

REPRODUCTIVE DISPLAYS OF THE WARBLING VIREO

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THE paucity of information on the ethology of the Vireonidae (Andrew, 1961) renders the following observations worthy of record. They were made through $9\times$ binoculars at a distance of 8 meters and recorded on a portable tape recorder.

Ithaca, N.Y., 17 May, 1963, 0900 EDT. A chase involving two Warbling Vireos (*Vireo gilvus*) was seen. Loud, short *Squeet* vocalizations were given repeatedly by one of the birds during the chase. One (A) landed in a large tangle of grapevines (*Vitis* sp.) about 70 cm from the ground, at the base of a large elm (*Ulmus americana*). The second bird (B) landed about 40 cm below A on an inclined vine. B spread its tail fully, rhythmically moving its body from side to side with movements of small amplitude (referred to as "weaving" below) while oriented with the head toward A, and while constantly giving soft *Squeets* (Fig. 1A). Bird A remained where it was (Fig. 1B) as B approached very slowly by short hops while remaining in the above attitude. When B had approached to a distance of about 10 cm from A, the tail was closed, the contour plumage of the ventrum was fluffed (but not ruffled), the wings were quivered *very* slightly at their tips (the carpals not being lifted from the body), the same orientation and vocalizations were continued while the mouth was opened wide, exposing the brilliant red lining (Fig. 1C). B continued to advance toward A, "weaving" until they were only about 3 cm apart. Then B continued to move slowly but now to the side of A. By moving to the side B also moved down the vine so that it was now slightly below the level of A. It continued to keep the gape pointed at A, however, by raising the head slightly. A remained where it had landed. The two birds then flew off together. The time from arrival to departure, during which B maintained a display attitude, was about one minute. A few minutes later a similar chase was observed in the same area, with the same loud *Squeets*. Both birds landed on a branch of the same elm tree, about 1.7 meters from the ground and about 10 cm apart. One bird (A) turned toward the other (B) and assumed the second display posture described above, "weaving," vocalizing, and orienting as before. Both birds were stretched in a head-forward position, and as A displayed (Fig. 1D), B struck repeatedly at its open mouth with its own closed bill (Fig. 1E). A then flew off and B flew up into the canopy of the elm and fed on small, green larvae gleaned from the foliage. The second encounter lasted about 15 seconds.

Although these observations were noted out of definite behavioral context, and the sexes of the individuals involved could not be determined, it is probable that this behavior was primarily reproductive. The head coloration of the nondisplaying bird, in both cases, was slightly lighter than that of the displaying bird.

Bent (1950) quotes Audubon's description of two displays in this species, one involving spreading of the wings and tail by the male, and strutting around the female in short circles while uttering a low warble; the other the assumption of a stiffened attitude and moving of the body from side to side. The context of the latter is not clear, nor is it clear whether one or both of the birds displayed.

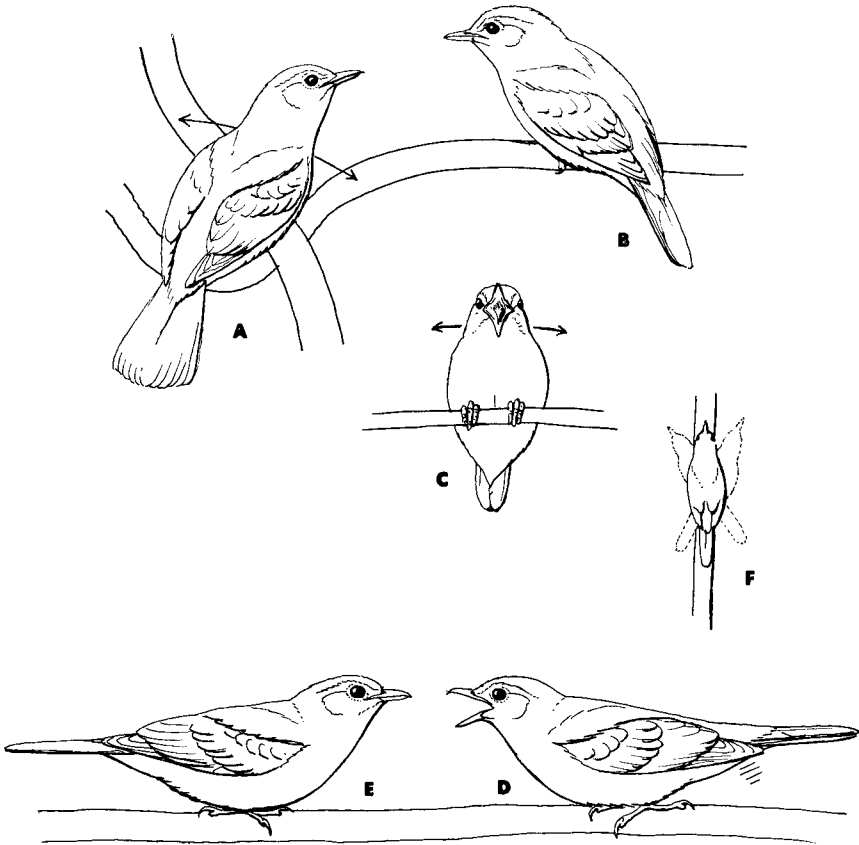


FIG. 1. Displays of *Vireo gilvus*. F is a dorsal view of D, showing lateral movement in "weaving."

Lewis (1921) reports reproductive fighting and chasing in the Philadelphia Vireo (*Vireo philadelphicus*) involving "squeeking" vocalizations. These chases were followed by copulation when the female lifted her tail, after perching, and gave a "mew, mew" call. Reproductive chasing occurs in the Red-eyed Vireo (*Vireo olivaceus*) (Bent, op. cit.; Southern, 1958); at least some of the chases are silent until the very end (Lawrence, 1953). Lawrence notes the approach of the male to the female with tail down and spread, vocalizations, and ruffled throat and crown feathers. These approaches sometimes ended in copulation. Bent (op. cit.) also reports: (1) the male giving a soft "song" while fluffed immediately preceding a reproductive chase; (2) Saunders' observation of a male giving a soft "song" and trembling the wings in front of a female; and (3) the sleeked male at right angles to the

fluffed female, "weaving" while giving soft, squeaky vocalizations. Tyler (1912) reports a similar observation. Southern (op. cit.) describes a solicitous female with wings spread and lowered, body vibrated rapidly, and a series of short chipping calls. Bent (op. cit.) cites Townsend's record of a male Solitary Vireo (*Vireo solitarius*) fluffing the plumage, especially the yellow flank feathers, and "singing" as he ". . . bobs and bows to the female. . . ." Bent cites Rathbun's account of reproductive chasing and fighting in Hutton's Vireo (*Vireo huttoni*). He cites Torrey's report of a fluffed posture, with the tail spread, in the male White-eyed Vireo (*Vireo griseus*) while perched in front of the female, and while repeatedly uttering a three-parted vocalization. The female struck at him with her bill. Nolan (1960) observed chasing, and wing-quivering by both sexes of *griseus*. Skutch (1960) notes reproductive chasing in the Yellow-green Vireo (*Vireo flavoviridis*) as well as a display in which the male sways from side to side with the mouth wide open, uttering low, weak notes, while perched close enough to the female to touch her. Nolan (op. cit.) records reproductive fighting and chasing, during which faint vocalizations were heard, in the Bell's Vireo (*Vireo bellii*). He also notes wing and tail-flicking, tail-flirting (laterally as in bathing), and tail-spreading in male and female *bellii*. Bent (op. cit.) cites a report by Grinnell, Dixon, and Linsdale of the male "singing" near the female with tail spread, twitching the tail while spreading it still more, and sometimes holding it down, nearly vertical.

The following behavior occurs in at least the species listed: reproductive chasing and/or fighting—*gilvus*, *philadelphicus*, *olivaceus*, *huttoni*, *griseus*, *flavoviridis*, and *bellii*; male fluffing some part of the body plumage—*gilvus*, *olivaceus*, *griseus*, and *solitarius*; female fluffing the body plumage—*olivaceus*; male tail-spreading—*gilvus*, *olivaceus*, *griseus*, and *bellii*; female tail-spreading—*bellii*; male "weaving"—*gilvus*, *olivaceus*, and *flavoviridis*; male bobbing—*solitarius*; female striking at displaying male—*gilvus* and *griseus*; male wing-quivering—*gilvus*, *olivaceus*, and *griseus*; female wing-quivering—*griseus*; male wing-spreading—*gilvus*; female wing-spreading—*olivaceus*; male and female lateral tail-twitching—*bellii*; male and female wing and tail-flicking—*bellii*; female body-quivering—*olivaceus*; male displaying gape—*gilvus* and *flavoviridis*.

It would be interesting to know how many species of vireos have brightly colored gapes, and if there is any sexual dichromatism in these parts as there is in the Yellow-breasted Chat (*Icteria virens*) (Ficken and Ficken, 1962). It is also worth noting that *Icteria* has one reproductive display involving ". . . swaying from side to side . . ." (Ficken and Ficken, op. cit.) which resembles the "weaving" found in at least three, and probably other vireos. *Icteria* holds food with its foot (Ficken and Ficken, op. cit.) as does *bellii*,

griseus (Nolan, op. cit.), *olivaceus* (Herrick cited in Nolan, op. cit.), and *solitarius* (Skutch cited in Bent, op. cit.). Further study of the ethology of the vireos and *Icteria* might well serve to clarify the taxonomic position of *Icteria*, which, as the Fickens point out (op. cit.), is clearly not a parulid.

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