

X Caterpillar Dermatitis X

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Since the time of ancient Greek medical writings contact with some caterpillars has been known to cause a rash. In recent years there have been very few reports in the literature, and we believe that few clinicians in this country are aware of the appearance and nature of caterpillar dermatitis and of the various caterpillars which can cause it. We here report an outbreak of an eruption affecting 30 children and adults, caused by contact with the yellow-tail moth caterpillar (*Euproctis similis*), and some more isolated cases due respectively to the garden tiger (*Arctia caja*), small egger (*Eriogaster lanestris*), and oak egger (*Lasiocampa quercus*) moth caterpillars. A series of patch tests have been carried out, and the cause of the condition is discussed.

Hermes and James (1961) give a list of caterpillars which have been responsible for rashes, but mention that many others might well have the same effect, and that with some species the "nettling" action may be mild, and therefore never reported. They list 16 species of caterpillars in Europe which have caused dermatitis, but many isolated cases of the condition are likely to have been unrecorded.

In *Modern Practice in Dermatology* (Mitchell-Heggs, 1950) caterpillar dermatitis is discussed by Dr. Sydney Thompson, and eight species of caterpillar are mentioned, including the oak egger. The brown tail moth caterpillar (*Euproctis chryso-rhoea*) is a common cause of such rashes in the U.S.A. and Europe (Tyzzer, 1907), and Smith (1966) described the cases of four gardeners who developed dermatitis from these caterpillars, present on vegetation they were handling, though one of the gardeners had only worked beneath a tree on which there were numerous caterpillars. Knight (1922) described a small outbreak of rashes in a group of seven people in the U.S.A. who had handled white-marked tussock moth caterpillars (*Haemero-campa leucostigma*).

In many cases of caterpillar dermatitis the rash is not severe, but, particularly in other countries, more dramatic cases and outbreaks have been recorded. In the southern United States *Megalopyge opercularis* may give rise to severe reactions (Lucas, 1942; Micks, 1952; McMillan and Purcell, 1964). Micks also mentions that at times these caterpillars have been so prevalent that schools have had to be closed. Caterpillars feeding on pine trees (*Thaumetopoea pinivora*) have led to outbreaks of severe dermatitis in forest workers in Israel (Katzenellebogen, 1955) and troops in Lebanon (Davis, 1947).

Usually the eruption occurs after contact with the caterpillar, but it may develop after handling the cocoons, and even from contact with the hairs deposited on clothing or towels, or carried by the wind. Hairs from adult moths have no nettling effect, but in the family Lymantridae, which includes the brown and yellow tail moths, the emerging female collects on her anal tuft caterpillar setae left in the cocoon. Later these are deposited round the eggs she lays (Eltringham, 1914; Clements, 1951). These ex-caterpillar hairs carried by moths may give rise to reactions, and Hill *et al.* (1948) describe an outbreak affecting 31 people on board an oil tanker which was invaded by a swarm of moths in South America.

Constitutional symptoms may occur with "stings" from the *Megalopyge opercularis* caterpillar, when severe pain, nausea,

sweating, headache, fever, shock, and even paralysis may arise (Bishop, 1923; Lucas, 1942; Micks, 1952). Occasionally caterpillar hairs involve the eye, causing inflammatory changes, and final loss of that organ (Corkey, 1955).

Case Reports

1. *Outbreak in a Yorkshire village affecting a group of children and adults, due to the yellow tail moth caterpillar (Euproctis similis).*

At least 22 children and eight adults were affected. These cases were first seen by the local practitioner, Dr. Mary Wells, who invited one of us to see some of the patients, and kindly provided a list of the affected patients in her practice. The outbreak occurred in June 1965, a large number of caterpillars having been present in the hedgerows round the village. Most of the children had been collecting or playing with the caterpillars, but some denied all direct contact with them, though other members of their families had had such contact. One sufferer was a baby who almost certainly had not touched caterpillars, but whose brother had done so, and whose mother had also had the rash. Generally speaking, those who had only indirect contact had a milder rash, but one mother had quite a severe one. She had three children, who had three separate appearances of the rash within about a fortnight, and the mother had not been completely clear of skin trouble for three weeks. The affected adults were always parents of children who had had the rash, usually the mother, though in one instance the father was also a sufferer.

The onset of the rash in children occurred about two or three days after contact with the caterpillars, and the parents usually showed signs after a further two or three days.

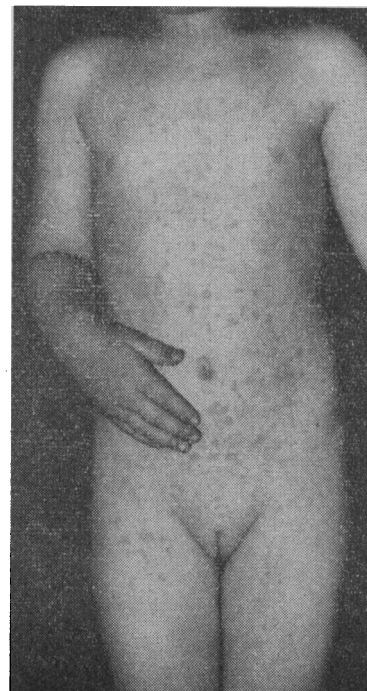


FIG. 1.—Widespread eruption from yellow tail moth caterpillar.

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The rash consisted of fine red papules, most pronounced on the arms and neck, but by no means limited to the exposed areas, and often spreading widely on to the trunk (Figs. 1 and 2). In addition to the fine papules there were many small weals, particularly on the trunk. Most of the children had no constitutional upset, but one or two were slightly feverish and off colour for a few days. The rash usually subsided in about a week, provided there was no further exposure.



FIG. 2.—Close-up of eruption from yellow tail moth caterpillar.

Specimens of the caterpillars were willingly provided by the children, and were identified as those of the yellow tail moth.

2. Mother and son with eruption due to the small egger moth caterpillar.

A boy aged 8 was first seen on 28 June 1965. Six days previously he had found numerous caterpillars and played with them, allowing them to crawl over his arms and neck. Itching began on the neck a few hours later, and next morning a rash developed over the neck, fingers, hands, and arms. He handled the caterpillars again during the next two days, and the eruption and itching increased. The rash continued to spread for a further three days, and at this time there were red papules profusely scattered over the body, especially on the forearms and sides of the neck. Some areas of skin were relatively clear, but apart from this there was no obvious grouping or linearity of lesions. Examination with a lens showed that many of the papules had a tiny black dot or line in the centre. In addition to the profuse papules, there were larger red weals, chiefly over the lower trunk and round the buttocks. No typical "target" was seen, but these lesions resembled those of erythema multiforme.

The rash continued to itch for the next four or five days but it gradually subsided, and after a week there was little to see except scratch marks. However, on careful examination with a lens a number of tiny black dots and lines could still be seen.

During this time some 20 caterpillars had been kept in a large container, and were those of the small egger moth. After the rash had been present for three days the boy's mother, suspecting the caterpillars to be the cause of the rash, stopped him handling them, and started to change the plant food daily herself, which necessitated picking up the caterpillars. A day later she developed an itching rash, particularly over the right arm and left side of the neck, and when seen after a further two days she had a similar rash to that of the boy on the fingers, hands, arms, and neck, worse on the right arm and the left side of the neck. Again grouping was not a feature and there was no linearity. The eruption consisted of red papules, some showing the tiny central dot or line, but there were none of the larger red weals which had been present on the boy. The rash cleared during the next week.

3. Isolated case due to unidentified caterpillar.

A week after we saw the above two cases a girl aged 5 attended the outpatient department with a rash over the fingers which had been present for a week. A papular eruption with a little scaling involved the backs and sides of the fingers, the backs of the hands, and, in patches, the front of the forearms. At first sight it could easily have been thought to be a resolving eczematous pampholyx, but many papules had tiny central spots or lines, and it was then discovered that on the day before the rash was noticed she had found some caterpillars, and had been collecting these in tins and playing with them during most of the afternoon. Unfortunately, none was available for identification.

4. Isolated case due to the garden tiger moth caterpillar.

In May 1965 a boy aged 13 had handled a caterpillar of the garden tiger moth, and a few hours later itching developed over the fingers, front of the forearm, and sides of the neck. The rash had the characteristics of the eruption described above, but was more obvious on the thumbs and index and middle fingers, the areas most in contact with the caterpillars. It settled slowly, and traces could be seen after two weeks.

5. A group of five boys with eruptions after handling oak egger moth caterpillars.

In September 1965 five boys aged 13 to 14, including the boy described under heading 4, came across a group of oak egger caterpillars and proceeded to capture these and then share them out. All five developed itching a few hours later, and the boy who handled the caterpillars most had a profuse rash over the fingers and thumbs. The eruption was observed regularly over the next two weeks, and it was noted that the tiny central spot or line became more apparent after the eruption started to settle down in a few days. The itching lasted three to four days, but the papules and slight scaling did not completely clear until after two weeks.

Patch Tests

1. Patch tests were carried out on 10 normal volunteers with pieces of caterpillar about 2–4 mm. across, and the routine Dalmas patch tests were applied to the front of the forearms. Two series of tests were applied at different times to small egger, and also to white ermine (*Spilesoma lubricipeda*) moth caterpillars. Both caterpillars evoked the same type of response. Six subjects had itching after a few hours and a red wealed area when the test patches were removed after 48 hours. Four subjects appeared to have no reaction when the patch was removed, but in the next few hours they began to itch and a weal developed similar to that of the more immediate reactors. The degree of reaction and itching varied in intensity from subject to subject.

2. Patch tests were carried out in a similar way on six normal subjects with pieces of the yellow tail moth caterpillar and also bunches of hairs from them. All six subjects showed marked red itching reactions within 48 hours which took a week or more to subside. In two a fine papular eruption developed on the inner upper arm below the patch-test area, possibly due to hairs falling from the test patch while it was being applied.

Discussion

The poisonous hairs or setae of the caterpillars are hollow cuticular tubes, and it is these which pierce the skin. Setae from which material has been extracted by water or alcohol do not cause any reaction, and the nature of the substance injected has been carefully investigated, notably by Goldman *et al.* (1960). Their conclusion in connexion with *Hemileuca maia* is that the toxin probably does not contain histamine, serotonin, or 5-hydroxytryptamine; a polypeptide is suspected. However,

other caterpillars may have a different type of venom—for example, Valle *et al.* (1954) showed the presence of histamine in setae of *Dirphia*.

Our own observation strongly suggests that the material injected acts as a primary irritant or pharmacologically active chemical. From the various cases and outbreaks it would seem that all the people who were in sufficient contact developed the rash, but some reacted more vigorously than others. The patch-test results confirm this impression, and all the subjects tested showed some reaction.

It is interesting that four tests were negative when the patches were removed at 48 hours, but a reaction developed a few hours later. It was felt that the material of the test patch had protected the site, and when it was removed the setae lying on the surface were driven into the skin by friction from clothing. However, against this simple mechanical explanation, Goldman *et al.* (1960) noted some cases which had a delayed positive patch test to the reactive part of the paper chromatogram of the caterpillar extract.

We have described four different types of caterpillars causing the eruption, and it would seem likely that it can occur from most of the hairy caterpillars, though presumably the toxic agents are more irritant or more plentiful in some species and perhaps at certain periods in their development. Also, with most chemical agents, some people will react more vigorously than others.

Caterpillars are present throughout the summer, but the habits of each species vary. The small egger moth, for example, passes the winter as the chrysalis, while others, such as the garden tiger, oak egger, and brown and yellow tail, usually hibernate as caterpillars. Some caterpillars, including the brown and yellow tail, live in common nests until fully grown, when they wander off independently. The times vary, therefore, when active fully grown caterpillars of each species are about, but June is perhaps the commonest month for caterpillar dermatitis to occur in this country. The number of caterpillars of one species varies considerably from locality to locality and year to year, and other gradual changes occur, such as in recent years the increasing prevalence of the brown tail moth. Presumably, many factors contributed to the very large number of yellow tail moth caterpillars which were present at the time of the outbreak described above.

Many textbooks describe the rash as eczematous, and as often occurring in streaks. In our cases the eruption consisted of randomly scattered papules, the grouping of which depended on the main site of contact. The central tiny dots and lines, presumably at the site of the penetrating hairs, are more easily seen after a few days, when the reaction is starting to subside. There is a little scaling in the later stages. The erythema-multiforme-like lesions, which were a prominent feature in the case of the boy described under heading 2, who had such a profuse eruption, are presumably a toxic allergic phenomenon; similar lesions have been described in association with reactions to many biting and stinging insects. It would be very easy to miss isolated cases of caterpillar dermatitis, and the patient may well not mention contact with caterpillars, unless special inquiries are made. There are a number of descriptions in the literature of papular eruptions affecting younger children, chiefly on exposed sites and often associated with outdoor activities, notably the cases recorded by Gianotti (1955, 1956), and Crosti and Gianotti (1956). It has been suggested by Niels Hjorth (1966) that some of these cases could be caused by contact with caterpillar hairs. It should also be noted how easily patients may contract the rash by indirect contact. At least eight parents, seven of them mothers, were affected,

probably through handling the children's clothes, though it might have been through touching the children themselves. It may be difficult to convince a patient who has never touched a caterpillar that this is the cause of the rash.

Summary

Dermatitis due to handling caterpillars is described in: (1) an outbreak involving at least 22 children and eight adults, due to handling the yellow tail moth caterpillar (*Euproctis similis*); it is probable that the adults were affected by indirect contact through the children's clothes, etc.; (2) a son and his mother after contact with small egger moth caterpillars (*Eriogaster lanestris*); (3) a young girl who had been playing with unidentified caterpillars; (4) a boy after handling a garden tiger moth caterpillar (*Arctia caja*); and (5) five boys who had been sharing out a "find" of oak egger moth caterpillars (*Lasiocampa quercus*).

Patch tests carried out on volunteers showed at all tested sites a reaction to the three caterpillars used—namely, the small egger, yellow tail, and white ermine.

The poisonous hairs of the caterpillars are hollow cuticular tubes which pierce the skin. The nature of the substance injected is not fully known, but the reaction appears to be due to a primary irritant or pharmacologically active substance rather than an allergic response.

Though the reaction will be more severe from some species, it is likely that most hairy caterpillars can produce dermatitis. The habits of the different species vary considerably, and caterpillar dermatitis may be met with at any time in summer or autumn, but it is commoner in June.

The eruption consists of scattered papules, which are not linear, but may show grouping, depending on the main site of contact. Tiny central dots and lines, presumably at the site of the penetrating hairs, can often be seen. Erythema-multiforme-like lesions over the trunk and buttocks occurred in one patient.

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