

DISTRIBUTION, ECOLOGY, AND BREEDING BIOLOGY OF THE RUFIOUS-THROATED SOLITAIRE IN JAMAICA

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THE Rufous-throated Solitaire (*Myadestes genibarbis*) is confined to the Antilles, occurring in Jamaica, Hispaniola, Dominica, Martinique, St. Lucia, and St. Vincent. Despite its wide distribution, no detailed studies have ever been reported for much of its life history. The reason for this paucity of information is clear from the memorable account by Wetmore (1937) of his experiences in Hispaniola. "When riding mountain trails that pass dense growths or damp rain-forest one may hear occasionally a series of clear whistled notes, like those of a flute, that come slowly through the air and then cease, to be repeated at a short interval, or perhaps answered from a distance. The countryman knows this disembodied voice as the *jilguero* or *musicien*, according to whether one is travelling in the Dominican Republic or in Haiti, but is almost sure to state that it is supposed to be a bird but that by no possible chance can one be seen. By the superstitious the notes are believed to emanate from some spirit."

The plumage of the Rufous-throated Solitaire is mostly gray, with rufous throat, foreneck, and posterior underparts; lower eyelids and chin white, much white on outer tail feathers; feet yellow. For 10 live birds, weights were 24.4–30 g (mean 27.1). The culmens of 13 adult Jamaican specimens range from 10.0–12.5 mm and average 11.4 mm (Ridgway 1907).

I studied Rufous-throated Solitaires in Jamaica during the winter of 1969, spring and summer of 1970, and summers of 1971 and 1972 while conducting a larger study on the Jamaican Woodpecker, *Centurus radiolatus* (Cruz 1973).

THE STUDY AREAS

The principal study area was a montane mist forest located near Hardwar Gap, St. Andrew Parish. This forest (Fig. 1), growing from 1220 to 1373 m, is low canopied, seldom exceeding 12 m. It is an area of high humidity owing to the high annual rainfall (over 200 cm) and mist that almost continuously covers the area. Dominant trees in this community are yacca (*Podocarpus urbanii*), bloodwood (*Cyrilla racemiflora*), jumba (*Alchornea latifolia*), and wild fig (*Clusia* spp.). There is also an abundance of undergrowth shrubs and lower order plants such as mosses and ferns, including the tree fern (*Cyathea*). Studies in the montane mist forest were made during the spring and summer of 1970, and summers of 1971 and 1972.

Rufous-throated Solitaires were also observed in the winter of 1969 and spring of 1970 in a wet limestone forest located in Worthy Park, St. Catherine Parish. The



Fig. 1. Montane mist forest community near Hardwar Gap, St. Andrew, Jamaica in the Rufous-throated Solitaire study area.

canopy in the wet limestone forest is dense and contains trees up to 30 m or more. Elevations range from 370 m in the valley to 950 m in the surrounding hills and mountains, and the precipitation averages 185 cm annually. Some of the characteristic trees are broadleaf (*Terminalia latifolia*), Jamaican cedar (*Cedrela odorata*),

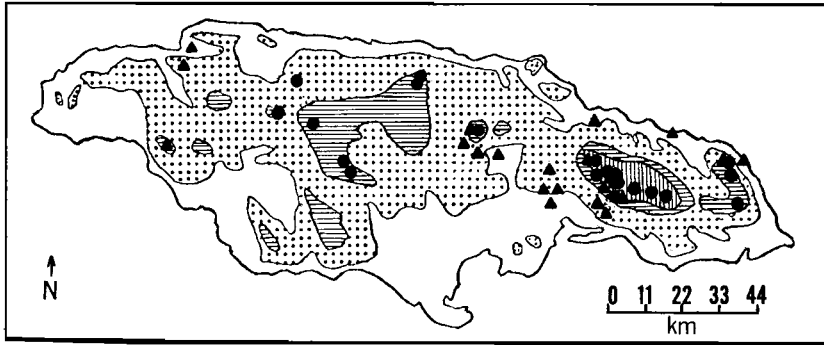


Fig. 2. Distribution of the Rufous-throated Solitaire in Jamaica. Black circles indicate distribution during the breeding season (April-August) and triangles indicate records during the nonbreeding season (September-March) based on field observations, the published literature, and personal communications. Open area = 0-152 m, dotted = 153-610 m, horizontal = 610-1071 m, vertical = greater than 1071 m.

sweetwoods (*Nectandra* spp.), bulletwoods (*Daphnopsis* spp.), and in more open places trumpet trees (*Cecropia peltata*).

In order to get as complete a picture as possible on the distribution and habitat preferences of the Rufous-throated Solitaire, I visited many distinct habitats in Jamaica. This information has been supplemented from the literature and by correspondence with persons knowledgeable of the avifauna of Jamaica.

DISTRIBUTION AND HABITAT

The Rufous-throated Solitaire is found in the montane regions of Jamaica where it is confined primarily to elevations above 610 m during the breeding season (Fig. 2). The optimal solitaire habitats are in places of high precipitation, such as the wet limestone forest, lower montane rain forest, montane mist forest, and elfin forests, where the bird occupies woodlands and thickets. It is especially common in the montane mist forest where I recorded an average of 25 birds per km near Hardwar Gap during the summer of 1972.

Some individuals undergo a regular vertical migration to lower elevations during the nonbreeding season (September-April). At this time of the year, solitaires occur at sea level (Fig. 2). The reasons for this altitudinal migration are not known, but it may be a response by the solitaires to the cooler temperatures at higher elevations during the winter.

FEEDING

Foraging zones.—Table 1 summarizes the percent of the total number of times (353) that the Rufous-throated Solitaire was seen in the dif-

TABLE 1
FORAGING BEHAVIOR OF THE RUFIOUS-THROATED SOLITAIRE

Foraging zones	Hovering for		Hawking for insects	Gleaning for		Percent of foraging zones
	Fruits	Invertebrates		Invertebrates	Fruits	
Ground	—	—	—	6	—	6 (2%)
Inner branches						129 (36%)
Lower	2 ¹	1	—	7	22	32 (9%)
Middle	1	2	—	16	46	65 (18%)
Upper	—	1	—	5	26	32 (9%)
Outer branches						177 (50%)
Lower	4	5	—	6	32	47 (13%)
Middle	4	4	—	12	74	94 (27%)
Upper	1	1	—	5	29	36 (10%)
Aerial	—	—	41	—	—	41 (12%)
Total	12 (3%) ²	14 (4%)	41 (12%)	57 (16%)	229 (65%)	353 (100%)

¹ Number of times foraging pattern was recorded in each foraging zone.

² Numbers in parentheses indicate percent of total observations.

ferent foraging zones at the Hardwar Gap study area. The data show that 50% of the time was spent foraging in the outer branches, 36% of the time in the inner branches, 12% in the aerial zone, and the remainder (2%) on the ground. The high incidence of feeding records in the outer branches is obviously related to the fact that most fruits of the tree grow in the outer zones. Within each major foraging zone of the tree (inner and outer branches) different subzones were used preferentially (Table 1). Note that 18% of the foraging records were in the middle inner branches and 27% were in the middle outer branches.

Food and foraging methods.—Foraging behavior of the Rufous-throated Solitaire in the Hardwar Gap study area also is shown in Table 1. The predominant foraging methods were gleaning for fruits (65%), gleaning for invertebrates (16%), and hawking for insects (12%). Hovering for fruits (3%) and invertebrates (4%) accounted for the rest of the foraging procedures.

The variety of fruits eaten by the Rufous-throated Solitaire was large, 18 different types were recorded. *Alchornea latifolia*, *Dendropanax arboreus*, and *Dunalia arborescens* fruits accounted for more than one-half of the fruits eaten in the Hardwar Gap study area. In the wet limestone forest, fruiting trees of the family Moraceae (*Ficus* and *Cecropia*) and Lauraceae (*Nectandra*) were the most important. The majority of fruits were taken from a perched position, but occasionally the birds took fruit by hovering in the manner of flycatchers (Tyrannidae).

Gleaning for invertebrates accounted for 16% of the total foraging

behavior recorded. This behavior involved slow and deliberate searching movements along the branches and foliage by the solitaire, examining the undersides of leaves and branches above it and the upperside of leaves and branches on its level, and darting forward or fluttering up to snatch its prey. In ground gleaning, the solitaire flew from the branches to the ground when it located an invertebrate prey and usually returned immediately to the original perch. The identifiable animals taken by the searching and gleaning in order of frequency were: larval lepidopterans, Coleoptera, Orthoptera, and Hymenoptera (ants).

Hawking (aerial sallies to capture flying insects) accounted for 12% of the total feeding observations. These flights were usually initiated from exposed outer branches of trees. Solitaires did not pursue insects for great distances as some flycatchers do, but flew directly outward from a commanding perch, seized an insect, then usually returned to the same perch. Insects caught in this manner were moths and beetles.

Stomach analysis.—Examination of the stomach contents of four solitaires collected in April of 1970 in the wet limestone forest showed that both animal and vegetable matter were represented with a percent occurrence of 75% and 100%, and comprising 24.6% and 75.4% respectively of the total volume. The most important animal taxa were members of the order Lepidoptera and Coleoptera, accounting for 14.5% and 7.2% of the total volume respectively. Plant material consisted of fruits and seeds, representing two identified families and two genera. The family Moraceae was the most important in the solitaire's diet, the seeds and fruits of *Ficus* and *Cecropia* accounting for 52.3% of the total volume. Both of these trees were visited by a large number of birds. In the Worthy Park area, 11 species of birds were seen feeding on the fruits of a single *Cecropia peltata* tree and 19 species were counted feeding on the fruits of a single *Ficus trigonata* tree (Cruz 1974). The high percentage of fruits in the diet of the solitaire, 75.4% of the total volume, is also in agreement with the foraging behavior results, where fruit-eating accounted for 68% of the total.

BREEDING BIOLOGY

Because information concerning reproductive activity is especially lacking for the Rufous-throated Solitaire, details are presented herewith. On 18 April 1970, I watched a solitaire building a nest in the fork of a *Podocarpus* tree at a height of 4 m. The bird flew out of view, returned in minutes with plant material, placed the material in the nest, and with the body and bill formed and shaped the nest cup. The finished nest, consisting of moss (primarily), lichens, leaves, and other plant material, was a well-concealed structure and blended perfectly with the mosses,

bromeliads, and lichens on the branches and tree trunk. Panton (1953) found a nest in the Clarendon Mountains, Clarendon Parish, in July 1896. The nest was lodged inside a bromeliad in a tree approximately 15 m from the ground. The nest, which Panton collected, was: "a rude structure of moss and a few blades of dry grass and leaves, lined with dried grass and leaves of very small bromeliads, fine stems of fern, and fibrous material taken from the trunks of trees." Pinchon (1963) describes the nests and eggs of the solitaire, with a photograph of a nest in an epiphyte. Newton (1953) found three solitaire nests in Jamaica. The first nest (Guava Ridge, May 1951) consisted of lichens and *Tillandsia* and was situated in a *Podocarpus* tree. The second nest (Port Royal Mountains, St. Andrew Parish, May 1952) was similar to the first but placed in a tangle of moss and creepers below a rock. The third nest (Springfield Gap, St. Andrew Parish, June 1953) was made of moss and situated at the apex of the spreading leaves of a tree fern. In Dominica, Percival Agar located a Rufous-throated Solitaire nest on the side of a perpendicular bank of a stream, 2 m above the stream bed (Bond 1941). On the neotropical mainland, the congeneric *M. ralloides* also nests on vertical banks (Wallace 1965).

On my return visit on 22 April, the nest contained two oval eggs that measured 24.2×17.1 mm and 24.5×17.5 mm. They were light blue, with varying amounts of brown distributed over the surface, but more concentrated at the larger end. On my visit to the nest site on 5 May, the presumed female flushed from the nest, which now contained two young with blackish natal down covering the humeral, capital, and spinal tracts. The nestlings had their eyes closed and I presumed that they were 3 to 5 days old. Both adults were nearby, but did not act particularly alarmed. On my final visit (6 May), I remained near the nest site for 3 h during the morning. During this period both parents made 23 feeding visits to the nest and one individual brooded the young for a period of 31 min.

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