

<1>

Accession Number

BACD199900115499

Author/Editor/Inventor

Brown Arthur V [a]. Lyttle Madeleine M. Brown Kristine B.

Institution

[a] Department of Biological Sciences, University of Arkansas, Fayetteville, AR, 72701 USA.

Title

Impacts of gravel mining on gravel bed streams.

Source

Transactions of the American Fisheries Society. 127(6). Nov., 1998. 979-994.

Abstract

The impacts of gravel mining on physical habitat, fine-sediment dynamics, biofilm, invertebrates, and fish were studied in three Ozark Plateaus gravel bed streams. Intense studies were performed upstream, on site, and downstream from one large mine on each stream. Invertebrates and fish were also sampled in disturbed and reference riffles at 10 small mines. Gravel mining significantly altered the geomorphology, fine-particle dynamics, turbidity, and biotic communities. Stream channel form was altered by increased bank-full widths, lengthened pools, and decreased riffles in affected reaches. Fine particulate organic matter transported from riffles to pools was decreased. Biofilm organic content was decreased on flats and increased on remaining riffles. Density and biomass of large invertebrates and density of small invertebrates were reduced at the small, more frequently mined sites. Total densities of fish in pools and game fish in pools and riffles were reduced by the large mines. Silt-sensitive species of fish were less numerous downstream from mines. Attempts to mitigate or restore streams impacted by gravel mining may be ineffective because the disturbance results from changes in physical structure of the streambed over distances of kilometers upstream and downstream of mining sites. Stream morphology was changed by lack of gravel bedload, not by how bedload was removed. Mining gravel from stream channels results in irreconcilable multiple-use conflicts.

<2>

Accession Number

BIOA199800254795

Author/Editor/Inventor

Crandall Keith A [a].

Institution

[a] 574 Widtsoe Build., Dep. Zool., Brigham Young Univ., Provo, UT 84602-5255 USA.

Title

Conservation phylogenetics of Ozark crayfishes: Assigning priorities for aquatic habitat protection.

Source

Biological Conservation. 84(2). May, 1998. 107-117.

Abstract

A molecular phylogeny based on nucleotide sequence data from the 16S region of the mitochondrial genome was estimated for 20 species of crayfish native to the Ozark Plateaus region of Missouri and Arkansas, USA. With this phylogeny and information on geographic distribution, ecological specialization, and species abundance, species were assessed for their status as rare and endangered. Three species not previously listed, *Orconectes nana*, *Orconectes macrus*, and *Cambarus maculatus*, merit inclusion as 'rare' in the Rare and Endangered Species of Missouri Checklist. Three other species merit inclusion with the status 'Watch

List': Orconectes hylas, Orconectes medius, and Cambarus hubbsi. Additionally, the status of the following species merit changing from 'Watch List' to 'Rare': Orconectes peruncus and Orconectes quadruncus. Faunal regions within the Ozark Plateaus were ranked for conservation priority using species richness, taxonomic diversity, and phylogenetic diversity. The White River, Black River, and Mississippi River regions of the Ozarks were found to rank highest in terms of conservation priorities.

<3>

Accession Number

BIOA199800178079

Author/Editor/Inventor

Schram Mark D. Gunter J Matthew. Engle David B.

Institution

Div. Biol. Chem., Lyon Coll., Batesville, AR 72501, USA.

Title

Diurnal vertical distribution and drift of zooplankton in an Ozark headwater stream pool.

Source

Journal of Freshwater Ecology. 13(1). March, 1998. 47-54.

Abstract

The diurnal vertical distribution and drift of zooplankton were examined in a deep (2.6 m), second order, stream pool in northcentral Arkansas. Zooplankton densities were substantial (max. > 1500/L) with the majority of the organisms occurring near or at the bottom. A significant increase in the density of copepods and rotifers occurred at 1 m during afternoon and evening hours, respectively. No increase was observed for Cladocera. Significantly more zooplankton drifted into the pool at night than drifted out. Increased densities during the night at both upstream and downstream sites were significant for all zooplankton groups except copepods at the downstream site.

<4>

Accession Number

BIOA199800163250

Author/Editor/Inventor

Doisy Kathy E [a]. Rabeni Charles F. Galat David L.

Institution

[a] Sch. Nat. Resources, Univ. Missouri, Columbia, MO 65211 USA.

Title

The benthic insect community of the Lower Jacks Fork River.

Source

Transactions of the Missouri Academy of Science. 31(0). 1997. 19-36.

Abstract

We documented the benthic insect community in a 4 km reach of an Ozark stream in June of 1993. Eleven different instream habitat types were quantitatively sampled using a vacuum benthos sampler. One hundred and eight samples yielded almost 30,000 invertebrate specimens representing 139 taxa. Mean abundance per sample (0.1 m²) was 274. Chironomids ranged from 13 to 88% of total abundance within the different habitats. Communities differed substantially among habitats. Vegetated edgewater had the highest richness (81 taxa). Low gradient riffles had the highest mean abundance (498 per 0.1 m²). High gradient riffles had the highest diversity. Environmental parameters such as depth, current velocity, substrate type, and organic matter were measured with each sample, and ranges of these data are tabulated along with a presence/absence table of the taxa and their associated habitats.

<5>

Accession Number

BIOA199799362228

Author/Editor/Inventor

Phillips Edward C.

Institution

Dep. Biol. Sci., Sam Houston State University, Huntsville, TX 77341, USA.

Title

Habitat preference of large predatory aquatic insects (Megaloptera and Odonata) in Ozark streams of Arkansas.

Source

Texas Journal of Science. 48(4). 1996. 255-260.

Abstract

Megaloptera and odonata larvae were collected from the White and Illinois rivers and Clear Creek in northwest Arkansas from February 1991 through February 1992. Collections were made from both coarse woody debris (CWD) and benthic habitats. Megalopterans were collected in significantly greater densities from benthic habitats (33 +/- 8/m²) than from coarse woody debris (7 +/- 2/m²). There was no significant difference in odonate density between the two habitat types. Of the insects collected, the megalopterans *Corydalus cornutus* and *Sialis* sp., and the odonate *Stylogomphus albistylus* had significantly greater densities in benthic habitats. No other species collected exhibited a significant preference for habitat type. *Corydalus cornutus* inhabiting wood exhibited a significant preference for wood that was well decayed and for wood with rough-textured.

<6>

Accession Number

BIOA199698741059

Author/Editor/Inventor

Gerber Anne S [a]. Templeton Alan R.

Institution

[a] Dep. Biol., Campus Box 1137, Washington Univ., Saint Louis, MO 63130 USA.

Title

Population sizes and within-deme movement of *Trimerotropis saxatilis* (Acrididae), a grasshopper with a fragmented distribution.

Source

Oecologia. 105(3). 1996. 343-350.

Abstract

Capture-mark-recapture studies were initiated in 1990 on four Missouri populations of the lichen grasshopper, *Trimerotropis saxatilis*. This grasshopper lives only on glade habitat, predominantly in the Ozark Mountains. Genetic data suggest that no gene flow occurs among *T. saxatilis* populations. Lichen grasshopper population size (both present and historical), and the likelihood of movement within and between glades, are the subjects of this study. Population sizes on all glades were found to be small (< 280 individuals) and to vary from year to year. Inbreeding effective sizes were found to be much larger than census sizes. On one of the sites, Graham Cave Glade, population size was calculated for 5 years; in 3 of those years (1991, 1993 and 1994) our studies of this population also tested for movement of *T. saxatilis* individuals among different regions of the moderately subdivided glade. Maintenance of Graham Cave Glade (burning and clearing) was initiated after the 1991 capture-mark-recapture season. Comparisons of before and after-burning intraglade movement probabilities did not show a significant difference. Grasshoppers more frequently remained in the part of the glade where they were previously

captured, but were able to move about the moderately subdivided glade. The presence of a closed-canopy forest, rather than distance, appears to be an effective dispersal barrier.

<7>

Accession Number

BIOA199698561111

Author/Editor/Inventor

Koppelman Jeffrey B [a]. Figg Dennis E.

Institution

[a] Fisheries Res. Sect., Missouri Dep. Conservation, 1110 South College Ave., Columbia, MO 65210 USA.

Title

Genetic estimates of variability and relatedness for conservation of an Ozark cave crayfish species complex.

Source

Conservation Biology. 9(5). 1995. 1288-1294.

Abstract

Allozyme-based genetic distances were used to determine the distinctness of six species of cave crayfish from the Ozark Plateau in Missouri, Arkansas, and Oklahoma. One of the cave species is in the subgenus *Erebicambarus* and the others are in *Jugicambarus*. Four of the six species are very rare and are found in only one to three known sites each. In addition, most populations of all the species are presumed to be small; rarely are more than a few individuals observed. A chela (claw) was collected from sixty individuals representing the six species, including all known populations of the four rare species. Variability and distance estimates were based on 20 presumptive gene loci. Population samples with identical genotypes were pooled. Thirteen loci were polymorphic, but average heterozygosity was low ($H = 1\%$) compared to epigeal crayfish species. Pairwise genetic distances within *Jugicambarus* ranged from $D = 0.051$ to 0.522 , and mean distance between subgenera was $D = 0.676$. The underground water systems in Ozark caves are defined by discreet recharge zones. Groundwater pollution threatens the stability of cave ecosystems, including the survival of cave crayfish. If restoration of threatened or extirpated populations becomes necessary, a database of genetic variability and relatedness estimates for known populations of all the species will aid decisions about numbers and sources of individuals for propagation or transfer.

<8>

Accession Number

BIOA199598373314

Author/Editor/Inventor

Phillips Edward C.

Institution

Dep. Biological Sciences, Sam Houston State Univ., Huntsville, TX 77341-2216, USA.

Title

Associations of aquatic Coleoptera with coarse woody debris in Ozark Streams, Arkansas.

Source

Coleopterists Bulletin. 49(2). 1995. 119-126.

Abstract

Coleoptera were collected from both coarse woody debris (CWD) and benthic habitats from the White River, Illinois River, and Clear Creek of Northwest Arkansas from February 1991 through February 1992. Overall density of beetles

was significantly greater on CWD than in benthic habitats. There were no significant seasonal differences in the densities of coleopterans. Most beetles collected from CWD showed a preference for wood with loose bark, and wood that was well decayed with many interstitial spaces. All coleopteran species tested showed a preference for wood with heavy volumes of biofilm. Wood with bark remaining was more heavily colonized by beetles if the bark had a rough texture than if the bark was smooth. Wood with loose bark and/or interstitial space probably provides concealment, and thus protection from predators. Wood with heavy volumes of biofilm probably also provides cover, and may additionally provide a food source for coleopterans.

<9>

Accession Number

BIOA199497542946

Author/Editor/Inventor

Marquis Robert J [a]. Whelan Christopher J.

Institution

[a] Dep. Biol., Univ. Mo.-St. Louis, 8001 Natural Bridge Road, St. Louis, MO 63121-4499 USA.

Title

Insectivorous birds increase growth of white oak through consumption of leaf-chewing insects.

Source

Ecology (Tempe). 75(7). 1994. 2007-2014.

Abstract

We examined the indirect effects of insectivorous birds on plant growth through consumption of leaf-chewing insects in a Missouri Ozark deciduous forest. Over a period of 2 yr, we compared insect numbers, leaf damage, and resultant plant growth for control saplings of white oak (*Quercus alba*), vs. saplings that we caged to limit access by insectivorous birds but not herbivorous insects. In a third treatment, we sprayed insecticide on young white oak trees to determine the impact of the insect herbivores on plant growth in the presence of birds. The total number of insects encountered on plants inside of cages was twice that on control plants for both years. Insecticide spraying reduced herbivore numbers substantially but did not eliminate them. As a result of the treatments, cage plants suffered 25% leaf area loss, control plants 13%, and spray plants 6% at the end of the first season (34, 24, and 9%, respectively, for the 2nd yr). As a result of the differences in damage, cage plants produced one-third less total aboveground biomass compared to insecticide-treated plants, with control plants producing intermediate values. Differences in biomass production were due mainly to decreased leaf biomass, which in turn was associated with decreased leaf size in subsequent years as a result of high damage during the previous year. This is the first terrestrial ecosystem study to demonstrate a significant impact of insectivorous birds on plant growth. Our results suggest that over the long term observed declines in North American populations of insectivorous birds may reduce forest productivity because of potentially higher numbers of leaf-chewing insects and the concomitant negative effect on plant growth.

<10>

Accession Number

BIOA199497401491

Author/Editor/Inventor

Phillips Edward C.

Institution

Dep. Biol. Sci., 601 Sci.-Eng. Build., Univ. Arkansas, Fayetteville, AR 72701, USA.

Title

Habitat preference and seasonal abundance of trichoptera larvae in Ozark streams, Arkansas.

Source

Journal of Freshwater Ecology. 9(2). 1994. 91-95.

Abstract

Trichopterans were collected from both coarse woody debris (CWD) and benthic habitats from three streams in northwest Arkansas from February 1992 through February 1993. Overall density of caddisflies was significantly greater in benthic habitats than on CWD. Trichopteran larvae had significantly greater densities during summer and fall than during winter and spring. *Lype diversa* was the only species that showed a preference for decay stage and was collected in greatest densities on wood with loose bark or on decayed wood with many interstitial spaces. No species tested showed a preference for volume of biofilm. However, on wood with bark remaining, wood with bark or rough texture produced greater densities of caddisflies than did wood with smooth bark.

<11>

Accession Number

BIOA199497401331

Author/Editor/Inventor

Phillips Edward C. Kilambi Raj V.

Institution

Dep. Biological Sci., 601 Science-Eng. Build., Univ. Arkansas, Fayetteville, AR 72701, USA.

Title

Use of coarse woody debris by diptera in Ozark streams, Arkansas.

Source

Journal of the North American Benthological Society. 13(2). 1994. 151-159.

Abstract

Aquatic dipterans were sampled from coarse woody debris (CWD) and stony benthic habitats from February 1991 through February 1992 in the White River, Illinois River, and Clear Creek of the Ozark Plateau in Arkansas. Chironomidae was the numerically dominant taxonomic group, and they were collected in significantly greater densities from CWD than from benthic habitats; but densities of other dipterans did not differ significantly between habitat types. Representatives of five taxa were collected in significantly greater densities from benthic habitats, and seven from CWD. The greatest estimated mean density of dipterans occurred during the spring, but differences were not significant because of high variation within seasons. The degree of decay of CWD was an important microhabitat factor for representatives of six taxa, of which four were xylophagous chironomids. The xylophages that were affected by degree of decay were *Brillia flavifrons*, *Polypedilum fallax*, *Stenochironomus* sp., and *Xylotopus* par. *Eukiefferiella* spp. and *Phaenospectra* sp. were the non-xylophages affected by decay stage. Biofilm volume appeared to be a less important factor in CWD use, but was important for representatives of two taxa (*B. flavifrons* and *Eukiefferiella* spp).

<12>

Accession Number

BIOA199497311182

Author/Editor/Inventor

Phillips Edward C. Kilambi Raj V.

Institution

Dep. Biol. Sci., Univ. Ark., Fayetteville, AR 72701, USA.

Title

Habitat type and seasonal effects on the distribution and density of Plecoptera in Ozark Streams, Arkansas.

Source

Annals of the Entomological Society of America. 87(3). 1994. 321-326.

Abstract

Plecoptera nymphs were collected from coarse woody debris (CWD) and benthic habitats from the White River, Illinois River, and Clear Creek of Northwest Arkansas from February 1991 through February 1992. Two-way analysis of variance comparing habitat type and season showed significant main effects. Densities were significantly greater in benthic habitats than on CWD and greater during winter and spring than during summer and fall. Significant two-way interactions were found between habitat type and season. Multiple regression analysis revealed a significant relationship among the seasonal density of winter stoneflies and flow rate, water temperature, and dissolved oxygen; densities increased as water temperature decreased and as dissolved oxygen concentration and flow rate increased. Densities of stonefly species with slow univoltine, semivoltine, or fast univoltine spring and summer life cycles showed no significant relationship with these factors. Two-way analysis of variance indicated that most species inhabiting coarse woody debris are found on wood with loose bark or wood that is well decayed and has many interstitial spaces. *Prostoia completa* (Walker) was the only species whose abundance was influenced by the volume of biofilm present on CWD and increased biofilm volume led to increased density. These results suggest that benthic habitats are preferred by most species of Plecoptera. but that CWD may also be an important habitat type for some species.

<13>

Accession Number

BIOA199497267222

Author/Editor/Inventor

Phillips Edward C. Kilambi Raj V.

Institution

Dep. Biol. Sci., 601 Sci.-Eng. Build., Univ. Arkansas, Fayetteville, AR 72701, USA.

Title

Utilization of coarse woody debris by Ephemeroptera in three Ozark streams of Arkansas.

Source

Southwestern Naturalist. 39(1). 1994. 58-62.

Abstract

Collections of ephemeropteran nymphs were made from both coarse woody debris (CWD) and benthic habitats from the White River, Illinois River, and Clear Creek of northwestern Arkansas, from February 1991 through February 1992. Two-way analysis of variance comparing the density of mayflies between habitat types, and among seasons yielded significant main effects only with habitat type. There was no two-way interaction. Mayflies were significantly more abundant in benthic habitats than on CWD. Of at least 35 species of mayflies, 11 were collected in significantly greater densities from benthic habitats, and only two from CWD. Degree of decay was an important factor in determining the abundance of species on CWD. Species with a preference were more abundant either on wood with loose bark remaining, or well decayed wood containing many interstitial spaces. The volume of biofilm on CWD was a factor in determining the abundance of only one species.

<14>

Accession Number

BIOA199395095174

Author/Editor/Inventor

Bergmann David J [a]. Chaplin Stephen J.

Institution

[a] Dep. Biochem., University Minnesota, Minneapolis, MN 55455.

Title

Correlates of species composition of grasshopper (Orthoptera: Acrididae) communities on Ozark cedar glades.

Source

Southwestern Naturalist. 37(4). 1992. 362-371.

Abstract

The composition of grasshopper communities on Ozark cedar glades and how these communities are affected by such factors as glade size, structural characteristics of plant cover, and surface characteristics of glades were examined. A significant correlation exists between the log(glade area) and both species diversity and the log(number of species). In the absence of periodic fires, plant succession on glades results in considerable change in the size, structure of plant cover, and surface characteristics of glades. These changes resulting from plant succession are associated with changes in the composition of grasshopper communities found on glades.

<15>

Accession Number

BIOA199395014418

Author/Editor/Inventor

Rabeni Charles F.

Institution

Missouri Cooperative Fish Wildlife Res. Unit, U.S. Fish Wildlife Service, 112 Stephens Hall, University Missouri, Columbia, Mo. 65211.

Title

Trophic linkage between stream centrarchids and their crayfish prey.

Source

Canadian Journal of Fisheries & Aquatic Sciences. 49(8). 1992. 1714-1721.

Abstract

Energetic links between smallmouth bass (*Micropterus dolomieu*) and rock bass (*Ambloplites rupestris*) and their crayfish foods were examined in an Ozark (USA) stream. A trophic level energy budget was developed by enumerating food habits for different age (size) fish, estimating annual production for both fish and crayfish, and using laboratory- and literature-derived bioenergetic and gross efficiency data. Both fishes began life feeding on small invertebrates (mayflies and chironomids) but within 3 mo switched to a diet of mainly crayfish and Cyprinidae. Total annual production of smallmouth bass was 0.262 g dry weight cntdot m-2 cntdot yr-1 (6344 J) and rock bass 0.148 g cntdot m-2 cntdot yr-1 (3607 J). Total annual production of crayfish was 4.15 g dry weight cntdot m-2 cntdot yr-1 (55 736 J) for *Orconectes luteus* and 5.05 g cntdot m-2 cntdot yr-1 (62 394 J) for *O. punctimanus*. Only about half of the crayfish production was available to fish, due to size-selective predation and behavioral traits of the prey. A predator-prey model suggested that nearly one third of total crayfish production during their vulnerable period was lost to centrarchids, and that half of the existing biomass was consumed. Fish are probably the major cause of mortality in crayfish and undoubtedly influence crayfish population dynamics and energy flow through the river system.

<16>

Accession Number

BIOA199395005464

Author/Editor/Inventor

Bowles David E [a]. Allen Robert T.

Institution

[a] United States Air Force Armstrong Lab., Occupational and Environmental Health Div., Environmental Biol. Branch, Brooks AFB, Texas 78235.

Title

Life histories of six species of caddisflies (Trichoptera) in an Ozark stream, USA.

Source

Journal of the Kansas Entomological Society. 65(2). 1992. 174-184.

Abstract

Life histories for the trichopteran species *Agapetus illini*, *Chimarra aterrima*, *C. obscura*, *Helicopsyche limnella*, *Polycentropus centralis*, and *Wormaldia moesta* were estimated by determining the seasonal occurrence and relative abundance of larval instars and pupae, and from adult collections. Head capsule width measurements revealed that all of the species had five larval instars. *Agapetus illini* and *W. moesta* were univoltine, but bivoltine life histories with overlapping generations were observed for *C. aterrima*, *C. obscura*, *H. limnella*, and *P. centralis*. Adults of bivoltine species were prevalent from early spring through late autumn, and larval recruitment from reproduction occurred throughout adult flight periods. Adults of univoltine species (*A. illini* and *W. moesta*) were collected only during May. Bivoltinism appears to be a common life-history pattern in warmwater streams of southern latitudes in North America.

<17>

Accession Number

094074376

Authors

Moulton S R II. Stewart K W.

Institution

DEP. BIOL. SCI., UNIV. NORTH TEX., DENTON, TEX. 76203.

Title

A NEW SPECIES OF CERACLEA TRICHOPTERA LEPTOCERIDAE FROM THE OZARK MOUNTAINS OF MISSOURI USA.

Source

Proceedings of the Entomological Society of Washington 94 (3). 1992. 361-365.

Abstract

A new species of the *Ceraclea* (*Athripsodina*) *annulicornis* species group is described from the Ozark Mountains of Missouri. *Ceraclea* (*Athripsodina*) *maccalmonti* n. sp. represents the ninth member of this group from the world and fourth species known from the Nearctic region. The adult genitalia, larva, and pupa are described and figured from field-collected and reared material. The known distribution of this species may be restricted to Bennett Spring in central Missouri.

<18>

Accession Number

093077891

Authors

Mathis M L. Bowles D E.
Institution
DEP. BIOLOGICAL SCI., UNIVERSITY ARKANSAS, FAYETTEVILLE, ARKANSAS 72701.
Title
A PRELIMINARY SURVEY OF THE TRICHOPTERA OF THE OZARK MOUNTAINS MISSOURI USA.
Source
Entomological News 103 (1). 1992. 19-29.
Abstract
One hundred thirty-three species of caddisflies representing 15 families and 49 genera are reported from the Ozark Mountains of Missouri. Families exhibiting the greatest species richness included the Hydroptilidae (36 spp.), Leptoceridae (26 spp.), and Hydropsychidae (26 spp.). Sixty-four species are reported for the first time from the state.

<19>

Accession Number
093002966
Authors
Brussock P P. Brown A V.
Institution
ENVIRONMENTAL LIABILITY MANAGEMENT INC., RES. PARK, 218 WALL STREET, PRINCETON, N.J. 08540, USA.
Title
RIFFLE-POOL GEOMORPHOLOGY DISRUPTS LONGITUDINAL PATTERNS OF STREAM BENTHOS.
Source
Hydrobiologia 220 (2). 1991. 109-118.
Abstract

An Ozark Plateau stream was studied to determine the influence of distinct pool and riffle geomorphology on the longitudinal zonation of macroinvertebrate species assemblages and functional group classification. All study sites were dominated by alluvial pool and riffle channel form and the first two orders became intermittent during summer months. Nine benthos samples were collected seasonally from riffles and pools at each of five sites using a vacuum benthos sampler. Diel temperature pulse and coarse particulate organic matter (CPOM) were measured at each site also. Water temperature was most variable in second order, and CPOM on riffles was not more abundant in upstream reaches. Annual average density and biomass of invertebrates were highest in third and fourth orders, respectively. Diversity was depressed in the intermittent headwater sites. Macroinvertebrate functional groups did not exhibit strong longitudinal trends as predicted by the river continuum model, with species assemblages apparently more strongly affected by the segment-level physical template, although shredders were more abundant in the headwaters during fall and winter. This study indicates that a reach-level perspective based on channel form is a necessary complement to holistic stream ecosystem models, especially in alluvial gravel streams.

<20>

Accession Number
092014744
Authors
Bowels D E. Allen R T.
Institution
UNITED STATES AIR FORCE ARMSTRONG LAB., OCCUPATIONAL ENVIRONMENTAL HEALTH DIRECTORATE, HUMAN SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, BROOKS AFB, TEXAS 78235.

Title

SECONDARY PRODUCTION OF NET-SPINNING CADDISFLIES TRICHOPTERA CURVIPALPIA IN AN OZARK STREAM ARKANSAS USA.

Source

Journal of Freshwater Ecology 6 (1). 1991. 93-100.

Abstract

Secondary production estimates were calculated for selected net-spinning caddisflies from an Ozark stream using the size-frequency method. Combined production for all species studied was estimated to be 2.64 g/m²/yr (dry mass). *Chimarra obscura* and *Cheumatopsyche* spp. were the most abundant caddisfly species contributing 48% and 47%, respectively, to total production. *Chimarra aterrima*, *Polycentropus centralis* and *Wormaldia moesta* contributed the remaining 5%. Annual P/B ratios ranged from 5 for the univoltine *W. moesta* to the 11.5 for the bivoltine *P. centralis*. A P/B ratio of 17 was estimated for *Cheumatopsyche* spp., but this large value was attributed to grouping at least four ecologically similar but distinct species. Annual mean production for some species was similar to estimates reported in other studies, but production for all species was considerably lower than estimates from other lotic ecosystems.

<21>

Accession Number

091116992

Authors

Lohman K. Jones J R. Baysinger Daniel C.

Institution

SCH. NATURAL RESOURCES, UNIV. MISSOURI, COLUMBIA, MISSOURI 65211, USA.

Title

EXPERIMENTAL EVIDENCE FOR NITROGEN LIMITATION IN A NORTHERN OZARK STREAM MISSOURI.

Source

Journal of the North American Benthological Society 10 (1). 1991. 14-23.

Abstract

Nutrient enrichment experiments were conducted during low flow periods in 1985 and 1986 in a northern Ozark stream characterized by low nitrate-N concentrations and molar ratios of TN:TP less than 20:1. Enrichment with nitrate to a concentration 3-6 times greater than ambient, either alone or in combination with phosphate addition, stimulated periphytic chlorophyll a by 4-6.times. and AFDM by 2-5 .times. over unenriched controls in two 30-d experiments. An intermediate increase in chlorophyll a in response to phosphate addition was observed in 1985 when TN:TP averaged 19:1. Differences in periphyton accrual among treatments were influenced by snail grazing (*Goniobasis*) during 1986 when periphyton biomass in N-enriched treatments continued to increase over the 30-d enrichment period, but remained at low levels in control and P-enriched treatments. Low nitrate-N concentrations and TN:TP .ltoreq. 20:1 were also characteristic of 16 sites on 10 streams in the northern Ozark Plateau during low flow periods in 1985 and 1986, suggesting that nitrogen limitation may be common in the region.

<22>

Accession Number

091051286

Authors

Allen R T.

Institution

DEP. ENTOMOLOGY, UNIV. ARKANSAS, FAYETTEVILLE, ARKANSAS 72701.

Title

INSECT ENDEMISM IN THE INTERIOR HIGHLANDS OF NORTH AMERICA.

Source

Florida Entomologist 73 (4). 1990. 539-569.

Abstract

Sixty-eight species of insects of considered endemic to the Interior Highlands of North America. The area encompassed by these species consists of the Ozark, Ouachita, Arbuckle, and Wichita Mountains of Illinois, Missouri, Arkansas, and Oklahoma. County maps are given for each species as well as maps showing the distribution of close relatives, where available. The hypothesis that all endemism in the Interior Highlands is the result of events associated with Pleistocene glaciation is questioned because the area has been an above water land mass since the Pennsylvania era. Based on taxon/area cladograms of sixteen of the species, a biogeographic pattern is suggested. It is further suggested that only two vicariant events were necessary to account for the origin of the species represented in the taxon/area cladograms. The times at which these events may have occurred is uncertain. The first event may have been in the early Cretaceous when the Interior Highlands was an isolated island surrounded by epicontinental seas.

<23>

Accession Number

090135933

Authors

Mccafferty W P.

Institution

DEP. ENTOMOL., PURDUE UNIV., WEST LAFAYETTE, INDIANA 49707.

Title

BIOGEOGRAPHIC AFFINITIES OF THE EPHEMEROPTERA OF THE BLACK HILLS SOUTH DAKOTA USA.

Source

Entomological News 101 (4). 1990. 193-199.

Abstract

Records of mayfly species in South Dakota are few in number. Most records are from the Black Hills region of southwestern South Dakota. Twelve new species records (genera *Caenis*, *Callibaetis*, *Dactylobaetis*, *Epeorus*, *Nixe*, *Paraleptophlebia*, *Siphonurus*, *Tricorythodes*) are also based on collections from the Black Hills. The diversity of the mayfly fauna in the Black Hills is relatively low, with only 19 species *Acentrella insignificans*, *B. brunneicolor*, *B. flavistriga*, *B. intercalaris*, *B. tricaudatus*, *Callibaetis ferrugineus*, *C. fluctuans*, *C. pallidus*, *C. pictus*, *D. cepheus*, *Dipheter hageni*, *Fallceon quilleri*, *Caenis amica*, *Ephemerella inermis*, *Epeorus grandis*, *N. criddlei*, *P. mollis*, *S. columbianus*, *T. minutus* in seven families known. The species mix consists of some widespread North American species, but also western continental species and eastern continental species whose respective easternmost and westernmost range limits meet in the Black Hills. The somewhat insular nature of this small montane region may explain low numbers of species, and its proximity to the main body of Rocky Mountains may explain the presence of its western component. Eastern species represented are primarily northeastern North American species with disjunct, probably relict, populations now isolated in the lower Appalachian Mountains, the Ozark-Ouachita Mountains, and the Black Hills.

<24>

Accession Number

090131405

Authors

Dorr L J.

Institution

NEW YORK BOTANICAL GARDEN, BRONX, N.Y. 10458-5126.

Title

A REVISION OF THE NORTH AMERICAN GENUS CALLIRHOE MALVACEAE.

Source

Memoirs of the New York Botanical Garden 56 1990. 1-76.

Abstract

Callirhoe, a North American genus of herbaceous annuals, biennials, and perennials, is restricted to northern Mexico, the Great Plains from Texas north to Nebraska, the Upper Mississippi River drainage, the Ozark and Ouachita mountains, and the Gulf Coastal Plain USA. Nine species and two additional varieties are recognized. Palynologically the genus represents an extreme in the high number of spines and pores on pollen grains. Several species of rust fungi attack species of Callirhoe, but host-parasite associations are broad. Similarly several species of weevils are parasitic on Callirhoe, but the economically important boll weevil does not occur naturally on it. Three species of Callirhoe are gynodioecious throughout their ranges and one species shows evidence of gynodioecy in a few populations. Male-sterile flowers are invariably smaller than perfect flowers. Wide crosses are possible in controlled situations, although hybridization appears to be rare in nature. The four species examined for compatibility are self-compatible, but only the annual species, *C. leiocarpa*, will set seed without mechanical intervention. Insect floral visitors and pollinators are diverse, yet several anthophorid bees have evolved specialized, oligolectic relationships with Callirhoe species. Cytologically Callirhoe is complex. The base chromosome number for the genus may be either $x = 14$ or 15 . Present cytological data do not favor one number over the other. Three species groups are recognized. The first group is composed of four exinvolucellate species, each of which is diploid with $n = 14$. The second group is an involucellate species pair with one species tetraploid with $n = 28$ and the other either tetraploid or octoploid with $n = 28$ and 56 , respectively. The third species group is also involucellate, but two species were exclusively diploid with $n = 15$ and a species complex of three varieties has diploid, $n = 15$, and tetraploid, $n = 30$, populations in each variety. Morphological characters place Callirhoe in the Malveae subtribe Malvinae, but the possibility that the subtribe is polyphyletic complicates the assessment of generic relationships.

<25>

Accession Number

090097304

Authors

Gore J A. Bryant R M Jr.

Institution

CENT. FIELD BIOL., LBL, AUSTIN PEAY STATE UNIV., CLARKESVILLE, TENN. 37044.

Title

TEMPORAL SHIFTS IN PHYSICAL HABITAT OF THE CRAYFISH ORCONECTES-NEGLECTUS FAXON.

Source

Hydrobiologia 199 (2). 1990. 131-142.

Abstract

A total of 300 samples was collected from February 1985 to August 1986 in a medium order Ozark Mountain stream. Physical habitat measurements of temperature, mean water column velocity, depth, and substrate character were recorded for each of the 25 monthly samples along with length and sex of all

individuals of *Orconectes neglectus* (Faxon). Analysis of habitat utilization and suitability (or preference) was conducted using exponential polynomial models of hydraulic stress models. There appeared to be equal preference for depth over the range measured. Both substrate and velocity preference curves were bimodal with each mode designating certain crayfish size classes. Young-of-the-year were found primarily in cobbled, high velocity areas while adults were found in low velocity, macrophyte beds. Utilization curves for laminar sublayer thickness also reflected size-dependent phenomena where young-of-the-year were found in thin sublayer areas and adults were found primarily in thick sublayers. When separated by time and size, adults were found to occupy higher velocity, cobbled habitats during at least two months. This time period corresponded with the time of egg-bearing and further analysis yielded a time-dependent habitat suitability surface which accounted for this movement pattern. We suggest that the application of these suitability surfaces, which reflect habitat changes during the annual life cycle, will produce more accurate predictions of density and will allow better habitat management decisions under various regulated flow scenarios.

<26>

Accession Number

089105467

Authors

Bowles D E.

Institution

UNITED STATES AIR FORCE SCH. AEROSPACE MED., MEDICAL ENTOMOLOGY SECTION,
BROOKS AFB, TEXAS 78235.

Title

LIFE HISTORY AND VARIABILITY OF SECONDARY PRODUCTION ESTIMATES FOR *CORYDALUS-CORNUTUS* MEGALOPTERA CORYDALIDAE IN AN OZARK STREAM.

Source

Journal of Agricultural Entomology 7 (1). 1990. 61-70.

Abstract

In the Mulberry River, Arkansas USA, *Corydalus cornutus* (Megaloptera: Corydalidae) had a univoltine life history with ten larval instars. Secondary production estimates (size-frequency method) from three adjacent riffles ranged from 0.37 to 2.98 g/m²/yr dryweight, and annual P/B ratios ranged from 7.4 to 9.0. Production estimates calculated from reduced sample sizes yielded variable results but in general did not decrease production estimates. Production estimates for two of three riffles changes little when sample size was reduced by one-half. This study suggests that single riffle sampling regimens are inadequate and may produce misleading results. A proposal for a stratified, inter-riffle sampling design is offered.

<27>

Accession Number

087035817

Authors

Power M E. Stewart A J. Matthews W J.

Institution

DEP. ZOOL., UNIV. CALIF., BERKELEY, CALIF. 94720, USA.

Title

GRAZER CONTROL OF ALGAE IN AN OZARK MOUNTAIN STREAM USA EFFECTS OF SHORT-TERM EXCLUSION.

Source

Ecology 69 (6). 1988. 1894-1898.

Abstract

Stony substrata in streams of the southwestern Ozark Mountains are covered with cyanobacterial felts dominated by *Calothrix* sp., an active nitrogen fixer. To study the effect of grazers on these producer assemblages, we exposed or protected periphyton from grazers for periods ranging from 4 to 33 d. When protected from grazing fishes and invertebrates, cyanobacterial felts are overgrown by turfs of benthic diatoms within 4-10 d. Diatom turfs also develop on bare substrata that are incubated in sites in the stream inaccessible to grazers. Diatom turfs exposed to grazing minnows are stripped off in 3-5 min, and when left exposed to grazers, are replaced by cyanobacterial felts within 11 d. Basal regeneration of *Calothrix* trichomes may contribute to their persistence under intense grazing.

<28>

Accession Number

086057359

Authors

Brussock P P. Willis L D. Brown A V.

Institution

N.J. DEP. ENVIRON. PROTECT., BUR. ENVIRON. EVAL. AND RISK ASSESSMENT, 440 E. STATE ST., TRENTON, N.J. 08625, USA.

Title

LEAF DECOMPOSITION IN AN OZARK CAVE AND SPRING.

Source

Journal of Freshwater Ecology 4 (3). 1988. 263-270.

Abstract

Decomposition of leaves was compared among sites in a stream that originates deep in a cave and then emerges as a spring brook. White oak (*Quercus alba*) leaf packs and plastic controls were placed in four similar riffle areas: (1) in the cave above a sink hole; (2) in the cave below a sink hole; (3) in the spring under an overhang; and (4) in the spring exposed to direct sunlight (through a forest canopy). Flow, temperature, and other aspects of physical-chemical water quality were constant among sites while availability of natural leaf litter, food abundance and variety, light, and the number and types of invertebrates varied. Processing rates ($-k$) at the cave sites (1 = 0.0075, 2 = 0.0085) were faster than rates for white oak reported for surface streams, despite a paucity of invertebrates in the cave and similar temperatures. Leaf packs which received sunlight had ten times more invertebrates associated with them than those under the overhang, but similar processing rates (0.019 and 0.024 respectively). Because of these results, we suspect that the decomposition rates outside the cave were faster due to factors other than macroinvertebrates.

<29>

Accession Number

084047258

Authors

Webb G E.

Institution

DEP. GEOL. MINERAL., UNIV. QUEENSL., ST. LUCIA, QUEENSL. 4067, AUST.

Title

THE CORAL FAUNA OF THE PITKIN FORMATION CHESTERIAN NORTHEASTERN OKLAHOMA AND NORTHWESTERN ARKANSAS USA.

Source

Journal of Paleontology 61 (3). 1987. 462-493.

Abstract

The Upper Chesterian Pitkin Formation of the Ozark Dome region contains a large and diverse, yet highly endemic, coral fauna consisting of 10 genera of rugose corals and three of tabulate corals. Coral distribution within the formation is affected by stratigraphic, paleoecologic, and possibly paleogeographic controls. Although it is impossible at this time to fully evaluate the importance of stratigraphic controls on the coral distribution, the occurrence of two types of carbonate bioherms within the formation provides substantial paleoecologic control on the distribution of certain corals. Despite the high endemism and facies restriction, the coral fauna has proven to be biostratigraphically sensitive, correlating with middle and upper Chesterian coral zones in the Western Interior Province of North America. Among the Pitkin corals herein described are the new genera: *Lesliella* n. gen. (*L. amplexa* n. sp., type species) and *Parvaxon* n. gen. (*P. minutum* n. sp., type species). Other newly described species are: *Amplexizaphrentis browni* n. sp., *Barytichisma clubinei* n. sp., *B. ozarkana* n. sp., and *Leonardophyllum arkansanum* n. sp., which represents the first reported occurrence of the genus in strata below the Pennsylvanian boundary.

<30>

Accession Number

083095347

Authors

Ernst M R. Stewart K W.

Institution

DEP. BIOL. SCI., NORTH TEXAS STATE UNIV., DENTON, TEX. 76201, USA.

Title

MICRODISTRIBUTION OF EIGHT STONEFLY SPECIES PLECOPTERA IN RELATION TO ORGANIC MATTER IN AN OZARK FOOTHILLS STREAM OKLAHOMA USA.

Source

Aquatic Insects 8 (4). 1986. 237-254.

Abstract

Stonefly density, biomass, size and diversity relationships with CPOM and FPOM were elucidated from 12 months of Surber sampling in a riffle of a 2nd order, northeastern Oklahoma stream in 1983-84. Samples taken across an observable gradient of allochthonous leaf material resulted in clumped CPOM distributions in monthly samples (n = 10) for 10 of 12 months. FPOM was regularly distributed among monthly samples. There was an inverse relationship between CPOM and FPOM for most months suggesting substratum interaction in organic matter retention. Mean annual density of 8 stonefly species was 113.+-. 150/0.1 m2. Nymphs were found in clumped distributions for 11 of 12 months (p < 0.05). Density, biomass and diversity were positively correlated to CPOM annually. Autecological analysis of 8 species showed varying degrees of association with CPOM and/or FPOM, suggesting specific habitat preference, ontogenetic shifts, or possible biotic interaction. Density and biomass of 4 species was related to CPOM (*Acroneuria evoluta*, predator; *Isoperla namata*, generalist; *Amphinemura delosa* and *Prostoia completa*, shredders). These species contributed 72.5% of the total stonefly biomass sampled (13.39 gm.dry wt.). CPOM provides both food and habitat for stoneflies, and is therefore important in their community structure and function. The other species studied were *Agnetina capitata* (Pictet) *Haploperla brevis* (Banks), *Leuctra tennis* (Walker) and *Neoperla* spp. complex (*N. catharae* Stark and Baumann, *N. Clymene* (Newman), *N. Stewart*: Stark and Baumann and an unidentified species).

<31>

Accession Number

082100896

Authors

Todd C S. Stewart K W.

Institution

DEP. BIOL. SCI., NORTH TEX. STATE UNIV., DENTON, TEX. 76203, USA.

Title

FOOD HABITS AND DIETARY OVERLAP OF NONGAME INSECTIVOROUS FISHES IN FLINT CREEK OKLAHOMA USA A WESTERN OZARK FOOTHILLS STREAM.

Source

Great Basin Naturalist 45 (4). 1985. 721-733.

Abstract

Insectivorous fishes were sampled from March, 1983 to February 1984, in Flint Creek, Delaware Co., Oklahoma. There was insignificant habitat segregation between *Etheostoma spectabile* and *E. punctulatum* and seasonal habitat partitioning between *Cottus carolinae* and both darters. Mature *E. spectabile* ate primarily chironomids and mayflies, whereas juveniles fed primarily on microcrustaceans. Mature *E. punctulatum* consumed fewer *Ephemerella* and *Leptophlebia* than *E. spectabile*, feeding on *Stenonema* and other crustaceans. Juvenile *E. punctulatum* fed mainly on amphipods and mayflies, and juvenile *E. spectabile* ate primarily microcrustaceans. *Cottus carolinae* elected primarily mayflies in spring-summer and chironomids in January-February. Coefficients of dietary overlap were highest between larger *E. spectabile* and juvenile *E. punctulatum* and lowest between immature *E. spectabile* and mature *E. punctulatum*. Overlap between the two darters was significantly correlated with differences in mean prey size ($p < 0.0005$). Overlap between sizes of *E. spectabile* was also significantly correlated to differences in mean prey sizes. *Etheostoma spectabile* generally preferred smaller prey than *E. punctulatum*. All three species avoided *Stenelmis*. *Cottus carolinae* avoided microcrustaceans. The study showed that resource partitioning among these three insectivorous fishes is affected by complex interactions of habitat and prey electivity, and prey size selectivity.

<32>

Accession Number

082083765

Authors

Ernst M R. Poulton B C. Stewart K W.

Institution

DALLAS COUNTY UTILITY RECLAMATION DISTRICT, P.O. BOX 160035, IRVING, TEX. 75016.

Title

NEOPERLA PLECOPTERA PERLIDAE OF THE SOUTHERN OZARK AND OUACHITA MOUNTAIN REGION ARKANSAS OKLAHOMA USA AND TWO NEW SPECIES OF NEOPERLA.

Source

Annals of the Entomological Society of America 79 (4). 1986. 645-661.

Abstract

Morphology of adults and egg chorionic structure are used to delineate seven species of *Neoperla* from 72 locations in the southern Ozark and Ouachita Mountain region: *N. clymene* (Newman), *N. stewarti* Stark & Baumann, *N. catharae* Stark & Baumann, *N. carlsoni* Stark & Baumann, *N. choctaw* Stark & Baumann, and two new species, *N. harpi* Ernst & Stewart and *N. robisoni* Poulton & Stewart. Eight thousand specimens, collected mostly with a blacklight trap were examined, with collections of 28 mating pairs and temporally staggered emergence periods corroborating morphological separations. Variations from previous descriptions are discussed and illustrated keys to adults and eggs are provided.

<33>

Accession Number

082081105

Authors

Ernst M R. Stewart K W.

Institution

ARMY CORPS ENGINEERS, WATERWAYS EXPERIMENT STATION, P.O. BOX 631, VICKSBURG, MICH. 39180, USA.

Title

EMERGENCE PATTERNS AND AN ASSESSMENT OF COLLECTING METHODS FOR ADULT STONEFLIES PLECOPTERA IN AN OZARK FOOTHILLS STREAM OKLAHOMA USA.

Source

Canadian Journal of Zoology 63 (12). 1985. 2962-2968.

Abstract

Emergence periods and patterns for adult stoneflies were assessed using five collecting methods on a second-order stream in northeastern Oklahoma. Twenty-two species, representing six families, displayed successional emergence periods with at least one species being present every month of the year. Searching emergent leaf packs, logs, and rocks with an aspirator and forceps resulted in the collection of 21 of 53 species (91%) and was particularly suited to cryptic species such as *Amphinemura delosa*, *Allocapnia rickeri*, *Prostoia completa*, and *Isoperla namata*. Sweeping resulted in the collection of fewer species (13 species, 57%), and was most applicable to actively flying, late spring emerging *Haploperla brevis* and *Alloperla caudata*. Light-trapping (12 species, 52%) was successful only during the late spring and summer for crepuscular Perlids such as *Neoperla* spp., *Acroneuria evoluta*, and *Perlesta placida*. Significantly greater numbers of females were found in light trap collections. Sticky traps (8 species, 35%) and pit traps (6 species, 26%) collected relatively few species. Significant correlations existed between benthic density and numbers of adults collected by searching and all methods combined. Collections of *Paracapnia angulata*, *Leuctra tenuis*, *Isoperla signata*, *Perlinella ephyre*, *Neoperla stewarti*, and *Neoperla catharae* represent extensions of the reported ranges of these species.

<34>

Accession Number

082012523

Authors

Linit M J. Johnson P S. Mckinney R A. Kearby W H.

Institution

DEP. ENTOMOL., UNIV. MO., COLUMBIA 65211.

Title

INSECTS AND LEAF AREA LOSSES OF PLANTED NORTHERN RED OAK QUERCUS-RUBRA SEEDLINGS IN AN OZARK MISSOURI USA FOREST.

Source

Forest Science 32 (1). 1986. 11-20.

Abstract

Insects representing 25 families from six orders were associated with northern red oak (*Quercus rubra* L.) seedlings planted in clearcut and partially cut plots. Most insect taxa were equally represented in both plot types. However, three of the most abundant insects were found in only one plot type: *Cyrtopistomus castaneus* (Roelofs) and *Limonius* spp. in partial cuts and *Attelabus bipustulatus* Fabricius in clearcuts. Linear regression equations were derived for estimating leaf area before defoliation from either leaf length or petiole diameter. Oak seedlings in clearcuts had twice the number of leaves and

potential standing leaf area as seedlings in partial cuts throughout the growing season. Leaf area losses in both overstory types averaged about 22 percent of potential standing leaf area by 30 October.

<35>

Accession Number

081102872

Authors

Doisy K E. Hall R D. Fischer F J.

Institution

DEP. ENTOMOL., UNIV. MO., COLUMBIA, MO. 65211.

Title

THE BLACK FLIES DIPTERA SIMULIIDAE OF AN OZARK STREAM IN SOUTHERN MISSOURI USA AND ASSOCIATED WATER QUALITY MEASUREMENTS.

Source

Journal of the Kansas Entomological Society 59 (1). 1986. 133-142.

Abstract

The black flies (Diptera:Simuliidae) and associated water quality indicators were sampled over a 2-year period from the Big Piney River and other areas of southern Missouri. A total of 14 black fly species was identified; of these, 9 are new records for the state *Prosimulium magnum*, *Simulium decorum*, *S. jenningsi*, *S. luggeri*, *S. parnassum*, *S. meridionale*, *P. mixtum*, *S. tuberosum*, *Cnephia pecuarum*. Five species comprised 99% of the total blackflies collected: *Prosimulium magnum* Dyar and Shannon, *Simulium vittatum* Zetterstedt, *S. tuberosum* (Lundstrom), *S. jenningsi* Malloch and *S. luggeri* Nicholson and Mickel. Of the water quality measurements, temperature appeared to be a factor influencing the distribution and abundance of black fly species in this study. In addition, substrate and water depth were important in constituting adequate black fly larval habitat.

<36>

Accession Number

081002366

Authors

Ernst M R. Stewart K W.

Institution

DEP. BIOL. SCI., NORTH TEX. STATE UNIV., DENTON, TEX. 76201.

Title

GROWTH AND DRIFT OF NINE STONEFLY SPECIES PLECOPTERA IN AN OKLAHOMA OZARK FOOTHILLS USA STREAM AND CONFORMATION TO REGRESSION MODELS.

Source

Annals of the Entomological Society of America 78 (5). 1985. 635-646.

Abstract

Growth and drift of nine stonefly species, in a second-order, northeastern Oklahoma stream were elucidated from 19 and 13 months of sampling, respectively. Observed growth of each species (head-capsule width versus days) was analyzed with five different regression models. Growth patterns generally conformed to either a power curve (double log) or semilog regression. Coefficients of determination for best fit models ranged from 0.41 to 0.79 and were all highly significant. *Haploperla brevis* (Banks), *Leuctra tenuis* (Walker), and *Amphinemura delosa* (Ricker) exhibited univoltine, fast life cycles that were best modeled by semilog regressions. The univoltine, slow cycle of *Acroneuria evoluta* Klapalek showed good fit with a power curve. The univoltine, fast life cycles of *Isoperla namata* Frison, *I. signata* (Banks), *Prostoia completa* (Walker), and *Allocapnia rickeri* Ricker fit different types of regressions.

Intraspecific differences in their growth curves shapes and rates were primarily attributed to temperature. Instars of *Agnetina capitata* (Pictet) nymphs were greatly spread over time and overlapped, making discretion of cohorts difficult. However, a semivoltine life cycle was suggested. This study suggests that growth characteristics of some stonefly species can be determined from lower sampling frequency, adequate to establish growth curve shape rather than the typical monthly increments. Comparison of significant semilog growth rates for each species corroborates the descriptive fast and slow classification. Stonefly drift density (0.1-7.5 nymphs per m³) was significantly lower than that of mayflies and Diptera and demonstrated a postsunset pulse. Multivariate regression of stonefly numbers in drift on current velocity and specific benthic densities accounted for a significant 25% of the variation in numbers drifting. Additional variation appears to be attributable to a greater degree of nymphal maturity as suggested by drift of predominantly pre-emergent nymphs.

<37>

Accession Number

080065660

Authors

Mayden R L.

Institution

MUSEUM NATURAL HISTORY, UNIV. KANSAS, LAWRENCE, KS 66045.

Title

BIOGEOGRAPHY OF OUACHITA HIGHLAND USA FISHES.

Source

Southwestern Naturalist 30 (2). 1985. 195-212.

Abstract

The Ouachita Mountain Province in southwestern Oklahoma and southeastern Arkansas is an uplifted and strongly faulted region drained largely by the Kiamichi, Little, Ouachita and Saline rivers. Although a small region relative to other highland provinces in North America the fauna is distinctive, with at least 8 endemic fish species. Congruent with these fish distributions are the distributions of 5 spp. of endemic crayfishes and 4 spp. of endemic salamanders. The distinctive aquatic fauna presumably evolved in a preglacial highland drainage system extending from the Blue River, Oklahoma to the Saline River in Arkansas. Biogeographically, several generalized tracks are discernable when species relationships are considered. The first track is one primarily inclusive of the Ozark Plateaus to the north. The second includes the Ouachita and Ozark highlands and highland regions east of the Mississippi valley and east to the Appalachian Mountains. Among fishes, 2 species groups and several allopatric populations of species exhibit this pattern. Congruent with this pattern are 3 spp. groups of crayfishes and 1 group of salamanders. Additional tracks are observed between rivers of the Ouachita Mountains and those surrounding the highlands or to the south in the Coastal Plain from Texas to the Atlantic Slope. Five species groups of fishes suggest this pattern and 3 species groups of crayfishes and 1 group of salamanders display congruence. Geological events hypothesized to be instrumental in the development of the first pattern include the development of the ancestral Arkansas River and glacial advance in the north. It is proposed that prior to the Pleistocene a highland topography and biota occurred not only in their present locations, but also in areas between the Ouachita and Ozark provinces and in the Central Lowlands Province north of existing highlands. The once continuous western highlands were vicariated with the development of the Arkansas River and its associated lowlands, prior to the Sangamonian interglacial. A northern vicariance occurred with the advance of glaciers and the deposition of their associated till in streams, creating habitats unsuitable for highland fishes.

Ouachita endemics demonstrating the second generalized pattern might have either invaded the highland region or represent an old fauna present during the most recent uplift, in the early Tertiary.

<38>

Accession Number

079063646

Authors

Duchrow R M.

Institution

MISSOURI DEPARTMENT OF CONSERVATION, 1110 COLLEGE AVENUE, COLUMBIA, MISSOURI 65201.

Title

EFFECTS OF LEAD TAILINGS ON BENTHOS AND WATER QUALITY OF 3 OZARK MISSOURI USA STREAMS.

Source

Transactions of the Missouri Academy of Science 17 1983. 5-18.

Abstract

Pb mine tailings were discharged into 2 Missouri Ozark streams (Saline and Logan creeks) on March 28-29, 1977 following heavy rainfall and runoff. Sedimentation caused severe damage to benthic invertebrate communities inhibiting the receiving streams. Adult fish populations seemed unaffected; no dead fish were found during each study. Degradation in a secondary receiving stream (Little St. Francis River) was limited to the reduction of pollution-sensitive mayfly and stonefly taxa. Benthic invertebrate communities began to recover in both study streams about 2 mo. after the tailings discharges, but still showed signs of adverse effects after 1 yr. Dissolved heavy metal concentrations never reached acutely toxic levels in either stream. Their concentrations were also below safe limits guidelines for the protection of aquatic life in most samples. The cause of degradation in both streams was primarily the physical effects of the tailings (sedimentation, smothering and abrasion). Heavy metals did not appear to contribute significantly to the degradation of the biota of either stream.

<39>

Accession Number

078074251

Authors

Ernst M R. Beitinger T L. Stewart K W.

Institution

Dep. Biol. Sci., North Tex. State Univ., Denton, Tex. 76203.

Title

Critical thermal maxima of nymphs of 3 Plecoptera species from an Ozark (USA) foothill stream.

Source

Freshwater Invertebrate Biology 3(2). 1984. 80-85.

Abstract

Prostoia completa, *Isoperla namata* and *Phasganophora capitata* nymphs captured from a second order stream in northeastern Oklahoma (USA) were exposed to a steady rise in temperature of 0.34 degree C/min to determine their critical thermal maxima (CTM). At a collection temperature of 6.5 degree C, the univoltine, winter emerging *Prostoia completa* had a significantly lower mean CTM (31.5 degree C) than the univoltine, spring emerging *I. namata* and semivoltine, summer emerging *Phasganophora capitata* which had mean CTM of 33.2 degree and 33.4 degree C, respectively. A 1 mo. age difference in *I. namata* (Feb. to March)

had no significant effect on mean CTM, and neither head capsule width nor sex of nymphs had a significant effect on the CTM within any of the 3 spp. *Phasganophora capitata* nymphs collected at 6.5 degree C and acclimated to 17.0 degree C had a significantly higher mean CTM (36.3 degree C) than those maintained at the 6.5 degree C collection temperature (33.4 degree C). *I. namata* treated similarly did not show a significant increase in temperature tolerance. Adaptation to summer emergence or the evolution of a semivoltine life cycle by *Phasganophora capitata* may include a greater ability for tolerance acclimation than found in *I. namata*.

<40>

Accession Number

077079277

Authors

Duchrow R M.

Institution

Mo. Dep. Conservation, 1110 College Ave., Columbia, MO 65201.

Title

Effects of barite tailings on benthos and turbidity of 2 Ozark (USA) streams.

Source

Transactions of the Missouri Academy of Science 16(0). 1982. 55-66.

Abstract

On Aug. 15, 1975, the dam of a settling pond near Mill Creek in Washington County, Missouri, broke. Sediment from barite tailings in the pond was released, causing an extensive fish kill in 3 miles of Mill Creek and 9 miles of Big River. The mixture of clay and water from the tailings also increased turbidity to the mouth of Big River, a distance of 71 miles from the mouth of Mill Creek. The extent and duration of damage were determined by comparing benthic invertebrate communities found in affected and unaffected portions of each stream for 1 yr. Initial damage to fish and benthos in both streams was apparent from the dead fish and reduced, dissimilar invertebrate communities. Duration of the damage varied between streams. Reestablishment of the invertebrate community in Mill Creek began after 38 days. Similar invertebrate communities were not found at the control and affected stations until 264 days after the dam failure. Invertebrate communities in Big River, further downstream from the tailings pond, were severely reduced for only 14 days. After 14 days, similar invertebrate communities were found at the control and affected stations. Rapid recovery in these downstream reaches was attributed to the larger volume of flow and greater distance from the sediment source. Aesthetic quality of both streams was noticeably affected by increased turbidity in these normally clear Ozark streams. Turbidity values were consistently higher throughout the study in affected portions of both streams when compared to unaffected portions.

<41>

Accession Number

076073098

Authors

Stark B P. Stewart K W. Feminella J.

Institution

Dep. Biol., Mississippi Coll., Clinton, Miss. 39058.

Title

New records and descriptions of *Alloperla* (Plecoptera: Chloroperlidae) from the Ozark-Ouachita region (USA).

Source

Entomological News 94(2). 1983. 55-59.

Abstract

The male of *Alloperla ouachita* sp. nov. from Arkansas is described and compared with other members of the *A. leonarda* Ricker group. Additional records of *A. caudata* Frison, *A. hamata* Surdick and *A. leonarda* from the Ozark-Ouachita region are given and a key to male *Alloperla* known from this area is presented.

<42>

Accession Number

071022658

Authors

Mayden R L. Burr B M. Dewey S L.

Institution

Museum Natural History, Univ. Kans., Lawrence, Kans., 66045.

Title

Aspects of the life history of the Ozark madtom, *Noturus albater*, in southeastern Missouri, USA (Pisces: Ictaluridae).

Source

American Midland Naturalist 104(2). 1980. 335-340.

Abstract

Selected aspects of the life history of *N. albater* Taylor were studied from collections and observations made in southeastern Missouri. During the breeding season, there was sexual dimorphism in shape and size of the genital papillae and degree of development of head musculature. The number of mature ova averaged 111.6 in ripe females. Nesting sites were under large rocks where eggs were laid in a pit and guarded by the male. Clutch size averaged approximately 40 eggs; the eggs were 3.5 - 4.0 mm wide and adhered to each other in a mass. *Notropis zonatus*, *Etheostoma caeruleum* and *Percina evides* were observed eating eggs and young. Under laboratory conditions eggs hatched in 196 h at 25 degree C. Prehatchlings (6.0 mm TL (total length)) were mostly devoid of melanophores, had a large yolk sac and the maxillary barbels and pectoral fins were beginning to develop. By 7 days, larvae (11.8 mm TL) were well-pigmented, had barbels, fins and most fin rays developed, the yolk sac nearly absorbed and had the appearance and body form essentially like that of an adult. Individuals of both sexes live at least 2+ yr. Aquatic Diptera larvae (mostly midges) were the dominant food item of adults.