 1942), Japen, Dampier and Goodenough Islands (Mayr 1937), and the White-rumped Swiftlet *Collacalia spodiopygius*, which throughout its wide distribution beyond PNG nests on the overhanging walls or roofs of caves (Tarburton 1986).

Until recently most ornithological expeditions into PNG have concentrated on taking specimens for identification and few swiftlet breeding colonies were located and described. In one exception Rand (1942) noted that the Mountain Swiftlet nested on ledges in subdued light near the bottom of a sink hole. This report did not indicate whether or not the ledges were on overhanging rock.

More recently Australian cavers on speleological expeditions into PNG have noted some swiftlet breeding sites on the floor of the caves. One cave containing White-rumped Swiftlets was at c. 1090 m on the Lelet Plateau, central New Ireland (P. Wilson, pers. comm.). The nests were among rocks and flowstone on a rock pile (Figure 1) at the bottom of a ladder pitch, not far from the cave entrance.

The second location involved Mountain Swiftlets and was in the Mamo Kananda Cave (formerly known as Atea Kananda Cave, M.R. 300) which is at 2000 m in the Muller Range, Southern Highlands Province (J.M. James, pers. comm.; Smith 1978). Most nest sites were on the roof in entrances or entrance chambers. Some solitary nests were found on the ground up to half a kilometre from the nearest known entrance.

As the widespread habit of nesting below overhanging rock would seem to prevent or significantly reduce predation for most swiftlet species, why is it that these swiftlets survive while nesting on the floor or on ledges close to the floor? It is difficult to conceive of any reason other than that the predators of swiftlets are uncommon at these high altitudes. Pythons and tree snakes are major predators of swiftlets in caves (Tarburton 1988) and it may be that it is too cold for such reptiles at these high altitudes. Max Mulligan and Clive Butcher, (pers. comm.) who have lived in many parts of the highlands for six years have never seen any pythons or tree snakes above 1000 m. Earthwatch personnel collecting lizards on Mt Kaindi found very few snakes at all between 660 and 3300 m (Gressitt & Nadkarni 1978).

Feral cats are the other known major ground-based predator of nesting swiftlets, but are uncommon and the only other mammalian predators able to prey on ground nesting swiftlets are rats. These are unlikely to have much impact as the introduced species (*Rattus exulans*, *R. norvegicus* & *R. rattus*) are the only ones known to eat birds and they are confined to coastal towns and lowlands (Menzies & Dennis 1979). The largest

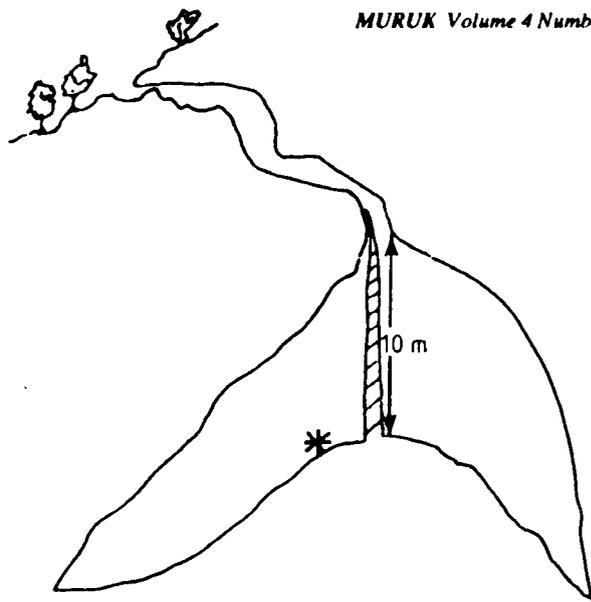


Figure 1. Cross section of the cave on the Lelet Plateau, New Ireland, showing the unusual nest site for White-rumped Swiftlets. An asterisk denotes the position of the nest, near the bottom of a 10 m ladder pitch.

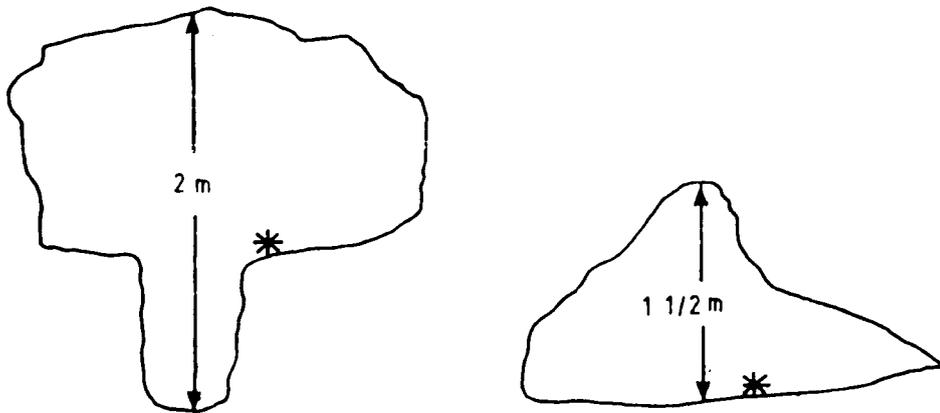


Figure 2. Cross section of two sites in the Mamo Kananda Cave where Mountain Swiftlets were nesting on the cave floor. Asterisks designate the location of the nests.

native rat is the Black-eared Giant Rat (*Mallomys rothschildi*) and it is known to be entirely vegetarian (Menzies & Dennis 1979). It could well be this lack of reptilian and mammalian predators that allows the swiftlets to indulge in this very different and seemingly unsafe nesting behaviour.

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NEST OF THE BLUE-CAPPED IFRITA *IFRITA KOWALDI*

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On 18 June 1989 the nest of a Blue-capped Ifrita was discovered, near the village of Myola, Northern Province, at c. 2100 m. This note is presented here as only a brief description of a Blue-capped Ifrita's nest appears in Rand & Gilliard (1967) and no further descriptions could be found.

The nest was in a tree with a trunk diameter of 15 - 22 cm. It was situated on a branch about 30 - 45 cm from the trunk and about 150 - 180 cm (*i.e.* eye-level) above the ground. The external dimensions of the nest were 15 - 18 cm across and 8 - 11 cm deep, but it was not quite uniform in shape because of the way it was attached to the branch. It was not tidily constructed and was covered on the outside, at least, with the same mosses as were to be found on most trees in the vicinity. This combination provided good camouflage and it was only because a bird was seen on the nest that it was