FRUITS AND THE ECOLOGY OF RESPLENDENT QUETZALS

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ABSTRACT.—Resplendent Quetzals (*Pharomachrus mocinno*) are typically termed "special-

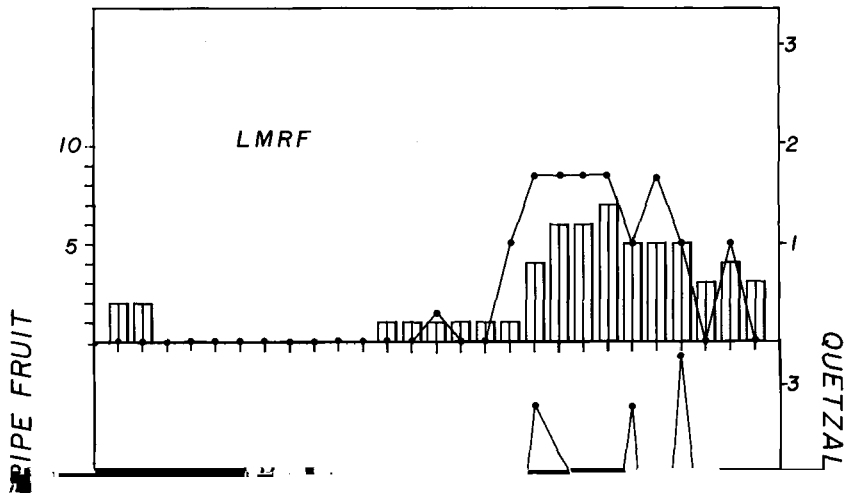
unique traits lie partly in the shortage of nat-

33,000 ha) surrounds the Reserve on the Atlantic

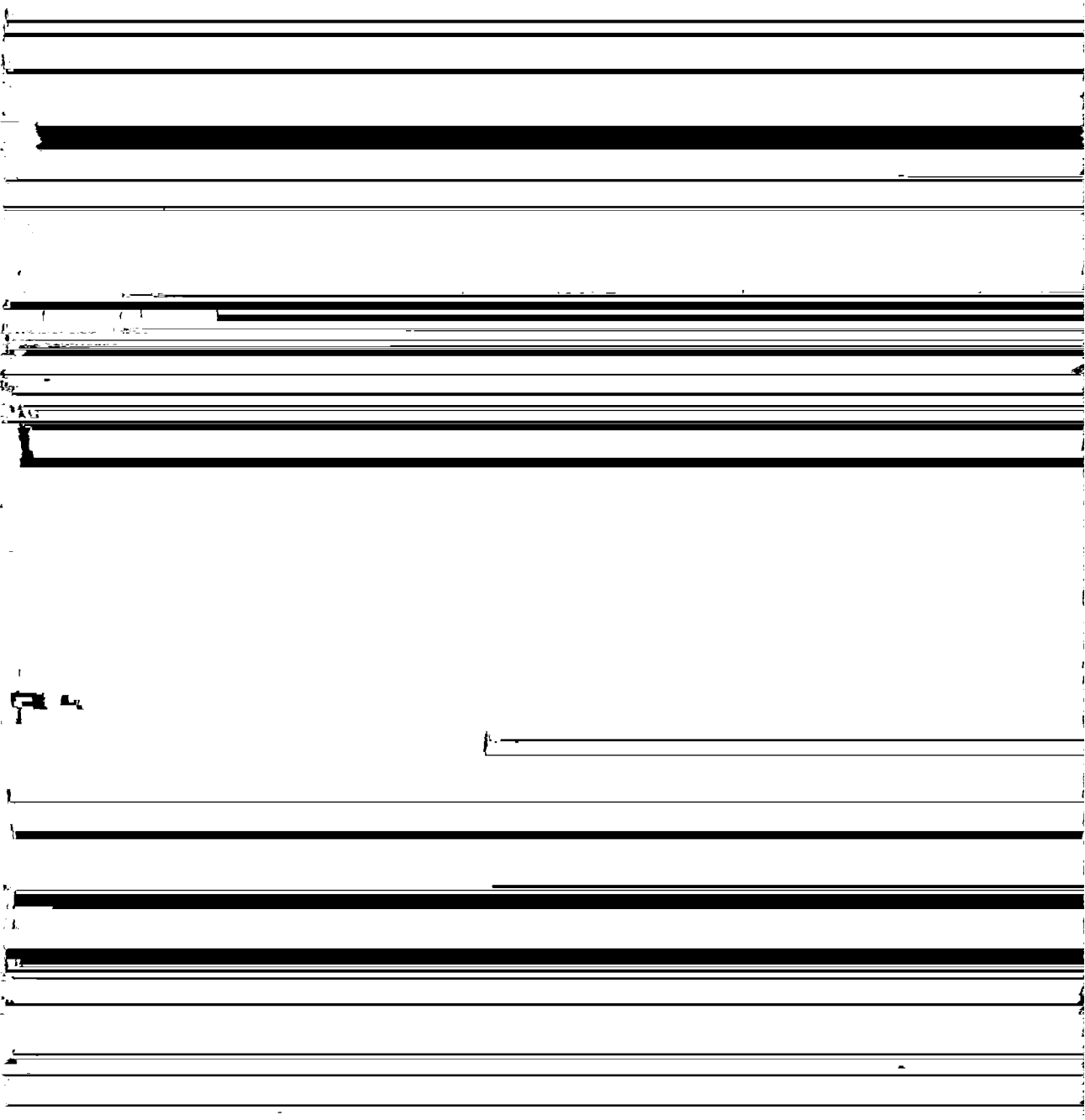
TABLE 1. Fruits eaten by quetzals at Monteverde, Costa Rica. Plant families are arranged according to Cronquist (1981). C = common (>10 observations); M = moderately common (2–10 obs.); R = rare (1

TABLE 1. Continued.

	Jan–Feb	Mar–Apr	May–Jun	Jul–Aug	Sep–Oct[a]	Nov–Dec[a]
Rubiaceae						
Chione costaricensis			R			
Coussarea austin-smithii	M					
Gi[illegible]	[illegible]					
unknown sp.			R			
ARECIDAE						
Araceae						
Anthurium sp.			R			
Bimonthly species total:						
Common	6	10	8	10	5	
Moderately common	5	6	5	3		
Rare	1	1	5	1	1	1
All species	12	17	18	14	5[a]	1[a]


LMRF
10
5
3
2
1
-3
RIPE FRUIT
QUETZAL

[lower montane rain forest (LMRF), lower insects or defending their nests against pred-



moist forest (LMMF), and premontane wet forest (PMWF)] that correspond to Holdridge's (1967) life zones, although they are based on

sometimes landed on the ground (W. and C. Guindon, T. Blagden pers. comm.; pers. obs.). Bowes and Allen's (1969) proposal that quetzals

n = 44 h observation) and during days 11–21 (28 May–7 June; n = 27 h). Because these observations record only items carried in the bill, they may under-represent fruit regurgitated in the nest. Proportions expressed as a fraction of identifiable items (n = 196). The male delivered more orthopterans ($P < 0.05$),

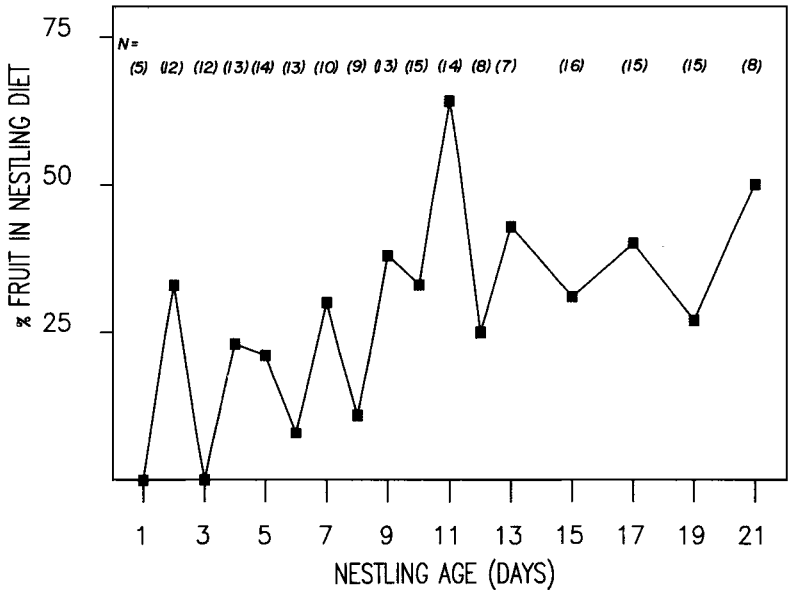


Fig. 2. Age versus proportion of fruit in the diet of nestling quetzals at nest 1. Spearman Rank Correlation: $r_s = 0.62$; $P < 0.01$. The number of food items for which frequencies were calculated is listed above each point. Each point represents 4–5 h of observation (71 h in total).

most entirely animal food" (insects, snails, lizards, and frogs) until the 10th day; fruits became important in the diet only after the 14th day. In the Monteverde population, certain insects, in particular beetles and grasshoppers, than did the female (Table 2; χ^2 One-sample Test: $P < 0.01$). The male also made significantly more deliveries in total ($P < 0.01$; χ^2 One-

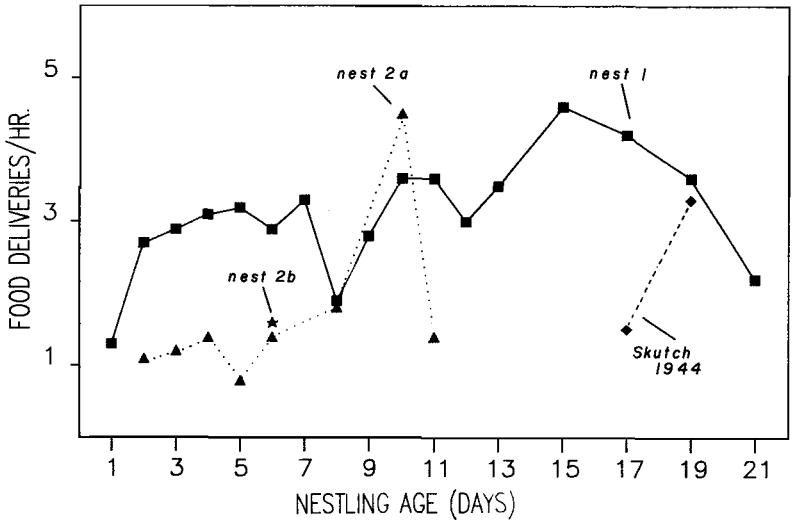
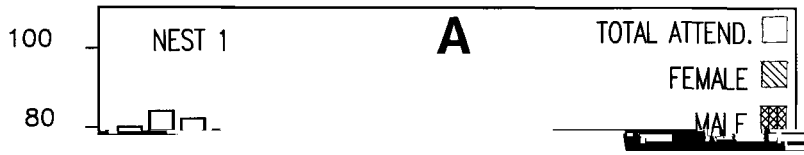


Fig. 3. Nestling age versus hourly rate of food delivery in quetzals. ■ = nest 1 (two nestlings until day 20; first clutch); ▲ = nest 2 (one nestling; first clutch); ★ = nest 2 (one nestling; second clutch); ◆ = data from Skutch (1944).

of light gaps or pastures, and 14% in snags in the open. Of 40 nests, 11 faced north-northeast, 13 east-southeast, 7 south-southwest, and 9 west-northwest. Nests were excavated in decaying *Ocotea tonduzii* and other Lauraceae (8 of the 10 decomposing snags that could be identified), *Eugenia* sp. (1/10), and *Quararibea* sp. (Bombacaceae; 1/10). If the same snag was

and afternoon shifts, however, as Skutch (1944) did. In 16 observations at four nests, each sex incubated with equal frequency betwen 0800 and 1200; the female tended to be present during early morning and late afternoon and the male during early afternoon. Although La-Bastille et al. (1972) seldom noticed eggs uncovered for more than 2–13 min, I often found


100
80
NEST 1
A
TOTAL ATTEND.
FEMALE
MALE

[redacted]

their nests vigorously against squirrels (T. Blanden pers. comm.), which are known to re-

ity fruits, their diets generally conform to McKey's (1975) model for specialists. The fruits

[redacted]

ed 60–90% of all seeds dropped by quetzals fall directly beneath the parent tree or within 100 m. Widely foraging tanagers or flycatchers probably spread seeds more effectively. Quetzals provide one aspect of high-quality seed dispersal, however, of which few bird species are capable, namely transporting bulky seeds (as in many Lauraceae) with substantial seedling reserves (McKey 1975).

regularity in the availability of any one fruit species, birds are unlikely to evolve a strong interdependence with one or a few species (Howe 1981, Wheelwright and Orians 1982, Thompson 1982).

Crome's (1975) detailed study of fruit-pigeons in tropical Queensland suggests coevolution with, or at least dependence upon, fruiting plants at the family level, as in quetzals.

birds for which fruit plays a less important role in their life histories. They also differ in many

Lauraceae are ripe, and 88% of the diet of one species consisted of fruits of the Lauraceae and

birds, but at the moment we lack the data to determine which differences are merely quan-

geon population movements mirrored the changing abundance of lauraceous fruits. In the

imals, most ripe fruits tend not to be cryptic, scarce, toxic, evasive, or spiny. They are "easy prey" (Snow 1971). Until now, the evidence for this postulate has come from analyses of time budgets of fruit-eating birds, which demonstrated that several species may spend only 8–17% of the day acquiring fruit during the

the Arenal National Forest surrounding the Reserve remains intact—the local population is in no immediate danger of the deleterious effects of inbreeding (Soulé and Wilcox 1980). Quetzals will probably be one of the first species lost, however, if the Reserve becomes isolated.

The Monteverde Cloud Forest Reserve com-

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