

SEWAGE-ASSOCIATED BREEDING OF
Aedes sollicitans AND
Aedes dorsalis IN
SOUTHWESTERN MICHIGAN¹

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Inland populations of *Aedes sollicitans* (Walker) have been found in man-made surface water habitats with and without high sodium chloride concentrations (Felton 1944, Horsfall 1956, Dixon 1957). Dixon (1957) noted that high concentrations of sulfates were a unifying characteristic of water at all *Ae. sollicitans* sites he examined, including the typical salt-marsh environment, while Horsfall (1956) observed that *Ae. sollicitans* sites in Illinois all contained sulfur but none was highly saline. *Aedes dorsalis* (Meigen) is also found in a range of habitats from fresh to highly saline water (Chapman 1960) and is often found in habitats high in sulfates (Petersen and Rees 1966). Grassy ground pools that receive direct sunlight favor the development of *Ae. dorsalis* at inland sites (Carpenter and LaCasse 1955).

On October 30, 1984, our laboratory received a report of intense and persistent biting by large mosquitoes at the Cassopolis sewage pond system in Cass County, Michigan. The system is located about 1.3 km west of the Cassopolis town center. Sewage from the town is pumped into an impoundment of ca. 230 × 130 m. A much smaller impoundment is situated to the southeast of the larger one. Directly east of and adjacent to the larger pond lies a large pit of ca. 210 × 60 m. The bottom of this pit is about 3 m lower in elevation than the impounded areas, and is covered with grass. Periodically, sewage water is discharged from the large impoundment into the pit. Each discharge takes place over a period of 5 days, at the end of which about half of the bottom of the pit is flooded. Most of this water percolates into the soil because the pit is poorly sealed. The last discharge of 1984 was October 3-7.

We inspected this site on November 1, 1984, during a light rain when the temperature was about 8°C. Mosquitoes bit us immediately upon our arrival. At this time, we collected more than 500 *Ae. dorsalis* (Meigen), 18 *Ae. sollicitans* (Walker), and 1 *Culex pipiens* Linn. by vacuum-

ing in the pit with a large suction aspirator (Nasci 1981). No mosquito larvae were found in the impounded areas after extensive dipping. However, immature stages of *Ae. dorsalis* (33 larvae, more than 50 pupae), *Ae. sollicitans* (4 pupae), *Ae. vexans* (Meigen) (1 larva), *Cx. pipiens* (36 larvae, more than 50 pupae), and *Culiseta inornata* (Williston) (1 larva) were collected from a shallow ground pool in the center of the pit.

We returned to this site on November 2, after overnight freezing temperatures. *Aedes dorsalis* females were still flying and attempting to bite. We found on a final visit on November 13 that the ground pool in the pit had dried, but that substantial numbers of *Ae. dorsalis* females were still present.

We submitted a soil sample taken from the pit to the Purdue University Plant and Soil Analysis Laboratory in West Lafayette, Indiana. Results of soil tests showed that the pit soil contained high levels of phosphate ions (240 lbs/acre) and sulfate ions (67 lbs/acre), but low levels of potassium ions (200 lbs/acre) and sodium ions (180 lbs/acre). The sample was 23% organic matter and had a pH of 6.7.

The pit represents an apparent inland, sewage-related source of *Ae. sollicitans* and *Ae. dorsalis*. These species are normally very rare in this area of the United States. Their occurrence in October and November is also quite unusual. This source is not characterized by high sodium chloride levels, but rather by high levels of sulfates, similar to sites reported by Horsfall (1956) for *Ae. sollicitans* and by Petersen and Rees (1966) for *Ae. dorsalis*. Probably each periodic flooding of the pit carries in new sulfates while at the same time flooding the grassy bottom, thereby causing the *Aedes* eggs to hatch.

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