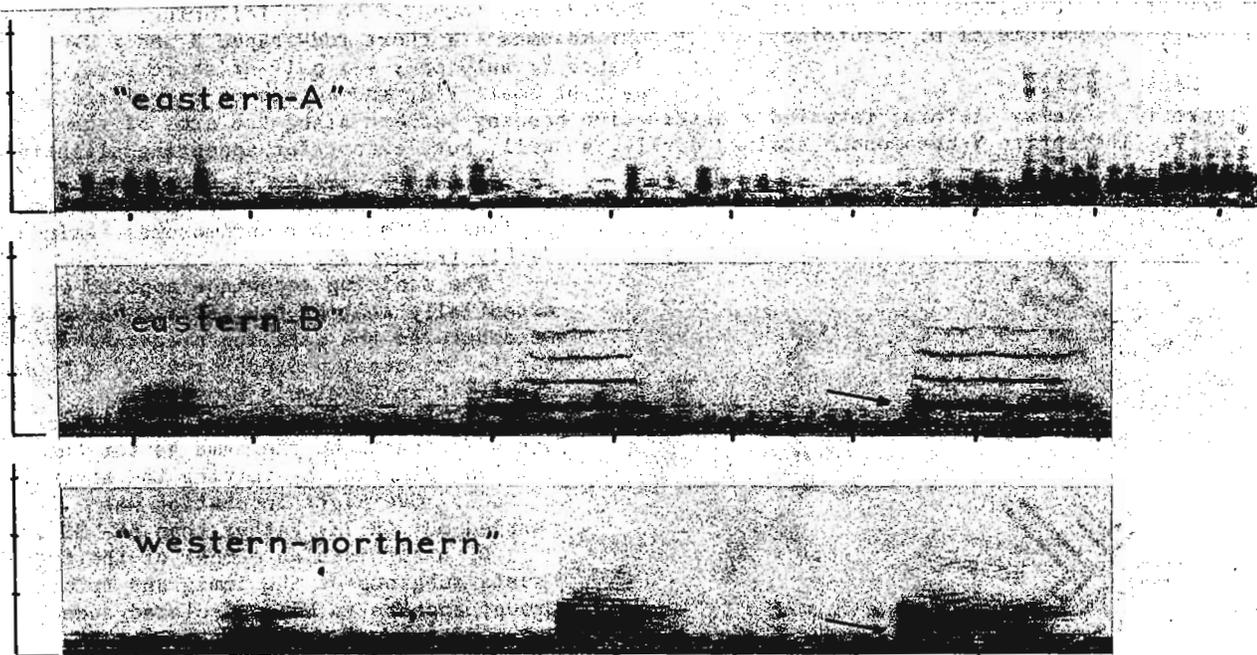


Patty, R.A.<sup>1</sup>, R.B. Goldstein<sup>2</sup> and D.D. Miller<sup>2</sup>. (1) Wake Forest University, Winston-Salem, North Carolina, and (2) University of Nebraska, Lincoln. Sonagrams prepared from *D. athabasca* male courtship sounds.

The Figure shows sonagrams made from recordings of amplified sounds of courting *D. athabasca* males. As previously stated (e.g. Miller and Voelker, *Journ. Hered.* 63:2, 1972), there appear to be two kinds of "eastern" *athabasca*, now designated "eastern A" and eastern B". The sonagrams so designated are those of males of two strains from Netcong, New Jersey (kindly pro-

vided by Dr. Max Levitan). The "western-northern" sonagram was derived from a Hallock, Minnesota, strain. Patterns similar to each of these have been found in sonagrams from a total of 17 "eastern A", 10 "eastern B", and 13 "western-northern" strains from widely scattered geographical sources in the ranges of these kinds of *athabasca* and will be presented and discussed elsewhere. The divisions of the vertical coordinates in the figure represent 1000 Hz (Hertz, or cycles per second) each, those in the horizontal coordinates 200 msec (milliseconds) each, 6-8 day old adults that had been isolated by sex soon after eclosion were put together (usually 1 female, 2 or more males) in a cylindrical clear plastic chamber (ca. 17 mm in diameter with a glass "ceiling" ca. 4 mm high) erected on the exposed Mylar membrane of a Wollensak dynamic microphone, which was fastened in an upright position under a dissecting microscope so the flies' activity could be watched. When courtship took place, the sound vibrations were fed into a Webcor tape recorder set at maximum volume and recording at 7.5 rpm. Sonagrams were prepared by one of us (R.B.G.) with a Kay Electric Company 6061-B sound spectrograph.

Our work began as an attempt to determine significant differences of spacing of vibration pulses between the different partially sexually isolated kinds of *D. athabasca*. The earliest



observations (by R.A.P.) employed a crystal microphone with a specially constructed band-pass filter to reduce noise by restricting transmitted frequencies mainly to the 200 to 800 Hz range (since a male courtship wing vibration frequency of about 444 Hz had been reported for *D. athabasca* by Ewing and Bennet-Clark, *Behaviour* XXXI:288, 1968). It became apparent from these observations that the intra-pulse frequencies of "eastern A" (e.g. Carbon County, Pennsylvania; Miller and Westphal, *Evolution* 21:479, 1967) were much lower than those of "eastern

B" and "western-northern" athabasca, the fundamental frequency of "eastern A" being about 204 Hz while those of "eastern B" and "western-northern" averaged about 462 and 407 Hz respectively. To improve reception, especially at the low frequencies, the simpler system described in the first paragraph was adopted.

The difference between the courtship sounds of "eastern A" and the other two is clearly audible in the amplified recordings. Males of "eastern A" produce a low-pitched "grunting, croaking" sound that does not appear to be limited to discrete pulses but which, as the sonagram shows, consists of elements (i.e. short bursts of sound consisting of fundamental and harmonics) spaced about 25 msec and produced in rather irregular "runs". Because of unavoidable background noise that accompanied all recordings it was often difficult to determine the fundamental frequency of "eastern A" by measuring the elevation of the lowest marking in the sonagram; however, this value appears regularly to be in the neighborhood of 200 Hz. Both "eastern B" and "western-northern" athabasca males produce discrete pulses of sound with a "buzzing, whining" quality. The level of the fundamental frequency, indicated by arrows in the figure, seems similar in these two kinds, usually in the 450-500 range, and their values overlap. Although the spacing of pulses appears different in the examples in the figure (about 450 msec for "eastern B", 400 msec for "western-northern"), other sonagrams show overlapping of these values too. As shown in the figure, these pulses may be produced in groups of three, the last a little longer than the others. Although these two songs are not easily distinguishable by ear (though some persons might be able to do so), the sonagrams clearly show different patterns of harmonics, fairly widely spaced ones (about 500 Hz intervals) for "eastern B" and closely spaced ones (about 125 Hz intervals) for "western-northern".

Wheeler, L.L., A.S. Capps and F.D. Wilson  
University of Texas, Austin. The heterochromatic chromosome of *D. nasutoides*.

(Figure 1). Giemsa staining revealed a distinctive banding pattern along the arms of the large V. The entire Y-chromosome stained darkly, as well, but, except for appearing slightly



Fig. 1.

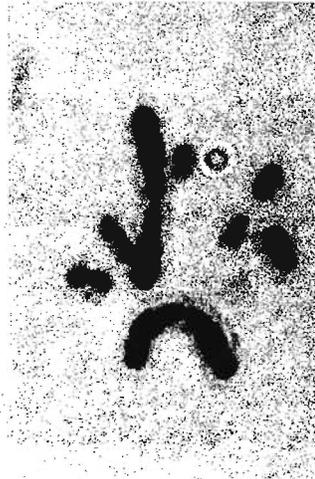


Fig. 2.

The karyotype of *D. nasutoides* Okada (UT stock 3035.2) was found to be the following: sex chromosomes - a short rod-shaped X and a J-shaped Y; autosomes - a pair of short rods, a pair of small V's, and a pair of very large V's (Figure 1). Giemsa staining revealed a distinctive banding pattern along the arms of the large V. The entire Y-chromosome stained darkly, as well, but, except for appearing slightly darker in the centromere region, it showed no banding pattern. Centromeric regions of the other chromosomes stained darkly (Figure 2).

The staining technique applied was essentially that of Hsu (1971). However, we denatured the ganglion preparations for 1-2 minutes in 0.035 or 0.007 M NaOH dissolved in Demerec's *Drosophila* Ringers'; the concentration of Na<sup>+</sup> ions was adjusted to be the same as for the original Ringers' by varying the amount of NaCl. Overnight incubation was carried out in 2X- rather than 6X- SSC.

*D. nasutoides*, a member of the hypocausta subgroup of the immigrans species group, appears to be an isolated endemic whose distribution is limited to the islands of Samoa. No closely related species have been recognized (M.R. Wheeler, personal communication). However, the possibility of variation among local populations should be investigated.

The molecular structure of the *D. nasutoides* chromosomes is currently being investigated by C.S. Lee and M. Cordeiro in this department.

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References: Hsu, T.C. 1971, *J. Hered.* 62:285-287.