found that *Prosimulium mixtum/P. fuscum* complex and *Cnephia mutata* Malloch were attracted to black and red silhouettes, while *Simulium venustum* Say was attracted more towards blue and *S. vittatum* Zetterstedt almost indiscriminately to all colors except yellow. Bennett et al. (1972) also found that almost equal number of blackflies landed on red or black silhouettes.

In our study, a sunny, clear, flat area at the side of the Tenga River, 20 km south of Bomdila (Arunachal Pradesh) was selected as the experimental site. The experiment was carried out during March/April 1979. Twelve sets of cotton[1] sleeping suits were made of six contrasting colors, i.e., black, red, green, olive green, white and yellow (two sets of each color). Two human subjects wearing garments of the same color, seated side by side, were treated as one unit. Likewise, six units were seated in two rows facing each other. The distance between the two rows and unit to unit was 3 meters. This study was conducted from 0800 to 1100 hr for 12 days. Colored units were moved every 30 min in cyclic order to the next position, so that a full cycle was completed in 3 hr. Human subjects changed their garments on the successive day to eliminate subject preference, if any. Simuliid flies, landing/biting on human subjects, were collected by two insect collectors with the help of aspirator tubes and later identified. The observations are recorded in Table 1.

Table 1. Numbers of *Simulium himalayense* landing on human subjects wearing different colored garments.

Color	No. of *S. himalayense* collected	Mean no./ collection	Ratio to yellow
Black	1080*	90.00*	6.32
Red	803*	66.92*	4.70
Green	518*	43.17*	3.03
Olive green	432	36.00	2.53
White	403	33.58	2.36
Yellow	171	14.25	1
Total	3407		

* Significant at 0.01 probability level. (Least significant difference (LSD) = 22.96).

Altogether, 3,754 simuliid flies were collected in 12 replicates. The collection was 90.8% *S. himalayense* Puri. Other species encountered were *S. indicum* Beacher, *S. baraudi* Puri, *S. kapuri* Datta, *S. praelargum* Datta and *S. striatum* Brunetti. The species composition was further confirmed by identification of larvae and pupae collected from the adjoining breeding places of the experimental site. The greatest collection was made on black garments followed by red; the lowest being on yellow. A two-way analysis of variance ($F^{[5,55]0.01} = 11.07$) showed that the collections from black, red and green garments were statistically significant among themselves as well as from yellow. Moreover, black and red showed a significant difference against all other colors tested. Similar observations were earlier recorded by Bradbury and Bennett (1974) and Bennett et al. (1972).

It has been observed that attractiveness of simuliids to color decreased with increased reflectivity, i.e., black/red < green < olive green < white < yellow. From the epidemiological point of view, it may be concluded that use of material of higher reflectivity will be helpful in reducing man: simuliid contact.

[1] Binny casement shade No. 5002, 3006, 2067, Army OG, WFS 105 BLD and 6027.

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OCCURRENCE OF *AEDES MITCHELLAE* IN INDIANA[1]

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Aedes mitchellae (Dyar), a ground pool-breeding mosquito, is largely limited to the coastal states from Delaware south to Florida and west to Texas (Darsie and Ward 1981). It has also been found in southern Oklahoma, Arkansas and Tennessee, and, except for a few infrequent and widely isolated reports, this is the limit of its range in non-coastal areas.

This summer, while examining New Jersey light trap collections for the St. Joseph County (Indiana) Mosquito Abatement Program, I

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identified a single male *Ae. mitchellae*. The identification was confirmed by Dr. George B. Craig, Jr. This represents a new state record for the species. The individual was collected on July 15, 1983 behind the Olive Elementary School in New Carlisle, IN during an extended dry spell. Attempts to locate larval habitats were unsuccessful. The specimen has been deposited in the U. S. National Museum.

There are two other reports of this species from the Great Lakes area. A female, originally recorded from Chicago, Illinois in 1906 as *Aedes taeniorhynchus*, was considered by Ross (1947) to be *Ae. mitchellae*. However, the northernmost record of this species is that of a female taken by a CO_2-baited CDC light trap in Kalamazoo, Michigan on August 10, 1979 (J. Freier and H. D. Newson, personal communication).

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NON-SUSCEPTIBILITY OF *CHAOBORUS FLAVICANS* (CHAOBORIDAE) TO THE MOSQUITO PATHOGEN *LAGENIDIUM GIGANTEUM* (OOMYCETES)[1]

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The oomycetous fungus *Lagenidium giganteum* Couch is currently under evaluation as a biological control agent for mosquitoes (Axtell et al. 1982, Jaronski 1983, Fetter-Lasko and Washino 1983). The published host spectrum of this fungus includes, in addition to the major genera of mosquitoes, gnats in the family Chaoboridae. The inclusion of the chaoborids was based on reports by Brown and Washino (1977, 1979) that the fungus gave partial control of the Clear Lake gnat, *Chaoborus astictopus* (Meigen), in small-scale field tests.

During evaluations of *L. giganteum* against larval mosquito populations in North Carolina, we were able to collect larvae of another chaoborid, C. *flavicans* (Meigen) and test their susceptibility to the North Carolina (NC) isolate of the fungus in an attempt to corroborate the observations of Brown and Washino. Both *C. flavicans* and *C. astictopus* are benthic/planktonic predators of copepods, chironomids, mosquitoes, oligochaetes and rotifers in ponds and lakes and the two species are ecologically and biologically similar (Saether 1972). In our bioassays *C. flavicans* was not susceptible to the fungus.

The fungus was cultured in Z Medium and plated onto hemp-seed agar according to the procedures of Jaronski et al. (1983). These cultures were stored for 7 days at 20°C before being used in the bioassays. For the bioassay, ½ petri dish of fungus culture was added to each of 3 plastic tubs (17 cm diam) containing 1.5 liters deionized water. Eight hours later (just before the start of zoospore production), 25 second-instar *C. flavicans*, freshly collected from the field, were added to each tub. At the same time 20 second-instar larvae of *Aedes aegypti* (Linn.) and 25 second-instar larvae of *Culex quinquefasciatus* Say were added to each tub to determine the infectivity to mosquitoes of the fungus used in the test. Both mosquito species were from laboratory colonies. An additional tub of water containing 25 larvae of each of the 3 species was left untreated. The bioassay was conducted at 20°C. After 4 days all larvae were collected by pipette and examined microscopically for infection by the fungus. By this time any fungal infections would have become visible, yet secondary infections would not have been manifest.

Mean percentage infection for *Cx. quinquefasciatus* was 82.7% (S.D. = 9.1), and for *Ae. aegypti*, was 86.6% (S.D. = 7.6). None of the chaoborid larvae became infected. Control mortality was 0%.

These results indicate that *C. flavicans* is not susceptible to *L. giganteum*. The mosquito larvae in each replicate tub were heavily infected by the fungus, yet none of the chaoborid larvae present with the mosquitoes succumbed. No zoospore encystment of the chaoborids' cuticles was evident by microscopic examination, nor were there any signs of aborted penetration by the fungus in the chaoborids. Evidently, nonsusceptibility was mediated on the level of zoospore-host interaction. It is doubtful that the fungal zoospores were preferentially attracted to the mosquito larvae, since we have been unable to observe any positive chemotaxis or chemokinesis in response to larvae, using either direct observation of zoospores in the vicinity of larvae or the assay technique used by Pommerville (1977) in his studies of oomycete behavior (Jaronski and Axtell, unpublished data).

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