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NORTHERLY-OUTLYING RECORDS OF TWO SPECIES OF HAWKMOTHS  
(LEPIDOPTERA: SPHINGIDAE) IN MICHIGANJohn F. Douglass<sup>1</sup>

The Grand Traverse Region of Lower Michigan is of special interest zoogeographically in that it includes the northernmost known localities for various species of organisms characteristic of the Carolinian Biotic Province (Douglass 1977, 1983; McCann 1979).

On 5 July 1984 I found a gravid female achemon sphinx (*Eumorpha achemon* [Drury]) dead on Figg. Rd., Benzie Co. (T26N, R16W, boundary Sec. 14-15, N of jct. Graves Rd.). The specimen (collected) is in fresh condition, and appeared to have been rather freshly killed: greenish eggs had spilled from the ruptured abdomen and were congealing in the sand. The most northerly previously recorded Michigan localities for *E. achemon* are in Oceana, Midland, and Bay Counties (Moore 1955, M. C. Nielsen, pers. comm.).

On 21 May 1988 I collected a male Abbott's sphinx (*Sphecodina abbottii* [Swainson]) beneath a mercury vapor light at the Douglass family cottage overlooking Green Lake, Grand Traverse Co. (T26N, R12W, SW1/4 Sec. 21). The specimen is in fresh condition. The northernmost previously recorded Michigan localities for this species are in Ingham, Livingston, and Bay Counties (Moore 1955, M. C. Nielsen, pers. comm.).

These new moth records extend each species' known Michigan range three tiers of counties to the north. It is not clear whether or not the specimens at hand come from resident populations. Average temperatures, recorded at Traverse City, were not appreciably higher than normal in the two months preceding either date of capture. However, southern Lower Michigan experienced an extreme drought during June 1984 and had its driest month of May on record in 1988 (U. S. Dept. of Commerce 1984, 1988a, b). The possibility that the specimens captured represent strays or temporary colonists from the south cannot be ruled out.

General amelioration of climates following the latest event of glaciation in the Great Lakes Region is viewed as having permitted northward range expansions by a variety of organisms (de Vos 1964). Within historic times, northward range expansions by some species have apparently been accelerated by logging and agricultural clearing (Douglass 1977). In addition, account should be taken of the findings of Cleland (1966, 1973): During an earlier interval or intervals, the northward 'tongue' of distribution of Carolinian species in western Lower Michigan was apparently more pronounced than at present. For example, northward range expansions by various species occurred along the Traverse Corridor (narrow coastal strip) during a warm climatic phase ca. 1000 yr B.P., and southward range restrictions (evident from the relictual nature of various plant, animal, and archaeological localities) apparently accompanied a return to cool, moist conditions beginning ca. 1300 A.D. Disjunct, northern populations of some species of insects currently found in northwestern Lower Michigan may thus be relictual.

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