

Food and foraging ecology of the Jamaican Becard.—Although the feeding habits and other aspects of niche utilization of some of the neotropical mainland Cotingidae are known (see Skutch 1970, Life histories of Central American birds, part 3, Berkeley, Cooper Ornithol. Soc., pp. 10–96), virtually nothing has been published about the ecology of the Jamaican Becard (*Platypsaris niger*), the only member of the family in the West Indian region. The following information on the Jamaican Becard, obtained while studying the Jamaican Woodpecker (*Centurus radiolatus*), should be helpful in the future analyses of this species. To my knowledge the only references to its food habits are those of Gosse (1847, The birds of Jamaica, London, Van Voorst Press, pp. 187–192) who states that it feeds on stationary insects, particularly large bugs (*Pentatoma*), caterpillars (Lepidoptera), insect eggs, and the fruits of gumbo-limbo (*Bursera simaruba*); and of Salmon (1964, Gosse Bird Club Broadsheet No. 2: 22) who reported a female taking grasshoppers (Orthoptera) to its nestlings.

This study was carried out in the Lluidas Vale (Worthy Park) region, St. Catherine Parish, Jamaica during the spring and summer of 1970 and summer of 1971. The vegetation of this area is wet limestone forest (Asprey and Robbins 1953, Ecol. Monogr. 23: 359), and the elevations range from 370 m in the valley to 950 m in the surrounding hills and mountains. This type of forest grows in limestone areas where annual precipitation exceeds 30 cm. Some of its characteristic trees are broadleaf (*Terminalia latifolia*), Jamaican cedar (*Cedrela odorata*), sweetwoods (*Nectandra* spp.), bulletwoods (*Dipholis* spp.), prickly yellow (*Xanthoxylum martinicensis*), trumpet tree (*Cecropia peltata*), and figs (*Ficus* spp.). Many of the trees in this region support epiphytes, bromeliads, and lianes growing in profusion.

I found the Jamaican Becard an uncommon resident in the wet limestone forest and wooded pastures of this region, usually encountered singly but sometimes in pairs. Primarily arboreal, its foraging activities are confined mainly to the middle and upper levels of the trees, although I saw one individual foraging low in a tree (Table 1). The species' foraging methods included the following categories: hovering or snatching (the bird is on the wing and the prey is not), flycatching or hawking (both bird and prey are on the wing), and gleaning from leaves. Hovering was the most frequent tactic employed and flycatching was the least frequently used (Table 1). As the number of feeding observations was small (32) and based on approximately seven individuals, it may not be truly representative. More extended observations could possibly show that other techniques or other

TABLE 1
FORAGING BEHAVIOR OF THE JAMAICAN BECARD

Foraging zones	Hovering for			Hawking for insects	Gleaning for		Percent of foraging zones
	arthropods	fruits	lizards		arthropods	fruits	
Lower ¹	1 ²						3 (1) ³
Middle	8	6		1	2	1	56 (18)
Upper	5	5	1	1	1		41 (13)
Percent of foraging behavior	44 (14) ³	34 (11)	3 (1)	6 (2)	10 (3)	3 (1)	100 (32)

¹ Foraging zones were arbitrarily divided into lower level (3–4.5 m), middle level (4.5–10.5 m), and upper level (greater than 10.5 m).

² Numbers of times foraging pattern was recorded in each foraging zone.

³ Numbers in parentheses indicate total number of observations.

feeding methods are used more frequently. When hunting animal food, they usually move slowly through the foliage or sit on a branch, moving their head from side to side. When they detect a prey they suddenly dart forward, seize it while hovering, and then return to a convenient perch against which they may beat the prey to immobilize it before swallowing. The most common method of picking fruits is to pluck it while hovering on the wing.

Of the 32 feedings recorded, 19 (60%) were on invertebrates, 1 (3%) was on a vertebrate, and 11 (37%) were on fruits (Table 1). The food items taken consisted of spiders (Araneae), insects (Odonata, Orthoptera, Coleoptera, Lepidoptera, and other unidentifiable insects), a lizard (*Anolis*), and fruits, particularly *Ficus*. Stomach contents of a male becard a local resident collected on 20 April 1970 and gave me consisted solely of *Ficus* fruits.

While much work needs to be done to complete our knowledge of its niche utilization pattern, a comparison of the results obtained for the Jamaican Becard with the results obtained by Skutch (ibid.) for the Central American Cotingidae indicate that the food and foraging pattern of the Jamaican Becard is more flexible and diverse than many of the mainland species, including in its repertoire combinations of patterns found in different Cotingidae, but not usually encountered in any single species. This niche expansion is probably related to the absence of similar species and the depauperate nature of the Jamaican avifauna in comparison with similar-sized mainland areas.

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The vocal repertoire of male American Woodcock.¹—One of the most interesting and spectacular acts in the life history of the American Woodcock, *Philohela minor*, is the courtship ritual of the male, which he carries out at dusk and dawn from open tracts of land known as "singing grounds" (Mendall and Aldous 1943). The male woodcock makes four principal sounds during his courtship performance: a buzzing "peent" call preceded by a barely audible "tuko," both given while on the ground and a vocal "chirping" during the aerial flight which is accompanied by a mechanical "twittering" produced by the wings. In addition a "cackle" is occasionally given in flight as a warning to invading males (Mendall and Aldous 1943, Pitelka 1943, Sheldon 1967). Our objective was to prepare spectrograms of all sounds emitted by woodcock on singing grounds.

We recorded all calls with battery powered Norelco Carry-Corder '150' cassette tape recorders and used 24-inch parabolic reflectors (C. W. Torngren Co., Somerville, Massachusetts) with 6-inch focal lengths to increase microphone sensitivity and directionality. Recording distances varied from 10 to 50 feet. Recordings were processed through a Kay Electric Company Sona-graph, Model 6061-B, using the wide band pass filter and FL-1 circuit.

While the vocal repertoires of several game species have been analyzed spectrographically (Ellis and Stokes 1966, Williams 1969, Heinz and Gysel 1970), no spectrographs of all known sounds male woodcock emit on singing grounds (Figure 1) have ever before been prepared. Peterson and Bartholomew (1969) state "overt

¹ Scientific paper No. 1263, West Virginia University, Agriculture Experiment Station.