

# **Annotated List of the Caddisflies (Trichoptera) of Winfield Creek, Kress Creek, and Spring Brook Creek, Illinois**

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## **ABSTRACT**

Annotated lists of caddisflies (Trichoptera) collected from three tributaries of the West Branch of the DuPage River in northeastern Illinois were developed. Ten caddisfly species were collected from the organically polluted streams: Winfield Creek, Kress Creek, and Spring Brook Creek. Seasonal data on flight periods were recorded.

## **INTRODUCTION**

Caddisflies (Trichoptera) comprise a relatively large order of aquatic insects with some 7000 species described worldwide (Arnett 1985) and over 180 species identified from Illinois (Ross 1944). Because of their importance within food chains and varying species tolerances to chemical changes, caddisflies are useful biotic indicators of organic pollution (Hilsenhoff 1987, Ohio Environmental Protection Agency 1987, Ross 1944).

The objective of the current study was to expand upon a previous survey of the West Branch of the DuPage River (West Branch) system (Petersen and Hinkle 1991) by surveying three West Branch tributaries: Winfield Creek, Kress Creek, and Spring Brook Creek. A major purpose of the northeastern Illinois study has been to generate a survey of caddisflies which persist in organically polluted streams, thereby contributing to the knowledge of pollution tolerance shown by caddisfly species.

## **DESCRIPTION OF THE STUDY SITES**

The West Branch is part of the 3553 km<sup>2</sup> Des Plaines River drainage basin. Physical characteristics of the West Branch, Winfield Creek, Kress Creek, and Spring Brook Creek are given in Table 1. The West Branch transects rapidly developing DuPage County from north to south (Figure 1). Its waters are moderately organically polluted largely by inputs from waste water treatment plants (Petersen 1991). Selected water quality measurements from established sampling sites in Winfield Creek, Kress Creek, and Spring Brook Creek (Figure 1) also indicate streams which are organically polluted (Table 2)(Petersen et al. 1992). Waste water treatment plants and private septic fields are believed to be the sources of this organic pollution.

Winfield Creek is an intermittent stream that ceases to flow during summer and early fall. Spring Brook Creek was also an intermittent stream prior to receiving effluents from the Wheaton waste water treatment plant. The daily discharge rate of treated water from the Wheaton waste water treatment plant is 33,000 KI/d. Winfield Creek and Spring Brook Creek mostly flow through residential areas before joining the West Branch. Kress Creek is contaminated by radioactive thorium from the now vacated Kerr-McGee Chemical Corporation owned chemical-process plant in West Chicago, IL. The creek is slated for Superfund priority cleanup. The last 2 km of Kress Creek flows through farmland before joining the West Branch.

## METHODS

Sampling stations were located in riffles in upstream and downstream sites along each stream, except for Kress Creek where only a downstream station was established (Figure 1). Larval caddisflies were collected every two weeks from each station when weather and flow permitted from September, 1990, to October, 1991. Stream collections of roughly 30 minutes duration each were taken using D-framed nets and by rock picking.

Flying adults were collected twice monthly using an ultraviolet light trap from April to October, 1991. This time covered the period when flying adults appeared. Despite the possibility of collecting species dispersing in from other streams, light trapping was added to sampling procedure since it provided information on flight periods and facilitated collections of small and rare species. During each sampling effort the ultraviolet light trap was set along the stream bank at dusk for 30 minutes. Voucher specimens of larvae and adults have been retained at College of DuPage.

## ANNOTATED LIST

The following is the list of caddisflies collected from Winfield Creek, Kress Creek, and Spring Brook Creek according to sampling station. The flight period of each species, the number of each sex light trapped, and the number of larvae collected at a station are given. When compared to lists of caddisflies that have been generated from other streams in the Midwest (e.g., see McElravy et al. 1976, Petersen and Foote 1979, Ross 1944), the number of species collected from the streams is small, thus reflecting the poor water quality in the streams. This disparity is evident even after ignoring the possibility that captures included species dispersing in from other areas.

### Family HYDROPTILIDAE

*Hydrotilla ajax* Ross. June-August; station 1 (1 male), station 2 (1 male), station 3 (2 males), station 4 (1 male), station 5 (1 male).

*H. perdita* Morton. August-early October. Station 2 (5 females), station 3 (1 male, 1 female), station 5 (1 female).

### Family HYDROPSYCHIDAE

*Ceratopsyche bronta* Ross. June, July; station 3 (4 females, 1 larva), station 5 (1 female).

*Cheumatopsyche* spp. 367 larvae were collected from station 3.

*Cheumatopsyche campyla* Ross. June-early October; station 1 (1 male, 1 female), station 2 (17 males, 20 females), station 3 (6 males, 34 females).

*C. pettiti* (Banks). May-August; station 2 (16 males, 4 females), station 3 (56 males, 67 females), station 4 (5 males, 3 females), station 5 (4 females).

*Hydropsyche betteni* Ross. June-early October; station 3 (2 males, 209 larvae), station 4 (2 females), station 5 (19 males, 7 females, 1 larva).

*H. bidens* Ross. Late July; station 1 (1 male).

*Potamyia flava* (Hagen). June, July; station 1 (2 males, 15 females), station 2 (1 male, 1 female), station 3 (1 male, 2 females).

#### Family LEPTOCERIDAE

*Athripsodes transversus* (Hagen). August; station 2 (2 females), station 3 (1 female).

*Oecetis inconspicua* (Walker). August; station 2 (1 male), station 3 (1 male).

#### Family PHILOPOTAMIDAE

*Chimarra aterrima* Hagen. May, June; station 1 (1 female), station 4 (1 female).

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Figure 1. Locations of the sampling stations along Winfield Creek, Kress Creek, and Spring Brook Creek in DuPage County, Illinois. Stations are numerically identified: 1 = Winfield Creek upstream; 2 = Winfield Creek downstream; 3 = Kress Creek; 4 = Spring Brook Creek upstream; and 5 = Spring Brook Creek downstream. Distances (km) of study sites from junction with the West Branch of the DuPage River (WB) and approximate widths (m) of streams at stations are sequentially given in parentheses.

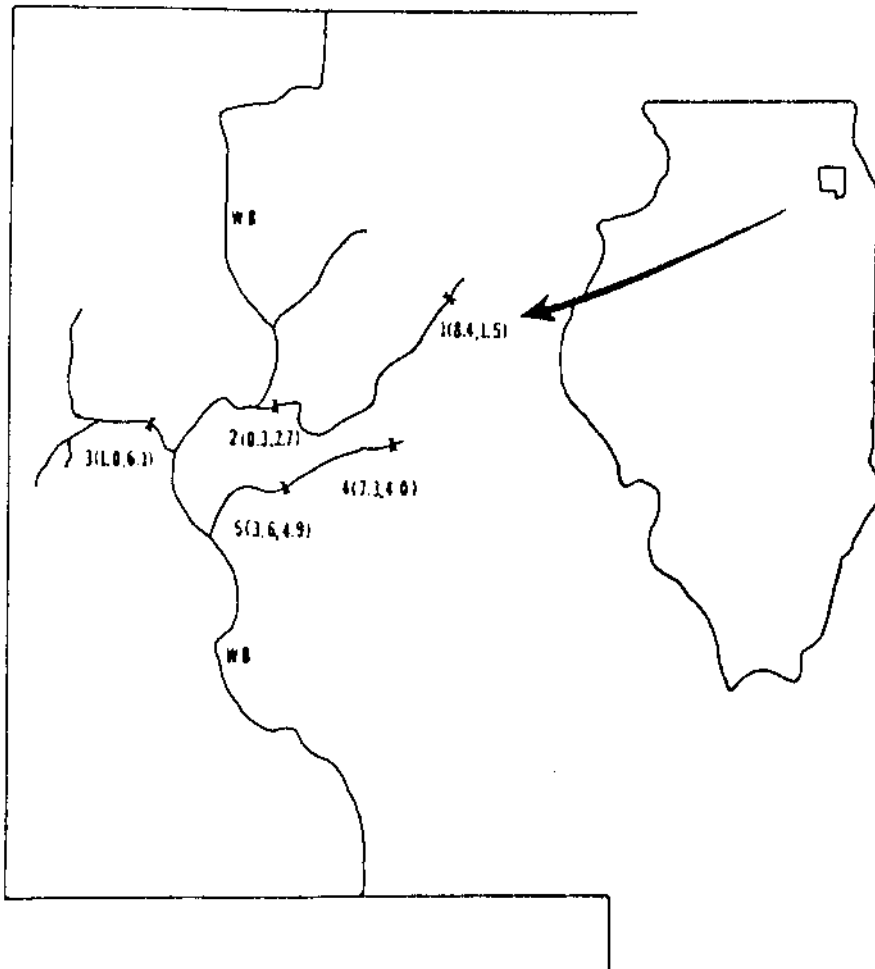


Table 1. Physical characteristics of the West Branch of the DuPage River, Winfield Creek, Kress Creek, and Spring Brook Creek as taken from the Northeastern Illinois Planning Commission (1978).

Stream	Length (km)	Average width (m)	Average gradient (m/km)	Drainage area (km <sup>2</sup> )
The West Branch of the DuPage River				
	45.6	47.9	0.70	974
Winfield Creek	11.6	1.8	1.42	23
Kress Creek	12.1	3.1	1.25	48
Spring Brook Creek	8.0	3.0	1.29	18

Table 2. Mean  $\pm$  standard deviation (Sampling size)( $\bar{x} \pm s(n)$ ) chemical concentrations(ppm) from Winfield Creek, Kress Creek, and Spring Brook Creek sampling stations. Also included are chemical concentrations that can be expected from relatively unpolluted waters (Clark 1977, Klein 1962). Symbols: PO<sub>4</sub> = orthophosphate; W = Winfield Creek; K = Kress Creek; SB = Spring Brook Creek.

Location -station	Ammonia- nitrogen	Nitrate- nitrogen	Chloride	PO <sub>4</sub>
W-1	0.47 $\pm$ 0.49(14)	0.35 $\pm$ 0.42(14)	240 $\pm$ 120(14)	0.34 $\pm$ 0.32(14)
W-2	0.41 $\pm$ 0.49(11)	0.32 $\pm$ 0.21(11)	190 $\pm$ 86(11)	0.27 $\pm$ 0.27(11)
K-3	0.79 $\pm$ 0.69(12)	0.94 $\pm$ 1.28(12)	104 $\pm$ 26(12)	0.28 $\pm$ 0.26(12)
SB-4	1.18 $\pm$ 0.80(14)	0.93 $\pm$ 0.53(14)	327 $\pm$ 125(14)	0.47 $\pm$ 0.46(14)
SB-5	0.68 $\pm$ 0.37(14)	2.53 $\pm$ 2.15(14)	452 $\pm$ 101(14)	1.36 $\pm$ 1.08(14)
Concentrations that can be expected from relatively unpolluted waters.				
	<0.2	Virtually absent	<250	