THE orange leaf-nosed bat, *Rhinonicteris aurantius*, has been poorly studied in the Kimberley region of Western Australia. The range of *R. aurantius* is continuous across the tropical north of Australia, extending throughout the Kimberley region and the Top End of the Northern Territory. Within this distribution, the species is reported to be rare and restricted to a few sites (Churchill 1991a). This pattern of distribution is due to a reliance on caves with warm, humid roost microclimates. Jolly (1988) and Churchill et al. (1988) recorded a narrow range of preferred roost temperature and relative humidity (RH) in the Northern Territory of between 28-32ºC and 90-96% respectively, although Churchill (1991a) recorded RH in roosts of *R. aurantius* of between 85-100% (30.43 ± 2.18 g m⁻³ vapour density). The species also tends to roost as far from the entrance as possible, which is often correlated with such extreme microclimate variables (Jolly 1988; Churchill 1991). The roost microclimate of *R. aurantius* in July 1987 in a medium-sized limestone cave near Geike Gorge (18º 06'S 125º 42'E) was recorded as 29.5ºC and 28.44 g m⁻³ (Churchill 1991b), within the preferred range of *R. aurantius*.

The preferred roost microclimate of *R. aurantius* in the Kimberley region is based upon the single observation of Churchill (1991b). This communication reports a more detailed examination of the microclimate conditions present in various parts of the same cave in Geike Gorge National Park to confirm that this regime is at least typical of the cave. Microclimate conditions were monitored over a period of several days to determine how these fluctuated in comparison with conditions outside the cave.

The microclimate was monitored over a period of approximately 40 hours between 15:00 29/8/96 - 08:00 31/8/96 with temperature and relative humidity “Hobo” dataloggers (Onset Applications). Four pairs of dataloggers were used in this study. One of each type of datalogger was placed in a dome where *R. aurantius* were observed to roost, the main chamber, the cave entrance and outside the cave as a control. Dataloggers recorded temperature and RH every 2.24 minutes.

Bat species recorded in the cave included *R. aurantius*, *Hipposideros ater* and *Vespadelus sp*. Counts were not made. Beyond the entrance to the cave is a narrow tunnel that opens into a large chamber. Small branches and domes extend from the main chamber.

Both microclimate variables were found to increase (generally) as cave depth increased and diurnal fluctuation decreased to the point where, in the dome, they were extremely stable (Figs. I & 2). The range of temperature and RH values recorded in the dome were 27.7 - 28.0ºC and 90.3 - 100% respectively. These correspond with the measurements made by Churchill (1991a, b) in 1987. *R. aurantius* was only observed roosting in the dome or the main chamber and individuals roosted apart from each other.

Very little study has been conducted on *R. aurantius* in the Kimberley and it is generally assumed to have the same roosting requirements as in the Northern Territory. The largest aggregations of *R. aurantius* in the Northern Territory and Queensland are either in limestone or sandstone caves or disused mines. Similar geology is present throughout the - Kimberley. The Geike Bat Cave is formed in the Devonian limestone of the Oscar Range. The geology of the Pilbara further south is markedly different and roost availability is probably more restricted within areas of relief (Armstrong 2000). The present study confirmed and extended Churchill’s (1991a, b) single-point observation that preferred roosting microclimates across the Kimberley and Northern Territory are within a restricted range of values. Furthermore, the stability of this microclimate is
apparent in comparison with regimes both outside the cave and within other areas of the cave. Both the temperature and RH range of preferred microclimate, as well as the stability of the regime, are probably diagnostic features of a roost of *R. aurantius* in the Kimberley. Further study on Kimberley *R. aurantius* is required, especially in terms of locating breeding colonies and examining possible summer exoduses.

**ACKNOWLEDGEMENTS**

Thank you to Shayne Baker and CRA Exploration Pty Ltd for field support and equipment, the Department of Conservation and Land Management for access and Dr Tony Start for advice.

**REFERENCES**


