SURVEY OF LYMANTRIA OBFUSCATA AND ITS NATURAL ENEMIES IN INDIA

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The status of Lymantria obfuscata Walker in India is discussed. Notes on its taxonomy, distribution, life-history and economic importance are given for comparison with those of the gypsy moth, Lymantria dispar (L.). Parasites of L. obfuscata in India are reviewed. A survey in 1961-66 revealed an additional 50 species of natural enemies of L. obfuscata in India. The incidence and biology of some of the important ones are presented. A comparison is made between these parasites and those of L. dispar. Some of the natural enemies of L. obfuscata already attack L. dispar in America. Others are closely related to the parasites of the gypsy moth. The scope for utilisation of parasites of L. obfuscata in other countries is discussed. Possible use of parasites of L. dispar from the U.S.A. or elsewhere against L. obfuscata in India is suggested.

KEY WORDS: Lymantria obfuscata, Lymantria dispar, natural enemies, biological control.

Attempts to control the gypsy moth, Lymantria dispar (L.) (Lep.: Lymantriidae), in the U.S.A. by introducing parasites have been unsuccessful. Rao (1958) suggested that studying the natural enemies of Lymantria obfuscata Walker in India might reveal other species for releasing in the U.S.A. and Pimentel (1963) suggested that a search for parasites and predators of closely allied species might be fruitful. Although a survey in 1961-66 revealed several species of Lymantriidae, only L. obfuscata was closely related to L. dispar.

This paper presents observations made during the survey which revealed a large number of egg, larval, and pupal parasites of L. obfuscata, some of which were the same as, or closely related to, those of L. dispar. A brief summary of this survey and related investigations in India has been reported elsewhere (Reardon, 1981).

OBSERVATIONS ON LYMANTRIA OBFUSCATA

TAXONOMY AND DISTRIBUTION

Although the Commonwealth Institute of Entomology Distribution Map (Anon, 1953) shows the southern limit of L. dispar as northern India, Nagaraja et al. (1968) showed that

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L. obfuscata occurs in the Western Himalayas. This was confirmed using serological methods (Kurian & Sirsi, 1970, 1971).

L. obfuscata is restricted to northwestern Himalayas and southern India. In contrast, L. dispar, occurs throughout the Palaearctic region as far east as the Altai Mountains and the Caspian Sea and in the extreme east of Asia, including Japan.

Habitat

The limited range of L. obfuscata suggests narrow ecological tolerances. Three study areas were chosen, Srinagar in Kashmir, Kotgarh in Himachal Pradesh and the Kulu Valley in Himachal Pradesh.

The Kashmir Valley, about 1,600 m altitude, is traversed by the Jhelum River and numerous fast-moving, snow-fed, streams from the surrounding mountains. The valley is snow-bound during the major part of winter, but is easily accessible from spring onwards. The most conspicuous elements in the flora are avenues of Populus spp. and abundant willows amongst the trees harbour egg masses of L. obfuscata. Collections were made from trees within a radius of about 60 km around Srinagar.

In the areas around Kotgarh, at altitudes of 1,400-2,000 m, L. obfuscata occurred on trees within 5-10 km of the banks of the Sutlej River. Its principal hosts were oaks scattered along the slopes, banks of rivulets and also in fields. A few willows were attacked. Larvae sheltered in crevices of tree trunks and beneath stacks of firewood, felled logs, solitary boulders and loosely piled stones alongside infested oaks.

In the Kulu valley, at altitudes of 1,200-1,600 m, L. obfuscata fed on alder (Alnus nitida Endler), alongside the Beas River between Bhunter and Manali. Pebbles and boulders in the dried-out parts of the river-bed offered ideal places for the congregation of larvae. Such sites enabled larvae to be detected easily and collected in large numbers. Other food plants were Salix spp., Quercus sp. and Robinia spp. but damage to these was negligible.

Economic Importance

L. obfuscata larvae defoliated poplar and willows in Kashmir, oak at Kotgarh and alder at Kulu. Many trees were killed by repeated defoliation during the study period and growth of infested trees was retarded. Larvae also fed on false acacia (Robinia pseudoacacia L.) and when their populations reached abnormally high numbers, they also fed on apple (Pyrus malus L.), cherry (Prunus avium L.), mulberry (Morus alba L.), pear (Pyrus communis L.), plum (Prunus domestica L.), rose (Rosa spp.) and walnut (Juglans regia L.). In south India, L. obfuscata has been recorded on cacao (Prem Kumar, 1974) and cashew (Misra & Basu Choudhuri, 1974). However, its attacks on this crop in India were not as severe as those of L. dispar in North America.

Beeson (1941) also recorded L. obfuscata larvae defoliating willows in Kashmir and then moving to other plants, such as apple, cherry, mulberry, pear, plum or walnut.

Life-history

L. dispar and L. obfuscata have much in common. The biology of L. dispar has been described in many publications, the first comprehensive account being that of Forbush & Fernald (1896). Life-cycle studies on L. obfuscata were made by Beeson (1941), Roonwal (1977) and Rishi & Shah (1982). Roonwal’s studies were made at Dehra Dun using egg masses brought from Kashmir and reared on unnatural food-plants, whereas the present observations were made in the area where the pest occurred.