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Prairie Phenology and Seed Germination

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RANGE EXTENSION OF THE SILVER CARP, *Hypophthalmichthys molitrix*

The silver carp, *Hypophthalmichthys molitrix* (Valenciennes), is listed as an exotic fish formerly established or of local occurrence (Robins, C. R., R. M. Bailey, C. E. Bond, J. R. Brooker, E. A. Lachner, R. N. Lea, and W. B. Scott. 1980. A List of Common and Scientific Names of Fishes from the United States and Canada. 4th Ed. Am. Fish. Soc. Sp. Pub. No. 12 p. 96). Single specimens were taken from the Ohio River below Smithland Dam on April 7, 1982 (B. McLemore, pers. comm.), from the Ohio River below Union Town Dam on February 19, 1982 (D. Bell, pers. comm.) and from a small canal between Wham Brake and LaFourche Canal Systems in Ouachita Parish, Louisiana on April 1, 1981 (J. Hughes, pers. comm.). On June 8, 1982, a single 4.1 kg specimen was collected in a trammel net by R. E. Lee, a commercial fisherman from Tomato, Arkansas, and deposited in the Arkansas State University Fish Collection (no. 9383). The specimen was an adult female, 70 cm in total length, 59 cm in standard length; it possessed 8 dorsal fin rays, 15 anal fin rays, 18 pectoral fin rays, 8 pelvic fin rays, and 109 scales in the lateral line.

This female specimen represents the first definite record of *H. molitrix* occurring in the Arkansas water of the Mississippi River, at river mile 804. Its previous distribution was reported to be limited to the Arkansas and White River Systems (Freeze, M. and S. Henderson, 1982. Distribution and Status of the Bighead Carp and Silver Carp in Arkansas. N. Am. Jour. Fish. Mgr. 2:197-200).

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SICKLEFIN CHUB, *Hybopsis meeki*, IN THE MISSISSIPPI RIVER BORDERING ARKANSAS

The sicklefin chub, *Hybopsis meeki* Jordon and Evermann, was collected December 29, 1980 in the Mississippi River bordering Arkansas at river mile 813.0, 15 river miles downstream from the Arkansas-Missouri state line. *H. meeki* was first reported in the Missouri River near St. Joseph, Mo. in 1884 (Pflieger, 1975). Also, Cross and Collins (1975) reported it rare in Kansas and collected only following floods on a few occasions. Conner and Guillory (1974) reported the Mississippi River range to extend downstream to the vicinity of Vicksburg, Mississippi. Additional specimens of *H. meeki* have been reported from Iowa, Nebraska and South Dakota (Moore, 1968).

The two specimens reported here were collected on a very cold, windy day by Allen Carter, Tom Buchanan, and Sam Henry. They were collected with a 3.2 mm mesh nylon seine and have been deposited in the Arkansas State University Museum of Zoology, lot #9366. They were caught over a sandy bottom in moderate current at depths of 0.5 to 1.5 m at approximately noon. The water temperature was approximately 2 °C. Both specimens were juveniles measuring 3.4 and 2.9 cm in total length, 2.5 and 2.2 cm in standard length. They had 8 dorsal fin rays, 8 anal fin rays, 14 pectoral fin rays, 7 pelvic fin rays, and 43 and 41 scales in the lateral line. These two specimens represent the first definite records of *H. meeki* for the Arkansas water of the Mississipi River. Not much is known about their feeding and reproductive habits. The mouth has many taste buds and it is believed that food is sorted from river bottom material that is taken indiscriminately (Davis and Miller, 1967). Pflieger (1975) reports that young have been found in the Missouri River during July, suggesting a spring spawning season.

Other fishes collected with the sicklefin chub included: rainbow smelt *Osmerus mordax* (Mitchill), speckled chub *Hybopsis aestivalis* (Girard), silver chub *Hybopsis storeriana* (Kirtland), emerald shiner *Notropis atherinoides* Rafinesque, river shiner *Notropis blennius* (Girard), silverband shiner *Notropis shumardi* (Girard), and bluegill *Lepomis macrochirus* Rafinesque. The authors wish to thank Dr. Henry W. Robison of Southern Arkansas University, for his verification of the specimens.

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PRAIRIE PHENOLOGY AND SEED GERMINATION

One of the more striking features of a prairie is the ever changing display of flowers amid the majestic grasses providing each season with new brilliance and delicate beauty until frost and winter when the bronze-colored grasses dominate the landscape. These cyclic phenomena are determined by environmental factors such as water and temperature. As flowers bloom, fruits develop and seeds mature, plant material diminishes and falls to the ground adding to the leaf litter where fungi and bacteria hasten decay in returning nutrients to the soil for reuse by still other prairie flora. Not only is there constant change in the vegetation, but the fauna associated with the prairie ecosystem are likely to come and go according to their various cycles; the vole, the quail, the rabbit and many birds add life to this biome.

This study was conducted in conjunction with the ongoing prairie restoration project of the 1.5 hectare field within the Jewel E. Moore Nature Reserve located on the University of Central Arkansas campus in Conway. (Data more accurately describing this prairie site can be found in: Wright

& Culwell, Early stages of prairie restoration on a 1.5 hectare field in Faulkner Co., Ark., Proc. Ark. Acad. Sci. 36:80-81, 1982). Following a late winter burn, early spring is heralded on this prairie by the blooming of such plants as bluets (Houstonia pusila), prairie ragwort *(Senecio tomentosus)*, Indian paintbrush *(Castilleja coccinea)*, and lance-leaved violet *(Viola lanceolata)*. Late spring produces flowers of self-heal *(Prunella vulgaris)*, Sampson's snakeroot *(Psoralea psoralioides)*, wild garlic *(Allium canadense* var. *mobilense)* and milkwort *(Polygala sanguinea)*. The profusion of spring colors subsides a bit as summer arrives with the blooming of wild petunia *(Ruellia humilis)*, hoary pea *(Tephrosia onobrychoides)* and black-eyed susan *(Rudbeckia hirta)*. Mid summer finds the more subdued rattlesnake master *(Eryngium yuccifolium)*, as well as the more stately and brilliant ironweed *(Vernonia missurica)*, button snakeroot *(Liatris pycnostachya)* and ashy sunflower *(Helianthus mollis)* in bloom. Fall colors are dominated by the white heath aster *(Aster pilosus)*, the big blue lobelia *(Lobelia puberula)* and the yellow of narrow-leaf sunflower *(Helianthus angustifolius)*. This progression of seasonal flower development will vary in years when there is less regular rainfall and periodic drought. The Figure shows seasonal flower development for most of the flowering plants exclusive of the grasses and sedges on the Nature Reserve Prairie (only *Castilleja coccinea* was introduced during restoration); timing of bloom may vary tremendously as one can note when comparing this seasonal development in 1982 with that recorded for the Roth and Konecny Prairies in 1976 (Irving & Brenholts, An ecological reconnaissance of the Roth and Konecny Prairies. Prepared for Ark. Nat. Her. Com., 1977).

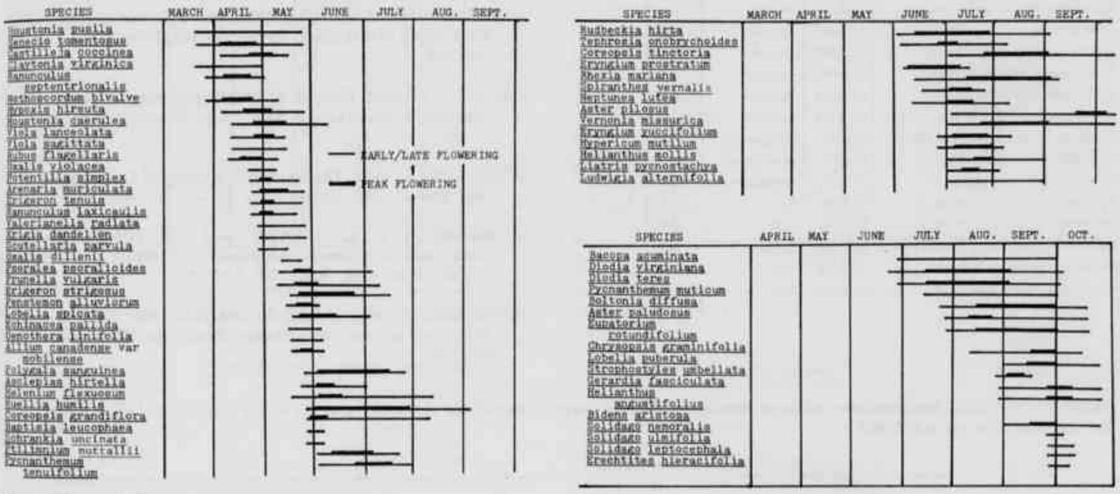

Figure. Seasonal flower development of 1982.

Restoration of the Jewel E. Moore Nature Reserve Prairie and the Prairie on Interstate 40 at Conway (Wright & Culwell, 1982) has involved mass sowing of seed. Seed of prairie species not present on the restoration sites or those present in only small numbers was collected in the fall of 1982 from Arkansas sites of railroad prairies between Hazen and Carlisle, and Conway and Mayflower. In an effort to assess what germination and growth can be expected during this growing season of 1983, germination tests were run on both stratified and unstratified seed. With the exception of five species, a four-week stratification period increased the percentage of germination of twenty species.

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SPIDERS COLLECTED FROM ABANDONED MINE TUNNELS IN THE OUACHITA NATIONAL FOREST

Although much attention has been given to the caves of Arkansas, Dunivan et al. (1982), McDaniel et al. (1979), McDaniel and Smith (1976), Grove (1974), Barnett (1970), Hubricht (1950), few scientific efforts have been made to document the fauna of mine tunnels.

In this study, six species representing four genera of spiders were collected from abandoned silver, gold and manganese mine tunnels in Garland, Montgomery and Polk counties within the boundary of the Ouachita National Forest, Arkansas, from December 1982 to March 1983 (Table). Spiders were collected from tunnels that varied from 10 to 150 meters in length, 2 to 3 meters in height and 1 to 2 meters in width. Temperatures averaged 15.5 degrees Centigrade and rarely varied. All of the tunnels contained seepage areas which provided enough moisture to maintain humidity near 100 percent and several of the tunnels received enough seepage to have small streams flowing from their entrances throughout the study period. The amount of organic debris found in these tunnels was variable, usually consisting of a small accumulation of leaves and/or crossties and wooden tunnel supports. Specimens were collected by standard methods and put directly into vials containing 70 percent alcohol and transported to the laboratory for identification.

The members of the genus *Dolomedes* are referred to as the "fishing spiders" and in each case these spiders were found where pooled water occurred in the tunnels. They were often observed poised directly above the waterline of these pools and were apparently catching aquatic insects which were seen utilizing pool areas. These spiders do not construct webs.