SPECIES COMPOSITION AND RELATIVE ABUNDANCE OF BENTHIC MACROINVERTEBRATES IN GLOVER CREEK, SOUTHEAST OKLAHOMA

Donald J. Orth*, Ray N. Jones, and O. Eugene Maughan
Oklahoma Cooperative Fishery Research Unit†, Oklahoma State University, Stillwater, Oklahoma 74078

INTRODUCTION

Glover Creek is the last major unregulated tributary of the Little River system of Oklahoma and Arkansas. There are no previously published accounts of the species composition or relative abundance of benthic macroinvertebrates in Glover Creek. During a three-year study (Oct. 1977-July 1980), we collected 119 samples of the benthic fauna in riffle habitats. These data can be used for comparison with species composition in the regulated tributaries and will serve as baseline information for Glover Creek.

Samples were taken once every three months using a circular depletion sampler (1). All samples were taken in riffle habitats, but attempts were made to sample at a range of depths and velocities within the riffles. All organisms were identified to the lowest taxon possible, and densities of each taxon were estimated for each season. On the basis of these densities, species were categorized as rare (< $1/m^2$), uncommon (1-$9/m^2$), common (10-$99/m^2$), or abundant ($100/m^2$). Since a few organisms were not identified to species (or genus) in every season, their relative abundance was determined on the basis of their percent composition in samples in which they were identified to species.

We identified 130 benthic macroinvertebrate taxa (Table 1), most of which were aquatic insects in the orders Diptera (42), Ephemeroptera (19), Trichoptera (18), and Plecoptera (14). The number of taxa was highest in winter (84), followed by fall (82), summer (80), and spring (71).

Some of the species collected were previously known to occur in this geographic area based on regional fauna lists (2, 3, 4), but their presence had not been confirmed in Glover Creek. The few studies that had been done on benthic macroinvertebrates in southern Oklahoma streams indicate the presence of some of the same genera as were found in Glover Creek (5, 6, 7), although more taxa and different species were found in Glover Creek. A previously unrecorded mayfly species, *Baetisca* nr. *gibbera,* was taken rarely or uncommonly in our samples (Table 1). This species generally occurs in the southeastern U. S., but had not been previously recorded from Oklahoma (9). Also notable were the greater number of species of Plecoptera in Glover Creek as compared with other samples from southern Oklahoma streams (5, 6, 7). Part of this difference may be due to the lack of collection of winter samples by investigators (5, 6, 7), which meant that the winter stoneflies were not encountered. However, the location of Glover Creek may also be responsible. Glover Creek is located in the oak-pine forest of the Ouachita physiographic province in an area which is near the southwestern limits of many eastern species of Plecoptera (8). Hence, the Glover Creek stoneflies include eastern as well as southwestern species.

ACKNOWLEDGMENTS

We thank M. E. Ambler and G. Russell for sorting, counting, and identifying the organisms in many of these samples, and S. Smith and R. J. Neves for reviewing the manuscript. Species and generic identifications were confirmed by H. P. Brown, Univ. Okla. (Coleoptera); E. D. Evans, Mich. Dep. Nat. Resour. (Megaloptera); R. W. Flowers, Fla. A & M (Ephemeroptera); K. W. Stewart, No. Tex. State Univ. (Plecoptera); and G. B. Wiggins, Univ. Toronto (Trichoptera). G. Russell, Okla. Dep. Wildl. Conserv., identified the Chironomidae.

*Present address: Department of Fisheries and Wildlife Sciences, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, 24061.
†Cooperators are the Oklahoma Department of Wildlife Conservation, Oklahoma State University, and the U. S. Fish and Wildlife Service.
Proc. Okla. Acad. Sci. 62:18-21 (1982)

TABLE 1. *Relative abundance of benthic macroinvertebrates in Glover Creek, Oklahoma, 1977-80* (blanks = no specimens *collected;* R = rare (<1/m²); U = uncommon (1-9/m²); C = common (10-99/m²); A = abundant (≥100/m²).

Taxa	Relative Abundance			
	Fall	Winter	Spring	Summer
Nematoda	U	R	U	U
Annelida				
Lumbriculus	C	A	C	C
Bothrioneurum				R
Piscicola	R	R		R
Mollusca				
Planorbidae	R			
Physidae			R	
Ferrissia	R			U
Unionidae	R	R		R
Sphaeriidae	R	R		R
Arthropoda				
Ostracoda	U			R
Hyallela azteca	R	R		
Lirceus prob. *hoppinae*	R	U	U	U
Orconectes palmeri longimanus	U	U	R	U
O. l. leptogonopodus	U	U	R	U
Hydracarina			U	R
Insecta				
Ephemeroptera				
Baetisca nr. *gibbera*	R	U	R	
Ephoron album		R		C
Ephemera	R	U		C
Hexagenia	R			C
Caenis	U	U	U	C
Tricorythodes	U			U
Ephemerella excrucians	U	U	U	C
E. (Danella) simplex[a]				
E. (Eurylophella)[a]				
Stenonema femoratum (= *tripunctatum*)	C	A	C	A
Stenacron interpunctatum	C	R	U	C
Heptagenia prob. *hebe*	R	U	U	C
Rhithrogena			U	
Choroterpes				C
Paraleptophlebia prob. *debilis*	U	U	U	R
Baetis	C	U	U	C
Pseudocloeon	U	U	C	C
Centroptilum				U
Isonychia	C	C	U	C
Odonata				
Gomphus	R	R	R	C
Stylogomphus			R	
Hagenius				R
Lanthus				R
Argia	U	C	U	C
Plecoptera				
Zealeuctra claasseni		R		
Nemoura			U	
Acroneuria evoluta	R	R	U	C
Neoperla clymene	C	C	C	A
Perlesta placida		U	C	R
Phasganophora capitata	R	U	U	U
Hydroperla crosbyi		U	R	
Isoperla clio		R	U	
I. marlynia		R	U	
I. mohri		R	U	
Hastoperla		U	U	
Strophopteryx fasciata		C	R	
Taeniopteryx burksi	U	C		
Allocapnia granulata (or *mohri*)		A	R	

TABLE 1. (continued)

Taxa	Relative Abundance			
	Fall	Winter	Spring	Summer
Hemiptera				
Velliidae				R
Gerris	R			
Megaloptera				
Corydalus cornutus	C	C	U	C
Sialis	U	R		U
Neuroptera				
Climacia				R
Sisyra				R
Trichoptera				
Chimarra	A	C	C	A
Wormaldia			C	
Polycentropus				U
Neureclipsis		U		R
Cheumatopsyche	A	C	U	A
Hydropsyche	C	C	U	C
Macronema	R	R		R
Rhyacophila			U	
Agapetus		R		
Dibusa angata		U		
Hydroptila		U	U	
Stactobiella			R	
Micrasema			R	
Hydatophylax	R			
Pycnopsyche		U	R	U
Helicopsyche	C	U	R	U
Ceraclea	R	U		
Oecetis				R
Lepidoptera				
Paragyractis	U	U	R	C
Coleoptera				
Stenelmis exigua				
larvae	A	A	A	A
adults	C	C	C	A
Microcylloepus pusillus				
larvae	C	C	C	U
adults	C	C	U	C
Dubiraphia	R	R	R	
Heterelmis	R		R	
Helichus	R		R	
Ectopria	R	R	R	
Psephenus herricki	C	C	U	C
Gyrinus				R
Peltodytes	R			
Berosus	U	R		
Diptera				
Tipula	U	U	U	R
Hexatoma	U	U	U	C
Culicidae	R			
Ceratopogonidae (Heleidae)	R	R		R
Atricopogon	R			
Simulium	U	A	U	U
Tabanus	U	U	U	U
Empididae	R	R	U	
Dolichopodidae	R			
Xenochironomus xenolabis		R	R	R
Pseudochironomus	U	U	U	
Stenochironomus		U		
Criptochironomus	R	U		R
Endochironomus	R			
Glyptotendipes	R			
Parachironomus	R			
Chironomus	U			
Goeldichironomus	U			
Dicrotendipes modestus	C	R		U

TABLE 1. (continued)

Taxa	Relative Abundance			
	Fall	Winter	Spring	Summer
Polypedilum	C	U	C	C
Tribelos		U		U
Microtendipes	R	C	U	A
Paratendipes				R
Micropsectra	U	R	U	U
Rheotanytarsus	R	U		C
Tanytarsus	U			
Cladotanytarsus				R
Psectrocladius				
species a	U	U	R	U
species b		R		
Cricotopus				
species a		C	R	U
species b	U	U	C	R
Orthocladius		C	R	
Heterotrissocladius			U	
Nanocladius				
species a		U	C	
species b	R	C		R
Trichocladius	R			
Procladius		R		R
Labrundinia				R
Ablabesmyia mallochi	U			R
Conchapelopia	R	C	U	C
Larsia	R			R
Clinotanypus		R		

a. Rare, no data on seasonal abundance.

REFERENCES

1. F. L. CARLE and O. E. MAUGHAN, Hydrobiologia 71: 181-187 (1980).

2. J. D. UNZICKER, L. AGGUS, and L. O. WARREN, J. Georgia Entomol. Soc. 5: 167-174 (1970).

3. S. W. EDWARDS, Texas J. Sci. 24: 491-516 (1973).

4. B. P. STARK and K. W. STEWART, J. Kans. Entomol. Soc. 46: 563-577 (1973).

5. R .E. McKINLEY, R. PRINS, and L. E. JECH, Proc. Okla. Acad. Sci. 52: 49-52 (1972).

6. W. K. REISEN, Proc. Okla. Acad. Sci. 55: 25-31 (1975).

7. J. WILHM, J. COOPER, and S. BURKS, Proc. Okla. Acad. Sci. 57: 85-88 (1979).

8. K. W. STEWART, R. W. BAUMANN, and B. P. STARK, Trans. Am. Entomol. Soc. 99: 507-547 (1974).

9. G. F. EDMUNDS, JR., S. L. JENSEN, and L. BERNER, *The Mayflies of North and Central America*, University of Minnesota Press, Minneapolis, 1976.