

Collections of *Chloris polydactyla* (L.) Swartz made near Edna, Jackson County, in 1932 (*W. A. Silveus 524*, April 15) and in 1955 (*F. W. Gould 6781*, April 20) are the first records of this perennial bunchgrass growing spontaneously in Texas. At the site of the Gould collection, four miles east of Edna, it was growing in a vigorous stand along a roadside ditch and adjacent fence row. The range of *Chloris polydactyla* is stated in Hitchcock's Manual as "southern Florida; West Indies to Paraguay." It is almost certain that this *Chloris* is present in Texas as an introduction, rather than a native species. Two specimens in Tracy Herbarium of Texas A. & M. College were collected from plants grown under cultivation at Angleton about thirty years ago (*H. Ness*, in 1926). Another specimen in the Tracy Herbarium is from plants growing in Hensel's Grass Nursery at College Station (*R. G. Reeves*, in 1940).

Behavior of *Natrix* in Aggregations

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Literature-reports and two recent observations in southern Louisiana offer an explanation of the aggregations of *Natrix* often reported in this area.

At 1145 hours on April 10, 1954, two *Natrix sipedon confluens* were observed swimming in a small pool in Sarpy Wildlife Refuge, a cypress-gum swamp in St. Charles Parish, 15 miles NW. of New Orleans on U.S. Hwy. 61. The movements of these snakes formed a pattern. They swam back and forth across the pond, coming at frequent intervals to the shore line with continual flickering of the tongue. At times, one snake would approach the other, hesitate briefly beside it, and then move away in a diagonal course to continue swimming.

These two water snakes were joined by three more *Natrix s. confluens*. All five snakes participated in the pattern. Two more *Natrix s. confluens* soon entered the group, and within ten minutes the total number was increased to ten. Approaches to one another became more numerous. The encounters were brief; in one instance, a bite by one of the pair terminated the relation.

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The snakes were unwary and easily approached, displaying curiosity to disturbances. One came out of the pond and upon the bank to within 6 feet of where Mr. Robert Webb was taking photographs.

The swimming activity continued for an hour and 15 minutes, when four males were captured and marked by clipping scales (Blanchard and Finster's 1933 method.) Since all the snakes involved were small and slim, the senior author concluded that all were males; females at this time of the year were easily recognized by their large size, owing to enlarged ovaries.

A single female was found 8 feet from the margin of the pond. Gonads and oviducts were removed in the laboratory; a smear from one duct near its junction with the cloaca showed a heavy concentration of motile sperm, indicating recent copulation.

The area was revisited at 1930 hours of the same day. Five snakes were seen in the pond and these were inactive and wary. None was captured.

Another trip was made to the area at 1000 hours of April 11. The temperature was 24° C., approximately that of the preceding day. Two snakes were seen basking in the pond that had been the scene of the previous activity.

In a second pond (on the opposite side of a low ridge from the pool observed on April 10), a number of males were seen. As they were not captured, we could not ascertain whether these were the same snakes previously observed. Two began the swimming movement. Attempts at what appeared to be courtship were observed. One snake nudged the other at several places along the body and was met each time by an avoidance and bite. These were probably intimidative reactions between males; the reactions were brief and resulted in no prolonged fighting. The number of snakes increased to 8, and the behavior of April 10 was repeated. Occasionally, each snake made curious bobbing motions with its head. By 1130 hours, activity had abated, and the snakes disappeared into the dense growths of cattail and cut-grass edging the pond.

The snakes were not feeding. The choice of the ponds was not dictated by availability, as there were many ponds within 100 feet, in which no aggregation occurred.

Another contemporaneous observation was made April 10, 1954, in Terrebonne Parish, at Forty-Acres Bridge on the road between Bayou Dularge and Bayou Grand Caillou, some 14 miles S. of Houma. The locality was a slough 35 feet wide connected by a canal with a low swampy area. In a stretch of 100 feet, the junior author saw 9 *Natrix cyclopion cyclopion* swimming back and forth, occasionally nudging one another. Three *Ancistrodon piscivorus leucostoma*, 3 *Thamnophis proximus*, 4 *Natrix s. confluens* and 1 *Natrix erythrogaster flavigaster* were collected in or around the slough. These were wary, but the *Natrix c. cyclopion* were seemingly oblivious to the presence of an observer, and were easily approached and captured. No certain identification of sex was made, but on the basis of body size, we concluded that all snakes participating in the aggregation were males.

Previous collecting over several years at the same locality had demonstrated that *Thamnophis s. proximus*, *Natrix s. confluens*, *Natrix e. flavigaster*, and *Ancistrodon p. leucostoma* were abundant. In comparison, *Natrix c. cyclopion* was scarce.

These aggregations were probably preliminary to mating. Many species of snakes are known to be belligerent to other males during the breeding season (5,6), but polyandry is not uncommon in *Thamnophis* and *Natrix* (3,9.) This simple type of mating-behavior is in contrast to the rather elaborate procedure preceding mating in other species. Breder (2) observed an aggregation of 5 *Thamnophis sirtalis sirtalis* in a small pond. Three males were swimming about in the manner described by us, and 2 females lay on the shore. Eventually, the males and females were united in a so-called "snake-ball" (see 4,11 for discussion.)

We interpret the observed aggregational behavior as an active search by males for their mates. The gathering of snakes at a focal point may be due to the efforts of snakes to locate others. In an experimental study of *Storeria dekayi*, Noble & Clausen (8) have demonstrated that movement of snakes to a common locality was accomplished by following the "trails" of other individuals. These authors, as well as Noble (7) have shown that vision is important in aggregation and in the location of the female by the male. The head-bobbing observed in the aggregation of *Natrix s.*

confluens may have been an effort to establish visual relations as mentioned by Walls (10).

More observations of this type of behavior are needed to establish the possibility that the seeking-behavior is a usual prelude to mating in *Thamnophis* and *Natrix* and that these aggregations result generally in polyandrous matings.

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The *Cassia fasciculata* Complex (Leguminosae) in Texas

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The genus *Cassia* is represented in Texas by 15 well-marked species. One of these, *C. fasciculata*, is a highly variable taxon composed of several intergrading infraspecific taxa. The following treatment is the result of several summers' field work combined with distributional data and morphological study of herbarium material. In the present paper it has been necessary to make two new varietal combinations in *C. fasciculata*. Hence, in conformity with Article 17 of the International Code of Botanical Nomenclature (1952)¹, it seems desirable to give a somewhat detailed account of the distributional and morphological evi-

¹ ARTICLE 17. "No one may change a name (or combination of names) without serious motives, based either on more profound knowledge of facts or on the necessity of giving up a nomenclature that is contrary to the rules of this Code."