

2. ADAPTATIONS AND FUNCTION

EVOLUTION OF THE KANGAROO BODY FORM

The unique kangaroo body form is seen in all Macropodiformes with the exception of the musky rat kangaroo, the most primitive of extant kangaroos. Instead, this has hindlimbs that are similar in size to its forelimbs. Musky rat kangaroos are strictly quadrupedal and have a synchronous plantigrade gait that is used for both slow and fast locomotion as they move through their rainforest habitat.

This suggests that what we know as the kangaroo body form evolved primarily because of the acquisition of a suite of musculoskeletal adaptations for bipedal hopping (saltation). Within the kangaroo's ancestors the transition from a quadrupedal gait to saltatory gait is believed to have occurred during the mid Eocene or early Oligocene epoch, 45–30 mybp. The development of elongated hindlimbs, with most of their muscle mass in the upper leg and pelvis, was the most significant change. Simultaneously



Figure 2.1: A musky rat kangaroo with the remains of a green katydid that it was holding in its paws while eating it. The back legs of the musky rat kangaroo are only slightly larger than the front legs. (Photo: Stan Breeden.)