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ATTACHMENT OF FIRST INSTAR *Simulium damnosum* (DIPTERA:SIMULIIDAE) LARVAE TO OLDER LARVAE

GEORGE J. BURTON<sup>1</sup>

National Cancer Institute Bldg. 37, Room 1D21  
National Institutes of Health, Bethesda  
Maryland 20014

First instar larvae of *Simulium damnosum* Theobald, the vector of onchocerciasis in Ghana, usually remain attached to the same substrate upon which the egg mass was laid by the female fly. They feed by browsing upon whatever microorganisms are growing on the substrate, such as diatoms or desmids, or trap plankton with their cephalic fans. The substrates are usually of plant origin, such as leaves, stems, twigs, or roots trailing in the current, but may also include stones, rocks, or the cement or concrete faces of dam spillways (Burton and McRae, 1965), dams proper, bridge abutments, or other supports.

Among a collection of older *S. damnosum* larvae made at Nangodi on the Red Volta River, Upper Region, Ghana, a large, closely-packed mass of mature larvae was found with many first instar larvae attached to their bodies (Fig. 1). Apparently the young larvae had either migrated on to the older ones by laborious locomotion along the grass stem substrate, or else had been deposited among the older larvae by the current. Under the microscope the young larvae were seen behaving as if they were on a normal substrate. They were outstretched in a feeding position, their cephalic fans opening and closing at intervals, trapping food particles and carrying them to the mouth, the microorganisms being raked off by the mandibles. The author is not aware that this type of attachment has been recorded before.

<sup>1</sup>These observations were made while the author was assigned to the National Institutes of Health (U.S.A.)—National Institute of Health and Medical Research (Ghana) Joint Research Program, Accra, Ghana.



FIG. 1.—First instar *Simulium damnosum* larvae attached to two older larvae which had themselves been attached to a grass stem along with a dense mass of other older larvae similarly affected (x7.8)

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A FIRST RECORD OF THE OCCURRENCE OF *Culiseta (Culicella) silvestris minnesotae* BAER (DIPTERA: CULICIDAE) IN NEW YORK<sup>1</sup>

ROBERT G. MEANS

New York State Museum & Science Service

AND

F. CHRISTIAN THOMPSON

1st U.S. Army Medical Lab, Fort George G. Meade

The male and female of *Culiseta minnesotae* were described by Barr in 1957 and the larva and pupa by Price in 1958. This species was later grouped with *C. silvestris* Shingarev as a morphologically and geographically distinct subspecies by Maslov (1964) in his revision of *Culiseta*.

Barr listed several Minnesota counties as the known distribution for *C. minnesotae* and stated

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that at least some of the specimens reported as *C. morsitans* by Stage, Gjullin & Yates (1952) from the Pacific northwest (Washington, Oregon & Idaho) were actually *C. minnesotae*. Since then *C. silvestris* (= *C. minnesotae*) has been reported from several northern states and Canada including Alberta (Graham 1969, Connecticut (Mallia 1964, Wallis & Whitman 1968), Idaho and Montana (Nielsen *et al* 1963), Illinois (Ross & Horsfall 1965), Indiana (Siverly 1965), Massachusetts (Spielman 1964, Hayes 1961, Main *et al.* 1968), New Jersey (Burbutis & Lake 1959, Hayes *et al.* 1962), Ontario (Stone 1965), Utah (Nielsen & Rees 1959), and Wisconsin (Siverly & DeFoliart 1968a, b).

On July 16 and 28, 1970, the senior author collected two female *C. silvestris* from light traps being operated in Shelby, Orleans County, New York as part of a survey of the mosquitoes of New York. Independently, Army Preventive Medicine personnel, acting as part of the First Army Mosquito Surveillance Program, collected four female *C. silvestris* from light traps in New York; one each from traps located at Stewart Airport, Orange County on June 12 and August 27 and at Camp Drum, Jefferson County on August 1 and 8. The latter four specimens were identified by the junior author and the specimens collected on June 12 and August 8 have been deposited in the New York State Museum collection along with those collected by the senior author.

Examination of the mosquito collections of the Suffolk County Mosquito Control Commission on Long Island by the senior author and Joseph Sanzone, entomologist for the Suffolk County Mosquito Control Commission, revealed that two specimens of *C. silvestris* had been misidentified as *C. morsitans*: 1 larva collected in Lake Ronkonkoma on May 28, 1969, and 1 female collected in a light trap in Calverton on September 25, 1969. The senior author also found one female *C. silvestris* labelled as *C. morsitans* in the Cornell University collection. This specimen had been reared from an immature stage collected at Cayuta Lake, Schuyler County, N.Y. on June 14, 1946. All identifications were confirmed by Dr. Alan Stone of the U.S. National Museum. This report brings to 56 the number of mosquito species recorded from New York (Jamnback 1969, Mullen 1971, Vockeroth 1954, Wallis & Whitman 1971).

Since *C. silvestris* is not strongly attracted to man or light (Graham 1969) and the larvae are easily overlooked during routine larval collecting (Price 1961), the species may be more prevalent than is indicated by present collection records. Little is known about the hosts of *C. silvestris*, although Hayes (1961) found that the species was attracted to and fed on a variety of small mammals and birds and that it preferred warm-blooded animals to reptiles and amphibians.

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PREDATION BY SPIDERS ON MOSQUITOES RESTING IN HOUSES IN TANZANIA

J. E. HUDSON

Tropical Pesticides Research Institute,  
Arusha, Tanzania<sup>1</sup>

AND

D. J. CLARK

British Museum (Natural History),  
London, S.W.7, England.

Whitmyre and Wills (1970) have described predation by the spider *Tegenaria domestica* on overwintering *Culex pipiens*. This note describes two observations of predation by jumping spiders (family: Salticidae) on mosquitoes resting in the flat-roofed "tembe" type houses of the Umbugwe tribe at Magugu, Tanzania. A fuller description of these houses is given by Smith (1964) in his paper on *Anopheles gambiae* Giles in the area.

The Tropical Pesticides Research Institute has an outstation at Magugu devoted to trials of insecticides in verandah trap huts (Smith, 1965). In June 1970, just after the long rains, large numbers of *Anopheles gambiae* species B and *Culex p. fatigans* Wied., and smaller numbers of *Anopheles funestus* Giles and *Mansonia uniformis* (Theo.) could be taken resting in the houses. While collections of *A. gambiae* for bioassays were

being made, it was noticed on two occasions that salticid spiders had caught mosquitoes, on one occasion a male *C. fatigans* and on the other a fed female *A. gambiae*. Salticid spiders of the same general appearance were quite a common sight on the inside and outside walls of houses at Magugu, and they were also found in the experimental huts. When the matter was raised with the laboratory staff they claimed to have seen spiders of this type catching mosquitoes in the experimental huts. Salticid spiders from experimental huts and houses were caught on this occasion, and later found to belong to two species: *Plexippus paykulli* (Aud.) and *Mene-merus bivittatus* (Dufour).

In October 1970 a more lengthy search of the houses was made, and the same two species collected, plus the following other species:

Family: Selenopidae

*Selenops radiatus* Latreille

*Selenops vigilans* Pocock

Family: Pholcidae

*Smeringopus* sp. near *arambourgi* Fage

*Artema mauriciana* Walck.

Family: Argiopidae

*Araneus nauticus* L. Koch

Family: Pisauridae

*Euprostheno pavesii* de Lessert

In the houses the *Selenops* were abundant though usually remaining hidden in cracks. The adults were large and would be unlikely to subsist on mosquitoes. The *Smeringopus* sp. and *Artema mauriciana* were resting in full view on an untidy tangle of threads beneath the ceilings. The mosquitoes were frequently seen resting on these threads close to the spiders themselves but were never seen to be attacked by them. The only spiders found in the experimental huts were *Smeringopus* sp. and the Salticids.

Whitmyre and Wills (*loc. cit.*) noted that at 45° F the *T. domestica* were more active than the mosquitoes and caught them without webs. In the "tembe" houses the fed *A. gambiae* remain motionless for long periods during the day and might be expected to be easy prey to the sharp-eyed and active jumping spiders, but the overall effect of spider predation on the resting mosquito population remains to be investigated.

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<sup>1</sup> Present address, Dept. of Entomology, University of Alberta, Edmonton, Alberta, Canada.