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DIET OF THE TOKAY GECKO (*GEKKO GECKO*) IN SOUTHERN FLORIDA

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The tokay gecko (*Gekko gecko*) of tropical Asia has been known to occur in Florida since the 1960s (Wilson and Porras 1983). Its mode of dispersal has been associated with deliberate release around residences and its mode of introduction is the pet trade (Wilson and Porras 1983). Despite the long-term presence of *G. gecko* in southern Florida and expanding geographic range in Florida (Means 1996), no published information exists on any aspects of its natural history in an introduced site. Here we provide data on the summer diet of *G. gecko* from an urban setting in southern Florida and relate this to the structure of the habitat in which the individuals were observed and captured.

Geckos were captured by hand beginning two hours after dark on 3, 7, and 15 July 1996 (40, 30, and 20 min., respectively) in a two square block area near the Miami International Airport, Miami, Dade Co., Florida. The method used was to repeatedly search the area. Geckos were collected by two people on the first visit and one person on the last two visits, killed within two hours of capture, and stored in 70% ETOH. For each gecko, sex was determined, snout-vent length (SVL) was measured in mm with calipers, and stomachs were removed. Contents of the stomach were identified to the level of family whenever possible and measured for length and width. All geckos were deposited in the Everglades Regional Collections Center (ERCC). Voucher specimens of prey were entered into the invertebrate collection of the ERCC. Means are followed by standard deviations. Statistics were calculated on Quatro Pro (Keough 1992).

Twenty geckos were collected in approximately 2.17 man-hours. Noticeably abundant (9.2 geckos observed/ hr), geckos were observed and collected primarily on the West Indian black olive (*Bucida buceras*) and exotic ficus (*Ficus* spp.) trees. Two juveniles and an adult male were collected from an unlit building.

Seven males (148.7±10.6 mm SVL; range=133-166; n=7), nine females (125. 9±7.6; range=110-134; n=9), and four juveniles (88, 104, 106, 106 mm SVL) were collected. Mean body size significantly differed (Z=4.49, P<0.0001) between the sexes. Tokays were capable of subduing a wide range of prey sizes. Consequently, mean prey length did not significantly differ between males (17.3±13.5; range=2-50; n=11), females (8.9±6.8; range=2-30; n=21), and juveniles (12.7±5.1; range=4-22; n=19). Likewise, no significant relationship (r=0.37, P>0.33; n=17) existed between maximum prey size and body size of the gecko.

Twenty-three categories of prey were present in the diet of this sample (Table 1). Dietary niche breadth (Levins 1968) of the total sample, ranging from 0 to 1, was wider as measured by number of stomachs common to each taxon (0.53) than as measured by frequency of taxa (0.37). Roaches, caterpillars, spiders, and beetles were the most numerous taxa present and common to the greatest number of stomachs. Despite the close proximity to lighted buildings, trees appeared to be self-sustaining systems for *G. gecko* for three reasons. First, no exclusively light-attracted prey, perhaps deflected from the building, were present in the sample. Second, few invertebrates of any taxon were present on the buildings. For example, no moths and only a few small (< 5 mm) hemipterans were seen on lighted portions of buildings. This is noteworthy, given the time of year sampled (the wet season) when insect abundance should be high. Perhaps the profuse

Table 1. Diet of the tokay gecko (*Gekko gecko*) in southern Florida. The number of prey items is followed in parentheses by number of stomachs in which the prey items were found.

Prey	Males (n=7)	Females (n=9)	Juveniles (n=4)	Total
Arachnida				
Araneida	2(2)	3(1)	1(1)	6(4)
Chilopoda	1(1)	0(0)	0(0)	1(1)
Crustacea				
Isopoda	1(1)	0(0)	1(1)	2(2)
Diplopoda	1(1)	0(0)	0(0)	1(1)
Isoptera	2(1)	0(0)	0(0)	2(1)
Coleoptera	0(0)	1(1)	0(0)	1(1)
Cerambycidae	0(0)	0(0)	1(1)	1(1)
Chrysomelidae	0(0)	0(0)	1(1)	1(1)
Curculionidae	0(0)	5(3)	0(0)	5(3)
Dytiscidae	0(0)	0(0)	1(1)	1(1)
Elateridae	0(0)	0(0)	1(1)	1(1)
Scarabeidae	0(0)	0(0)	1(1)	1(1)
Diptera				
Calliphoridae	0(0)	1(1)	0(0)	1(1)
Hemiptera	0(0)	1(1)	0(0)	1(1)
Cydnidae	0(0)	0(0)	1(1)	1(1)
Pentatomidae	2(2)	1(1)	0(0)	3(3)
Hymenoptera				
Formicidae	0(0)	3(2)	0(0)	3(2)
Lepidoptera (larvae)	2(1)	10(8)	0(0)	12(9)
Orthoptera				
Blattidae	2(1)	2(1)	12(3)	16(5)
Tettigoniidae	0(0)	0(0)	1(1)	1(1)
Trichoptera	0(0)	4(2)	0(0)	4(2)
Gastropoda	0(0)	1(1)	0(0)	1(1)
Skin	2(2)	0(0)	0(0)	2(2)
Empty	1(1)	1(1)	0(0)	2(2)

lighting of the buildings and streets of the study site prevented any one building from attracting more than a few insects. Third, many taxa of prey were associated with the trees' leaf litter (isopods), vegetation (caterpillars), or both (roaches, ants). For these reasons, it was not surprising that very few geckos were observed, and consequently caught, on buildings which corroborated the importance of habitat other than buildings for food.

The close connection between diet and habitat in this sample supports the assertions that tree-dwelling *G. gecko* were autonomous, not dependent on light-attracted prey deflected from buildings, and that vegetation was used more so than buildings by geckos. In its native range, *G. gecko* inhabits human dwellings and natural areas (Brown and Alcala 1978). The ubiquity of black olive and ficus trees in urban settings of southern Florida and observations of *G. gecko* on avocado (*Persea americana*), royal poinciana (*Delonix regia*), and coconut palms (*Cocos nucifera*) in Homestead (W. Meshaka, pers. obs.) raise the possibility that *G. gecko* could invade continuous tracts of disturbed vegetation which would enable it to reach the edges of natural systems. Of greater concern is that the presence of the native strangler fig (*F. aurea*) and short-leaved fig (*F. citrifolia*) in some nat-

ural systems of southern Florida could then present *G. gecko* with the opportunity to invade undisturbed habitat.

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