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Polygyny in the Yellow Warbler.—Observations of polygynous matings in Parulinae are rare. Ford (Curr. Ornithol. 1:329–356, 1983) lists 12 species of North American Parulinae, including the Yellow Warbler (*Dendroica petechia*), that are reported to practice polygyny. S. G. Sealy (pers. comm.) and coworkers have noted two apparent cases of polygynous Yellow Warblers at their study site near Delta Manitoba. Here, I report detailed observations of color-marked birds to verify the existence of polygyny in Yellow Warblers and compare the behavior of polygynous and monogamous males.

Yellow Warblers were studied in 1980 and 1981 at the University of Michigan Dearborn Biological Station (Wayne Co., MI) and in 1981 at Metrobeach Metropark (Macomb Co., MI). Birds were banded with U.S. Fish and Wildlife aluminum bands and with celluloid color bands, permitting detailed observations of individuals engaged in territorial disputes and nesting activities. Territories were mapped by following males and plotting the locations of boundary disputes on gridded maps of each study area. I searched daily for all females associated with color-banded males. Observations were kept on nesting behavior and pair-bonds.

Polygyny was observed for Yellow Warblers at Dearborn and Metrobeach. During the two breeding seasons, 21 nesting birds were observed for at least 54 days (Table 1). Three polygynous males were paired with 5 females who built 9 nests. (One of the males was paired with the same female in consecutive years.) Simultaneous associations occurred when polygynous males were paired with females nesting at the same time. When females nested

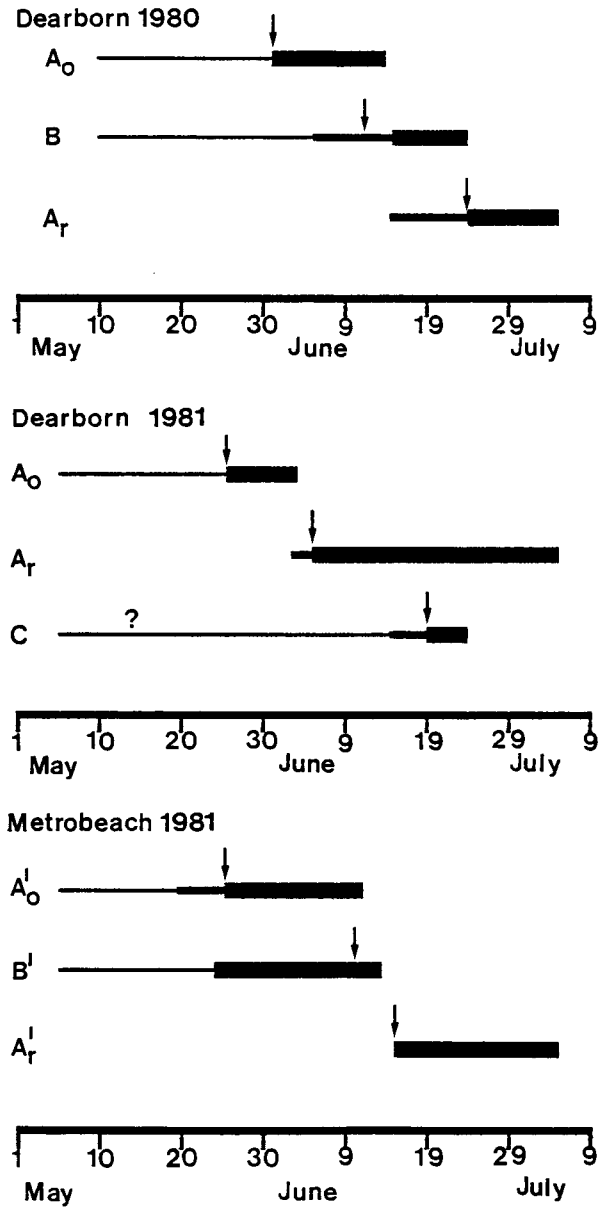
TABLE 1

OBSERVATIONS OF POLYGYNOUS YELLOW WARBLERS AT DEARBORN AND METROBEACH, MICHIGAN, 1980–1981

Location	Year	Observation period (days)	Duration of simultaneous associations	Male behavior during associations
Dearborn	1980	60	17 June–7 July	Feeding female
	1981	54	17 June–25 June	Feeding young
				Territory defense
Metrobeach	1980	62	28 May–7 July	Alarm calls

→

FIG. 1. The breeding period of polygynous Yellow Warblers at Dearborn and Metrobeach, Michigan, 1980–1981. Thin lines represent time females were on the breeding site prior to nesting. Medium lines are based on presumed nesting activities obtained by dating



backwards to nest initiation (see Goossen and Sealy, Can. Field Nat. 96:189–199, 1982). Thick lines represent time a nest was under observation. Arrows indicate when males were first seen with females. Subscript o = an original nest; r = a replacement; ? = the period when a female was not observed on territory.

asynchronously, males directed most of their activities to females that nested first. Males switched their efforts to the second female when the breeding attempt of the first female failed or when her young fledged.

In 1980, two females (A and B) were associated repeatedly with a male (AB) at the Dearborn locality (Fig. 1). The nesting activities of these two females were synchronized from 7 June through 23 June. Following the apparent predation of female A's nest on 13 June, male AB spent most of his time with female B. On 23 June, when female B's young fledged, male AB was found with female A at her replacement nest.

Male AB and female A returned to Dearborn in 1981, and were once again paired (Fig. 1). Male AB was associated with female A and her original nest from 25 May through 2 June, and with her replacement attempt from 6 June through 27 June. On 19 June, male AB was also observed with another female (C), who nested unsuccessfully. The location of this female prior to the discovery of her nest was unknown.

Polygyny was also witnessed at Metrobeach in 1981. A male (AB′) was repeatedly and simultaneously associated with two females (A′, B′) (Fig. 1, Table 1). Associations with female A′ included two breeding attempts (from 28 May through 10 June, 13 June through 7 July). Male AB′ was also observed with female B′ from 10 June through 12 June. This nest was parasitized by a cowbird (8 June) and deserted on 12 June. No further breeding attempts were made by female B′.

Yellow Warblers maintained type A territories (Nice, Am. Midl. Nat. 26:441–487, 1941); however, several males were observed off territory singing near females. Wandering behavior, also observed by M. R. Lein (pers. comm.), Ford (1983), and Nolan (Ornithol. Monogr. 26, 1978) for Prairie Warblers (*D. discolor*), was most prevalent during the incubation period of each male's first mate (pers. obs.). Territory size of polygynous males ($\bar{x}$ = 0.78 ha, N = 3) was significantly greater than that of monogamous males ($\bar{x}$ = 0.21 ± 0.05 ha [SD], N = 20; Mann Whitney $U = 59$, $0.002 < P < 0.005$).

Productivity (no. young fledged per breeding bird) was higher for polygynous males ($\bar{x}$ = 3.67 ± 0.33, N = 3), and females mated to polygynists ($\bar{x}$ = 1.83 ± 0.70, N = 6) than for monogamists ($\bar{x}$ = 1.40 ± 0.36, N = 20). The difference was significant for males ($\chi^2 = 6.97$, df = 1, $P < 0.01$) but not for females ($\chi^2 = 0.458$, df = 1, $P > 0.25$).

Nolan (1978) found that polygynous Prairie Warblers acquired first mates earlier than their monogamous counterparts, and that instability of sex bonds was associated with a high incidence of nest mortality due to predation. In this study, polygynists claimed territories first and then were apparently selected first by females.

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Two male Bobolinks feed young at the same nest.—Male "helpers at the nest" have been reported for many species of birds (Brown, Am. Zool. 14:63–80, 1974; Woolfenden, Proc. Int. Ornithol. Congr. 16:674–684, 1976; Emlen, pp. 245–281 *in* Behavioral Ecology, J. R. Krebs and N. B. Davies, eds., Sinauer, Sunderland, Massachusetts, 1978); however, this