

LEPIDOPTERA ASSOCIATED WITH PIG CARRION

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Putrid fish, decomposing snakes, lizards, and mammals, and the urine, excrement, and odors of carnivorous animals attract certain species of butterflies and moths (Holland, 1931; Field, 1938; Klots, 1951). These products, which are often considered offensive, have been used as baits by experienced collectors for attracting butterflies. Clark (1932) recommended suspending dead snakes from trees to attract woodland butterflies, especially those which ordinarily remain high in the trees. According to Klots (1958) there is some evidence that some butterflies (*e.g.*, *Apatura*) and moths are perhaps exclusively carrion feeders.

During the summers of 1962, 1963, and 1966 a comparative study of pig carcasses both exposed to and isolated from arthropods was undertaken to determine the actual processes and rates of decomposition (Payne, 1965). A faunistic survey was conducted in conjunction with this study (Payne and Crossley, 1966). Special attention was focused on the food habits, relative abundance, order of succession, and microseral distribution of individual members of the carrion microcommunity. The present paper deals with the lepidopteran species which were associated with the various stages of pig decay.

RESULTS AND DISCUSSION

Twenty-one species of Lepidoptera were collected from pig carrion. Table 1 gives a systematic list of all 21 species and their relative abundance during the different stages of pig decomposition. A brief synopsis of these species and their food habits follows.

PAPILIONIDAE.—Two species, *Battus philenor* and *Papilio glaucus* were frequently observed feeding at carrion. These large butterflies even attempted to enter the protective cages containing pig carcasses. They were attracted to the pig carrion when odors and decay were most pronounced (advanced decay stage). According to Chermock (1952) *B. philenor* is also attracted to deer dung and manure piles, and Reinthal (1966) collected over 50 *P. glaucus* from fresh cow dung and from decaying bodies of butterflies (*glaucus*). Reed (1958) collected both of the above papilionids from dog carcasses in Tennessee.

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TABLE 1. SYSTEMATIC LIST OF LEPIDOPTERA COLLECTED FROM DEAD PIGS DURING SUMMER MONTHS 1962, 1963, AND 1966, CLEMSON, SOUTH CAROLINA.³

Species	Stages of Decomposition				
	Fresh	Bloated	Active decay	Advanced decay	Dry
PAPILIONIDAE					
<i>Battus philenor</i> (Linnaeus)				—	—
<i>Papilio glaucus</i> Linnaeus				—	—
SATYRIDAE					
<i>Minois alope</i> (Fabricius)				—	—
NYMPHALIDAE					
<i>Chlosyne nycteis</i> (Doubleday & Hewitson)				—	—
<i>Phyciodes tharos</i> (Drury)				—	—
<i>Polygonia faunus</i> Edwards				—	—
<i>Asterocampa clyton</i> (Boisduval & LeConte)				—	—
<i>Asterocampa celtis</i> (Boisduval & LeConte)				—	—
HESPERIDAE					
<i>Epargyreus clarus</i> (Cramer)				—	—
<i>Atrytone ruricola metacomet</i> (Harris)				—	—
<i>Wallengrenia otho</i> (J. E. Smith)				—	—
SPHINGIDAE					
<i>Amphion nesus</i> (Cramer)				—	—
NOCTUIDAE					
<i>Palthis asopialis</i> (Guenée) ⁴					
GEOMETRIDAE					
<i>Mellilla xanthometata</i> (Walker)				—	—
<i>Anacitrinella pampinaria</i> (Guenée)				—	—
<i>Epimecis virginaria</i> (Cramer)				—	—
PYRALIDAE : PYRAUSTINAE					
<i>Desmia funeralis</i> (Hubner)				—	—

³ The relative abundance of each species during the different stages of decomposition is indicated by a solid line (abundant) or a broken line (scarce).

⁴ For record only. No evidence of attraction to the carrion community. Insufficient evidence to determine seral distribution.

TABLE 1—(Continued)

Species	Stages of Decomposition				
	Fresh	Bloated	Active decay	Advanced decay	Dry
<i>Anageshna primordialis</i> (Dyar)				— — — — —	
TINEIDAE					
<i>Tinea</i> sp.					— — — — —
<i>Acedes fuscipunctella</i> (Haworth)					— — — — —
<i>Acedes pallescentella</i> (Stainton)					— — — — —

SATYRIDAE.—Only one species, *Cercyonis pegala alope* a wood nymph, was attracted to carrion. It too, preferred the moist carrion and was observed sucking fluids from the actively decomposing pigs. These butterflies were among the most numerous at the carrion site; however, they were not the most common butterflies to actually feed on the carrion. They would often alight on the cages containing the pigs without entering to feed. Pig carcasses suspended at four feet from trees were preferred to carcasses on the ground or in the water. Another satyrid, *Euptychia cymela* (Cramer), was observed regularly at the carrion site but was not observed feeding.

NYPHALIDAE.—Five species, *Chlosyne nycteis*, *Phyciodes tharos*, *Polygonia faunus*, *Asterocampa clyton*, and *Asterocampa celtis*, were observed feeding on carrion fluids. *A. celtis* and *A. clyton* were collected from pigs placed in water and those which were suspended from trees 25 feet above the ground. These two *Asterocampa*s seem strongly attracted to carrion, and have been collected from dead dogs (Reed, 1958) and dead snakes (Clark, 1932). According to Clark, they often feed on carrion to the point of stupefaction.

Melitaea nycteis and *P. tharos* often entered the ½ inch galvanized hardware cloth covered cages to feed upon carrion fluids. *Polygonia comma* (Harris) and *P. interrogationis* were collected from dog carcasses in Tennessee (Reed, 1958); however, only *P. faunus* was positively identified from pig carrion in South Carolina. The other *Polygonia*s may have been present and eluded capture.

Nymphalis vau-album j-album (Boisduval and LeConte), congregates at decaying animal matter and has been reported feeding in numbers on long-dead porcupines (Macy and Shepard, 1941). *Limenitis arthemis* (Drury), is reported (Saunders, 1932 and Klots, 1951) to be fond of

excreta of foxes and raccoons, and the dead and decomposing bodies of various animals. *L. a. astyanax* (F.), is also addicted to carrion, manure, and excrement (Klots, 1951). Neither *Nymphalis* nor *Limenitis* was observed at pig carrion in this study.

HESPERIIDAE.—Three species, *Eparigyreus clarus*, *Atrytone ruricola metacomet*, and *Wallengrenia otho*, were collected from carrion. *A. r. metacomet* ranked as one of the more common carrion visitors, and was often observed probing the carcass with proboscis before carrion fluids were present (evident), as if trying to locate a suitable place to feed. *E. clarus* was attracted to a bait of chicken feathers and entrails at Clemson, S. C. and was the only skipper collected from dog carcasses in Tennessee by Reed (1958).

The hesperiids often visited the carcasses without feeding or alighting on the pigs but merely alighting on cages or ground. *E. clarus* and *A. metacomet* were collected from carrion in water and from pigs suspended from trees at 4–10 feet.

SPHINGIDAE.—One species, *Amphion nessus*, was a common visitor to the decaying carcasses. *A. nessus* arrived at the soupy carrion in the late afternoon before sunset, while the other moths were night visitors only. This sphingid was attracted to carrion in water and those pigs suspended from trees at four feet. As many as three moths have been observed feeding simultaneously on one pig carcass. *A. nessus* and *Sphecodina abbotti* (Swainson) were taken from dog carcasses in Tennessee (Reed, 1958).

NOCTUIDAE.—Only one noctuid, *Palthis asopialis*, was collected from pig carrion. Three specimens were collected; two were observed at night on the dried carcass and one was found beneath the carcass during the daylight hours. They were not observed feeding. Underwing moths, *Catocala fraxini* L., have been reported feeding on dead fish in Russia (Remington, 1947). No underwings were observed by us on dead pigs although they were present at the carcass site.

GEOMETRIDAE.—Three species, *Mellilla xanthometata*, *Anavitrinella pampinaria*, and *Epimecis virginaria*, were observed feeding on carrion on the ground, in the water, and suspended from trees. *A. pampinaria* was the dominant geometrid attracted to carrion at night. These geometrids were often observed feeding on the carrion fluids which had drained to the soil. The only geometrid taken from carcasses by Reed (1958) was *Melanolophia canadaria* Guenée.

PYRALIDAE: PYRAUSTINAE.—Two species, *Desmia funeralis* and *Anageshna primordialis*, were taken from pig carrion. *D. funeralis* was collected from carcasses in the water and those suspended from trees at four feet, and was even collected from a chicken feathers and entrails bait.

TINEIDAE.—Three species, *Tinea* sp., *Acedes fuscipunctella*, and *Acedes pallescentella*, were associated with the carcasses exposed on the ground and those suspended from trees 4–52 feet, during the late stages of decomposition. They even completed a life cycle on the carcasses. Their larvae fed upon the remaining dried carrion tissues, skin, and hair; they also constructed larval cases from bits of pig hair and skin. Adults were not observed feeding on carrion but were taken from the water containing dead pigs.

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LITERATURE CITED

- CHERMOCK, R. L., 1952. The use of bait to attract butterflies. *Lepid. News*, 6(1): 32–33.
- CLARK, A. H., 1932. The butterflies of the District of Columbia and vicinity. U. S. Natl. Mus., Bull. 157, 337 p.
- FIELD, W. D., 1938. A manual of the butterflies and skippers of Kansas. Bull. Univ. Kansas, Lawrence, 39(10), 328 p.
- HOLLAND, W. J., 1931. The butterfly book. Doubleday and Co., Garden City, New York, 424 p.
- KLOTS, A. B., 1951. A field guide to the butterflies. Houghton-Mifflin Co., Boston, 349 p.
1958. The world of butterflies and moths. McGraw-Hill Co., New York, 207 p.
- MACY, R. W. & H. H. SHEPARD, 1941. Butterflies. Univ. of Minn. Press, Minneapolis, 247 p.
- PAYNE, J. A., 1965. A summer carrion study of the baby pig, *Sus scrofa* Linnaeus. *Ecology*, 46: 592–602.
- PAYNE, J. A. & D. A. CROSSLEY, JR., 1966. Animal species associated with pig carrion. ORNL-TM-1432, 70 p. Oak Ridge National Laboratory, Oak Ridge, Tenn.
- REED, H. B., JR., 1958. A study of dog carcass communities in Tennessee, with special reference to the insects. *Amer. Midland Natur.* 59: 213–245.
- REINTHAL, W. J., 1966. Butterfly aggregations. *J. Res. Lepid.*, 5(1): 51–59.
- REMINGTON, C. L., 1947. General Notes. *Lepid. News*, 1(3): 34.
- SAUNDERS, A. A., 1932. Butterflies of the Allegheny State Park. New York State Museum Hdbk., Albany, 270 p.