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LANTHUS ALBISTYLUS (HAGEN), A NEW RECORD FOR MICHIGAN,
WITH ECOLOGICAL NOTES ON THE SPECIES
(ODONATA:COMPHIDAE)

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Although the dainty gomphine Lanthus albistylus (Hagen) has been recorded from most of the Northeastern States, Ontario, New Brunswick, Nova Scotia, and from Tennessee west to Missouri, rather extensive collecting failed to reveal its presence in Michigan until 1936, when the writer secured an adult male and an almost fully grown nymph. Because of the ecological distinctness of the collection site, it is believed that a few notes on the habitat may be of value.

Both specimens were taken from Kirne Creek, Lake County, Michigan. For many years this stream has been entirely owned and controlled by a private club whose members have used it only for trout fishing. As a result of this type of usage, the stream in the vicinity of the section where the specimens were taken retains a more natural character than do neighboring waters, most of which have been variously affected by human activities.

Kirne Creek originates as the outlet of a small, shallow, weedy lake, from which it flows approximately three miles to empty into the

Pere Marquette River. Throughout the greater part of its course it has eroded a rather narrow, steep-sided valley, which for the first mile or so is clothed with a mixed second growth forest of oak, pine and hemlock, the remainder supporting good plantings of white and Norway pine, with the immediate stream side shaded by dense growths of white cedar, alder, willow, birch and hemlock. At its source the stream is about ten feet wide, its waters flowing sluggishly over a bottom of shifting sand. After a few hundred yards the character is altered as increasing amounts of gravel appear in the bottom and the flow becomes rapid. Small springs then commence to drain into the stream, shortly becoming so numerous as to form a chain of seepages almost continuous to the mouth. This results in a very soft shore line which supports heavy growths of watercress (Roripa nasturtium), white water buttercup (Ranunculus aquatilis), and water weed (Anacharis canadensis) [= Elodea]. Near the source, but little vegetation occurs in the stream proper. As spring water supplies increase, however, sparse clumps of white water buttercup appear in sufficient numbers to bind and secure small bars of shifting sand. Continuing downstream, vegetation increases in the channel, and is augmented by dense marginal beds of Chara and Anacharis. Throughout its course, the stream contains many fallen trees, waterlogged stumps and timbers.

A water analysis conducted on Kinne Creek at 6:15 a. m., August 19, 1936, near the spot where the nymph was taken, yielded the following figures:

Air temperature	64.5°F.
Water temperature	57.5°F.
Free carbon dioxide	7.0 p.p.m.
Methyl orange alkalinity	112.0 p.p.m.
Phenolphthalein alkalinity	0.0
Dissolved oxygen	7.5 p.p.m.
pH	7.8

The pH value indicates definite alkalinity, and the figure given by the methyl orange test for bicarbonates demonstrates that the stream is of the "hard water" type.

On the afternoon of July 27, 1936, a single adult male of Lanthus albistylus (Hagen) was taken as it rested on an abandoned concrete screen support which had at one time served to check downstream migration of warm water fishes from the lake. For a few minutes prior to capture, the insect was observed to make short, rapid flights, returning almost at once to its original resting place. Its behavior seemed more libelluline than gomphine, and at a distance it was mistaken for a Leucorrhinia strayed from the lake. Upon a nearer approach the yellow compound eyes and abdominal appendages were discerned, and the insect's true identity suspected. A careful search of more than a mile of stream failed to reveal any more adults.

On November 7, 1936, while engaged in studying the invertebrate bottom fauna of the stream in connection with a fish production problem, I took a single albistylus nymph. The collecting station was located about 300 yards below the point where the adult was captured in July, and differed from it in being less densely shaded owing to the presence, fifteen yards upstream, of a small road bridge whose construction had opened up the characteristic dense growth of streamside trees and shrubs. Here the stream width was about fifteen feet, the average depth six inches, the current swift, flowing over a bottom of fine gravel and sand which supported a sparse growth of Ranunculus aquatilis. The station received open shade from overhanging alders rooted in a large, swampy, spring seepage area on the left shore. At noon on this date the air temperature was 33°, that of the water 43°F.

The nymph was taken in a square-foot sample of the bottom collected with a net similar to that described by Surber (1937: 194-195). The associates of albistylus in this area are indicated by a list of the forms found in the sample:

Organism	Number of species	Number of individuals
Turbellaria		
Planariidae	1	1
Annelidae		
Tubificidae	1	1
Crustacea		
<u>Gammarus</u> sp.	1	1
Ephemeroptera		
<u>Baetis</u> sp. near <u>vagans</u>	1	1
<u>Paraleptophlebia</u> <u>mollis</u>	1	1
<u>Ephemerella</u> sp.	1	41
Odonata		
<u>Lanthus</u> <u>albistylus</u>	1	1
Plecoptera		
<u>Pteronarcys</u> <u>nobilis</u>	1	1
<u>Allocapnia</u> <u>torontoensis</u>	1	14
<u>Togoperla</u> <u>media</u>	1	1
Coleoptera		
Elmidae	1	36
Trichoptera		
<u>Hydropsyche</u> spp.	3	68
Diptera		
Tipulidae	3	6
Simuliidae	2	49
Chironomidae	1	13
Rhagionidae		
<u>Atherix</u> <u>variegata</u>	1	1

The Michigan male is larger and more robust than any other specimens of this species in the University of Michigan Museum of Zoology collection.

It also differs in preserving, in death as in life, compound eyes of a light canary yellow color. Its size disparity is shown in the following tabulation of averages:

<u>Locality</u>	<u>Number of specimens</u>	<u>Length of abdomen</u>	<u>Length of hind wing</u>
Maine	3 males	25.5 mm.	20.0 mm.
Missouri	3 males	25.3	20.5
Kentucky	2 males	26.0	21.0
West Virginia	1 male	26.0	20.5
Pennsylvania	3 males	26.3	20.2
Ontario	2 males	27.0	21.5
Michigan	1 male	28.0	23.0

A survey of the literature reveals a surprising paucity of published notes on the ecology of albistylus. Williamson (1905: 310) writes that at the Rockcastle River, Livingston, Kentucky, it was "observed in the afternoon resting on boulders and pebbles about a wide, slow ripple." Walker (1906: 108) states that in Ontario it was "locally common over rapids on the North Branch of the Muskoka River"; and again, (1933: 112-113), he mentions taking it in Nova Scotia along ". . . a small rapid forest stream with shallow riffles and intermittent pools. For a mile or so above the highway bridge it flows through dense woods but it is wide enough to admit the sunlight to a greater or less extent." Near St. Margarets, New Brunswick, he reported finding it along a similar but larger stream.

It is possible that in Michigan albistylus has as requirements a combination of ample shade, copious spring water supplies, and particular bottom type such as is offered by Kinne Creek, but which is duplicated in few other streams in the state, and that for this reason, being rare and local in distribution, it has hitherto escaped the attention of collectors.

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