

the latter part of August and early September. The bivoltine condition prevails in Washington State as well (MacNeill, *op. cit.*).

At Penticton, the observed nectar sources visited by adults of this skipper comprise two groups of plants in particular; namely, phlox and knapweed. During the flight period of the first generation, the major nectar source is *Phlox longifolia* Nutt. This plant possesses pink or lavender-coloured blossoms from May into June, and it is found abundantly as far north in the dry interior as Peachland (Lyons 1974, Trees, shrubs and flowers to know in British Columbia, J. M. Dent & Sons (Canada) Ltd., Toronto, Vancouver). During the flight period of the second generation, the predominant flowering plant is one of several species of knapweed. At an observation site near the Penticton Industrial Park, the knapweed present is diffuse knapweed, *Centaurea diffusa* Lam. This Eurasiatic plant is common in southern British Columbia, and individual plants possess either white or purplish flowers (Frankton & Mulligan 1970, Weeds of Canada, Canada Department of Agriculture Publ. 948).

The Sabuleti Skipper seems to have pioneered this territory successfully, presuming that it truly was absent during the time of previous faunal studies. A rapid flying, small species of skipper, it is difficult to capture. However, it has recently been numerous in and around developed and inhabited areas, making it difficult to overlook. To accomplish a pioneering extension of range, the adults of this species had to be able to find adequate nectar sources during two periods of the growing season. Without a substantial and acceptable nectar source in the fall, second generation adults presumably would starve. Diffuse knapweed is the only abundant nectar source that this skipper has been observed to visit during the fall in the vicinity of Penticton. The presence of this particular species of introduced knapweed, therefore, may have been directly associated with the success of northward pioneering and apparent establishment by this skipper in the dry interior region of British Columbia.

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LARVAL HIBERNATION OF GEOMETRIDAE IN EASTERN UNITED STATES

Over the past few years, I often encountered partially grown gray stick-like geometrid larvae in autumn well after leaf fall at various localities in Pennsylvania, New Jersey, and Massachusetts. Similarly, such larvae were also found in early spring before leaf development. They were found hanging by silken threads from low limbs or shrubs or on my clothing in fall and crawling actively in spring.

I placed such larvae in small glass jars with tight lids and left them outside for the winter. Absorbent paper was placed in the jar for the larva to rest on. The larvae usually spun silken pads and attached themselves to the paper. The paper was occasionally dampened, often by placing a small amount of melting snow in the jar. The larvae usually survived until spring but most died in March, apparently from desiccation or excessive exposure to sunlight resulting in part from neglect.

The few surviving ones were fed in spring whatever deciduous trees or shrubs that were readily available. In all cases mixtures of *Rosa* spp., *Pyrus* spp., *Prunus*

spp., and *Quercus* spp. formed the bulk of the diet. From seven larvae so fed, the following results were obtained. One of two apparently identical larvae from a small series taken on a sugar maple (*Acer saccharum*) from 28 October–1 November 1974 at Sunderland, Franklin Co., Massachusetts eclosed in late May 1975 as a melanic of a *Hypagyrtis* sp., probably *H. unipunctata* (Haworth). The other larva died in May after the last molt and is preserved at the Peabody Museum of Natural History at Yale University.

Another moth of this genus was reared from a larva found on white oak (*Quercus alba*) at Glendale, Camden Co., New Jersey on 30 November 1975. The larva fed on the usual plants and also molted once in addition to pupation. Ecdysis was in June 1976. The specimen is a female of the powdery brown form common in and near the New Jersey Pine Barrens. Many other identical appearing larvae were collected earlier in November in Cape May Co., New Jersey mostly on white oak. These died from mold in February. I tentatively identified the reared moth as *Hypagyrtis pustularia* Hübner.

A larva found on my clothes at Leverett, Franklin Co., Massachusetts 10 November 1973 eclosed the following May as *Protoboarmia porcelaria* Guenée. The larva molted once or twice before the pupal molt. It fed in the spring on all of the food plants mentioned. A similar, but more mature larva was found on 25 March 1974 at Batsto, Burlington Co., New Jersey. It was crawling on the twigs of *Leucothoe racemosa* on which the flower racemes were just beginning to grow. These proved to be suitable as food in the laboratory. This larva was parasitized by a tachinid, and its identity was not definitely established.

On 22 April 1974 large gray geometrid larva with short lateral filaments was found on an apple limb at Amherst, Massachusetts. The tree had partially expanded leaves at the time, which were the bulk of the diet of this larva in the laboratory. It eclosed in late May as a *Campaea perlata* Guenée. It did not molt prior to pupation.

Finally, on 20 April 1975 a large, rather slender gray larva with a protuberance on one thoracic segment was found crawling in a blueberry (*Vaccinium vacillans*) patch on the barrens at Batsto, New Jersey. The spring was quite late, and the only plants with any new growth in the immediate area were *Leucothoe racemosa*, whose racemes had partially expanded in late February. This larva was reared to adult, chiefly on *Pyrus* spp. *Prunus serotina* and *Vaccinium corymbosum* were also offered and eaten freely. It molted once. The moth eclosed very late in May as *Euchlaena astylusaria* Walker, a female of the tan form.

Unfortunately, detailed descriptions are not available for the above larvae. All were marked solely with gray, black, and brownish shades. All rested in the typical stick-mimicking posture of many Geometridae.

Besides the larval hibernation, I have noticed another similarity between these species, namely that all have two generations in the above areas, and adults of the spring flight period are larger in size than those of the later emergence. This is especially pronounced in females of *Campaea perlata*. It seems likely that this phenomenon is the direct result of feeding on superior quality spring foliage.

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